

ANADARKO PETROLEUM CORP

WELD COUNTY (NAD 83)

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

GRACIE 24-8HZ

JOB #2018-425-461

19 August, 2018

Survey: FINAL SURVEYS





Project: WELD COUNTY (NAD 83)
 Site: SE SW SEC 24 T2N R66W 6th P.M.
 Well: GRACIE 24-8HZ
 Wellbore: JOB #2018-425-461
 Design: FINAL SURVEYS

ANNOTATIONS

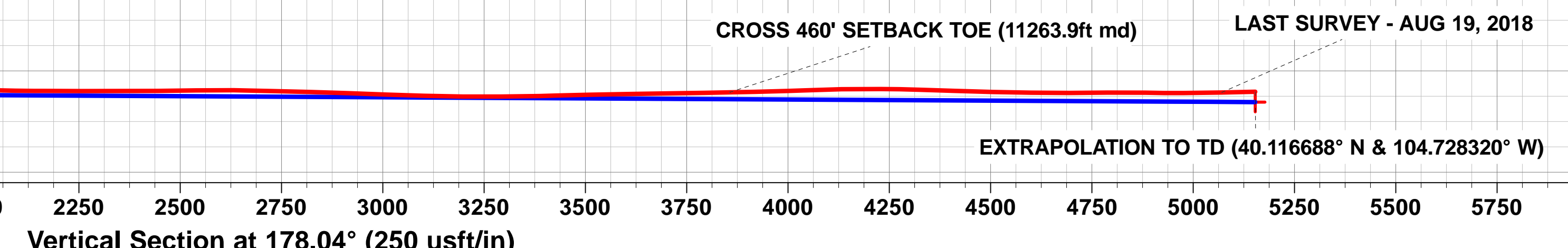
