

ANADARKO PETROLEUM CORP

Project: WELD COUNTY (NAD 83)
 Site: SW SW SEC 21 T3N R66W 6th P.M.
 Well: SARCHET 21-7HZ
 Wellbore: ORIGINAL WELLBORE
 Design: ORIGINAL WELLBORE

KB 21' @ 5003.00usft (PD 464)

Ground Level: 4982.00



Azimuths to True North
 Magnetic North: 7.98°

Magnetic Field
 Strength: 52045.9nT
 Dip Angle: 66.64°
 Date: 7/29/2019
 Model: IGRF2015

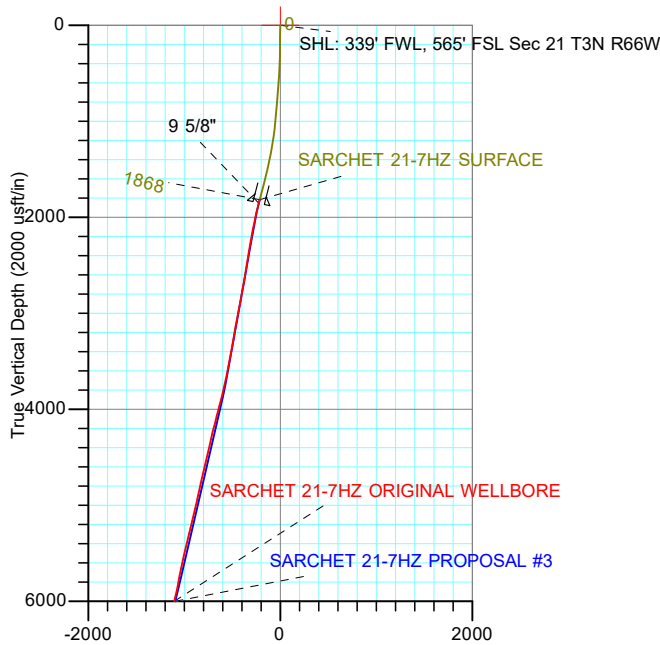
PROJECT DETAILS: WELD COUNTY (NAD 83)

Geodetic System: Universal Transverse Mercator (US Survey Feet)
 Datum: North American Datum 1983
 Ellipsoid: GRS 1980
 Zone: Zone 13N (108 W to 102 W)

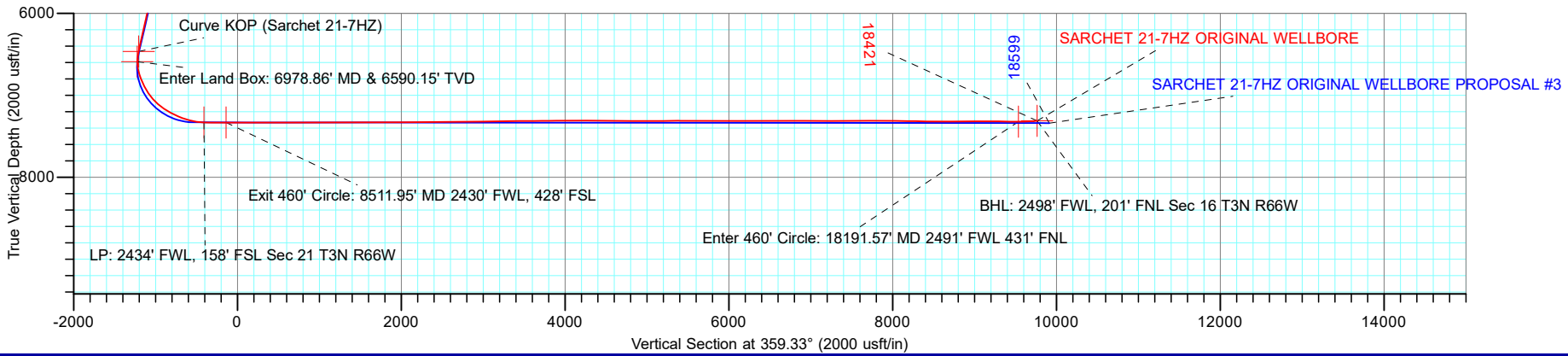
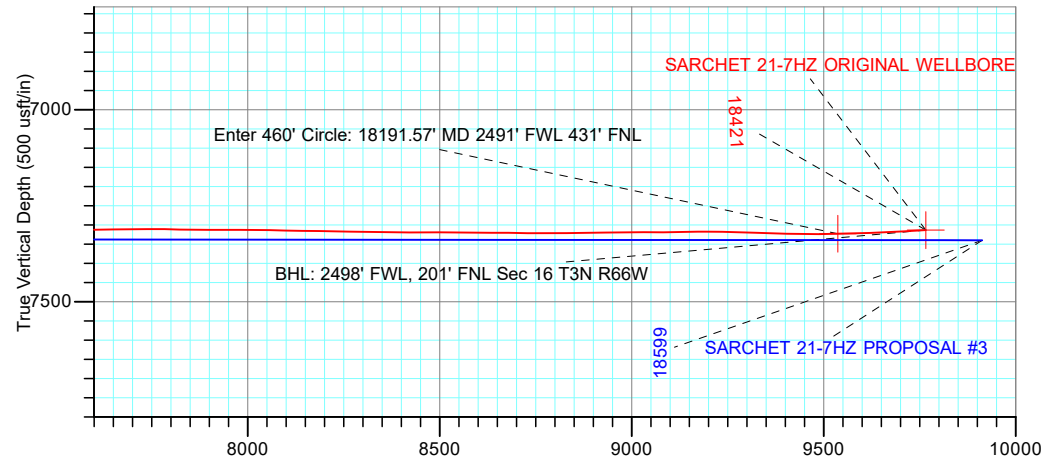


DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Latitude	Longitude
BHL: 2498' FWL, 201' FNL Sec 16 T3N R66W	7313.97	9790.56	2071.13	40.231578	-104.782976
Curve KOP (Sarchet 21-7HZ)	6466.94	-1185.02	1751.82	40.201450	-104.784123
Enter 460' Circle: 18191.57' MD 2491' FWL 431' FNL	7323.19	9561.39	2066.40	40.230949	-104.782993
Enter Land Box: 6978.86' MD & 6590.15' TVD	6590.15	-1201.18	1805.70	40.201406	-104.783930
Exit 460' Circle: 8511.95' MD 2430' FWL, 428' FSL	7333.50	-113.81	2093.62	40.204390	-104.782899
LP: 2434' FWL, 158' FSL Sec 21 T3N R66W	7333.02	-384.69	2097.60	40.203647	-104.782884
SHL: 339' FWL, 565' FSL Sec 21 T3N R66W	0.00	0.00	0.00	40.204703	-104.790394



