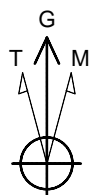


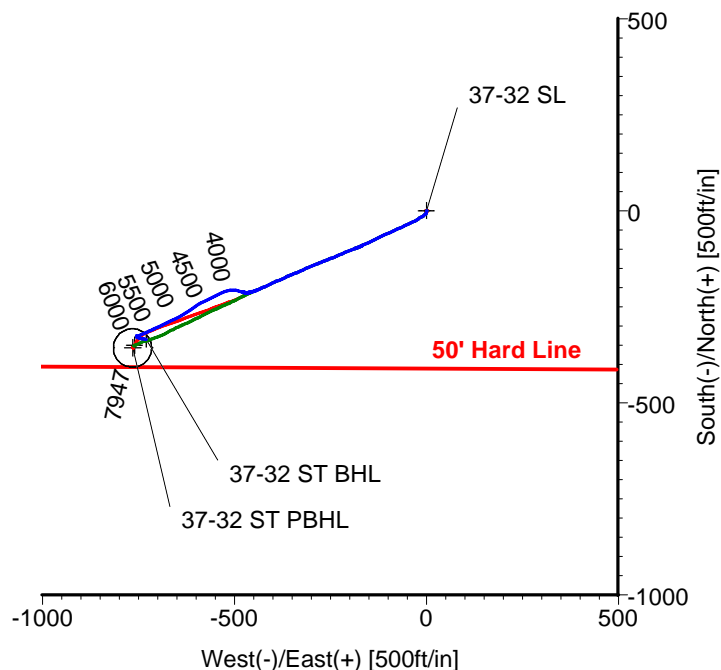
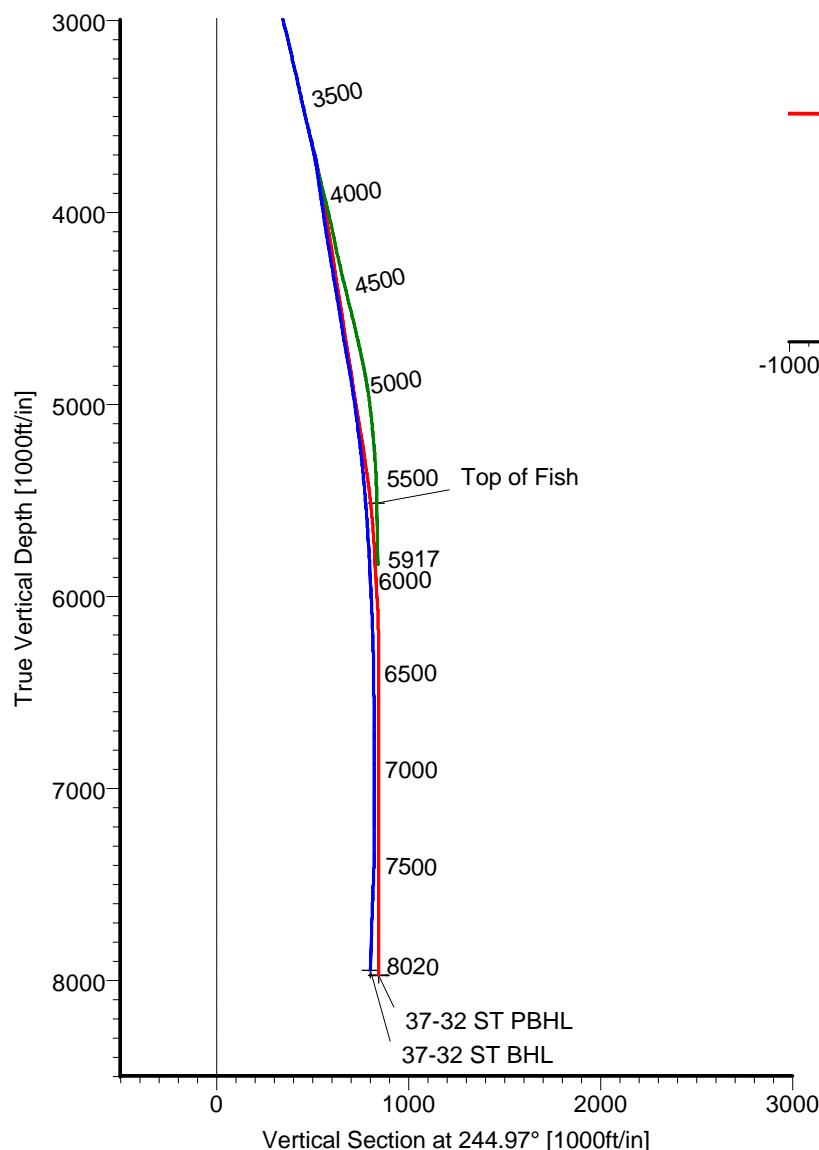
# ANADARKO PETROLEUM