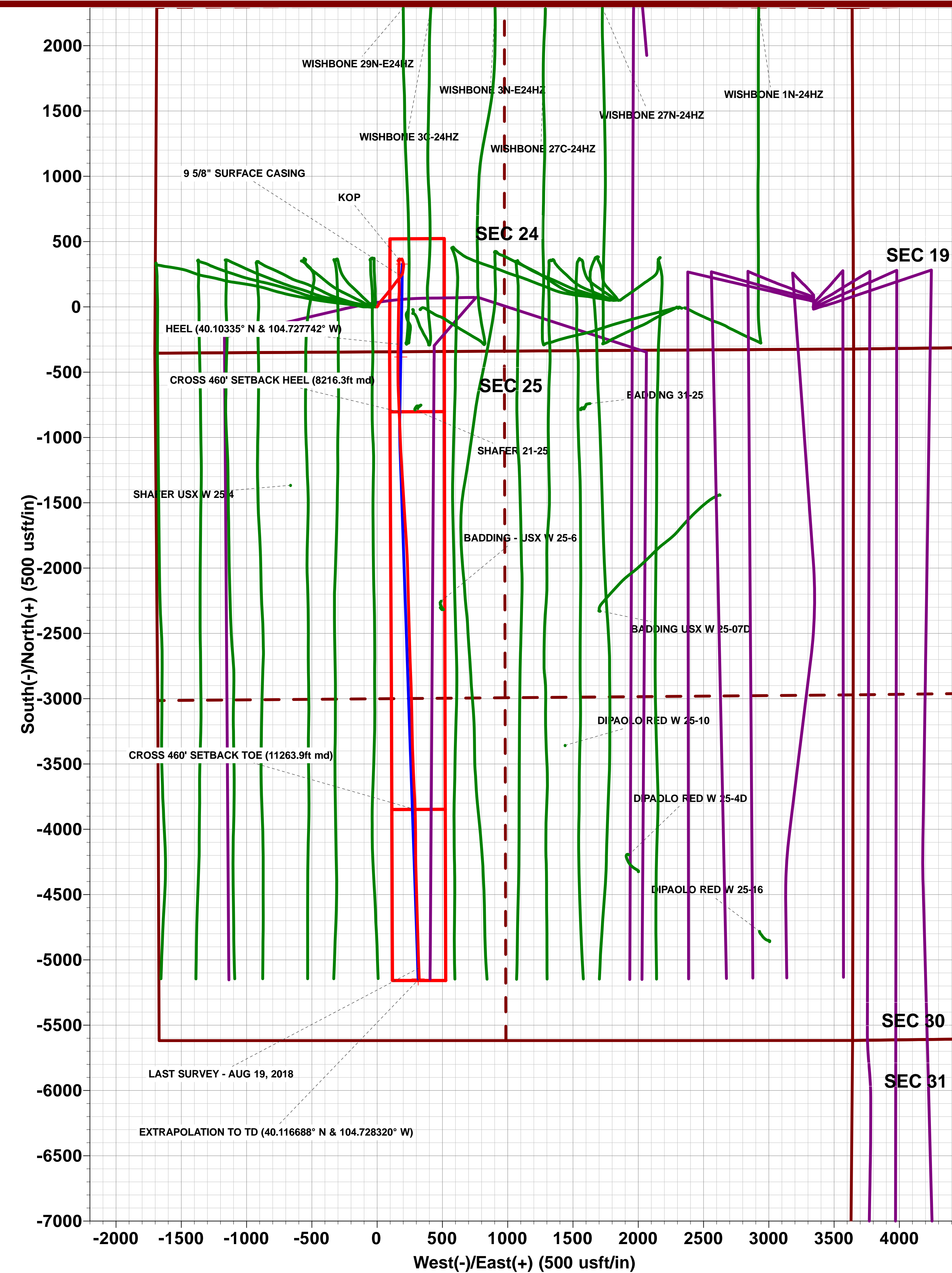
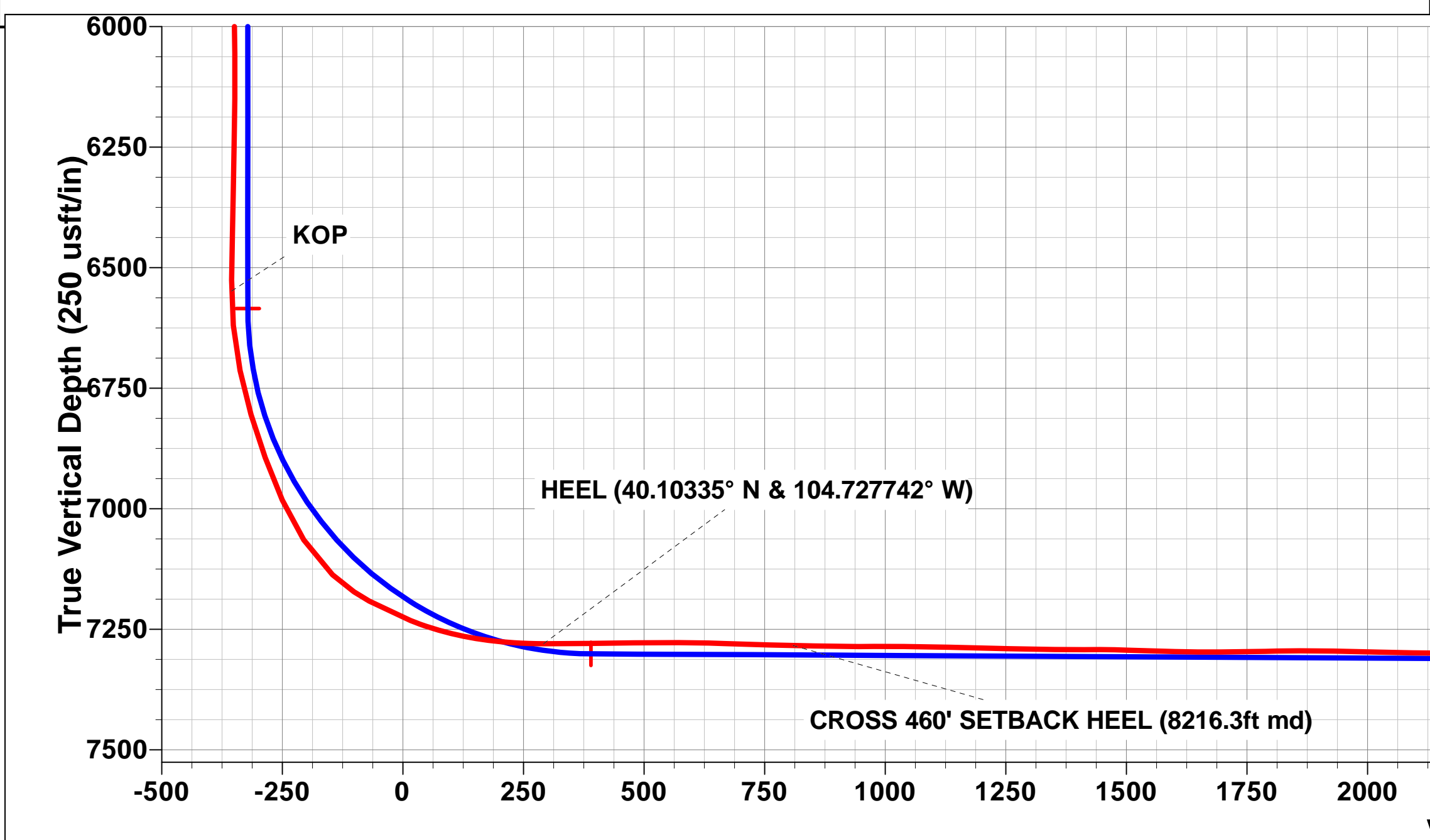
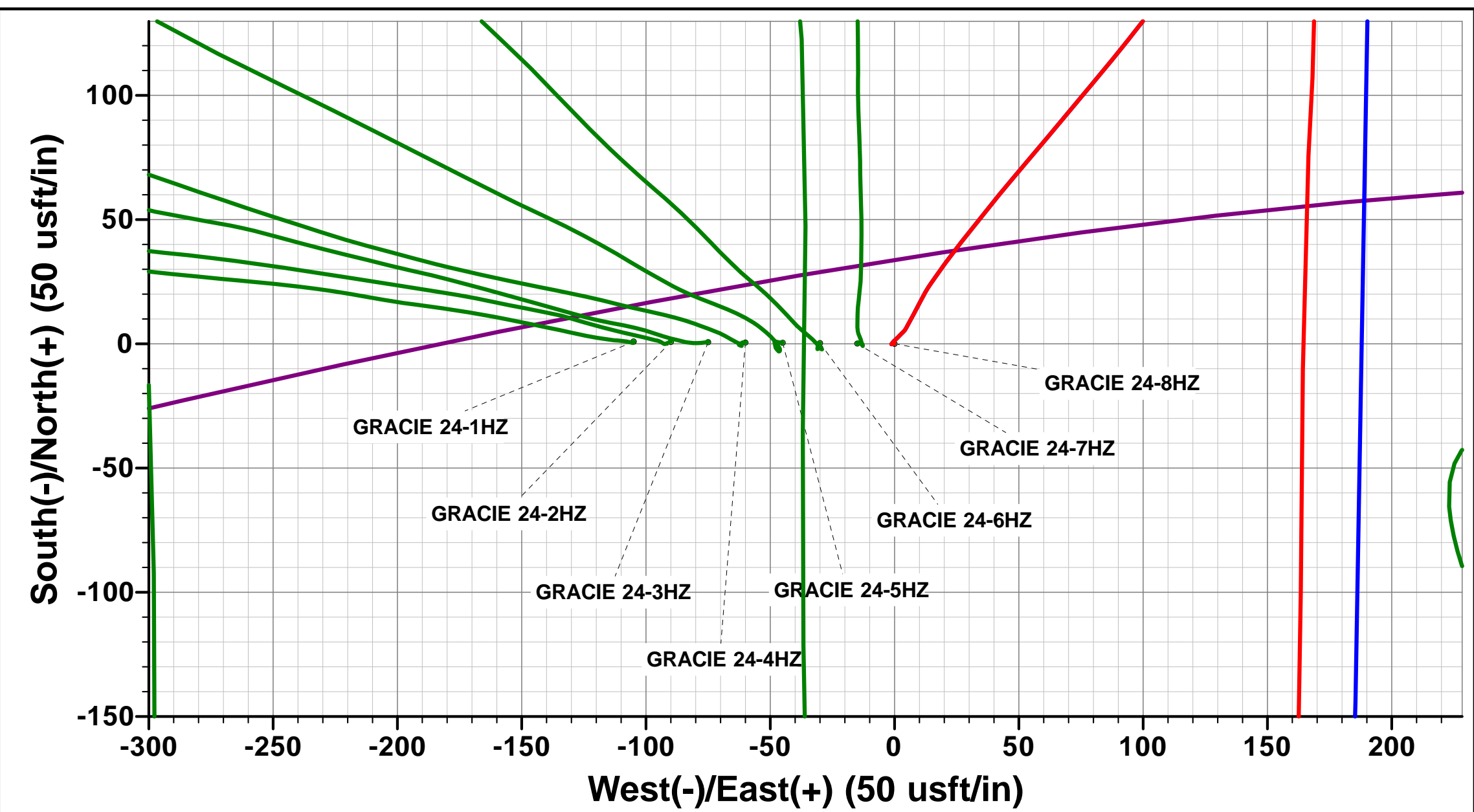
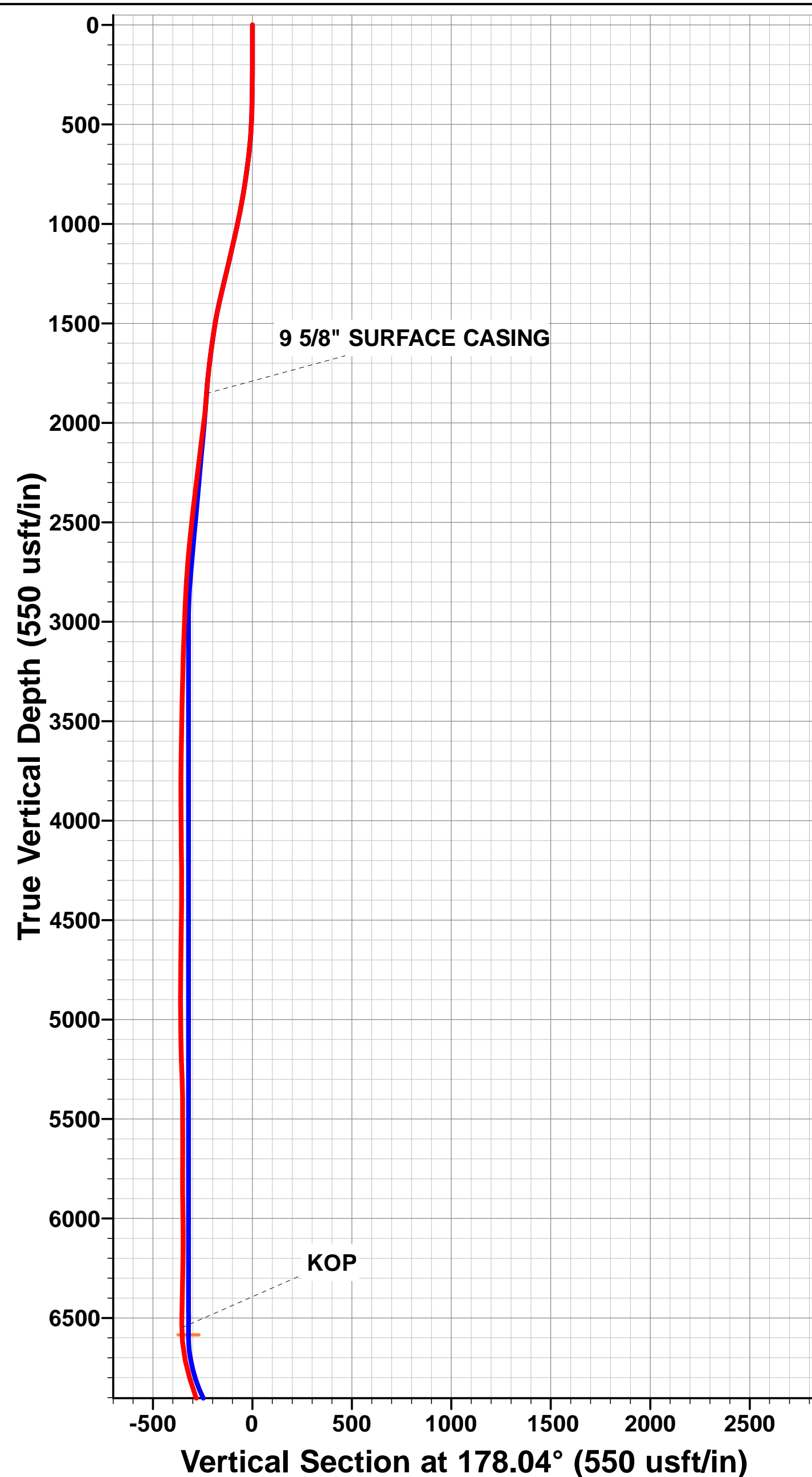
TVD	MD	Inc	Azi	+N/-S	+E/-W	Vsect	Departure	Annotation
1852.0	1887.0	6.36	41.52	237.1	182.5	-230.7	301.7	9 5/8" SURFACE CASING
6548.6	6591.0	0.84	124.87	361.2	168.9	-355.3	500.1	KOP
7280.1	7699.0	89.60	180.39	-286.4	160.5	291.7	1148.7	HEEL (40.10335° N & 104.727742° W)
7283.7	8216.3	88.66	177.72	-803.4	168.9	808.7	1685.9	CROSS 460' SETBACK HEEL (8216.3ft md)
7303.2	11263.9	91.33	177.46	-3847.6	290.8	3855.3	4712.9	CROSS 460' SETBACK TOE (11263.9ft md)
7303.3	12479.0	91.15	177.81	-5062.1	319.2	5070.0	5927.8	LAST SURVEY - AUG 19, 2018
7301.7	12562.0	91.15	177.81	-5145.0	322.4	5153.0	6010.7	EXTRAPOLATION TO TD (40.116688° N & 104.728320° W)

