

ANADARKO PETROLEUM CORP

WELD COUNTY (NAD 83)

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

GRACIE 24-6HZ

JOB #2018-423-461

13 August, 2018

Survey: FINAL SURVEYS





Project: WELD COUNTY (NAD 83)
 Site: SE SW SEC 24 T2N R66W 6th P.M.
 Well: GRACIE 24-6HZ
 Wellbore: JOB #2018-423-461
 Design: FINAL SURVEYS

ANNOTATIONS

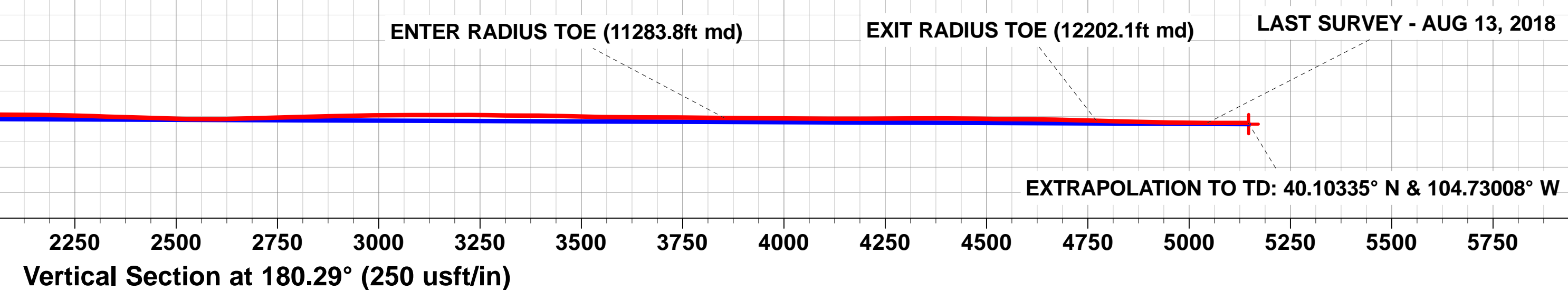
