

ANADARKO PETROLEUM CORP

WELD COUNTY (NAD 83)

SE SW SEC. 13 T1N R67W 6th P.M.

QUARTER CIRCLE 24-9HZ

JOB # 2018-309-461

15 June, 2018

Survey: FINAL SURVEYS





Project: WELD COUNTY (NAD 83)
Site: SE SW SEC. 13 T1N R67W 6th P.M.
Well: QUARTER CIRCLE 24-9HZ
Wellbore: JOB # 2018-309-461
Design: FINAL SURVEYS

ANNOTATIONS

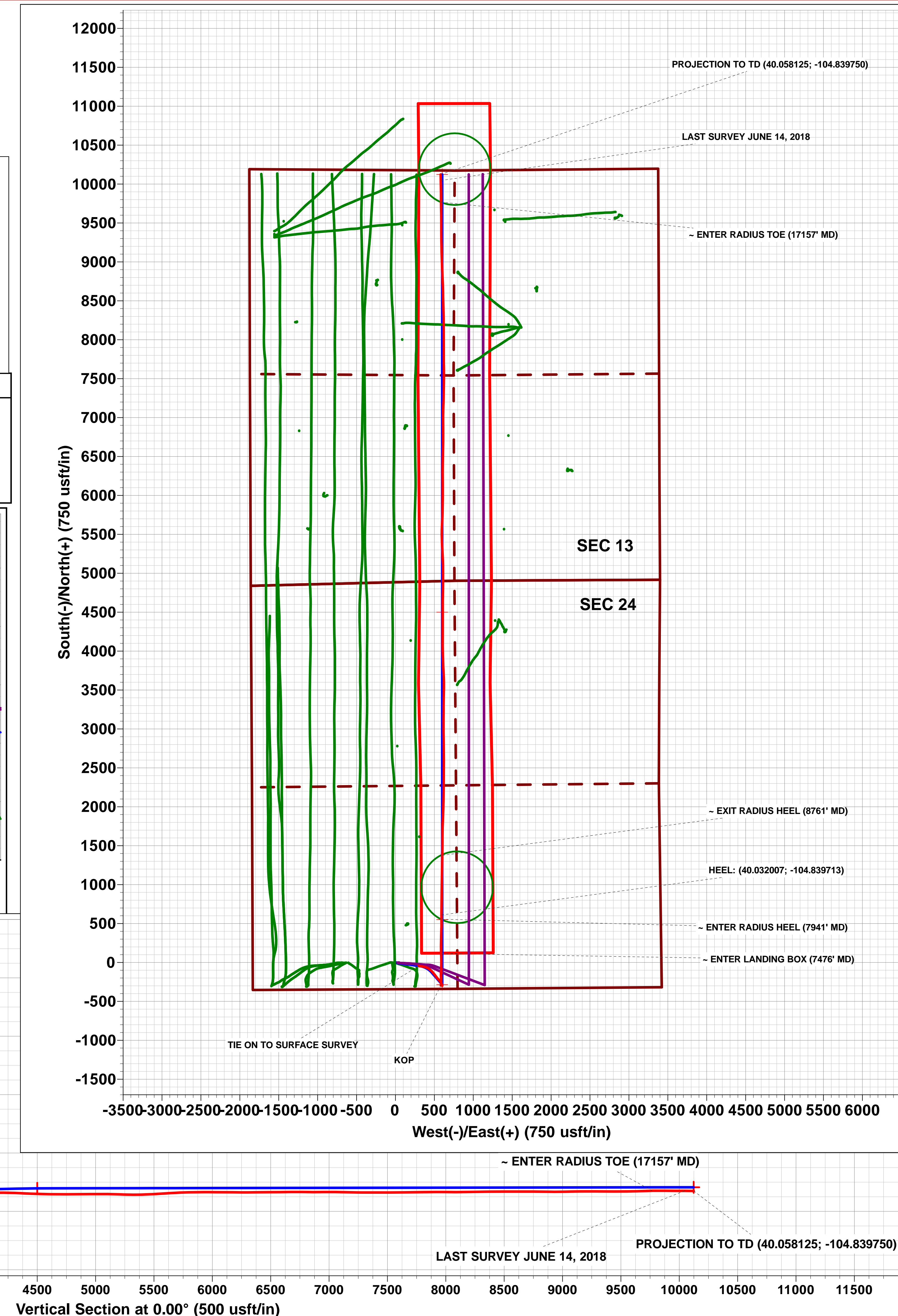
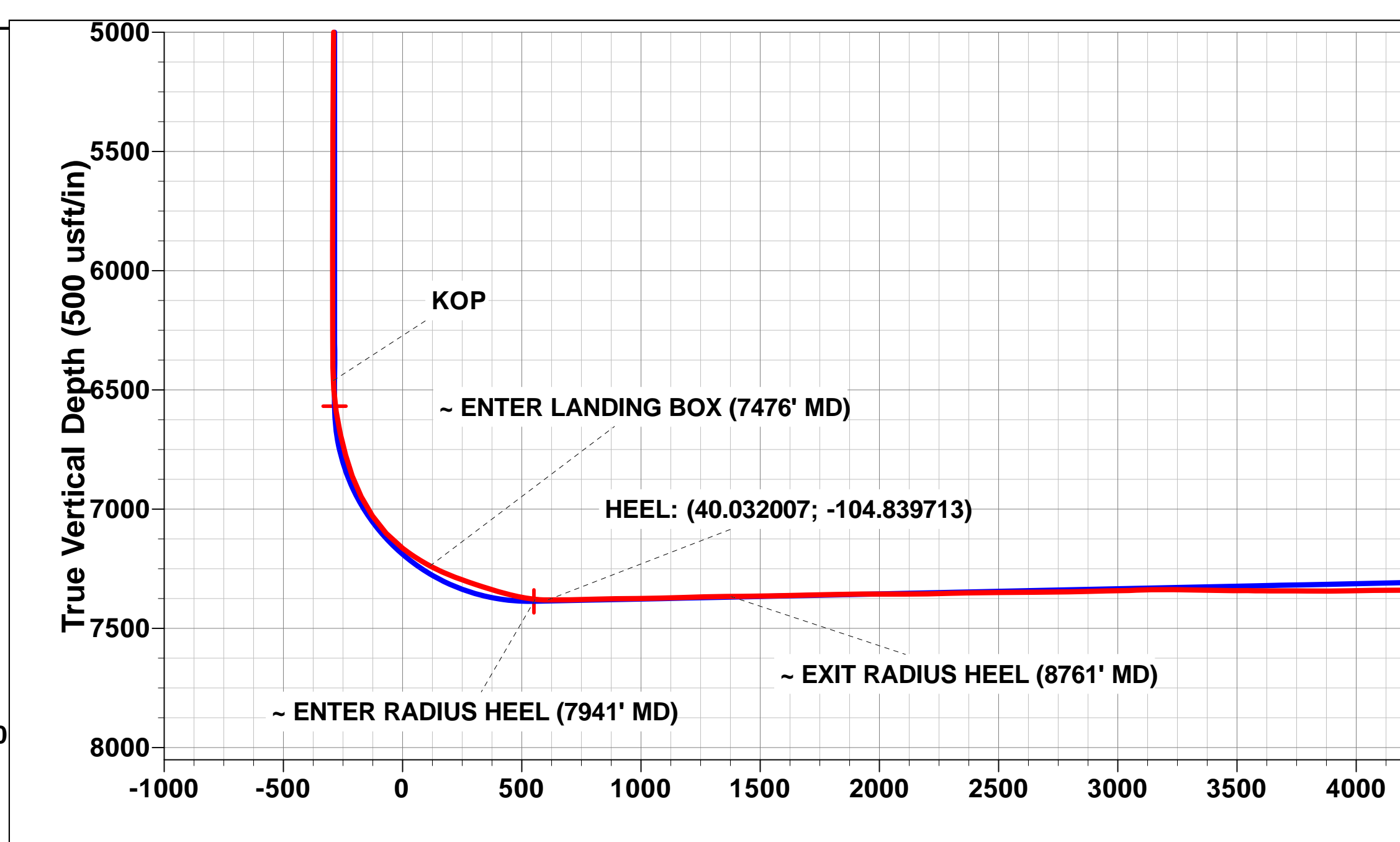