AS DRILLED LOCAL COORDINATES:

SHL: 344ft FSL & 1700ft FWL Sec 24
 HEEL: 137.4ft FNL & 1903.7ft FWL Sec 25
 BHL: 473.5ft FSL & 1994.2ft FWL Sec 25

WELLBORE TARGET DETAILS (LAT/LONG)

Name	TVD	+N/-S	+E/-W	Latitude	Longitude
BHL - GRACIE 24-8HZ (P2)	7327.0	-5145.5	314.2	40° 6' 12.057 N	104° 43' 39.975 W
HEEL - GRACIE 24-8HZ (P2)	7301.0	-383.8	181.2	40° 6' 59.112 N	104° 43' 41.686 W
KOP - GRACIE 24-8HZ (P2)	6584.8	328.4	193.7	40° 7' 6.150 N	104° 43' 41.526 W



Survey Report



Company:	ANADARKO PETROLEUM CORP	Local Co-ordinate Reference:	Well GRACIE 24-8HZ
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 24-8HZ	North Reference:	True
Wellbore:	JOB #2018-425-461	Survey Calculation Method:	Minimum Curvature
Design:	FINAL SURVEYS	Database:	EOG RESOURCES

Project	WELD COUNTY (NAD 83)		
Map System:	Universal Transverse Mercator (US Survey Fee	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
From:	Lat/Long	Easting:	1,716,104.98 usft
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16"
		Latitude:	40° 7' 2.914 N
		Longitude:	104° 43' 45.370 W
		Grid Convergence:	0.17 °

Well	GRACIE 24-8HZ		
Well Position	+N-S	0.0 usft	Northing:
	+E-W	0.0 usft	Easting:
Position Uncertainty		0.0 usft	Wellhead Elevation:
			usft
			Latitude:
			40° 7' 2.905 N
			Longitude:
			104° 43' 44.019 W
			Ground Level:
			5,083.0 usft

Wellbore	JOB #2018-425-461				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	18/07/2018	8.05	66.61	52,123

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	178.04

Survey Program	Date	19/08/2018		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
132.0	12,562.0	FINAL SURVEYS (JOB #2018-425-461)	APC_ISCWSA REV 2 MM 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
132.0	0.79	263.75	132.0	4,971.0	-0.1	-0.9	0.1	0.60	0.60	0.00
164.0	0.35	260.77	164.0	4,939.0	-0.1	-1.2	0.1	1.38	-1.37	-9.31
196.0	0.22	61.87	196.0	4,907.0	-0.1	-1.3	0.1	1.76	-0.41	503.44
227.0	0.70	30.05	227.0	4,876.0	0.1	-1.1	-0.1	1.70	1.55	-102.65
291.0	0.92	42.01	291.0	4,812.0	0.8	-0.6	-0.8	0.43	0.34	18.69
322.0	1.01	43.50	322.0	4,781.0	1.2	-0.2	-1.2	0.30	0.29	4.81
386.0	1.23	51.41	386.0	4,717.0	2.0	0.7	-2.0	0.42	0.34	12.36
417.0	1.93	42.36	417.0	4,686.0	2.6	1.3	-2.6	2.39	2.26	-29.19
449.0	2.94	46.40	448.9	4,654.1	3.6	2.3	-3.5	3.20	3.16	12.62
481.0	3.25	43.68	480.9	4,622.1	4.8	3.5	-4.7	1.07	0.97	-8.50
512.0	3.91	30.32	511.8	4,591.2	6.3	4.6	-6.2	3.42	2.13	-43.10
544.0	4.48	27.24	543.7	4,559.3	8.4	5.8	-8.2	1.91	1.78	-9.62

