



Project: WELD COUNTY (NAD 83)
Site: SW SW SEC. 13 T1N R67W 6th P.M.
Well: QUARTER CIRCLE 24-3HZ
Wellbore: JOB # 2018-203-461
Design: FINAL SURVEYS

ANNOTATIONS

TVD	MD	Inc	Azi	+N/-S	+E/-W	VSec	Departure	Annotation
1793.3	1838.0	18.15	261.89	-65.9	-317.4	-67.8	326.1	TIE IN TO SURFACE SURVEYS
1836.0	1883.0	18.14	257.92	-68.4	-331.2	-70.4	340.1	9 5/8" SURFACE CASING
6465.9	6551.0	4.37	44.98	-294.2	-475.3	-297.1	731.5	KOP
7181.5	7405.7	57.08	358.29	103.8	-462.3	100.9	1131.4	~ ENTER LANDING BOX (7406'MD)
7382.9	7900.0	79.72	1.44	549.3	-458.5	546.5	1577.1	HEEL (40.031834,-104.845778)
7382.0	8763.8	91.46	1.61	1412.0	-447.5	1409.2	2440.0	~ CROSS 460' SETBACK (8764' MD)
7317.4	17084.5	91.11	359.70	9730.0	-412.9	9727.3	10759.3	~ CROSS 460' SETBACK(17085' MD)
7296.8	17435.0	95.70	0.80	10079.8	-413.5	10077.1	11109.1	LAST SURVEY MAY 9, 2018
7291.0	17493.0	95.70	0.80	10137.5	-412.7	10134.8	11166.8	PROJECTION TO TOE (40.058154, -104.845615)

PROPOSED LOCAL COORDINATES:

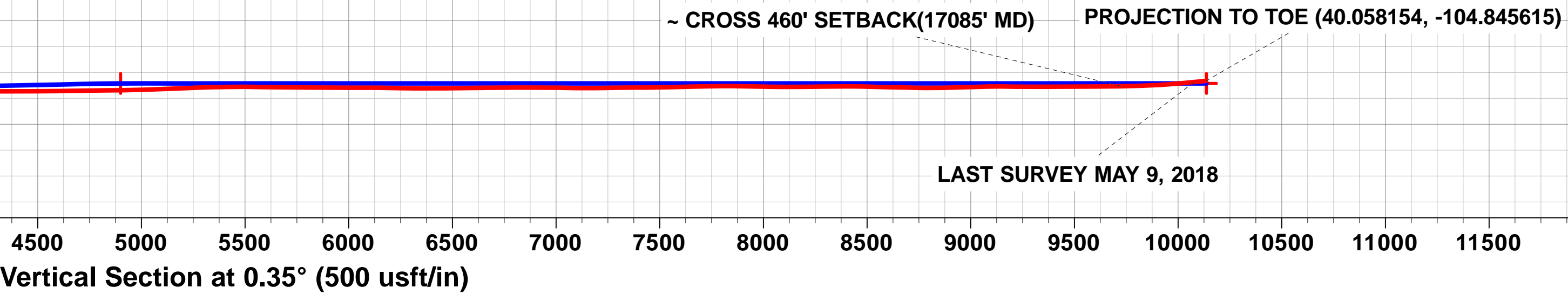
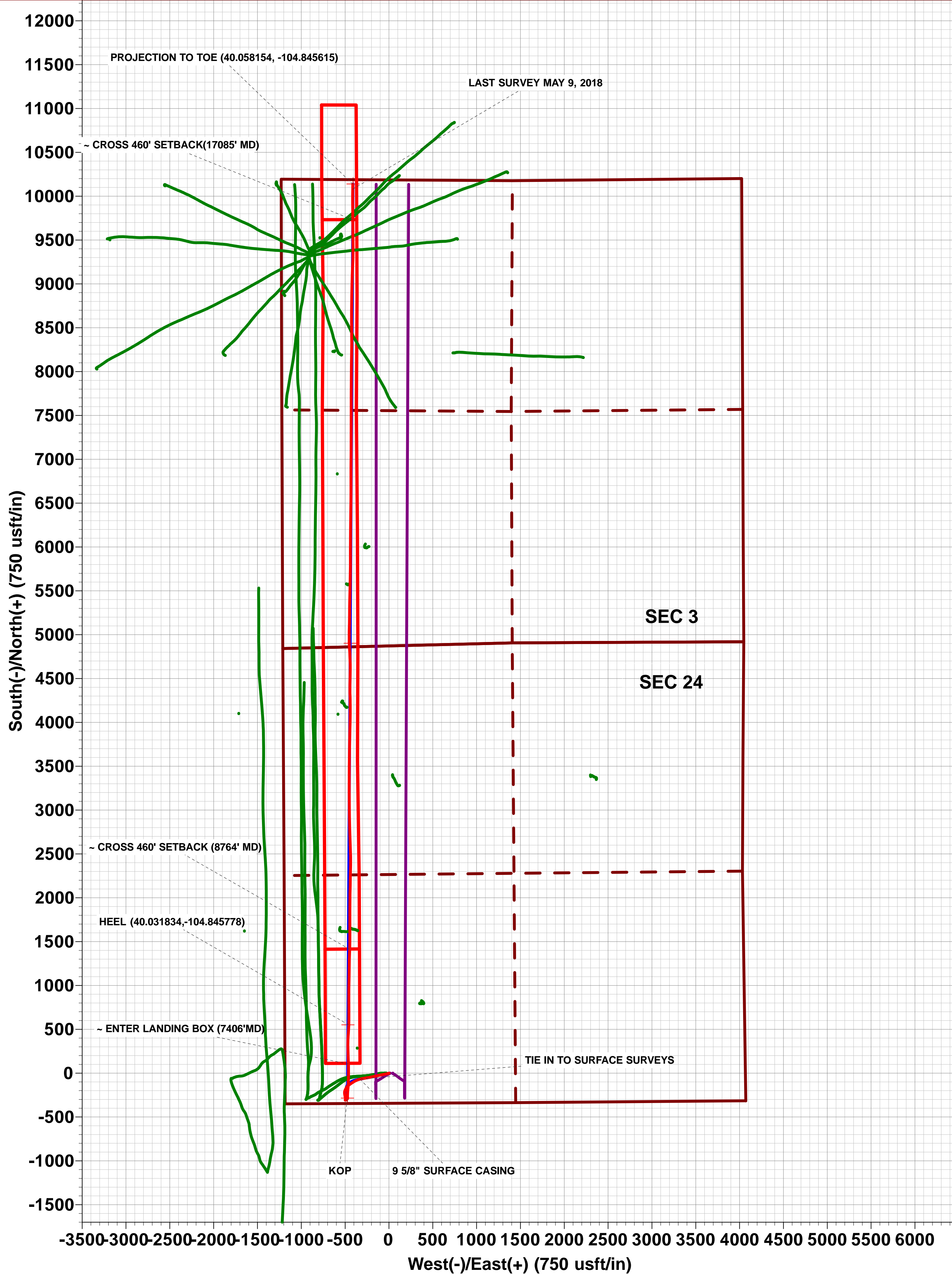
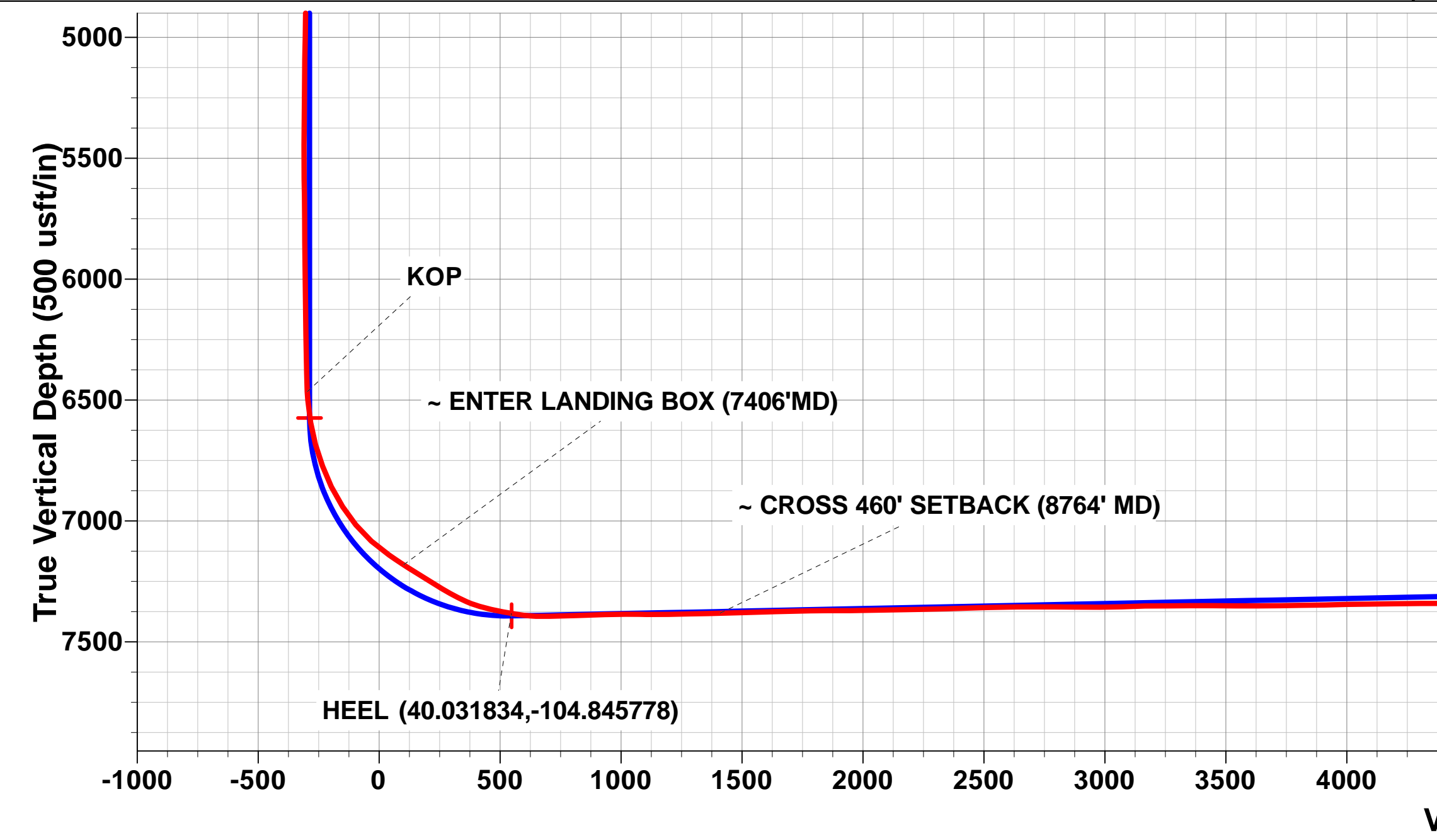
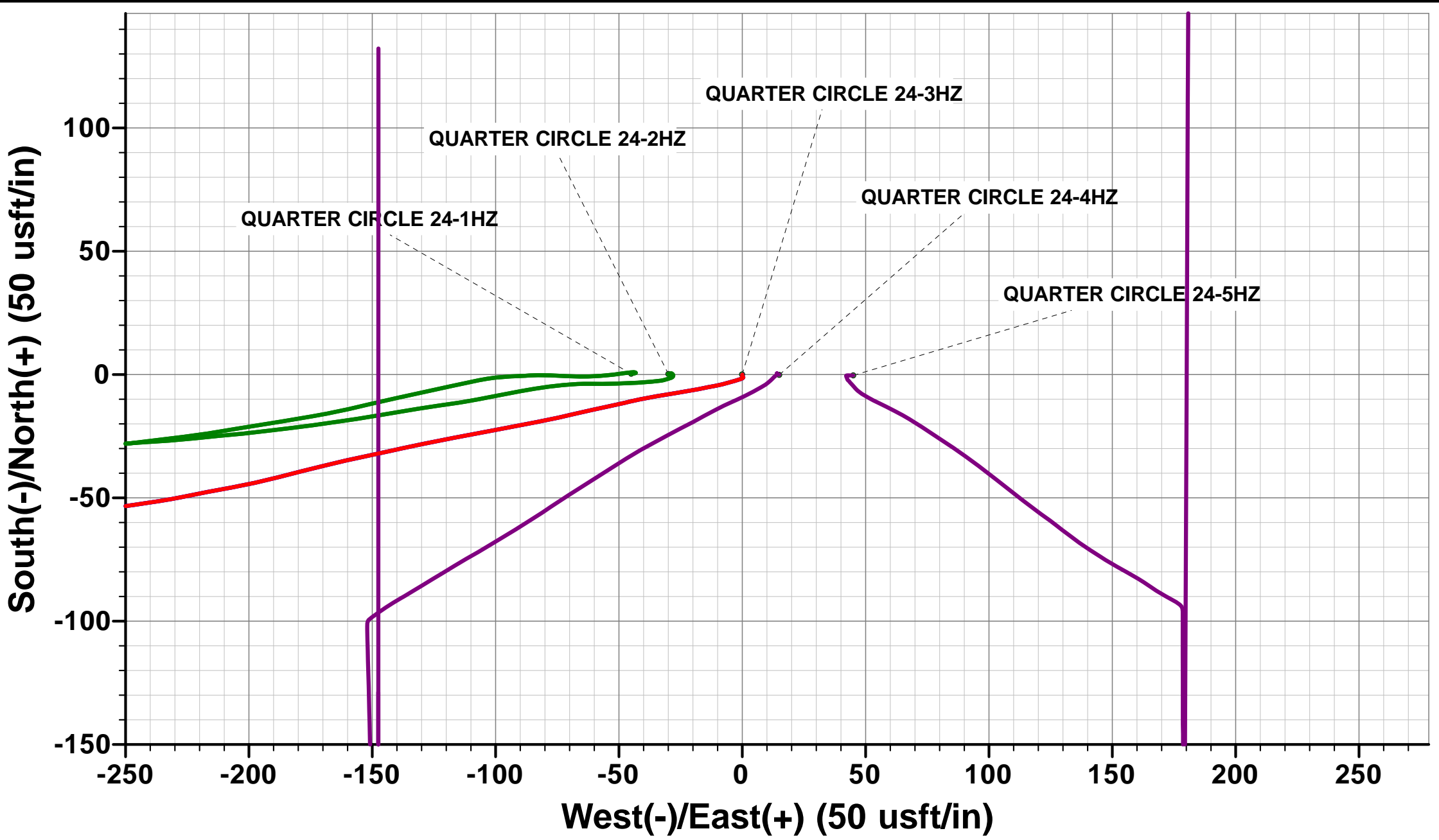
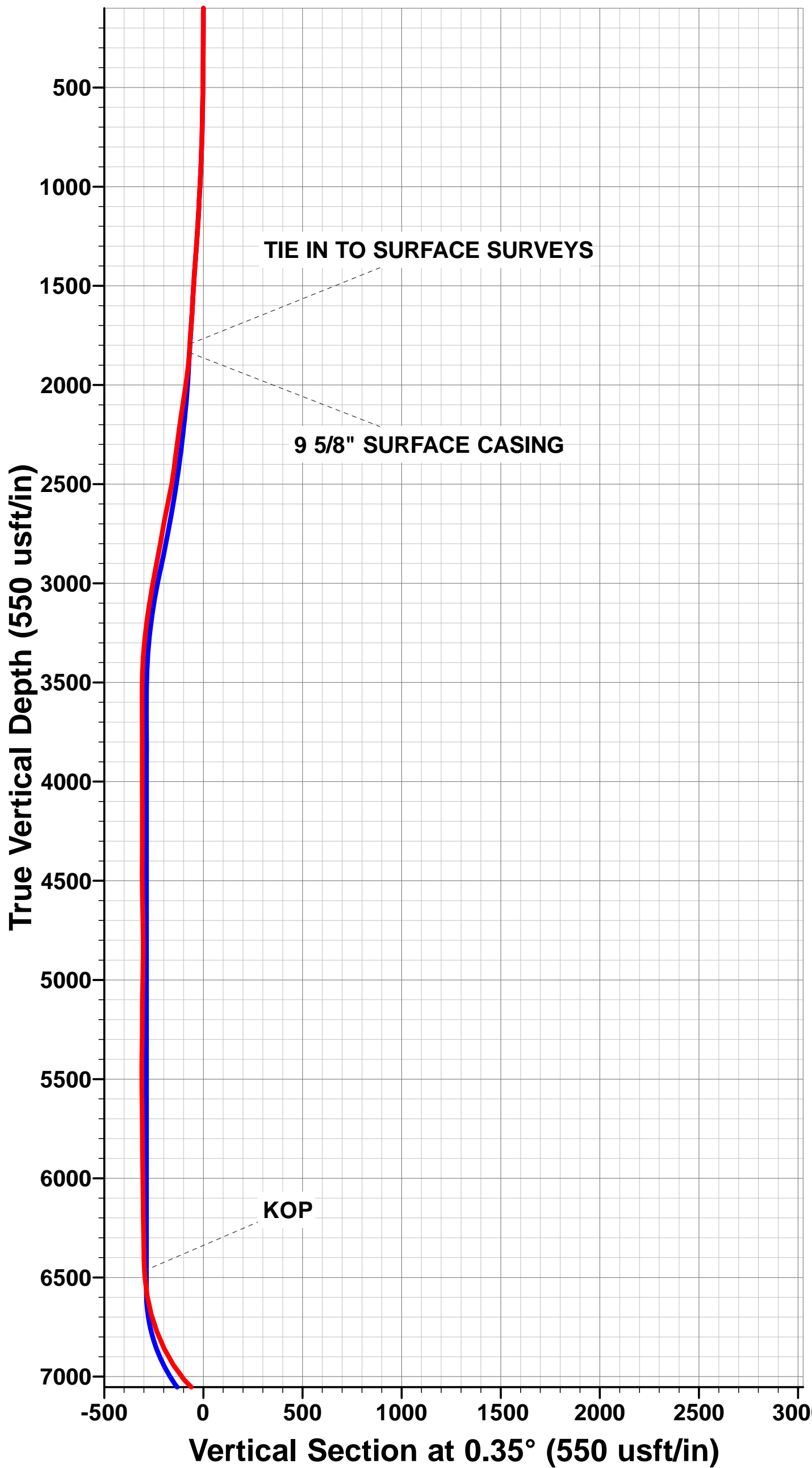
SHL: 344ft FSL & 1186ft FWL Sec 24