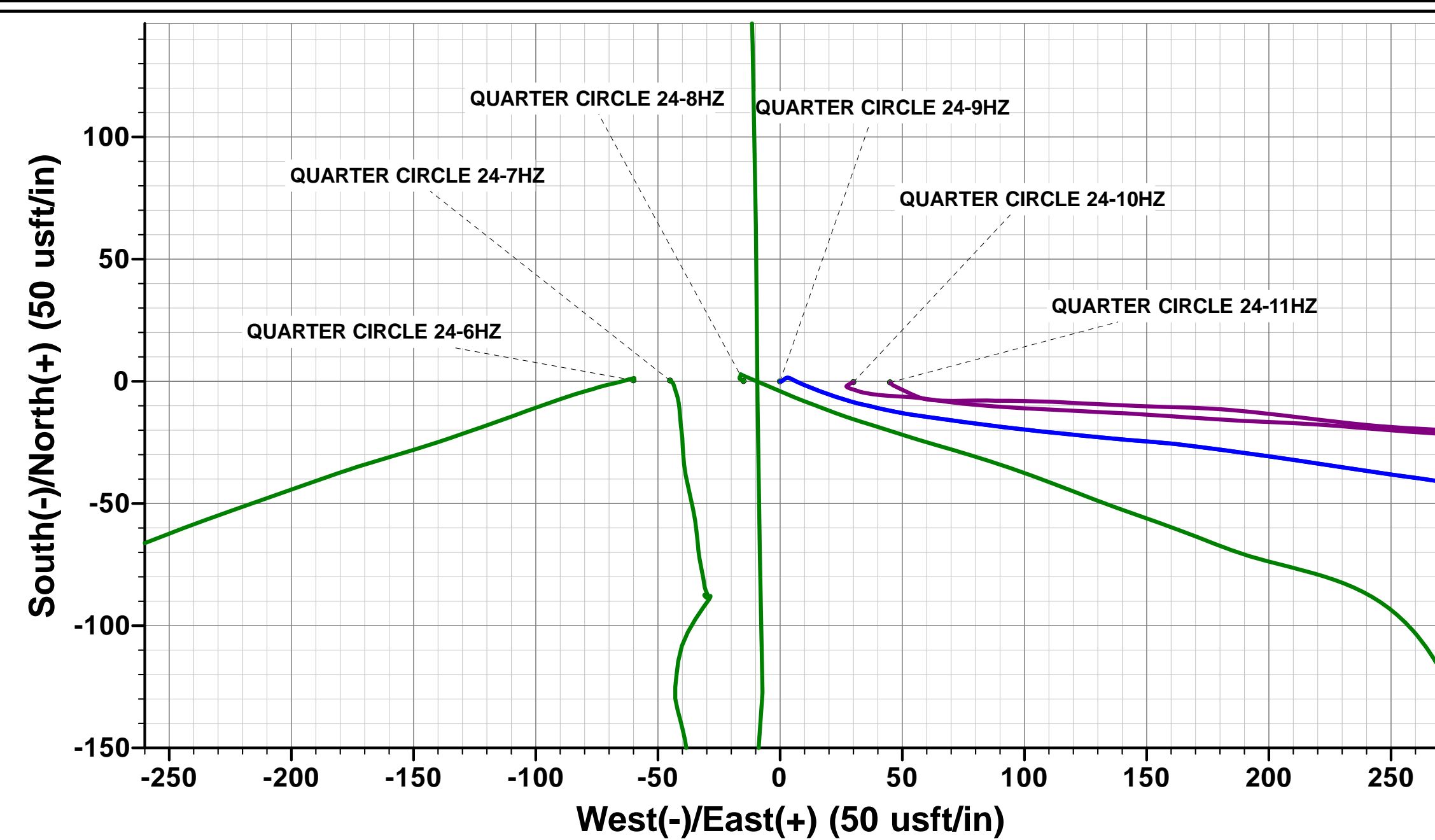
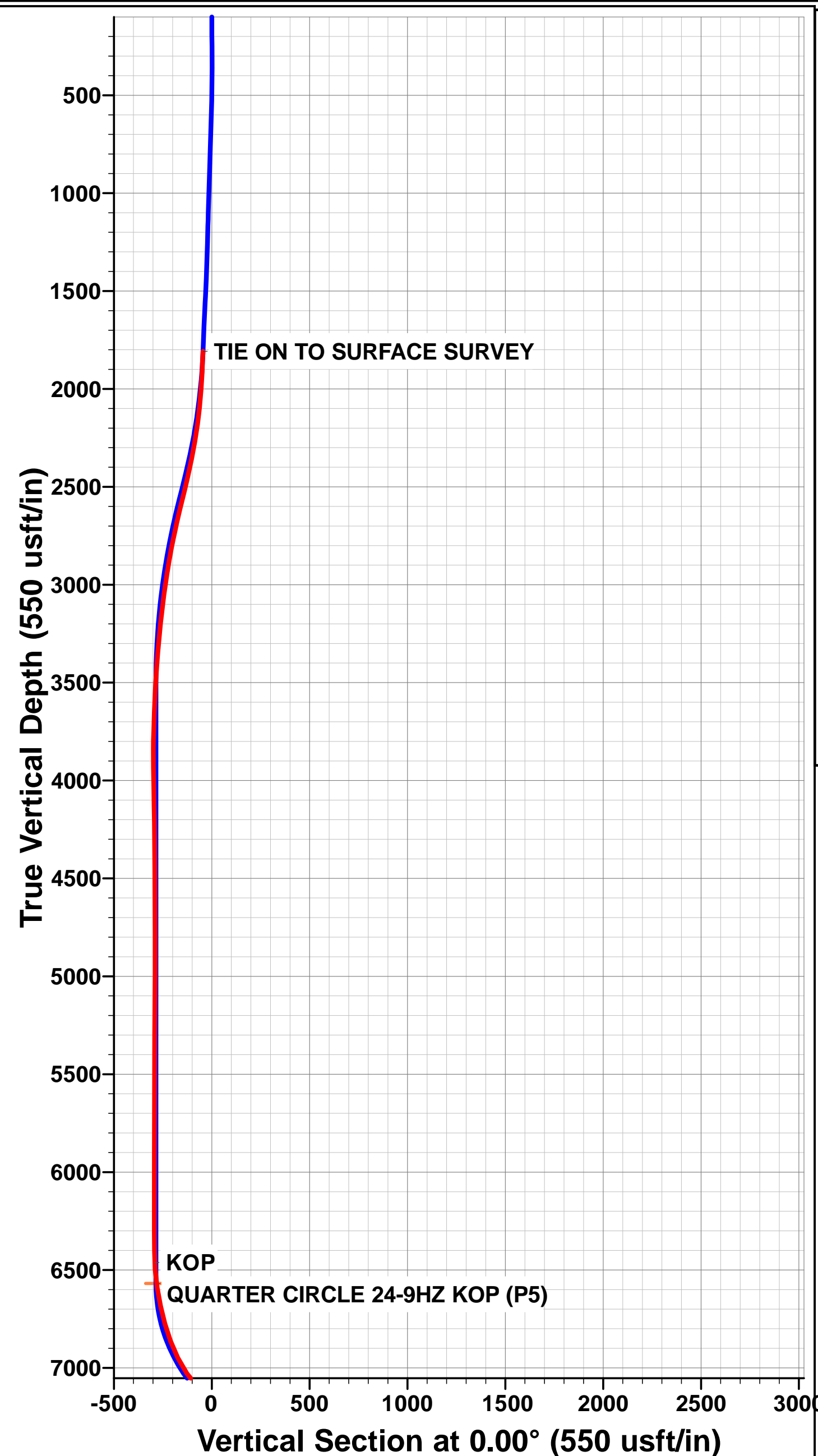
TVD	MD	Inc	Azi	+N/-S	+E/-W	VSec	Departure	Annotation
1807.7	1847.0	17.09	97.79	-44.6	299.0	-44.6	0.0	TIE ON TO SURFACE SURVEY
6461.6	6555.0	2.47	8.95	-290.7	585.8	-290.7	447.4	KOP
7238.7	7476.0	61.94	358.54	115.2	587.3	115.2	854.0	~ ENTER LANDING BOX (7476' MD)
7378.8	7941.0	84.36	359.78	556.5	592.1	556.5	1294.9	~ ENTER RADIUS HEEL (7941' MD)
7381.4	7994.0	90.00	359.50	609.4	591.8	609.4	1347.6	HEEL: (40.032007; -104.839713)
7366.9	8761.0	90.02	0.82	1376.2	602.1	1376.2	2114.5	~ EXIT RADIUS HEEL (8761' MD)
7324.1	17157.0	91.09	359.56	9768.7	585.9	9768.7	10508.9	~ ENTER RADIUS TOE (17157' MD)
7325.0	17434.0	89.70	358.90	10045.7	582.6	10045.7	10785.9	LAST SURVEY JUNE 14, 2018
7325.4	17512.0	89.70	358.90	10123.6	581.1	10123.6	10863.9	PROJECTION TO TD (40.058125; -104.839750)

