

ANADARKO PETROLEUM CORP

Project: WELD COUNTY (NAD 83)
 Site: SW SW SEC 21 T3N R66W 6th P.M.
 Well: SARCHET 21-2HZ
 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: 52046.0nT
 Dip Angle: 66.64°
 Date: 7/29/2019
 Model: IGRF2015

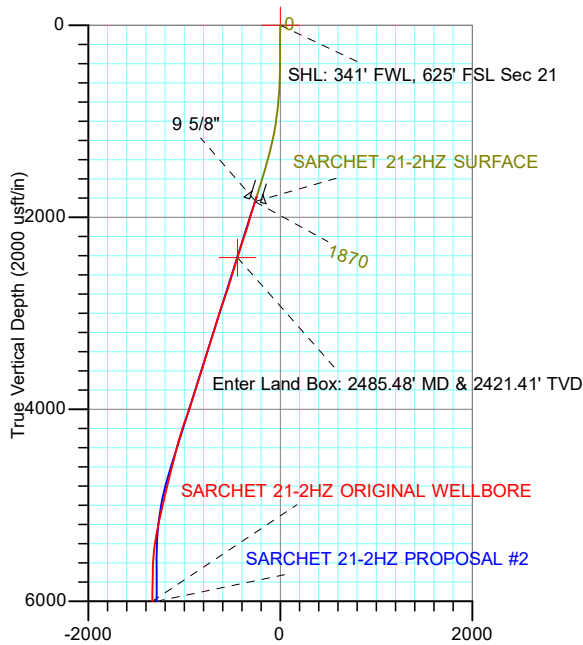
PROJECT DETAILS: WELD COUNTY (NAD 83)

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

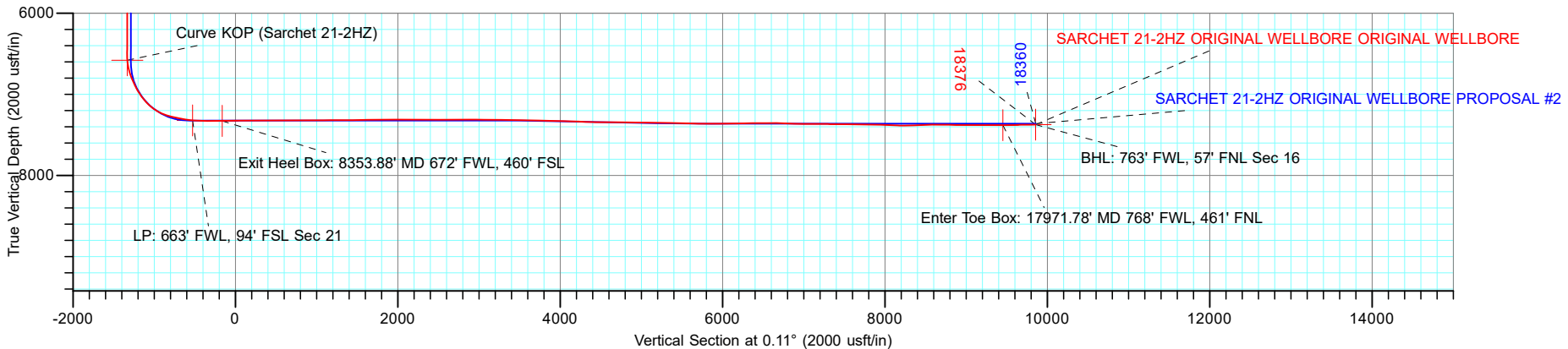
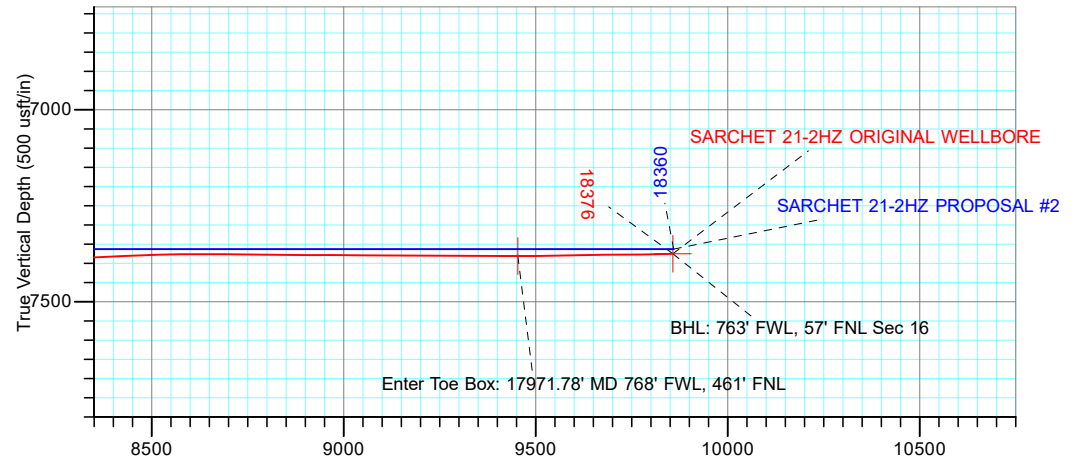


DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Latitude	Longitude
BHL: 763' FWL, 57' FNL Sec 16	7375.09	9856.65	334.31	40.231924	-104.789195
Curve KOP (Sarchet 21-2HZ)	6581.25	-1331.01	357.87	40.201214	-104.789111
Enter Land Box: 2485.48' MD & 2421.41' TVD	2421.41	-446.06	123.70	40.203643	-104.789949
Enter Toe Box: 17971.78' MD 768' FWL, 461' FNL	7381.37	9452.58	342.56	40.230815	-104.789165
Exit Heel Box: 8353.88' MD 672' FWL, 460' FSL	7328.47	-160.99	333.75	40.204426	-104.789197
LP: 663' FWL, 94' FSL Sec 21	7322.67	-526.65	326.46	40.203422	-104.789223
SHL: 341' FWL, 625' FSL Sec 21	0.00	0.00	0.00	40.204868	-104.790392



