

# ANADARKO PETROLEUM CORP

Project: WELD COUNTY (NAD 83)  
 Site: SW SW SEC 21 T3N R66W 6th P.M.  
 Well: SARCHET 21-1HZ  
 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

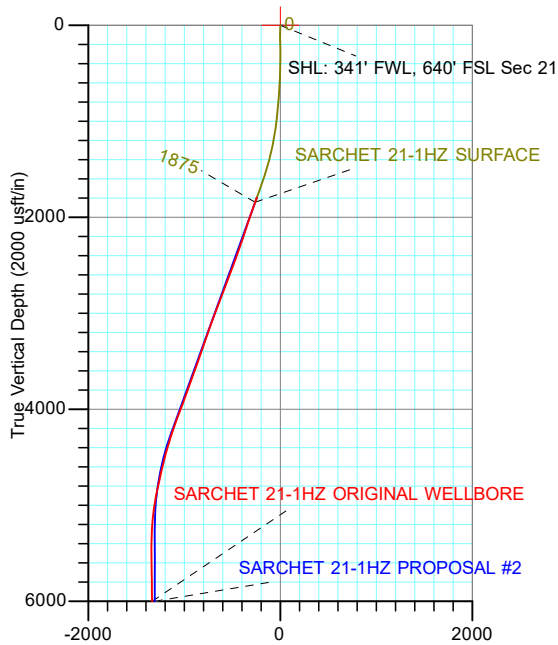
PROJECT DETAILS: WELD COUNTY (NAD 83)

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

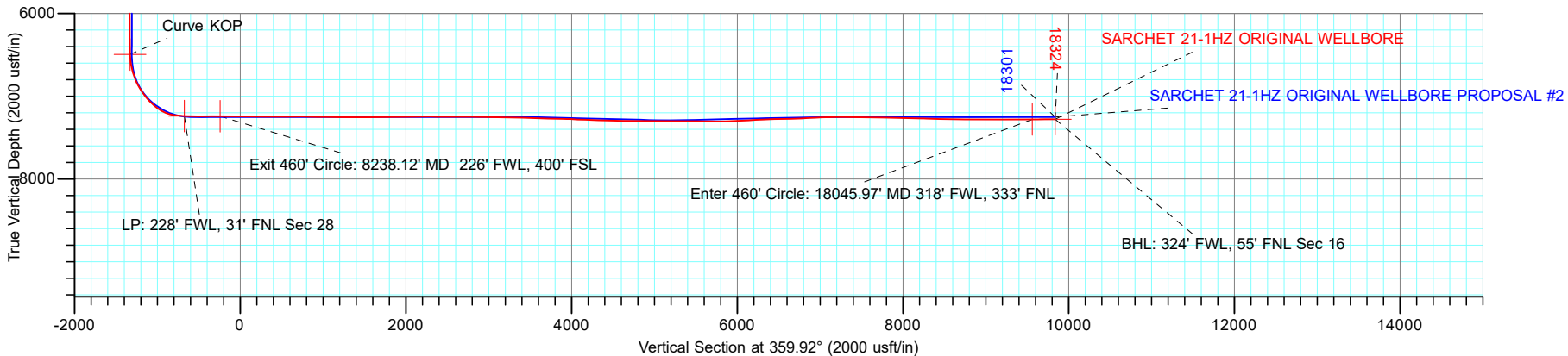
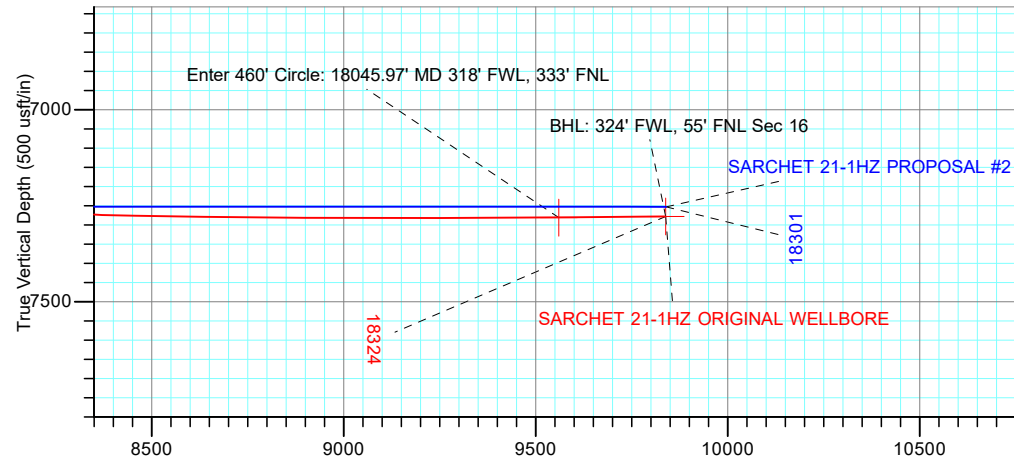


### DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Latitude	Longitude
BHL: 324' FWL, 55' FNL Sec 16	7278.03	9837.98	-104.81	40.231914	-104.790767
Curve KOP	6497.10	-1329.73	-82.13	40.201259	-104.790686
Enter 460' Circle: 18045.97' MD 318' FWL, 333' FNL	7281.17	9560.00	-109.08	40.231151	-104.790783
Exit 460' Circle: 8238.12' MD 226' FWL, 400' FSL	7242.85	-241.35	-111.97	40.204246	-104.790793
LP: 228' FWL, 31' FNL Sec 28	7240.74	-672.28	-107.07	40.203063	-104.790775
SHL: 341' FWL, 640' FSL Sec 21	0.00	0.00	0.00	40.204909	-104.790392



**Actual Line Calls**  
**SHL: 341' FWL, 640' FSL Sec 21 T3N R66W**  
**Heel: 228' FWL, 31' FNL Sec 28 T3N R66W**  
**BHL: 324' FWL, 55' FNL Sec 16 T3N R66W**



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

Design: ORIGINAL WELLBORE (SARCHET 21-1HZ/ORIGINAL WELLBORE)  
 SW SW SEC 21 T3N R66W 6th P.M.  
 Created By: Micah Ault Date: 13:31, November 05 2019  
 Date: \_\_\_\_\_  
 Approved: \_\_\_\_\_ Date: \_\_\_\_\_

