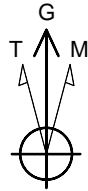


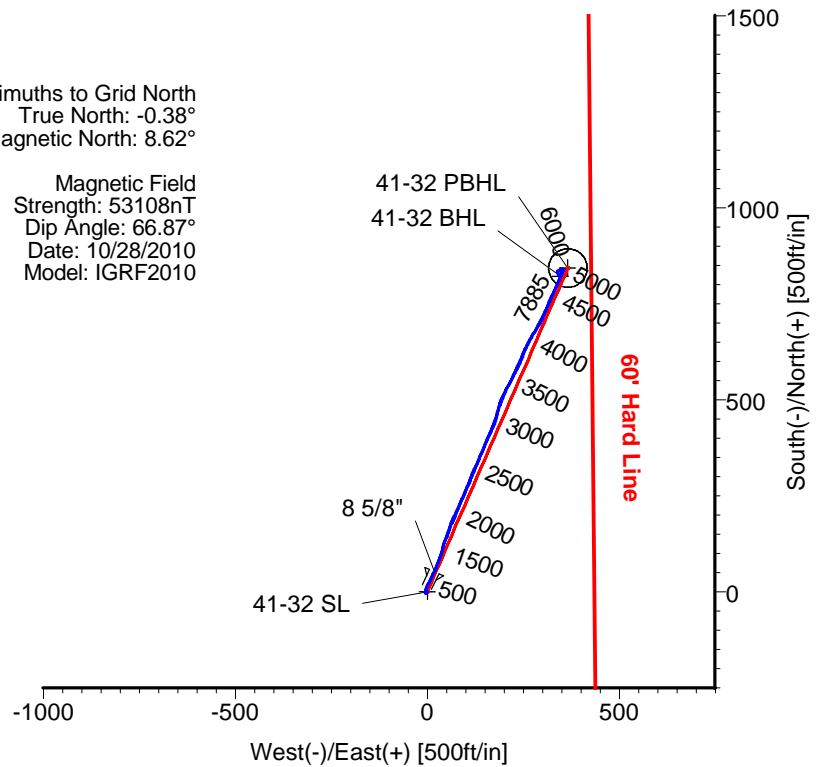
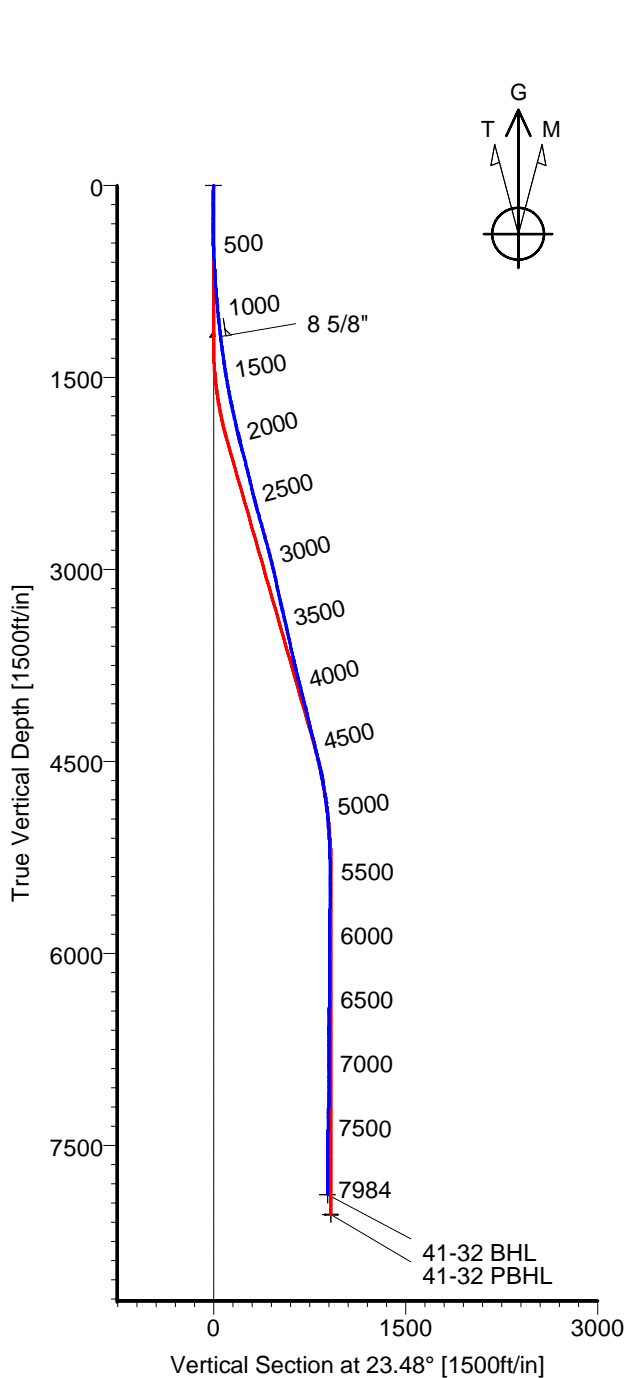
# ANADARKO PETROLEUM

