

ANADARKO PETROLEUM CORP

WELD COUNTY (NAD 83)

SE SW SEC 24 T2N R66W 6th P.M.

GRACIE 24-3HZ

JOB #2018-420-461

04 August, 2018

Survey: FINAL SURVEYS





Project: WELD COUNTY (NAD 83)
 Site: SE SW SEC 24 T2N R66W 6th P.M.
 Well: GRACIE 24-3HZ
 Wellbore: JOB #2018-420-461
 Design: FINAL SURVEYS

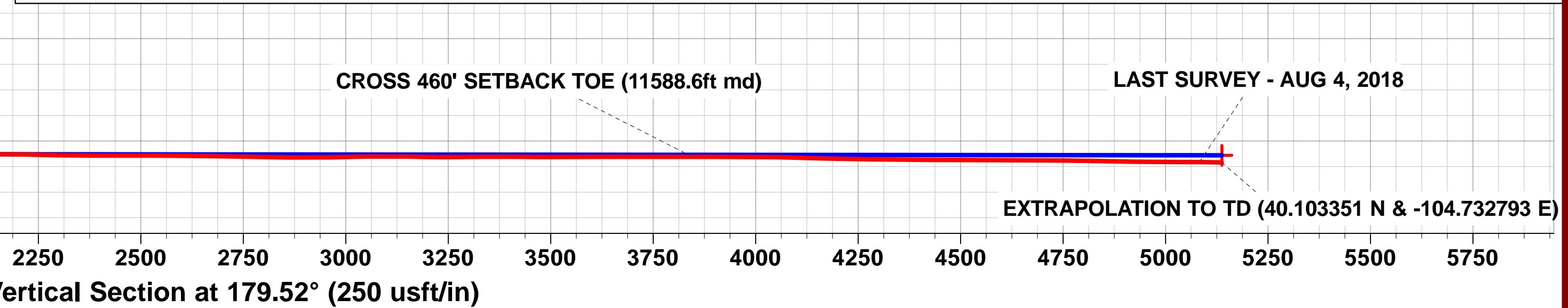
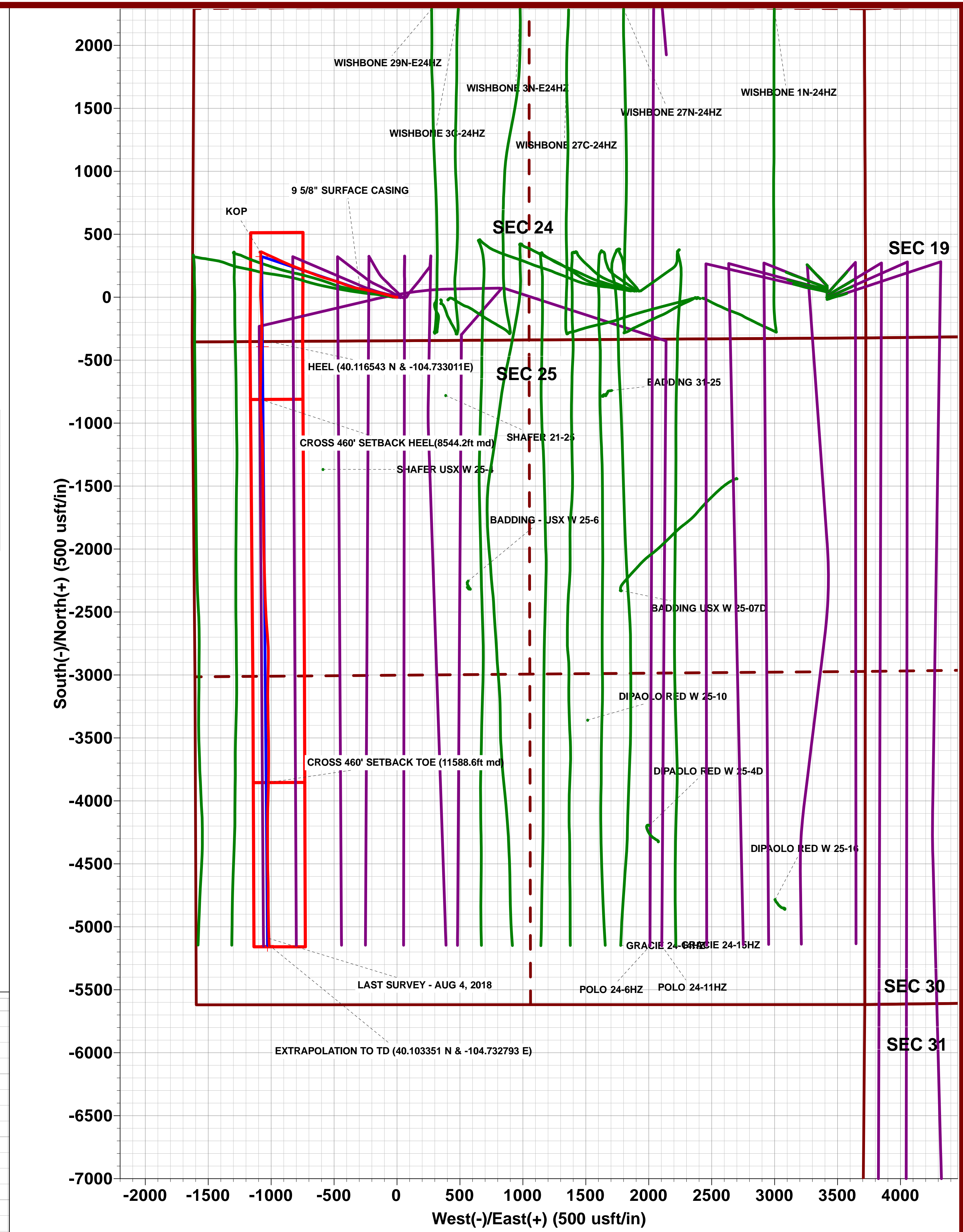
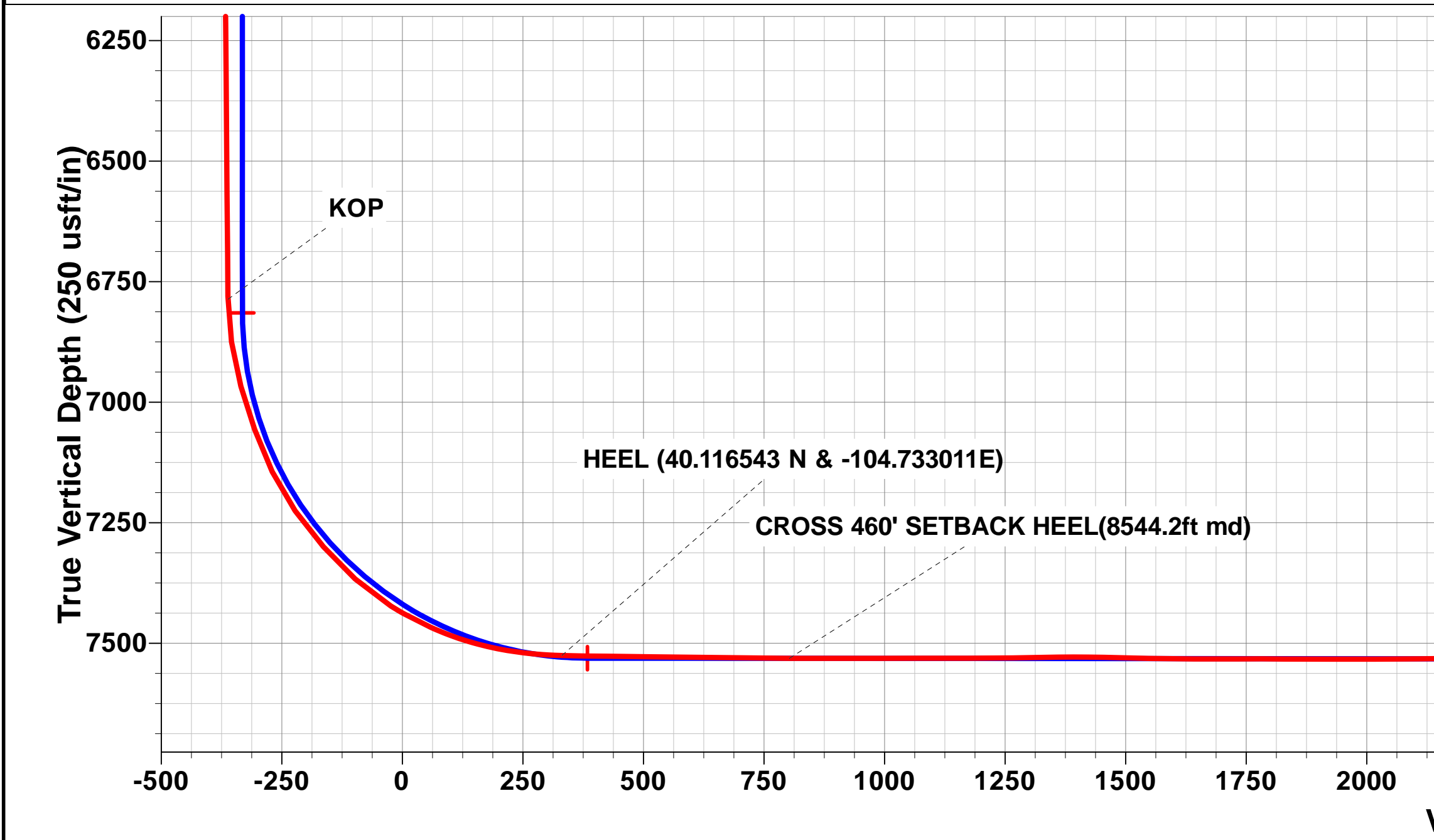
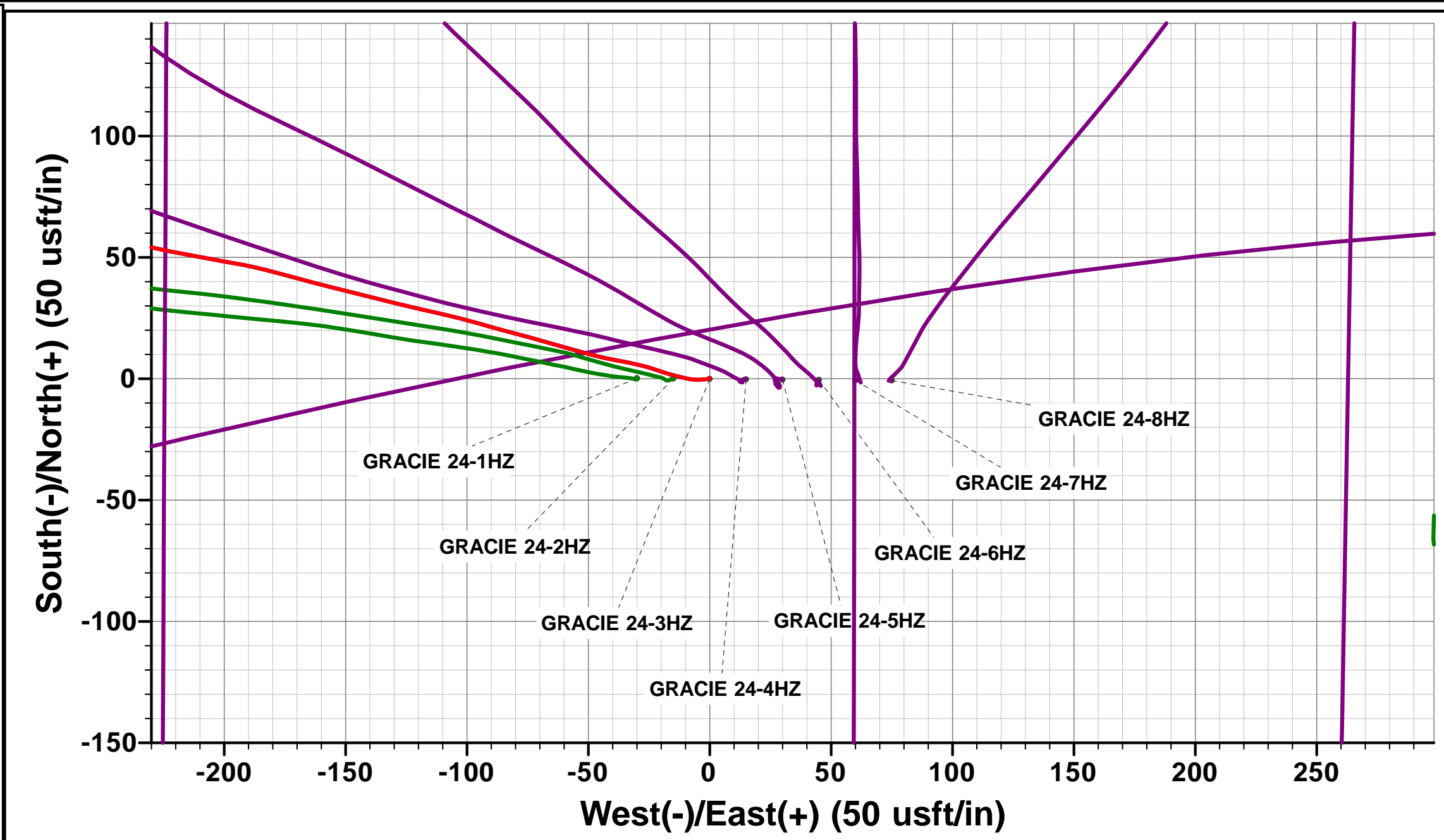
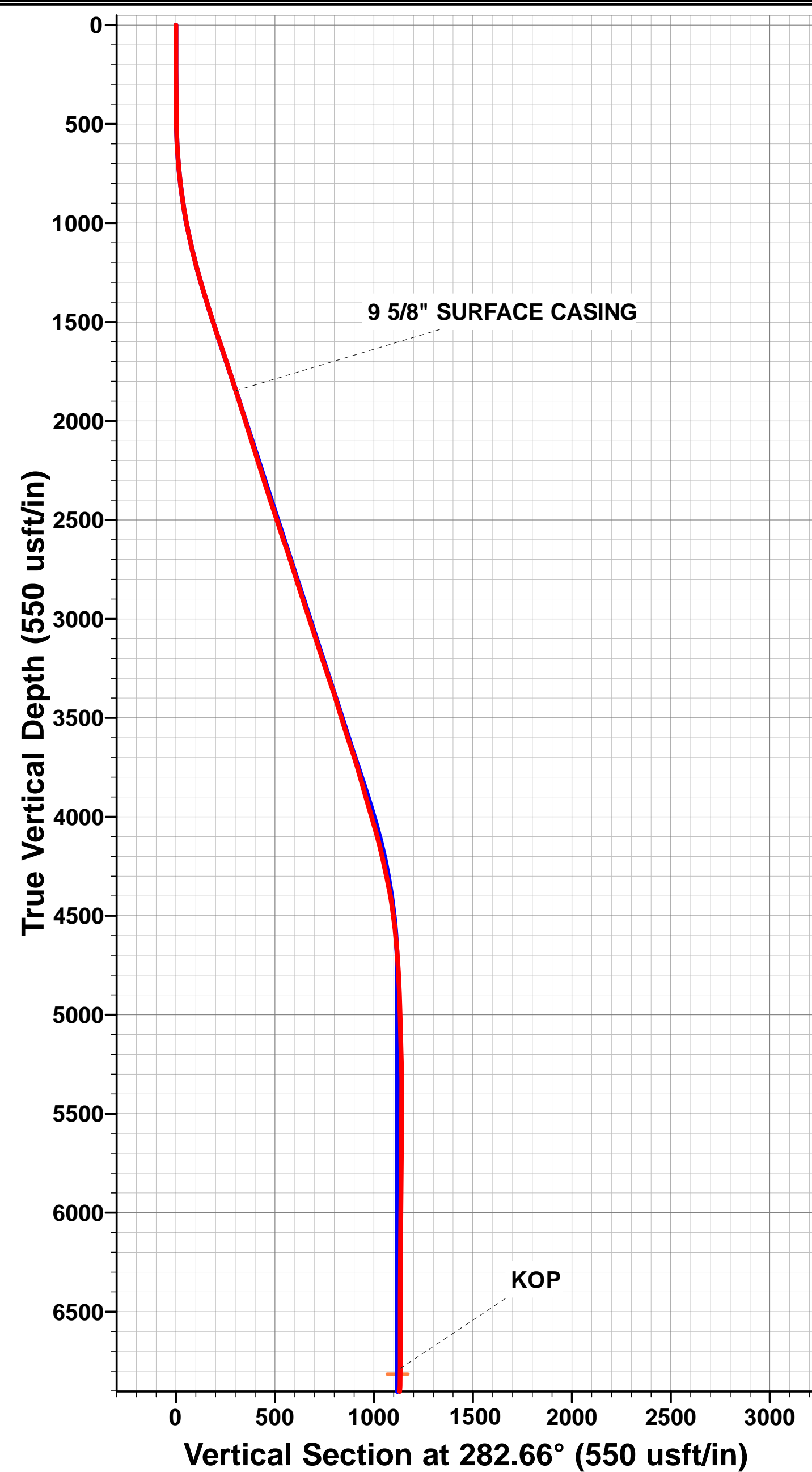
ANNOTATIONS