Actual Line Calls
SHL: 341' FWL, 625' FSL Sec 21 T3N R66W
Heel: 663' FWL, 94' FSL Sec 21 T3N R66W
BHL: 763' FWL, 57' FNL Sec 16 T3N R66W



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

Design: ORIGINAL WELLBORE (SARCHET 21-2HZ/ORIGINAL WELLBORE)
 SW SW SEC 21 T3N R66W 6th P.M.
 Created By: Micah Ault Date: 16:33, November 05 2019
 Approved: _____ Date: _____

ANADARKO PETROLEUM CORP

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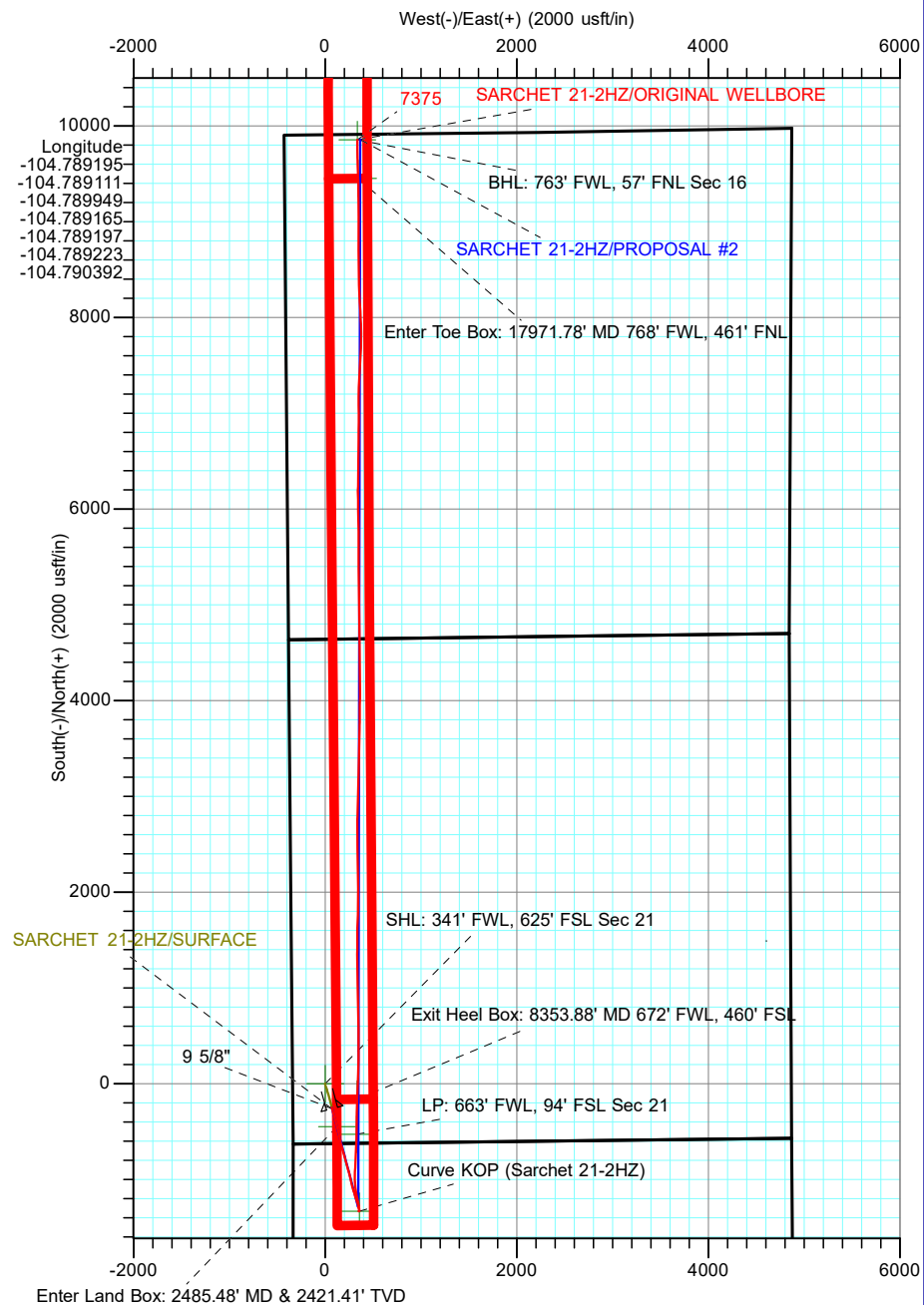
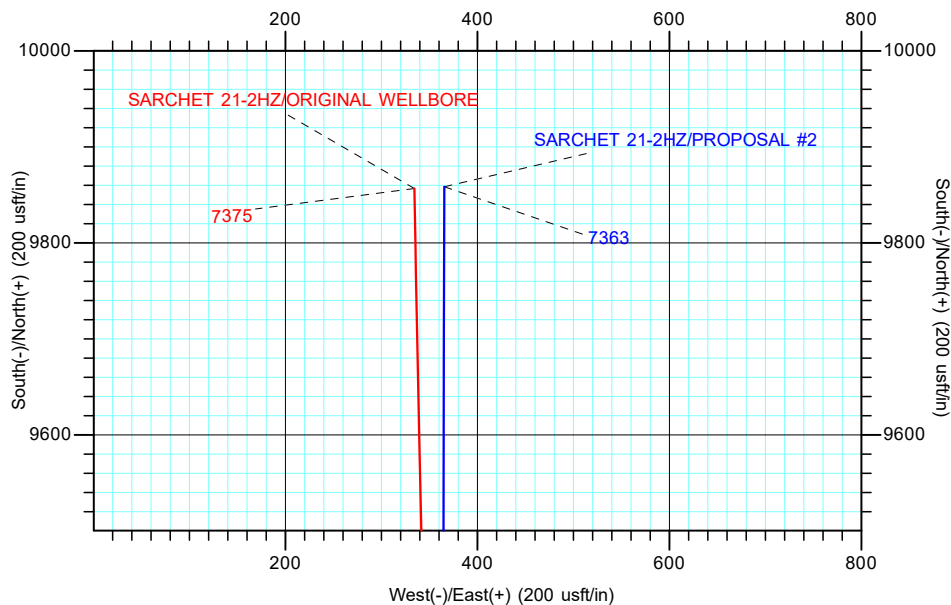
PROJECT DETAILS: WELD COUNTY (NAD 83)
 Geodetic System: Universal Transverse Mercator (US Survey Feet)
 Datum: North American Datum 1983
 Ellipsoid: GRS 1980
 Zone: Zone 13N (108 W to 102 W)



DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
BHL: 763' FWL, 57' FNL Sec 16	7375.09	9856.65	334.31	14611258.05	1699252.65	40.231924	-104.789195
Curve KOP (Sarchet 21-2HZ)	6581.25	-1331.01	357.87	14600074.91	1699302.61	40.201214	-104.789111
Enter Land Box: 2485.48' MD & 2421.41' TVD	2421.41	-446.06	123.70	14600958.95	1699066.45	40.203643	-104.789949
Enter Toe Box: 17971.78' MD 768' FWL, 461' FNL	7381.37	9452.58	342.56	14610854.16	1699261.85	40.230815	-104.789165
Exit Heel Box: 8353.88' MD 672' FWL, 460' FSL	7328.47	-160.99	333.75	14601244.40	1699275.74	40.204426	-104.789197
LP: 663' FWL, 94' FSL Sec 21	7322.67	-526.65	326.46	14600878.87	1699269.32	40.203422	-104.789223
SHL: 341' FWL, 625' FSL Sec 21	0.00	0.00	0.00	14601404.54	1698941.74	40.204868	-104.790392

Actual Line Calls
 SHL: 341' FWL, 625' FSL Sec 21 T3N R66W
 Heel: 663' FWL, 94' FSL Sec 21 T3N R66W
 BHL: 763' FWL, 57' FNL Sec 16 T3N R66W



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 SW SW SEC 21 T3N R66W 6th P.M.
 Created By: Micah Ault Date: 16:34, November 05 2019
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ANADARKO PETROLEUM CORP

**WELD COUNTY (NAD 83)
SW SW SEC 21 T3N R66W 6th P.M.
SARCHET 21-2HZ**

ORIGINAL WELLBORE

Design: ORIGINAL WELLBORE

Standard Survey Report

05 November, 2019

Company:	ANADARKO PETROLEUM CORP	Local Co-ordinate Reference:	Well SARCHET 21-2HZ
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 21-2HZ	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 21-2HZ					
Well Position	+N/-S	0.00 usft	Northing:	14,601,404.54 usft	Latitude:	40.204868
	+E/-W	0.00 usft	Easting:	1,698,941.74 usft	Longitude:	-104.790392
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	52,045.98213825

Design	ORIGINAL WELLBORE				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	1,820.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)	
	0.00	0.00	0.00	0.11	

Survey Program	Date	11/5/2019			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
128.00	1,820.00	FINAL SURVEYS - SURFACE (JOB # 201	APC_ISCWSA REV 2 MWD+	Fixed:v2:crustal field declination	
1,959.00	18,314.00	Survey #1 (ORIGINAL WELLBORE)	APC_ISCWSA REV 2 MWD+	Fixed:v2:crustal field declination	
18,376.00	18,376.00	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: 341' FWL, 625' FSL Sec 21										
128.00	0.22	175.96	128.00	-0.25	0.02	-0.25	0.17	0.17	0.00	
223.00	0.92	143.26	222.99	-1.04	0.49	-1.04	0.78	0.74	-34.42	
318.00	0.44	224.27	317.99	-1.91	0.69	-1.91	1.01	-0.51	85.27	
412.00	0.62	290.22	411.99	-1.99	-0.04	-1.99	0.63	0.19	70.16	
508.00	0.40	195.29	507.98	-2.14	-0.62	-2.14	0.80	-0.23	-98.89	
603.00	3.60	167.43	602.91	-5.37	-0.06	-5.37	3.42	3.37	-29.33	
699.00	4.35	169.72	698.68	-11.89	1.25	-11.89	0.80	0.78	2.39	