Actual Line Calls
SHL: 339' FWL, 565' FSL Sec 21 T3N R66W
Heel: 2434' FWL, 158' FSL Sec 21 T3N R66W
BHL: 2498' FWL, 201' FNL Sec 16 T3N R66W



TOTAL DIRECTIONAL SERVICES LLC
 671 Academy Ct, Windsor, CO 80550
 Phone: (970) 460-9402

Design: ORIGINAL WELLBORE (SARCHET 21-7HZ/ORIGINAL WELLBORE)
 SW SW SEC 21 T3N R66W 6th P.M.
 Created By: Micah Ault Date: 14:33, November 08 2019
 Date: _____
 Approved: _____ Date: _____

ANADARKO PETROLEUM CORP

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Magnetic Field
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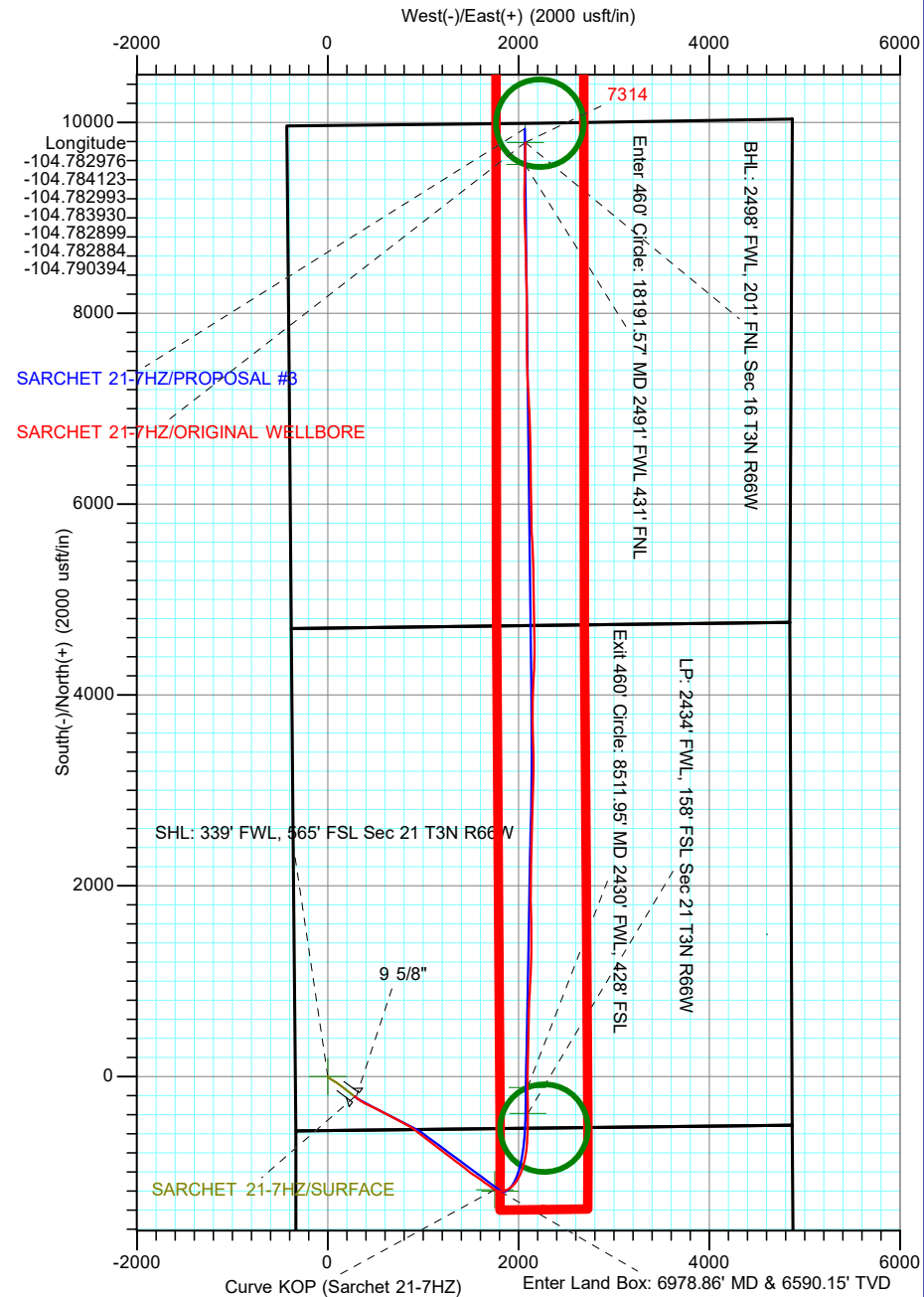
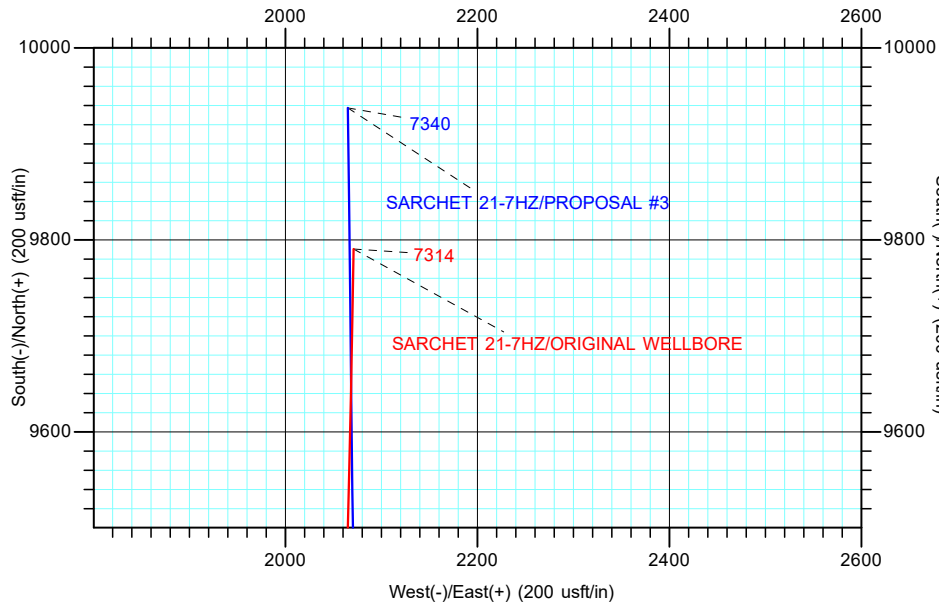
PROJECT DETAILS: WELD COUNTY (NAD 83)
 Geodetic System: Universal Transverse Mercator (US Survey Feet)
 Datum: North American Datum 1983
 Ellipsoid: GRS 1980
 Zone: Zone 13N (108 W to 102 W)



DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
BHL: 2498' FWL, 201' FNL Sec 16 T3N R66W	7313.97	9790.56	2071.13	14611136.10	1700988.61	40.231578	-104.782976
Curve KOP (Sarchet 21-7HZ)	6466.94	-1185.02	1751.82	14600164.14	1700695.34	40.201450	-104.784123
Enter 460' Circle: 18191.57' MD 2491' FWL 431' FNL	7323.19	9561.39	2066.40	14610907.01	1700984.42	40.230949	-104.782993
Enter Land Box: 6978.86' MD & 6590.15' TVD	6590.15	-1201.18	1805.70	14600148.12	1700749.23	40.201406	-104.783930
Exit 460' Circle: 8511.95' MD 2430' FWL, 428' FSL	7333.50	-113.81	2093.62	14601235.73	1701034.47	40.204390	-104.782899
LP: 2434' FWL, 158' FSL Sec 21 T3N R66W	7333.02	-384.69	2097.60	14600964.97	1701039.09	40.203647	-104.782884
SHL: 339' FWL, 565' FSL Sec 21 T3N R66W	0.00	0.00	0.00	14601344.55	1698941.42	40.204703	-104.790394

Actual Line Calls
SHL: 339' FWL, 565' FSL Sec 21 T3N R66W
Heel: 2434' FWL, 158' FSL Sec 21 T3N R66W
BHL: 2498' FWL, 201' FNL Sec 16 T3N R66W



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Design: ORIGINAL WELLBORE (SARCHET 21-7HZ/ORIGINAL WELLBORE)
 SW SW SEC 21 T3N R66W 6th P.M.
 Created By: Micah Ault Date: 14:36, November 08 2019
 Date: _____
 Approved: _____ Date: _____

ANADARKO PETROLEUM CORP

**WELD COUNTY (NAD 83)
SW SW SEC 21 T3N R66W 6th P.M.
SARCHET 21-7HZ**

ORIGINAL WELLBORE

Design: ORIGINAL WELLBORE

Standard Survey Report

08 November, 2019

Company:	ANADARKO PETROLEUM CORP	Local Co-ordinate Reference:	Well SARCHET 21-7HZ
Project:	WELD COUNTY (NAD 83)	TVD Reference:	KB 21' @ 5003.00usft (PD 464)
Site:	SW SW SEC 21 T3N R66W 6th P.M.	MD Reference:	KB 21' @ 5003.00usft (PD 464)
Well:	SARCHET 21-7HZ	North Reference:	True
Wellbore:	ORIGINAL WELLBORE	Survey Calculation Method:	Minimum Curvature
Design:	ORIGINAL WELLBORE	Database:	EDM 5000.15 Single User Db

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 21 T3N R66W 6th P.M.				
Site Position:		Northing:	14,601,419.51 usft	Latitude:	40.204909
From:	Lat/Long	Easting:	1,698,941.78 usft	Longitude:	-104.790392
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.14 °

Well	SARCHET 21-7HZ					
Well Position	+N/-S	0.00 usft	Northing:	14,601,344.55 usft	Latitude:	40.204703
	+E/-W	0.00 usft	Easting:	1,698,941.42 usft	Longitude:	-104.790394
Position Uncertainty		0.00 usft	Wellhead Elevation:	usft	Ground Level:	4,982.00 usft

Wellbore	ORIGINAL WELLBORE				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	7/29/2019	7.98	66.64	52,045.89642888

Design	ORIGINAL WELLBORE				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	1,868.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)	
	0.00	0.00	0.00	359.33	

Survey Program	Date	11/8/2019			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
128.00	1,868.00	FINAL SURVEYS - SURFACE (JOB # 201	APC_ISCWSA REV 2 MWD+	Fixed:v2:crustal field declination	
2,032.00	18,364.00	Survey #1 (ORIGINAL WELLBORE)	APC_ISCWSA REV 2 MWD+	Fixed:v2:crustal field declination	
18,421.00	18,421.00	Survey #2 (ORIGINAL WELLBORE)	BLIND	OWSG BLIND	

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SHL: 339' FWL, 565' FSL Sec 21 T3N R66W										
128.00	0.53	201.62	128.00	-0.55	-0.22	-0.55	0.41	0.41	0.00	0.00
223.00	0.53	152.49	222.99	-1.35	-0.18	-1.35	0.46	0.00	-51.72	
318.00	1.41	155.48	317.98	-2.80	0.51	-2.81	0.93	0.93	3.15	
412.00	2.90	135.09	411.91	-5.54	2.67	-5.57	1.76	1.59	-21.69	
508.00	5.89	130.61	507.62	-10.47	8.12	-10.56	3.13	3.11	-4.67	
603.00	7.60	127.44	601.96	-17.46	16.81	-17.65	1.84	1.80	-3.34	
699.00	8.39	117.86	697.03	-24.59	28.05	-24.92	1.61	0.82	-9.98	

Company:	ANADARKO PETROLEUM CORP	Local Co-ordinate Reference:	Well SARCHET 21-7HZ
Project:	WELD COUNTY (NAD 83)	TVD Reference:	KB 21' @ 5003.00usft (PD 464)
Site:	SW SW SEC 21 T3N R66W 6th P.M.	MD Reference:	KB 21' @ 5003.00usft (PD 464)
Well:	SARCHET 21-7HZ	North Reference:	True
Wellbore:	ORIGINAL WELLBORE	Survey Calculation Method:	Minimum Curvature
Design:	ORIGINAL WELLBORE	Database:	EDM 5000.15 Single User Db

