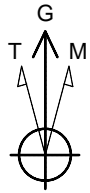


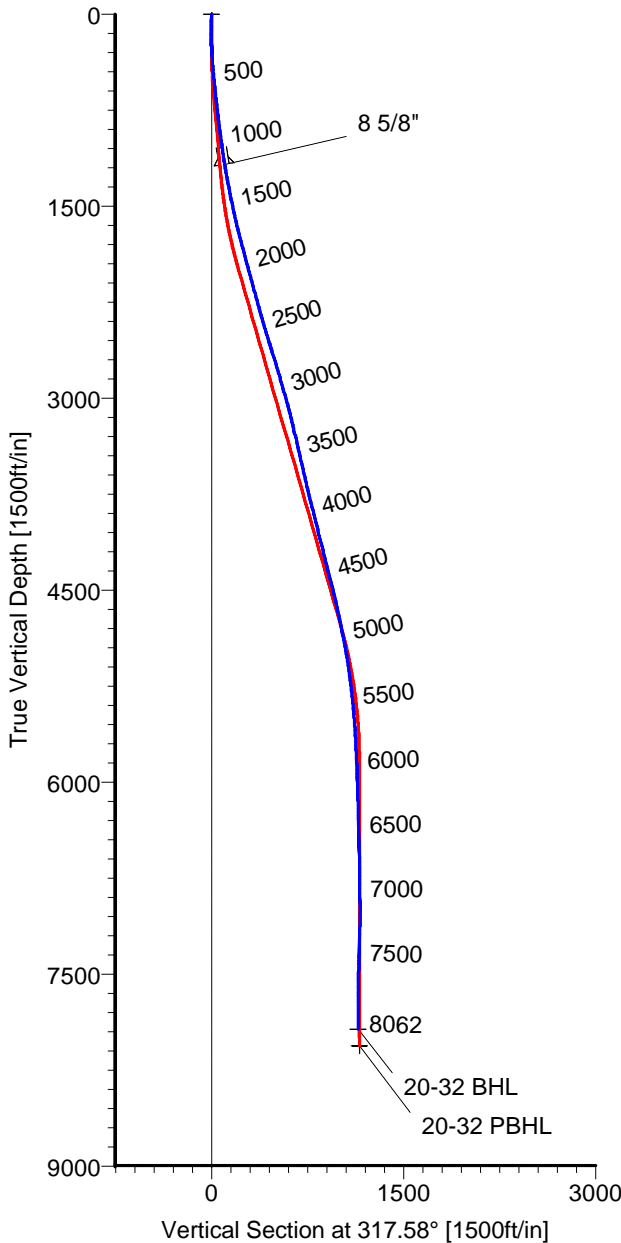
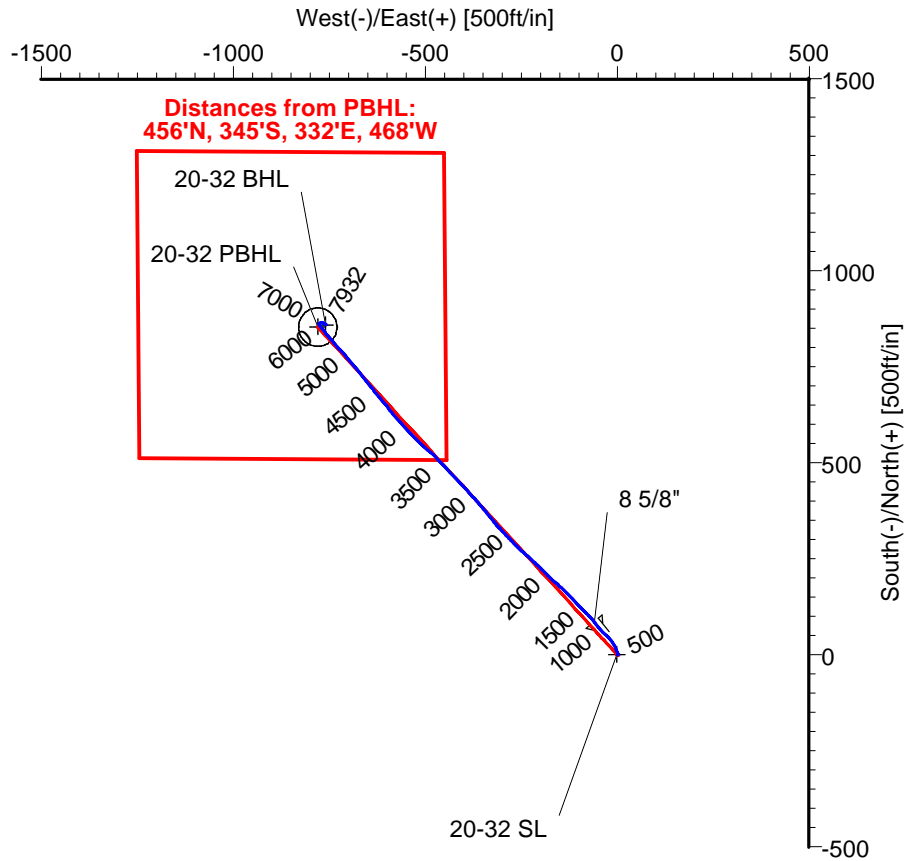
ANADARKO PETROLEUM