Field: Weld County, CO  
Site: Varra 16-32 Pad  
Well: 37-32  
Wellpath: Sidetrack



Azimuths to Grid North  
True North:  $-0.38^{\circ}$   
Magnetic North:  $8.59^{\circ}$

Magnetic Field  
Strength: 53077nT  
Dip Angle:  $66.86^{\circ}$   
Date: 01/29/2011  
Model: IGRF2010



## LEGEND

- 37-32, Sidetrack, Plan #2
- 37-32 (Original Hole)
- Sidetrack

## TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Latitude	Longitude	Shape
37-32 SL	0.00	0.00	0.00	40°10'34.608N	104°54'21.996W	Point
Top of Fish	5516.42	-350.26	-758.34	40°10'31.197N	104°54'31.796W	Point
37-32 ST BHL	7946.67	-335.13	-728.46	40°10'31.344N	104°54'31.410W	Point
37-32 ST PBHL	7975.00	-357.12	-764.87	40°10'31.129N	104°54'31.881W	Circle (Radius: 50)

Wellpath: (37-32/Sidetrack)

Created By: Ivonne Gonzalez

Date: 02/06/2011

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 16-32 Pad <b>Well:</b> 37-32 <b>Wellpath:</b> Sidetrack	<b>Date:</b> 02/06/2011 <b>Co-ordinate(NE) Reference:</b> Well: 37-32, Grid North <b>Vertical (TVD) Reference:</b> SITE 4848.0 <b>Section (VS) Reference:</b> Well (0.00N,0.00E,244.97Azi) <b>Survey Calculation Method:</b> Minimum Curvature	<b>Time:</b> 08:07:18 <b>Page:</b> 1 <b>Db:</b> Sybase
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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 16-32 Pad Currently centered on 37-32			
<b>Site Position:</b> <b>From:</b> Geographic <b>Position Uncertainty:</b> 0.00 ft <b>Ground Level:</b> 4835.00 ft	<b>Northing:</b> 1307620.01 ft <b>Easting:</b> 3165955.44 ft	<b>Latitude:</b> 40 10 34.608 N <b>Longitude:</b> 104 54 21.996 W <b>North Reference:</b> Grid <b>Grid Convergence:</b> 0.38 deg	

<b>Well:</b> 37-32  <b>Well Position:</b> +N/-S 0.00 ft +E/-W 0.00 ft <b>Position Uncertainty:</b> 0.00 ft	<b>Slot Name:</b> 37-32  <b>Latitude:</b> 40 10 34.608 N <b>Longitude:</b> 104 54 21.996 W
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<b>Wellpath:</b> Sidetrack  <b>Current Datum:</b> SITE <b>Magnetic Data:</b> 01/29/2011 <b>Field Strength:</b> 53077 nT <b>Vertical Section:</b> Depth From (TVD) ft	<b>Height</b> 4848.00 ft	<b>Drilled From:</b> Original Hole <b>Tie-on Depth:</b> 5917.00 ft <b>Above System Datum:</b> Mean Sea Level <b>Declination:</b> 8.97 deg <b>Mag Dip Angle:</b> 66.86 deg <b>+N/-S</b> ft <b>+E/-W</b> ft <b>Direction</b> deg
0.00	0.00	0.00 244.97