TVD	MD	Inc	Azi	+N/-S	+E/-W	VSec	Departure	Annotation
1847.1	1887.0	18.11	280.19	66.9	-294.8	-69.4	303.4	9 5/8" SURFACE CASING
6786.6	6950.0	0.88	177.20	352.7	-1081.9	-361.7	1169.7	KOP
7525.6	8072.0	88.51	181.89	-339.7	-1076.3	330.7	1862.2	HEEL (40.116543 N & -104.733011E)
7531.3	8544.2	89.77	178.33	-811.8	-1085.0	802.6	2334.4	CROSS 460' SETBACK HEEL(8544.2ft md)
7538.7	11588.6	90.01	180.84	-3854.4	-1021.2	3845.7	5378.5	CROSS 460' SETBACK TOE (11588.6ft md)
7551.6	12826.0	89.26	177.95	-5091.5	-1017.7	5082.8	6615.8	LAST SURVEY - AUG 4, 2018
7552.3	12880.0	89.26	177.95	-5145.5	-1015.7	5136.8	6669.8	EXTRAPOLATION TO TD (40.103351 N & -104.732793 E)

AS DRILLED LOCAL COORDINATES:
 SHL: 345ft FSL & 1625ft FWL Sec 24
 HEEL: 12ft FSL & 550.6ft FWL Sec 24
 BHL: 473ft FSL & 581.1ft FWL Sec 25

