

# ANADARKO PETROLEUM CORP

Project: WELD COUNTY (NAD 83)  
 Site: SW SW SEC 21 T3N R66W 6th P.M.  
 Well: SARCHET 21-5HZ  
 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

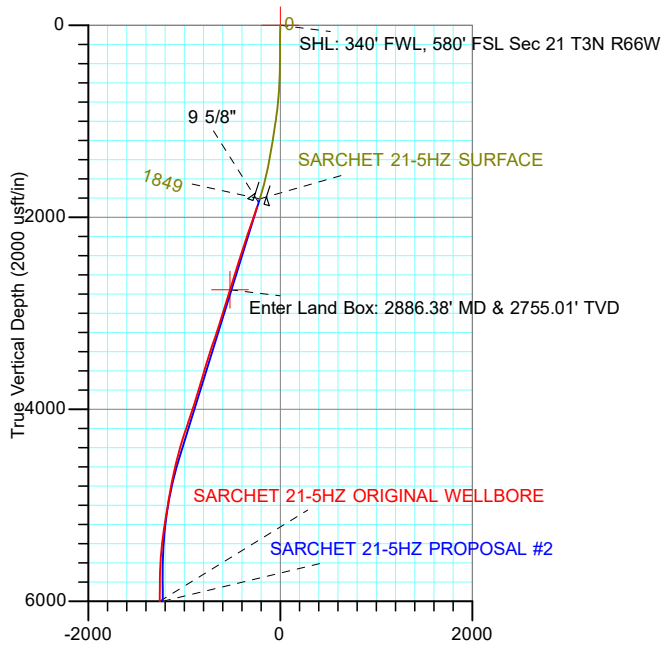
PROJECT DETAILS: WELD COUNTY (NAD 83)

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

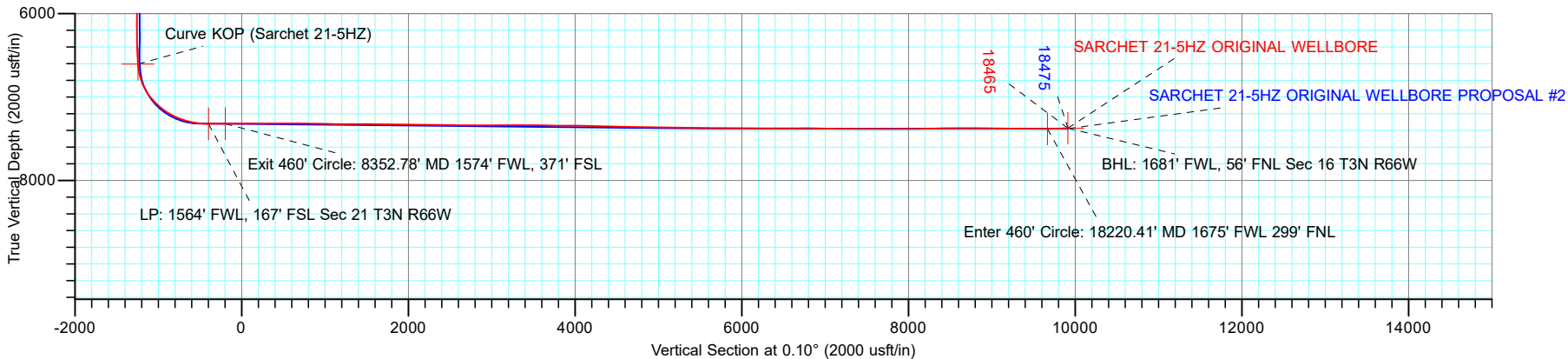
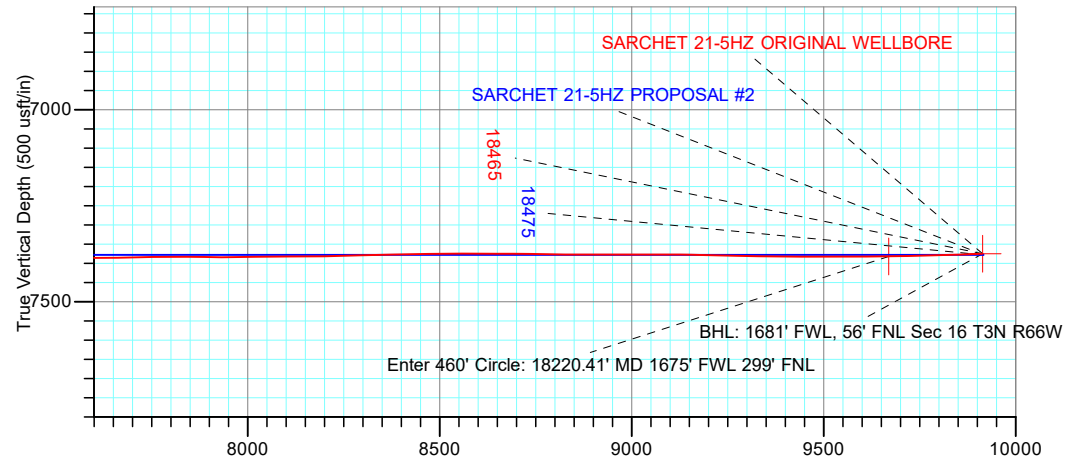


### DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Latitude	Longitude
BHL: 1681' FWL, 56' FNL Sec 16 T3N R66W	7375.01	9911.72	1252.26	40.231952	-104.785909
Curve KOP (Sarchet 21-5HZ)	6607.95	-1245.73	1192.24	40.201325	-104.786126
Enter 460' Circle: 18220.41' MD 1675' FWL 299' FNL	7382.01	9667.27	1248.57	40.231281	-104.785922
Enter Land Box: 2886.38' MD & 2755.01' TVD	2755.01	-523.12	505.78	40.203308	-104.788583
Exit 460' Circle: 8352.78' MD 1574' FWL, 371' FSL	7320.34	-196.65	1235.98	40.204204	-104.785969
LP: 1564' FWL, 167' FSL Sec 21 T3N R66W	7322.51	-399.26	1228.25	40.203648	-104.785996
SHL: 340' FWL, 580' FSL Sec 21 T3N R66W	0.00	0.00	0.00	40.204744	-104.790394