AS DRILLED LOCAL COORDINATES:

SHL: 343ft FSL & 1834ft FWL Sec 24
HEEL: 949.5ft FSL & 2428.3ft FWL Sec 24
BHL: 51ft FNL & 2457.8ft FWL Sec 13

WELLBORE TARGET DETAILS (LAT/LONG)

Name	TVD	+N/-S	+E/-W	Latitude	Longitude
QUARTER CIRCLE 24-9HZ BHL (P5)	7294.0	10123.4	600.3	40° 3' 29.246 N	104° 50' 22.852 W
QUARTER CIRCLE 24-9HZ HEEL (P5)	7387.0	550.9	600.5	40° 1' 54.648 N	104° 50' 22.852 W
QUARTER CIRCLE 24-9HZ INT PT (P5)	7303.0	4500.0	600.5	40° 2' 33.674 N	104° 50' 22.851 W
QUARTER CIRCLE 24-9HZ KOP (P5)	6568.7	-285.2	600.5	40° 1' 46.386 N	104° 50' 22.852 W



Survey Report



Company:	ANADARKO PETROLEUM CORP	Local Co-ordinate Reference:	Well QUARTER CIRCLE 24-9HZ
Project:	WELD COUNTY (NAD 83)	TVD Reference:	KB 20' @ 4961.0usft (PD461)
Site:	SE SW SEC. 13 T1N R67W 6th P.M.	MD Reference:	KB 20' @ 4961.0usft (PD461)
Well:	QUARTER CIRCLE 24-9HZ	North Reference:	True
Wellbore:	JOB # 2018-309-461	Survey Calculation Method:	Minimum Curvature
Design:	FINAL SURVEYS	Database:	EOG RESOURCES

Project	WELD COUNTY (NAD 83)		
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)	Using geodetic scale factor	

Site	SE SW SEC. 13 T1N R67W 6th P.M.				
Site Position:		Northing:	14,537,819.11 usft	Latitude:	40° 1' 49.208 N
From:	Lat/Long	Easting:	1,684,634.02 usft	Longitude:	104° 50' 31.343 W
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16"	Grid Convergence:	0.10 °