WELLBORE TARGET DETAILS (LAT/LONG)

Name	TVD	+N/-S	+E/-W	Latitude	Longitude
BHL - GRACIE 24-3HZ (P2)	7535.0	-5146.5	-1028.8	40° 6' 12.053 N	104° 43' 58.224 W
HEEL - GRACIE 24-3HZ (P2)	7531.0	-392.7	-1068.9	40° 6' 59.031 N	104° 43' 58.742 W
KOP - GRACIE 24-3HZ (P2)	6814.8	322.8	-1074.9	40° 7' 6.102 N	104° 43' 58.820 W



Survey Report



Company:	ANADARKO PETROLEUM CORP	Local Co-ordinate Reference:	Well GRACIE 24-3HZ
Project:	WELD COUNTY (NAD 83)	TVD Reference:	KB 20' @ 5103.0usft (PD 461)
Site:	SE SW SEC 24 T2N R66W 6th P.M.	MD Reference:	KB 20' @ 5103.0usft (PD 461)
Well:	GRACIE 24-3HZ	North Reference:	True
Wellbore:	JOB #2018-420-461	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 24 T2N R66W 6th P.M.				
Site Position:		Northing:	14,569,626.93 usft	Latitude:	40° 7' 2.914 N
From:	Lat/Long	Easting:	1,716,104.98 usft	Longitude:	104° 43' 45.370 W
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16"	Grid Convergence:	0.17 °

Well	GRACIE 24-3HZ					
Well Position	+N/-S	0.0 usft	Northing:	14,569,626.82 usft	Latitude:	40° 7' 2.912 N
	+E/-W	0.0 usft	Easting:	1,716,134.95 usft	Longitude:	104° 43' 44.984 W
Position Uncertainty		0.0 usft	Wellhead Elevation:	usft	Ground Level:	5,083.0 usft

Wellbore	JOB #2018-420-461				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	17/07/2018	8.05	66.61	52,124

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	179.52

Survey Program	Date	04/08/2018			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
131.0	12,880.0	FINAL SURVEYS (JOB #2018-420-461)	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	5,103.0	0.0	0.0	0.0	0.00	0.00	0.00	
131.0	0.18	355.56	131.0	4,972.0	0.2	0.0	-0.2	0.14	0.14	0.00	
163.0	0.09	234.75	163.0	4,940.0	0.2	0.0	-0.2	0.75	-0.28	-377.53	
195.0	0.22	343.03	195.0	4,908.0	0.3	-0.1	-0.3	0.82	0.41	338.37	
227.0	0.09	194.85	227.0	4,876.0	0.3	-0.1	-0.3	0.94	-0.41	-463.06	
258.0	0.26	257.87	258.0	4,845.0	0.3	-0.2	-0.3	0.75	0.55	203.29	
290.0	0.13	303.57	290.0	4,813.0	0.3	-0.3	-0.3	0.60	-0.41	142.81	
321.0	0.26	223.68	321.0	4,782.0	0.3	-0.4	-0.3	0.87	0.42	-257.71	
353.0	0.13	207.33	353.0	4,750.0	0.2	-0.4	-0.2	0.44	-0.41	-51.09	
385.0	0.44	241.87	385.0	4,718.0	0.1	-0.5	-0.1	1.07	0.97	107.94	
417.0	0.26	201.53	417.0	4,686.0	0.0	-0.7	0.0	0.92	-0.56	-126.06	
448.0	0.66	266.04	448.0	4,655.0	-0.1	-0.9	0.1	1.92	1.29	208.10	
480.0	1.49	267.44	480.0	4,623.0	-0.2	-1.5	0.1	2.59	2.59	4.37	

