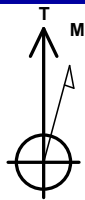


# ANADARKO PETROLEUM CORP

Project: WELD COUNTY (NAD 83)  
 Site: Cleland 11-15HZ  
 Well: Cleland 15-2HZ  
 Wellbore: OH  
 Design: OH



Azimuths to True North  
 Magnetic North: 8.06°

Magnetic Field  
 Strength: 51920.7nT  
 Dip Angle: 66.48°  
 Date: 10/6/2019  
 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)



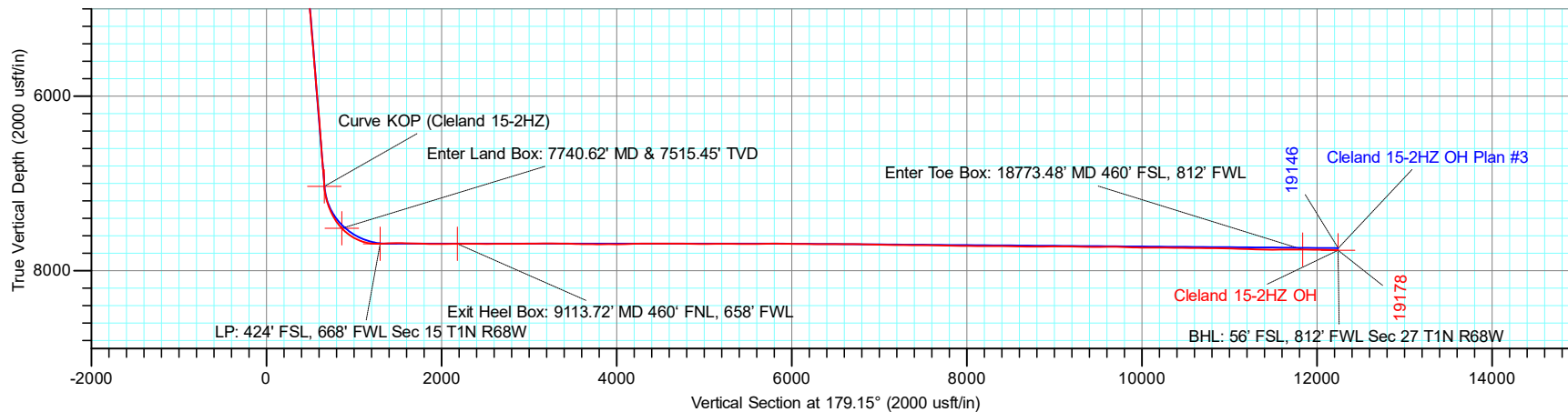
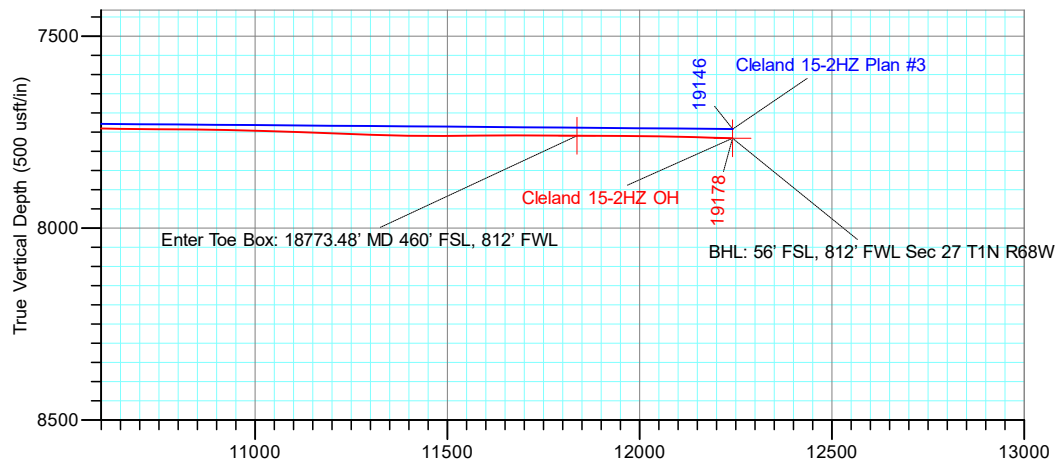
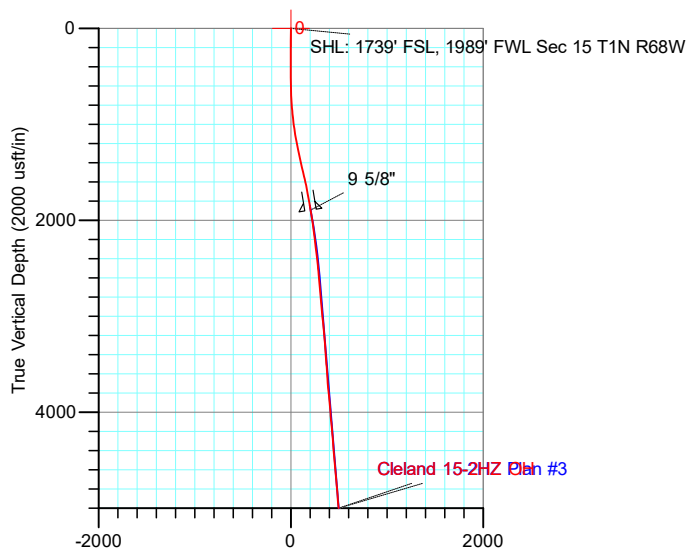
### DESIGN TARGET DETAILS

**1N-68W-15**

20' KB + 5152' GE @ 5172.00usft

Name	TVD	+N/-S	+E/-W	Latitude	Longitude
BHL: 56' FSL, 812' FWL Sec 27 T1N R68W	7766.47	-12259.99	-1137.88	40.015043	-104.996150
Curve KOP (Cleland 15-2HZ)	7034.98	-679.33	-1195.66	40.046833	-104.996359
Enter Land Box: 7740.62' MD & 7515.45' TVD	7515.45	-880.82	-1302.40	40.046280	-104.996740
Enter Toe Box: 18773.48' MD 460' FSL, 812' FWL	7759.55	-11855.71	-1146.33	40.016153	-104.996181
Exit Heel Box: 9113.72' MD 460' FNL, 658' FWL	7692.79	-2201.84	-1328.48	40.042654	-104.996833
LP: 424' FSL, 668' FWL Sec 15 T1N R68W	7692.34	-1318.69	-1320.56	40.045078	-104.996805
SHL: 1739' FSL, 1989' FWL Sec 15 T1N R68W	0.00	0.00	0.00	40.048698	-104.992088