Field: Weld County, CO  
Site: Varra 8-32 Pad  
Well: 41-32  
Wellpath: Original Hole



Azimuths to Grid North  
True North:  $-0.38^{\circ}$   
Magnetic North:  $8.62^{\circ}$

Magnetic Field  
Strength: 53108nT  
Dip Angle:  $66.87^{\circ}$   
Date: 10/28/2010  
Model: IGRF2010



## CASING DETAILS

No.	TVD	MD	Name	Size
1	1178.51	1181.00	8 5/8"	8.625

## LEGEND

- 41-32, Original Hole, Plan #1
- Original Hole

## TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Latitude	Longitude	Shape
41-32 SL	0.00	0.00	0.00	40°11'01.860N	104°54'21.276W	Point
41-32 BHL	7884.69	821.69	348.20	40°11'09.957N	104°54'16.719W	Point
41-32 PBHL	8040.00	843.28	366.39	40°11'10.169N	104°54'16.482W	Circle (Radius: 50)

Wellpath: (41-32/Original Hole)

Created By: Ivonne Gonzalez

Date: 02/16/2011

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

<b>Company:</b> ANADARKO PETROLEUM <b>Field:</b> Weld County, CO <b>Site:</b> Varra 8-32 Pad <b>Well:</b> 41-32 <b>Wellpath:</b> Original Hole	<b>Date:</b> 02/16/2011 <b>Co-ordinate(NE) Reference:</b> <b>Vertical (TVD) Reference:</b> <b>Section (VS) Reference:</b> <b>Survey Calculation Method:</b>	<b>Time:</b> 08:49:13 Well: 41-32, Grid North SITE 0.0 Well (0.00N,0.00E,23.48Azi) Minimum Curvature	<b>Page:</b> 1 <b>Db:</b> Adapti
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<b>Field:</b> Weld County, CO	
<b>Map System:</b> US State Plane Coordinate System 1983 <b>Geo Datum:</b> GRS 1980 <b>Sys Datum:</b> Mean Sea Level	<b>Map Zone:</b> Colorado, Northern Zone <b>Coordinate System:</b> Well Centre <b>Geomagnetic Model:</b> IGRF2010

<b>Site:</b> Varra 8-32 Pad Currently centered on 41-32	
<b>Site Position:</b> <b>From:</b> Geographic <b>Position Uncertainty:</b> 0.00 ft <b>Ground Level:</b> 4801.00 ft	<b>Northing:</b> 1310377.94 ft <b>Easting:</b> 3165992.85 ft <b>Latitude:</b> 40 11 1.860 N <b>Longitude:</b> 104 54 21.276 W <b>North Reference:</b> Grid <b>Grid Convergence:</b> 0.38 deg

<b>Well:</b> 41-32	<b>Slot Name:</b> 41-32
<b>Well Position:</b> +N/-S 0.00 ft +E/-W 0.00 ft <b>Position Uncertainty:</b> 0.00 ft	<b>Northing:</b> 1310377.94 ft <b>Easting :</b> 3165992.85 ft <b>Latitude:</b> 40 11 1.860 N <b>Longitude:</b> 104 54 21.276 W

<b>Wellpath:</b> Original Hole	<b>Drilled From:</b> Surface <b>Tie-on Depth:</b> 0.00 ft <b>Above System Datum:</b> Mean Sea Level <b>Declination:</b> 9.01 deg <b>Mag Dip Angle:</b> 66.87 deg
<b>Current Datum:</b> SITE <b>Magnetic Data:</b> 10/28/2010 <b>Field Strength:</b> 53108 nT <b>Vertical Section:</b> Depth From (TVD) ft	<b>Height</b> 0.00 ft +N/-S ft +E/-W ft <b>Direction</b> deg
0.00	0.00 0.00 23.48