Survey Report



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Project:	WELD COUNTY (NAD 83)	TDV Reference:	KB 20' @ 5103.0usft (PD 461)
Site:	SE SW SEC 24 T2N R66W 6th P.M.	MD Reference:	KB 20' @ 5103.0usft (PD 461)
Well:	GRACIE 24-3HZ	North Reference:	True
Wellbore:	JOB #2018-420-461	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)
511.0	1.76	261.64	511.0	4,592.0	-0.2	-2.4	0.2	1.02	0.87	-18.71
543.0	1.89	267.62	543.0	4,560.0	-0.3	-3.4	0.3	0.72	0.41	18.69
575.0	2.37	265.95	574.9	4,528.1	-0.4	-4.6	0.4	1.51	1.50	-5.22
606.0	3.03	274.74	605.9	4,497.1	-0.4	-6.0	0.3	2.51	2.13	28.35
638.0	3.38	278.08	637.9	4,465.1	-0.2	-7.8	0.1	1.24	1.09	10.44
670.0	4.39	283.35	669.8	4,433.2	0.2	-9.9	-0.3	3.34	3.16	16.47
702.0	4.48	282.91	701.7	4,401.3	0.8	-12.3	-0.9	0.30	0.28	-1.37
734.0	5.36	284.67	733.6	4,369.4	1.5	-15.0	-1.6	2.79	2.75	5.50
765.0	6.24	287.48	764.4	4,338.6	2.3	-18.0	-2.5	2.98	2.84	9.06
797.0	6.94	288.89	796.2	4,306.8	3.5	-21.5	-3.7	2.25	2.19	4.41
829.0	7.60	287.04	827.9	4,275.1	4.7	-25.3	-4.9	2.19	2.06	-5.78
860.0	8.04	282.39	858.7	4,244.3	5.8	-29.4	-6.0	2.48	1.42	-15.00
892.0	8.44	281.86	890.3	4,212.7	6.8	-33.9	-7.0	1.27	1.25	-1.66
924.0	8.57	279.75	922.0	4,181.0	7.6	-38.6	-8.0	1.06	0.41	-6.59
955.0	9.32	282.56	952.6	4,150.4	8.6	-43.3	-8.9	2.80	2.42	9.06
987.0	10.74	284.41	984.1	4,118.9	9.9	-48.7	-10.3	4.55	4.44	5.78
1,018.0	11.56	286.25	1,014.5	4,088.5	11.5	-54.5	-11.9	2.88	2.65	5.94
1,050.0	11.95	285.46	1,045.8	4,057.2	13.2	-60.7	-13.8	1.32	1.22	-2.47
1,082.0	12.13	286.17	1,077.1	4,025.9	15.1	-67.2	-15.6	0.73	0.56	2.22
1,114.0	12.52	285.11	1,108.4	3,994.6	16.9	-73.7	-17.5	1.41	1.22	-3.31
1,145.0	13.54	284.85	1,138.6	3,964.4	18.7	-80.5	-19.4	3.30	3.29	-0.84
1,177.0	14.06	285.46	1,169.7	3,933.3	20.7	-87.9	-21.4	1.69	1.62	1.91
1,209.0	14.59	285.90	1,200.7	3,902.3	22.9	-95.5	-23.7	1.69	1.66	1.37
1,240.0	14.85	284.58	1,230.7	3,872.3	24.9	-103.1	-25.8	1.37	0.84	-4.26
1,272.0	15.42	282.83	1,261.6	3,841.4	26.9	-111.2	-27.8	2.28	1.78	-5.47
1,304.0	16.04	282.83	1,292.4	3,810.6	28.8	-119.7	-29.8	1.94	1.94	0.00
1,335.0	16.57	283.77	1,322.1	3,780.9	30.8	-128.1	-31.9	1.91	1.71	3.03
1,367.0	16.96	284.06	1,352.8	3,750.2	33.0	-137.1	-34.2	1.25	1.22	0.91
1,398.0	17.05	283.70	1,382.4	3,720.6	35.2	-145.9	-36.4	0.45	0.29	-1.16
1,430.0	17.27	284.32	1,413.0	3,690.0	37.5	-155.1	-38.8	0.89	0.69	1.94
1,461.0	17.45	284.58	1,442.6	3,660.4	39.8	-164.0	-41.2	0.63	0.58	0.84
1,493.0	17.45	285.64	1,473.1	3,629.9	42.3	-173.3	-43.8	0.99	0.00	3.31
1,525.0	18.11	284.06	1,503.6	3,599.4	44.8	-182.7	-46.3	2.55	2.06	-4.94
1,556.0	18.28	280.89	1,533.0	3,570.0	46.9	-192.2	-48.5	3.24	0.55	-10.23
1,588.0	18.90	279.57	1,563.3	3,539.7	48.7	-202.2	-50.4	2.34	1.94	-4.12
1,652.0	18.68	281.77	1,623.9	3,479.1	52.5	-222.5	-54.4	1.16	-0.34	3.44
1,684.0	18.46	282.12	1,654.3	3,448.7	54.6	-232.4	-56.6	0.77	-0.69	1.09
1,715.0	18.54	281.51	1,683.7	3,419.3	56.7	-242.1	-58.7	0.68	0.26	-1.97
1,746.0	18.90	282.04	1,713.0	3,390.0	58.7	-251.8	-60.8	1.28	1.16	1.71
1,778.0	17.93	281.77	1,743.4	3,359.6	60.8	-261.7	-63.0	3.04	-3.03	-0.84
1,810.0	17.80	280.54	1,773.8	3,329.2	62.7	-271.3	-64.9	1.25	-0.41	-3.84
1,841.0	18.11	280.28	1,803.3	3,299.7	64.4	-280.7	-66.7	1.03	1.00	-0.84
9 5/8" SURFACE CASING										
1,887.0	18.11	280.19	1,847.1	3,255.9	66.9	-294.8	-69.4	0.06	0.00	-0.20
1,939.0	18.11	280.08	1,896.5	3,206.5	69.8	-310.7	-72.4	0.06	0.00	-0.20
2,033.0	16.75	284.06	1,986.2	3,116.8	75.6	-338.2	-78.5	1.92	-1.45	4.23
2,127.0	17.57	289.25	2,076.0	3,027.0	83.6	-364.8	-86.7	1.85	0.87	5.52
2,221.0	17.01	288.02	2,165.7	2,937.3	92.5	-391.2	-95.8	0.71	-0.60	-1.31
2,315.0	18.30	291.80	2,255.3	2,847.7	102.3	-418.0	-105.8	1.84	1.37	4.02
2,409.0	17.36	290.84	2,344.8	2,758.2	112.7	-444.8	-116.5	1.05	-1.00	-1.02
2,504.0	18.91	288.47	2,435.1	2,667.9	122.7	-472.7	-126.6	1.81	1.63	-2.49
2,598.0	17.67	286.67	2,524.3	2,578.7	131.6	-500.8	-135.8	1.45	-1.32	-1.91
2,692.0	19.49	286.39	2,613.4	2,489.6	140.1	-529.5	-144.5	1.94	1.94	-0.30