Well	QUARTER CIRCLE 24-9HZ					
Well Position	+N/-S	0.0 usft	Northing:	14,537,818.81 usft	Latitude:	40° 1' 49.204 N
	+E/-W	0.0 usft	Easting:	1,684,693.97 usft	Longitude:	104° 50' 30.572 W
Position Uncertainty		0.0 usft	Wellhead Elevation:	usft	Ground Level:	4,941.0 usft

Wellbore	JOB # 2018-309-461				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	17/05/2018	8.12	66.52	52,086

Design	FINAL SURVEYS			
Audit Notes:				
Version:	1.0	Phase:	ACTUAL	Tie On Depth: 1,847.0
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.0	0.0	0.0	0.00

Survey Program	Date	15/06/2018			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
128.0	1,847.0	FINAL SURVEYS - SURFACE (JOB # 201	APC_ISCWSA REV 2 MWD+	Fixed:v2:crustal field declination	
1,960.0	17,512.0	FINAL SURVEYS (JOB # 2018-309-461)	APC_ISCWSA REV 2 MWD+	Fixed:v2:crustal field declination	

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	Subsea Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
TIE ON TO SURFACE SURVEY										
1,847.0	17.09	97.79	1,807.7	3,153.3	-44.6	299.0	-44.6	0.00	0.00	0.00
1,960.0	19.00	98.10	1,915.1	3,045.9	-49.4	333.6	-49.4	1.69	1.69	0.27
2,053.0	18.50	102.50	2,003.2	2,957.8	-54.7	363.0	-54.7	1.61	-0.54	4.73
2,147.0	17.80	108.90	2,092.5	2,868.5	-62.6	391.2	-62.6	2.25	-0.74	6.81
2,240.0	16.20	117.10	2,181.5	2,779.5	-73.1	416.2	-73.1	3.10	-1.72	8.82
2,332.0	16.20	126.50	2,269.8	2,691.2	-86.6	437.9	-86.6	2.85	0.00	10.22
2,426.0	16.30	136.00	2,360.1	2,600.9	-103.9	457.6	-103.9	2.83	0.11	10.11
2,519.0	16.40	138.40	2,449.3	2,511.7	-123.1	475.4	-123.1	0.73	0.11	2.58
2,614.0	17.40	142.10	2,540.2	2,420.8	-144.4	493.0	-144.4	1.55	1.05	3.89
2,708.0	17.00	141.80	2,630.0	2,331.0	-166.2	510.2	-166.2	0.44	-0.43	-0.32

Survey Report



Company:	ANADARKO PETROLEUM CORP	Local Co-ordinate Reference:	Well QUARTER CIRCLE 24-9HZ
Project:	WELD COUNTY (NAD 83)	TVD Reference:	KB 20' @ 4961.0usft (PD461)
Site:	SE SW SEC. 13 T1N R67W 6th P.M.	MD Reference:	KB 20' @ 4961.0usft (PD461)
Well:	QUARTER CIRCLE 24-9HZ	North Reference:	True
Wellbore:	JOB # 2018-309-461	Survey Calculation Method:	Minimum Curvature
Design:	FINAL SURVEYS	Database:	EOG RESOURCES

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	Subsea Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
2,802.0	15.60	141.30	2,720.2	2,240.8	-186.9	526.6	-186.9	1.50	-1.49	-0.53
2,894.0	14.30	139.80	2,809.1	2,151.9	-205.2	541.6	-205.2	1.47	-1.41	-1.63
2,988.0	12.10	141.40	2,900.6	2,060.4	-221.8	555.3	-221.8	2.37	-2.34	1.70
3,083.0	10.60	139.40	2,993.8	1,967.2	-236.2	567.2	-236.2	1.63	-1.58	-2.11
3,177.0	8.80	146.60	3,086.4	1,874.6	-248.8	576.8	-248.8	2.31	-1.91	7.66
3,272.0	6.80	150.00	3,180.5	1,780.5	-259.7	583.6	-259.7	2.16	-2.11	3.58
3,366.0	6.10	153.30	3,274.0	1,687.0	-269.0	588.6	-269.0	0.84	-0.74	3.51
3,461.0	5.20	150.00	3,368.5	1,592.5	-277.3	593.0	-277.3	1.01	-0.95	-3.47
3,556.0	4.00	151.40	3,463.2	1,497.8	-283.9	596.8	-283.9	1.27	-1.26	1.47
3,649.0	3.00	163.80	3,556.0	1,405.0	-289.1	599.0	-289.1	1.34	-1.08	13.33
3,743.0	2.20	174.00	3,649.9	1,311.1	-293.2	599.9	-293.2	0.98	-0.85	10.85
3,838.0	1.70	179.60	3,744.9	1,216.1	-296.5	600.1	-296.5	0.56	-0.53	5.89
3,932.0	0.60	189.20	3,838.8	1,122.2	-298.3	600.0	-298.3	1.18	-1.17	10.21
4,027.0	1.20	10.90	3,933.8	1,027.2	-297.9	600.1	-297.9	1.89	0.63	-187.68
4,121.0	0.90	9.60	4,027.8	933.2	-296.2	600.4	-296.2	0.32	-0.32	-1.38
4,216.0	1.00	348.50	4,122.8	838.2	-294.6	600.4	-294.6	0.38	0.11	-22.21
4,310.0	1.00	321.40	4,216.8	744.2	-293.2	599.7	-293.2	0.50	0.00	-28.83
4,404.0	0.90	300.20	4,310.8	650.2	-292.2	598.6	-292.2	0.39	-0.11	-22.55
4,499.0	0.80	312.00	4,405.8	555.2	-291.3	597.4	-291.3	0.21	-0.11	12.42
4,593.0	0.50	303.90	4,499.8	461.2	-290.7	596.6	-290.7	0.33	-0.32	-8.62
4,686.0	0.50	321.20	4,592.8	368.2	-290.1	596.0	-290.1	0.16	0.00	18.60
4,780.0	0.80	286.20	4,686.8	274.2	-289.6	595.1	-289.6	0.52	0.32	-37.23
4,875.0	0.80	280.20	4,781.7	179.3	-289.3	593.8	-289.3	0.09	0.00	-6.32
4,969.0	0.80	287.60	4,875.7	85.3	-289.0	592.6	-289.0	0.11	0.00	7.87
5,086.0	1.00	253.90	4,992.7	-31.7	-289.0	590.8	-289.0	0.47	0.17	-28.80
5,181.0	0.60	231.00	5,087.7	-126.7	-289.6	589.6	-289.6	0.53	-0.42	-24.11
5,276.0	0.70	214.40	5,182.7	-221.7	-290.4	588.9	-290.4	0.22	0.11	-17.47
5,371.0	0.80	246.40	5,277.7	-316.7	-291.1	588.0	-291.1	0.45	0.11	33.68
5,465.0	1.00	242.40	5,371.7	-410.7	-291.8	586.6	-291.8	0.22	0.21	-4.26
5,558.0	1.10	251.70	5,464.7	-503.7	-292.4	585.1	-292.4	0.21	0.11	10.00
5,653.0	0.50	244.60	5,559.7	-598.7	-292.9	583.8	-292.9	0.64	-0.63	-7.47
5,748.0	0.30	80.80	5,654.7	-693.7	-293.0	583.7	-293.0	0.83	-0.21	-172.42
5,843.0	0.40	106.80	5,749.7	-788.7	-293.1	584.3	-293.1	0.19	0.11	27.37
5,937.0	0.30	99.90	5,843.7	-882.7	-293.2	584.8	-293.2	0.12	-0.11	-7.34
6,030.0	0.10	12.90	5,936.7	-975.7	-293.2	585.1	-293.2	0.33	-0.22	-93.55
6,124.0	0.10	82.80	6,030.7	-1,069.7	-293.1	585.2	-293.1	0.12	0.00	74.36
6,217.0	0.10	185.40	6,123.7	-1,162.7	-293.2	585.3	-293.2	0.17	0.00	110.32
6,310.0	0.10	73.90	6,216.7	-1,255.7	-293.2	585.3	-293.2	0.18	0.00	-119.89
6,403.0	0.10	117.20	6,309.7	-1,348.7	-293.2	585.5	-293.2	0.08	0.00	46.56
6,498.0	1.00	1.10	6,404.6	-1,443.6	-292.4	585.6	-292.4	1.10	0.95	-122.21
KOP										
6,555.0	2.47	8.95	6,461.6	-1,500.6	-290.7	585.8	-290.7	2.60	2.57	13.76
6,591.0	3.40	10.40	6,497.6	-1,536.6	-288.9	586.1	-288.9	2.60	2.59	4.04
6,685.0	9.00	5.20	6,591.0	-1,630.0	-278.8	587.2	-278.8	5.98	5.96	-5.53
6,779.0	12.30	358.80	6,683.4	-1,722.4	-261.5	587.7	-261.5	3.72	3.51	-6.81
6,872.0	15.30	356.90	6,773.7	-1,812.7	-239.3	586.8	-239.3	3.26	3.23	-2.04
6,965.0	20.00	359.50	6,862.3	-1,901.3	-211.2	586.0	-211.2	5.12	5.05	2.80
7,059.0	27.00	358.00	6,948.4	-1,987.4	-173.7	585.1	-173.7	7.47	7.45	-1.60
7,152.0	33.80	1.50	7,028.6	-2,067.6	-126.7	585.1	-126.7	7.55	7.31	3.76
7,246.0	42.80	4.80	7,102.3	-2,141.3	-68.6	588.4	-68.6	9.82	9.57	3.51
7,339.0	52.90	358.80	7,164.6	-2,203.6	0.1	590.3	0.1	11.86	10.86	-6.45
7,432.0	58.70	358.30	7,216.9	-2,255.9	77.0	588.4	77.0	6.25	6.24	-0.54