**Actual Line Calls**  
**SHL: 340' FWL, 580' FSL Sec 21 T3N R66W**  
**Heel: 1564' FWL, 167' FSL Sec 21 T3N R66W**  
**BHL: 1681' FWL, 56' FNL Sec 16 T3N R66W**



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

Design: ORIGINAL WELLBORE (SARCHET 21-5HZ/ORIGINAL WELLBORE)  
 SW SW SEC 21 T3N R66W 6th P.M.  
 Created By: Micah Ault Date: 13:34, November 08 2019  
 Approved: \_\_\_\_\_ Date: \_\_\_\_\_

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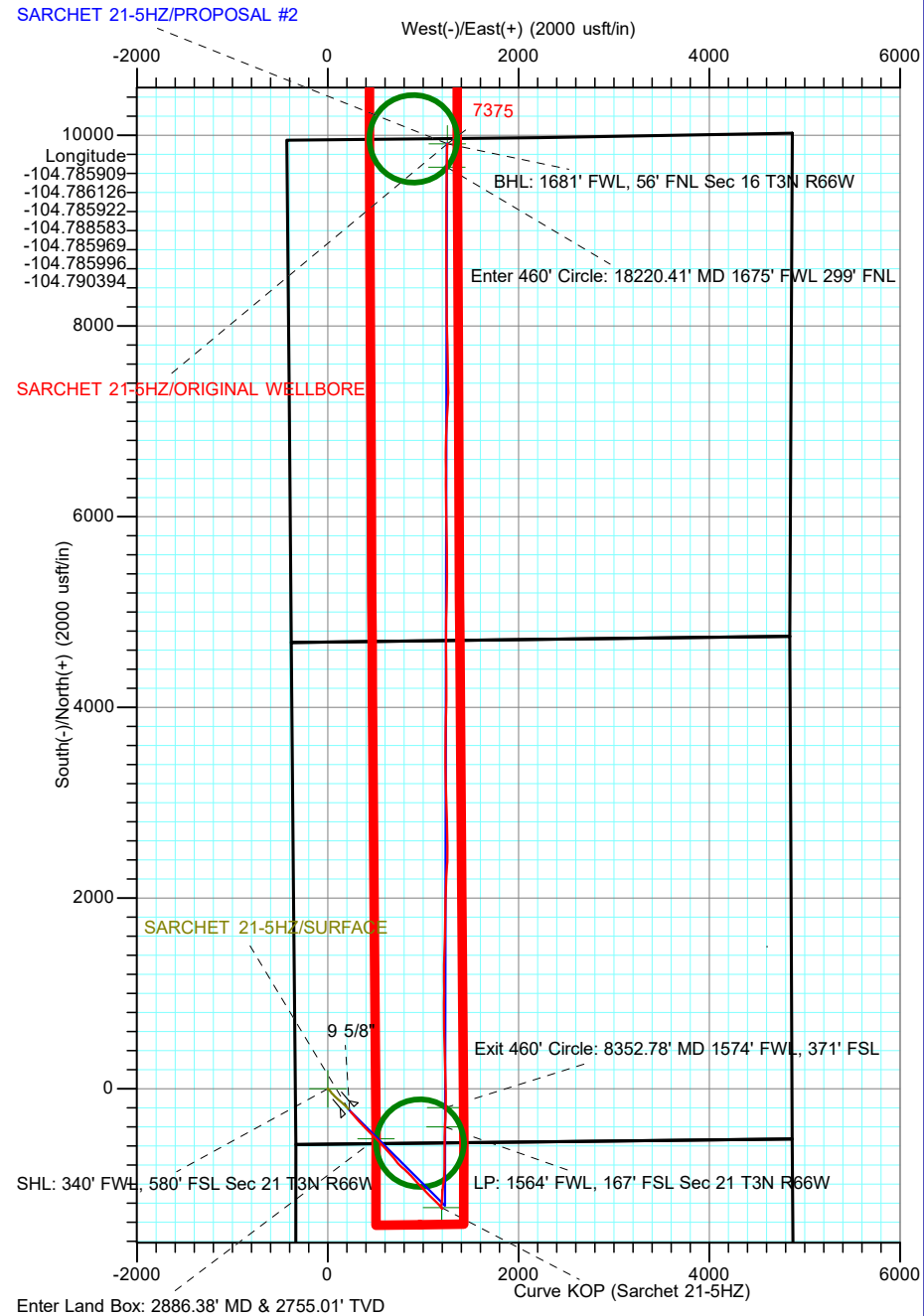
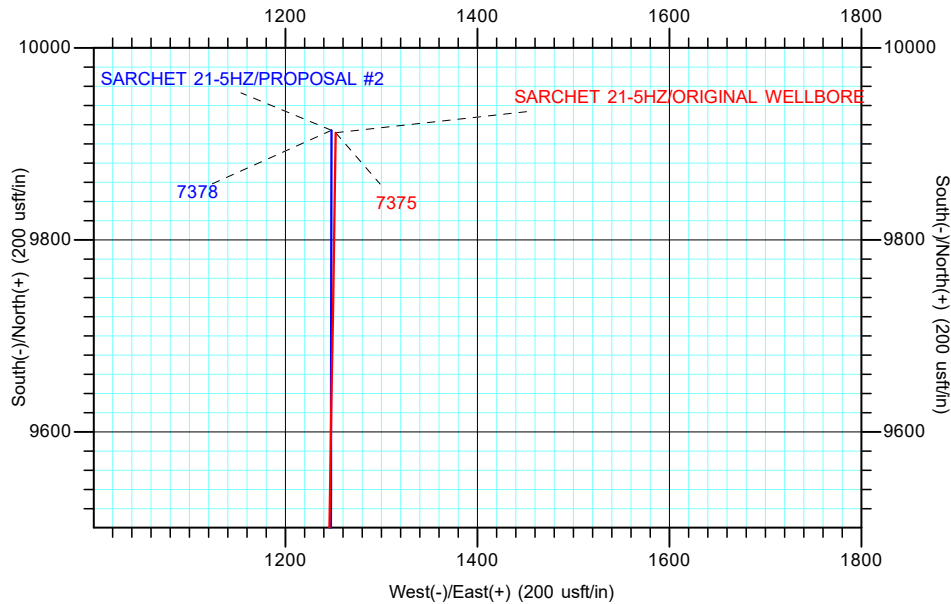
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 Geodetic System: Universal Transverse Mercator (US Survey Feet)  
 Datum: North American Datum 1983  
 Ellipsoid: GRS 1980  
 Zone: Zone 13N (108 W to 102 W)



### DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
BHL: 1681' FWL, 56' FNL Sec 16 T3N R66W	7375.01	9911.72	1252.26	14611270.25	1700169.82	40.231952	-104.785909
Curve KOP (Sarchet 21-5HZ)	6607.95	-1245.73	1192.24	14600117.11	1700136.17	40.201325	-104.786126
Enter 460' Circle: 18220.41' MD 1675' FWL 299' FNL	7382.01	9667.27	1248.57	14611025.89	1700166.71	40.231281	-104.785922
Enter Land Box: 2886.38' MD & 2755.01' TVD	2755.01	-523.12	505.78	14600837.81	1699448.27	40.203308	-104.788583
Exit 460' Circle: 8352.78' MD 1574' FWL, 371' FSL	7320.34	-196.65	1235.98	14601165.87	1700177.41	40.204204	-104.785969
LP: 1564' FWL, 167' FSL Sec 21 T3N R66W	7322.51	-399.26	1228.25	14600963.32	1700170.16	40.203648	-104.785996
SHL: 340' FWL, 580' FSL Sec 21 T3N R66W	0.00	0.00	0.00	14601359.52	1698941.46	40.204744	-104.790394

**Actual Line Calls**  
**SHL: 340' FWL, 580' FSL Sec 21 T3N R66W**  
**Heel: 1564' FWL, 167' FSL Sec 21 T3N R66W**  
**BHL: 1681' FWL, 56' FNL Sec 16 T3N R66W**



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 SW SW SEC 21 T3N R66W 6th P.M.  
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## **ANADARKO PETROLEUM CORP**

**WELD COUNTY (NAD 83)  
SW SW SEC 21 T3N R66W 6th P.M.  
SARCHET 21-5HZ**

**ORIGINAL WELLBORE**

**Design: ORIGINAL WELLBORE**

## **Standard Survey Report**

**08 November, 2019**

<b>Company:</b>	ANADARKO PETROLEUM CORP	<b>Local Co-ordinate Reference:</b>	Well SARCHET 21-5HZ
<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 21-5HZ	<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 21-5HZ					
<b>Well Position</b>	<b>+N/-S</b>	0.00 usft	<b>Northing:</b>	14,601,359.52 usft	<b>Latitude:</b>	40.204744
	<b>+E/-W</b>	0.00 usft	<b>Easting:</b>	1,698,941.46 usft	<b>Longitude:</b>	-104.790394
<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	52,045.91780564

<b>Design</b>	ORIGINAL WELLBORE				
<b>Audit Notes:</b>					
<b>Version:</b>	1.0	<b>Phase:</b>	ACTUAL	<b>Tie On Depth:</b>	1,849.00
<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	0.10	

<b>Survey Program</b>	<b>Date</b>	11/8/2019			
<b>From (usft)</b>	<b>To (usft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>	
128.00	1,849.00	FINAL SURVEYS - SURFACE (JOB # 201	APC_ISCWSA REV 2 MWD+	Fixed:v2:crustal field declination	
1,942.00	18,410.00	Survey #1 (ORIGINAL WELLBORE)	APC_ISCWSA REV 2 MWD+	Fixed:v2:crustal field declination	
18,465.00	18,465.00	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: 340' FWL, 580' FSL Sec 21 T3N R66W</b>										
128.00	0.53	135.35	128.00	-0.42	0.42	-0.42	0.41	0.41	0.00	
223.00	0.40	74.45	223.00	-0.64	1.04	-0.64	0.51	-0.14	-64.11	
318.00	0.40	130.87	317.99	-0.77	1.61	-0.77	0.40	0.00	59.39	
412.00	1.80	127.18	411.97	-1.88	3.04	-1.87	1.49	1.49	-3.93	
508.00	3.21	129.82	507.88	-4.51	6.30	-4.50	1.47	1.47	2.75	
603.00	4.39	135.00	602.67	-8.79	10.92	-8.77	1.29	1.24	5.45	
699.00	5.10	134.74	698.34	-14.39	16.55	-14.36	0.74	0.74	-0.27	