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
793.00	8.88	121.55	789.96	-31.59	40.29	-32.06	0.79	0.52	3.93	
889.00	9.18	120.32	884.77	-39.33	53.22	-39.95	0.37	0.31	-1.28	
984.00	10.02	120.06	978.44	-47.30	66.91	-48.08	0.89	0.88	-0.27	
1,079.00	12.26	123.58	1,071.65	-57.02	82.47	-57.98	2.46	2.36	3.71	
1,174.00	13.54	124.28	1,164.25	-68.86	100.06	-70.03	1.36	1.35	0.74	
1,269.00	15.07	125.77	1,256.30	-82.35	119.27	-83.74	1.66	1.61	1.57	
1,364.00	17.84	128.23	1,347.40	-98.57	140.73	-100.21	3.01	2.92	2.59	
1,460.00	18.94	128.06	1,438.50	-117.28	164.55	-119.20	1.15	1.15	-0.18	
1,554.00	21.71	127.53	1,526.64	-137.28	190.35	-139.50	2.95	2.95	-0.56	
1,649.00	22.24	128.59	1,614.73	-159.20	218.34	-161.74	0.70	0.56	1.12	
1,744.00	21.53	128.23	1,702.89	-181.20	246.09	-184.06	0.76	-0.75	-0.38	
1,838.00	22.90	126.48	1,789.91	-202.75	274.34	-205.94	1.62	1.46	-1.86	
1,868.00	22.76	126.65	1,817.56	-209.68	283.69	-212.98	0.52	-0.47	0.57	
LAST SURVEY JULY 5, 2019										
1,907.00	22.62	126.37	1,853.54	-218.63	295.78	-222.07	0.45	-0.35	-0.73	
9 5/8"										
2,032.00	22.19	125.43	1,969.10	-246.57	334.38	-250.46	0.45	-0.35	-0.75	
2,122.00	22.89	120.87	2,052.23	-265.41	363.25	-269.64	2.09	0.78	-5.07	
2,211.00	22.18	118.13	2,134.44	-282.21	392.93	-286.78	1.42	-0.80	-3.08	
2,301.00	20.52	116.53	2,218.26	-297.26	422.02	-302.18	1.95	-1.84	-1.78	
2,390.00	20.93	114.67	2,301.50	-310.87	450.43	-316.11	0.87	0.46	-2.09	
2,480.00	19.92	113.92	2,385.84	-323.79	479.05	-329.37	1.16	-1.12	-0.83	
2,569.00	20.07	118.23	2,469.48	-337.17	506.37	-343.06	1.66	0.17	4.84	
2,659.00	20.73	116.51	2,553.84	-351.58	534.23	-357.80	0.99	0.73	-1.91	
2,749.00	21.07	116.40	2,637.92	-365.88	562.97	-372.44	0.38	0.38	-0.12	
2,838.00	19.70	113.82	2,721.34	-379.06	591.02	-385.94	1.84	-1.54	-2.90	
2,928.00	22.08	117.52	2,805.43	-393.00	619.91	-400.22	3.02	2.64	4.11	
3,018.00	21.34	117.87	2,889.04	-408.47	649.39	-416.04	0.83	-0.82	0.39	
3,108.00	21.75	119.36	2,972.75	-424.30	678.40	-432.21	0.76	0.46	1.66	
3,197.00	20.79	120.02	3,055.69	-440.29	706.44	-448.52	1.11	-1.08	0.74	
3,287.00	20.41	119.37	3,139.93	-455.98	733.95	-464.53	0.49	-0.42	-0.72	
3,377.00	21.98	116.98	3,223.85	-471.32	762.64	-480.20	1.99	1.74	-2.66	
3,466.00	19.75	117.02	3,307.00	-485.71	790.88	-494.92	2.51	-2.51	0.04	
3,556.00	19.33	116.90	3,391.82	-499.35	817.71	-508.88	0.47	-0.47	-0.13	
3,645.00	19.48	118.63	3,475.77	-513.13	843.87	-522.96	0.67	0.17	1.94	
3,735.00	21.20	123.69	3,560.16	-529.35	870.59	-539.49	2.73	1.91	5.62	
3,824.00	20.18	125.67	3,643.42	-547.23	896.45	-557.67	1.39	-1.15	2.22	
3,914.00	20.77	127.02	3,727.73	-565.89	921.80	-576.63	0.84	0.66	1.50	
4,003.00	21.60	127.10	3,810.72	-585.27	947.47	-596.31	0.93	0.93	0.09	
4,093.00	22.04	126.58	3,894.27	-605.33	974.24	-616.68	0.53	0.49	-0.58	
4,182.00	21.94	128.38	3,976.79	-625.60	1,000.69	-637.26	0.77	-0.11	2.02	
4,272.00	22.95	127.45	4,059.98	-646.71	1,027.80	-658.68	1.19	1.12	-1.03	
4,361.00	22.01	128.37	4,142.21	-667.61	1,054.65	-679.90	1.13	-1.06	1.03	
4,451.00	22.27	126.50	4,225.58	-688.23	1,081.58	-700.83	0.83	0.29	-2.08	

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Wellbore:	ORIGINAL WELLBORE	Survey Calculation Method:	Minimum Curvature
Design:	ORIGINAL WELLBORE	Database:	EDM 5000.15 Single User Db