Survey Report



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Site:	SE SW SEC 24 T2N R66W 6th P.M.	MD Reference:	KB 20' @ 5103.0usft (PD 461)
Well:	GRACIE 24-8HZ	North Reference:	True
Wellbore:	JOB #2018-425-461	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)
575.0	5.58	28.91	574.6	4,528.4	10.8	7.0	-10.5	3.58	3.55	5.39
607.0	6.28	28.29	606.4	4,496.6	13.7	8.6	-13.4	2.20	2.19	-1.94
639.0	7.38	26.89	638.2	4,464.8	17.1	10.4	-16.7	3.48	3.44	-4.37
671.0	8.09	29.35	669.9	4,433.1	20.9	12.4	-20.4	2.45	2.22	7.69
702.0	8.92	35.06	700.6	4,402.4	24.7	14.9	-24.2	3.82	2.68	18.42
734.0	9.84	34.97	732.2	4,370.8	29.0	17.9	-28.4	2.88	2.87	-0.28
766.0	10.55	36.56	763.7	4,339.3	33.6	21.2	-32.8	2.39	2.22	4.97
798.0	11.34	38.05	795.1	4,307.9	38.4	24.9	-37.5	2.62	2.47	4.66
829.0	12.08	39.28	825.4	4,277.6	43.3	28.8	-42.3	2.52	2.39	3.97
861.0	12.26	37.44	856.7	4,246.3	48.6	33.0	-47.5	1.34	0.56	-5.75
925.0	14.19	39.63	919.0	4,184.0	60.1	42.1	-58.6	3.12	3.02	3.42
956.0	15.29	40.16	949.0	4,154.0	66.1	47.2	-64.5	3.57	3.55	1.71
987.0	15.78	39.98	978.9	4,124.1	72.5	52.5	-70.6	1.59	1.58	-0.58
1,019.0	16.13	40.51	1,009.6	4,093.4	79.2	58.2	-77.1	1.18	1.09	1.66
1,051.0	16.61	39.81	1,040.3	4,062.7	86.1	64.0	-83.8	1.62	1.50	-2.19
1,082.0	16.92	39.81	1,070.0	4,033.0	92.9	69.7	-90.5	1.00	1.00	0.00
1,114.0	17.09	39.81	1,100.6	4,002.4	100.1	75.7	-97.5	0.53	0.53	0.00
1,146.0	17.23	39.72	1,131.2	3,971.8	107.4	81.8	-104.5	0.45	0.44	-0.28
1,178.0	17.01	39.54	1,161.8	3,941.2	114.6	87.8	-111.6	0.71	-0.69	-0.56
1,210.0	17.01	38.23	1,192.4	3,910.6	121.9	93.6	-118.7	1.20	0.00	-4.09
1,241.0	16.96	38.14	1,222.0	3,881.0	129.0	99.2	-125.6	0.18	-0.16	-0.29
1,272.0	17.09	37.70	1,251.7	3,851.3	136.2	104.8	-132.5	0.59	0.42	-1.42
1,336.0	17.71	36.47	1,312.7	3,790.3	151.5	116.4	-147.4	1.13	0.97	-1.92
1,368.0	16.88	36.91	1,343.3	3,759.7	159.1	122.0	-154.8	2.63	-2.59	1.37
1,399.0	16.44	37.08	1,373.0	3,730.0	166.2	127.4	-161.7	1.43	-1.42	0.55
1,430.0	15.42	37.17	1,402.8	3,700.2	173.0	132.5	-168.4	3.29	-3.29	0.29
1,462.0	14.81	36.03	1,433.7	3,669.3	179.7	137.5	-174.9	2.12	-1.91	-3.56
1,494.0	13.45	37.26	1,464.7	3,638.3	186.0	142.2	-181.0	4.35	-4.25	3.84
1,525.0	12.83	37.52	1,494.9	3,608.1	191.6	146.4	-186.4	2.01	-2.00	0.84
1,557.0	11.65	38.14	1,526.2	3,576.8	196.9	150.6	-191.6	3.71	-3.69	1.94
1,589.0	11.16	38.05	1,557.5	3,545.5	201.9	154.5	-196.5	1.53	-1.53	-0.28
1,620.0	10.15	37.87	1,588.0	3,515.0	206.4	158.0	-200.9	3.26	-3.26	-0.58
1,652.0	9.84	37.79	1,619.5	3,483.5	210.8	161.4	-205.2	0.97	-0.97	-0.25
1,684.0	10.28	38.49	1,651.0	3,452.0	215.2	164.9	-209.4	1.43	1.37	2.19
1,716.0	9.14	38.49	1,682.6	3,420.4	219.4	168.3	-213.5	3.56	-3.56	0.00
1,747.0	8.83	38.49	1,713.2	3,389.8	223.2	171.3	-217.2	1.00	-1.00	0.00
1,779.0	7.91	37.96	1,744.8	3,358.2	226.9	174.1	-220.8	2.89	-2.87	-1.66
1,810.0	7.51	38.14	1,775.6	3,327.4	230.1	176.7	-224.0	1.29	-1.29	0.58
1,839.0	6.68	39.37	1,804.3	3,298.7	232.9	178.9	-226.7	2.91	-2.86	4.24
9 5/8" SURFACE CASING										
1,887.0	6.36	41.52	1,852.0	3,251.0	237.1	182.5	-230.7	0.84	-0.66	4.49
1,940.0	6.02	44.16	1,904.7	3,198.3	241.3	186.4	-234.8	0.84	-0.64	4.98
2,034.0	7.76	25.83	1,998.1	3,104.9	250.5	192.6	-243.8	2.96	1.85	-19.50
2,128.0	7.80	7.68	2,091.2	3,011.8	262.6	196.2	-255.7	2.60	0.04	-19.31
2,222.0	7.52	7.86	2,184.4	2,918.6	275.0	197.9	-268.0	0.30	-0.30	0.19
2,316.0	6.98	6.09	2,277.6	2,825.4	286.7	199.3	-279.8	0.62	-0.57	-1.88
2,410.0	6.66	8.74	2,370.9	2,732.1	297.8	200.8	-290.8	0.48	-0.34	2.82
2,505.0	6.28	9.54	2,465.3	2,637.7	308.4	202.5	-301.3	0.41	-0.40	0.84
2,599.0	5.88	353.96	2,558.8	2,544.2	318.2	202.8	-311.1	1.80	-0.43	-16.57
2,692.0	5.53	357.40	2,651.4	2,451.6	327.5	202.1	-320.4	0.53	-0.38	3.70
2,785.0	4.46	335.96	2,744.0	2,359.0	335.2	200.4	-328.2	2.29	-1.15	-23.05
2,878.0	3.31	345.32	2,836.8	2,266.2	341.1	198.3	-334.2	1.41	-1.24	10.06
2,972.0	2.40	344.23	2,930.7	2,172.3	345.7	197.0	-338.7	0.97	-0.97	-1.16