<b>Company:</b>	ANADARKO PETROLEUM CORP	<b>Local Co-ordinate Reference:</b>	Well SARCHET 21-5HZ
<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 21-5HZ	<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	6.42	142.56	791.86	-21.50	22.71	-21.46	1.63	1.40	8.32	
889.00	8.13	142.74	887.09	-31.17	30.08	-31.11	1.78	1.78	0.19	
984.00	11.16	141.33	980.73	-43.69	39.90	-43.62	3.20	3.19	-1.48	
1,079.00	12.17	134.83	1,073.78	-57.93	52.74	-57.84	1.74	1.06	-6.84	
1,174.00	12.57	134.83	1,166.57	-72.28	67.18	-72.16	0.42	0.42	0.00	
1,269.00	14.63	133.16	1,258.90	-87.78	83.26	-87.63	2.21	2.17	-1.76	
1,364.00	15.12	131.05	1,350.72	-104.12	101.36	-103.94	0.77	0.52	-2.22	
1,460.00	15.82	130.87	1,443.24	-120.91	120.70	-120.69	0.73	0.73	-0.19	
1,554.00	18.11	131.66	1,533.14	-139.00	141.30	-138.76	2.45	2.44	0.84	
1,649.00	20.26	132.37	1,622.86	-159.91	164.49	-159.62	2.28	2.26	0.75	
1,744.00	21.88	134.21	1,711.51	-183.33	189.33	-183.00	1.84	1.71	1.94	
1,849.00	23.73	138.34	1,808.30	-212.77	217.40	-212.39	2.33	1.76	3.93	
1,890.00	23.56	139.38	1,845.86	-225.15	228.22	-224.75	1.10	-0.42	2.54	
<b>9 5/8"</b>										
1,942.00	23.35	140.72	1,893.57	-241.01	241.51	-240.59	1.10	-0.40	2.58	
2,032.00	24.82	139.49	1,975.73	-269.18	265.07	-268.72	1.73	1.63	-1.37	
2,121.00	23.96	139.01	2,056.78	-297.03	289.06	-296.52	0.99	-0.97	-0.54	
2,211.00	25.86	138.25	2,138.41	-325.47	314.12	-324.92	2.14	2.11	-0.84	
2,301.00	25.15	137.08	2,219.64	-354.12	340.21	-353.52	0.97	-0.79	-1.30	
2,390.00	24.57	136.41	2,300.39	-381.37	365.85	-380.73	0.72	-0.65	-0.75	
2,480.00	24.06	136.34	2,382.41	-408.19	391.42	-407.51	0.57	-0.57	-0.08	
2,569.00	23.40	134.74	2,463.88	-433.76	416.50	-433.03	1.04	-0.74	-1.80	
2,659.00	22.46	134.39	2,546.77	-458.36	441.48	-457.59	1.06	-1.04	-0.39	
2,748.00	23.61	133.75	2,628.67	-482.58	466.50	-481.77	1.32	1.29	-0.72	
2,838.00	24.37	136.99	2,710.90	-508.62	492.19	-507.76	1.69	0.84	3.60	
2,886.38	24.14	136.69	2,755.01	-523.12	505.78	-522.24	0.54	-0.48	-0.63	
<b>Enter Land Box: 2886.38' MD &amp; 2755.01' TVD</b>										
2,928.00	23.94	136.42	2,793.02	-535.43	517.44	-534.53	0.54	-0.48	-0.64	
3,018.00	23.55	136.69	2,875.40	-561.74	542.36	-560.79	0.45	-0.43	0.30	
3,107.00	23.16	135.62	2,957.11	-587.19	566.80	-586.20	0.65	-0.44	-1.20	
3,197.00	22.70	135.77	3,040.00	-612.28	591.29	-611.25	0.52	-0.51	0.17	
3,287.00	23.88	138.27	3,122.67	-638.32	615.53	-637.25	1.71	1.31	2.78	
3,377.00	22.96	138.24	3,205.25	-665.01	639.35	-663.89	1.02	-1.02	-0.03	
3,466.00	24.53	139.61	3,286.71	-692.03	662.88	-690.87	1.87	1.76	1.54	
3,556.00	22.63	139.61	3,369.19	-719.45	686.21	-718.25	2.11	-2.11	0.00	
3,645.00	24.24	140.92	3,450.85	-746.68	708.83	-745.44	1.90	1.81	1.47	
3,735.00	22.40	141.22	3,533.50	-774.39	731.22	-773.11	2.05	-2.04	0.33	
3,914.00	22.30	129.23	3,699.14	-822.48	778.91	-821.12	2.54	-0.06	-6.70	
4,003.00	22.72	133.43	3,781.36	-844.98	804.47	-843.57	1.87	0.47	4.72	
4,093.00	25.33	133.38	3,863.56	-870.15	831.09	-868.70	2.90	2.90	-0.06	
4,182.00	23.90	135.40	3,944.47	-896.07	857.59	-894.57	1.86	-1.61	2.27	
4,272.00	25.27	136.70	4,026.31	-923.03	883.57	-921.49	1.64	1.52	1.44	
4,361.00	24.52	137.03	4,107.04	-950.37	909.18	-948.78	0.86	-0.84	0.37	
4,451.00	23.89	137.23	4,189.12	-977.41	934.29	-975.78	0.71	-0.70	0.22	