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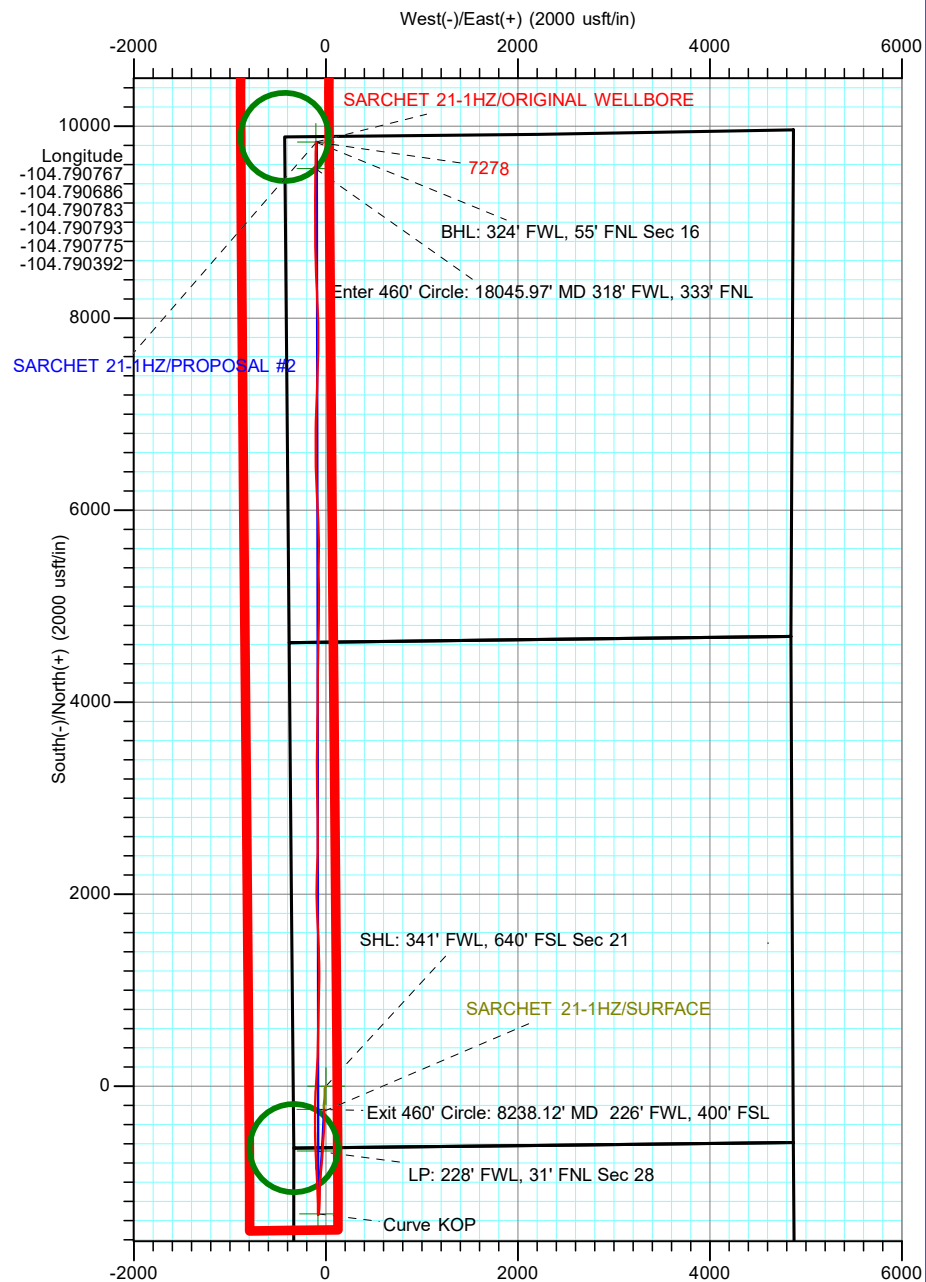
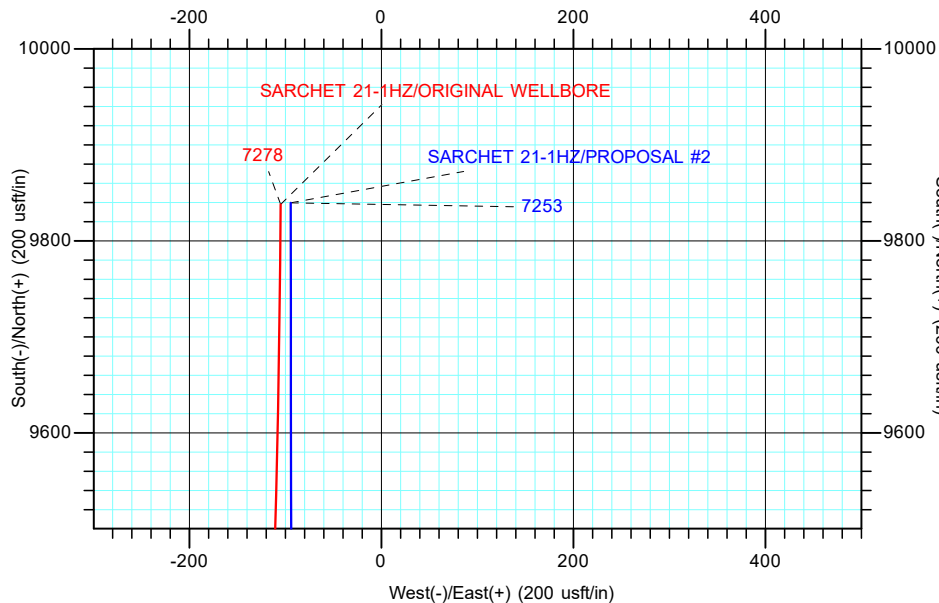
PROJECT DETAILS: WELD COUNTY (NAD 83)  
 Geodetic System: Universal Transverse Mercator (US Survey Feet)  
 Datum: North American Datum 1983  
 Ellipsoid: GRS 1980  
 Zone: Zone 13N (108 W to 102 W)



### DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
BHL: 324' FWL, 55' FNL Sec 16	7278.03	9837.98	-104.81	14611253.32	1698813.79	40.231914	-104.790767
Curve KOP	6497.10	-1329.73	-82.13	14600090.12	1698862.83	40.201259	-104.790686
Enter 460' Circle: 18045.97' MD 318' FWL, 333' FNL	7281.17	9560.00	-109.08	14610975.44	1698810.18	40.231151	-104.790783
Exit 460' Circle: 8238.12' MD 226' FWL, 400' FSL	7242.85	-241.35	-111.97	14601177.99	1698830.43	40.204246	-104.790793
LP: 228' FWL, 31' FNL Sec 28	7240.74	-672.28	-107.07	14600747.25	1698836.34	40.203063	-104.790775
SHL: 341' FWL, 640' FSL Sec 21	0.00	0.00	0.00	14601419.51	1698941.78	40.204909	-104.790392

**Actual Line Calls**  
**SHL: 341' FWL, 640' FSL Sec 21 T3N R66W**  
**Heel: 228' FWL, 31' FNL Sec 28 T3N R66W**  
**BHL: 324' FWL, 55' FNL Sec 16 T3N R66W**



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Design: ORIGINAL WELLBORE (SARCHET 21-1HZ/ORIGINAL WELLBORE)  
 SW SW SEC 21 T3N R66W 6th P.M.  
 Created By: Micah Ault Date: 13:30, November 05 2019  
 Date: \_\_\_\_\_  
 Approved: \_\_\_\_\_ Date: \_\_\_\_\_

# **ANADARKO PETROLEUM CORP**

**WELD COUNTY (NAD 83)  
SW SW SEC 21 T3N R66W 6th P.M.  
SARCHET 21-1HZ**

**ORIGINAL WELLBORE**

**Design: ORIGINAL WELLBORE**

## **Standard Survey Report**

**05 November, 2019**

<b>Company:</b>	ANADARKO PETROLEUM CORP	<b>Local Co-ordinate Reference:</b>	Well SARCHET 21-1HZ
<b>Project:</b>	WELD COUNTY (NAD 83)	<b>TVD Reference:</b>	KB 21' @ 5003.00usft (PD 464)
<b>Site:</b>	SW SW SEC 21 T3N R66W 6th P.M.	<b>MD Reference:</b>	KB 21' @ 5003.00usft (PD 464)
<b>Well:</b>	SARCHET 21-1HZ	<b>North Reference:</b>	True
<b>Wellbore:</b>	ORIGINAL WELLBORE	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	ORIGINAL WELLBORE	<b>Database:</b>	EDM 5000.15 Single User Db

<b>Project</b>	WELD COUNTY (NAD 83)		
<b>Map System:</b>	Universal Transverse Mercator (US Survey Feet)	<b>System Datum:</b>	Mean Sea Level
<b>Geo Datum:</b>	North American Datum 1983		
<b>Map Zone:</b>	Zone 13N (108 W to 102 W)	Using geodetic scale factor	

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

<b>Well</b>	SARCHET 21-1HZ					
<b>Well Position</b>	<b>+N/-S</b>	0.00 usft	<b>Northing:</b>	14,601,419.51 usft	<b>Latitude:</b>	40.204909
	<b>+E/-W</b>	0.00 usft	<b>Easting:</b>	1,698,941.78 usft	<b>Longitude:</b>	-104.790392
<b>Position Uncertainty</b>		0.00 usft	<b>Wellhead Elevation:</b>	usft	<b>Ground Level:</b>	4,982.00 usft

<b>Wellbore</b>	ORIGINAL WELLBORE				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	IGRF2015	7/29/2019	7.98	66.64	52,046.00351493

<b>Design</b>	ORIGINAL WELLBORE				
<b>Audit Notes:</b>					
<b>Version:</b>	1.0	<b>Phase:</b>	ACTUAL	<b>Tie On Depth:</b>	1,825.00
<b>Vertical Section:</b>	<b>Depth From (TVD) (usft)</b>	<b>+N/-S (usft)</b>	<b>+E/-W (usft)</b>	<b>Direction (°)</b>	
	0.00	0.00	0.00	359.92	

<b>Survey Program</b>	<b>Date</b>	9/19/2019			
<b>From (usft)</b>	<b>To (usft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>	
128.00	1,825.00	FINAL SURVEYS - SURFACE (JOB # 201	APC_ISCWSA REV 2 MWD+	Fixed:v2:crustal field declination	
1,959.00	18,262.00	Survey #1 (ORIGINAL WELLBORE)	APC_ISCWSA REV 2 MWD+	Fixed:v2:crustal field declination	
18,324.00	18,324.00	Survey #2 (ORIGINAL WELLBORE)	BLIND	OWSG BLIND	

<b>Survey</b>										
<b>Measured Depth (usft)</b>	<b>Inclination (°)</b>	<b>Azimuth (°)</b>	<b>Vertical Depth (usft)</b>	<b>+N/-S (usft)</b>	<b>+E/-W (usft)</b>	<b>Vertical Section (usft)</b>	<b>Dogleg Rate (°/100usft)</b>	<b>Build Rate (°/100usft)</b>	<b>Turn Rate (°/100usft)</b>	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>SHL: 341' FWL, 640' FSL Sec 21</b>										
128.00	0.18	133.51	128.00	-0.14	0.15	-0.14	0.14	0.14	0.00	0.00
223.00	0.44	319.66	223.00	0.04	0.02	0.04	0.65	0.27	-183.00	
318.00	0.40	297.34	318.00	0.47	-0.51	0.47	0.18	-0.04	-23.49	
412.00	1.10	238.01	411.99	0.14	-1.57	0.14	1.02	0.74	-63.12	
508.00	1.67	218.67	507.96	-1.44	-3.23	-1.44	0.76	0.59	-20.15	
603.00	3.47	212.08	602.86	-4.96	-5.62	-4.95	1.92	1.89	-6.94	
699.00	4.22	202.50	698.65	-10.68	-8.51	-10.67	1.03	0.78	-9.98	