Survey Report



Company:	ANADARKO PETROLEUM CORP	Local Co-ordinate Reference:	Well QUARTER CIRCLE 24-9HZ
Project:	WELD COUNTY (NAD 83)	TVD Reference:	KB 20' @ 4961.0usft (PD461)
Site:	SE SW SEC. 13 T1N R67W 6th P.M.	MD Reference:	KB 20' @ 4961.0usft (PD461)
Well:	QUARTER CIRCLE 24-9HZ	North Reference:	True
Wellbore:	JOB # 2018-309-461	Survey Calculation Method:	Minimum Curvature
Design:	FINAL SURVEYS	Database:	EOG RESOURCES

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	Subsea Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
~ ENTER LANDING BOX (7476' MD)										
7,476.0	61.94	358.54	7,238.7	-2,277.7	115.2	587.3	115.2	7.38	7.37	0.54
7,527.0	65.70	358.80	7,261.2	-2,300.2	161.0	586.2	161.0	7.38	7.37	0.51
7,621.0	70.30	0.70	7,296.4	-2,335.4	248.1	585.9	248.1	5.24	4.89	2.02
7,714.0	72.20	1.50	7,326.3	-2,365.3	336.1	587.6	336.1	2.20	2.04	0.86
7,806.0	74.60	2.20	7,352.6	-2,391.6	424.2	590.4	424.2	2.71	2.61	0.76
7,900.0	80.00	0.00	7,373.2	-2,412.2	515.9	592.2	515.9	6.18	5.74	-2.34
~ ENTER RADIUS HEEL (7941' MD)										
7,941.0	84.36	359.78	7,378.8	-2,417.8	556.5	592.1	556.5	10.65	10.64	-0.54
HEEL: (40.032007; -104.839713)										
7,994.0	90.00	359.50	7,381.4	-2,420.4	609.4	591.8	609.4	10.65	10.64	-0.53
8,089.0	91.00	0.50	7,380.6	-2,419.6	704.4	591.8	704.4	1.49	1.05	1.05
8,183.0	91.80	0.50	7,378.3	-2,417.3	798.4	592.6	798.4	0.85	0.85	0.00
8,276.0	90.50	0.90	7,376.4	-2,415.4	891.3	593.7	891.3	1.46	-1.40	0.43
8,371.0	90.80	1.10	7,375.3	-2,414.3	986.3	595.4	986.3	0.38	0.32	0.21
8,463.0	91.20	1.00	7,373.7	-2,412.7	1,078.3	597.1	1,078.3	0.45	0.43	-0.11
8,556.0	92.00	0.80	7,371.1	-2,410.1	1,171.2	598.5	1,171.2	0.89	0.86	-0.22
8,650.0	91.70	1.20	7,368.1	-2,407.1	1,265.2	600.2	1,265.2	0.53	-0.32	0.43
8,742.0	89.80	0.90	7,366.9	-2,405.9	1,357.2	601.9	1,357.2	2.09	-2.07	-0.33
~ EXIT RADIUS HEEL (8761' MD)										
8,761.0	90.02	0.82	7,366.9	-2,405.9	1,376.2	602.1	1,376.2	1.25	1.17	-0.43
8,836.0	90.90	0.50	7,366.3	-2,405.3	1,451.1	603.0	1,451.1	1.25	1.17	-0.43
8,931.0	91.50	0.10	7,364.3	-2,403.3	1,546.1	603.5	1,546.1	0.76	0.63	-0.42
9,025.0	91.30	0.70	7,362.0	-2,401.0	1,640.1	604.2	1,640.1	0.67	-0.21	0.64
9,120.0	90.70	1.60	7,360.4	-2,399.4	1,735.1	606.1	1,735.1	1.14	-0.63	0.95
9,213.0	91.70	2.20	7,358.4	-2,397.4	1,828.0	609.1	1,828.0	1.25	1.08	0.65
9,306.0	90.20	2.20	7,356.9	-2,395.9	1,920.9	612.7	1,920.9	1.61	-1.61	0.00
9,400.0	89.80	1.00	7,356.9	-2,395.9	2,014.9	615.3	2,014.9	1.35	-0.43	-1.28
9,493.0	90.20	0.60	7,356.9	-2,395.9	2,107.9	616.6	2,107.9	0.61	0.43	-0.43
9,588.0	91.00	1.00	7,355.9	-2,394.9	2,202.8	618.0	2,202.8	0.94	0.84	0.42
9,683.0	91.90	1.40	7,353.5	-2,392.5	2,297.8	619.9	2,297.8	1.04	0.95	0.42
9,778.0	90.20	0.00	7,351.7	-2,390.7	2,392.8	621.1	2,392.8	2.32	-1.79	-1.47
9,871.0	91.40	359.90	7,350.4	-2,389.4	2,485.7	621.0	2,485.7	1.29	1.29	-0.11
9,964.0	90.20	0.80	7,349.1	-2,388.1	2,578.7	621.6	2,578.7	1.61	-1.29	0.97
10,059.0	90.20	359.10	7,348.8	-2,387.8	2,673.7	621.5	2,673.7	1.79	0.00	-1.79
10,153.0	91.00	358.90	7,347.8	-2,386.8	2,767.7	619.9	2,767.7	0.88	0.85	-0.21
10,246.0	91.70	358.80	7,345.6	-2,384.6	2,860.7	618.0	2,860.7	0.76	0.75	-0.11
10,339.0	91.00	359.70	7,343.4	-2,382.4	2,953.6	616.8	2,953.6	1.23	-0.75	0.97
10,433.0	91.30	0.40	7,341.6	-2,380.6	3,047.6	616.9	3,047.6	0.81	0.32	0.74
10,527.0	91.90	0.20	7,338.9	-2,377.9	3,141.6	617.4	3,141.6	0.67	0.64	-0.21
10,621.0	89.30	0.50	7,338.0	-2,377.0	3,235.6	617.9	3,235.6	2.78	-2.77	0.32
10,714.0	88.60	0.60	7,339.7	-2,378.7	3,328.5	618.8	3,328.5	0.76	-0.75	0.11
10,806.0	88.90	1.00	7,341.7	-2,380.7	3,420.5	620.1	3,420.5	0.54	0.33	0.43
10,900.0	90.20	1.40	7,342.4	-2,381.4	3,514.5	622.1	3,514.5	1.45	1.38	0.43
10,993.0	89.20	358.80	7,342.9	-2,381.9	3,607.5	622.2	3,607.5	3.00	-1.08	-2.80
11,086.0	90.40	356.60	7,343.2	-2,382.2	3,700.4	618.5	3,700.4	2.69	1.29	-2.37
11,179.0	89.20	358.10	7,343.5	-2,382.5	3,793.3	614.2	3,793.3	2.07	-1.29	1.61
11,271.0	90.20	358.10	7,344.0	-2,383.0	3,885.2	611.2	3,885.2	1.09	1.09	0.00
11,364.0	91.30	358.30	7,342.8	-2,381.8	3,978.2	608.2	3,978.2	1.20	1.18	0.22
11,458.0	90.50	359.50	7,341.3	-2,380.3	4,072.1	606.4	4,072.1	1.53	-0.85	1.28
11,550.0	90.80	0.60	7,340.3	-2,379.3	4,164.1	606.5	4,164.1	1.24	0.33	1.20
11,644.0	88.00	0.00	7,341.3	-2,380.3	4,258.1	607.0	4,258.1	3.05	-2.98	-0.64
11,738.0	87.50	0.10	7,345.0	-2,384.0	4,352.0	607.1	4,352.0	0.54	-0.53	0.11

Survey Report



Company:	ANADARKO PETROLEUM CORP	Local Co-ordinate Reference:	Well QUARTER CIRCLE 24-9HZ
Project:	WELD COUNTY (NAD 83)	TVD Reference:	KB 20' @ 4961.0usft (PD461)
Site:	SE SW SEC. 13 T1N R67W 6th P.M.	MD Reference:	KB 20' @ 4961.0usft (PD461)
Well:	QUARTER CIRCLE 24-9HZ	North Reference:	True
Wellbore:	JOB # 2018-309-461	Survey Calculation Method:	Minimum Curvature
Design:	FINAL SURVEYS	Database:	EOG RESOURCES