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<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)
4,540.00	24.02	139.11	4,270.46	-1,004.34	958.38	-1,002.66	0.87	0.15	2.11
4,630.00	21.44	139.07	4,353.46	-1,030.62	981.16	-1,028.90	2.87	-2.87	-0.04
4,719.00	21.23	135.61	4,436.37	-1,054.42	1,003.08	-1,052.67	1.43	-0.24	-3.89
4,809.00	19.71	134.86	4,520.68	-1,076.77	1,025.24	-1,074.98	1.71	-1.69	-0.83
4,899.00	18.02	134.58	4,605.84	-1,097.25	1,045.92	-1,095.42	1.88	-1.88	-0.31
4,988.00	16.67	134.73	4,690.80	-1,115.90	1,064.79	-1,114.04	1.52	-1.52	0.17
5,078.00	15.86	134.96	4,777.19	-1,133.67	1,082.67	-1,131.78	0.90	-0.90	0.26
5,168.00	13.95	134.47	4,864.16	-1,149.96	1,099.11	-1,148.04	2.13	-2.12	-0.54
5,257.00	12.41	133.94	4,950.81	-1,164.12	1,113.65	-1,162.17	1.74	-1.73	-0.60
5,347.00	14.17	135.00	5,038.40	-1,178.62	1,128.41	-1,176.65	1.97	1.96	1.18
5,437.00	13.21	134.70	5,125.84	-1,193.64	1,143.51	-1,191.64	1.07	-1.07	-0.33
5,527.00	11.78	132.53	5,213.71	-1,207.08	1,157.59	-1,205.06	1.67	-1.59	-2.41
5,616.00	10.61	143.02	5,301.02	-1,219.77	1,169.21	-1,217.73	2.63	-1.31	11.79
5,706.00	9.12	139.77	5,389.69	-1,231.84	1,178.80	-1,229.78	1.77	-1.66	-3.61
5,795.00	5.95	143.25	5,477.91	-1,240.92	1,186.12	-1,238.85	3.60	-3.56	3.91
5,885.00	5.24	138.38	5,567.48	-1,247.73	1,191.64	-1,245.65	0.95	-0.79	-5.41
5,999.00	1.34	148.43	5,681.27	-1,252.76	1,195.80	-1,250.67	3.45	-3.42	8.82
6,089.00	1.15	144.44	5,771.25	-1,254.39	1,196.87	-1,252.30	0.23	-0.21	-4.43
6,178.00	0.93	149.79	5,860.24	-1,255.74	1,197.76	-1,253.65	0.27	-0.25	6.01
6,268.00	0.74	152.39	5,950.23	-1,256.89	1,198.39	-1,254.80	0.22	-0.21	2.89
6,358.00	0.39	196.13	6,040.22	-1,257.70	1,198.58	-1,255.60	0.59	-0.39	48.60
6,447.00	0.58	220.03	6,129.22	-1,258.33	1,198.20	-1,256.24	0.31	0.21	26.85
6,537.00	0.93	340.18	6,219.22	-1,258.00	1,197.66	-1,255.90	1.47	0.39	133.50
6,627.00	0.93	328.63	6,309.20	-1,256.68	1,197.04	-1,254.59	0.21	0.00	-12.83
6,716.00	2.52	341.80	6,398.16	-1,254.21	1,196.05	-1,252.12	1.83	1.79	14.80
6,806.00	2.25	335.18	6,488.08	-1,250.73	1,194.69	-1,248.64	0.43	-0.30	-7.36
6,895.00	2.47	328.05	6,577.01	-1,247.51	1,192.94	-1,245.43	0.41	0.25	-8.01
6,909.98	3.50	338.37	6,591.97	-1,246.81	1,192.60	-1,244.73	7.74	6.89	68.91
<b>KOP - SARCHET 21-5HZ</b>									
6,921.07	4.31	342.74	6,603.03	-1,246.10	1,192.35	-1,244.02	7.74	7.27	39.37
<b>KOP - SARCHET 21-5HZ (P2)</b>									
6,926.00	4.67	344.19	6,607.95	-1,245.73	1,192.24	-1,243.65	7.74	7.39	29.50
<b>Curve KOP (Sarchet 21-5HZ)</b>									
6,985.00	9.14	352.44	6,666.50	-1,238.77	1,190.97	-1,236.69	7.74	7.57	13.98
7,075.00	14.87	8.73	6,754.52	-1,220.25	1,191.79	-1,218.17	7.34	6.37	18.10
7,164.00	22.98	7.45	6,838.64	-1,191.69	1,195.78	-1,189.60	9.12	9.11	-1.44
7,254.00	29.40	1.49	6,919.37	-1,152.14	1,198.63	-1,150.04	7.70	7.13	-6.62
7,344.00	37.09	0.73	6,994.59	-1,102.84	1,199.56	-1,100.75	8.56	8.54	-0.84
7,433.00	44.98	9.10	7,061.72	-1,044.81	1,204.88	-1,042.71	10.79	8.87	9.40
7,523.00	49.67	7.14	7,122.71	-979.33	1,214.19	-977.21	5.45	5.21	-2.18
7,612.00	55.34	2.63	7,176.88	-909.02	1,220.09	-906.89	7.53	6.37	-5.07
7,702.00	64.60	2.04	7,221.87	-831.25	1,223.24	-829.12	10.30	10.29	-0.66
7,792.00	67.87	359.57	7,258.14	-748.91	1,224.38	-746.77	4.42	3.63	-2.74