**ACTUAL LINE CALLS**  
**SHL: 1739' FSL, 1989' FWL Sec 15 T1N R68W**  
**HEEL: 424' FSL, 668' FWL Sec 15 T1N R68W**  
**BHL: 56' FSL, 812' FWL Sec 27 T1N R68W**



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

Design: OH (Cleland 15-2HZ/OH)  
 Cleland 11-15HZ  
 Created By: Micah Ault  
 Date: 14:11, January 06 2020  
 Approved: \_\_\_\_\_ Date: \_\_\_\_\_

# ANADARKO PETROLEUM CORP

Project: WELD COUNTY (NAD 83)  
 Site: Cleland 11-15HZ  
 Well: Cleland 15-2HZ  
 Wellbore: OH  
 Design: OH



Azimuths to True North  
 Magnetic North: 8.06°

Magnetic Field  
 Strength: 51920.7nT  
 Dip Angle: 66.48°  
 Date: 10/6/2019  
 Model: IGRF2015

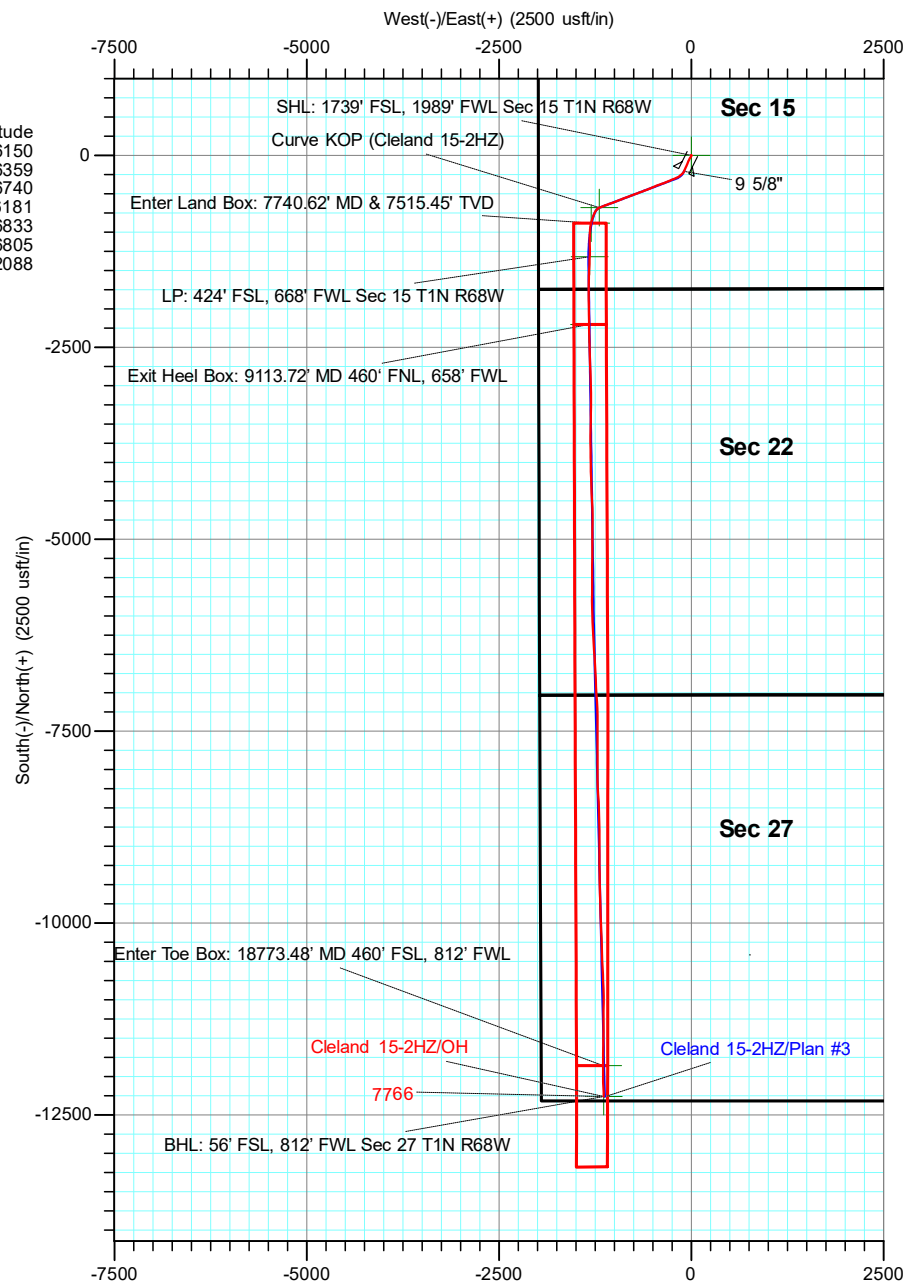
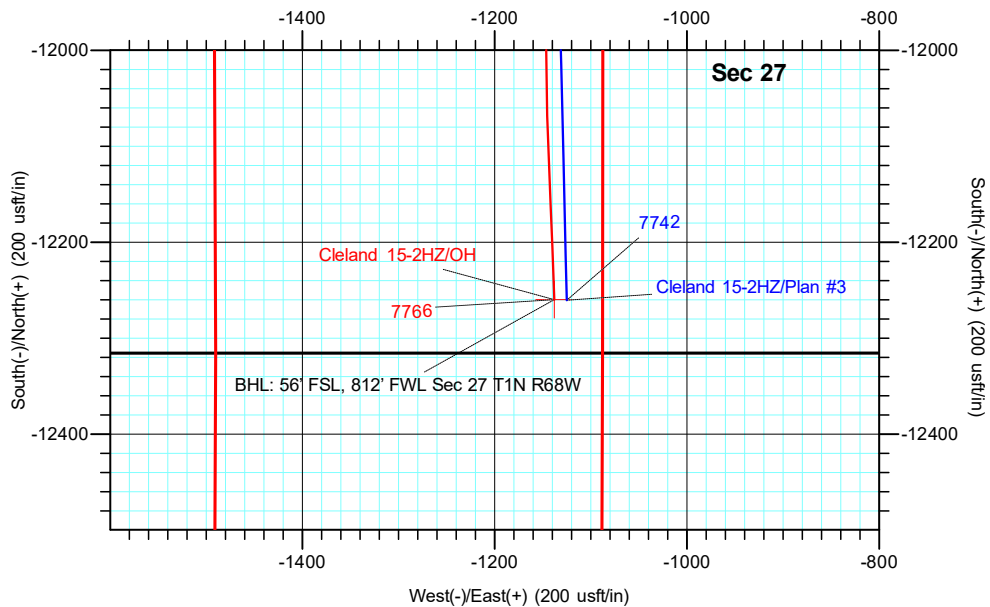
PROJECT DETAILS: WELD COUNTY (NAD 83)  
 Geodetic System: Universal Transverse Mercator (US Survey Feet)  
 Datum: North American Datum 1983  
 Ellipsoid: GRS 1980  
 Zone: Zone 13N (108 W to 102 W)



### DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
BHL: 56' FSL, 812' FWL Sec 27 T1N R68W	7766.47	-12259.99	-1137.88	14532211.36	1641494.51	40.015043	-104.996150
Curve KOP (Cleland 15-2HZ)	7034.98	-679.33	-1195.66	14543787.39	1641435.73	40.046833	-104.996359
Enter Land Box: 7740.62' MD & 7515.45' TVD	7515.45	-880.82	-1302.40	14543585.97	1641329.05	40.046280	-104.996740
Enter Toe Box: 18773.48' MD 460' FSL, 812' FWL	7759.55	-11855.71	-1146.33	14532615.48	1641486.03	40.016153	-104.996181
Exit Heel Box: 9113.72' MD 460' FNL, 658' FWL	7692.79	-2201.84	-1328.48	14542265.47	1641303.10	40.042654	-104.996833
LP: 424' FSL, 668' FWL Sec 15 T1N R68W	7692.34	-1318.69	-1320.56	14543148.27	1641310.94	40.045078	-104.996805
SHL: 1739' FSL, 1989' FWL Sec 15 T1N R68W	0.00	0.00	0.00	14544466.55	1642630.85	40.048698	-104.992088

**ACTUAL LINE CALLS**  
**SHL: 1739' FSL, 1989' FWL Sec 15 T1N R68W**  
**HEEL: 424' FSL, 668' FWL Sec 15 T1N R68W**  
**BHL: 56' FSL, 812' FWL Sec 27 T1N R68W**



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

Design: OH (Cleland 15-2HZ/OH)  
 Cleland 11-15HZ  
 Created By: Micah Ault  
 Date: 14:12, January 06 2020  
 Approved: \_\_\_\_\_  
 Date: \_\_\_\_\_



# **ANADARKO PETROLEUM CORP**

**WELD COUNTY (NAD 83)**

**Cleland 11-15HZ**

**Cleland 15-2HZ**

**OH**

**Design: OH**

## **Standard Survey Report**

**06 January, 2020**



<b>Company:</b>	ANADARKO PETROLEUM CORP	<b>Local Co-ordinate Reference:</b>	Well Cleland 15-2HZ
<b>Project:</b>	WELD COUNTY (NAD 83)	<b>TVD Reference:</b>	20' KB + 5152' GE @ 5172.00usft
<b>Site:</b>	Cleland 11-15HZ	<b>MD Reference:</b>	20' KB + 5152' GE @ 5172.00usft
<b>Well:</b>	Cleland 15-2HZ	<b>North Reference:</b>	True
<b>Wellbore:</b>	OH	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	OH	<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>	Cleland 11-15HZ				
<b>Site Position:</b>		<b>Northing:</b>	14,544,455.99 usft	<b>Latitude:</b>	40.048669
<b>From:</b>	Map	<b>Easting:</b>	1,642,620.22 usft	<b>Longitude:</b>	-104.992126
<b>Position Uncertainty:</b>	0.00 usft	<b>Slot Radius:</b>	13-3/16 "	<b>Grid Convergence:</b>	0.01 °

<b>Well</b>	Cleland 15-2HZ					
<b>Well Position</b>	<b>+N/-S</b>	0.00 usft	<b>Northing:</b>	14,544,466.55 usft	<b>Latitude:</b>	40.048698
	<b>+E/-W</b>	0.00 usft	<b>Easting:</b>	1,642,630.85 usft	<b>Longitude:</b>	-104.992088
<b>Position Uncertainty</b>		3.28 usft	<b>Wellhead Elevation:</b>	usft	<b>Ground Level:</b>	5,152.00 usft

<b>Wellbore</b>	OH				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	IGRF2015	10/6/2019	8.06	66.48	51,920.68832543

<b>Design</b>	OH				
<b>Audit Notes:</b>					
<b>Version:</b>	1.0	<b>Phase:</b>	ACTUAL	<b>Tie On Depth:</b>	0.00
<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	179.15	

<b>Survey Program</b>	<b>Date</b>	1/6/2020			
<b>From (usft)</b>	<b>To (usft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>	
131.00	1,868.00	Survey #1 (OH)	APC_ISCWSA REV 2 MWD+	Fixed:v2:crustal field declination	
1,943.00	19,122.00	Survey #2 (OH)	APC_ISCWSA REV 2 MWD+	Fixed:v2:crustal field declination	
19,178.00	19,178.00	Survey #3 (OH)	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 (Cleland 15-2HZ) - SHL: 1739' FSL, 1989' FWL Sec 15 T1N R68W</b>										
131.00	0.09	348.46	131.00	0.10	-0.02	-0.10	0.07	0.07	0.00	
226.00	0.26	359.71	226.00	0.39	-0.04	-0.39	0.18	0.18	11.84	
321.00	0.44	13.07	321.00	0.96	0.04	-0.96	0.21	0.19	14.06	
416.00	1.45	60.27	415.98	1.91	1.17	-1.89	1.26	1.06	49.68	
511.00	0.70	153.52	510.97	1.99	2.47	-1.95	1.73	-0.79	98.16	
606.00	2.15	207.04	605.94	-0.12	1.92	0.15	1.92	1.53	56.34	
701.00	2.50	202.30	700.87	-3.62	0.33	3.63	0.42	0.37	-4.99	