<b>Survey Program for Definitive Wellpath</b>					
<b>Date:</b> 02/16/2011	<b>Validated:</b> No	<b>Version:</b> 0			
<b>Actual From</b> ft	<b>To</b> ft	<b>Survey</b>	<b>Toolcode</b>	<b>Tool Name</b>	
46.00	7939.00	Survey #1 (46.00-7939.00)	MWD	Std MWD	
7984.00	7984.00	Survey #2 (7984.00-7984.00)	Project	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
46.00	1.40	212.90	46.00	-0.47	-0.31	-0.55	3.04	3.04	0.00	MWD
111.00	1.80	211.50	110.97	-2.01	-1.27	-2.35	0.62	0.62	-2.15	MWD
170.00	1.40	239.30	169.95	-3.17	-2.37	-3.85	1.46	-0.68	47.12	MWD
231.00	1.40	283.90	230.93	-3.37	-3.74	-4.58	1.74	0.00	73.11	MWD
291.00	1.10	322.60	290.92	-2.73	-4.80	-4.42	1.46	-0.50	64.50	MWD
350.00	0.90	24.80	349.91	-1.86	-4.95	-3.68	1.77	-0.34	105.42	MWD
427.00	1.80	13.90	426.89	-0.14	-4.40	-1.88	1.21	1.17	-14.16	MWD
518.00	3.00	15.00	517.81	3.55	-3.45	1.88	1.32	1.32	1.21	MWD
609.00	3.50	15.00	608.66	8.53	-2.11	6.98	0.55	0.55	0.00	MWD
700.00	3.90	22.00	699.47	14.08	-0.23	12.82	0.66	0.44	7.69	MWD
790.00	3.90	25.50	789.26	19.68	2.23	18.94	0.26	0.00	3.89	MWD
881.00	4.60	28.00	880.01	25.70	5.28	25.67	0.80	0.77	2.75	MWD
972.00	5.30	27.30	970.67	32.65	8.92	33.50	0.77	0.77	-0.77	MWD
1063.00	5.90	27.00	1061.24	40.56	12.97	42.37	0.66	0.66	-0.33	MWD
1136.00	6.50	26.20	1133.81	47.61	16.50	50.24	0.83	0.82	-1.10	MWD
1211.00	6.90	24.50	1208.30	55.52	20.24	58.98	0.60	0.53	-2.27	MWD
1302.00	7.90	21.30	1298.54	66.32	24.78	70.70	1.19	1.10	-3.52	MWD
1393.00	8.10	18.20	1388.65	78.23	29.05	83.33	0.52	0.22	-3.41	MWD
1483.00	9.50	19.90	1477.59	91.24	33.56	97.06	1.58	1.56	1.89	MWD
1574.00	10.40	16.80	1567.22	106.17	38.49	112.71	1.15	0.99	-3.41	MWD
1665.00	11.40	15.40	1656.58	122.70	43.25	129.77	1.14	1.10	-1.54	MWD