<b>Company:</b>	ANADARKO PETROLEUM CORP	<b>Local Co-ordinate Reference:</b>	Well SARCHET 21-5HZ
<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 21-5HZ	<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)	
7,881.00	73.55	358.66	7,287.53	-664.95	1,223.07	-662.82	6.45	6.38	-1.02	
7,971.00	80.35	0.55	7,307.84	-577.33	1,222.48	-575.20	7.83	7.56	2.10	
8,031.39	83.72	1.54	7,316.21	-517.55	1,223.57	-515.42	5.81	5.58	1.64	
<b>HEEL - SARCHET 21-5HZ</b>										
8,032.77	83.80	1.56	7,316.36	-516.17	1,223.61	-514.04	5.81	5.58	1.63	
<b>HEEL - SARCHET 21-5HZ (P2)</b>										
8,061.00	85.37	2.02	7,319.03	-488.09	1,224.49	-485.95	5.81	5.58	1.62	
8,150.00	90.14	2.83	7,322.51	-399.26	1,228.25	-397.12	5.44	5.36	0.91	
<b>LP: 1564' FWL, 167' FSL Sec 21 T3N R66W</b>										
8,240.00	90.85	2.58	7,321.73	-309.36	1,232.50	-307.21	0.84	0.79	-0.28	
8,329.00	90.58	1.25	7,320.62	-220.42	1,235.47	-218.27	1.52	-0.30	-1.49	
8,352.78	90.77	1.16	7,320.34	-196.65	1,235.98	-194.49	0.88	0.80	-0.37	
<b>Exit 460' Circle: 8352.78' MD 1574' FWL, 371' FSL</b>										
8,419.00	91.30	0.92	7,319.15	-130.45	1,237.18	-128.29	0.88	0.80	-0.37	
8,509.00	89.08	359.73	7,318.85	-40.46	1,237.69	-38.30	2.80	-2.47	-1.32	
8,598.00	89.77	358.51	7,319.74	48.52	1,236.32	50.68	1.57	0.78	-1.37	
8,688.00	90.17	357.89	7,319.79	138.48	1,233.50	140.63	0.82	0.44	-0.69	
8,778.00	91.31	357.54	7,318.63	228.40	1,229.91	230.54	1.33	1.27	-0.39	
8,867.00	90.59	358.75	7,317.15	317.33	1,227.03	319.48	1.58	-0.81	1.36	
8,957.00	89.63	358.28	7,316.98	407.30	1,224.69	409.44	1.19	-1.07	-0.52	
9,047.00	90.55	357.98	7,316.84	497.25	1,221.76	499.39	1.08	1.02	-0.33	
9,136.00	88.49	359.95	7,317.58	586.23	1,220.15	588.36	3.20	-2.31	2.21	
9,226.00	89.76	358.23	7,318.96	676.20	1,218.72	678.33	2.38	1.41	-1.91	
9,315.00	90.50	359.51	7,318.76	765.18	1,216.97	767.30	1.66	0.83	1.44	
9,405.00	89.80	2.26	7,318.52	855.16	1,218.36	857.28	3.15	-0.78	3.06	
9,495.00	87.59	0.44	7,320.57	945.10	1,220.48	947.23	3.18	-2.46	-2.02	
9,584.00	88.43	359.77	7,323.66	1,034.05	1,220.64	1,036.18	1.21	0.94	-0.75	
9,674.00	88.42	358.90	7,326.13	1,124.01	1,219.59	1,126.13	0.97	-0.01	-0.97	
9,764.00	89.88	0.48	7,327.47	1,213.99	1,219.11	1,216.11	2.39	1.62	1.76	
9,853.00	90.80	0.27	7,326.94	1,302.98	1,219.69	1,305.11	1.06	1.03	-0.24	
9,943.00	90.16	1.29	7,326.19	1,392.97	1,220.92	1,395.10	1.34	-0.71	1.13	
10,033.00	88.93	1.57	7,326.90	1,482.94	1,223.16	1,485.07	1.40	-1.37	0.31	
10,123.00	89.77	1.74	7,327.92	1,572.89	1,225.76	1,575.03	0.95	0.93	0.19	
10,212.00	89.96	1.85	7,328.13	1,661.85	1,228.55	1,663.99	0.25	0.21	0.12	
10,302.00	90.64	1.48	7,327.66	1,751.81	1,231.16	1,753.96	0.86	0.76	-0.41	
10,391.00	89.16	1.45	7,327.82	1,840.78	1,233.44	1,842.93	1.66	-1.66	-0.03	
10,481.00	89.69	1.21	7,328.72	1,930.75	1,235.53	1,932.90	0.65	0.59	-0.27	
10,571.00	87.89	0.56	7,330.62	2,020.71	1,236.92	2,022.87	2.13	-2.00	-0.72	
10,661.00	88.33	0.42	7,333.59	2,110.66	1,237.69	2,112.82	0.51	0.49	-0.16	
10,750.00	88.41	3.79	7,336.12	2,199.55	1,240.95	2,201.72	3.79	0.09	3.79	
10,840.00	89.99	4.21	7,337.38	2,289.32	1,247.23	2,291.50	1.82	1.76	0.47	
10,929.00	90.54	2.15	7,336.97	2,378.18	1,252.17	2,380.36	2.40	0.62	-2.31	
11,019.00	89.10	359.36	7,337.25	2,468.16	1,253.35	2,470.34	3.49	-1.60	-3.10	
11,109.00	89.90	1.20	7,338.03	2,558.15	1,253.79	2,560.34	2.23	0.89	2.04	