HEEL: 895.5ft FSL & 730ft FWL Sec 24

BHL: 51ft FNL & 817ft FWL Sec 13

WELLBORE TARGET DETAILS (LAT/LONG)

Name	TVD	+N/-S	+E/-W	Latitude	Longitude
QUARTER CIRCLE 24-3HZ BHL (P2)	7303.0	10139.3	-409.5	40° 3' 29.372 N	104° 50' 44.171 W
QUARTER CIRCLE 24-3HZ HEEL (P2)	7393.0	550.8	-468.4	40° 1' 54.616 N	104° 50' 44.926 W



Survey Report



Company:	ANADARKO PETROLEUM CORP	Local Co-ordinate Reference:	Well QUARTER CIRCLE 24-3HZ
Project:	WELD COUNTY (NAD 83)	TVD Reference:	KB 20' @ 4961.0usft (PD461)
Site:	SW SW SEC. 13 T1N R67W 6th P.M.	MD Reference:	KB 20' @ 4961.0usft (PD461)
Well:	QUARTER CIRCLE 24-3HZ	North Reference:	True
Wellbore:	JOB # 2018-203-461	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	SW SW SEC. 13 T1N R67W 6th P.M.				
Site Position:		Northing:	14,537,814.76 usft	Latitude:	40° 1' 49.176 N
From:	Lat/Long	Easting:	1,684,001.16 usft	Longitude:	104° 50' 39.482 W
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16"	Grid Convergence:	0.10 °

Well	QUARTER CIRCLE 24-3HZ					
Well Position	+N/-S	0.0 usft	Northing:	14,537,814.53 usft	Latitude:	40° 1' 49.173 N
	+E/-W	0.0 usft	Easting:	1,684,046.10 usft	Longitude:	104° 50' 38.904 W
Position Uncertainty		0.0 usft	Wellhead Elevation:	usft	Ground Level:	4,941.0 usft

Wellbore	JOB # 2018-203-461				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	26/04/2018	8.13	66.52	52,093

Design	FINAL SURVEYS				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)	
	0.0	0.0	0.0	0.35	

Survey Program	Date	09/05/2018			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
126.0	17,493.0	FINAL SURVEYS (JOB # 2018-203-461)	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)
0.0	0.00	0.00	0.0	4,961.0	0.0	0.0	0.0	0.00	0.00	0.00
126.0	0.26	180.15	126.0	4,835.0	-0.3	0.0	-0.3	0.21	0.21	0.00
158.0	0.09	334.49	158.0	4,803.0	-0.3	0.0	-0.3	1.07	-0.53	482.31
190.0	0.04	212.41	190.0	4,771.0	-0.3	0.0	-0.3	0.36	-0.16	-381.50
222.0	0.44	164.33	222.0	4,739.0	-0.5	0.0	-0.5	1.29	1.25	-150.25
253.0	0.48	165.74	253.0	4,708.0	-0.7	0.1	-0.7	0.13	0.13	4.55
285.0	0.44	134.36	285.0	4,676.0	-0.9	0.2	-0.9	0.79	-0.12	-98.06
316.0	0.35	130.32	316.0	4,645.0	-1.1	0.3	-1.0	0.30	-0.29	-13.03
348.0	0.13	142.18	348.0	4,613.0	-1.1	0.4	-1.1	0.70	-0.69	37.06
379.0	0.53	213.11	379.0	4,582.0	-1.3	0.4	-1.3	1.62	1.29	228.81
411.0	0.97	249.67	411.0	4,550.0	-1.5	0.0	-1.5	1.97	1.37	114.25
442.0	1.49	246.95	442.0	4,519.0	-1.8	-0.6	-1.8	1.69	1.68	-8.77
474.0	1.63	252.05	474.0	4,487.0	-2.1	-1.4	-2.1	0.62	0.44	15.94