# Allis-Chalmers Energy, Inc.

## Survey Report

<b>Company:</b> ANADARKO PETROLEUM <b>Field:</b> Weld County, CO <b>Site:</b> Varra 8-32 Pad <b>Well:</b> 41-32 <b>Wellpath:</b> Original Hole	<b>Date:</b> 02/16/2011 <b>Co-ordinate(NE) Reference:</b> Well: 41-32, Grid North <b>Vertical (TVD) Reference:</b> SITE 0.0 <b>Section (VS) Reference:</b> Well (0.00N,0.00E,23.48Azi) <b>Survey Calculation Method:</b> Minimum Curvature	<b>Time:</b> 08:49:13 <b>Page:</b> 2 <b>Db:</b> 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
1756.00	12.30	23.10	1745.65	140.29	49.45	148.37	2.00	0.99	8.46	MWD
1846.00	12.70	17.50	1833.52	158.54	56.18	167.80	1.42	0.44	-6.22	MWD
1937.00	12.50	20.30	1922.32	177.32	62.61	187.58	0.71	-0.22	3.08	MWD
2028.00	15.00	26.60	2010.71	197.09	71.30	209.18	3.20	2.75	6.92	MWD
2119.00	14.60	22.40	2098.70	218.22	80.94	232.40	1.26	-0.44	-4.62	MWD
2209.00	14.40	24.10	2185.83	238.93	89.83	254.93	0.52	-0.22	1.89	MWD
2300.00	13.70	21.70	2274.11	259.27	98.44	277.02	1.00	-0.77	-2.64	MWD
2391.00	13.40	24.10	2362.58	278.91	106.73	298.34	0.70	-0.33	2.64	MWD
2482.00	14.30	19.60	2450.93	299.12	114.81	320.09	1.54	0.99	-4.95	MWD
2572.00	15.50	24.10	2537.91	320.57	123.44	343.21	1.85	1.33	5.00	MWD
2663.00	16.00	24.50	2625.49	343.08	133.61	367.91	0.56	0.55	0.44	MWD
2754.00	15.70	22.40	2713.03	365.88	143.50	392.76	0.71	-0.33	-2.31	MWD
2845.00	15.10	22.40	2800.76	388.22	152.71	416.92	0.66	-0.66	0.00	MWD
2935.00	14.80	24.80	2887.72	409.49	162.00	440.13	0.76	-0.33	2.67	MWD
3026.00	13.40	22.70	2975.98	429.77	170.95	462.30	1.64	-1.54	-2.31	MWD
3118.00	12.50	17.10	3065.64	449.12	177.99	482.85	1.68	-0.98	-6.09	MWD
3208.00	12.10	14.30	3153.57	467.57	183.18	501.84	0.80	-0.44	-3.11	MWD
3299.00	12.50	17.10	3242.49	486.23	188.43	521.05	0.79	0.44	3.08	MWD
3390.00	13.70	23.80	3331.12	505.50	195.68	541.61	2.12	1.32	7.36	MWD
3481.00	13.20	28.40	3419.63	524.50	204.97	562.74	1.30	-0.55	5.05	MWD
3572.00	12.00	25.90	3508.43	542.15	214.04	582.54	1.45	-1.32	-2.75	MWD
3662.00	12.10	26.20	3596.45	559.03	222.30	601.31	0.13	0.11	0.33	MWD
3753.00	12.70	25.90	3685.33	576.59	230.88	620.83	0.66	0.66	-0.33	MWD
3844.00	14.60	25.20	3773.75	595.97	240.13	642.29	2.10	2.09	-0.77	MWD
3935.00	13.70	20.60	3861.99	616.43	248.80	664.52	1.58	-0.99	-5.05	MWD
4026.00	14.30	25.50	3950.29	636.66	257.43	686.52	1.46	0.66	5.38	MWD
4117.00	14.40	29.00	4038.46	656.70	267.76	709.01	0.96	0.11	3.85	MWD
4207.00	13.70	30.50	4125.76	675.68	278.59	730.73	0.88	-0.78	1.67	MWD
4298.00	12.70	30.50	4214.36	693.58	289.14	751.35	1.10	-1.10	0.00	MWD
4389.00	14.40	26.20	4302.82	712.35	299.21	772.59	2.17	1.87	-4.73	MWD
4480.00	14.10	23.10	4391.03	732.70	308.56	794.97	0.90	-0.33	-3.41	MWD
4571.00	13.40	23.10	4479.42	752.60	317.04	816.60	0.77	-0.77	0.00	MWD
4661.00	12.50	26.00	4567.13	770.95	325.41	836.76	1.23	-1.00	3.22	MWD
4752.00	10.00	24.10	4656.37	787.01	332.95	854.50	2.78	-2.75	-2.09	MWD
4843.00	9.20	22.70	4746.10	800.93	338.98	869.68	0.92	-0.88	-1.54	MWD
4934.00	7.20	22.40	4836.16	812.92	343.97	882.65	2.20	-2.20	-0.33	MWD
5025.00	5.50	27.70	4926.60	822.05	348.17	892.71	1.97	-1.87	5.82	MWD
5115.00	3.50	25.20	5016.32	828.36	351.34	899.75	2.23	-2.22	-2.78	MWD
5206.00	2.80	21.30	5107.18	832.94	353.33	904.75	0.80	-0.77	-4.29	MWD
5297.00	1.80	24.50	5198.11	836.31	354.73	908.40	1.11	-1.10	3.52	MWD
5387.00	1.10	9.40	5288.08	838.45	355.46	910.65	0.88	-0.78	-16.78	MWD
5478.00	0.50	323.00	5379.07	839.63	355.36	911.70	0.92	-0.66	-50.99	MWD
5569.00	0.70	267.10	5470.07	839.92	354.57	911.65	0.65	0.22	-61.43	MWD
5660.00	0.70	252.70	5561.06	839.73	353.48	911.03	0.19	0.00	-15.82	MWD
5751.00	1.40	257.90	5652.04	839.33	351.86	910.03	0.78	0.77	5.71	MWD
5842.00	0.50	213.60	5743.03	838.77	350.56	908.99	1.21	-0.99	-48.68	MWD
5932.00	0.50	250.90	5833.03	838.31	349.97	908.34	0.36	0.00	41.44	MWD
6023.00	0.90	251.60	5924.02	837.95	348.92	907.59	0.44	0.44	0.77	MWD
6114.00	0.00	130.30	6015.02	837.73	348.24	907.11	0.99	-0.99	0.00	MWD
6205.00	0.40	283.90	6106.02	837.81	347.93	907.06	0.44	0.44	0.00	MWD
6296.00	0.90	270.20	6197.01	837.88	346.91	906.72	0.57	0.55	-15.05	MWD
6386.00	0.50	203.10	6287.01	837.53	346.05	906.05	0.94	-0.44	-74.56	MWD
6477.00	0.50	230.50	6378.00	836.91	345.58	905.30	0.26	0.00	30.11	MWD