<b>Company:</b>	ANADARKO PETROLEUM CORP	<b>Local Co-ordinate Reference:</b>	Well SARCHET 21-5HZ
<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 21-5HZ	<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)
11,198.00	89.09	358.50	7,338.82	2,647.14	1,253.56	2,649.32	3.17	-0.91	-3.03
11,288.00	89.99	358.19	7,339.54	2,737.10	1,250.96	2,739.28	1.06	1.00	-0.34
11,378.00	90.75	358.59	7,338.96	2,827.06	1,248.43	2,829.23	0.95	0.84	0.44
11,467.00	89.27	358.38	7,338.94	2,916.02	1,246.08	2,918.19	1.68	-1.66	-0.24
11,557.00	89.52	357.97	7,339.89	3,005.97	1,243.21	3,008.14	0.53	0.28	-0.46
11,647.00	89.35	357.51	7,340.78	3,095.90	1,239.67	3,098.06	0.54	-0.19	-0.51
11,736.00	90.10	359.24	7,341.21	3,184.86	1,237.14	3,187.01	2.12	0.84	1.94
11,826.00	91.56	359.05	7,339.91	3,274.84	1,235.80	3,276.99	1.64	1.62	-0.21
11,915.00	90.90	359.27	7,337.99	3,363.81	1,234.49	3,365.96	0.78	-0.74	0.25
12,005.00	89.44	359.66	7,337.73	3,453.80	1,233.65	3,455.95	1.68	-1.62	0.43
12,094.00	88.50	0.61	7,339.33	3,542.78	1,233.86	3,544.93	1.50	-1.06	1.07
12,184.00	89.55	0.38	7,340.86	3,632.76	1,234.64	3,634.91	1.19	1.17	-0.26
12,273.00	87.96	0.96	7,342.79	3,721.73	1,235.68	3,723.89	1.90	-1.79	0.65
12,363.00	89.13	1.21	7,345.08	3,811.69	1,237.38	3,813.84	1.33	1.30	0.28
12,452.00	90.29	1.95	7,345.53	3,900.65	1,239.84	3,902.81	1.55	1.30	0.83
12,542.00	90.45	0.82	7,344.95	3,990.62	1,242.01	3,992.78	1.27	0.18	-1.26
12,632.00	87.95	359.90	7,346.20	4,080.60	1,242.58	4,082.76	2.96	-2.78	-1.02
12,721.00	89.17	359.89	7,348.44	4,169.57	1,242.42	4,171.73	1.37	1.37	-0.01
12,811.00	88.01	359.89	7,350.65	4,259.54	1,242.24	4,261.70	1.29	-1.29	0.00
12,900.00	88.79	359.73	7,353.14	4,348.51	1,241.95	4,350.67	0.89	0.88	-0.18
12,990.00	89.88	359.92	7,354.18	4,438.50	1,241.67	4,440.66	1.23	1.21	0.21
13,080.00	89.03	359.84	7,355.04	4,528.49	1,241.49	4,530.65	0.95	-0.94	-0.09
13,169.00	88.11	0.01	7,357.26	4,617.47	1,241.37	4,619.62	1.05	-1.03	0.19
13,259.00	88.44	359.97	7,359.97	4,707.42	1,241.35	4,709.58	0.37	0.37	-0.04
13,349.00	89.43	359.68	7,361.64	4,797.41	1,241.08	4,799.57	1.15	1.10	-0.32
13,438.00	88.75	0.71	7,363.06	4,886.39	1,241.38	4,888.55	1.39	-0.76	1.16
13,528.00	89.71	0.91	7,364.27	4,976.38	1,242.65	4,978.54	1.09	1.07	0.22
13,618.00	88.51	1.33	7,365.66	5,066.35	1,244.41	5,068.51	1.41	-1.33	0.47
13,707.00	89.45	1.75	7,367.25	5,155.30	1,246.80	5,157.47	1.16	1.06	0.47
13,797.00	88.14	0.45	7,369.14	5,245.26	1,248.53	5,247.43	2.05	-1.46	-1.44
13,886.00	89.28	0.74	7,371.15	5,334.23	1,249.46	5,336.40	1.32	1.28	0.33
13,976.00	88.38	359.54	7,372.98	5,424.21	1,249.68	5,426.38	1.67	-1.00	-1.33
14,049.78	89.30	359.59	7,374.48	5,497.97	1,249.11	5,500.15	1.25	1.24	0.07
<b>INT PT - SARCHET 21-5HZ</b>									
14,066.00	89.50	359.60	7,374.65	5,514.19	1,249.00	5,516.36	1.25	1.24	0.07
14,155.00	90.83	0.19	7,374.39	5,603.19	1,248.84	5,605.36	1.63	1.49	0.66
14,245.00	89.46	359.21	7,374.16	5,693.18	1,248.37	5,695.35	1.87	-1.52	-1.09
14,335.00	90.60	359.21	7,374.12	5,783.17	1,247.12	5,785.34	1.27	1.27	0.00
14,424.00	88.43	359.07	7,374.87	5,872.15	1,245.79	5,874.32	2.44	-2.44	-0.16
14,513.00	89.27	358.75	7,376.66	5,961.12	1,244.10	5,963.28	1.01	0.94	-0.36
14,603.00	90.27	358.46	7,377.02	6,051.09	1,241.91	6,053.25	1.16	1.11	-0.32
14,692.00	91.44	359.00	7,375.69	6,140.05	1,239.93	6,142.21	1.45	1.31	0.61
14,782.00	89.71	359.44	7,374.79	6,230.04	1,238.71	6,232.19	1.98	-1.92	0.49
14,871.00	88.92	359.58	7,375.85	6,319.03	1,237.95	6,321.18	0.90	-0.89	0.16