<b>Company:</b>	ANADARKO PETROLEUM CORP	<b>Local Co-ordinate Reference:</b>	Well SARCHET 21-1HZ
<b>Project:</b>	WELD COUNTY (NAD 83)	<b>TVD Reference:</b>	KB 21' @ 5003.00usft (PD 464)
<b>Site:</b>	SW SW SEC 21 T3N R66W 6th P.M.	<b>MD Reference:</b>	KB 21' @ 5003.00usft (PD 464)
<b>Well:</b>	SARCHET 21-1HZ	<b>North Reference:</b>	True
<b>Wellbore:</b>	ORIGINAL WELLBORE	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	ORIGINAL WELLBORE	<b>Database:</b>	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	5.32	193.45	792.32	-18.12	-10.85	-18.10	1.41	1.17	-9.63	
889.00	5.36	188.18	887.90	-26.88	-12.52	-26.87	0.51	0.04	-5.49	
984.00	6.55	177.45	982.39	-36.69	-12.91	-36.67	1.71	1.25	-11.29	
1,079.00	8.61	179.21	1,076.56	-49.21	-12.57	-49.20	2.18	2.17	1.85	
1,174.00	9.62	179.30	1,170.36	-64.26	-12.38	-64.24	1.06	1.06	0.09	
1,269.00	11.38	181.23	1,263.76	-81.57	-12.48	-81.55	1.89	1.85	2.03	
1,364.00	14.62	184.57	1,356.32	-102.90	-13.64	-102.88	3.50	3.41	3.52	
1,460.00	15.10	184.92	1,449.11	-127.43	-15.68	-127.41	0.51	0.50	0.36	
1,554.00	18.06	185.10	1,539.19	-154.15	-18.02	-154.13	3.15	3.15	0.19	
1,649.00	18.72	183.69	1,629.34	-184.03	-20.31	-184.00	0.84	0.69	-1.48	
1,744.00	19.82	178.95	1,719.02	-215.35	-21.00	-215.32	2.01	1.16	-4.99	
1,825.00	20.04	178.95	1,795.17	-242.96	-20.49	-242.93	0.27	0.27	0.00	
<b>LAST SURVEY JULY 1, 2019</b>										
1,959.00	20.03	179.61	1,921.06	-288.86	-19.92	-288.83	0.17	-0.01	0.49	
2,048.00	19.29	176.76	2,004.87	-318.78	-18.98	-318.75	1.36	-0.83	-3.20	
2,138.00	18.46	175.01	2,090.03	-347.82	-16.90	-347.79	1.12	-0.92	-1.94	
2,227.00	17.27	180.44	2,174.74	-375.07	-15.78	-375.05	2.30	-1.34	6.10	
2,317.00	17.90	182.99	2,260.54	-402.24	-16.60	-402.22	1.11	0.70	2.83	
2,406.00	20.10	184.30	2,344.69	-431.15	-18.46	-431.13	2.52	2.47	1.47	
2,496.00	20.17	182.51	2,429.19	-462.08	-20.30	-462.05	0.69	0.08	-1.99	
2,586.00	20.64	184.44	2,513.54	-493.39	-22.21	-493.36	0.91	0.52	2.14	
2,675.00	20.70	184.48	2,596.81	-524.71	-24.65	-524.68	0.07	0.07	0.04	
2,765.00	21.58	183.64	2,680.75	-557.09	-26.95	-557.05	1.03	0.98	-0.93	
2,855.00	20.00	182.43	2,764.89	-588.99	-28.65	-588.94	1.82	-1.76	-1.34	
2,944.00	21.39	184.95	2,848.15	-620.36	-30.69	-620.32	1.85	1.56	2.83	
3,034.00	21.02	184.73	2,932.05	-652.80	-33.44	-652.75	0.42	-0.41	-0.24	
3,124.00	20.46	183.72	3,016.22	-684.58	-35.79	-684.53	0.74	-0.62	-1.12	
3,213.00	19.97	183.37	3,099.74	-715.28	-37.70	-715.22	0.57	-0.55	-0.39	
3,303.00	18.36	182.06	3,184.75	-744.79	-39.11	-744.73	1.85	-1.79	-1.46	
3,393.00	19.93	187.01	3,269.77	-774.18	-41.49	-774.12	2.51	1.74	5.50	
3,482.00	19.51	186.09	3,353.55	-804.01	-44.92	-803.95	0.59	-0.47	-1.03	
3,572.00	19.63	183.70	3,438.36	-834.04	-47.49	-833.98	0.90	0.13	-2.66	
3,661.00	19.91	184.21	3,522.11	-864.08	-49.57	-864.01	0.37	0.31	0.57	
3,751.00	21.03	186.92	3,606.43	-895.39	-52.64	-895.32	1.63	1.24	3.01	
3,841.00	17.92	186.00	3,691.27	-925.20	-56.03	-925.12	3.47	-3.46	-1.02	
3,930.00	19.58	183.84	3,775.54	-953.70	-58.46	-953.62	2.02	1.87	-2.43	
4,019.00	21.34	183.86	3,858.93	-984.74	-60.55	-984.65	1.98	1.98	0.02	
4,109.00	19.17	188.18	3,943.36	-1,015.71	-63.76	-1,015.62	2.93	-2.41	4.80	
4,198.00	21.07	179.18	4,026.95	-1,046.18	-65.61	-1,046.09	4.08	2.13	-10.11	
4,288.00	20.97	180.10	4,110.96	-1,078.46	-65.40	-1,078.37	0.38	-0.11	1.02	
4,377.00	20.10	179.83	4,194.30	-1,109.68	-65.38	-1,109.59	0.98	-0.98	-0.30	
4,467.00	17.95	180.26	4,279.38	-1,139.02	-65.40	-1,138.92	2.39	-2.39	0.48	
4,557.00	15.49	178.90	4,365.57	-1,164.90	-65.23	-1,164.81	2.77	-2.73	-1.51	