<b>Company:</b>	ANADARKO PETROLEUM CORP	<b>Local Co-ordinate Reference:</b>	Well Cleland 15-2HZ
<b>Project:</b>	WELD COUNTY (NAD 83)	<b>TVD Reference:</b>	20' KB + 5152' GE @ 5172.00usft
<b>Site:</b>	Cleland 11-15HZ	<b>MD Reference:</b>	20' KB + 5152' GE @ 5172.00usft
<b>Well:</b>	Cleland 15-2HZ	<b>North Reference:</b>	True
<b>Wellbore:</b>	OH	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	OH	<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)	
797.00	4.66	204.67	796.67	-9.10	-2.10	9.07	2.25	2.25	2.47	
892.00	6.90	210.47	891.18	-17.53	-6.60	17.43	2.43	2.36	6.11	
986.00	8.13	212.76	984.37	-27.99	-13.06	27.79	1.35	1.31	2.44	
1,081.00	10.46	210.21	1,078.12	-41.09	-21.04	40.77	2.49	2.45	-2.68	
1,176.00	12.44	206.52	1,171.23	-57.70	-29.95	57.25	2.22	2.08	-3.88	
1,271.00	12.61	201.68	1,263.97	-76.49	-38.35	75.92	1.12	0.18	-5.09	
1,367.00	12.92	202.91	1,357.60	-96.12	-46.40	95.42	0.43	0.32	1.28	
1,463.00	13.84	201.77	1,450.99	-116.67	-54.83	115.84	1.00	0.96	-1.19	
1,558.00	14.94	203.44	1,543.01	-138.45	-63.92	137.49	1.24	1.16	1.76	
1,653.00	12.57	202.65	1,635.28	-159.23	-72.77	158.14	2.50	-2.49	-0.83	
1,747.00	11.38	203.53	1,727.23	-177.18	-80.41	175.96	1.28	-1.27	0.94	
1,842.00	11.34	206.87	1,820.37	-194.10	-88.38	192.77	0.69	-0.04	3.52	
1,868.00	11.16	207.40	1,845.87	-198.61	-90.69	197.25	0.80	-0.69	2.04	
1,919.00	10.42	206.53	1,895.97	-207.12	-95.02	205.69	1.49	-1.45	-1.71	
<b>9 5/8"</b>										
1,943.00	10.07	206.07	1,919.59	-210.95	-96.91	209.49	1.49	-1.45	-1.90	
2,037.00	11.27	214.86	2,011.97	-225.87	-105.77	224.28	2.15	1.28	9.35	
2,132.00	11.23	230.88	2,105.16	-239.33	-118.26	237.55	3.28	-0.04	16.86	
2,226.00	10.91	229.88	2,197.41	-250.83	-132.16	248.85	0.40	-0.34	-1.06	
2,319.00	10.17	231.12	2,288.84	-261.66	-145.28	259.47	0.83	-0.80	1.33	
2,412.00	11.97	232.68	2,380.11	-272.66	-159.35	270.27	1.96	1.94	1.68	
2,507.00	11.99	241.67	2,473.05	-283.32	-175.87	280.68	1.96	0.02	9.46	
2,599.00	13.77	247.79	2,562.74	-291.99	-194.42	289.07	2.44	1.93	6.65	
2,692.00	12.91	246.75	2,653.23	-300.28	-214.21	297.07	0.96	-0.92	-1.12	
2,785.00	13.12	249.02	2,743.84	-308.16	-233.61	304.66	0.59	0.23	2.44	
2,879.00	13.49	244.50	2,835.32	-316.70	-253.47	312.90	1.17	0.39	-4.81	
2,972.00	13.57	247.66	2,925.74	-325.51	-273.35	321.42	0.80	0.09	3.40	
3,065.00	15.27	248.24	3,015.80	-334.20	-294.82	329.79	1.83	1.83	0.62	
3,158.00	13.43	246.87	3,105.90	-342.98	-316.13	338.26	2.01	-1.98	-1.47	
3,250.00	13.23	246.25	3,195.42	-351.42	-335.59	346.40	0.27	-0.22	-0.67	
3,343.00	12.66	247.77	3,286.06	-359.56	-354.76	354.26	0.71	-0.61	1.63	
3,438.00	13.58	252.56	3,378.58	-366.84	-375.04	361.24	1.50	0.97	5.04	
3,530.00	13.99	251.68	3,467.93	-373.58	-395.90	367.66	0.50	0.45	-0.96	
3,623.00	11.84	250.13	3,558.57	-380.35	-415.55	374.15	2.34	-2.31	-1.67	
3,717.00	11.97	251.06	3,650.55	-386.80	-433.84	380.32	0.25	0.14	0.99	
3,810.00	13.40	245.07	3,741.28	-394.47	-452.74	387.71	2.09	1.54	-6.44	
3,902.00	14.04	245.98	3,830.65	-403.51	-472.60	396.45	0.73	0.70	0.99	
3,996.00	13.15	246.40	3,922.02	-412.43	-492.81	405.07	0.95	-0.95	0.45	
4,090.00	12.44	252.85	4,013.69	-419.69	-512.28	412.05	1.70	-0.76	6.86	
4,184.00	14.47	242.97	4,105.12	-428.02	-532.42	420.07	3.26	2.16	-10.51	
4,277.00	14.55	250.17	4,195.16	-437.26	-553.77	429.00	1.94	0.09	7.74	
4,372.00	11.94	247.79	4,287.62	-445.03	-574.09	436.46	2.81	-2.75	-2.51	
4,465.00	12.66	248.72	4,378.49	-452.36	-592.50	443.52	0.80	0.77	1.00	