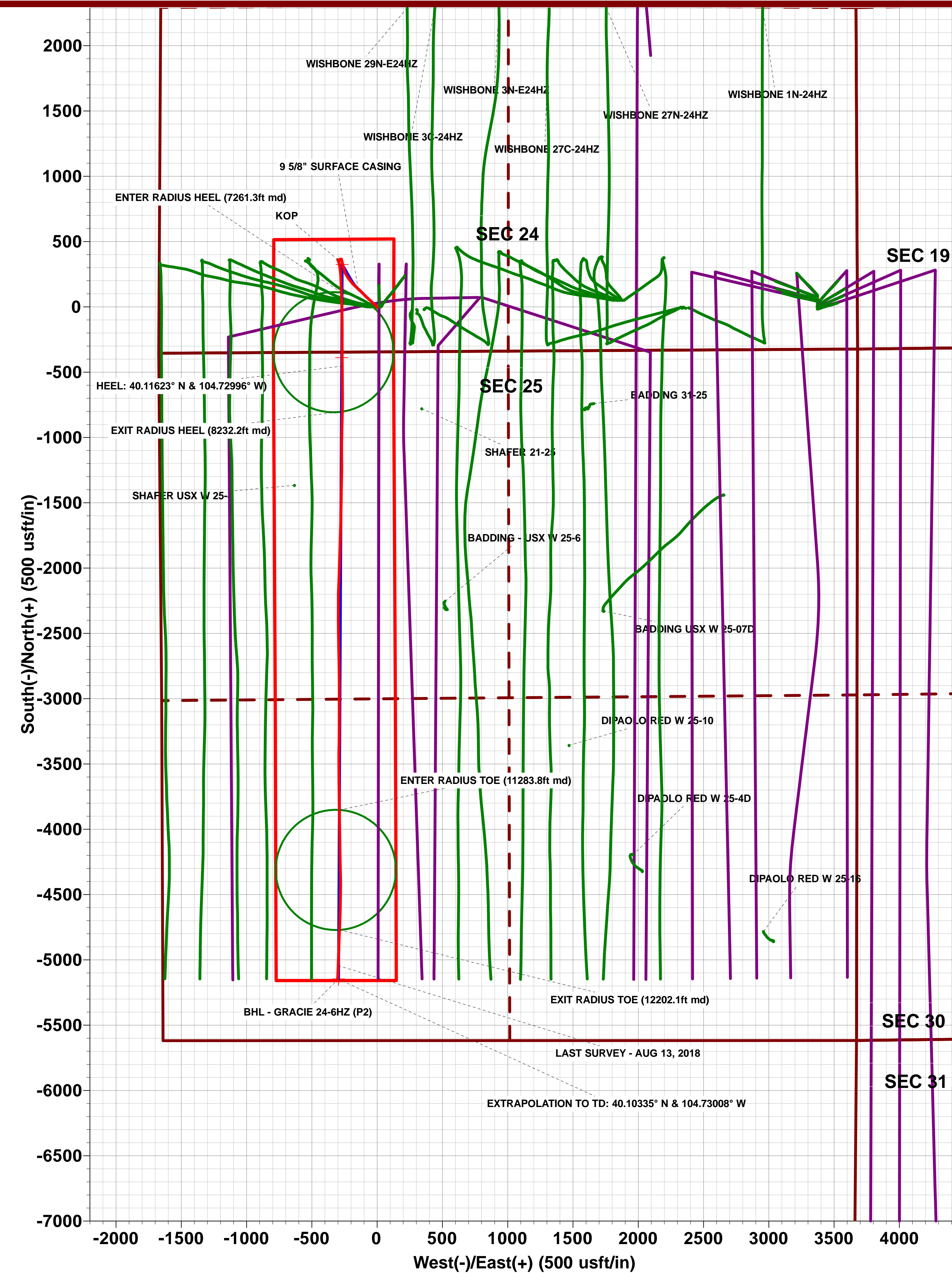
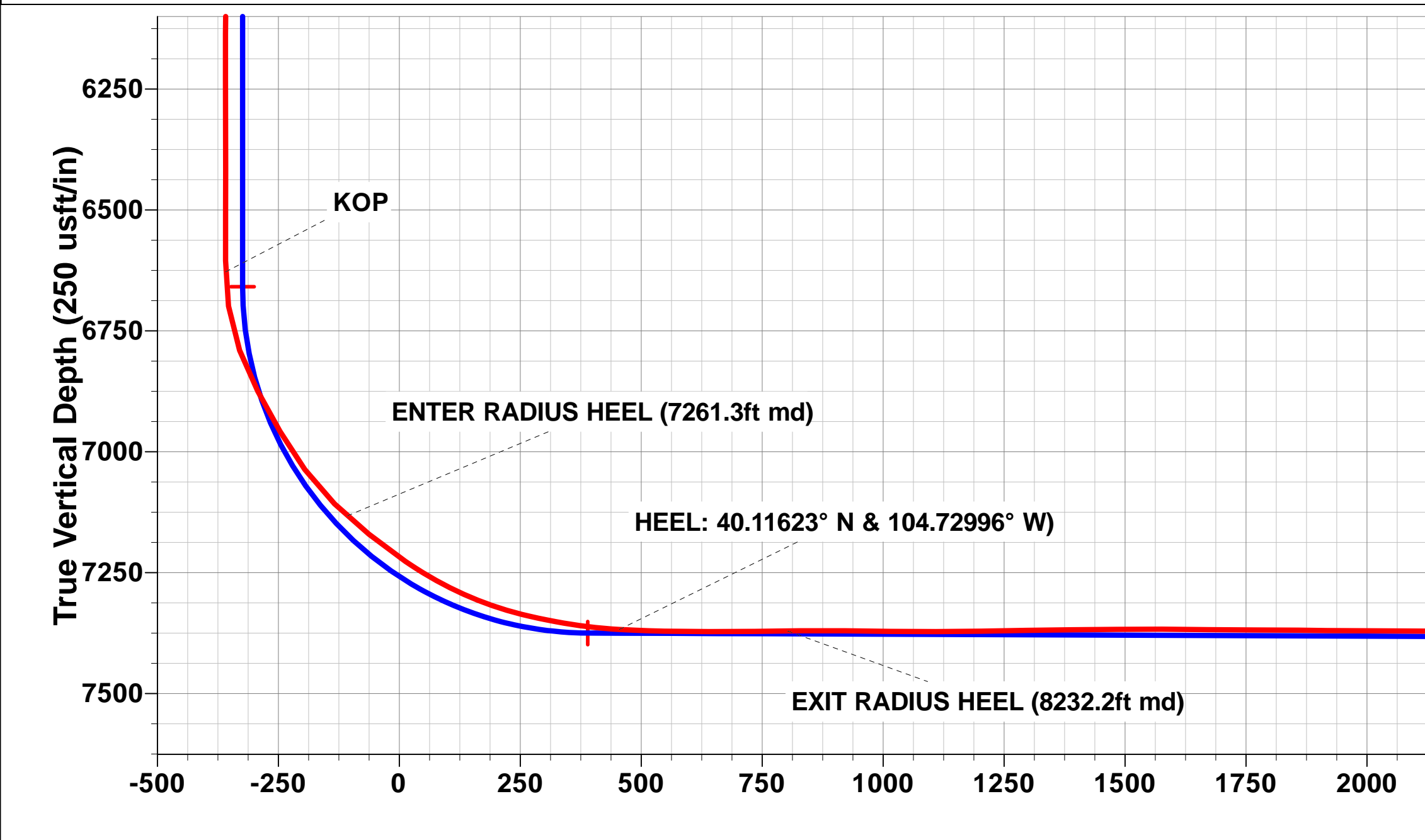
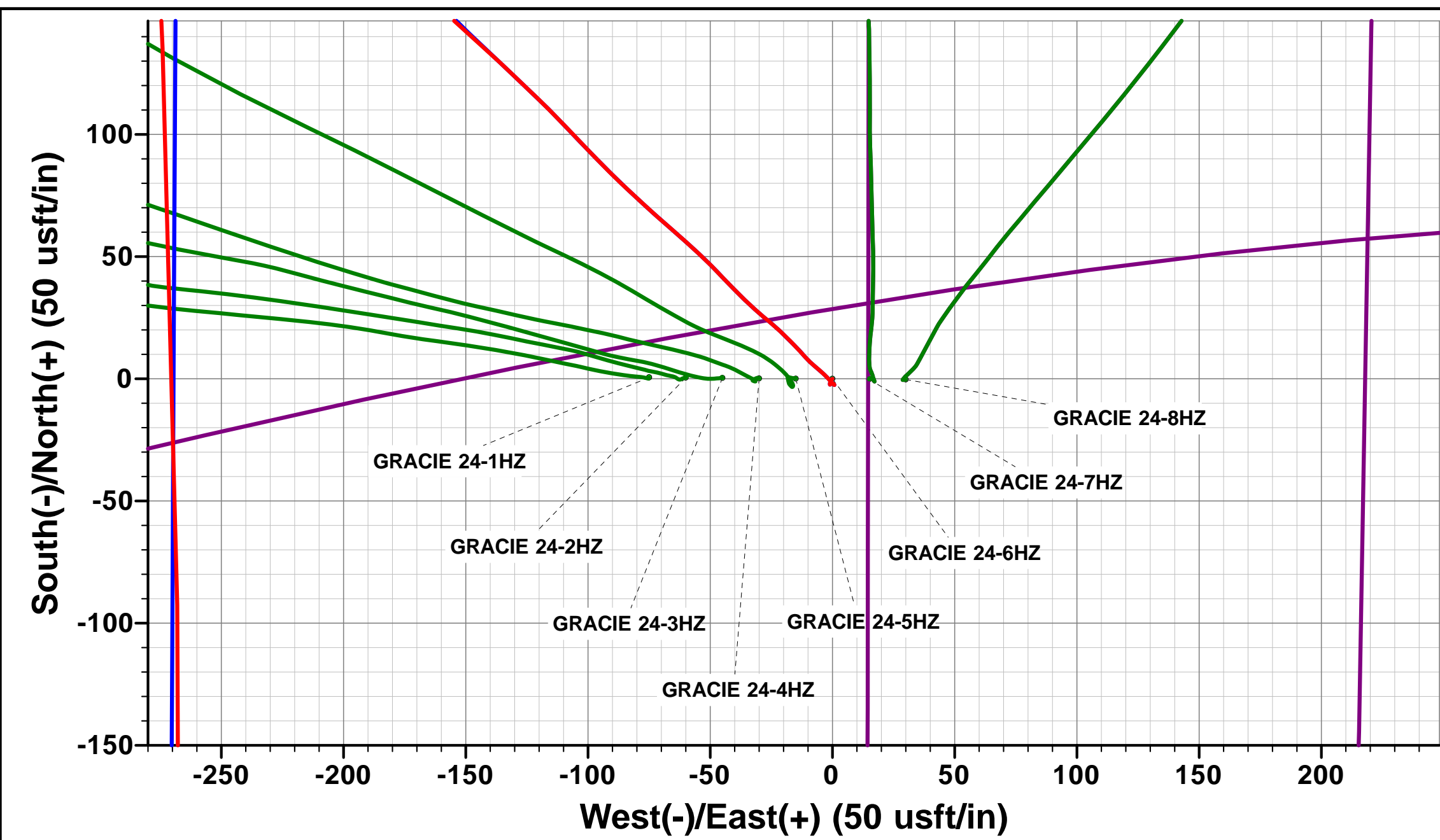
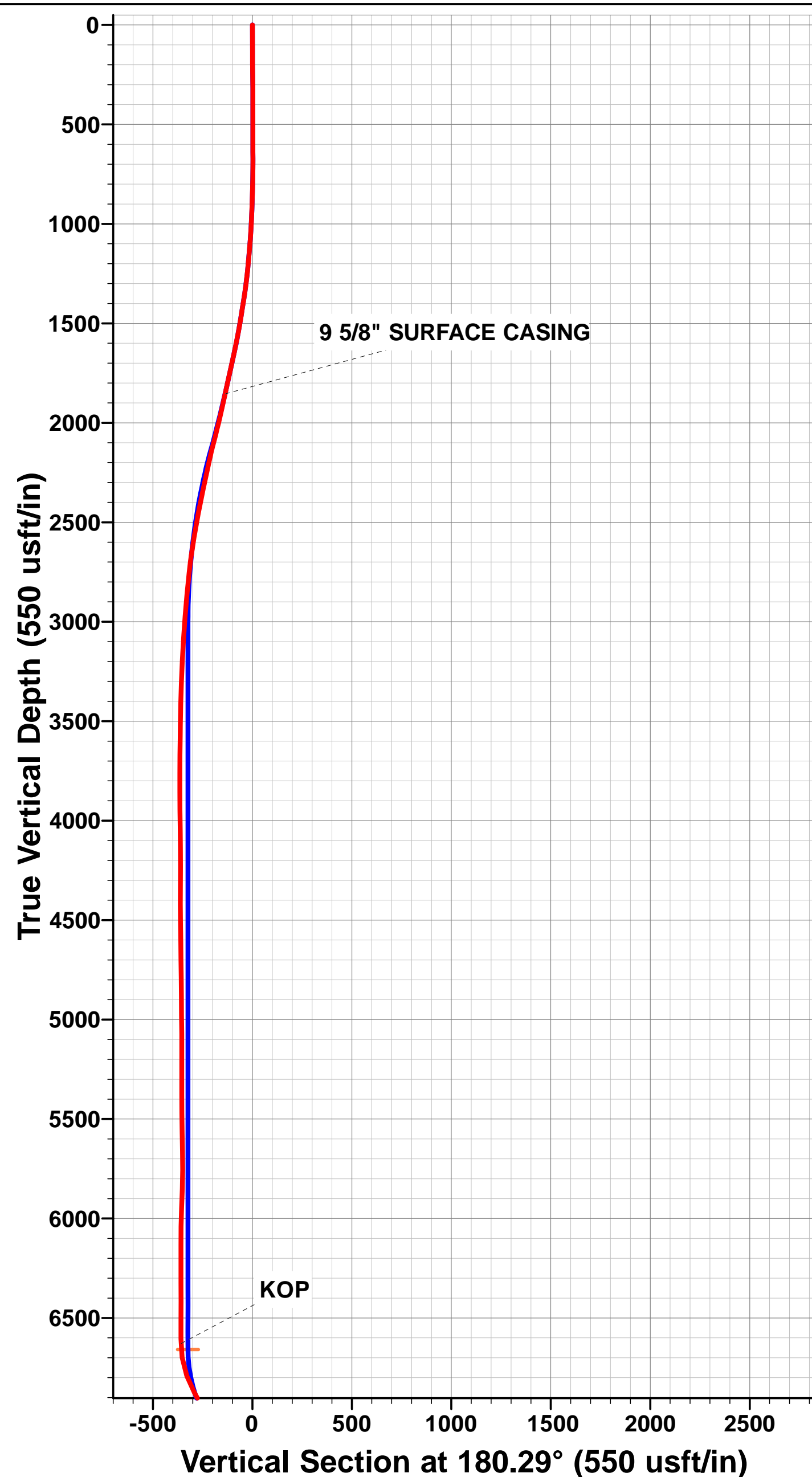
TVD	MD	Inc	Azi	+N/-S	+E/-W	VsectDeparture	Annotation
1854.1	1878.0	18.24	312.59	138.1	-145.3	-137.3	208.1
6628.1	6683.0	2.01	149.30	360.4	-300.3	-358.9	530.1
7132.5	7261.3	47.96	178.18	108.7	-272.9	-107.3	784.2
7367.7	7884.0	86.70	179.56	-453.3	-266.8	454.6	1345.7
7370.8	8232.2	90.85	181.26	-801.4	-266.1	802.7	1693.8
7378.9	11283.8	89.25	178.45	-3852.0	-288.7	3853.4	4745.0
7385.8	12202.1	88.61	182.30	-4770.0	-288.2	4771.4	5663.2
7391.0	12476.0	89.92	182.18	-5043.6	-298.2	5045.1	5937.0
7391.2	12577.0	89.92	182.18	-5144.6	-302.0	5146.0	6038.0