Field: Weld County, CO
Site: Varra 16-32 Pad
Well: 20-32
Wellpath: Original Hole



Azimuths to Grid North
True North: -0.38°
Magnetic North: 8.60°

Magnetic Field
Strength: 53083nT
Dip Angle: 66.86°
Date: 01/10/2011
Model: IGRF2010



LEGEND

- 20-32,Original Hole,Plan #2
- Original Hole

CASING DETAILS

No.	TVD	MD	Name	Size
1	1173.68	1180.00	8 5/8"	8.625

TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Latitude	Longitude	Shape
20-32 SL	0.00	0.00	0.00	40°10'34.606N	104°54'21.789W	Point
20-32 BHL	7931.82	859.10	-759.15	40°10'43.146N	104°54'31.496W	Point
20-32 PBHL	8058.00	852.98	-779.45	40°10'43.087N	104°54'31.758W	Circle (Radius: 50)

Wellpath: (20-32/Original Hole)

Created By: Ivonne Gonzalez

Date: 01/24/2011

ALLIS CHALMERS DIRECTIONAL DRILLING SERVICES
911 Regional Park Drive Houston, Texas 77060
Phone: 713-934-9600 Fax: 713-934-9067



**DIRECTIONAL
DRILLING SERVICES**

Allis-Chalmers Energy, Inc.

Survey Report

Company: ANADARKO PETROLEUM Field: Weld County, CO Site: Varra 16-32 Pad Well: 20-32 Wellpath: Original Hole	Date: 01/24/2011 Co-ordinate(NE) Reference: Well: 20-32, Grid North Vertical (TVD) Reference: SITE 4848.0 Section (VS) Reference: Well (0.00N,0.00E,317.58Azi) Survey Calculation Method: Minimum Curvature	Time: 15:49:23 Page: 1 Db: Adapti
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Field: Weld County, CO	
Map System: US State Plane Coordinate System 1983 Geo Datum: GRS 1980 Sys Datum: Mean Sea Level	Map Zone: Colorado, Northern Zone Coordinate System: Well Centre Geomagnetic Model: IGRF2010

Site: Varra 16-32 Pad Currently centered on 37-32	
Site Position: From: Geographic Position Uncertainty: 0.00 ft Ground Level: 4835.00 ft	Northing: 1307620.01 ft Easting: 3165955.44 ft Latitude: 40 10 34.608 N Longitude: 104 54 21.996 W North Reference: Grid Grid Convergence: 0.38 deg

Well: 20-32	Slot Name: 20-32
Well Position: +N/-S -0.08 ft +E/-W 16.03 ft Position Uncertainty: 0.00 ft	Latitude: 40 10 34.606 N Longitude: 104 54 21.789 W Easting : 3165971.47 ft

Wellpath: Original Hole Current Datum: SITE Magnetic Data: 01/10/2011 Field Strength: 53083 nT Vertical Section: Depth From (TVD) ft	Drilled From: Surface Tie-on Depth: 0.00 ft Above System Datum: Mean Sea Level Declination: 8.98 deg Mag Dip Angle: 66.86 deg Direction: deg
Height 4848.00 ft	+N/-S ft +E/-W ft 0.00 0.00 0.00 317.58