<b>Company:</b>	ANADARKO PETROLEUM CORP	<b>Local Co-ordinate Reference:</b>	Well Cleland 15-2HZ
<b>Project:</b>	WELD COUNTY (NAD 83)	<b>TVD Reference:</b>	20' KB + 5152' GE @ 5172.00usft
<b>Site:</b>	Cleland 11-15HZ	<b>MD Reference:</b>	20' KB + 5152' GE @ 5172.00usft
<b>Well:</b>	Cleland 15-2HZ	<b>North Reference:</b>	True
<b>Wellbore:</b>	OH	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	OH	<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)	
4,559.00	13.97	250.24	4,469.96	-459.94	-612.77	450.80	1.44	1.39	1.62	
4,652.00	14.60	248.51	4,560.08	-468.03	-634.24	458.57	0.82	0.68	-1.86	
4,746.00	14.86	250.78	4,651.00	-476.33	-656.65	466.54	0.67	0.28	2.41	
4,840.00	14.25	248.91	4,741.98	-484.47	-678.83	474.34	0.82	-0.65	-1.99	
4,933.00	15.45	250.68	4,831.87	-492.68	-701.20	482.23	1.38	1.29	1.90	
5,028.00	14.00	250.09	4,923.75	-500.78	-723.94	489.99	1.53	-1.53	-0.62	
5,122.00	14.22	249.44	5,014.91	-508.71	-745.44	497.60	0.29	0.23	-0.69	
5,239.00	11.06	249.49	5,129.06	-517.69	-769.42	506.22	2.70	-2.70	0.04	
5,332.00	13.44	246.58	5,219.94	-525.11	-787.69	513.37	2.64	2.56	-3.13	
5,426.00	14.59	249.48	5,311.14	-533.61	-808.80	521.55	1.43	1.22	3.09	
5,519.00	14.51	248.89	5,401.16	-541.91	-830.64	529.53	0.18	-0.09	-0.63	
5,614.00	11.83	248.28	5,493.65	-549.80	-850.80	537.12	2.82	-2.82	-0.64	
5,709.00	13.84	250.95	5,586.27	-557.11	-870.59	544.14	2.21	2.12	2.81	
5,802.00	15.13	250.55	5,676.32	-564.78	-892.54	551.48	1.39	1.39	-0.43	
5,895.00	12.58	247.48	5,766.60	-572.71	-913.35	559.09	2.85	-2.74	-3.30	
5,988.00	13.94	248.27	5,857.12	-580.73	-933.11	566.83	1.48	1.46	0.85	
6,083.00	13.09	248.21	5,949.49	-588.96	-953.73	574.75	0.89	-0.89	-0.06	
6,177.00	13.67	247.69	6,040.94	-597.13	-973.89	582.62	0.63	0.62	-0.55	
6,271.00	14.77	249.23	6,132.06	-605.60	-995.37	590.76	1.24	1.17	1.64	
6,363.00	14.79	250.25	6,221.01	-613.72	-1,017.39	598.56	0.28	0.02	1.11	
6,457.00	14.68	251.65	6,311.92	-621.53	-1,039.99	606.03	0.40	-0.12	1.49	
6,552.00	12.98	250.53	6,404.17	-628.87	-1,061.47	613.06	1.81	-1.79	-1.18	
6,646.00	14.31	251.68	6,495.51	-636.05	-1,082.45	619.92	1.44	1.41	1.22	
6,739.00	11.74	250.83	6,586.11	-642.77	-1,102.30	626.34	2.77	-2.76	-0.91	
6,833.00	11.72	247.44	6,678.15	-649.57	-1,120.15	632.88	0.73	-0.02	-3.61	
6,926.00	13.62	246.07	6,768.88	-657.64	-1,138.89	640.67	2.07	2.04	-1.47	
7,019.00	13.73	246.30	6,859.24	-666.51	-1,159.00	649.25	0.13	0.12	0.25	
7,112.00	12.62	253.13	6,949.80	-673.90	-1,178.83	656.34	2.05	-1.19	7.34	
7,199.00	10.84	250.94	7,034.98	-679.33	-1,195.66	661.52	2.11	-2.04	-2.52	
<b>Curve KOP (Cleland 15-2HZ)</b>										
7,205.00	10.72	250.76	7,040.87	-679.70	-1,196.72	661.87	2.11	-2.03	-2.96	
7,298.00	16.82	227.96	7,131.22	-691.58	-1,214.91	673.48	8.66	6.56	-24.52	
7,393.00	22.21	219.35	7,220.75	-714.69	-1,236.52	696.27	6.42	5.67	-9.06	
7,488.00	25.10	204.34	7,307.84	-746.97	-1,256.24	728.25	7.01	3.04	-15.80	
7,581.00	31.34	200.63	7,389.75	-787.62	-1,272.90	768.65	6.97	6.71	-3.99	
7,674.00	39.08	198.04	7,465.68	-838.20	-1,290.53	818.97	8.47	8.32	-2.78	
7,740.63	44.24	193.31	7,515.46	-880.83	-1,302.40	861.42	9.06	7.74	-7.10	
<b>Enter Land Box: 7740.62' MD &amp; 7515.45' TVD</b>										
7,767.00	46.33	191.68	7,534.01	-899.12	-1,306.45	879.65	9.06	7.93	-6.19	
7,859.00	54.53	184.00	7,592.62	-969.26	-1,315.82	949.64	10.98	8.91	-8.35	
7,951.00	63.91	181.65	7,639.65	-1,048.11	-1,319.63	1,028.42	10.43	10.20	-2.55	
8,045.00	73.59	179.77	7,673.68	-1,135.61	-1,320.67	1,115.89	10.46	10.30	-2.00	
8,138.00	84.90	178.67	7,691.01	-1,226.82	-1,319.41	1,207.11	12.22	12.16	-1.18	
8,230.00	93.44	182.76	7,692.34	-1,318.69	-1,320.56	1,298.95	10.29	9.28	4.45	