Survey Report



Company:	ANADARKO PETROLEUM CORP	Local Co-ordinate Reference:	Well QUARTER CIRCLE 24-3HZ
Project:	WELD COUNTY (NAD 83)	TVD Reference:	KB 20' @ 4961.0usft (PD461)
Site:	SW SW SEC. 13 T1N R67W 6th P.M.	KB Reference:	KB 20' @ 4961.0usft (PD461)
Well:	QUARTER CIRCLE 24-3HZ	North Reference:	True
Wellbore:	JOB # 2018-203-461	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)
505.0	2.02	253.98	505.0	4,456.0	-2.3	-2.3	-2.4	1.27	1.26	6.23
537.0	2.94	253.80	536.9	4,424.1	-2.7	-3.7	-2.8	2.88	2.87	-0.56
569.0	3.60	253.54	568.9	4,392.1	-3.2	-5.4	-3.3	2.06	2.06	-0.81
601.0	4.61	256.44	600.8	4,360.2	-3.8	-7.6	-3.9	3.22	3.16	9.06
633.0	5.36	258.02	632.7	4,328.3	-4.4	-10.3	-4.5	2.38	2.34	4.94
664.0	6.42	261.36	663.5	4,297.5	-5.0	-13.5	-5.1	3.59	3.42	10.77
696.0	7.21	257.58	695.3	4,265.7	-5.7	-17.2	-5.8	2.84	2.47	-11.81
728.0	7.95	259.52	727.0	4,234.0	-6.5	-21.3	-6.7	2.45	2.31	6.06
760.0	8.61	260.04	758.7	4,202.3	-7.4	-25.9	-7.5	2.08	2.06	1.62
791.0	9.10	261.98	789.3	4,171.7	-8.1	-30.6	-8.3	1.85	1.58	6.26
823.0	9.98	259.78	820.9	4,140.1	-8.9	-35.8	-9.2	2.98	2.75	-6.87
855.0	11.07	257.94	852.3	4,108.7	-10.1	-41.6	-10.3	3.56	3.41	-5.75
887.0	11.91	257.14	883.7	4,077.3	-11.5	-47.8	-11.7	2.67	2.62	-2.50
918.0	12.22	257.41	914.0	4,047.0	-12.9	-54.1	-13.2	1.02	1.00	0.87
950.0	12.57	257.94	945.2	4,015.8	-14.3	-60.8	-14.7	1.15	1.09	1.66
982.0	12.66	256.88	976.5	3,984.5	-15.9	-67.6	-16.3	0.78	0.28	-3.31
1,014.0	13.23	257.23	1,007.7	3,953.3	-17.5	-74.6	-17.9	1.80	1.78	1.09
1,045.0	14.19	259.34	1,037.8	3,923.2	-19.0	-81.8	-19.5	3.49	3.10	6.81
1,077.0	14.46	259.17	1,068.8	3,892.2	-20.4	-89.6	-21.0	0.85	0.84	-0.53
1,109.0	15.42	259.25	1,099.7	3,861.3	-22.0	-97.7	-22.6	3.00	3.00	0.25
1,140.0	16.26	259.34	1,129.5	3,831.5	-23.6	-106.0	-24.2	2.71	2.71	0.29
1,172.0	16.61	258.99	1,160.2	3,800.8	-25.3	-114.9	-26.0	1.14	1.09	-1.09
1,204.0	16.83	258.81	1,190.9	3,770.1	-27.0	-123.9	-27.8	0.71	0.69	-0.56
1,268.0	17.09	257.32	1,252.1	3,708.9	-30.9	-142.2	-31.8	0.79	0.41	-2.33
1,299.0	17.53	258.64	1,281.7	3,679.3	-32.8	-151.2	-33.7	1.90	1.42	4.26
1,331.0	17.31	256.97	1,312.2	3,648.8	-34.8	-160.6	-35.8	1.71	-0.69	-5.22
1,363.0	17.27	256.62	1,342.8	3,618.2	-37.0	-169.8	-38.0	0.35	-0.12	-1.09
1,394.0	17.27	255.30	1,372.4	3,588.6	-39.2	-178.8	-40.3	1.26	0.00	-4.26
1,426.0	17.45	255.83	1,402.9	3,558.1	-41.6	-188.0	-42.8	0.75	0.56	1.66
1,458.0	17.80	257.50	1,433.4	3,527.6	-43.9	-197.4	-45.1	1.92	1.09	5.22
1,490.0	18.15	259.52	1,463.8	3,497.2	-45.8	-207.1	-47.1	2.23	1.09	6.31
1,521.0	18.24	259.43	1,493.3	3,467.7	-47.6	-216.6	-48.9	0.30	0.29	-0.29
1,553.0	18.19	258.46	1,523.7	3,437.3	-49.5	-226.4	-50.9	0.96	-0.16	-3.03
1,584.0	18.94	260.75	1,553.1	3,407.9	-51.3	-236.2	-52.7	3.37	2.42	7.39
1,616.0	18.94	262.33	1,583.3	3,377.7	-52.8	-246.4	-54.3	1.60	0.00	4.94
1,648.0	19.29	261.71	1,613.6	3,347.4	-54.3	-256.8	-55.8	1.26	1.09	-1.94
1,680.0	19.51	259.52	1,643.8	3,317.2	-56.0	-267.3	-57.6	2.37	0.69	-6.84
1,743.0	19.20	257.58	1,703.2	3,257.8	-60.1	-287.8	-61.9	1.13	-0.49	-3.08
1,775.0	18.90	257.33	1,733.4	3,227.6	-62.4	-297.9	-64.2	0.97	-0.94	-0.78
1,807.0	18.11	260.13	1,763.8	3,197.2	-64.4	-307.9	-66.3	3.72	-2.47	8.75
TIE IN TO SURFACE SURVEYS										
1,838.0	18.15	261.89	1,793.3	3,167.7	-65.9	-317.4	-67.8	1.77	0.13	5.68
9 5/8" SURFACE CASING										
1,883.0	18.14	257.92	1,836.0	3,125.0	-68.4	-331.2	-70.4	2.75	-0.02	-8.82
1,954.0	18.30	251.70	1,903.5	3,057.5	-74.2	-352.6	-76.3	2.75	0.23	-8.76
2,047.0	17.00	240.70	1,992.1	2,968.9	-85.4	-378.3	-87.7	3.84	-1.40	-11.83
2,141.0	15.60	238.40	2,082.3	2,878.7	-98.8	-401.1	-101.2	1.64	-1.49	-2.45
2,234.0	14.90	236.00	2,172.1	2,788.9	-112.0	-421.7	-114.6	1.01	-0.75	-2.58
2,327.0	13.60	235.60	2,262.2	2,698.8	-124.9	-440.6	-127.6	1.40	-1.40	-0.43
2,421.0	12.40	236.60	2,353.8	2,607.2	-136.7	-458.1	-139.5	1.30	-1.28	1.06
2,513.0	11.20	225.70	2,443.8	2,517.2	-148.3	-472.8	-151.2	2.75	-1.30	-11.85
2,608.0	13.20	211.70	2,536.7	2,424.3	-164.0	-485.1	-167.0	3.74	2.11	-14.74
2,702.0	12.60	204.70	2,628.4	2,332.6	-182.5	-495.0	-185.5	1.78	-0.64	-7.45