<b>Company:</b>	ANADARKO PETROLEUM CORP	<b>Local Co-ordinate Reference:</b>	Well SARCHET 21-1HZ
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<b>Site:</b>	SW SW SEC 21 T3N R66W 6th P.M.	<b>MD Reference:</b>	KB 21' @ 5003.00usft (PD 464)
<b>Well:</b>	SARCHET 21-1HZ	<b>North Reference:</b>	True
<b>Wellbore:</b>	ORIGINAL WELLBORE	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	ORIGINAL WELLBORE	<b>Database:</b>	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)	
4,646.00	15.35	180.31	4,451.36	-1,188.57	-65.07	-1,188.47	0.45	-0.16	1.58	
4,736.00	13.08	180.15	4,538.60	-1,210.66	-65.16	-1,210.57	2.52	-2.52	-0.18	
4,825.00	13.03	182.80	4,625.30	-1,230.76	-65.68	-1,230.66	0.67	-0.06	2.98	
4,915.00	13.53	186.53	4,712.90	-1,251.35	-67.37	-1,251.26	1.10	0.56	4.14	
5,005.00	12.46	187.27	4,800.59	-1,271.44	-69.80	-1,271.34	1.20	-1.19	0.82	
5,094.00	10.90	187.91	4,887.75	-1,289.30	-72.17	-1,289.20	1.76	-1.75	0.72	
5,184.00	9.59	185.47	4,976.31	-1,305.19	-74.06	-1,305.09	1.53	-1.46	-2.71	
5,274.00	7.91	180.90	5,065.26	-1,318.85	-74.87	-1,318.74	2.02	-1.87	-5.08	
5,363.00	6.14	188.07	5,153.59	-1,329.69	-75.63	-1,329.58	2.22	-1.99	8.06	
5,453.00	3.35	187.96	5,243.27	-1,337.06	-76.67	-1,336.95	3.10	-3.10	-0.12	
5,543.00	0.55	223.43	5,333.21	-1,339.98	-77.33	-1,339.87	3.24	-3.11	39.41	
5,632.00	0.69	271.77	5,422.21	-1,340.27	-78.16	-1,340.16	0.59	0.16	54.31	
5,722.00	0.58	268.33	5,512.20	-1,340.27	-79.16	-1,340.15	0.13	-0.12	-3.82	
5,812.00	0.62	315.90	5,602.20	-1,339.93	-79.95	-1,339.82	0.54	0.04	52.86	
5,901.00	0.75	339.73	5,691.19	-1,339.04	-80.49	-1,338.92	0.35	0.15	26.78	
6,015.00	0.90	355.13	5,805.18	-1,337.45	-80.82	-1,337.33	0.23	0.13	13.51	
6,105.00	0.65	331.71	5,895.17	-1,336.29	-81.13	-1,336.18	0.44	-0.28	-26.02	
6,194.00	1.04	342.32	5,984.16	-1,335.08	-81.61	-1,334.96	0.47	0.44	11.92	
6,284.00	0.83	299.03	6,074.15	-1,333.98	-82.43	-1,333.87	0.80	-0.23	-48.10	
6,373.00	0.42	274.64	6,163.15	-1,333.64	-83.32	-1,333.53	0.54	-0.46	-27.40	
6,463.00	0.40	312.06	6,253.15	-1,333.41	-83.88	-1,333.29	0.29	-0.02	41.58	
6,553.00	0.87	31.34	6,343.14	-1,332.61	-83.76	-1,332.49	0.99	0.52	88.09	
6,643.00	1.11	52.20	6,433.13	-1,331.49	-82.71	-1,331.38	0.48	0.27	23.18	
6,707.00	2.48	3.73	6,497.10	-1,329.73	-82.13	-1,329.62	3.02	2.14	-75.73	
<b>Curve KOP</b>										
6,732.00	3.18	357.87	6,522.07	-1,328.50	-82.12	-1,328.38	3.02	2.79	-23.45	
6,748.35	4.32	2.11	6,538.38	-1,327.43	-82.12	-1,327.31	7.20	7.00	25.95	
<b>KOP - SARCHET 21-1HZ (P2)</b>										
6,764.34	5.46	4.53	6,554.31	-1,326.07	-82.04	-1,325.95	7.20	7.09	15.12	
<b>KOP - SARCHET 21-1HZ</b>										
6,822.00	9.58	8.48	6,611.47	-1,318.59	-81.11	-1,318.47	7.20	7.15	6.85	
6,911.00	14.61	354.03	6,698.48	-1,300.08	-81.19	-1,299.97	6.55	5.65	-16.24	
7,001.00	22.64	357.99	6,783.70	-1,271.43	-82.98	-1,271.32	9.03	8.92	4.40	
7,091.00	26.23	356.04	6,865.63	-1,234.27	-84.96	-1,234.15	4.09	3.99	-2.17	
7,180.00	33.92	359.77	6,942.59	-1,189.74	-86.42	-1,189.62	8.89	8.64	4.19	
7,270.00	40.37	1.87	7,014.30	-1,135.44	-85.57	-1,135.32	7.30	7.17	2.33	
7,359.00	45.10	356.20	7,079.68	-1,075.12	-86.72	-1,075.00	6.85	5.31	-6.37	
7,449.00	51.75	355.91	7,139.37	-1,007.99	-91.36	-1,007.87	7.39	7.39	-0.32	
7,538.00	62.04	357.14	7,187.91	-933.68	-95.82	-933.54	11.62	11.56	1.38	
7,628.00	77.64	356.25	7,218.84	-849.60	-100.71	-849.45	17.36	17.33	-0.99	
7,718.00	83.57	358.57	7,233.52	-760.94	-104.71	-760.79	7.06	6.59	2.58	
7,807.00	87.13	358.38	7,240.74	-672.28	-107.07	-672.13	4.01	4.00	-0.21	
<b>LP: 228' FWL, 31' FNL Sec 28</b>										
7,888.38	88.69	358.02	7,243.70	-591.00	-109.62	-590.84	1.97	1.92	-0.44	
<b>HEEL - SARCHET 21-1HZ (P2)</b>										