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
4,540.00	19.80	127.15	4,308.64	-707.36	1,107.15	-720.26	2.79	-2.78	0.73
4,630.00	20.90	126.47	4,393.02	-726.11	1,132.21	-739.30	1.25	1.22	-0.76
4,719.00	20.60	128.93	4,476.25	-745.39	1,157.16	-758.87	1.04	-0.34	2.76
4,809.00	19.38	131.04	4,560.83	-765.14	1,180.74	-778.90	1.57	-1.36	2.34
4,899.00	20.59	126.15	4,645.41	-784.28	1,204.79	-798.32	2.29	1.34	-5.43
4,988.00	21.10	126.59	4,728.59	-803.06	1,230.29	-817.40	0.60	0.57	0.49
5,078.00	21.57	126.59	4,812.42	-822.58	1,256.58	-837.22	0.52	0.52	0.00
5,168.00	18.81	125.11	4,896.88	-840.79	1,281.73	-855.72	3.12	-3.07	-1.64
5,257.00	21.04	128.70	4,980.55	-859.04	1,305.94	-874.25	2.86	2.51	4.03
5,347.00	21.81	126.64	5,064.33	-879.12	1,331.97	-894.63	1.20	0.86	-2.29
5,437.00	19.98	125.94	5,148.41	-898.12	1,357.83	-913.94	2.05	-2.03	-0.78
5,527.00	21.06	126.78	5,232.70	-916.83	1,383.24	-932.94	1.24	1.20	0.93
5,616.00	20.03	128.73	5,316.04	-935.94	1,407.94	-952.34	1.39	-1.16	2.19
5,706.00	20.91	128.68	5,400.35	-955.62	1,432.50	-972.31	0.98	0.98	-0.06
5,795.00	21.66	129.09	5,483.28	-975.90	1,457.64	-992.88	0.86	0.84	0.46
5,885.00	20.92	126.98	5,567.14	-996.04	1,483.37	-1,013.32	1.18	-0.82	-2.34
5,974.00	19.66	125.31	5,650.62	-1,014.25	1,508.28	-1,031.82	1.56	-1.42	-1.88
6,090.00	17.92	124.26	5,760.43	-1,035.58	1,538.96	-1,053.51	1.53	-1.50	-0.91
6,180.00	18.81	123.73	5,845.85	-1,051.43	1,562.47	-1,069.63	1.01	0.99	-0.59
6,269.00	20.11	124.80	5,929.76	-1,068.13	1,586.97	-1,086.62	1.51	1.46	1.20
6,359.00	20.23	124.85	6,014.24	-1,085.85	1,612.44	-1,104.64	0.13	0.13	0.06
6,448.00	22.13	127.39	6,097.23	-1,104.83	1,638.39	-1,123.91	2.37	2.13	2.85
6,538.00	19.27	124.42	6,181.41	-1,123.52	1,664.12	-1,142.90	3.38	-3.18	-3.30
6,628.00	20.77	125.69	6,265.97	-1,141.23	1,689.33	-1,160.90	1.74	1.67	1.41
6,718.00	22.01	125.41	6,349.77	-1,160.31	1,716.04	-1,180.30	1.38	1.38	-0.31
6,807.00	19.15	125.54	6,433.08	-1,178.46	1,741.51	-1,198.75	3.21	-3.21	0.15
6,842.99	20.57	119.60	6,466.94	-1,185.02	1,751.82	-1,205.42	6.85	3.94	-16.51
Curve KOP (Sarchet 21-7HZ)									
6,897.00	23.02	112.11	6,517.09	-1,193.68	1,769.86	-1,214.30	6.85	4.54	-13.86
6,978.88	30.82	93.92	6,590.16	-1,201.16	1,805.73	-1,222.20	13.76	9.53	-22.22
Enter Land Box: 6978.86' MD & 6590.15' TVD									
6,986.00	31.59	92.75	6,596.25	-1,201.38	1,809.41	-1,222.45	13.76	10.82	-16.41
7,076.00	33.61	70.54	6,672.34	-1,194.18	1,856.62	-1,215.81	13.42	2.24	-24.68
7,165.00	32.76	60.04	6,746.89	-1,173.94	1,900.74	-1,196.08	6.52	-0.96	-11.80
7,255.00	31.38	47.05	6,823.25	-1,145.77	1,939.04	-1,168.37	7.80	-1.53	-14.43
7,345.00	33.21	32.02	6,899.44	-1,108.85	1,969.31	-1,131.80	9.13	2.03	-16.70
7,434.00	36.61	29.53	6,972.42	-1,065.08	1,995.32	-1,088.34	4.14	3.82	-2.80
7,524.00	43.17	24.46	7,041.46	-1,013.63	2,021.33	-1,037.20	8.13	7.29	-5.63
7,613.00	49.29	18.03	7,103.03	-953.75	2,044.42	-977.60	8.63	6.88	-7.22
7,703.00	56.82	11.22	7,157.13	-884.22	2,062.34	-908.28	10.32	8.37	-7.57
7,793.00	60.65	8.74	7,203.83	-808.47	2,075.64	-832.69	4.86	4.26	-2.76
7,882.00	65.57	5.15	7,244.08	-729.72	2,085.17	-754.05	6.59	5.53	-4.03
7,972.00	69.23	2.57	7,278.67	-646.84	2,090.74	-671.24	4.85	4.07	-2.87

Company:	ANADARKO PETROLEUM CORP	Local Co-ordinate Reference:	Well SARCHET 21-7HZ
Project:	WELD COUNTY (NAD 83)	TVD Reference:	KB 21' @ 5003.00usft (PD 464)
Site:	SW SW SEC 21 T3N R66W 6th P.M.	MD Reference:	KB 21' @ 5003.00usft (PD 464)
Well:	SARCHET 21-7HZ	North Reference:	True
Wellbore:	ORIGINAL WELLBORE	Survey Calculation Method:	Minimum Curvature
Design:	ORIGINAL WELLBORE	Database:	EDM 5000.15 Single User Db