Survey Program for Definitive Wellpath					
Date: 01/24/2011 Actual From ft 50.00 8062.00	To ft 8017.00 8062.00	Validated: No Survey Survey #1 (50.00-8017.00) Survey #2 (8062.00-8062.00)	Version: 0 Toolcode MWD Project	Tool Name Std MWD Projection	

Survey										
MD ft	Incl deg	Azim deg	TVD ft	+N/-S ft	+E/-W ft	VS ft	DLS deg/100ft	Build deg/100ft	Turn deg/100ft	Tool/Comment
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	TIE LINE
50.00	0.50	101.80	50.00	-0.04	0.21	-0.18	1.00	1.00	0.00	MWD
141.00	1.10	76.50	140.99	0.08	1.45	-0.92	0.75	0.66	-27.80	MWD
230.00	1.40	356.00	229.97	1.36	2.21	-0.48	1.83	0.34	-90.45	MWD
320.00	4.40	339.80	319.85	5.70	0.94	3.58	3.42	3.33	-18.00	MWD
427.00	5.30	337.00	426.47	14.10	-2.41	12.04	0.87	0.84	-2.62	MWD
517.00	6.00	331.70	516.03	22.07	-6.27	20.52	0.97	0.78	-5.89	MWD
654.00	6.30	325.70	652.24	34.58	-13.90	34.90	0.52	0.22	-4.38	MWD
790.00	6.90	310.30	787.35	46.03	-24.33	50.40	1.37	0.44	-11.32	MWD
925.00	7.60	316.20	921.27	57.72	-36.70	67.36	0.76	0.52	4.37	MWD
1062.00	8.10	321.90	1056.99	71.86	-48.92	86.05	0.67	0.36	4.16	MWD
1135.00	8.60	323.30	1129.22	80.28	-55.36	96.61	0.74	0.68	1.92	MWD
1180.00	9.05	319.59	1173.68	85.67	-59.66	103.49	1.61	1.00	-8.24	8 5/8"
1240.00	9.70	315.20	1232.88	92.85	-66.28	113.26	1.61	1.08	-7.32	MWD
1331.00	10.90	315.90	1322.41	104.47	-77.67	129.52	1.33	1.32	0.77	MWD
1422.00	11.40	315.20	1411.70	117.03	-90.00	147.10	0.57	0.55	-0.77	MWD
1512.00	12.00	315.50	1499.83	130.01	-102.82	165.34	0.67	0.67	0.33	MWD
1603.00	12.80	317.30	1588.70	144.17	-116.29	184.87	0.98	0.88	1.98	MWD
1694.00	13.70	315.20	1677.28	159.23	-130.72	205.72	1.12	0.99	-2.31	MWD
1784.00	14.60	313.40	1764.55	174.58	-146.47	227.68	1.11	1.00	-2.00	MWD
1875.00	15.30	312.70	1852.47	190.60	-163.63	251.09	0.79	0.77	-0.77	MWD
1966.00	14.80	315.50	1940.35	207.04	-180.60	274.66	0.97	-0.55	3.08	MWD

Allis-Chalmers Energy, Inc.

Survey Report

Company: ANADARKO PETROLEUM Field: Weld County, CO Site: Varra 16-32 Pad Well: 20-32 Wellpath: Original Hole	Date: 01/24/2011 Co-ordinate(NE) Reference: Well: 20-32, Grid North Vertical (TVD) Reference: SITE 4848.0 Section (VS) Reference: Well (0.00N,0.00E,317.58Azi) Survey Calculation Method: Minimum Curvature	Time: 15:49:23 Page: 2 Db: Adapti
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Survey