<b>Company:</b>	ANADARKO PETROLEUM CORP	<b>Local Co-ordinate Reference:</b>	Well SARCHET 21-1HZ
<b>Project:</b>	WELD COUNTY (NAD 83)	<b>TVD Reference:</b>	KB 21' @ 5003.00usft (PD 464)
<b>Site:</b>	SW SW SEC 21 T3N R66W 6th P.M.	<b>MD Reference:</b>	KB 21' @ 5003.00usft (PD 464)
<b>Well:</b>	SARCHET 21-1HZ	<b>North Reference:</b>	True
<b>Wellbore:</b>	ORIGINAL WELLBORE	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	ORIGINAL WELLBORE	<b>Database:</b>	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)
7,888.47	88.69	358.02	7,243.70	-590.90	-109.63	-590.75	0.00	0.00	0.00
<b>HEEL - SARCHET 21-1HZ</b>									
7,897.00	88.86	357.98	7,243.88	-582.38	-109.92	-582.23	2.00	1.94	-0.45
7,987.00	90.21	358.37	7,244.62	-492.43	-112.79	-492.27	1.56	1.50	0.43
8,077.00	91.10	0.24	7,243.59	-402.45	-113.88	-402.29	2.30	0.99	2.08
8,166.00	90.03	1.05	7,242.71	-313.46	-112.88	-313.30	1.51	-1.20	0.91
8,238.12	89.75	0.40	7,242.85	-241.35	-111.97	-241.19	0.98	-0.39	-0.90
<b>Exit 460' Circle: 8238.12' MD 226' FWL, 400' FSL</b>									
8,256.00	89.68	0.24	7,242.94	-223.47	-111.87	-223.31	0.98	-0.39	-0.90
8,345.00	90.29	1.55	7,242.96	-134.48	-110.48	-134.33	1.62	0.69	1.47
8,435.00	89.51	3.62	7,243.12	-44.58	-106.42	-44.43	2.46	-0.87	2.30
8,525.00	88.50	2.83	7,244.68	45.26	-101.35	45.40	1.42	-1.12	-0.88
8,614.00	88.20	3.15	7,247.24	134.10	-96.71	134.24	0.49	-0.34	0.36
8,704.00	90.08	3.28	7,248.59	223.95	-91.67	224.08	2.09	2.09	0.14
8,794.00	90.41	1.65	7,248.21	313.86	-87.80	313.98	1.85	0.37	-1.81
8,883.00	90.96	1.74	7,247.14	402.82	-85.16	402.93	0.63	0.62	0.10
8,973.00	90.05	1.43	7,246.35	492.78	-82.68	492.89	1.07	-1.01	-0.34
9,063.00	89.23	1.08	7,246.92	582.75	-80.70	582.87	0.99	-0.91	-0.39
9,152.00	90.76	1.40	7,246.92	671.73	-78.78	671.84	1.76	1.72	0.36
9,242.00	88.87	1.03	7,247.21	761.70	-76.87	761.81	2.14	-2.10	-0.41
9,331.00	88.88	1.09	7,248.96	850.67	-75.22	850.78	0.07	0.01	0.07
9,421.00	88.97	1.27	7,250.65	940.64	-73.37	940.74	0.22	0.10	0.20
9,511.00	89.41	1.51	7,251.92	1,030.60	-71.19	1,030.70	0.56	0.49	0.27
9,600.00	89.61	1.43	7,252.68	1,119.57	-68.90	1,119.66	0.24	0.22	-0.09
9,690.00	89.52	358.65	7,253.37	1,209.56	-68.84	1,209.65	3.09	-0.10	-3.09
9,780.00	89.50	357.87	7,254.14	1,299.51	-71.57	1,299.61	0.87	-0.02	-0.87
9,869.00	89.63	359.29	7,254.81	1,388.48	-73.78	1,388.58	1.60	0.15	1.60
9,959.00	89.11	358.02	7,255.80	1,478.45	-75.89	1,478.55	1.52	-0.58	-1.41
10,049.00	89.65	356.60	7,256.78	1,568.34	-80.12	1,568.45	1.69	0.60	-1.58
10,138.00	90.86	357.33	7,256.38	1,657.21	-84.83	1,657.33	1.59	1.36	0.82
10,228.00	90.98	356.40	7,254.94	1,747.06	-89.75	1,747.19	1.04	0.13	-1.03
10,318.00	90.93	358.67	7,253.44	1,836.96	-93.62	1,837.09	2.52	-0.06	2.52
10,407.00	91.36	358.07	7,251.66	1,925.91	-96.15	1,926.04	0.83	0.48	-0.67
10,497.00	91.79	0.12	7,249.18	2,015.86	-97.57	2,015.99	2.33	0.48	2.28
10,587.00	91.07	0.70	7,246.94	2,105.83	-96.93	2,105.96	1.03	-0.80	0.64
10,676.00	89.48	2.29	7,246.51	2,194.79	-94.61	2,194.92	2.53	-1.79	1.79
10,766.00	89.31	1.92	7,247.46	2,284.72	-91.30	2,284.85	0.45	-0.19	-0.41
10,856.00	89.74	1.81	7,248.21	2,374.67	-88.37	2,374.79	0.49	0.48	-0.12
10,945.00	89.59	1.28	7,248.73	2,463.64	-85.97	2,463.76	0.62	-0.17	-0.60
11,035.00	90.21	0.76	7,248.88	2,553.62	-84.37	2,553.74	0.90	0.69	-0.58
11,124.00	89.46	359.88	7,249.14	2,642.62	-83.87	2,642.74	1.30	-0.84	-0.99
11,214.00	89.54	359.37	7,249.93	2,732.62	-84.46	2,732.73	0.57	0.09	-0.57
11,304.00	89.66	358.44	7,250.55	2,822.60	-86.18	2,822.71	1.04	0.13	-1.03