<b>Company:</b>	ANADARKO PETROLEUM CORP	<b>Local Co-ordinate Reference:</b>	Well Cleland 15-2HZ
<b>Project:</b>	WELD COUNTY (NAD 83)	<b>TVD Reference:</b>	20' KB + 5152' GE @ 5172.00usft
<b>Site:</b>	Cleland 11-15HZ	<b>MD Reference:</b>	20' KB + 5152' GE @ 5172.00usft
<b>Well:</b>	Cleland 15-2HZ	<b>North Reference:</b>	True
<b>Wellbore:</b>	OH	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	OH	<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)	
<b>LP: 424' FSL, 668' FWL Sec 15 T1N R68W</b>										
8,310.57	92.19	181.84	7,688.38	-1,399.10	-1,323.79	1,379.31	1.92	-1.55	-1.14	
<b>Heel (Cleland 15-2HZ)</b>										
8,324.00	91.98	181.69	7,687.90	-1,412.52	-1,324.21	1,392.72	1.92	-1.55	-1.14	
8,419.00	90.75	182.85	7,685.63	-1,507.41	-1,327.97	1,487.54	1.78	-1.29	1.22	
8,512.00	88.79	180.96	7,686.01	-1,600.35	-1,331.06	1,580.43	2.93	-2.11	-2.03	
8,604.00	87.97	181.26	7,688.61	-1,692.29	-1,332.84	1,672.34	0.95	-0.89	0.33	
8,698.00	88.25	179.82	7,691.71	-1,786.24	-1,333.73	1,766.25	1.56	0.30	-1.53	
8,793.00	88.22	179.50	7,694.63	-1,881.19	-1,333.16	1,861.21	0.34	-0.03	-0.34	
8,887.00	90.33	179.43	7,695.82	-1,975.17	-1,332.29	1,955.19	2.25	2.24	-0.07	
8,980.00	91.01	178.61	7,694.74	-2,068.15	-1,330.69	2,048.18	1.15	0.73	-0.88	
9,073.00	90.85	179.31	7,693.23	-2,161.12	-1,329.01	2,141.17	0.77	-0.17	0.75	
9,113.72	90.37	179.20	7,692.79	-2,201.84	-1,328.48	2,181.89	1.21	-1.18	-0.28	
<b>Exit Heel Box: 9113.72' MD 460' FNL, 658' FWL</b>										
9,167.00	89.74	179.05	7,692.74	-2,255.11	-1,327.66	2,235.17	1.21	-1.18	-0.28	
9,261.00	89.58	179.44	7,693.30	-2,349.10	-1,326.42	2,329.17	0.45	-0.17	0.41	
9,355.00	89.57	178.72	7,694.00	-2,443.09	-1,324.91	2,423.16	0.77	-0.01	-0.77	
9,448.00	90.19	178.07	7,694.19	-2,536.05	-1,322.31	2,516.15	0.97	0.67	-0.70	
9,541.00	90.10	177.89	7,693.96	-2,628.99	-1,319.03	2,609.13	0.22	-0.10	-0.19	
9,634.00	90.31	177.80	7,693.62	-2,721.92	-1,315.53	2,702.11	0.25	0.23	-0.10	
9,727.00	90.29	177.82	7,693.14	-2,814.85	-1,311.98	2,795.08	0.03	-0.02	0.02	
9,820.00	90.66	177.36	7,692.37	-2,907.77	-1,308.07	2,888.04	0.63	0.40	-0.49	
9,912.00	90.52	179.02	7,691.42	-2,999.71	-1,305.16	2,980.02	1.81	-0.15	1.80	
10,005.00	90.88	179.57	7,690.28	-3,092.70	-1,304.02	3,073.01	0.71	0.39	0.59	
10,098.00	89.96	179.85	7,689.60	-3,185.69	-1,303.55	3,166.01	1.03	-0.99	0.30	
10,191.00	89.87	180.68	7,689.74	-3,278.69	-1,303.98	3,258.99	0.90	-0.10	0.89	
10,285.00	89.38	180.77	7,690.35	-3,372.68	-1,305.17	3,352.95	0.53	-0.52	0.10	
10,377.00	88.61	181.21	7,691.97	-3,464.65	-1,306.76	3,444.89	0.96	-0.84	0.48	
10,470.00	87.85	181.13	7,694.84	-3,557.59	-1,308.66	3,537.78	0.82	-0.82	-0.09	
10,564.00	89.81	180.51	7,696.76	-3,651.56	-1,310.00	3,631.72	2.19	2.09	-0.66	
10,657.00	89.04	179.94	7,697.69	-3,744.55	-1,310.37	3,724.70	1.03	-0.83	-0.61	
10,750.00	90.32	179.35	7,698.21	-3,837.54	-1,309.79	3,817.69	1.52	1.38	-0.63	
10,843.00	89.95	179.15	7,697.99	-3,930.54	-1,308.57	3,910.69	0.45	-0.40	-0.22	
10,937.00	89.33	178.71	7,698.58	-4,024.52	-1,306.82	4,004.69	0.81	-0.66	-0.47	
11,030.00	92.26	179.36	7,697.29	-4,117.48	-1,305.25	4,097.67	3.23	3.15	0.70	
11,124.00	92.20	177.24	7,693.64	-4,211.37	-1,302.46	4,191.58	2.25	-0.06	-2.26	
11,217.00	90.94	178.39	7,691.09	-4,304.26	-1,298.92	4,284.52	1.83	-1.35	1.24	
11,311.00	89.37	177.85	7,690.83	-4,398.21	-1,295.84	4,378.50	1.77	-1.67	-0.57	
11,404.00	89.68	177.35	7,691.60	-4,491.12	-1,291.94	4,471.46	0.63	0.33	-0.54	
11,498.00	90.26	176.26	7,691.65	-4,584.97	-1,286.70	4,565.38	1.31	0.62	-1.16	
11,592.00	90.90	179.39	7,690.70	-4,678.89	-1,283.14	4,659.34	3.40	0.68	3.33	
11,687.00	88.30	181.16	7,691.36	-4,773.87	-1,283.59	4,754.31	3.31	-2.74	1.86	
11,782.00	88.97	180.65	7,693.63	-4,868.83	-1,285.09	4,849.23	0.89	0.71	-0.54	
11,876.00	89.48	180.15	7,694.90	-4,962.82	-1,285.75	4,943.20	0.76	0.54	-0.53	