AS DRILLED LOCAL COORDINATES:

SHL: 345ft FSL & 1670ft FWL Sec 24
 HEEL: 107.2ft FNL & 1403.7ft FWL Sec 25
 BHL: 473.9ft FSL & 1339.9ft FWL Sec 25

WELLBORE TARGET DETAILS (LAT/LONG)

Name	TVD	+N/-S	+E/-W	Latitude	Longitude
BHL - GRACIE 24-6HZ (P2)	7394.0	-5145.5	-295.9	40° 6' 12.059 N	104° 43' 48.213 W
HEEL - GRACIE 24-6HZ (P2)	7375.0	-388.1	-271.5	40° 6' 59.073 N	104° 43' 47.899 W
KOP - GRACIE 24-6HZ (P2)	6658.8	325.2	-267.9	40° 7' 6.122 N	104° 43' 47.853 W



Survey Report



Company:	ANADARKO PETROLEUM CORP	Local Co-ordinate Reference:	Well GRACIE 24-6HZ
Project:	WELD COUNTY (NAD 83)	TVD Reference:	KB 20' @ 5103.0usft (PD461)
Site:	SE SW SEC 24 T2N R66W 6th P.M.	MD Reference:	KB 20' @ 5103.0usft (PD461)
Well:	GRACIE 24-6HZ	North Reference:	True
Wellbore:	JOB #2018-423-461	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 24-6HZ		
Well Position	+N-S	0.0 usft	Northing: 14,569,626.55 usft
	+E-W	0.0 usft	Easting: 1,716,179.92 usft
Position Uncertainty	0.0 usft	Wellhead Elevation:	usft
		Latitude:	40° 7' 2.908 N
		Longitude:	104° 43' 44.405 W
		Ground Level:	5,083.0 usft

Wellbore	JOB #2018-423-461				
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	180.29

Survey Program	Date	13/08/2018		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
132.0	12,577.0	FINAL SURVEYS (JOB #2018-423-461)	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	0.22	227.98	132.0	4,971.0	-0.2	-0.2	0.2	0.17	0.17	0.00
164.0	0.70	221.04	164.0	4,939.0	-0.4	-0.4	0.4	1.51	1.50	-21.69
196.0	0.40	207.59	196.0	4,907.0	-0.6	-0.5	0.6	1.01	-0.94	-42.03
227.0	0.79	205.92	227.0	4,876.0	-0.9	-0.7	0.9	1.26	1.26	-5.39
259.0	0.66	206.36	259.0	4,844.0	-1.3	-0.9	1.3	0.41	-0.41	1.37
291.0	1.10	187.64	291.0	4,812.0	-1.7	-1.0	1.7	1.63	1.37	-58.50
322.0	0.53	188.78	322.0	4,781.0	-2.2	-1.0	2.2	1.84	-1.84	3.68
354.0	0.26	155.12	354.0	4,749.0	-2.4	-1.0	2.4	1.08	-0.84	-105.19
386.0	0.53	49.83	386.0	4,717.0	-2.3	-0.9	2.3	2.03	0.84	-329.03
417.0	0.53	54.05	417.0	4,686.0	-2.2	-0.7	2.2	0.13	0.00	13.61
449.0	0.44	53.34	449.0	4,654.0	-2.0	-0.5	2.0	0.28	-0.28	-2.22
481.0	0.44	83.93	481.0	4,622.0	-1.9	-0.2	1.9	0.73	0.00	95.59