Survey Report



Company:	ANADARKO PETROLEUM CORP	Local Co-ordinate Reference:	Well QUARTER CIRCLE 24-3HZ
Project:	WELD COUNTY (NAD 83)	TVD Reference:	KB 20' @ 4961.0usft (PD461)
Site:	SW SW SEC. 13 T1N R67W 6th P.M.	MD Reference:	KB 20' @ 4961.0usft (PD461)
Well:	QUARTER CIRCLE 24-3HZ	North Reference:	True
Wellbore:	JOB # 2018-203-461	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)
2,796.0	10.80	200.60	2,720.4	2,240.6	-200.0	-502.4	-203.1	2.11	-1.91	-4.36
2,889.0	10.20	187.50	2,811.9	2,149.1	-216.4	-506.5	-219.4	2.64	-0.65	-14.09
2,982.0	11.40	172.30	2,903.2	2,057.8	-233.6	-506.4	-236.7	3.31	1.29	-16.34
3,077.0	10.40	168.00	2,996.5	1,964.5	-251.3	-503.3	-254.4	1.36	-1.05	-4.53
3,171.0	9.20	168.30	3,089.1	1,871.9	-267.0	-500.0	-270.0	1.28	-1.28	0.32
3,266.0	7.80	171.80	3,183.1	1,777.9	-280.8	-497.6	-283.8	1.57	-1.47	3.68
3,360.0	6.20	170.80	3,276.4	1,684.6	-292.1	-495.9	-295.1	1.71	-1.70	-1.06
3,455.0	4.00	166.70	3,371.0	1,590.0	-300.4	-494.3	-303.4	2.35	-2.32	-4.32
3,550.0	2.20	140.40	3,465.9	1,495.1	-305.0	-492.4	-308.0	2.37	-1.89	-27.68
3,644.0	0.80	81.20	3,559.8	1,401.2	-306.3	-490.6	-309.3	2.04	-1.49	-62.98
3,738.0	0.60	48.20	3,653.8	1,307.2	-305.9	-489.5	-308.9	0.47	-0.21	-35.11
3,832.0	0.40	60.00	3,747.8	1,213.2	-305.4	-488.9	-308.4	0.24	-0.21	12.55
3,927.0	0.50	94.60	3,842.8	1,118.2	-305.3	-488.2	-308.3	0.30	0.11	36.42
4,021.0	0.70	111.00	3,936.8	1,024.2	-305.5	-487.2	-308.5	0.28	0.21	17.45
4,116.0	0.50	65.70	4,031.8	929.2	-305.6	-486.3	-308.5	0.52	-0.21	-47.68
4,210.0	0.40	342.30	4,125.8	835.2	-305.1	-486.1	-308.0	0.64	-0.11	-88.72
4,304.0	0.30	272.70	4,219.8	741.2	-304.7	-486.4	-307.7	0.43	-0.11	-74.04
4,398.0	0.60	263.10	4,313.8	647.2	-304.8	-487.1	-307.8	0.33	0.32	-10.21
4,493.0	1.10	240.50	4,408.8	552.2	-305.3	-488.4	-308.3	0.62	0.53	-23.79
4,587.0	1.20	282.50	4,502.8	458.2	-305.5	-490.2	-308.5	0.88	0.11	44.68
4,680.0	1.40	338.00	4,595.8	365.2	-304.3	-491.5	-307.3	1.32	0.22	59.68
4,774.0	1.50	318.10	4,689.7	271.3	-302.3	-492.8	-305.3	0.54	0.11	-21.17
4,869.0	1.30	287.10	4,784.7	176.3	-301.1	-494.7	-304.1	0.81	-0.21	-32.63
4,963.0	0.50	169.40	4,878.7	82.3	-301.1	-495.6	-304.2	1.70	-0.85	-125.21
5,080.0	0.80	159.60	4,995.7	-34.7	-302.4	-495.2	-305.4	0.27	0.26	-8.38
5,176.0	1.20	172.00	5,091.7	-130.7	-304.0	-494.8	-307.0	0.47	0.42	12.92
5,270.0	0.00	133.50	5,185.7	-224.7	-305.0	-494.7	-308.0	1.28	-1.28	0.00
5,459.0	1.90	229.20	5,374.6	-413.6	-307.1	-497.1	-310.1	1.01	1.01	0.00
5,552.0	1.00	303.90	5,467.6	-506.6	-307.6	-498.9	-310.6	2.04	-0.97	80.32
5,648.0	0.60	40.70	5,563.6	-602.6	-306.8	-499.3	-309.8	1.28	-0.42	100.83
5,742.0	0.80	39.00	5,657.6	-696.6	-305.9	-498.6	-308.9	0.21	0.21	-1.81
5,837.0	0.80	44.50	5,752.6	-791.6	-304.9	-497.7	-307.9	0.08	0.00	5.79
5,932.0	0.80	56.80	5,847.6	-886.6	-304.1	-496.7	-307.1	0.18	0.00	12.95
6,025.0	0.80	41.50	5,940.6	-979.6	-303.2	-495.7	-306.2	0.23	0.00	-16.45
6,118.0	0.80	20.70	6,033.6	-1,072.6	-302.1	-495.0	-305.1	0.31	0.00	-22.37
6,211.0	1.60	68.40	6,126.5	-1,165.5	-301.0	-493.6	-304.0	1.31	0.86	51.29
6,305.0	3.00	67.80	6,220.5	-1,259.5	-299.6	-490.1	-302.6	1.49	1.49	-0.64
6,398.0	3.70	79.10	6,313.3	-1,352.3	-298.1	-484.9	-301.1	1.03	0.75	12.15
6,493.0	4.00	70.00	6,408.1	-1,447.1	-296.4	-478.8	-299.3	0.72	0.32	-9.58
KOP										
6,551.0	4.37	44.98	6,465.9	-1,504.9	-294.2	-475.3	-297.1	3.18	0.64	-43.14
6,585.0	4.90	33.30	6,499.8	-1,538.8	-292.0	-473.6	-294.9	3.18	1.56	-34.35
6,679.0	9.90	355.70	6,593.1	-1,632.1	-280.6	-472.0	-283.5	7.14	5.32	-40.00
6,773.0	15.30	358.30	6,684.8	-1,723.8	-260.1	-473.0	-263.0	5.77	5.74	2.77
6,866.0	20.60	3.50	6,773.2	-1,812.2	-231.5	-472.3	-234.4	5.95	5.70	5.59
6,959.0	26.10	5.90	6,858.6	-1,897.6	-194.8	-469.2	-197.7	6.00	5.91	2.58
7,054.0	32.50	3.50	6,941.4	-1,980.4	-148.5	-465.5	-151.3	6.85	6.74	-2.53
7,147.0	39.50	1.80	7,016.6	-2,055.6	-93.9	-463.1	-96.8	7.60	7.53	-1.83
7,240.0	48.20	1.30	7,083.6	-2,122.6	-29.6	-461.3	-32.4	9.36	9.35	-0.54
7,333.0	55.30	359.30	7,141.1	-2,180.1	43.4	-461.0	40.6	7.82	7.63	-2.15
~ CROSS HARDLINE										
7,413.8	57.28	358.18	7,186.0	-2,225.0	110.6	-462.5	107.8	2.70	2.45	-1.39
7,427.0	57.60	358.00	7,193.1	-2,232.1	121.7	-462.9	118.9	2.70	2.45	-1.35