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
8,062.00	75.07	2.37	7,306.24	-561.29	2,094.43	-585.74	6.49	6.49	-0.22	
8,133.87	80.24	1.13	7,321.61	-491.14	2,096.56	-515.62	7.39	7.19	-1.73	
HEEL - SARCHET 21-7HZ (P3)										
8,134.77	80.30	1.11	7,321.76	-490.24	2,096.58	-514.73	7.39	7.19	-1.69	
HEEL - SARCHET 21-7HZ										
8,151.00	81.47	0.84	7,324.33	-474.23	2,096.86	-498.71	7.39	7.19	-1.69	
8,241.00	87.44	0.12	7,333.02	-384.69	2,097.60	-409.19	6.68	6.63	-0.80	
LP: 2434' FWL, 158' FSL Sec 21 T3N R66W										
8,331.00	90.69	359.13	7,334.49	-294.72	2,097.01	-319.22	3.77	3.61	-1.10	
8,420.00	90.36	358.86	7,333.67	-205.74	2,095.45	-230.23	0.48	-0.37	-0.30	
8,510.00	89.87	358.85	7,333.49	-115.76	2,093.65	-140.23	0.54	-0.54	-0.01	
8,511.95	89.85	358.89	7,333.50	-113.81	2,093.62	-138.28	2.12	-0.83	1.94	
Exit 460' Circle: 8511.95' MD 2430' FWL, 428' FSL										
8,600.00	89.12	0.60	7,334.29	-25.76	2,093.22	-50.24	2.12	-0.83	1.94	
8,689.00	90.45	1.00	7,334.62	63.22	2,094.46	38.73	1.56	1.49	0.45	
8,779.00	89.73	1.64	7,334.48	153.20	2,096.54	128.67	1.07	-0.80	0.71	
8,868.00	91.35	1.79	7,333.64	242.15	2,099.20	217.59	1.83	1.82	0.17	
8,958.00	90.37	0.67	7,332.29	332.12	2,101.13	307.53	1.65	-1.09	-1.24	
9,048.00	89.34	1.21	7,332.52	422.11	2,102.61	397.49	1.29	-1.14	0.60	
9,137.00	90.48	0.86	7,332.66	511.09	2,104.22	486.45	1.34	1.28	-0.39	
9,227.00	89.78	1.45	7,332.45	601.07	2,106.03	576.40	1.02	-0.78	0.66	
9,317.00	90.77	1.54	7,332.02	691.04	2,108.38	666.34	1.10	1.10	0.10	
9,406.00	88.67	2.80	7,332.46	779.97	2,111.75	755.22	2.75	-2.36	1.42	
9,496.00	89.66	3.19	7,333.77	869.83	2,116.45	845.02	1.18	1.10	0.43	
9,586.00	90.53	2.61	7,333.62	959.72	2,121.00	934.85	1.16	0.97	-0.64	
9,675.00	88.97	2.27	7,334.01	1,048.63	2,124.79	1,023.71	1.79	-1.75	-0.38	
9,765.00	89.53	2.05	7,335.19	1,138.56	2,128.18	1,113.59	0.67	0.62	-0.24	
9,855.00	90.13	2.48	7,335.45	1,228.49	2,131.74	1,203.48	0.82	0.67	0.48	
9,944.00	90.17	1.37	7,335.22	1,317.44	2,134.73	1,292.38	1.25	0.04	-1.25	
10,034.00	89.94	359.47	7,335.13	1,407.43	2,135.39	1,382.36	2.13	-0.26	-2.11	
10,124.00	90.89	359.43	7,334.48	1,497.42	2,134.53	1,472.36	1.06	1.06	-0.04	
10,213.00	89.54	358.84	7,334.15	1,586.41	2,133.18	1,561.36	1.66	-1.52	-0.66	
10,303.00	90.41	357.85	7,334.19	1,676.37	2,130.58	1,651.34	1.46	0.97	-1.10	
10,392.00	90.45	359.23	7,333.52	1,765.33	2,128.32	1,740.33	1.55	0.04	1.55	
10,482.00	89.51	0.04	7,333.55	1,855.33	2,127.74	1,830.32	1.38	-1.04	0.90	
10,572.00	90.58	0.38	7,333.48	1,945.33	2,128.07	1,920.31	1.25	1.19	0.38	
10,662.00	91.44	0.66	7,331.89	2,035.31	2,128.89	2,010.28	1.00	0.96	0.31	
10,751.00	90.87	0.99	7,330.10	2,124.28	2,130.17	2,099.23	0.74	-0.64	0.37	
10,841.00	91.53	1.23	7,328.21	2,214.25	2,131.91	2,189.16	0.78	0.73	0.27	
10,930.00	90.89	0.90	7,326.33	2,303.21	2,133.57	2,278.10	0.81	-0.72	-0.37	
11,020.00	89.45	1.10	7,326.07	2,393.19	2,135.14	2,368.06	1.62	-1.60	0.22	
11,110.00	90.31	1.44	7,326.26	2,483.17	2,137.13	2,458.01	1.03	0.96	0.38	
11,199.00	91.18	1.30	7,325.10	2,572.14	2,139.26	2,546.95	0.99	0.98	-0.16	
11,289.00	90.20	1.72	7,324.02	2,662.10	2,141.63	2,636.87	1.18	-1.09	0.47	

Company:	ANADARKO PETROLEUM CORP	Local Co-ordinate Reference:	Well SARCHET 21-7HZ
Project:	WELD COUNTY (NAD 83)	TVD Reference:	KB 21' @ 5003.00usft (PD 464)
Site:	SW SW SEC 21 T3N R66W 6th P.M.	MD Reference:	KB 21' @ 5003.00usft (PD 464)
Well:	SARCHET 21-7HZ	North Reference:	True
Wellbore:	ORIGINAL WELLBORE	Survey Calculation Method:	Minimum Curvature
Design:	ORIGINAL WELLBORE	Database:	EDM 5000.15 Single User Db