# Allis-Chalmers Energy, Inc.

## Survey Report

**Company:** ANADARKO PETROLEUM  
**Field:** Weld County, CO  
**Site:** Varra 8-32 Pad  
**Well:** 41-32  
**Wellpath:** Original Hole

<b>Date:</b> 02/16/2011	<b>Time:</b> 08:49:13	<b>Page:</b> 3
<b>Co-ordinate(NE) Reference:</b>	Well: 41-32, Grid North	
<b>Vertical (TVD) Reference:</b>	SITE 0.0	
<b>Section (VS) Reference:</b>	Well (0.00N,0.00E,23.48Azi)	
<b>Survey Calculation Method:</b>	Minimum Curvature	<b>Db:</b> Adapti

## 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
6568.00	0.40	143.30	6469.00	836.40	345.47	904.79	0.69	-0.11	-95.82	MWD
6659.00	0.50	280.40	6560.00	836.22	345.27	904.54	0.92	0.11	150.66	MWD
6750.00	0.50	278.70	6651.00	836.35	344.48	904.35	0.02	0.00	-1.87	MWD
6840.00	0.70	221.40	6740.99	836.00	343.73	903.73	0.67	0.22	-63.67	MWD
7022.00	1.40	253.00	6922.96	834.51	340.87	901.23	0.49	0.38	17.36	MWD
7204.00	0.50	354.30	7104.94	834.65	338.66	900.48	0.87	-0.49	55.66	MWD
7385.00	2.60	169.30	7285.89	831.40	339.35	897.77	1.71	1.16	96.69	MWD
7567.00	1.90	121.90	7467.76	825.75	342.68	893.91	1.05	-0.38	-26.04	MWD
7748.00	0.90	133.80	7648.71	823.18	346.25	892.98	0.57	-0.55	6.57	MWD
7939.00	0.40	117.70	7839.69	821.83	347.92	892.41	0.28	-0.26	-8.43	MWD
7984.00	0.40	117.70	7884.69	821.69	348.20	892.39	0.00	0.00	0.00	41-32 BHL

## Targets

Name	Description		TVD ft	+N/-S ft	+E/-W ft	Map Northing ft	Map Easting ft	<---- Latitude ---->			<--- Longitude --->		
	Dip.	Dir.						Deg	Min	Sec	Deg	Min	Sec
41-32 SL			0.00	0.00	0.00	1310377.94	3165992.85	40	11	1.860 N	104	54	21.276 W
41-32 BHL			7884.69	821.69	348.20	1311199.63	3166341.05	40	11	9.957 N	104	54	16.719 W
41-32 PBHL			8040.00	843.28	366.39	1311221.22	3166359.24	40	11	10.169 N	104	54	16.482 W
-Circle (Radius: 50)													