Survey Report



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Site:	SE SW SEC 24 T2N R66W 6th P.M.	MD Reference:	KB 20' @ 5103.0usft (PD461)
Well:	GRACIE 24-6HZ	North Reference:	True
Wellbore:	JOB #2018-423-461	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)
512.0	0.35	111.53	512.0	4,591.0	-1.9	0.0	1.9	0.67	-0.29	89.03
544.0	0.57	92.89	544.0	4,559.0	-2.0	0.2	2.0	0.82	0.69	-58.25
575.0	0.48	128.23	575.0	4,528.0	-2.1	0.5	2.1	1.06	-0.29	114.00
607.0	0.13	117.59	607.0	4,496.0	-2.2	0.6	2.2	1.10	-1.09	-33.25
639.0	0.40	162.15	639.0	4,464.0	-2.3	0.7	2.3	1.00	0.84	139.25
671.0	0.44	135.35	671.0	4,432.0	-2.5	0.8	2.5	0.62	0.12	-83.75
702.0	0.44	288.36	702.0	4,401.0	-2.5	0.8	2.5	2.76	0.00	493.58
734.0	0.79	315.26	734.0	4,369.0	-2.3	0.5	2.3	1.39	1.09	84.06
766.0	1.67	316.49	766.0	4,337.0	-1.8	0.0	1.8	2.75	2.75	3.84
798.0	1.89	321.15	798.0	4,305.0	-1.1	-0.6	1.1	0.82	0.69	14.56
829.0	2.24	316.75	829.0	4,274.1	-0.3	-1.4	0.3	1.24	1.13	-14.19
893.0	2.37	315.70	892.9	4,210.1	1.6	-3.1	-1.6	0.21	0.20	-1.64
925.0	2.77	309.90	924.8	4,178.2	2.6	-4.2	-2.5	1.49	1.25	-18.12
956.0	3.96	309.81	955.8	4,147.2	3.7	-5.6	-3.7	3.84	3.84	-0.29
987.0	4.44	310.86	986.7	4,116.3	5.2	-7.3	-5.2	1.57	1.55	3.39
1,019.0	5.05	313.50	1,018.6	4,084.4	7.0	-9.3	-6.9	2.02	1.91	8.25
1,051.0	5.45	319.04	1,050.5	4,052.5	9.1	-11.3	-9.0	2.02	1.25	17.31
1,082.0	5.80	317.45	1,081.3	4,021.7	11.4	-13.3	-11.3	1.24	1.13	-5.13
1,114.0	6.64	314.55	1,113.1	3,989.9	13.9	-15.7	-13.8	2.80	2.62	-9.06
1,146.0	7.12	315.61	1,144.9	3,958.1	16.6	-18.4	-16.5	1.55	1.50	3.31
1,178.0	7.29	313.85	1,176.6	3,926.4	19.4	-21.3	-19.3	0.87	0.53	-5.50
1,210.0	8.13	310.16	1,208.4	3,894.6	22.3	-24.5	-22.1	3.05	2.62	-11.53
1,241.0	8.88	309.46	1,239.0	3,864.0	25.2	-28.0	-25.1	2.44	2.42	-2.26
1,272.0	9.49	312.62	1,269.6	3,833.4	28.4	-31.7	-28.3	2.55	1.97	10.19
1,304.0	10.90	314.12	1,301.1	3,801.9	32.3	-35.9	-32.2	4.48	4.41	4.69
1,336.0	11.65	314.82	1,332.5	3,770.5	36.7	-40.3	-36.5	2.38	2.34	2.19
1,368.0	12.00	317.10	1,363.8	3,739.2	41.4	-44.9	-41.2	1.82	1.09	7.12
1,399.0	12.44	315.08	1,394.1	3,708.9	46.2	-49.4	-45.9	1.98	1.42	-6.52
1,430.0	13.23	313.50	1,424.3	3,678.7	51.0	-54.4	-50.7	2.79	2.55	-5.10
1,462.0	13.89	311.65	1,455.4	3,647.6	56.0	-59.9	-55.7	2.47	2.06	-5.78
1,494.0	13.89	310.78	1,486.5	3,616.5	61.1	-65.7	-60.8	0.65	0.00	-2.72
1,557.0	15.51	312.62	1,547.4	3,555.6	71.7	-77.6	-71.4	2.68	2.57	2.92
1,589.0	16.13	313.41	1,578.2	3,524.8	77.7	-84.0	-77.3	2.05	1.94	2.47
1,620.0	16.66	314.64	1,608.0	3,495.0	83.8	-90.3	-83.3	2.04	1.71	3.97
1,652.0	16.96	315.43	1,638.6	3,464.4	90.3	-96.8	-89.8	1.18	0.94	2.47
1,684.0	17.36	316.49	1,669.2	3,433.8	97.1	-103.4	-96.6	1.59	1.25	3.31
1,716.0	17.31	316.75	1,699.7	3,403.3	104.0	-109.9	-103.5	0.29	-0.16	0.81
1,747.0	16.88	314.38	1,729.4	3,373.6	110.6	-116.3	-110.0	2.64	-1.39	-7.65
1,779.0	17.23	313.50	1,760.0	3,343.0	117.1	-123.0	-116.4	1.36	1.09	-2.75
1,810.0	17.84	313.76	1,789.5	3,313.5	123.5	-129.8	-122.8	1.98	1.97	0.84
1,839.0	18.33	313.50	1,817.1	3,285.9	129.7	-136.3	-129.0	1.71	1.69	-0.90
9 5/8" SURFACE CASING										
1,878.0	18.24	312.59	1,854.1	3,248.9	138.1	-145.3	-137.3	0.76	-0.22	-2.32
1,939.0	18.12	311.16	1,912.1	3,190.9	150.8	-159.4	-150.0	0.76	-0.20	-2.35
2,033.0	19.09	314.84	2,001.2	3,101.8	171.2	-181.3	-170.3	1.62	1.03	3.91
2,127.0	18.04	322.68	2,090.3	3,012.7	193.7	-201.1	-192.6	2.88	-1.12	8.34
2,220.0	15.79	324.21	2,179.2	2,923.8	215.4	-217.2	-214.3	2.47	-2.42	1.65
2,314.0	13.77	325.87	2,270.1	2,832.9	235.0	-230.9	-233.8	2.20	-2.15	1.77
2,409.0	13.40	335.47	2,362.5	2,740.5	254.4	-241.9	-253.2	2.40	-0.39	10.11
2,504.0	11.36	345.21	2,455.3	2,647.7	273.5	-248.8	-272.2	3.07	-2.15	10.25
2,598.0	9.94	342.04	2,547.7	2,555.3	290.1	-253.7	-288.8	1.63	-1.51	-3.37
2,691.0	9.14	340.90	2,639.4	2,463.6	304.7	-258.6	-303.4	0.88	-0.86	-1.23
2,784.0	6.75	347.97	2,731.5	2,371.5	317.1	-262.1	-315.7	2.77	-2.57	7.60