Survey Report



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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 24-8HZ	North Reference:	True
Wellbore:	JOB #2018-425-461	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)
3,066.0	2.14	345.93	3,024.6	2,078.4	349.3	196.1	-342.3	0.29	-0.28	1.81
3,159.0	1.99	348.49	3,117.5	1,985.5	352.5	195.3	-345.6	0.19	-0.16	2.75
3,253.0	1.72	346.46	3,211.5	1,891.5	355.5	194.7	-348.6	0.30	-0.29	-2.16
3,349.0	1.39	345.50	3,307.5	1,795.5	358.0	194.1	-351.2	0.34	-0.34	-1.00
3,443.0	1.33	343.32	3,401.4	1,701.6	360.2	193.5	-353.3	0.08	-0.06	-2.32
3,537.0	1.24	325.44	3,495.4	1,607.6	362.0	192.6	-355.3	0.44	-0.10	-19.02
3,630.0	1.37	317.00	3,588.4	1,514.6	363.7	191.2	-356.9	0.25	0.14	-9.08
3,723.0	1.04	318.02	3,681.4	1,421.6	365.1	189.9	-358.4	0.36	-0.35	1.10
3,817.0	0.69	293.15	3,775.4	1,327.6	366.0	188.8	-359.3	0.54	-0.37	-26.46
3,910.0	0.50	243.15	3,868.3	1,234.7	366.0	187.9	-359.4	0.57	-0.20	-53.76
4,004.0	0.52	228.73	3,962.3	1,140.7	365.6	187.3	-358.9	0.14	0.02	-15.34
4,098.0	0.64	238.08	4,056.3	1,046.7	365.0	186.5	-358.4	0.16	0.13	9.95
4,192.0	1.50	244.01	4,150.3	952.7	364.2	184.9	-357.6	0.92	0.91	6.31
4,287.0	1.77	247.66	4,245.3	857.7	363.1	182.5	-356.6	0.30	0.28	3.84
4,380.0	2.04	254.30	4,338.2	764.8	362.1	179.5	-355.7	0.37	0.29	7.14
4,474.0	0.90	311.63	4,432.2	670.8	362.1	177.4	-355.8	1.84	-1.21	60.99
4,567.0	2.32	295.75	4,525.2	577.8	363.4	175.1	-357.2	1.59	1.53	-17.08
4,659.0	1.07	27.14	4,617.1	485.9	365.0	173.9	-358.8	2.80	-1.36	99.34
4,753.0	0.71	336.63	4,711.1	391.9	366.3	174.0	-360.2	0.88	-0.38	-53.73
4,846.0	0.82	293.95	4,804.1	298.9	367.1	173.2	-361.0	0.61	0.12	-45.89
4,941.0	0.83	272.42	4,899.1	203.9	367.4	171.9	-361.3	0.32	0.01	-22.66
5,034.0	1.06	246.43	4,992.1	110.9	367.1	170.4	-361.1	0.52	0.25	-27.95
5,129.0	1.58	231.36	5,087.1	15.9	365.9	168.6	-360.0	0.65	0.55	-15.86
5,248.0	1.90	181.21	5,206.0	-103.0	362.9	167.3	-357.0	1.26	0.27	-42.14
5,343.0	2.74	186.66	5,300.9	-197.9	359.1	167.0	-353.2	0.91	0.88	5.74
5,436.0	0.19	54.33	5,393.9	-290.9	357.0	166.8	-351.1	3.09	-2.74	-142.29
5,530.0	0.47	264.15	5,487.9	-384.9	357.0	166.6	-351.1	0.68	0.30	-159.77
5,625.0	1.40	240.74	5,582.9	-479.9	356.4	165.2	-350.6	1.04	0.98	-24.64
5,719.0	0.72	20.83	5,676.9	-573.9	356.4	164.4	-350.6	2.13	-0.72	149.03
5,814.0	0.41	260.73	5,771.9	-668.9	356.9	164.3	-351.1	1.04	-0.33	-126.42
5,908.0	0.94	245.19	5,865.9	-762.9	356.6	163.2	-350.8	0.59	0.56	-16.53
6,003.0	1.50	236.54	5,960.9	-857.9	355.5	161.5	-349.8	0.62	0.59	-9.11
6,098.0	1.44	233.66	6,055.8	-952.8	354.1	159.5	-348.5	0.10	-0.06	-3.03
6,192.0	2.16	65.78	6,149.8	-1,046.8	354.2	160.2	-348.5	3.81	0.77	-178.60
6,286.0	1.84	58.44	6,243.7	-1,140.7	355.7	163.1	-349.9	0.44	-0.34	-7.81
6,381.0	1.79	47.82	6,338.7	-1,235.7	357.5	165.5	-351.6	0.36	-0.05	-11.18
6,474.0	1.38	37.41	6,431.7	-1,328.7	359.3	167.2	-353.4	0.54	-0.44	-11.19
6,568.0	1.35	37.36	6,525.6	-1,422.6	361.1	168.6	-355.2	0.03	-0.03	-0.05
KOP										
6,591.0	0.84	124.87	6,548.6	-1,445.6	361.2	168.9	-355.3	6.77	-2.22	380.48
6,662.0	5.28	176.94	6,619.5	-1,516.5	357.7	169.5	-351.7	6.77	6.26	73.34
6,757.0	11.87	187.94	6,713.4	-1,610.4	343.6	168.4	-337.7	7.12	6.94	11.58
6,851.0	16.56	180.84	6,804.5	-1,701.5	320.6	166.8	-314.8	5.31	4.99	-7.55
6,945.0	19.65	182.40	6,893.9	-1,790.9	291.5	166.0	-285.6	3.33	3.29	1.66
7,040.0	24.32	179.63	6,981.9	-1,878.9	255.9	165.4	-250.1	5.03	4.92	-2.92
7,134.0	32.37	176.13	7,064.6	-1,961.6	211.4	167.2	-205.5	8.74	8.56	-3.72
7,228.0	46.88	179.35	7,136.8	-2,033.8	151.6	169.3	-145.8	15.59	15.44	3.43
7,285.0	55.69	183.50	7,172.4	-2,069.4	107.2	168.1	-101.4	16.46	15.46	7.28
7,322.0	61.47	182.48	7,191.7	-2,088.7	75.7	166.5	-70.0	15.80	15.62	-2.76
7,417.0	68.43	180.53	7,231.9	-2,128.9	-10.3	164.3	15.9	7.56	7.33	-2.05
7,511.0	76.69	180.59	7,260.1	-2,157.1	-99.9	163.4	105.4	8.79	8.79	0.06
7,605.0	84.58	181.30	7,275.3	-2,172.3	-192.5	161.9	197.9	8.43	8.39	0.76