Company:	ANADARKO PETROLEUM CORP	Local Co-ordinate Reference:	Well SARCHET 21-2HZ
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 21-2HZ	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	5.36	160.84	792.35	-19.55	3.33	-19.54	1.34	1.07	-9.45	
889.00	6.94	161.02	887.79	-29.27	6.69	-29.26	1.65	1.65	0.19	
984.00	8.04	159.70	981.98	-40.93	10.86	-40.91	1.17	1.16	-1.39	
1,079.00	10.02	158.73	1,075.80	-54.86	16.16	-54.83	2.09	2.08	-1.02	
1,174.00	12.52	164.01	1,168.96	-72.46	22.00	-72.42	2.84	2.63	5.56	
1,269.00	13.71	163.92	1,261.48	-93.18	27.95	-93.13	1.25	1.25	-0.09	
1,364.00	15.34	164.53	1,353.44	-116.11	34.42	-116.05	1.72	1.72	0.64	
1,460.00	16.17	164.53	1,445.83	-141.23	41.37	-141.15	0.86	0.86	0.00	
1,554.00	17.71	166.38	1,535.75	-167.75	48.23	-167.65	1.74	1.64	1.97	
1,649.00	18.37	165.94	1,626.08	-196.31	55.27	-196.20	0.71	0.69	-0.46	
1,744.00	18.18	164.53	1,716.29	-225.11	62.86	-224.99	0.51	-0.20	-1.48	
1,820.00	18.15	164.53	1,788.50	-247.95	69.18	-247.82	0.04	-0.04	0.00	
LAST SURVEY JULY 2, 2019										
1,861.00	18.04	164.67	1,827.48	-260.23	72.56	-260.09	0.29	-0.27	0.34	
9 5/8"										
1,959.00	17.77	165.01	1,920.73	-289.30	80.44	-289.15	0.29	-0.27	0.35	
2,048.00	16.69	163.61	2,005.73	-314.68	87.56	-314.52	1.30	-1.21	-1.57	
2,138.00	17.30	165.05	2,091.80	-340.01	94.66	-339.83	0.82	0.68	1.60	
2,227.00	19.28	165.56	2,176.30	-367.03	101.74	-366.83	2.23	2.22	0.57	
2,317.00	18.76	164.40	2,261.39	-395.36	109.34	-395.15	0.71	-0.58	-1.29	
2,407.00	18.28	164.12	2,346.73	-422.87	117.09	-422.65	0.54	-0.53	-0.31	
2,496.00	17.40	164.04	2,431.45	-449.09	124.57	-448.85	0.99	-0.99	-0.09	
2,586.00	17.44	166.34	2,517.32	-475.14	131.46	-474.88	0.77	0.04	2.56	
2,675.00	18.58	167.97	2,601.96	-501.97	137.56	-501.70	1.40	1.28	1.83	
2,765.00	17.19	166.24	2,687.61	-528.91	143.71	-528.63	1.65	-1.54	-1.92	
2,855.00	19.47	168.89	2,773.04	-556.55	149.77	-556.26	2.70	2.53	2.94	
2,944.00	19.47	169.47	2,856.95	-585.69	155.34	-585.39	0.22	0.00	0.65	
3,034.00	19.08	166.77	2,941.91	-614.75	161.44	-614.44	1.08	-0.43	-3.00	
3,124.00	18.15	166.34	3,027.20	-642.69	168.12	-642.37	1.04	-1.03	-0.48	
3,214.00	17.15	164.45	3,112.96	-669.10	174.99	-668.76	1.28	-1.11	-2.10	
3,303.00	17.95	163.26	3,197.82	-694.87	182.46	-694.52	0.99	0.90	-1.34	
3,393.00	19.01	164.41	3,283.18	-722.27	190.39	-721.91	1.25	1.18	1.28	
3,482.00	17.22	162.17	3,367.76	-748.78	198.32	-748.40	2.16	-2.01	-2.52	
3,572.00	16.94	165.89	3,453.79	-774.18	205.60	-773.78	1.25	-0.31	4.13	
3,662.00	19.78	164.50	3,539.20	-801.58	212.86	-801.17	3.19	3.16	-1.54	
3,751.00	17.42	164.32	3,623.55	-828.92	220.49	-828.49	2.65	-2.65	-0.20	
3,841.00	18.83	165.04	3,709.08	-855.92	227.88	-855.48	1.59	1.57	0.80	
3,930.00	16.76	164.41	3,793.82	-882.16	235.04	-881.71	2.34	-2.33	-0.71	
4,019.00	19.30	165.47	3,878.44	-908.76	242.18	-908.30	2.88	2.85	1.19	
4,109.00	17.14	164.82	3,963.93	-935.96	249.38	-935.48	2.41	-2.40	-0.72	
4,198.00	20.52	165.76	4,048.15	-963.75	256.66	-963.25	3.81	3.80	1.06	
4,288.00	20.04	165.80	4,132.57	-993.99	264.32	-993.48	0.53	-0.53	0.04	
4,378.00	19.17	166.34	4,217.35	-1,023.29	271.59	-1,022.77	0.99	-0.97	0.60	
4,467.00	17.38	167.40	4,301.86	-1,050.47	277.94	-1,049.93	2.05	-2.01	1.19	