Survey Report



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Site:	SE SW SEC 24 T2N R66W 6th P.M.	MD Reference:	KB 20' @ 5103.0usft (PD461)
Well:	GRACIE 24-6HZ	North Reference:	True
Wellbore:	JOB #2018-423-461	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)
2,877.0	5.78	346.29	2,823.9	2,279.1	327.0	-264.4	-325.6	1.06	-1.04	-1.81
2,970.0	4.87	348.29	2,916.5	2,186.5	335.4	-266.3	-334.0	1.00	-0.98	2.15
3,064.0	3.96	345.67	3,010.2	2,092.8	342.4	-267.9	-341.1	0.99	-0.97	-2.79
3,158.0	3.47	347.49	3,104.0	1,999.0	348.3	-269.3	-347.0	0.54	-0.52	1.94
3,252.0	2.90	347.57	3,197.9	1,905.1	353.4	-270.5	-352.1	0.61	-0.61	0.09
3,348.0	2.41	344.77	3,293.8	1,809.2	357.8	-271.5	-356.4	0.53	-0.51	-2.92
3,442.0	2.21	340.55	3,387.7	1,715.3	361.4	-272.6	-360.0	0.28	-0.21	-4.49
3,536.0	0.40	10.57	3,481.7	1,621.3	363.4	-273.2	-362.0	1.99	-1.93	31.94
3,629.0	0.69	338.83	3,574.7	1,528.3	364.3	-273.3	-362.9	0.44	0.31	-34.13
3,722.0	0.94	321.69	3,667.7	1,435.3	365.4	-274.0	-364.0	0.37	0.27	-18.43
3,815.0	0.97	290.27	3,760.7	1,342.3	366.2	-275.2	-364.9	0.56	0.03	-33.78
3,909.0	0.89	258.51	3,854.6	1,248.4	366.4	-276.7	-365.0	0.55	-0.09	-33.79
4,003.0	1.13	235.56	3,948.6	1,154.4	365.7	-278.2	-364.3	0.50	0.26	-24.41
4,097.0	1.26	231.51	4,042.6	1,060.4	364.5	-279.7	-363.1	0.16	0.14	-4.31
4,191.0	1.34	236.87	4,136.6	966.4	363.3	-281.5	-361.9	0.15	0.09	5.70
4,286.0	0.43	338.80	4,231.6	871.4	363.0	-282.5	-361.6	1.57	-0.96	107.29
4,379.0	0.74	291.12	4,324.6	778.4	363.6	-283.2	-362.1	0.59	0.33	-51.27
4,473.0	1.29	268.11	4,418.6	684.4	363.7	-284.8	-362.3	0.72	0.59	-24.48
4,566.0	0.82	192.82	4,511.5	591.5	363.1	-286.0	-361.6	1.44	-0.51	-80.96
4,658.0	1.03	131.53	4,603.5	499.5	361.9	-285.5	-360.4	1.04	0.23	-66.62
4,752.0	1.15	135.09	4,697.5	405.5	360.6	-284.2	-359.2	0.15	0.13	3.79
4,845.0	0.67	150.97	4,790.5	312.5	359.5	-283.3	-358.1	0.58	-0.52	17.08
4,939.0	0.54	175.41	4,884.5	218.5	358.6	-283.0	-357.2	0.30	-0.14	26.00
5,033.0	0.47	178.35	4,978.5	124.5	357.8	-283.0	-356.3	0.08	-0.07	3.13
5,127.0	0.66	229.72	5,072.5	30.5	357.0	-283.4	-355.6	0.55	0.20	54.65
5,246.0	1.11	271.06	5,191.5	-88.5	356.6	-285.1	-355.2	0.63	0.38	34.74
5,341.0	1.19	273.28	5,286.5	-183.5	356.7	-287.0	-355.2	0.10	0.08	2.34
5,433.0	1.47	268.67	5,378.4	-275.4	356.7	-289.1	-355.2	0.33	0.30	-5.01
5,527.0	0.65	185.28	5,472.4	-369.4	356.1	-290.3	-354.7	1.64	-0.87	-88.71
5,622.0	1.32	219.44	5,567.4	-464.4	354.8	-291.1	-353.3	0.91	0.71	35.96
5,717.0	1.76	225.07	5,662.4	-559.4	352.9	-292.8	-351.4	0.49	0.46	5.93
5,811.0	2.41	270.88	5,756.3	-653.3	351.9	-295.8	-350.4	1.84	0.69	48.73
5,906.0	2.48	353.72	5,851.3	-748.3	354.0	-298.0	-352.5	3.41	0.07	87.20
6,001.0	2.05	329.87	5,946.2	-843.2	357.5	-299.1	-356.0	1.08	-0.45	-25.11
6,095.0	1.32	344.10	6,040.1	-937.1	360.0	-300.3	-358.5	0.89	-0.78	15.14
6,190.0	0.50	266.46	6,135.1	-1,032.1	361.0	-301.0	-359.5	1.38	-0.86	-81.73
6,284.0	0.36	242.85	6,229.1	-1,126.1	360.8	-301.6	-359.3	0.24	-0.15	-25.12
6,378.0	0.23	152.14	6,323.1	-1,220.1	360.5	-301.8	-359.0	0.46	-0.14	-96.50
6,472.0	0.19	66.21	6,417.1	-1,314.1	360.4	-301.6	-358.9	0.31	-0.04	-91.41
6,566.0	0.38	76.51	6,511.1	-1,408.1	360.6	-301.1	-359.1	0.21	0.20	10.96
6,660.0	0.39	69.02	6,605.1	-1,502.1	360.8	-300.5	-359.2	0.05	0.01	-7.97
KOP										
6,683.0	2.01	149.30	6,628.1	-1,525.1	360.4	-300.3	-358.9	8.60	7.02	349.05
6,754.0	8.08	157.76	6,698.8	-1,595.8	354.8	-297.7	-353.2	8.60	8.56	11.91
6,849.0	21.71	164.83	6,790.4	-1,687.4	331.5	-290.6	-330.0	14.45	14.35	7.44
6,942.0	27.25	173.49	6,875.0	-1,772.0	293.7	-283.7	-292.3	7.08	5.96	9.31
7,037.0	30.58	175.96	6,958.2	-1,855.2	248.0	-279.5	-246.6	3.72	3.51	2.60
7,131.0	35.66	177.79	7,036.9	-1,933.9	196.7	-276.7	-195.3	5.51	5.40	1.95
7,225.0	46.19	177.18	7,107.8	-2,004.8	135.3	-274.0	-133.9	11.21	11.20	-0.65
ENTER RADIUS HEEL (7261.3ft md)										
7,261.3	47.96	178.18	7,132.5	-2,029.5	108.7	-272.9	-107.3	5.29	4.89	2.76
7,320.0	50.85	179.69	7,170.7	-2,067.7	64.2	-272.1	-62.8	5.29	4.92	2.57
7,414.0	55.82	177.41	7,226.9	-2,123.9	-11.2	-270.2	12.5	5.63	5.29	-2.43