Survey Report



Company:	ANADARKO PETROLEUM CORP	Local Co-ordinate Reference:	Well GRACIE 24-8HZ
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 24-8HZ	North Reference:	True
Wellbore:	JOB #2018-425-461	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)
HEEL (40.10335° N & 104.727742° W)										
7,699.0	89.60	180.39	7,280.1	-2,177.1	-286.4	160.5	291.7	5.43	5.34	-0.97
7,793.0	91.42	180.13	7,279.3	-2,176.3	-380.3	160.1	385.6	1.96	1.94	-0.28
7,886.0	90.13	180.53	7,278.0	-2,175.0	-473.3	159.5	478.5	1.45	-1.39	0.43
7,980.0	89.95	178.69	7,278.0	-2,175.0	-567.3	160.2	572.5	1.97	-0.19	-1.96
8,073.0	87.97	177.65	7,279.6	-2,176.6	-660.3	163.1	665.4	2.40	-2.13	-1.12
8,167.0	88.53	177.75	7,282.5	-2,179.5	-754.1	166.9	759.4	0.61	0.60	0.11
CROSS 460' SETBACK HEEL (8216.3ft md)										
8,216.3	88.66	177.72	7,283.7	-2,180.7	-803.4	168.9	808.7	0.28	0.27	-0.06
8,260.0	88.78	177.69	7,284.7	-2,181.7	-847.0	170.6	852.4	0.28	0.27	-0.06
8,353.0	89.66	177.35	7,286.0	-2,183.0	-939.9	174.6	945.4	1.01	0.95	-0.37
8,447.0	90.24	178.14	7,286.0	-2,183.0	-1,033.9	178.3	1,039.4	1.04	0.62	0.84
8,542.0	88.01	176.64	7,287.5	-2,184.5	-1,128.7	182.7	1,134.3	2.83	-2.35	-1.58
8,634.0	88.96	176.34	7,289.9	-2,186.9	-1,220.5	188.3	1,226.3	1.08	1.03	-0.33
8,727.0	89.07	176.42	7,291.5	-2,188.5	-1,313.3	194.2	1,319.2	0.15	0.12	0.09
8,821.0	90.34	177.11	7,292.0	-2,189.0	-1,407.2	199.5	1,413.2	1.54	1.35	0.73
8,915.0	87.80	176.37	7,293.5	-2,190.5	-1,501.0	204.8	1,507.1	2.81	-2.70	-0.79
9,009.0	88.69	176.12	7,296.4	-2,193.4	-1,594.8	211.0	1,601.1	0.98	0.95	-0.27
9,103.0	90.34	176.42	7,297.2	-2,194.2	-1,688.6	217.1	1,695.0	1.78	1.76	0.32
9,197.0	91.36	176.33	7,295.8	-2,192.8	-1,782.4	223.0	1,788.9	1.09	1.09	-0.10
9,290.0	89.90	177.13	7,294.8	-2,191.8	-1,875.2	228.3	1,881.9	1.79	-1.57	0.86
9,384.0	88.19	178.37	7,296.4	-2,193.4	-1,969.1	232.0	1,975.9	2.25	-1.82	1.32
9,477.0	89.28	178.42	7,298.4	-2,195.4	-2,062.1	234.6	2,068.9	1.17	1.17	0.05
9,572.0	89.59	178.40	7,299.4	-2,196.4	-2,157.0	237.3	2,163.9	0.33	0.33	-0.02
9,664.0	89.87	178.73	7,299.8	-2,196.8	-2,249.0	239.6	2,255.9	0.47	0.30	0.36
9,759.0	90.25	178.46	7,299.7	-2,196.7	-2,344.0	241.9	2,350.9	0.49	0.40	-0.28
9,854.0	90.18	177.93	7,299.3	-2,196.3	-2,438.9	244.9	2,445.9	0.56	-0.07	-0.56
9,947.0	91.43	178.78	7,298.0	-2,195.0	-2,531.9	247.5	2,538.8	1.63	1.34	0.91
10,040.0	88.84	178.03	7,297.8	-2,194.8	-2,624.8	250.1	2,631.8	2.90	-2.78	-0.81
10,135.0	88.81	178.00	7,299.8	-2,196.8	-2,719.7	253.4	2,726.8	0.04	-0.03	-0.03
10,230.0	88.27	177.94	7,302.2	-2,199.2	-2,814.6	256.8	2,821.8	0.57	-0.57	-0.06
10,323.0	88.04	178.04	7,305.2	-2,202.2	-2,907.5	260.1	2,914.7	0.27	-0.25	0.11
10,418.0	87.85	178.35	7,308.6	-2,205.6	-3,002.4	263.0	3,009.7	0.38	-0.20	0.33
10,511.0	88.44	179.02	7,311.6	-2,208.6	-3,095.4	265.2	3,102.6	0.96	0.63	0.72
10,606.0	89.27	178.77	7,313.5	-2,210.5	-3,190.3	267.0	3,197.6	0.91	0.87	-0.26
10,700.0	90.82	178.85	7,313.4	-2,210.4	-3,284.3	269.0	3,291.6	1.65	1.65	0.09
10,795.0	90.82	178.33	7,312.0	-2,209.0	-3,379.3	271.3	3,386.6	0.55	0.00	-0.55
10,890.0	91.71	177.75	7,310.0	-2,207.0	-3,474.2	274.5	3,481.5	1.12	0.94	-0.61
10,983.0	90.77	177.71	7,307.9	-2,204.9	-3,567.1	278.2	3,574.5	1.01	-1.01	-0.04
11,077.0	91.63	177.16	7,306.0	-2,203.0	-3,661.0	282.4	3,668.5	1.09	0.91	-0.59
11,170.0	90.19	177.56	7,304.5	-2,201.5	-3,753.8	286.7	3,761.5	1.61	-1.55	0.43
11,263.0	91.33	177.44	7,303.3	-2,200.3	-3,846.8	290.8	3,854.4	1.23	1.23	-0.13
CROSS 460' SETBACK TOE (11263.9ft md)										
11,263.9	91.33	177.46	7,303.2	-2,200.2	-3,847.6	290.8	3,855.3	2.15	-0.09	2.15
11,356.0	91.25	179.44	7,301.2	-2,198.2	-3,939.7	293.3	3,947.4	2.15	-0.09	2.15
11,448.0	92.58	179.64	7,298.1	-2,195.1	-4,031.6	294.0	4,039.3	1.46	1.45	0.22
11,541.0	90.88	179.60	7,295.3	-2,192.3	-4,124.6	294.7	4,132.2	1.83	-1.83	-0.04
11,637.0	89.64	179.41	7,294.8	-2,191.8	-4,220.6	295.5	4,228.2	1.31	-1.29	-0.20
11,730.0	88.19	178.26	7,296.6	-2,193.6	-4,313.5	297.4	4,321.2	1.99	-1.56	-1.24
11,823.0	88.29	178.51	7,299.5	-2,196.5	-4,406.5	300.0	4,414.1	0.29	0.11	0.27
11,916.0	88.56	178.27	7,302.0	-2,199.0	-4,499.4	302.6	4,507.1	0.39	0.29	-0.26
12,009.0	89.27	178.74	7,303.8	-2,200.8	-4,592.3	305.0	4,600.1	0.92	0.76	0.51
12,103.0	89.92	178.02	7,304.4	-2,201.4	-4,686.3	307.7	4,694.1	1.03	0.69	-0.77