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Well:	SARCHET 21-2HZ	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)	
4,557.00	15.12	169.04	4,388.26	-1,075.11	283.11	-1,074.57	2.56	-2.51	1.82	
4,646.00	15.61	162.86	4,474.08	-1,097.95	288.84	-1,097.40	1.92	0.55	-6.94	
4,736.00	13.14	161.79	4,561.26	-1,119.24	295.61	-1,118.68	2.76	-2.74	-1.19	
4,825.00	14.86	160.79	4,647.61	-1,139.63	302.53	-1,139.05	1.95	1.93	-1.12	
4,915.00	14.11	161.53	4,734.75	-1,160.94	309.80	-1,160.34	0.86	-0.83	0.82	
5,005.00	14.84	165.25	4,821.90	-1,182.49	316.21	-1,181.88	1.31	0.81	4.13	
5,094.00	13.27	163.85	4,908.23	-1,203.32	321.95	-1,202.70	1.80	-1.76	-1.57	
5,184.00	13.57	159.36	4,995.77	-1,223.13	328.55	-1,222.49	1.20	0.33	-4.99	
5,274.00	14.53	160.49	5,083.08	-1,243.65	336.04	-1,243.00	1.11	1.07	1.26	
5,364.00	12.57	159.63	5,170.57	-1,263.47	343.22	-1,262.81	2.19	-2.18	-0.96	
5,453.00	11.29	170.02	5,257.66	-1,281.14	348.10	-1,280.46	2.80	-1.44	11.67	
5,543.00	8.98	168.97	5,346.25	-1,296.71	350.97	-1,296.03	2.57	-2.57	-1.17	
5,632.00	7.80	169.20	5,434.29	-1,309.46	353.43	-1,308.78	1.33	-1.33	0.26	
5,722.00	6.19	188.51	5,523.63	-1,320.26	353.86	-1,319.58	3.14	-1.79	21.46	
5,812.00	2.05	219.87	5,613.39	-1,326.30	352.11	-1,325.62	5.07	-4.60	34.84	
5,901.00	1.24	218.78	5,702.35	-1,328.27	350.49	-1,327.59	0.91	-0.91	-1.22	
6,106.00	0.74	155.36	5,907.33	-1,331.20	349.65	-1,330.53	0.55	-0.24	-30.94	
6,195.00	0.50	111.45	5,996.32	-1,331.87	350.25	-1,331.19	0.58	-0.27	-49.34	
6,285.00	0.42	41.93	6,086.32	-1,331.76	350.84	-1,331.09	0.59	-0.09	-77.24	
6,374.00	0.59	76.42	6,175.32	-1,331.41	351.50	-1,330.74	0.38	0.19	38.75	
6,464.00	0.93	89.23	6,265.31	-1,331.29	352.68	-1,330.62	0.42	0.38	14.23	
6,554.00	1.02	107.16	6,355.29	-1,331.52	354.18	-1,330.84	0.35	0.10	19.92	
6,643.00	1.11	94.10	6,444.28	-1,331.82	355.79	-1,331.13	0.29	0.10	-14.67	
6,733.00	0.98	96.00	6,534.26	-1,331.96	357.43	-1,331.27	0.15	-0.14	2.11	
6,780.00	2.42	2.31	6,581.25	-1,331.01	357.87	-1,330.32	5.68	3.07	-199.33	
Curve KOP (Sarchet 21-2HZ)										
6,807.54	3.92	353.90	6,608.74	-1,329.49	357.79	-1,328.80	5.68	5.44	-30.55	
KOP - SARCHET 21-2HZ										
6,810.85	4.10	353.30	6,612.04	-1,329.26	357.76	-1,328.57	5.68	5.54	-17.98	
KOP - SARCHET 21-2HZ (P2)										
6,823.00	4.78	351.51	6,624.16	-1,328.33	357.64	-1,327.64	5.68	5.57	-14.75	
6,912.00	18.46	355.10	6,711.13	-1,310.54	355.88	-1,309.85	15.38	15.37	4.03	
7,002.00	21.82	350.65	6,795.62	-1,279.83	351.94	-1,279.15	4.10	3.73	-4.94	
7,091.00	25.32	347.08	6,877.19	-1,244.94	345.00	-1,244.28	4.25	3.93	-4.01	
7,181.00	32.12	346.41	6,956.07	-1,202.88	335.06	-1,202.23	7.56	7.56	-0.74	
7,271.00	36.15	348.74	7,030.55	-1,153.57	324.25	-1,152.94	4.71	4.48	2.59	
7,360.00	43.28	355.12	7,099.00	-1,097.33	316.52	-1,096.72	9.22	8.01	7.17	
7,450.00	51.74	356.55	7,159.74	-1,031.20	311.76	-1,030.60	9.47	9.40	1.59	
7,539.00	59.30	0.26	7,210.10	-957.93	309.83	-957.33	9.16	8.49	4.17	
7,629.00	70.04	3.95	7,248.55	-876.78	312.92	-876.18	12.49	11.93	4.10	
7,719.00	76.01	2.39	7,274.82	-790.88	317.66	-790.26	6.84	6.63	-1.73	
7,808.00	78.27	1.76	7,294.63	-704.17	320.80	-703.55	2.63	2.54	-0.71	
7,898.00	79.53	1.84	7,311.95	-615.90	323.58	-615.28	1.40	1.40	0.09	