<b>Company:</b>	ANADARKO PETROLEUM CORP	<b>Local Co-ordinate Reference:</b>	Well SARCHET 21-1HZ
<b>Project:</b>	WELD COUNTY (NAD 83)	<b>TVD Reference:</b>	KB 21' @ 5003.00usft (PD 464)
<b>Site:</b>	SW SW SEC 21 T3N R66W 6th P.M.	<b>MD Reference:</b>	KB 21' @ 5003.00usft (PD 464)
<b>Well:</b>	SARCHET 21-1HZ	<b>North Reference:</b>	True
<b>Wellbore:</b>	ORIGINAL WELLBORE	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	ORIGINAL WELLBORE	<b>Database:</b>	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)	
11,394.00	89.52	357.52	7,251.20	2,912.54	-89.35	2,912.66	1.03	-0.16	-1.02	
11,483.00	88.94	359.63	7,252.39	3,001.50	-91.57	3,001.62	2.46	-0.65	2.37	
11,573.00	88.75	359.71	7,254.21	3,091.48	-92.08	3,091.60	0.23	-0.21	0.09	
11,663.00	89.48	0.12	7,255.60	3,181.46	-92.22	3,181.59	0.93	0.81	0.46	
11,752.00	88.33	0.35	7,257.30	3,270.45	-91.85	3,270.57	1.32	-1.29	0.26	
11,841.00	87.64	359.89	7,260.43	3,359.39	-91.67	3,359.51	0.93	-0.78	-0.52	
11,931.00	88.16	359.88	7,263.73	3,449.33	-91.85	3,449.45	0.58	0.58	-0.01	
11,981.26	88.56	0.00	7,265.16	3,499.57	-91.90	3,499.69	0.84	0.80	0.24	
<b>INT PT 1 - SARCHET 21-1HZ</b>										
12,021.00	88.88	0.10	7,266.05	3,539.30	-91.86	3,539.42	0.84	0.80	0.24	
12,110.00	88.89	1.21	7,267.78	3,628.27	-90.85	3,628.40	1.25	0.01	1.25	
12,200.00	88.09	0.85	7,270.15	3,718.23	-89.23	3,718.35	0.97	-0.89	-0.40	
12,289.00	88.33	0.37	7,272.93	3,807.18	-88.28	3,807.30	0.60	0.27	-0.54	
12,379.00	89.03	0.93	7,275.01	3,897.15	-87.26	3,897.27	1.00	0.78	0.62	
12,468.00	87.30	0.39	7,277.86	3,986.09	-86.24	3,986.21	2.04	-1.94	-0.61	
12,558.00	87.38	0.36	7,282.03	4,075.99	-85.65	4,076.11	0.09	0.09	-0.03	
12,647.00	87.58	0.23	7,285.95	4,164.91	-85.19	4,165.02	0.27	0.22	-0.15	
12,737.00	88.05	0.60	7,289.38	4,254.84	-84.54	4,254.95	0.66	0.52	0.41	
12,827.00	88.23	0.64	7,292.30	4,344.79	-83.56	4,344.90	0.20	0.20	0.04	
12,916.00	88.63	1.17	7,294.74	4,433.74	-82.16	4,433.85	0.75	0.45	0.60	
13,006.00	89.58	1.17	7,296.14	4,523.71	-80.32	4,523.82	1.06	1.06	0.00	
13,095.00	88.61	1.03	7,297.55	4,612.68	-78.61	4,612.79	1.10	-1.09	-0.16	
13,185.00	88.65	1.20	7,299.70	4,702.64	-76.86	4,702.74	0.19	0.04	0.19	
13,275.00	88.50	1.06	7,301.94	4,792.59	-75.09	4,792.69	0.23	-0.17	-0.16	
13,364.00	89.09	1.39	7,303.81	4,881.55	-73.19	4,881.65	0.76	0.66	0.37	
13,454.00	91.38	0.16	7,303.44	4,971.54	-71.97	4,971.63	2.89	2.54	-1.37	
13,544.00	90.98	359.08	7,301.59	5,061.51	-72.57	5,061.61	1.28	-0.44	-1.20	
13,582.74	90.48	358.82	7,301.10	5,100.25	-73.27	5,100.34	1.46	-1.30	-0.66	
<b>INT PT 2 - SARCHET 21-1HZ</b>										
13,633.00	89.82	358.49	7,300.97	5,150.49	-74.45	5,150.59	1.46	-1.30	-0.66	
13,723.00	90.22	359.16	7,300.94	5,240.47	-76.30	5,240.57	0.87	0.44	0.74	
13,812.00	89.58	0.32	7,301.09	5,329.47	-76.70	5,329.57	1.49	-0.72	1.30	
13,902.00	88.94	0.38	7,302.25	5,419.46	-76.15	5,419.56	0.71	-0.71	0.07	
13,992.00	89.29	0.52	7,303.64	5,509.44	-75.45	5,509.54	0.42	0.39	0.16	
14,082.00	89.40	0.43	7,304.67	5,599.43	-74.70	5,599.53	0.16	0.12	-0.10	
14,171.00	89.06	359.84	7,305.87	5,688.42	-74.49	5,688.52	0.77	-0.38	-0.66	
14,261.00	90.34	358.41	7,306.34	5,778.41	-75.86	5,778.51	2.13	1.42	-1.59	
14,350.00	91.85	357.33	7,304.64	5,867.33	-79.17	5,867.43	2.09	1.70	-1.21	
14,440.00	92.33	357.34	7,301.36	5,957.17	-83.35	5,957.28	0.53	0.53	0.01	
14,529.00	92.78	357.05	7,297.39	6,045.97	-87.70	6,046.09	0.60	0.51	-0.33	
14,618.00	93.39	356.95	7,292.60	6,134.72	-92.36	6,134.85	0.69	0.69	-0.11	
14,708.00	93.00	357.11	7,287.58	6,224.46	-97.01	6,224.59	0.47	-0.43	0.18	
14,797.00	92.69	358.21	7,283.17	6,313.28	-100.64	6,313.41	1.28	-0.35	1.24	
14,887.00	92.04	357.95	7,279.45	6,403.15	-103.65	6,403.29	0.78	-0.72	-0.29	