Survey Report



Company:	ANADARKO PETROLEUM CORP	Local Co-ordinate Reference:	Well GRACIE 24-3HZ
Project:	WELD COUNTY (NAD 83)	TD Reference:	KB 20' @ 5103.0usft (PD 461)
Site:	SE SW SEC 24 T2N R66W 6th P.M.	MV Reference:	KB 20' @ 5103.0usft (PD 461)
Well:	GRACIE 24-3HZ	North Reference:	True
Wellbore:	JOB #2018-420-461	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)
2,785.0	17.81	285.30	2,701.5	2,401.5	148.2	-558.1	-152.9	1.84	-1.81	-1.17
2,878.0	17.58	287.53	2,790.1	2,312.9	156.2	-585.2	-161.1	0.77	-0.25	2.40
2,971.0	17.85	290.35	2,878.7	2,224.3	165.4	-612.0	-170.5	0.97	0.29	3.03
3,065.0	18.10	289.24	2,968.1	2,134.9	175.2	-639.3	-180.6	0.45	0.27	-1.18
3,159.0	19.13	291.72	3,057.2	2,045.8	185.7	-667.4	-191.3	1.38	1.10	2.64
3,253.0	18.00	290.84	3,146.3	1,956.7	196.6	-695.2	-202.4	1.24	-1.20	-0.94
3,348.0	18.17	291.30	3,236.6	1,866.4	207.2	-722.8	-213.2	0.23	0.18	0.48
3,442.0	19.38	290.48	3,325.6	1,777.4	218.0	-751.0	-224.3	1.32	1.29	-0.87
3,537.0	17.18	290.66	3,415.8	1,687.2	228.4	-778.9	-235.0	2.32	-2.32	0.19
3,630.0	17.04	291.86	3,504.7	1,598.3	238.4	-804.4	-245.1	0.41	-0.15	1.29
3,723.0	18.56	291.43	3,593.3	1,509.7	248.8	-830.9	-255.8	1.64	1.63	-0.46
3,816.0	18.77	293.37	3,681.4	1,421.6	260.2	-858.4	-267.4	0.70	0.23	2.09
3,910.0	15.97	294.17	3,771.1	1,331.9	271.5	-884.1	-278.9	2.99	-2.98	0.85
4,003.0	16.31	292.11	3,860.4	1,242.6	281.6	-907.8	-289.2	0.72	0.37	-2.22
4,097.0	16.83	295.72	3,950.5	1,152.5	292.5	-932.3	-300.3	1.23	0.55	3.84
4,191.0	16.66	295.76	4,040.5	1,062.5	304.3	-956.7	-312.3	0.18	-0.18	0.04
4,286.0	14.57	294.31	4,132.0	971.0	315.1	-979.9	-323.3	2.24	-2.20	-1.53
4,380.0	12.76	293.98	4,223.3	879.7	324.2	-1,000.1	-332.6	1.93	-1.93	-0.35
4,473.0	12.16	293.69	4,314.2	788.8	332.3	-1,018.5	-340.8	0.65	-0.65	-0.31
4,566.0	9.94	296.03	4,405.4	697.6	339.8	-1,034.7	-348.4	2.43	-2.39	2.52
4,658.0	7.98	295.28	4,496.3	606.7	346.0	-1,047.6	-354.7	2.13	-2.13	-0.82
4,752.0	5.29	296.69	4,589.7	513.3	350.7	-1,057.3	-359.6	2.87	-2.86	1.50
4,845.0	5.05	295.64	4,682.3	420.7	354.4	-1,064.9	-363.3	0.28	-0.26	-1.13
4,940.0	3.31	281.88	4,777.0	326.0	356.8	-1,071.3	-365.7	2.10	-1.83	-14.48
5,033.0	1.91	310.68	4,869.9	233.1	358.3	-1,075.1	-367.3	2.02	-1.51	30.97
5,128.0	2.10	299.34	4,964.9	138.1	360.2	-1,077.8	-369.2	0.46	0.20	-11.94
5,248.0	2.05	226.44	5,084.8	18.2	359.8	-1,081.3	-368.9	2.05	-0.04	-60.75
5,343.0	2.42	237.65	5,179.7	-76.7	357.6	-1,084.2	-366.7	0.60	0.39	11.80
5,435.0	1.94	267.92	5,271.7	-168.7	356.5	-1,087.4	-365.6	1.34	-0.52	32.90
5,529.0	0.92	4.89	5,365.7	-262.7	357.2	-1,089.0	-366.3	2.39	-1.09	103.16
5,624.0	0.51	19.08	5,460.7	-357.7	358.3	-1,088.8	-367.5	0.47	-0.43	14.94
5,719.0	0.92	76.44	5,555.6	-452.6	358.9	-1,087.9	-368.0	0.82	0.43	60.38
5,813.0	0.80	85.38	5,649.6	-546.6	359.2	-1,086.5	-368.2	0.19	-0.13	9.51
5,908.0	0.49	86.56	5,744.6	-641.6	359.2	-1,085.4	-368.3	0.33	-0.33	1.24
6,003.0	0.43	112.44	5,839.6	-736.6	359.1	-1,084.7	-368.2	0.23	-0.06	27.24
6,097.0	0.36	107.80	5,933.6	-830.6	358.9	-1,084.1	-368.0	0.08	-0.07	-4.94
6,192.0	0.68	108.08	6,028.6	-925.6	358.6	-1,083.3	-367.7	0.34	0.34	0.29
6,286.0	0.52	143.38	6,122.6	-1,019.6	358.1	-1,082.5	-367.2	0.42	-0.17	37.55
6,380.0	0.56	149.85	6,216.6	-1,113.6	357.4	-1,082.0	-366.4	0.08	0.04	6.88
6,474.0	0.51	162.42	6,310.6	-1,207.6	356.6	-1,081.6	-365.6	0.14	-0.05	13.37
6,568.0	0.42	176.41	6,404.6	-1,301.6	355.8	-1,081.5	-364.9	0.15	-0.10	14.88
6,662.0	0.47	190.09	6,498.6	-1,395.6	355.1	-1,081.5	-364.2	0.12	0.05	14.55
6,756.0	0.59	197.85	6,592.6	-1,489.6	354.3	-1,081.8	-363.3	0.15	0.13	8.26
6,851.0	0.48	186.51	6,687.6	-1,584.6	353.4	-1,081.9	-362.5	0.16	-0.12	-11.94
6,944.0	0.37	164.95	6,780.6	-1,677.6	352.7	-1,081.9	-361.8	0.21	-0.12	-23.18
KOP										
6,950.0	0.88	177.20	6,786.6	-1,683.6	352.7	-1,081.9	-361.7	8.78	8.54	204.10
7,039.0	8.69	184.90	6,875.2	-1,772.2	345.3	-1,082.4	-354.3	8.78	8.77	8.66
7,133.0	15.38	180.62	6,967.1	-1,864.1	325.7	-1,083.2	-334.8	7.18	7.12	-4.55
7,227.0	19.87	177.56	7,056.7	-1,953.7	297.3	-1,082.6	-306.3	4.88	4.78	-3.26
7,322.0	25.39	176.25	7,144.3	-2,041.3	260.8	-1,080.6	-269.8	5.83	5.81	-1.38
7,416.0	35.21	180.15	7,225.4	-2,122.4	213.5	-1,079.4	-222.5	10.65	10.45	4.15
7,511.0	41.33	182.43	7,299.9	-2,196.9	154.7	-1,080.8	-163.7	6.61	6.44	2.40