Survey Report



Company:	ANADARKO PETROLEUM CORP	Local Co-ordinate Reference:	Well GRACIE 24-6HZ
Project:	WELD COUNTY (NAD 83)	TVD Reference:	KB 20' @ 5103.0usft (PD461)
Site:	SE SW SEC 24 T2N R66W 6th P.M.	MD Reference:	KB 20' @ 5103.0usft (PD461)
Well:	GRACIE 24-6HZ	North Reference:	True
Wellbore:	JOB #2018-423-461	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)
7,509.0	62.23	179.49	7,275.7	-2,172.7	-92.5	-268.0	93.9	7.00	6.75	2.19
7,603.0	69.92	180.05	7,313.8	-2,210.8	-178.4	-267.7	179.8	8.20	8.18	0.60
7,696.0	77.11	180.23	7,340.2	-2,237.2	-267.5	-267.9	268.9	7.73	7.73	0.19
7,790.0	81.27	179.46	7,357.8	-2,254.8	-359.8	-267.6	361.2	4.50	4.43	-0.82
HEEL: 40.11623° N & 104.72996° W)										
7,884.0	86.70	179.56	7,367.7	-2,264.7	-453.3	-266.8	454.6	5.78	5.78	0.11
7,977.0	89.07	179.83	7,371.1	-2,268.1	-546.2	-266.4	547.5	2.56	2.55	0.29
8,070.0	89.79	179.44	7,372.0	-2,269.0	-639.2	-265.8	640.5	0.88	0.77	-0.42
8,164.0	90.63	180.02	7,371.7	-2,268.7	-733.2	-265.3	734.5	1.09	0.89	0.62
EXIT RADIUS HEEL (8232.2ft md)										
8,232.2	90.85	181.26	7,370.8	-2,267.8	-801.4	-266.1	802.7	1.85	0.32	1.82
8,258.0	90.93	181.73	7,370.4	-2,267.4	-827.2	-266.8	828.5	1.85	0.32	1.82
8,351.0	89.03	181.54	7,370.4	-2,267.4	-920.1	-269.4	921.5	2.05	-2.04	-0.20
8,445.0	89.43	180.86	7,371.7	-2,268.7	-1,014.1	-271.4	1,015.5	0.84	0.43	-0.72
8,539.0	90.12	179.73	7,372.1	-2,269.1	-1,108.1	-271.9	1,109.5	1.41	0.73	-1.20
8,632.0	90.89	179.33	7,371.2	-2,268.2	-1,201.1	-271.1	1,202.4	0.93	0.83	-0.43
8,725.0	91.17	181.38	7,369.6	-2,266.6	-1,294.1	-271.7	1,295.4	2.22	0.30	2.20
8,819.0	90.16	181.12	7,368.5	-2,265.5	-1,388.0	-273.7	1,389.4	1.11	-1.07	-0.28
8,913.0	91.13	180.96	7,367.4	-2,264.4	-1,482.0	-275.4	1,483.4	1.05	1.03	-0.17
9,006.0	89.21	180.97	7,367.1	-2,264.1	-1,575.0	-277.0	1,576.4	2.06	-2.06	0.01
9,101.0	89.63	181.46	7,368.1	-2,265.1	-1,670.0	-279.0	1,671.4	0.68	0.44	0.52
9,195.0	89.89	181.89	7,368.5	-2,265.5	-1,763.9	-281.8	1,765.3	0.53	0.28	0.46
9,288.0	89.48	181.80	7,369.0	-2,266.0	-1,856.9	-284.7	1,858.3	0.45	-0.44	-0.10
9,381.0	89.40	181.68	7,369.9	-2,266.9	-1,949.8	-287.6	1,951.3	0.16	-0.09	-0.13
9,475.0	89.51	182.00	7,370.8	-2,267.8	-2,043.8	-290.6	2,045.2	0.36	0.12	0.34
9,569.0	89.96	182.75	7,371.3	-2,268.3	-2,137.7	-294.5	2,139.2	0.93	0.48	0.80
9,662.0	88.34	180.07	7,372.6	-2,269.6	-2,230.6	-296.8	2,232.1	3.37	-1.74	-2.88
9,757.0	88.09	180.20	7,375.6	-2,272.6	-2,325.6	-297.0	2,327.1	0.30	-0.26	0.14
9,852.0	88.63	179.69	7,378.3	-2,275.3	-2,420.6	-296.9	2,422.0	0.78	0.57	-0.54
9,944.0	87.97	179.18	7,381.0	-2,278.0	-2,512.5	-296.0	2,514.0	0.91	-0.72	-0.55
10,038.0	91.14	178.78	7,381.8	-2,278.8	-2,606.5	-294.3	2,607.9	3.40	3.37	-0.43
10,133.0	91.80	178.80	7,379.3	-2,276.3	-2,701.4	-292.3	2,702.9	0.70	0.69	0.02
10,228.0	91.34	179.18	7,376.7	-2,273.7	-2,796.4	-290.6	2,797.8	0.63	-0.48	0.40
10,321.0	91.62	179.02	7,374.3	-2,271.3	-2,889.3	-289.2	2,890.8	0.35	0.30	-0.17
10,415.0	90.87	180.77	7,372.3	-2,269.3	-2,983.3	-289.0	2,984.7	2.03	-0.80	1.86
10,509.0	89.56	180.00	7,371.9	-2,268.9	-3,077.3	-289.6	3,078.7	1.62	-1.39	-0.82
10,604.0	90.60	180.10	7,371.8	-2,268.8	-3,172.3	-289.7	3,173.7	1.10	1.09	0.11
10,698.0	88.92	180.52	7,372.2	-2,269.2	-3,266.3	-290.2	3,267.7	1.84	-1.79	0.45
10,793.0	90.05	181.71	7,373.0	-2,270.0	-3,361.3	-292.1	3,362.7	1.73	1.19	1.25
10,888.0	88.30	179.77	7,374.4	-2,271.4	-3,456.2	-293.3	3,457.7	2.75	-1.84	-2.04
10,981.0	89.01	179.53	7,376.6	-2,273.6	-3,549.2	-292.7	3,550.7	0.81	0.76	-0.26
11,074.0	90.04	179.72	7,377.4	-2,274.4	-3,642.2	-292.1	3,643.6	1.13	1.11	0.20
11,167.0	89.70	179.43	7,377.6	-2,274.6	-3,735.2	-291.4	3,736.6	0.48	-0.37	-0.31
11,261.0	89.14	178.03	7,378.5	-2,275.5	-3,829.2	-289.4	3,830.6	1.60	-0.60	-1.49
ENTER RADIUS TOE (11283.8ft md)										
11,283.8	89.25	178.45	7,378.9	-2,275.9	-3,852.0	-288.7	3,853.4	1.91	0.47	1.85
11,354.0	89.58	179.75	7,379.6	-2,276.6	-3,922.2	-287.6	3,923.6	1.91	0.47	1.85
11,446.0	89.63	179.66	7,380.2	-2,277.2	-4,014.1	-287.1	4,015.6	0.11	0.05	-0.10
11,539.0	89.55	178.87	7,380.9	-2,277.9	-4,107.1	-285.9	4,108.5	0.85	-0.09	-0.85
11,634.0	90.37	178.71	7,380.9	-2,277.9	-4,202.1	-283.9	4,203.5	0.88	0.86	-0.17
11,728.0	90.63	178.62	7,380.1	-2,277.1	-4,296.1	-281.7	4,297.5	0.29	0.28	-0.10
11,821.0	89.76	179.05	7,379.8	-2,276.8	-4,389.1	-279.8	4,390.4	1.04	-0.94	0.46
11,914.0	88.82	181.22	7,381.0	-2,278.0	-4,482.1	-280.0	4,483.4	2.54	-1.01	2.33