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
11,379.00	90.99	1.89	7,323.08	2,752.05	2,144.47	2,726.78	0.90	0.88	0.19	
11,468.00	90.03	1.82	7,322.29	2,841.00	2,147.35	2,815.69	1.08	-1.08	-0.08	
11,558.00	90.92	1.45	7,321.54	2,930.95	2,149.92	2,905.61	1.07	0.99	-0.41	
11,648.00	90.56	1.53	7,320.38	3,020.92	2,152.26	2,995.54	0.41	-0.40	0.09	
11,737.00	91.50	1.08	7,318.78	3,109.88	2,154.28	3,084.47	1.17	1.06	-0.51	
11,827.00	90.72	1.32	7,317.04	3,199.84	2,156.17	3,174.41	0.91	-0.87	0.27	
11,916.00	90.17	0.41	7,316.35	3,288.83	2,157.51	3,263.37	1.19	-0.62	-1.02	
12,006.00	90.78	359.41	7,315.60	3,378.82	2,157.37	3,353.36	1.30	0.68	-1.11	
12,095.00	89.20	357.89	7,315.61	3,467.79	2,155.27	3,442.35	2.46	-1.78	-1.71	
12,185.00	90.40	357.40	7,315.93	3,557.71	2,151.57	3,532.31	1.44	1.33	-0.54	
12,274.00	90.65	359.27	7,315.11	3,646.67	2,148.99	3,621.29	2.12	0.28	2.10	
12,364.00	91.74	359.09	7,313.24	3,736.64	2,147.70	3,711.27	1.23	1.21	-0.20	
12,453.00	89.60	0.33	7,312.20	3,825.62	2,147.25	3,800.25	2.78	-2.40	1.39	
12,543.00	90.69	0.82	7,311.97	3,915.62	2,148.15	3,890.23	1.33	1.21	0.54	
12,633.00	89.44	2.02	7,311.87	4,005.59	2,150.38	3,980.17	1.93	-1.39	1.33	
12,722.00	90.33	2.45	7,312.04	4,094.52	2,153.85	4,069.05	1.11	1.00	0.48	
12,812.00	91.90	2.86	7,310.29	4,184.40	2,158.02	4,158.88	1.80	1.74	0.46	
12,902.00	89.47	2.35	7,309.22	4,274.29	2,162.11	4,248.72	2.76	-2.70	-0.57	
12,991.00	89.77	1.15	7,309.81	4,363.25	2,164.83	4,337.64	1.39	0.34	-1.35	
13,081.00	90.22	1.06	7,309.82	4,453.23	2,166.57	4,427.59	0.51	0.50	-0.10	
13,170.00	87.92	359.28	7,311.26	4,542.21	2,166.83	4,516.56	3.27	-2.58	-2.00	
13,260.00	88.37	358.64	7,314.17	4,632.15	2,165.20	4,606.51	0.87	0.50	-0.71	
13,350.00	88.97	359.16	7,316.26	4,722.11	2,163.47	4,696.48	0.88	0.67	0.58	
13,439.00	90.07	358.81	7,317.01	4,811.09	2,161.89	4,785.48	1.30	1.24	-0.39	
13,529.00	91.18	358.77	7,316.03	4,901.06	2,159.99	4,875.47	1.23	1.23	-0.04	
13,619.00	89.47	0.03	7,315.52	4,991.05	2,159.05	4,965.46	2.36	-1.90	1.40	
13,708.00	90.30	359.88	7,315.69	5,080.05	2,158.98	5,054.45	0.95	0.93	-0.17	
13,798.00	92.07	359.99	7,313.83	5,170.03	2,158.88	5,144.43	1.97	1.97	0.12	
13,887.00	90.45	359.01	7,311.88	5,259.00	2,158.10	5,233.40	2.13	-1.82	-1.10	
13,977.00	90.55	357.34	7,311.09	5,348.94	2,155.24	5,323.38	1.86	0.11	-1.86	
14,067.00	88.02	357.17	7,312.21	5,438.83	2,150.93	5,413.30	2.82	-2.81	-0.19	
14,156.00	89.10	357.05	7,314.45	5,527.68	2,146.44	5,502.21	1.22	1.21	-0.13	
14,246.00	90.19	357.24	7,315.01	5,617.57	2,141.96	5,592.14	1.23	1.21	0.21	
14,336.00	91.08	357.63	7,314.01	5,707.47	2,137.93	5,682.08	1.08	0.99	0.43	
14,425.00	90.25	359.58	7,312.98	5,796.43	2,135.76	5,771.06	2.38	-0.93	2.19	
14,514.00	89.17	358.93	7,313.43	5,885.42	2,134.61	5,860.06	1.42	-1.21	-0.73	
14,604.00	90.46	359.35	7,313.72	5,975.41	2,133.26	5,950.06	1.51	1.43	0.47	
14,693.00	88.38	358.94	7,314.62	6,064.39	2,131.93	6,039.05	2.38	-2.34	-0.46	
14,783.00	90.10	359.29	7,315.81	6,154.37	2,130.54	6,129.04	1.95	1.91	0.39	
14,872.00	91.44	359.19	7,314.62	6,243.35	2,129.36	6,218.03	1.51	1.51	-0.11	
14,962.00	89.40	358.54	7,313.96	6,333.33	2,127.58	6,308.01	2.38	-2.27	-0.72	
15,051.00	90.89	359.67	7,313.73	6,422.31	2,126.19	6,397.01	2.10	1.67	1.27	
15,141.00	88.91	358.90	7,313.89	6,512.30	2,125.06	6,487.00	2.36	-2.20	-0.86	
15,230.00	90.00	358.99	7,314.74	6,601.28	2,123.42	6,576.00	1.23	1.22	0.10	

Company:	ANADARKO PETROLEUM CORP	Local Co-ordinate Reference:	Well SARCHET 21-7HZ
Project:	WELD COUNTY (NAD 83)	TVD Reference:	KB 21' @ 5003.00usft (PD 464)
Site:	SW SW SEC 21 T3N R66W 6th P.M.	MD Reference:	KB 21' @ 5003.00usft (PD 464)
Well:	SARCHET 21-7HZ	North Reference:	True
Wellbore:	ORIGINAL WELLBORE	Survey Calculation Method:	Minimum Curvature
Design:	ORIGINAL WELLBORE	Database:	EDM 5000.15 Single User Db