<b>Company:</b>	ANADARKO PETROLEUM CORP	<b>Local Co-ordinate Reference:</b>	Well SARCHET 21-1HZ
<b>Project:</b>	WELD COUNTY (NAD 83)	<b>TVD Reference:</b>	KB 21' @ 5003.00usft (PD 464)
<b>Site:</b>	SW SW SEC 21 T3N R66W 6th P.M.	<b>MD Reference:</b>	KB 21' @ 5003.00usft (PD 464)
<b>Well:</b>	SARCHET 21-1HZ	<b>North Reference:</b>	True
<b>Wellbore:</b>	ORIGINAL WELLBORE	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	ORIGINAL WELLBORE	<b>Database:</b>	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)	
14,976.00	90.82	358.23	7,277.23	6,492.07	-106.62	6,492.21	1.41	-1.37	0.31	
15,066.00	91.34	0.02	7,275.53	6,582.04	-107.99	6,582.18	2.07	0.58	1.99	
15,156.00	91.56	0.75	7,273.26	6,672.01	-107.39	6,672.15	0.85	0.24	0.81	
15,245.00	92.35	0.36	7,270.22	6,760.95	-106.53	6,761.09	0.99	0.89	-0.44	
15,334.00	93.19	359.94	7,265.92	6,849.85	-106.29	6,849.99	1.05	0.94	-0.47	
15,423.00	92.26	0.91	7,261.69	6,938.74	-105.63	6,938.88	1.51	-1.04	1.09	
15,484.83	92.38	1.78	7,259.18	7,000.50	-104.18	7,000.64	1.42	0.20	1.41	
<b>INT PT 3 - SARCHET 21-1HZ</b>										
15,513.00	92.44	2.18	7,258.00	7,028.63	-103.21	7,028.77	1.42	0.20	1.41	
15,602.00	91.66	2.87	7,254.81	7,117.49	-99.29	7,117.62	1.17	-0.88	0.78	
15,691.00	90.55	2.86	7,253.10	7,206.36	-94.84	7,206.48	1.25	-1.25	-0.01	
15,781.00	89.91	2.57	7,252.74	7,296.26	-90.58	7,296.37	0.78	-0.71	-0.32	
15,870.00	89.50	1.99	7,253.19	7,385.18	-87.04	7,385.30	0.80	-0.46	-0.65	
15,960.00	88.36	1.56	7,254.88	7,475.12	-84.25	7,475.23	1.35	-1.27	-0.48	
16,050.00	88.81	1.54	7,257.10	7,565.06	-81.82	7,565.17	0.50	0.50	-0.02	
16,139.00	89.49	1.87	7,258.42	7,654.01	-79.17	7,654.12	0.85	0.76	0.37	
16,229.00	88.97	359.36	7,259.63	7,743.99	-78.21	7,744.09	2.85	-0.58	-2.79	
16,318.00	89.60	359.37	7,260.74	7,832.98	-79.19	7,833.08	0.71	0.71	0.01	
16,408.00	87.82	358.14	7,262.76	7,922.93	-81.15	7,923.03	2.40	-1.98	-1.37	
16,497.00	88.48	358.32	7,265.64	8,011.84	-83.89	8,011.95	0.77	0.74	0.20	
16,587.00	88.80	357.95	7,267.77	8,101.77	-86.82	8,101.88	0.54	0.36	-0.41	
16,676.00	89.70	357.79	7,268.94	8,190.70	-90.13	8,190.81	1.03	1.01	-0.18	
16,766.00	87.66	357.73	7,271.01	8,280.60	-93.65	8,280.72	2.27	-2.27	-0.07	
16,856.00	88.30	357.87	7,274.18	8,370.48	-97.10	8,370.60	0.73	0.71	0.16	
16,945.00	88.76	357.78	7,276.47	8,459.38	-100.48	8,459.51	0.53	0.52	-0.10	
17,035.00	89.22	357.48	7,278.05	8,549.29	-104.20	8,549.43	0.61	0.51	-0.33	
17,124.00	89.19	356.99	7,279.29	8,638.18	-108.49	8,638.32	0.55	-0.03	-0.55	
17,214.00	90.05	359.27	7,279.89	8,728.12	-111.43	8,728.27	2.71	0.96	2.53	
17,304.00	88.98	0.50	7,280.65	8,818.12	-111.61	8,818.26	1.81	-1.19	1.37	
17,393.00	89.57	359.85	7,281.77	8,907.11	-111.33	8,907.25	0.99	0.66	-0.73	
17,483.00	89.82	0.48	7,282.25	8,997.11	-111.08	8,997.25	0.75	0.28	0.70	
17,572.00	90.07	0.06	7,282.34	9,086.10	-110.66	9,086.25	0.55	0.28	-0.47	
17,662.00	90.32	359.78	7,282.03	9,176.10	-110.78	9,176.25	0.42	0.28	-0.31	
17,752.00	89.95	359.16	7,281.82	9,266.10	-111.61	9,266.25	0.80	-0.41	-0.69	
17,841.00	90.67	359.23	7,281.34	9,355.09	-112.86	9,355.24	0.81	0.81	0.08	
17,931.00	89.65	1.77	7,281.09	9,445.08	-112.08	9,445.22	3.04	-1.13	2.82	
18,021.00	90.10	1.32	7,281.28	9,535.04	-109.65	9,535.19	0.71	0.50	-0.50	
18,045.97	90.42	1.31	7,281.17	9,560.00	-109.08	9,560.14	1.28	1.28	-0.04	
<b>Enter 460' Circle: 18045.97' MD 318' FWL, 333' FNL</b>										
18,110.00	91.24	1.28	7,280.24	9,624.01	-107.63	9,624.15	1.28	1.28	-0.04	
18,200.00	90.31	0.54	7,279.03	9,713.99	-106.20	9,714.13	1.32	-1.03	-0.82	
18,262.00	90.51	0.68	7,278.58	9,775.99	-105.54	9,776.12	0.39	0.32	0.23	
18,324.00	90.51	0.68	7,278.03	9,837.98	-104.81	9,838.12	0.00	0.00	0.00	
<b>BHL - SARCHET 21-1HZ - BHL - SARCHET 21-1HZ (P2) - BHL: 324' FWL, 55' FNL Sec 16</b>										

<b>Company:</b>	ANADARKO PETROLEUM CORP	<b>Local Co-ordinate Reference:</b>	Well SARCHET 21-1HZ
<b>Project:</b>	WELD COUNTY (NAD 83)	<b>TVD Reference:</b>	KB 21' @ 5003.00usft (PD 464)
<b>Site:</b>	SW SW SEC 21 T3N R66W 6th P.M.	<b>MD Reference:</b>	KB 21' @ 5003.00usft (PD 464)
<b>Well:</b>	SARCHET 21-1HZ	<b>North Reference:</b>	True
<b>Wellbore:</b>	ORIGINAL WELLBORE	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	ORIGINAL WELLBORE	<b>Database:</b>	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	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
SHL: 341' FWL, 640' FS - hit/miss target - Shape - Point	0.00	0.00	0.00	0.00	0.00	14,601,419.51	1,698,941.78	40.204909	-104.790392
Curve KOP - actual wellpath hits target center - Point	0.00	0.00	6,497.10	-1,329.73	-82.13	14,600,090.11	1,698,862.82	40.201259	-104.790686
LP: 228' FWL, 31' FNL S - actual wellpath misses target center by 0.01usft at 7807.00usft MD (7240.74 TVD, -672.28 N, -107.07 E) - Point	0.00	0.00	7,240.74	-672.28	-107.07	14,600,747.24	1,698,836.34	40.203064	-104.790776
Exit 460' Circle: 8238.12 - actual wellpath hits target center - Point	0.00	0.00	7,242.85	-241.35	-111.97	14,601,177.99	1,698,830.43	40.204246	-104.790793
BHL: 324' FWL, 55' FNL - actual wellpath hits target center - Point	0.00	0.00	7,278.03	9,837.98	-104.81	14,611,253.32	1,698,813.79	40.231914	-104.790768
Enter 460' Circle: 18045 - actual wellpath hits target center - Point	0.00	0.00	7,281.17	9,560.00	-109.08	14,610,975.44	1,698,810.18	40.231151	-104.790783

Measured Depth (usft)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Comment
1,825.00	1,795.17	-242.96	-20.49	LAST SURVEY JULY 1, 2019

Checked By: \_\_\_\_\_ Approved By: \_\_\_\_\_ Date: \_\_\_\_\_