Company:	ANADARKO PETROLEUM CORP	Local Co-ordinate Reference:	Well SARCHET 21-2HZ
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 21-2HZ	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)	
7,943.75	83.22	1.85	7,318.82	-570.70	325.03	-570.08	8.06	8.06	0.02	
HEEL - SARCHET 21-2HZ										
7,944.01	83.24	1.85	7,318.85	-570.44	325.04	-569.82	8.06	8.06	0.02	
HEEL - SARCHET 21-2HZ (P2)										
7,988.00	86.78	1.86	7,322.67	-526.65	326.46	-526.02	8.06	8.06	0.02	
LP: 663' FWL, 94' FSL Sec 21										
8,077.00	87.56	0.69	7,327.07	-437.78	328.44	-437.15	1.58	0.88	-1.31	
8,167.00	89.68	1.19	7,329.24	-347.82	329.91	-347.19	2.42	2.36	0.56	
8,257.00	89.85	0.94	7,329.60	-257.84	331.59	-257.20	0.34	0.19	-0.28	
8,346.00	91.37	1.56	7,328.66	-168.87	333.53	-168.23	1.84	1.71	0.70	
8,353.88	91.37	1.65	7,328.47	-160.99	333.75	-160.35	1.09	0.02	1.09	
Exit Heel Box: 8353.88' MD 672' FWL, 460' FSL										
8,436.00	91.39	2.54	7,326.49	-78.95	336.75	-78.31	1.09	0.02	1.09	
8,526.00	89.94	1.78	7,325.45	10.97	340.14	11.63	1.82	-1.61	-0.84	
8,615.00	90.49	1.88	7,325.11	99.93	342.98	100.58	0.63	0.62	0.11	
8,705.00	90.65	1.40	7,324.22	189.89	345.56	190.55	0.56	0.18	-0.53	
8,794.00	89.63	0.11	7,324.00	278.87	346.73	279.54	1.85	-1.15	-1.45	
8,884.00	90.61	359.99	7,323.81	368.87	346.81	369.54	1.10	1.09	-0.13	
8,974.00	90.88	359.50	7,322.64	458.86	346.41	459.53	0.62	0.30	-0.54	
9,063.00	89.23	0.39	7,322.55	547.86	346.32	548.52	2.11	-1.85	1.00	
9,153.00	89.55	0.09	7,323.51	637.85	346.70	638.52	0.49	0.36	-0.33	
9,243.00	90.52	359.48	7,323.46	727.85	346.36	728.52	1.27	1.08	-0.68	
9,332.00	90.58	358.38	7,322.60	816.83	344.70	817.49	1.24	0.07	-1.24	
9,422.00	90.99	358.23	7,321.37	906.78	342.04	907.44	0.49	0.46	-0.17	
9,512.00	89.36	357.52	7,321.10	996.72	338.70	997.36	1.98	-1.81	-0.79	
9,601.00	91.89	358.43	7,320.12	1,085.65	335.56	1,086.29	3.02	2.84	1.02	
9,691.00	89.99	358.64	7,318.65	1,175.60	333.25	1,176.24	2.12	-2.11	0.23	
9,781.00	89.67	0.27	7,318.92	1,265.59	332.40	1,266.23	1.85	-0.36	1.81	
9,870.00	89.97	1.21	7,319.19	1,354.59	333.55	1,355.22	1.11	0.34	1.06	
9,960.00	89.96	0.11	7,319.25	1,444.58	334.58	1,445.22	1.22	-0.01	-1.22	
10,050.00	91.53	0.56	7,318.08	1,534.57	335.11	1,535.21	1.81	1.74	0.50	
10,139.00	92.29	0.35	7,315.11	1,623.51	335.82	1,624.15	0.89	0.85	-0.24	
10,229.00	90.87	1.47	7,312.63	1,713.46	337.25	1,714.11	2.01	-1.58	1.24	
10,318.00	89.55	2.11	7,312.31	1,802.42	340.03	1,803.07	1.65	-1.48	0.72	
10,408.00	89.93	1.38	7,312.71	1,892.37	342.77	1,893.03	0.91	0.42	-0.81	
10,498.00	90.09	0.30	7,312.70	1,982.36	344.09	1,983.02	1.21	0.18	-1.20	
10,588.00	89.17	359.48	7,313.28	2,072.36	343.91	2,073.02	1.37	-1.02	-0.91	
10,677.00	89.51	358.76	7,314.30	2,161.34	342.55	2,162.00	0.89	0.38	-0.81	
10,767.00	89.57	358.03	7,315.03	2,251.30	340.03	2,251.95	0.81	0.07	-0.81	
10,857.00	90.15	359.46	7,315.25	2,341.28	338.05	2,341.92	1.71	0.64	1.59	
10,946.00	90.69	358.60	7,314.59	2,430.26	336.55	2,430.90	1.14	0.61	-0.97	
11,036.00	90.35	0.67	7,313.78	2,520.25	335.98	2,520.89	2.33	-0.38	2.30	
11,125.00	89.99	0.08	7,313.51	2,609.25	336.56	2,609.89	0.78	-0.40	-0.66	
11,215.00	89.57	359.04	7,313.86	2,699.24	335.87	2,699.88	1.25	-0.47	-1.16	