Survey Report



Company:	ANADARKO PETROLEUM CORP	Local Co-ordinate Reference:	Well GRACIE 24-6HZ
Project:	WELD COUNTY (NAD 83)	TVD Reference:	KB 20' @ 5103.0usft (PD461)
Site:	SE SW SEC 24 T2N R66W 6th P.M.	MD Reference:	KB 20' @ 5103.0usft (PD461)
Well:	GRACIE 24-6HZ	North Reference:	True
Wellbore:	JOB #2018-423-461	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)
12,007.0	89.97	180.73	7,381.9	-2,278.9	-4,575.0	-281.6	4,576.4	1.34	1.24	-0.53
12,101.0	88.44	182.32	7,383.2	-2,280.2	-4,669.0	-284.1	4,670.4	2.35	-1.63	1.69
12,194.0	88.62	182.31	7,385.6	-2,282.6	-4,761.9	-287.9	4,763.3	0.19	0.19	-0.01
EXIT RADIUS TOE (12202.1ft md)										
12,202.1	88.61	182.30	7,385.8	-2,282.8	-4,770.0	-288.2	4,771.4	0.23	-0.18	-0.15
12,288.0	88.45	182.17	7,388.0	-2,285.0	-4,855.8	-291.5	4,857.2	0.23	-0.18	-0.15
12,383.0	88.98	181.89	7,390.2	-2,287.2	-4,950.7	-294.9	4,952.1	0.63	0.56	-0.29
LAST SURVEY - AUG 13, 2018										
12,476.0	89.92	182.18	7,391.0	-2,288.0	-5,043.6	-298.2	5,045.1	1.06	1.01	0.31
EXTRAPOLATION TO TD: 40.10335° N & 104.73008° W										
12,577.0	89.92	182.18	7,391.2	-2,288.2	-5,144.6	-302.0	5,146.0	0.00	0.00	0.00

Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N-S (usft)	+E-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
BHL - GRACIE 24-6H - hit/miss target - Shape	0.00	0.00	7,394.0	-5,145.5	-295.9	14,564,482.19	1,715,899.80	40° 6' 12.059 N	104° 43' 48.213 W
- survey misses target center by 6.8usft at 12577.0usft MD (7391.2 TVD, -5144.6 N, -302.0 E)									
- Point									
HEEL - GRACIE 24-6 - survey misses target center by 13.8usft at 7819.9usft MD (7361.9 TVD, -389.4 N, -267.4 E)	0.00	0.00	7,375.0	-388.1	-271.5	14,569,237.78	1,715,909.74	40° 6' 59.073 N	104° 43' 47.899 W
- Point									
KOP - GRACIE 24-6H - survey misses target center by 46.0usft at 6717.6usft MD (6662.6 TVD, 358.6 N, -299.3 E)	0.00	0.00	6,658.8	325.2	-267.9	14,569,950.82	1,715,911.17	40° 7' 6.122 N	104° 43' 47.853 W
- Point									
BHL - GRACIE 24-6H - survey misses target center by 6.5usft at 12577.0usft MD (7391.2 TVD, -5144.6 N, -302.0 E)	0.00	0.00	7,393.0	-5,145.5	-295.9	14,564,482.19	1,715,899.80	40° 6' 12.059 N	104° 43' 48.213 W
- Point									
KOP - GRACIE 24-6H - survey misses target center by 101.0usft at 6821.3usft MD (6764.3 TVD, 340.5 N, -293.1 E)	0.00	0.00	6,738.4	246.1	-268.3	14,569,871.71	1,715,911.02	40° 7' 5.340 N	104° 43' 47.858 W
- Point									

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N-S (usft)	+E-W (usft)	
1,878.0	1,854.1	138.1	-145.3	9 5/8" SURFACE CASING
6,683.0	6,628.1	360.4	-300.3	KOP
7,261.3	7,132.5	108.7	-272.9	ENTER RADIUS HEEL (7261.3ft md)
7,884.0	7,367.7	-453.3	-266.8	HEEL: 40.11623° N & 104.72996° W
8,232.2	7,370.8	-801.4	-266.1	EXIT RADIUS HEEL (8232.2ft md)
11,283.8	7,378.9	-3,852.0	-288.7	ENTER RADIUS TOE (11283.8ft md)
12,202.1	7,385.8	-4,770.0	-288.2	EXIT RADIUS TOE (12202.1ft md)
12,476.0	7,391.0	-5,043.6	-298.2	LAST SURVEY - AUG 13, 2018
12,577.0	7,391.2	-5,144.6	-302.0	EXTRAPOLATION TO TD: 40.10335° N & 104.73008° W

Checked By: _____ Approved By: _____ Date: _____