Survey Report



Company:	ANADARKO PETROLEUM CORP	Local Co-ordinate Reference:	Well GRACIE 24-3HZ
Project:	WELD COUNTY (NAD 83)	TDV Reference:	KB 20' @ 5103.0usft (PD 461)
Site:	SE SW SEC 24 T2N R66W 6th P.M.	MD Reference:	KB 20' @ 5103.0usft (PD 461)
Well:	GRACIE 24-3HZ	North Reference:	True
Wellbore:	JOB #2018-420-461	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)
7,605.0	47.69	181.48	7,366.9	-2,263.9	88.8	-1,083.0	-97.9	6.80	6.77	-1.01
7,698.0	58.15	179.45	7,422.9	-2,319.9	14.8	-1,083.5	-23.8	11.38	11.25	-2.18
7,792.0	65.76	175.69	7,467.1	-2,364.1	-68.0	-1,079.9	59.0	8.83	8.10	-4.00
7,886.0	74.16	178.26	7,499.3	-2,396.3	-156.1	-1,075.3	147.1	9.30	8.94	2.73
7,979.0	82.36	180.51	7,518.2	-2,415.2	-247.1	-1,074.3	238.1	9.13	8.82	2.42
HEEL (40.116543 N & -104.733011E)										
8,072.0	88.51	181.89	7,525.6	-2,422.6	-339.7	-1,076.3	330.7	6.78	6.61	1.48
8,166.0	89.64	182.29	7,527.1	-2,424.1	-433.7	-1,079.7	424.6	1.28	1.20	0.43
8,259.0	88.93	180.33	7,528.3	-2,425.3	-526.6	-1,081.8	517.5	2.24	-0.76	-2.11
8,353.0	89.82	180.64	7,529.3	-2,426.3	-620.6	-1,082.6	611.5	1.00	0.95	0.33
8,447.0	89.00	181.98	7,530.3	-2,427.3	-714.6	-1,084.8	705.5	1.67	-0.87	1.43
8,541.0	89.76	178.34	7,531.3	-2,428.3	-808.6	-1,085.0	799.4	3.96	0.81	-3.87
CROSS 460' SETBACK HEEL(8544.2ft md)										
8,544.2	89.77	178.33	7,531.3	-2,428.3	-811.8	-1,085.0	802.6	0.38	0.31	-0.23
8,634.0	90.05	178.13	7,531.4	-2,428.4	-901.5	-1,082.2	892.4	0.38	0.31	-0.23
8,727.0	89.95	177.24	7,531.4	-2,428.4	-994.4	-1,078.4	985.4	0.96	-0.11	-0.96
8,821.0	90.46	176.35	7,531.1	-2,428.1	-1,088.3	-1,073.2	1,079.3	1.09	0.54	-0.95
8,915.0	89.38	178.46	7,531.2	-2,428.2	-1,182.2	-1,068.9	1,173.2	2.52	-1.15	2.24
9,008.0	91.43	179.66	7,530.6	-2,427.6	-1,275.2	-1,067.4	1,266.2	2.55	2.20	1.29
9,102.0	90.75	179.29	7,528.8	-2,425.8	-1,369.1	-1,066.5	1,360.2	0.82	-0.72	-0.39
9,197.0	88.49	179.39	7,529.4	-2,426.4	-1,464.1	-1,065.4	1,455.2	2.38	-2.38	0.11
9,290.0	88.89	178.90	7,531.6	-2,428.6	-1,557.1	-1,064.0	1,548.1	0.68	0.43	-0.53
9,383.0	89.69	179.11	7,532.7	-2,429.7	-1,650.1	-1,062.4	1,641.1	0.89	0.86	0.23
9,477.0	90.49	179.30	7,532.6	-2,429.6	-1,744.1	-1,061.1	1,735.1	0.87	0.85	0.20
9,571.0	89.25	179.07	7,532.8	-2,429.8	-1,838.1	-1,059.8	1,829.1	1.34	-1.32	-0.24
9,664.0	90.21	179.78	7,533.2	-2,430.2	-1,931.0	-1,058.9	1,922.1	1.28	1.03	0.76
9,759.0	89.96	178.43	7,533.1	-2,430.1	-2,026.0	-1,057.4	2,017.1	1.45	-0.26	-1.42
9,854.0	90.78	178.36	7,532.5	-2,429.5	-2,121.0	-1,054.7	2,112.1	0.87	0.86	-0.07
9,946.0	88.63	178.68	7,532.9	-2,429.9	-2,213.0	-1,052.3	2,204.1	2.36	-2.34	0.35
10,040.0	89.09	178.24	7,534.8	-2,431.8	-2,306.9	-1,049.8	2,298.0	0.68	0.49	-0.47
10,135.0	89.61	177.65	7,535.9	-2,432.9	-2,401.8	-1,046.4	2,393.0	0.83	0.55	-0.62
10,230.0	90.32	177.28	7,535.9	-2,432.9	-2,496.7	-1,042.2	2,487.9	0.84	0.75	-0.39
10,323.0	89.32	176.01	7,536.2	-2,433.2	-2,589.6	-1,036.8	2,580.8	1.74	-1.08	-1.37
10,417.0	89.54	174.92	7,537.2	-2,434.2	-2,683.3	-1,029.3	2,674.6	1.18	0.23	-1.16
10,511.0	88.69	177.55	7,538.6	-2,435.6	-2,777.1	-1,023.2	2,768.4	2.94	-0.90	2.80
10,606.0	89.31	181.05	7,540.3	-2,437.3	-2,872.0	-1,022.0	2,863.4	3.74	0.65	3.68
10,700.0	90.77	181.35	7,540.2	-2,437.2	-2,966.0	-1,024.0	2,957.3	1.59	1.55	0.32
10,795.0	91.61	180.84	7,538.2	-2,435.2	-3,061.0	-1,025.8	3,052.3	1.03	0.88	-0.54
10,889.0	88.40	179.68	7,538.2	-2,435.2	-3,154.9	-1,026.2	3,146.2	3.63	-3.41	-1.23
10,983.0	89.82	179.32	7,539.7	-2,436.7	-3,248.9	-1,025.4	3,240.2	1.56	1.51	-0.38
11,076.0	91.37	179.00	7,538.7	-2,435.7	-3,341.9	-1,024.0	3,333.2	1.70	1.67	-0.34
11,169.0	88.75	178.95	7,538.6	-2,435.6	-3,434.9	-1,022.4	3,426.2	2.82	-2.82	-0.05
11,263.0	90.24	179.13	7,539.5	-2,436.5	-3,528.9	-1,020.8	3,520.2	1.60	1.59	0.19
11,356.0	90.89	179.76	7,538.5	-2,435.5	-3,621.9	-1,019.9	3,613.2	0.97	0.70	0.68
11,448.0	89.06	180.48	7,538.6	-2,435.6	-3,713.8	-1,020.1	3,705.2	2.14	-1.99	0.78
11,541.0	90.53	180.34	7,538.9	-2,435.9	-3,806.8	-1,020.7	3,798.2	1.59	1.58	-0.15
CROSS 460' SETBACK TOE (11588.6ft md)										
11,588.6	90.01	180.84	7,538.7	-2,435.7	-3,854.4	-1,021.2	3,845.7	1.50	-1.08	1.04
11,636.0	89.50	181.33	7,538.9	-2,435.9	-3,901.8	-1,022.1	3,893.1	1.50	-1.08	1.04
11,730.0	90.14	181.99	7,539.2	-2,436.2	-3,995.8	-1,024.8	3,987.1	0.98	0.68	0.70
11,822.0	88.34	180.86	7,540.4	-2,437.4	-4,087.7	-1,027.1	4,079.0	2.31	-1.96	-1.23
11,916.0	88.76	180.43	7,542.8	-2,439.8	-4,181.7	-1,028.2	4,172.9	0.64	0.45	-0.46
12,009.0	89.01	179.90	7,544.6	-2,441.6	-4,274.7	-1,028.5	4,265.9	0.63	0.27	-0.57