<b>Company:</b>	ANADARKO PETROLEUM CORP	<b>Local Co-ordinate Reference:</b>	Well SARCHET 21-5HZ
<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 21-5HZ	<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)	
14,961.00	90.43	0.63	7,376.36	6,409.02	1,238.11	6,411.17	2.04	1.68	1.17	
15,050.00	89.12	359.67	7,376.71	6,498.02	1,238.34	6,500.17	1.82	-1.47	-1.08	
15,140.00	89.78	359.73	7,377.57	6,588.01	1,237.87	6,590.16	0.74	0.73	0.07	
15,229.00	91.47	0.19	7,376.60	6,677.00	1,237.81	6,679.15	1.97	1.90	0.52	
15,318.00	89.49	1.16	7,375.86	6,765.99	1,238.86	6,768.14	2.48	-2.22	1.09	
15,408.00	88.76	2.04	7,377.23	6,855.94	1,241.37	6,858.10	1.27	-0.81	0.98	
15,497.00	89.98	2.26	7,378.21	6,944.87	1,244.71	6,947.03	1.39	1.37	0.25	
15,586.00	88.66	3.72	7,379.27	7,033.74	1,249.35	7,035.91	2.21	-1.48	1.64	
15,676.00	89.78	3.92	7,380.49	7,123.53	1,255.35	7,125.71	1.26	1.24	0.22	
15,765.00	89.79	1.97	7,380.83	7,212.41	1,259.92	7,214.60	2.19	0.01	-2.19	
15,855.00	89.20	0.70	7,381.62	7,302.38	1,262.02	7,304.57	1.56	-0.66	-1.41	
15,944.00	88.47	359.23	7,383.43	7,391.36	1,261.96	7,393.55	1.84	-0.82	-1.65	
16,034.00	89.13	359.35	7,385.31	7,481.33	1,260.85	7,483.52	0.75	0.73	0.13	
16,123.00	89.94	358.64	7,386.04	7,570.31	1,259.29	7,572.50	1.21	0.91	-0.80	
16,213.00	90.64	358.95	7,385.58	7,660.29	1,257.39	7,662.47	0.85	0.78	0.34	
16,303.00	91.62	358.76	7,383.81	7,750.25	1,255.60	7,752.43	1.11	1.09	-0.21	
16,392.00	89.02	358.26	7,383.31	7,839.21	1,253.28	7,841.39	2.97	-2.92	-0.56	
16,482.00	90.03	358.63	7,384.05	7,929.18	1,250.84	7,931.35	1.20	1.12	0.41	
16,571.00	91.32	358.87	7,383.01	8,018.15	1,248.90	8,020.31	1.47	1.45	0.27	
16,661.00	89.79	359.35	7,382.13	8,108.13	1,247.50	8,110.29	1.78	-1.70	0.53	
16,750.00	91.00	359.06	7,381.52	8,197.12	1,246.27	8,199.28	1.40	1.36	-0.33	
16,840.00	92.05	359.04	7,379.13	8,287.07	1,244.77	8,289.23	1.17	1.17	-0.02	
16,929.00	90.54	359.67	7,377.11	8,376.04	1,243.77	8,378.20	1.84	-1.70	0.71	
17,019.00	91.48	358.80	7,375.53	8,466.02	1,242.57	8,468.17	1.42	1.04	-0.97	
17,109.00	89.35	0.87	7,374.88	8,556.00	1,242.31	8,558.16	3.30	-2.37	2.30	
17,198.00	90.34	359.79	7,375.12	8,645.00	1,242.83	8,647.15	1.65	1.11	-1.21	
17,288.00	88.70	359.85	7,375.87	8,734.99	1,242.54	8,737.15	1.82	-1.82	0.07	
17,377.00	89.55	359.62	7,377.23	8,823.98	1,242.13	8,826.13	0.99	0.96	-0.26	
17,467.00	90.63	359.32	7,377.09	8,913.97	1,241.30	8,916.13	1.25	1.20	-0.33	
17,557.00	89.17	0.36	7,377.25	9,003.97	1,241.05	9,006.12	1.99	-1.62	1.16	
17,646.00	90.51	0.24	7,377.49	9,092.97	1,241.51	9,095.12	1.51	1.51	-0.13	
17,736.00	88.13	0.57	7,378.56	9,182.95	1,242.15	9,185.11	2.67	-2.64	0.37	
17,826.00	88.99	0.80	7,380.82	9,272.92	1,243.23	9,275.07	0.99	0.96	0.26	
17,915.00	89.32	0.77	7,382.14	9,361.90	1,244.44	9,364.05	0.37	0.37	-0.03	
18,005.00	89.82	0.50	7,382.81	9,451.89	1,245.44	9,454.05	0.63	0.56	-0.30	
18,094.00	90.10	0.81	7,382.87	9,540.88	1,246.46	9,543.04	0.47	0.31	0.35	
18,184.00	90.50	1.04	7,382.40	9,630.87	1,247.91	9,633.03	0.51	0.44	0.26	
18,220.41	90.74	1.03	7,382.01	9,667.27	1,248.57	9,669.43	0.65	0.65	-0.02	
<b>Enter 460' Circle: 18220.41' MD 1675' FWL 299' FNL</b>										
18,273.00	91.08	1.02	7,381.18	9,719.85	1,249.51	9,722.01	0.65	0.65	-0.02	
18,363.00	91.80	0.83	7,378.91	9,809.81	1,250.96	9,811.97	0.83	0.80	-0.21	
18,410.00	92.31	0.70	7,377.23	9,856.77	1,251.59	9,858.94	1.12	1.09	-0.28	
18,465.00	92.31	0.70	7,375.01	9,911.72	1,252.26	9,913.89	0.00	0.00	0.00	
<b>BHL - SARCHET 21-5HZ - BHL - SARCHET 21-5HZ (P2) - BHL: 1681' FWL, 56' FNL Sec 16 T3N R66W</b>										

<b>Company:</b>	ANADARKO PETROLEUM CORP	<b>Local Co-ordinate Reference:</b>	Well SARCHET 21-5HZ
<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 21-5HZ	<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: 340' FWL, 580' FS - actual wellpath hits target center - Point	0.00	0.00	0.00	0.00	0.00	14,601,359.52	1,698,941.46	40.204744	-104.790394
Enter Land Box: 2886.3f - actual wellpath hits target center - Point	0.00	0.00	2,755.01	-523.12	505.78	14,600,837.80	1,699,448.27	40.203308	-104.788583
Curve KOP (Sarchet 21- - actual wellpath hits target center - Point	0.00	0.00	6,607.95	-1,245.73	1,192.24	14,600,117.10	1,700,136.16	40.201325	-104.786126
Exit 460' Circle: 8352.78 - actual wellpath misses target center by 0.01usft at 8352.78usft MD (7320.34 TVD, -196.65 N, 1235.98 E) - Point	0.00	0.00	7,320.34	-196.65	1,235.98	14,601,165.87	1,700,177.41	40.204204	-104.785969
LP: 1564' FWL, 167' FSI - actual wellpath hits target center - Point	0.00	0.00	7,322.51	-399.26	1,228.25	14,600,963.32	1,700,170.16	40.203648	-104.785997
BHL: 1681' FWL, 56' FN - actual wellpath hits target center - Point	0.00	0.00	7,375.01	9,911.72	1,252.26	14,611,270.24	1,700,169.82	40.231952	-104.785909
Enter 460' Circle: 18220 - actual wellpath hits target center - Point	0.00	0.00	7,382.01	9,667.27	1,248.57	14,611,025.88	1,700,166.71	40.231281	-104.785922

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
1,890.00	1,845.86	9 5/8"	9-5/8	12-1/4

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