Survey Report



Company:	ANADARKO PETROLEUM CORP	Local Co-ordinate Reference:	Well QUARTER CIRCLE 24-3HZ
Project:	WELD COUNTY (NAD 83)	TVD Reference:	KB 20' @ 4961.0usft (PD461)
Site:	SW SW SEC. 13 T1N R67W 6th P.M.	MD Reference:	KB 20' @ 4961.0usft (PD461)
Well:	QUARTER CIRCLE 24-3HZ	North Reference:	True
Wellbore:	JOB # 2018-203-461	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)
7,522.0	58.20	358.00	7,243.5	-2,282.5	202.1	-465.7	199.3	0.63	0.63	0.00
7,616.0	59.30	358.20	7,292.3	-2,331.3	282.4	-468.3	279.6	1.18	1.17	0.21
7,708.0	66.60	2.40	7,334.1	-2,373.1	364.3	-467.8	361.4	8.91	7.93	4.57
7,800.0	77.20	3.90	7,362.7	-2,401.7	451.5	-463.0	448.6	11.63	11.52	1.63
7,894.0	79.30	1.50	7,381.8	-2,420.8	543.4	-458.7	540.6	3.35	2.23	-2.55
HEEL										
7,900.0	79.72	1.44	7,382.9	-2,421.9	549.3	-458.5	546.5	7.07	7.00	-1.00
7,989.0	86.00	0.60	7,394.0	-2,433.0	637.5	-456.9	634.7	7.12	7.06	-0.94
8,083.0	92.90	359.50	7,394.9	-2,433.9	731.5	-456.9	728.7	7.43	7.34	-1.17
8,177.0	92.10	359.50	7,390.8	-2,429.8	825.4	-457.7	822.6	0.85	-0.85	0.00
8,271.0	91.50	0.60	7,387.8	-2,426.8	919.3	-457.6	916.5	1.33	-0.64	1.17
8,365.0	89.60	1.00	7,386.9	-2,425.9	1,013.3	-456.3	1,010.5	2.07	-2.02	0.43
8,458.0	90.10	0.80	7,387.2	-2,426.2	1,106.3	-454.8	1,103.5	0.58	0.54	-0.22
8,551.0	90.70	0.90	7,386.5	-2,425.5	1,199.3	-453.4	1,196.5	0.65	0.65	0.11
8,644.0	91.20	1.60	7,385.0	-2,424.0	1,292.3	-451.4	1,289.5	0.92	0.54	0.75
8,737.0	91.60	2.10	7,382.7	-2,421.7	1,385.2	-448.4	1,382.4	0.69	0.43	0.54
~ CROSS 460' SETBACK										
8,764.8	91.45	1.60	7,382.0	-2,421.0	1,413.0	-447.5	1,410.2	1.88	-0.53	-1.81
8,831.0	91.10	0.40	7,380.5	-2,419.5	1,479.1	-446.4	1,476.4	1.88	-0.53	-1.81
8,925.0	92.80	0.40	7,377.3	-2,416.3	1,573.1	-445.7	1,570.3	1.81	1.81	0.00
9,020.0	90.50	359.50	7,374.5	-2,413.5	1,668.0	-445.8	1,665.3	2.60	-2.42	-0.95
9,114.0	91.80	0.10	7,372.7	-2,411.7	1,762.0	-446.1	1,759.2	1.52	1.38	0.64
9,208.0	89.70	0.30	7,371.4	-2,410.4	1,856.0	-445.8	1,853.2	2.24	-2.23	0.21
9,300.0	90.60	0.50	7,371.2	-2,410.2	1,948.0	-445.2	1,945.2	1.00	0.98	0.22
9,394.0	90.90	1.00	7,370.0	-2,409.0	2,042.0	-443.9	2,039.2	0.62	0.32	0.53
9,488.0	91.60	1.20	7,367.9	-2,406.9	2,135.9	-442.1	2,133.2	0.77	0.74	0.21
9,582.0	90.40	0.70	7,366.3	-2,405.3	2,229.9	-440.6	2,227.2	1.38	-1.28	-0.53
9,677.0	91.80	2.10	7,364.4	-2,403.4	2,324.9	-438.2	2,322.1	2.08	1.47	1.47
9,772.0	92.30	359.50	7,361.0	-2,400.0	2,419.8	-436.9	2,417.1	2.79	0.53	-2.74
9,865.0	91.30	358.20	7,358.1	-2,397.1	2,512.7	-438.8	2,510.0	1.76	-1.08	-1.40
9,959.0	90.20	358.10	7,356.9	-2,395.9	2,606.6	-441.8	2,603.9	1.18	-1.17	-0.11
10,053.0	91.10	358.60	7,355.8	-2,394.8	2,700.6	-444.5	2,697.8	1.10	0.96	0.53
10,147.0	89.00	357.70	7,355.7	-2,394.7	2,794.5	-447.6	2,791.8	2.43	-2.23	-0.96
10,240.0	89.50	358.60	7,357.0	-2,396.0	2,887.5	-450.6	2,884.7	1.11	0.54	0.97
10,334.0	90.30	359.60	7,357.1	-2,396.1	2,981.5	-452.0	2,978.7	1.36	0.85	1.06
10,427.0	92.30	0.40	7,355.0	-2,394.0	3,074.4	-452.0	3,071.6	2.32	2.15	0.86
10,521.0	91.00	359.10	7,352.3	-2,391.3	3,168.4	-452.4	3,165.6	1.96	-1.38	-1.38
10,615.0	89.80	0.00	7,351.7	-2,390.7	3,262.4	-453.2	3,259.6	1.60	-1.28	0.96
10,708.0	91.20	0.20	7,350.8	-2,389.8	3,355.4	-453.0	3,352.6	1.52	1.51	0.22
10,802.0	89.10	0.20	7,350.6	-2,389.6	3,449.4	-452.7	3,446.6	2.23	-2.23	0.00
10,895.0	89.60	0.20	7,351.6	-2,390.6	3,542.4	-452.4	3,539.5	0.54	0.54	0.00
10,987.0	90.20	0.90	7,351.8	-2,390.8	3,634.4	-451.5	3,631.5	1.00	0.65	0.76
11,080.0	91.40	1.80	7,350.5	-2,389.5	3,727.3	-449.3	3,724.5	1.61	1.29	0.97
11,172.0	90.40	0.90	7,349.1	-2,388.1	3,819.3	-447.1	3,816.5	1.46	-1.09	-0.98
11,265.0	91.50	1.10	7,347.5	-2,386.5	3,912.3	-445.5	3,909.5	1.20	1.18	0.22
11,358.0	91.30	1.70	7,345.3	-2,384.3	4,005.2	-443.2	4,002.4	0.68	-0.22	0.65
11,453.0	90.10	0.00	7,344.1	-2,383.1	4,100.2	-441.8	4,097.4	2.19	-1.26	-1.79
11,545.0	91.40	359.70	7,342.9	-2,381.9	4,192.2	-442.1	4,189.4	1.45	1.41	-0.33
11,638.0	89.80	358.40	7,341.9	-2,380.9	4,285.2	-443.6	4,282.4	2.22	-1.72	-1.40
11,732.0	90.30	359.60	7,341.8	-2,380.8	4,379.1	-445.2	4,376.3	1.38	0.53	1.28
11,826.0	90.50	1.00	7,341.2	-2,380.2	4,473.1	-444.8	4,470.3	1.50	0.21	1.49
11,920.0	90.50	2.10	7,340.4	-2,379.4	4,567.1	-442.2	4,564.3	1.17	0.00	1.17
12,014.0	90.80	358.20	7,339.3	-2,378.3	4,661.1	-442.0	4,658.3	4.16	0.32	-4.15