MD ft	Incl deg	Azim deg	TVD ft	+N/-S ft	+E/-W ft	VS ft	DLS deg/100ft	Build deg/100ft	Turn deg/100ft	Tool/Comment
2057.00	15.70	313.80	2028.14	223.85	-197.63	298.56	1.10	0.99	-1.87	MWD
2147.00	15.30	311.70	2114.87	240.18	-215.29	322.53	0.77	-0.44	-2.33	MWD
2238.00	15.10	312.70	2202.69	256.20	-232.96	346.28	0.36	-0.22	1.10	MWD
2329.00	15.80	311.70	2290.40	272.48	-250.92	370.41	0.82	0.77	-1.10	MWD
2420.00	16.00	316.20	2377.92	289.78	-268.85	395.28	1.37	0.22	4.95	MWD
2511.00	16.70	317.30	2465.24	308.44	-286.40	420.89	0.84	0.77	1.21	MWD
2601.00	17.40	315.50	2551.28	327.54	-304.60	447.27	0.97	0.78	-2.00	MWD
2692.00	17.20	321.90	2638.18	347.83	-322.44	474.29	2.10	-0.22	7.03	MWD
2783.00	16.90	321.90	2725.18	368.83	-338.91	500.89	0.33	-0.33	0.00	MWD
2874.00	16.40	318.40	2812.36	388.85	-355.60	526.93	1.23	-0.55	-3.85	MWD
2965.00	16.00	317.00	2899.75	407.63	-372.68	552.31	0.61	-0.44	-1.54	MWD
3056.00	15.80	318.00	2987.27	426.00	-389.53	577.24	0.37	-0.22	1.10	MWD
3146.00	15.10	316.60	3074.02	443.63	-405.78	601.22	0.88	-0.78	-1.56	MWD
3237.00	13.70	315.90	3162.15	459.98	-421.42	623.84	1.55	-1.54	-0.77	MWD
3328.00	13.00	319.10	3250.70	475.45	-435.62	644.84	1.12	-0.77	3.52	MWD
3418.00	13.20	317.70	3338.35	490.71	-449.17	665.24	0.42	0.22	-1.56	MWD
3509.00	12.80	313.80	3427.02	505.37	-463.44	685.69	1.06	-0.44	-4.29	MWD
3600.00	13.00	313.40	3515.73	519.38	-478.15	705.95	0.24	0.22	-0.44	MWD
3691.00	13.50	310.60	3604.30	533.32	-493.65	726.71	0.89	0.55	-3.08	MWD
3782.00	13.00	311.70	3692.88	547.04	-509.36	747.43	0.62	-0.55	1.21	MWD
3872.00	13.50	316.20	3780.49	561.36	-524.19	768.00	1.27	0.56	5.00	MWD
3963.00	14.60	316.90	3868.76	577.40	-539.38	790.09	1.22	1.21	0.77	MWD
4054.00	14.30	317.70	3956.89	594.09	-554.78	812.80	0.40	-0.33	0.88	MWD
4145.00	13.90	318.70	4045.14	610.61	-569.55	834.96	0.51	-0.44	1.10	MWD
4236.00	13.90	320.50	4133.48	627.26	-583.72	856.81	0.48	0.00	1.98	MWD
4327.00	14.30	319.80	4221.74	644.28	-597.93	878.96	0.48	0.44	-0.77	MWD
4417.00	13.70	319.80	4309.06	660.91	-611.98	900.71	0.67	-0.67	0.00	MWD
4508.00	14.80	322.20	4397.26	678.32	-626.06	923.07	1.37	1.21	2.64	MWD
4599.00	14.40	321.50	4485.33	696.36	-640.23	945.94	0.48	-0.44	-0.77	MWD
4690.00	13.00	320.80	4573.73	713.15	-653.74	967.45	1.55	-1.54	-0.77	MWD
4780.00	12.30	320.80	4661.55	728.42	-666.20	987.13	0.78	-0.78	0.00	MWD
4871.00	11.60	320.80	4750.58	743.02	-678.11	1005.94	0.77	-0.77	0.00	MWD
4962.00	11.60	320.80	4839.72	757.20	-689.67	1024.21	0.00	0.00	0.00	MWD
5053.00	10.60	319.80	4929.01	770.69	-700.86	1041.71	1.12	-1.10	-1.10	MWD
5144.00	9.30	318.70	5018.64	782.61	-711.11	1057.42	1.44	-1.43	-1.21	MWD
5234.00	8.30	316.20	5107.58	792.76	-720.41	1071.19	1.19	-1.11	-2.78	MWD
5325.00	7.60	319.40	5197.71	802.07	-728.87	1083.77	0.91	-0.77	3.52	MWD
5416.00	6.50	317.70	5288.02	810.45	-736.25	1094.94	1.23	-1.21	-1.87	MWD
5507.00	5.60	321.50	5378.51	817.73	-742.48	1104.52	1.08	-0.99	4.18	MWD
5597.00	4.80	321.50	5468.14	824.11	-747.56	1112.65	0.89	-0.89	0.00	MWD
5688.00	3.90	320.10	5558.88	829.47	-751.92	1119.54	1.00	-0.99	-1.54	MWD
5779.00	3.30	313.10	5649.70	833.63	-755.82	1125.25	0.82	-0.66	-7.69	MWD
5870.00	2.60	322.90	5740.58	837.07	-758.97	1129.91	0.95	-0.77	10.77	MWD
5960.00	2.40	329.30	5830.49	840.32	-761.17	1133.79	0.38	-0.22	7.11	MWD
6051.00	2.30	323.60	5921.42	843.42	-763.22	1137.47	0.28	-0.11	-6.26	MWD
6142.00	2.10	321.50	6012.35	846.20	-765.34	1140.95	0.24	-0.22	-2.31	MWD
6232.00	1.90	320.50	6102.29	848.64	-767.32	1144.09	0.23	-0.22	-1.11	MWD
6414.00	1.20	319.40	6284.23	852.42	-770.48	1149.01	0.38	-0.38	-0.60	MWD
6595.00	1.20	315.00	6465.19	855.20	-773.05	1152.79	0.05	0.00	-2.43	MWD
6777.00	1.40	321.90	6647.14	858.29	-775.77	1156.91	0.14	0.11	3.79	MWD
6958.00	0.90	26.60	6828.11	861.30	-776.50	1159.63	0.72	-0.28	35.75	MWD
7140.00	1.10	30.10	7010.08	864.09	-774.98	1160.66	0.11	0.11	1.92	MWD
7322.00	2.10	101.40	7192.02	864.95	-770.84	1158.50	1.12	0.55	39.18	MWD