Company:	ANADARKO PETROLEUM CORP	Local Co-ordinate Reference:	Well SARCHET 21-2HZ
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 21-2HZ	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)	
11,305.00	89.76	1.78	7,314.39	2,789.23	336.51	2,789.87	3.05	0.21	3.04	
11,395.00	91.10	1.32	7,313.71	2,879.19	338.94	2,879.84	1.57	1.49	-0.51	
11,484.00	88.91	2.51	7,313.70	2,968.14	341.92	2,968.79	2.80	-2.46	1.34	
11,574.00	89.20	2.41	7,315.19	3,058.04	345.78	3,058.70	0.34	0.32	-0.11	
11,663.00	89.86	1.46	7,315.92	3,146.99	348.79	3,147.65	1.30	0.74	-1.07	
11,753.00	89.84	0.55	7,316.15	3,236.97	350.36	3,237.64	1.01	-0.02	-1.01	
11,842.00	89.99	0.16	7,316.28	3,325.97	350.92	3,326.64	0.47	0.17	-0.44	
11,932.00	87.85	0.63	7,317.98	3,415.95	351.54	3,416.61	2.43	-2.38	0.52	
12,015.59	88.09	0.43	7,320.94	3,499.48	352.31	3,500.15	0.37	0.29	-0.23	
INT PT 1 - SARCHET 21-2HZ										
12,022.00	88.11	0.42	7,321.15	3,505.89	352.36	3,506.56	0.37	0.29	-0.23	
12,111.00	90.29	1.86	7,322.40	3,594.85	354.13	3,595.53	2.94	2.45	1.62	
12,200.00	89.54	2.59	7,322.53	3,683.78	357.59	3,684.46	1.18	-0.84	0.82	
12,290.00	88.31	0.76	7,324.22	3,773.72	360.22	3,774.41	2.45	-1.37	-2.03	
12,380.00	89.07	0.65	7,326.27	3,863.69	361.32	3,864.38	0.85	0.84	-0.12	
12,469.00	87.65	359.99	7,328.82	3,952.65	361.82	3,953.34	1.76	-1.60	-0.74	
12,559.00	88.38	0.25	7,331.94	4,042.60	362.01	4,043.28	0.86	0.81	0.29	
12,648.00	88.26	359.83	7,334.55	4,131.56	362.07	4,132.25	0.49	-0.13	-0.47	
12,738.00	87.98	359.15	7,337.50	4,221.51	361.27	4,222.19	0.82	-0.31	-0.76	
12,828.00	88.00	359.46	7,340.66	4,311.44	360.18	4,312.13	0.34	0.02	0.34	
12,917.00	88.07	358.93	7,343.71	4,400.38	358.93	4,401.06	0.60	0.08	-0.60	
13,007.00	90.53	0.19	7,344.81	4,490.36	358.24	4,491.04	3.07	2.73	1.40	
13,096.00	89.80	0.73	7,344.55	4,579.36	358.95	4,580.04	1.02	-0.82	0.61	
13,186.00	90.13	0.53	7,344.61	4,669.35	359.94	4,670.04	0.43	0.37	-0.22	
13,276.00	89.11	358.95	7,345.20	4,759.35	359.53	4,760.03	2.09	-1.13	-1.76	
13,365.00	88.66	358.84	7,346.94	4,848.31	357.82	4,848.99	0.52	-0.51	-0.12	
13,455.00	88.23	358.32	7,349.38	4,938.25	355.59	4,938.93	0.75	-0.48	-0.58	
13,545.00	89.10	358.83	7,351.47	5,028.20	353.35	5,028.87	1.12	0.97	0.57	
13,634.00	89.62	358.50	7,352.47	5,117.17	351.28	5,117.83	0.69	0.58	-0.37	
13,724.00	89.38	359.01	7,353.25	5,207.14	349.32	5,207.81	0.63	-0.27	0.57	
13,813.00	90.36	0.09	7,353.46	5,296.14	348.62	5,296.80	1.64	1.10	1.21	
13,903.00	89.53	0.30	7,353.54	5,386.14	348.93	5,386.80	0.95	-0.92	0.23	
13,993.00	88.32	0.17	7,355.23	5,476.12	349.30	5,476.78	1.35	-1.34	-0.14	
14,016.47	88.26	0.19	7,355.93	5,499.57	349.37	5,500.23	0.27	-0.26	0.08	
INT PT 2 - SARCHET 21-2HZ										
14,082.00	88.09	0.24	7,358.02	5,565.07	349.62	5,565.74	0.27	-0.26	0.08	
14,172.00	88.19	359.33	7,360.94	5,655.03	349.28	5,655.69	1.02	0.11	-1.01	
14,262.00	89.81	359.29	7,362.51	5,745.00	348.20	5,745.66	1.80	1.80	-0.04	
14,351.00	90.05	358.75	7,362.62	5,833.99	346.67	5,834.64	0.66	0.27	-0.61	
14,440.00	89.99	358.50	7,362.59	5,922.96	344.54	5,923.61	0.29	-0.07	-0.28	
14,530.00	90.16	359.84	7,362.47	6,012.95	343.24	6,013.60	1.50	0.19	1.49	
14,619.00	91.31	359.00	7,361.33	6,101.94	342.33	6,102.58	1.60	1.29	-0.94	
14,709.00	91.36	0.23	7,359.23	6,191.91	341.73	6,192.55	1.37	0.06	1.37	
14,798.00	89.91	1.41	7,358.25	6,280.89	343.00	6,281.54	2.10	-1.63	1.33	