Survey Report



Company:	ANADARKO PETROLEUM CORP	Local Co-ordinate Reference:	Well QUARTER CIRCLE 24-3HZ
Project:	WELD COUNTY (NAD 83)	TVD Reference:	KB 20' @ 4961.0usft (PD461)
Site:	SW SW SEC. 13 T1N R67W 6th P.M.	MD Reference:	KB 20' @ 4961.0usft (PD461)
Well:	QUARTER CIRCLE 24-3HZ	North Reference:	True
Wellbore:	JOB # 2018-203-461	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)
12,108.0	91.00	357.70	7,337.8	-2,376.8	4,755.0	-445.3	4,752.2	0.57	0.21	-0.53
12,202.0	90.40	356.50	7,336.7	-2,375.7	4,848.9	-450.1	4,846.0	1.43	-0.64	-1.28
12,295.0	91.10	359.90	7,335.4	-2,374.4	4,941.8	-453.0	4,938.9	3.73	0.75	3.66
12,389.0	91.70	0.40	7,333.1	-2,372.1	5,035.8	-452.8	5,032.9	0.83	0.64	0.53
12,482.0	92.40	1.50	7,329.8	-2,368.8	5,128.7	-451.2	5,125.8	1.40	0.75	1.18
12,577.0	92.60	0.40	7,325.7	-2,364.7	5,223.6	-449.6	5,220.7	1.18	0.21	-1.16
12,670.0	91.50	1.10	7,322.4	-2,361.4	5,316.5	-448.4	5,313.7	1.40	-1.18	0.75
12,764.0	91.30	1.20	7,320.1	-2,359.1	5,410.5	-446.5	5,407.6	0.24	-0.21	0.11
12,856.0	89.20	1.10	7,319.7	-2,358.7	5,502.4	-444.7	5,499.6	2.29	-2.28	-0.11
12,951.0	89.00	1.20	7,321.1	-2,360.1	5,597.4	-442.8	5,594.6	0.24	-0.21	0.11
13,043.0	89.90	1.50	7,322.0	-2,361.0	5,689.4	-440.6	5,686.6	1.03	0.98	0.33
13,137.0	89.30	359.60	7,322.7	-2,361.7	5,783.4	-439.7	5,780.6	2.12	-0.64	-2.02
13,232.0	89.40	0.10	7,323.8	-2,362.8	5,878.4	-440.0	5,875.6	0.54	0.11	0.53
13,326.0	89.70	0.50	7,324.5	-2,363.5	5,972.4	-439.5	5,969.6	0.53	0.32	0.43
13,419.0	90.60	0.50	7,324.3	-2,363.3	6,065.4	-438.7	6,062.6	0.97	0.97	0.00
13,514.0	89.10	0.40	7,324.5	-2,363.5	6,160.4	-437.9	6,157.6	1.58	-1.58	-0.11
13,607.0	89.00	0.60	7,326.0	-2,365.0	6,253.3	-437.1	6,250.5	0.24	-0.11	0.22
13,701.0	89.50	0.60	7,327.3	-2,366.3	6,347.3	-436.1	6,344.5	0.53	0.53	0.00
13,795.0	90.30	0.90	7,327.4	-2,366.4	6,441.3	-434.9	6,438.5	0.91	0.85	0.32
13,889.0	91.50	0.90	7,326.0	-2,365.0	6,535.3	-433.4	6,532.5	1.28	1.28	0.00
13,984.0	89.60	359.90	7,325.1	-2,364.1	6,630.3	-432.8	6,627.5	2.26	-2.00	-1.05
14,078.0	91.70	0.20	7,324.0	-2,363.0	6,724.3	-432.7	6,721.5	2.26	2.23	0.32
14,172.0	89.50	359.90	7,323.0	-2,362.0	6,818.3	-432.6	6,815.5	2.36	-2.34	-0.32
14,266.0	89.60	359.80	7,323.7	-2,362.7	6,912.3	-432.8	6,909.5	0.15	0.11	-0.11
14,362.0	89.50	0.20	7,324.5	-2,363.5	7,008.2	-432.8	7,005.5	0.43	-0.10	0.42
14,456.0	89.00	0.30	7,325.7	-2,364.7	7,102.2	-432.4	7,099.5	0.54	-0.53	0.11
14,551.0	90.70	0.80	7,326.0	-2,365.0	7,197.2	-431.5	7,194.5	1.87	1.79	0.53
14,645.0	91.30	0.70	7,324.3	-2,363.3	7,291.2	-430.3	7,288.4	0.65	0.64	-0.11
14,739.0	89.80	359.70	7,323.4	-2,362.4	7,385.2	-430.0	7,382.4	1.92	-1.60	-1.06
14,833.0	91.30	359.70	7,322.5	-2,361.5	7,479.2	-430.4	7,476.4	1.60	1.60	0.00
14,927.0	90.60	0.40	7,321.0	-2,360.0	7,573.2	-430.4	7,570.4	1.05	-0.74	0.74
15,020.0	92.00	359.60	7,318.9	-2,357.9	7,666.1	-430.4	7,663.4	1.73	1.51	-0.86
15,115.0	90.80	0.20	7,316.5	-2,355.5	7,761.1	-430.5	7,758.3	1.41	-1.26	0.63
15,209.0	89.30	0.60	7,316.5	-2,355.5	7,855.1	-429.9	7,852.3	1.65	-1.60	0.43
15,302.0	88.90	0.70	7,317.9	-2,356.9	7,948.1	-428.8	7,945.3	0.44	-0.43	0.11
15,396.0	89.10	0.60	7,319.6	-2,358.6	8,042.1	-427.8	8,039.3	0.24	0.21	-0.11
15,491.0	90.30	0.70	7,320.1	-2,359.1	8,137.1	-426.7	8,134.3	1.27	1.26	0.11
15,586.0	91.30	1.00	7,318.7	-2,357.7	8,232.0	-425.3	8,229.3	1.10	1.05	0.32
15,680.0	89.40	359.70	7,318.2	-2,357.2	8,326.0	-424.7	8,323.3	2.45	-2.02	-1.38
15,773.0	90.70	359.90	7,318.1	-2,357.1	8,419.0	-425.0	8,416.3	1.41	1.40	0.22
15,867.0	88.00	359.50	7,319.1	-2,358.1	8,513.0	-425.5	8,510.3	2.90	-2.87	-0.43
15,961.0	88.60	359.70	7,321.9	-2,360.9	8,607.0	-426.2	8,604.2	0.67	0.64	0.21
16,054.0	89.50	0.20	7,323.5	-2,362.5	8,700.0	-426.2	8,697.2	1.11	0.97	0.54
16,146.0	89.20	0.80	7,324.5	-2,363.5	8,791.9	-425.4	8,789.2	0.73	-0.33	0.65
16,241.0	90.60	1.60	7,324.7	-2,363.7	8,886.9	-423.5	8,884.2	1.70	1.47	0.84
16,334.0	93.20	1.00	7,321.6	-2,360.6	8,979.8	-421.3	8,977.1	2.87	2.80	-0.65
16,429.0	90.90	1.30	7,318.2	-2,357.2	9,074.8	-419.4	9,072.0	2.44	-2.42	0.32
16,524.0	88.80	2.10	7,318.4	-2,357.4	9,169.7	-416.6	9,167.0	2.37	-2.21	0.84
16,618.0	90.00	2.60	7,319.4	-2,358.4	9,263.6	-412.8	9,260.9	1.38	1.28	0.53
16,710.0	90.00	1.50	7,319.4	-2,358.4	9,355.6	-409.5	9,352.9	1.20	0.00	-1.20
16,803.0	89.90	359.00	7,319.5	-2,358.5	9,448.6	-409.1	9,445.9	2.69	-0.11	-2.69
16,896.0	91.40	359.10	7,318.5	-2,357.5	9,541.5	-410.6	9,538.8	1.62	1.61	0.11
16,990.0	89.40	359.20	7,317.8	-2,356.8	9,635.5	-412.0	9,632.8	2.13	-2.13	0.11