Survey Report



Company:	ANADARKO PETROLEUM CORP	Local Co-ordinate Reference:	Well GRACIE 24-3HZ
Project:	WELD COUNTY (NAD 83)	TVD Reference:	KB 20' @ 5103.0usft (PD 461)
Site:	SE SW SEC 24 T2N R66W 6th P.M.	MD Reference:	KB 20' @ 5103.0usft (PD 461)
Well:	GRACIE 24-3HZ	North Reference:	True
Wellbore:	JOB #2018-420-461	Survey Calculation Method:	Minimum Curvature
Design:	FINAL SURVEYS	Database:	EOG RESOURCES

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)
12,103.0	89.33	179.83	7,545.9	-2,442.9	-4,368.7	-1,028.2	4,359.9	0.35	0.34	-0.07
12,196.0	90.12	179.78	7,546.4	-2,443.4	-4,461.7	-1,027.9	4,452.9	0.85	0.85	-0.05
12,290.0	89.60	178.50	7,546.6	-2,443.6	-4,555.7	-1,026.5	4,546.9	1.47	-0.55	-1.36
12,385.0	89.50	178.23	7,547.4	-2,444.4	-4,650.6	-1,023.8	4,641.9	0.30	-0.11	-0.28
12,478.0	90.04	180.95	7,547.7	-2,444.7	-4,743.6	-1,023.1	4,734.9	2.98	0.58	2.92
12,572.0	88.49	179.10	7,548.9	-2,445.9	-4,837.6	-1,023.2	4,828.9	2.57	-1.65	-1.97
12,665.0	89.22	178.76	7,550.8	-2,447.8	-4,930.6	-1,021.4	4,921.8	0.87	0.78	-0.37
12,759.0	90.17	178.89	7,551.3	-2,448.3	-5,024.5	-1,019.5	5,015.8	1.02	1.01	0.14
LAST SURVEY - AUG 4, 2018										
12,826.0	89.26	177.95	7,551.6	-2,448.6	-5,091.5	-1,017.7	5,082.8	1.95	-1.36	-1.40
EXTRAPOLATION TO TD (40.103351 N & -104.732793 E)										
12,880.0	89.26	177.95	7,552.3	-2,449.3	-5,145.5	-1,015.7	5,136.8	0.00	0.00	0.00

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
BHL - GRACIE 24-3HZ - survey misses target center by 13.3usft at 12880.0usft MD (7552.3 TVD, -5145.5 N, -1015.7 E) - Point	0.00	0.00	7,550.0	-5,146.5	-1,028.8	14,564,479.23	1,715,122.22	40° 6' 12.053 N	104° 43' 58.224 W
HEEL - GRACIE 24-3HZ - survey misses target center by 10.2usft at 8124.8usft MD (7526.7 TVD, -392.5 N, -1078.1 E) - Point	0.00	0.00	7,531.0	-392.7	-1,068.9	14,569,230.98	1,715,067.69	40° 6' 59.031 N	104° 43' 58.742 W
KOP - GRACIE 24-3HZ - survey misses target center by 29.6usft at 6980.6usft MD (6817.1 TVD, 351.5 N, -1082.0 E) - Point	0.00	0.00	6,814.8	322.8	-1,074.9	14,569,946.23	1,715,059.53	40° 7' 6.102 N	104° 43' 58.820 W
KOP - GRACIE 24-3HZ - survey misses target center by 99.4usft at 7079.4usft MD (6914.9 TVD, 338.2 N, -1082.9 E) - Point	0.00	0.00	6,894.4	241.3	-1,074.2	14,569,864.75	1,715,060.46	40° 7' 5.296 N	104° 43' 58.811 W
HEEL - GRACIE 24-3HZ - survey misses target center by 10.2usft at 8124.8usft MD (7526.7 TVD, -392.5 N, -1078.1 E) - Point	0.00	0.00	7,531.0	-392.7	-1,068.9	14,569,230.98	1,715,067.69	40° 6' 59.031 N	104° 43' 58.742 W
BHL - GRACIE 24-3HZ () - survey misses target center by 21.7usft at 12880.0usft MD (7552.3 TVD, -5145.5 N, -1015.7 E) - Point	0.00	0.00	7,535.0	-5,146.5	-1,028.8	14,564,479.23	1,715,122.22	40° 6' 12.053 N	104° 43' 58.224 W

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
1,887.0	1,847.1	66.9	-294.8	9 5/8" SURFACE CASING
6,950.0	6,786.6	352.7	-1,081.9	KOP
8,072.0	7,525.6	-339.7	-1,076.3	HEEL (40.116543 N & -104.733011E)
8,544.2	7,531.3	-811.8	-1,085.0	CROSS 460' SETBACK HEEL(8544.2ft md)
11,588.6	7,538.7	-3,854.4	-1,021.2	CROSS 460' SETBACK TOE (11588.6ft md)
12,826.0	7,551.6	-5,091.5	-1,017.7	LAST SURVEY - AUG 4, 2018
12,880.0	7,552.3	-5,145.5	-1,015.7	EXTRAPOLATION TO TD (40.103351 N & -104.732793 E)

Checked By: _____ Approved By: _____ Date: _____