<b>Company:</b>	ANADARKO PETROLEUM CORP	<b>Local Co-ordinate Reference:</b>	Well Cleland 15-2HZ
<b>Project:</b>	WELD COUNTY (NAD 83)	<b>TVD Reference:</b>	20' KB + 5152' GE @ 5172.00usft
<b>Site:</b>	Cleland 11-15HZ	<b>MD Reference:</b>	20' KB + 5152' GE @ 5172.00usft
<b>Well:</b>	Cleland 15-2HZ	<b>North Reference:</b>	True
<b>Wellbore:</b>	OH	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	OH	<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)	
11,969.00	90.53	180.20	7,694.89	-5,055.82	-1,286.03	5,036.19	1.13	1.13	0.05	
12,062.00	91.67	179.59	7,693.11	-5,148.80	-1,285.86	5,129.16	1.39	1.23	-0.66	
12,155.00	89.22	181.31	7,692.38	-5,241.78	-1,286.59	5,222.12	3.22	-2.63	1.85	
12,249.00	89.31	180.89	7,693.59	-5,335.76	-1,288.40	5,316.06	0.46	0.10	-0.45	
12,342.00	89.70	179.87	7,694.39	-5,428.75	-1,289.01	5,409.03	1.17	0.42	-1.10	
12,435.00	89.77	179.69	7,694.82	-5,521.75	-1,288.66	5,502.03	0.21	0.08	-0.19	
12,528.00	90.70	180.71	7,694.44	-5,614.75	-1,288.98	5,595.01	1.48	1.00	1.10	
12,620.00	90.86	180.13	7,693.19	-5,706.73	-1,289.66	5,686.98	0.65	0.17	-0.63	
12,713.00	90.73	180.69	7,691.90	-5,799.72	-1,290.32	5,779.94	0.62	-0.14	0.60	
12,806.00	88.81	178.87	7,692.27	-5,892.71	-1,289.96	5,872.93	2.84	-2.06	-1.96	
12,899.00	89.12	177.64	7,693.95	-5,985.65	-1,287.13	5,965.90	1.36	0.33	-1.32	
12,940.02	89.29	177.61	7,694.52	-6,026.63	-1,285.43	6,006.90	0.43	0.43	-0.09	
<b>6000' VS TGT (Cleland 15-2HZ)</b>										
12,993.00	89.52	177.56	7,695.07	-6,079.56	-1,283.20	6,059.86	0.43	0.43	-0.09	
13,088.00	89.45	176.97	7,695.92	-6,174.45	-1,278.66	6,154.80	0.63	-0.07	-0.62	
13,182.00	89.80	177.58	7,696.54	-6,268.34	-1,274.20	6,248.75	0.75	0.37	0.65	
13,275.00	89.86	176.68	7,696.81	-6,361.22	-1,269.54	6,341.69	0.97	0.06	-0.97	
13,368.00	89.97	174.74	7,696.95	-6,453.96	-1,262.58	6,434.52	2.09	0.12	-2.09	
13,462.00	89.66	177.62	7,697.25	-6,547.74	-1,256.32	6,528.38	3.08	-0.33	3.06	
13,556.00	89.95	176.81	7,697.57	-6,641.63	-1,251.75	6,622.33	0.92	0.31	-0.86	
13,650.00	90.49	176.52	7,697.21	-6,735.47	-1,246.28	6,716.24	0.65	0.57	-0.31	
13,745.00	88.28	178.02	7,698.23	-6,830.35	-1,241.76	6,811.17	2.81	-2.33	1.58	
13,840.00	88.63	177.19	7,700.79	-6,925.23	-1,237.79	6,906.10	0.95	0.37	-0.87	
13,933.00	88.51	176.67	7,703.11	-7,018.06	-1,232.81	6,999.00	0.57	-0.13	-0.56	
14,027.00	88.91	175.51	7,705.23	-7,111.82	-1,226.40	7,092.84	1.31	0.43	-1.23	
14,120.00	89.68	177.48	7,706.38	-7,204.63	-1,220.72	7,185.73	2.27	0.83	2.12	
14,214.00	89.16	180.08	7,707.33	-7,298.60	-1,218.72	7,279.72	2.82	-0.55	2.77	
14,307.00	89.50	180.11	7,708.41	-7,391.59	-1,218.87	7,372.70	0.37	0.37	0.03	
14,400.00	89.70	180.15	7,709.06	-7,484.59	-1,219.08	7,465.68	0.22	0.22	0.04	
14,493.00	89.63	180.19	7,709.61	-7,577.59	-1,219.36	7,558.67	0.09	-0.08	0.04	
14,587.00	89.11	180.20	7,710.64	-7,671.58	-1,219.68	7,652.64	0.55	-0.55	0.01	
14,681.00	88.69	179.94	7,712.45	-7,765.56	-1,219.79	7,746.61	0.53	-0.45	-0.28	
14,775.00	88.84	179.96	7,714.47	-7,859.54	-1,219.71	7,840.58	0.16	0.16	0.02	
14,870.00	88.78	179.85	7,716.44	-7,954.52	-1,219.56	7,935.55	0.13	-0.06	-0.12	
14,963.00	89.54	179.23	7,717.81	-8,047.51	-1,218.81	8,028.54	1.05	0.82	-0.67	
15,055.00	89.90	179.70	7,718.26	-8,139.50	-1,217.95	8,120.54	0.64	0.39	0.51	
15,150.00	89.86	178.80	7,718.46	-8,234.49	-1,216.71	8,215.54	0.95	-0.04	-0.95	
15,243.00	90.44	174.35	7,718.21	-8,327.30	-1,211.15	8,308.42	4.83	0.62	-4.78	
15,336.00	89.17	176.66	7,718.53	-8,420.01	-1,203.86	8,401.22	2.83	-1.37	2.48	
15,431.00	88.64	179.22	7,720.35	-8,514.92	-1,200.45	8,496.18	2.75	-0.56	2.69	
15,525.00	88.68	178.85	7,722.54	-8,608.88	-1,198.87	8,590.15	0.40	0.04	-0.39	
15,619.00	88.94	177.80	7,724.50	-8,702.82	-1,196.12	8,684.12	1.15	0.28	-1.12	
15,712.00	90.32	180.11	7,725.10	-8,795.79	-1,194.42	8,777.11	2.89	1.48	2.48	