Survey Report



Company:	ANADARKO PETROLEUM CORP	Local Co-ordinate Reference:	Well QUARTER CIRCLE 24-3HZ
Project:	WELD COUNTY (NAD 83)	TVD Reference:	KB 20' @ 4961.0usft (PD461)
Site:	SW SW SEC. 13 T1N R67W 6th P.M.	MD Reference:	KB 20' @ 4961.0usft (PD461)
Well:	QUARTER CIRCLE 24-3HZ	North Reference:	True
Wellbore:	JOB # 2018-203-461	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)
17,084.0	91.10	359.70	7,317.4	-2,356.4	9,729.5	-412.9	9,726.8	1.89	1.81	0.53
~ CROSS 460' SETBACK										
17,086.5	91.13	359.70	7,317.3	-2,356.3	9,732.0	-412.9	9,729.3	1.18	1.17	-0.11
17,178.0	92.20	359.60	7,314.7	-2,353.7	9,823.5	-413.5	9,820.8	1.18	1.17	-0.11
17,273.0	93.40	359.80	7,310.0	-2,349.0	9,918.3	-414.0	9,915.6	1.28	1.26	0.21
17,366.0	95.00	0.10	7,303.2	-2,342.2	10,011.1	-414.1	10,008.4	1.75	1.72	0.32
LAST SURVEY MAY 9, 2018										
17,435.0	95.70	0.80	7,296.8	-2,335.8	10,079.8	-413.5	10,077.1	1.43	1.01	1.01
PROJECTION TO TD										
17,493.0	95.70	0.80	7,291.0	-2,330.0	10,137.5	-412.7	10,134.8	0.00	0.00	0.00

Survey Report



Company:	ANADARKO PETROLEUM CORP	Local Co-ordinate Reference:	Well QUARTER CIRCLE 24-3HZ
Project:	WELD COUNTY (NAD 83)	TVD Reference:	KB 20' @ 4961.0usft (PD461)
Site:	SW SW SEC. 13 T1N R67W 6th P.M.	MD Reference:	KB 20' @ 4961.0usft (PD461)
Well:	QUARTER CIRCLE 24-3HZ	North Reference:	True
Wellbore:	JOB # 2018-203-461	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 13.9usft at 7902.6usft MD (7383.4 TVD, 551.8 N, -458.4 E) - Point	0.00	0.00	7,393.0	550.8	-468.4	14,538,364.28	1,683,576.89	40° 1' 54.616 N	104° 50' 44.926 W
QUARTER CIRCLE 24- - survey misses target center by 2.0usft at 6660.2usft MD (6574.5 TVD, -283.6 N, -471.9 E) - Point	0.00	0.00	6,574.7	-284.7	-473.5	14,537,529.12	1,683,573.26	40° 1' 46.359 N	104° 50' 44.991 W
QUARTER CIRCLE 24- - survey misses target center by 37.2usft at 7905.8usft MD (7383.9 TVD, 555.1 N, -458.4 E) - Point	0.00	0.00	7,419.4	550.8	-468.4	14,538,364.28	1,683,576.89	40° 1' 54.616 N	104° 50' 44.926 W
QUARTER CIRCLE 24- - survey misses target center by 12.5usft at 17493.0usft MD (7291.0 TVD, 10137.5 N, -412.7 E) - Point	0.00	0.00	7,303.0	10,139.3	-409.5	14,547,949.04	1,683,618.99	40° 3' 29.372 N	104° 50' 44.171 W
QUARTER CIRCLE 24- - survey misses target center by 124.0usft at 6929.4usft MD (6831.8 TVD, -207.4 N, -470.5 E) - Point	0.00	0.00	6,782.9	-93.5	-472.4	14,537,720.26	1,683,574.08	40° 1' 48.249 N	104° 50' 44.976 W
QUARTER CIRCLE 24- - survey misses target center by 34.8usft at 12256.1usft MD (7336.1 TVD, 4902.9 N, -452.5 E) - Point	0.00	0.00	7,303.0	4,902.8	-441.6	14,542,714.59	1,683,596.13	40° 2' 37.624 N	104° 50' 44.582 W

Survey Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
1,838.0	1,793.3	-65.9	-317.4	TIE IN TO SURFACE SURVEYS
1,883.0	1,836.0	-68.4	-331.2	9 5/8" SURFACE CASING
6,551.0	6,465.9	-294.2	-475.3	KOP
7,413.8	7,186.0	110.6	-462.5	~ CROSS HARDLINE
7,900.0	7,382.9	549.3	-458.5	HEEL
8,764.8	7,382.0	1,413.0	-447.5	~ CROSS 460' SETBACK
17,086.5	7,317.3	9,732.0	-412.9	~ CROSS 460' SETBACK
17,435.0	7,296.8	10,079.8	-413.5	LAST SURVEY MAY 9, 2018
17,493.0	7,291.0	10,137.5	-412.7	PROJECTION TO TD

Checked By: _____ Approved By: _____ Date: _____