Allis-Chalmers Energy, Inc.

Survey Report

Company: ANADARKO PETROLEUM Field: Weld County, CO Site: Varra 16-32 Pad Well: 20-32 Wellpath: Original Hole	Date: 01/24/2011 Co-ordinate(NE) Reference: Well: 20-32, Grid North Vertical (TVD) Reference: SITE 4848.0 Section (VS) Reference: Well (0.00N,0.00E,317.58Azi) Survey Calculation Method: Minimum Curvature Db: Adapti
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Survey

MD ft	Incl deg	Azim deg	TVD ft	+N/-S ft	+E/-W ft	VS ft	DLS deg/100ft	Build deg/100ft	Turn deg/100ft	Tool/Comment
7503.00	2.10	111.30	7372.90	863.09	-764.50	1152.85	0.20	0.00	5.47	MWD
7684.00	0.90	119.70	7553.84	861.18	-760.17	1148.52	0.67	-0.66	4.64	MWD
7866.00	0.20	173.90	7735.83	860.15	-758.90	1146.90	0.44	-0.38	29.78	MWD
8017.00	0.40	199.50	7886.83	859.39	-759.05	1146.44	0.16	0.13	16.95	MWD
8062.00	0.40	199.50	7931.82	859.10	-759.15	1146.30	0.00	0.00	0.00	20-32 BHL

Targets

Name	Description Dip.	Dir.	TVD ft	+N/-S ft	+E/-W ft	Map Northing ft	Map Easting ft	<--- Latitude ---> Deg Min Sec			<--- Longitude ---> Deg Min Sec		
20-32 SL			0.00	0.00	0.00	1307619.93	3165971.47	40	10	34.606 N	104	54	21.789 W
20-32 BHL			7931.82	859.10	-759.15	1308479.03	3165212.32	40	10	43.146 N	104	54	31.496 W
20-32 PBHL			8058.00	852.98	-779.45	1308472.91	3165192.02	40	10	43.087 N	104	54	31.758 W
-Circle (Radius: 50)													

Casing Points

MD ft	TVD ft	Diameter in	Hole Size in	Name
1180.00	1173.68	8.625	9.875	8 5/8"