<b>Company:</b>	ANADARKO PETROLEUM CORP	<b>Local Co-ordinate Reference:</b>	Well Cleland 15-2HZ
<b>Project:</b>	WELD COUNTY (NAD 83)	<b>TVD Reference:</b>	20' KB + 5152' GE @ 5172.00usft
<b>Site:</b>	Cleland 11-15HZ	<b>MD Reference:</b>	20' KB + 5152' GE @ 5172.00usft
<b>Well:</b>	Cleland 15-2HZ	<b>North Reference:</b>	True
<b>Wellbore:</b>	OH	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	OH	<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)	
15,806.00	90.37	179.64	7,724.53	-8,889.79	-1,194.22	8,871.10	0.50	0.05	-0.50	
15,898.00	90.36	180.02	7,723.94	-8,981.79	-1,193.95	8,963.09	0.41	-0.01	0.41	
15,992.00	91.25	179.10	7,722.62	-9,075.77	-1,193.22	9,057.07	1.36	0.95	-0.98	
16,084.00	88.57	180.24	7,722.77	-9,167.76	-1,192.69	9,149.06	3.17	-2.91	1.24	
16,177.00	88.61	179.81	7,725.06	-9,260.73	-1,192.73	9,242.02	0.46	0.04	-0.46	
16,272.00	89.08	179.23	7,726.97	-9,355.71	-1,191.94	9,337.00	0.79	0.49	-0.61	
16,365.00	89.57	179.17	7,728.07	-9,448.70	-1,190.64	9,429.99	0.53	0.53	-0.06	
16,458.00	90.33	178.27	7,728.15	-9,541.67	-1,188.56	9,522.99	1.27	0.82	-0.97	
16,552.00	91.02	178.56	7,727.04	-9,635.63	-1,185.96	9,616.97	0.80	0.73	0.31	
16,646.00	88.07	178.45	7,727.79	-9,729.58	-1,183.51	9,710.95	3.14	-3.14	-0.12	
16,739.00	88.04	178.09	7,730.94	-9,822.49	-1,180.71	9,803.89	0.39	-0.03	-0.39	
16,833.00	88.04	178.20	7,734.16	-9,916.38	-1,177.66	9,897.82	0.12	0.00	0.12	
16,927.00	89.34	178.10	7,736.31	-10,010.31	-1,174.63	9,991.78	1.39	1.38	-0.11	
17,022.00	90.14	177.51	7,736.74	-10,105.23	-1,170.99	10,086.75	1.05	0.84	-0.62	
17,115.00	90.37	176.89	7,736.32	-10,198.12	-1,166.45	10,179.70	0.71	0.25	-0.67	
17,209.00	88.71	178.96	7,737.08	-10,292.05	-1,163.05	10,273.66	2.82	-1.77	2.20	
17,303.00	89.36	178.08	7,738.66	-10,386.00	-1,160.62	10,367.64	1.16	0.69	-0.94	
17,395.00	89.34	178.19	7,739.71	-10,477.95	-1,157.62	10,459.62	0.12	-0.02	0.12	
17,489.00	89.37	177.03	7,740.76	-10,571.86	-1,153.70	10,553.58	1.23	0.03	-1.23	
17,583.00	89.34	177.56	7,741.82	-10,665.75	-1,149.27	10,647.53	0.56	-0.03	0.56	
17,677.00	89.65	177.56	7,742.65	-10,759.66	-1,145.27	10,741.49	0.33	0.33	0.00	
17,771.00	89.57	177.45	7,743.29	-10,853.57	-1,141.18	10,835.44	0.14	-0.09	-0.12	
17,865.00	88.62	180.26	7,744.78	-10,947.53	-1,139.30	10,929.42	3.16	-1.01	2.99	
17,958.00	88.33	180.06	7,747.25	-11,040.49	-1,139.56	11,022.37	0.38	-0.31	-0.22	
18,053.00	87.96	180.53	7,750.33	-11,135.44	-1,140.05	11,117.30	0.63	-0.39	0.49	
18,146.00	87.92	180.57	7,753.67	-11,228.38	-1,140.94	11,210.22	0.06	-0.04	0.04	
18,239.00	87.96	180.15	7,757.01	-11,321.32	-1,141.52	11,303.14	0.45	0.04	-0.45	
18,333.00	88.83	180.43	7,759.65	-11,415.28	-1,142.00	11,397.08	0.97	0.93	0.30	
18,426.00	90.59	180.86	7,760.12	-11,508.27	-1,143.04	11,490.04	1.95	1.89	0.46	
18,520.00	90.62	181.23	7,759.12	-11,602.24	-1,144.76	11,583.99	0.39	0.03	0.39	
18,614.00	89.66	180.53	7,758.89	-11,696.23	-1,146.20	11,677.94	1.26	-1.02	-0.74	
18,708.00	89.87	179.74	7,759.28	-11,790.23	-1,146.42	11,771.92	0.87	0.22	-0.84	
18,773.48	89.66	180.09	7,759.55	-11,855.71	-1,146.33	11,837.40	0.62	-0.32	0.53	
<b>Enter Toe Box: 18773.48' MD 460' FSL, 812' FWL</b>										
18,800.00	89.58	180.23	7,759.72	-11,882.23	-1,146.40	11,863.91	0.62	-0.32	0.53	
18,894.00	89.68	179.91	7,760.33	-11,976.23	-1,146.51	11,957.90	0.36	0.11	-0.34	
18,986.00	89.12	178.46	7,761.29	-12,068.21	-1,145.21	12,049.89	1.69	-0.61	-1.58	
19,080.00	88.44	177.19	7,763.29	-12,162.12	-1,141.64	12,143.84	1.53	-0.72	-1.35	
19,122.00	88.06	177.97	7,764.58	-12,204.06	-1,139.87	12,185.81	2.07	-0.90	1.86	
19,178.00	88.06	177.97	7,766.47	-12,259.99	-1,137.88	12,241.76	0.00	0.00	0.00	
<b>PBHL (Cleland 15-2HZ) - BHL: 56' FSL, 812' FWL Sec 27 T1N R68W</b>										

<b>Company:</b>	ANADARKO PETROLEUM CORP	<b>Local Co-ordinate Reference:</b>	Well Cleland 15-2HZ
<b>Project:</b>	WELD COUNTY (NAD 83)	<b>TVD Reference:</b>	20' KB + 5152' GE @ 5172.00usft
<b>Site:</b>	Cleland 11-15HZ	<b>MD Reference:</b>	20' KB + 5152' GE @ 5172.00usft
<b>Well:</b>	Cleland 15-2HZ	<b>North Reference:</b>	True
<b>Wellbore:</b>	OH	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	OH	<b>Database:</b>	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: 1739' FSL, 1989' F - actual wellpath hits target center - Point	0.00	0.00	0.00	0.00	0.00	14,544,466.55	1,642,630.85	40.048698	-104.992088	
Curve KOP (Cleland 15- - actual wellpath hits target center - Point	0.00	0.00	7,034.98	-679.33	-1,195.66	14,543,787.38	1,641,435.73	40.046833	-104.996359	
Enter Land Box: 7740.62 - actual wellpath misses target center by 0.01usft at 7740.62usft MD (7515.45 TVD, -880.82 N, -1302.40 E) - Point	0.00	0.00	7,515.45	-880.82	-1,302.40	14,543,585.96	1,641,329.05	40.046280	-104.996740	
LP: 424' FSL, 668' FWL - actual wellpath hits target center - Point	0.00	0.00	7,692.34	-1,318.69	-1,320.56	14,543,148.27	1,641,310.93	40.045078	-104.996805	
Exit Heel Box: 9113.72' I - actual wellpath hits target center - Point	0.00	0.00	7,692.79	-2,201.84	-1,328.48	14,542,265.47	1,641,303.09	40.042654	-104.996833	
Enter Toe Box: 18773.48 - actual wellpath misses target center by 0.01usft at 18773.48usft MD (7759.55 TVD, -11855.71 N, -1146.33 E) - Point	0.00	0.00	7,759.55	-11,855.71	-1,146.33	14,532,615.49	1,641,486.03	40.016153	-104.996181	
BHL: 56' FSL, 812' FWL - actual wellpath hits target center - Point	0.00	0.00	7,766.47	-12,259.99	-1,137.88	14,532,211.37	1,641,494.51	40.015043	-104.996151	

Casing Points						
Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")		
1,919.00	1,895.97	9 5/8"	9-5/8	12-1/4		

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