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	Subsea Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
11,831.0	87.90	0.00	7,348.7	-2,387.7	4,445.0	607.2	4,445.0	0.44	0.43	-0.11
11,925.0	88.40	0.20	7,351.7	-2,390.7	4,538.9	607.3	4,538.9	0.57	0.53	0.21
12,019.0	89.10	0.30	7,353.8	-2,392.8	4,632.9	607.7	4,632.9	0.75	0.74	0.11
12,114.0	90.40	1.00	7,354.2	-2,393.2	4,727.9	608.8	4,727.9	1.55	1.37	0.74
12,208.0	90.50	0.80	7,353.5	-2,392.5	4,821.9	610.3	4,821.9	0.24	0.11	-0.21
12,301.0	89.80	359.90	7,353.2	-2,392.2	4,914.9	610.9	4,914.9	1.23	-0.75	-0.97
12,395.0	91.30	0.80	7,352.3	-2,391.3	5,008.9	611.4	5,008.9	1.86	1.60	0.96
12,488.0	89.00	358.30	7,352.1	-2,391.1	5,101.8	610.7	5,101.8	3.65	-2.47	-2.69
12,583.0	87.90	357.40	7,354.6	-2,393.6	5,196.7	607.2	5,196.7	1.50	-1.16	-0.95
12,677.0	89.10	357.40	7,357.1	-2,396.1	5,290.6	602.9	5,290.6	1.28	1.28	0.00
12,770.0	91.00	357.40	7,357.0	-2,396.0	5,383.5	598.7	5,383.5	2.04	2.04	0.00
12,842.0	92.40	358.10	7,354.9	-2,393.9	5,455.4	595.8	5,455.4	2.17	1.94	0.97
12,936.0	94.00	1.50	7,349.6	-2,388.6	5,549.3	595.5	5,549.3	3.99	1.70	3.62
13,028.0	93.40	3.30	7,343.7	-2,382.7	5,641.0	599.4	5,641.0	2.06	-0.65	1.96
13,122.0	92.10	2.00	7,339.2	-2,378.2	5,734.8	603.7	5,734.8	1.95	-1.38	-1.38
13,217.0	91.00	0.50	7,336.6	-2,375.6	5,829.7	605.8	5,829.7	1.96	-1.16	-1.58
13,311.0	90.50	0.60	7,335.4	-2,374.4	5,923.7	606.7	5,923.7	0.54	-0.53	0.11
13,404.0	89.00	359.90	7,335.8	-2,374.8	6,016.7	607.1	6,016.7	1.78	-1.61	-0.75
13,499.0	90.20	0.20	7,336.4	-2,375.4	6,111.7	607.2	6,111.7	1.30	1.26	0.32
13,592.0	88.90	359.70	7,337.2	-2,376.2	6,204.7	607.1	6,204.7	1.50	-1.40	-0.54
13,686.0	90.30	0.00	7,337.8	-2,376.8	6,298.7	606.8	6,298.7	1.52	1.49	0.32
13,780.0	91.20	0.40	7,336.6	-2,375.6	6,392.7	607.2	6,392.7	1.05	0.96	0.43
13,874.0	90.00	1.30	7,335.6	-2,374.6	6,486.6	608.6	6,486.6	1.60	-1.28	0.96
13,969.0	90.30	0.90	7,335.4	-2,374.4	6,581.6	610.4	6,581.6	0.53	0.32	-0.42
14,063.0	91.00	1.60	7,334.3	-2,373.3	6,675.6	612.4	6,675.6	1.05	0.74	0.74
14,157.0	89.20	359.90	7,334.1	-2,373.1	6,769.6	613.7	6,769.6	2.63	-1.91	-1.81
14,252.0	89.50	359.70	7,335.2	-2,374.2	6,864.6	613.3	6,864.6	0.38	0.32	-0.21
14,347.0	91.00	359.50	7,334.8	-2,373.8	6,959.6	612.7	6,959.6	1.59	1.58	-0.21
14,442.0	89.30	1.20	7,334.6	-2,373.6	7,054.6	613.2	7,054.6	2.53	-1.79	1.79
14,536.0	88.50	1.20	7,336.4	-2,375.4	7,148.5	615.2	7,148.5	0.85	-0.85	0.00
14,630.0	89.10	1.80	7,338.3	-2,377.3	7,242.5	617.7	7,242.5	0.90	0.64	0.64
14,724.0	90.10	1.30	7,339.0	-2,378.0	7,336.4	620.2	7,336.4	1.19	1.06	-0.53
14,818.0	89.90	0.30	7,339.0	-2,378.0	7,430.4	621.5	7,430.4	1.08	-0.21	-1.06
14,912.0	90.90	0.70	7,338.3	-2,377.3	7,524.4	622.4	7,524.4	1.15	1.06	0.43
15,005.0	90.10	359.20	7,337.5	-2,376.5	7,617.4	622.3	7,617.4	1.83	-0.86	-1.61
15,100.0	90.50	359.00	7,337.0	-2,376.0	7,712.4	620.8	7,712.4	0.47	0.42	-0.21
15,194.0	91.50	0.50	7,335.4	-2,374.4	7,806.4	620.4	7,806.4	1.92	1.06	1.60
15,287.0	90.00	0.20	7,334.2	-2,373.2	7,899.4	620.9	7,899.4	1.64	-1.61	-0.32
15,381.0	89.30	359.30	7,334.7	-2,373.7	7,993.4	620.5	7,993.4	1.21	-0.74	-0.96
15,476.0	90.00	359.70	7,335.3	-2,374.3	8,088.3	619.7	8,088.3	0.85	0.74	0.42
15,571.0	91.40	0.30	7,334.2	-2,373.2	8,183.3	619.7	8,183.3	1.60	1.47	0.63
15,665.0	90.50	358.50	7,332.6	-2,371.6	8,277.3	618.7	8,277.3	2.14	-0.96	-1.91
15,758.0	91.20	358.50	7,331.2	-2,370.2	8,370.3	616.3	8,370.3	0.75	0.75	0.00
15,852.0	90.10	358.70	7,330.2	-2,369.2	8,464.2	614.0	8,464.2	1.19	-1.17	0.21
15,946.0	89.30	358.40	7,330.6	-2,369.6	8,558.2	611.6	8,558.2	0.91	-0.85	-0.32
16,039.0	90.90	359.10	7,330.5	-2,369.5	8,651.2	609.6	8,651.2	1.88	1.72	0.75
16,131.0	89.50	357.70	7,330.2	-2,369.2	8,743.1	607.0	8,743.1	2.15	-1.52	-1.52
16,226.0	88.80	357.50	7,331.6	-2,370.6	8,838.0	603.0	8,838.0	0.77	-0.74	-0.21
16,319.0	89.90	357.80	7,332.6	-2,371.6	8,931.0	599.2	8,931.0	1.23	1.18	0.32
16,414.0	91.30	358.20	7,331.6	-2,370.6	9,025.9	595.9	9,025.9	1.53	1.47	0.42
16,509.0	90.40	358.90	7,330.2	-2,369.2	9,120.8	593.5	9,120.8	1.20	-0.95	0.74
16,603.0	90.80	358.70	7,329.2	-2,368.2	9,214.8	591.5	9,214.8	0.48	0.43	-0.21
16,695.0	89.30	359.40	7,329.2	-2,368.2	9,306.8	590.0	9,306.8	1.80	-1.63	0.76

Survey Report



Company:	ANADARKO PETROLEUM CORP	Local Co-ordinate Reference:	Well QUARTER CIRCLE 24-9HZ
Project:	WELD COUNTY (NAD 83)	TVD Reference:	KB 20' @ 4961.0usft (PD461)
Site:	SE SW SEC. 13 T1N R67W 6th P.M.	MD Reference:	KB 20' @ 4961.0usft (PD461)
Well:	QUARTER CIRCLE 24-9HZ	North Reference:	True
Wellbore:	JOB # 2018-309-461	Survey Calculation Method:	Minimum Curvature
Design:	FINAL SURVEYS	Database:	EOG RESOURCES