Survey Report



Company:	ANADARKO PETROLEUM CORP	Local Co-ordinate Reference:	Well GRACIE 24-8HZ
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 24-8HZ	North Reference:	True
Wellbore:	JOB #2018-425-461	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)
12,197.0	90.99	177.99	7,303.7	-2,200.7	-4,780.2	311.0	4,788.1	1.14	1.14	-0.03
12,291.0	88.75	178.57	7,303.9	-2,200.9	-4,874.2	313.8	4,882.1	2.46	-2.38	0.62
12,385.0	90.41	178.50	7,304.6	-2,201.6	-4,968.1	316.2	4,976.1	1.77	1.77	-0.07
LAST SURVEY - AUG 19, 2018										
12,479.0	91.15	177.81	7,303.3	-2,200.3	-5,062.1	319.2	5,070.0	1.08	0.79	-0.73
EXTRAPOLATION TO TD (40.116688° N & 104.728320° W)										
12,562.0	91.15	177.81	7,301.7	-2,198.7	-5,145.0	322.4	5,153.0	0.00	0.00	0.00

Target Name	- hit/miss target	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N-S (usft)	+E-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
KOP - GRACIE 24-8H	- survey misses target center by 106.5usft at 6721.5usft MD (6678.5 TVD, 350.1 N, 169.1 E)	0.00	0.00	6,663.4	247.3	192.3	14,569,874.10	1,716,401.34	40° 7' 5.349 N	104° 43' 41.544 W
- Point										
KOP - GRACIE 24-8H	- survey misses target center by 40.0usft at 6629.0usft MD (6586.6 TVD, 360.1 N, 169.3 E)	0.00	0.00	6,584.8	328.4	193.7	14,569,955.20	1,716,402.50	40° 7' 6.150 N	104° 43' 41.526 W
- Point										
HEEL - GRACIE 24-8	- survey misses target center by 29.7usft at 7796.1usft MD (7279.2 TVD, -383.4 N, 160.1 E)	0.00	0.00	7,300.0	-383.8	181.2	14,569,243.24	1,716,392.24	40° 6' 59.112 N	104° 43' 41.686 W
- Point										
BHL - GRACIE 24-8H	- survey misses target center by 26.6usft at 12561.6usft MD (7301.7 TVD, -5144.6 N, 322.4 E)	0.00	0.00	7,327.0	-5,145.5	314.2	14,564,483.88	1,716,539.65	40° 6' 12.057 N	104° 43' 39.975 W
- Point										
HEEL - GRACIE 24-8	- survey misses target center by 30.4usft at 7796.1usft MD (7279.2 TVD, -383.4 N, 160.1 E)	0.00	0.00	7,301.0	-383.8	181.2	14,569,243.24	1,716,392.24	40° 6' 59.112 N	104° 43' 41.686 W
- Point										
BHL - GRACIE 24-8H	- survey misses target center by 40.2usft at 12561.4usft MD (7301.7 TVD, -5144.4 N, 322.4 E)	0.00	0.00	7,341.0	-5,145.5	314.2	14,564,483.88	1,716,539.65	40° 6' 12.057 N	104° 43' 39.975 W
- Point										

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N-S (usft)	+E-W (usft)	
1,887.0	1,852.0	237.1	182.5	9 5/8" SURFACE CASING
6,591.0	6,548.6	361.2	168.9	KOP
7,699.0	7,280.1	-286.4	160.5	HEEL (40.10335° N & 104.727742° W)
8,216.3	7,283.7	-803.4	168.9	CROSS 460' SETBACK HEEL (8216.3ft md)
11,263.9	7,303.2	-3,847.6	290.8	CROSS 460' SETBACK TOE (11263.9ft md)
12,479.0	7,303.3	-5,062.1	319.2	LAST SURVEY - AUG 19, 2018
12,562.0	7,301.7	-5,145.0	322.4	EXTRAPOLATION TO TD (40.116688° N & 104.728320° W)

Checked By: _____ Approved By: _____ Date: _____