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
15,319.00	91.41	359.26	7,313.64	6,690.26	2,122.07	6,664.99	1.61	1.58	0.30	
15,409.00	89.74	357.68	7,312.74	6,780.22	2,119.66	6,754.97	2.55	-1.86	-1.76	
15,498.00	90.58	358.48	7,312.49	6,869.16	2,116.68	6,843.94	1.30	0.94	0.90	
15,587.00	88.82	357.14	7,312.96	6,958.09	2,113.28	6,932.91	2.49	-1.98	-1.51	
15,677.00	89.51	357.14	7,314.27	7,047.97	2,108.79	7,022.83	0.77	0.77	0.00	
15,766.00	89.99	357.25	7,314.65	7,136.86	2,104.43	7,111.77	0.55	0.54	0.12	
15,856.00	91.01	357.08	7,313.87	7,226.75	2,099.98	7,201.70	1.15	1.13	-0.19	
15,945.00	88.55	356.81	7,314.21	7,315.61	2,095.24	7,290.61	2.78	-2.76	-0.30	
16,035.00	89.76	357.70	7,315.54	7,405.50	2,090.93	7,380.54	1.67	1.34	0.99	
16,124.00	90.77	359.90	7,315.13	7,494.47	2,089.07	7,469.53	2.72	1.13	2.47	
16,214.00	91.98	359.10	7,312.97	7,584.44	2,088.28	7,559.50	1.61	1.34	-0.89	
16,304.00	89.71	0.01	7,311.64	7,674.42	2,087.58	7,649.48	2.72	-2.52	1.01	
16,393.00	90.51	359.73	7,311.47	7,763.42	2,087.38	7,738.48	0.95	0.90	-0.31	
16,483.00	88.73	0.22	7,312.07	7,853.41	2,087.34	7,828.47	2.05	-1.98	0.54	
16,572.00	89.97	0.03	7,313.08	7,942.41	2,087.54	7,917.45	1.41	1.39	-0.21	
16,662.00	89.61	359.77	7,313.41	8,032.40	2,087.38	8,007.45	0.49	-0.40	-0.29	
16,751.00	88.44	358.54	7,314.92	8,121.38	2,086.07	8,096.43	1.91	-1.31	-1.38	
16,841.00	89.89	358.84	7,316.23	8,211.34	2,084.01	8,186.41	1.65	1.61	0.33	
16,931.00	88.40	359.12	7,317.57	8,301.32	2,082.41	8,276.40	1.68	-1.66	0.31	
17,020.00	89.42	359.08	7,319.27	8,390.29	2,081.01	8,365.38	1.15	1.15	-0.04	
17,110.00	90.46	358.83	7,319.36	8,480.27	2,079.37	8,455.38	1.19	1.16	-0.28	
17,199.00	88.88	358.53	7,319.87	8,569.24	2,077.32	8,544.37	1.81	-1.78	-0.34	
17,289.00	90.21	358.45	7,320.59	8,659.21	2,074.95	8,634.35	1.48	1.48	-0.09	
17,378.00	89.08	357.91	7,321.14	8,748.16	2,072.12	8,723.33	1.41	-1.27	-0.61	
17,468.00	90.17	358.02	7,321.73	8,838.10	2,068.93	8,813.30	1.22	1.21	0.12	
17,558.00	91.64	357.94	7,320.31	8,928.03	2,065.75	8,903.26	1.64	1.63	-0.09	
17,648.00	89.48	359.46	7,319.43	9,017.99	2,063.71	8,993.25	2.93	-2.40	1.69	
17,737.00	90.93	359.26	7,319.11	9,106.99	2,062.72	9,082.24	1.64	1.63	-0.22	
17,827.00	90.84	358.81	7,317.72	9,196.96	2,061.20	9,172.23	0.51	-0.10	-0.50	
17,916.00	87.73	1.07	7,318.83	9,285.94	2,061.11	9,261.20	4.32	-3.49	2.54	
18,006.00	88.43	1.01	7,321.85	9,375.87	2,062.74	9,351.11	0.78	0.78	-0.07	
18,095.00	89.42	1.16	7,323.52	9,464.84	2,064.43	9,440.05	1.13	1.11	0.17	
18,185.00	90.86	1.18	7,323.30	9,554.82	2,066.26	9,530.00	1.60	1.60	0.02	
18,191.57	90.95	1.20	7,323.19	9,561.39	2,066.40	9,536.57	1.41	1.37	0.31	
Enter 460' Circle: 18191.57' MD 2491' FWL 431' FNL										
18,274.00	92.08	1.46	7,321.01	9,643.76	2,068.31	9,618.92	1.41	1.37	0.31	
18,364.00	93.04	0.94	7,316.99	9,733.65	2,070.20	9,708.78	1.21	1.07	-0.58	
18,421.00	93.04	0.94	7,313.97	9,790.56	2,071.13	9,765.67	0.00	0.00	0.00	
BHL - SARCHET 21-7HZ (P3) - BHL: 2498' FWL, 201' FNL Sec 16 T3N R66W - BHL - SARCHET 21-7HZ										

Company:	ANADARKO PETROLEUM CORP	Local Co-ordinate Reference:	Well SARCHET 21-7HZ
Project:	WELD COUNTY (NAD 83)	TVD Reference:	KB 21' @ 5003.00usft (PD 464)
Site:	SW SW SEC 21 T3N R66W 6th P.M.	MD Reference:	KB 21' @ 5003.00usft (PD 464)
Well:	SARCHET 21-7HZ	North Reference:	True
Wellbore:	ORIGINAL WELLBORE	Survey Calculation Method:	Minimum Curvature
Design:	ORIGINAL WELLBORE	Database:	EDM 5000.15 Single User Db

Design 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
SHL: 339' FWL, 565' FS - actual wellpath hits target center - Point	0.00	0.00	0.00	0.00	0.00	14,601,344.55	1,698,941.42	40.204703	-104.790394
Curve KOP (Sarchet 21- - actual wellpath hits target center - Point	0.00	0.00	6,466.94	-1,185.02	1,751.82	14,600,164.14	1,700,695.34	40.201450	-104.784123
Enter Land Box: 6978.86' - actual wellpath misses target center by 0.03usft at 6978.86usft MD (6590.14 TVD, -1201.16 N, 1805.72 E) - Point	0.00	0.00	6,590.15	-1,201.18	1,805.70	14,600,148.11	1,700,749.23	40.201406	-104.783930
BHL: 2498' FWL, 201' FI - actual wellpath hits target center - Point	0.00	0.00	7,313.97	9,790.56	2,071.13	14,611,136.09	1,700,988.61	40.231578	-104.782976
Enter 460' Circle: 18191 - actual wellpath hits target center - Point	0.00	0.00	7,323.19	9,561.39	2,066.40	14,610,907.01	1,700,984.42	40.230949	-104.782993
LP: 2434' FWL, 158' FSI - actual wellpath hits target center - Point	0.00	0.00	7,333.02	-384.69	2,097.60	14,600,964.97	1,701,039.09	40.203647	-104.782885
Exit 460' Circle: 8511.95 - actual wellpath hits target center - Point	0.00	0.00	7,333.50	-113.81	2,093.62	14,601,235.73	1,701,034.47	40.204391	-104.782899

Casing Points					
Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")	
1,907.00	1,853.54	9 5/8"	9-5/8	12-1/4	

Design Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment	
		+N/-S (usft)	+E/-W (usft)		
1,868.00	1,817.56	-209.68	283.69	LAST SURVEY JULY 5, 2019	

Checked By: _____ Approved By: _____ Date: _____