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	Subsea Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
16,789.0	89.70	0.20	7,330.0	-2,369.0	9,400.8	589.7	9,400.8	0.95	0.43	0.85
16,881.0	90.10	359.60	7,330.1	-2,369.1	9,492.8	589.5	9,492.8	0.78	0.43	-0.65
16,975.0	90.80	359.20	7,329.4	-2,368.4	9,586.8	588.5	9,586.8	0.86	0.74	-0.43
17,069.0	92.40	359.00	7,326.8	-2,365.8	9,680.7	587.1	9,680.7	1.72	1.70	-0.21
~ ENTER RADIUS TOE (17157' MD)										
17,157.0	91.09	359.56	7,324.1	-2,363.1	9,768.7	585.9	9,768.7	1.62	-1.49	0.64
17,163.0	91.00	359.60	7,324.0	-2,363.0	9,774.7	585.9	9,774.7	1.62	-1.49	0.64
17,258.0	89.30	359.70	7,323.7	-2,362.7	9,869.7	585.3	9,869.7	1.79	-1.79	0.11
17,351.0	89.70	358.90	7,324.5	-2,363.5	9,962.7	584.2	9,962.7	0.96	0.43	-0.86
LAST SURVEY JUNE 14, 2018										
17,434.0	89.70	358.90	7,325.0	-2,364.0	10,045.7	582.6	10,045.7	0.00	0.00	0.00
PROJECTION TO TD (40.058125; -104.839750)										
17,512.0	89.70	358.90	7,325.4	-2,364.4	10,123.6	581.1	10,123.6	0.00	0.00	0.00

Survey Report



Company:	ANADARKO PETROLEUM CORP	Local Co-ordinate Reference:	Well QUARTER CIRCLE 24-9HZ
Project:	WELD COUNTY (NAD 83)	TVD Reference:	KB 20' @ 4961.0usft (PD461)
Site:	SE SW SEC. 13 T1N R67W 6th P.M.	MD Reference:	KB 20' @ 4961.0usft (PD461)
Well:	QUARTER CIRCLE 24-9HZ	North Reference:	True
Wellbore:	JOB # 2018-309-461	Survey Calculation Method:	Minimum Curvature
Design:	FINAL SURVEYS	Database:	EOG RESOURCES

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
QUARTER CIRCLE 24- - survey misses target center by 14.7usft at 6662.1usft MD (6568.3 TVD, -282.1 N, 586.9 E) - Point	0.00	0.00	6,568.7	-287.8	600.5	14,537,532.23	1,685,294.76	40° 1' 46.360 N	104° 50' 22.852 W
QUARTER CIRCLE 24- - survey misses target center by 36.8usft at 17511.2usft MD (7325.4 TVD, 10122.9 N, 581.1 E) - Point	0.00	0.00	7,294.0	10,123.4	600.3	14,547,939.23	1,685,276.04	40° 3' 29.246 N	104° 50' 22.852 W
QUARTER CIRCLE 24- - survey misses target center by 12.1usft at 7936.5usft MD (7378.3 TVD, 552.1 N, 592.1 E) - Point	0.00	0.00	7,387.0	550.9	600.5	14,538,370.55	1,685,293.27	40° 1' 54.648 N	104° 50' 22.852 W
QUARTER CIRCLE 24- - survey misses target center by 37.6usft at 17511.2usft MD (7325.4 TVD, 10122.9 N, 581.1 E) - Point	0.00	0.00	7,293.0	10,123.4	600.3	14,547,939.23	1,685,276.04	40° 3' 29.246 N	104° 50' 22.852 W
QUARTER CIRCLE 24- - survey misses target center by 13.9usft at 6662.3usft MD (6568.5 TVD, -282.1 N, 586.9 E) - Point	0.00	0.00	6,568.7	-285.2	600.5	14,537,534.80	1,685,294.75	40° 1' 46.386 N	104° 50' 22.852 W
QUARTER CIRCLE 24- - survey misses target center by 36.8usft at 17511.2usft MD (7325.4 TVD, 10122.9 N, 581.1 E) - Point	0.00	0.00	7,294.0	10,123.4	600.3	14,547,939.23	1,685,276.04	40° 3' 29.246 N	104° 50' 22.852 W
QUARTER CIRCLE 24- - survey misses target center by 48.0usft at 11884.5usft MD (7350.5 TVD, 4498.5 N, 607.2 E) - Point	0.00	0.00	7,303.0	4,500.0	600.5	14,542,318.08	1,685,286.22	40° 2' 33.674 N	104° 50' 22.851 W
QUARTER CIRCLE 24- - survey misses target center by 12.1usft at 7936.5usft MD (7378.3 TVD, 552.1 N, 592.1 E) - Point	0.00	0.00	7,387.0	550.9	600.5	14,538,370.55	1,685,293.27	40° 1' 54.648 N	104° 50' 22.852 W
QUARTER CIRCLE 24- - survey misses target center by 60.9usft at 11884.1usft MD (7350.5 TVD, 4498.0 N, 607.2 E) - Point	0.00	0.00	7,290.0	4,500.0	600.5	14,542,318.08	1,685,286.22	40° 2' 33.674 N	104° 50' 22.851 W
QUARTER CIRCLE 24- - survey misses target center by 13.0usft at 7936.7usft MD (7378.4 TVD, 552.2 N, 592.1 E) - Point	0.00	0.00	7,388.2	550.9	600.5	14,538,370.55	1,685,293.27	40° 1' 54.648 N	104° 50' 22.852 W

Survey Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
1,847.0	1,807.7	-44.6	299.0	TIE ON TO SURFACE SURVEY
6,555.0	6,461.6	-290.7	585.8	KOP
7,476.0	7,238.7	115.2	587.3	~ ENTER LANDING BOX (7476' MD)
7,941.0	7,378.8	556.5	592.1	~ ENTER RADIUS HEEL (7941' MD)
7,994.0	7,381.4	609.4	591.8	HEEL: (40.032007; -104.839713)
8,761.0	7,366.9	1,376.2	602.1	~ EXIT RADIUS HEEL (8761' MD)
17,157.0	7,324.1	9,768.7	585.9	~ ENTER RADIUS TOE (17157' MD)
17,434.0	7,325.0	10,045.7	582.6	LAST SURVEY JUNE 14, 2018
17,512.0	7,325.4	10,123.6	581.1	PROJECTION TO TD (40.058125; -104.839750)

Checked By: _____	Approved By: _____	Date: _____
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