Company:	ANADARKO PETROLEUM CORP	Local Co-ordinate Reference:	Well SARCHET 21-2HZ
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 21-2HZ	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)	
14,888.00	90.53	0.78	7,357.90	6,370.87	344.72	6,371.52	0.98	0.69	-0.70	
14,977.00	90.59	0.41	7,357.03	6,459.86	345.65	6,460.52	0.42	0.07	-0.42	
15,067.00	89.87	0.93	7,356.67	6,549.86	346.70	6,550.51	0.99	-0.80	0.58	
15,156.00	90.33	0.45	7,356.51	6,638.85	347.77	6,639.50	0.75	0.52	-0.54	
15,246.00	87.97	0.95	7,357.85	6,728.83	348.87	6,729.48	2.68	-2.62	0.56	
15,335.00	87.66	0.18	7,361.24	6,817.76	349.75	6,818.41	0.93	-0.35	-0.87	
15,424.00	88.51	0.26	7,364.22	6,906.70	350.09	6,907.36	0.96	0.96	0.09	
15,514.00	89.00	359.94	7,366.17	6,996.68	350.25	6,997.34	0.65	0.54	-0.36	
15,603.00	89.18	359.58	7,367.58	7,085.67	349.87	7,086.33	0.45	0.20	-0.40	
15,692.00	90.54	359.82	7,367.80	7,174.67	349.41	7,175.32	1.55	1.53	0.27	
15,782.00	89.85	1.71	7,367.50	7,264.65	350.61	7,265.31	2.24	-0.77	2.10	
15,871.00	88.53	3.85	7,368.75	7,353.53	354.93	7,354.20	2.82	-1.48	2.40	
15,961.00	89.05	3.54	7,370.65	7,443.33	360.72	7,444.00	0.67	0.58	-0.34	
16,050.00	89.74	3.07	7,371.59	7,532.17	365.85	7,532.86	0.94	0.78	-0.53	
16,140.00	90.76	2.36	7,371.20	7,622.07	370.12	7,622.76	1.38	1.13	-0.79	
16,230.00	88.36	1.05	7,371.89	7,712.02	372.80	7,712.72	3.04	-2.67	-1.46	
16,319.00	89.58	1.23	7,373.49	7,800.98	374.57	7,801.69	1.39	1.37	0.20	
16,409.00	87.69	358.42	7,375.64	7,890.94	374.29	7,891.65	3.76	-2.10	-3.12	
16,498.00	87.70	357.79	7,379.22	7,979.82	371.35	7,980.52	0.71	0.01	-0.71	
16,588.00	88.04	356.53	7,382.56	8,069.65	366.89	8,070.34	1.45	0.38	-1.40	
16,677.00	87.75	356.00	7,385.83	8,158.40	361.10	8,159.08	0.68	-0.33	-0.60	
16,767.00	90.62	357.52	7,387.11	8,248.23	356.02	8,248.90	3.61	3.19	1.69	
16,856.00	92.18	358.12	7,384.94	8,337.14	352.63	8,337.80	1.88	1.75	0.67	
16,946.00	92.55	358.35	7,381.22	8,427.02	349.86	8,427.68	0.48	0.41	0.26	
17,036.00	91.59	359.34	7,377.97	8,516.94	348.05	8,517.59	1.53	-1.07	1.10	
17,125.00	90.43	0.21	7,376.40	8,605.92	347.70	8,606.58	1.63	-1.30	0.98	
17,215.00	89.32	0.65	7,376.60	8,695.92	348.38	8,696.57	1.33	-1.23	0.49	
17,304.00	89.19	0.43	7,377.76	8,784.91	349.21	8,785.56	0.29	-0.15	-0.25	
17,394.00	89.93	0.95	7,378.45	8,874.90	350.30	8,875.55	1.00	0.82	0.58	
17,484.00	89.69	359.67	7,378.75	8,964.89	350.78	8,965.55	1.45	-0.27	-1.42	
17,573.00	89.87	359.55	7,379.09	9,053.89	350.18	9,054.55	0.24	0.20	-0.13	
17,663.00	89.49	359.42	7,379.59	9,143.89	349.37	9,144.54	0.45	-0.42	-0.14	
17,752.00	89.67	358.74	7,380.24	9,232.87	347.94	9,233.52	0.79	0.20	-0.76	
17,842.00	89.57	358.24	7,380.84	9,322.84	345.57	9,323.48	0.57	-0.11	-0.56	
17,932.00	89.79	358.91	7,381.34	9,412.81	343.33	9,413.45	0.78	0.24	0.74	
17,971.78	90.14	358.88	7,381.37	9,452.58	342.56	9,453.22	0.88	0.88	-0.08	
Enter Toe Box: 17971.78' MD 768' FWL, 461' FNL										
18,021.00	90.57	358.84	7,381.06	9,501.79	341.58	9,502.43	0.88	0.88	-0.08	
18,111.00	91.67	358.46	7,379.30	9,591.75	339.46	9,592.38	1.29	1.22	-0.42	
18,200.00	90.24	359.17	7,377.82	9,680.71	337.62	9,681.34	1.79	-1.61	0.80	
18,290.00	90.75	358.75	7,377.04	9,770.69	335.99	9,771.32	0.73	0.57	-0.47	
18,314.00	91.39	358.90	7,376.59	9,794.68	335.50	9,795.31	2.74	2.67	0.63	
18,376.00	91.39	358.90	7,375.09	9,856.65	334.31	9,857.27	0.00	0.00	0.00	
BHL - SARCHET 21-2HZ (P2) - BHL: 763' FWL, 57' FNL Sec 16 - BHL - SARCHET 21-2HZ										

Company:	ANADARKO PETROLEUM CORP	Local Co-ordinate Reference:	Well SARCHET 21-2HZ
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 21-2HZ	North Reference:	True
Wellbore:	ORIGINAL WELLBORE	Survey Calculation Method:	Minimum Curvature
Design:	ORIGINAL WELLBORE	Database:	EDM 5000.15 Single User Db

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)
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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: 341' FWL, 625' FS - actual wellpath hits target center - Point	0.00	0.00	0.00	0.00	0.00	14,601,404.54	1,698,941.74	40.204868	-104.790392
Curve KOP (Sarchet 21- - actual wellpath hits target center - Point	0.00	0.00	6,581.25	-1,331.01	357.87	14,600,074.90	1,699,302.61	40.201214	-104.789111
LP: 663' FWL, 94' FSL S - actual wellpath hits target center - Point	0.00	0.00	7,322.67	-526.65	326.46	14,600,878.87	1,699,269.31	40.203422	-104.789224
Exit Heel Box: 8353.88' l - actual wellpath hits target center - Point	0.00	0.00	7,328.47	-160.99	333.75	14,601,244.40	1,699,275.74	40.204426	-104.789198
BHL: 763' FWL, 57' FNL - actual wellpath hits target center - Point	0.00	0.00	7,375.09	9,856.65	334.31	14,611,258.04	1,699,252.65	40.231924	-104.789195
Enter Toe Box: 17971.7ℓ - actual wellpath hits target center - Point	0.00	0.00	7,381.37	9,452.58	342.56	14,610,854.15	1,699,261.85	40.230815	-104.789166

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
1,861.00	1,827.48	9 5/8"	9-5/8	12-1/4

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
1,820.00	1,788.50	-247.95	69.18	LAST SURVEY JULY 2, 2019

Checked By: _____ Approved By: _____ Date: _____