<b>Survey Program for Definitive Wellpath</b> <b>Date:</b> 02/06/2011 <b>Validated:</b> No <b>Version:</b> 1				
Actual From	To	Survey	Toolcode	Tool Name
81.00	3646.00	Survey #1 (81.00-5825.00) (0)	MWD	Std MWD
3739.00	7824.00	Survey #1 (3739.00-7824.00)	MWD	Std MWD
8020.00	8020.00	Survey #2 (8020.00-8020.00)	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
81.00	0.90	152.40	81.00	-0.56	0.29	-0.03	1.11	1.11	0.00	MWD
170.00	1.10	170.30	169.98	-2.03	0.76	0.17	0.41	0.22	20.11	MWD
261.00	1.40	185.10	260.96	-3.99	0.81	0.95	0.48	0.33	16.26	MWD
350.00	1.80	213.60	349.93	-6.24	-0.06	2.69	0.99	0.45	32.02	MWD
427.00	1.90	225.90	426.89	-8.14	-1.65	4.93	0.53	0.13	15.97	MWD
518.00	2.30	222.40	517.83	-10.53	-3.96	8.05	0.46	0.44	-3.85	MWD
609.00	2.60	228.20	608.74	-13.26	-6.73	11.71	0.43	0.33	6.37	MWD
699.00	2.50	242.20	698.66	-15.53	-9.99	15.62	0.70	-0.11	15.56	MWD
790.00	2.50	244.20	789.57	-17.32	-13.53	19.59	0.10	0.00	2.20	MWD
881.00	2.30	241.40	880.49	-19.06	-16.92	23.40	0.25	-0.22	-3.08	MWD
972.00	2.30	238.90	971.42	-20.88	-20.09	27.03	0.11	0.00	-2.75	MWD
1063.00	2.50	238.20	1062.34	-22.87	-23.34	30.82	0.22	0.22	-0.77	MWD
1140.00	2.80	237.50	1139.25	-24.76	-26.35	34.35	0.39	0.39	-0.91	MWD
1194.00	3.20	237.80	1193.18	-26.28	-28.74	37.16	0.74	0.74	0.56	MWD
1285.00	4.00	243.50	1284.00	-29.05	-33.73	42.85	0.96	0.88	6.26	MWD
1376.00	5.10	244.20	1374.71	-32.22	-40.21	50.07	1.21	1.21	0.77	MWD
1467.00	4.80	245.60	1465.37	-35.56	-47.32	57.92	0.36	-0.33	1.54	MWD
1558.00	6.00	245.90	1555.97	-39.07	-55.13	66.48	1.32	1.32	0.33	MWD
1649.00	6.20	247.00	1646.45	-42.93	-63.99	76.15	0.25	0.22	1.21	MWD
1739.00	6.70	248.70	1735.88	-46.74	-73.36	86.24	0.59	0.56	1.89	MWD

# Allis-Chalmers Energy, Inc.

## Survey Report

<b>Company:</b> ANADARKO PETROLEUM <b>Field:</b> Weld County, CO <b>Site:</b> Varra 16-32 Pad <b>Well:</b> 37-32 <b>Wellpath:</b> Sidetrack	<b>Date:</b> 02/06/2011 <b>Co-ordinate(NE) Reference:</b> Well: 37-32, Grid North <b>Vertical (TVD) Reference:</b> SITE 4848.0 <b>Section (VS) Reference:</b> Well (0.00N,0.00E,244.97Azi) <b>Survey Calculation Method:</b> Minimum Curvature	<b>Time:</b> 08:07:18 <b>Page:</b> 2 <b>Db:</b> Sybase
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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
1830.00	7.60	245.20	1826.17	-51.19	-83.77	97.56	1.10	0.99	-3.85	MWD
1921.00	7.90	245.20	1916.34	-56.34	-94.91	109.83	0.33	0.33	0.00	MWD
2012.00	8.60	247.30	2006.40	-61.59	-106.86	122.88	0.84	0.77	2.31	MWD
2103.00	10.00	245.20	2096.20	-67.53	-120.31	137.58	1.58	1.54	-2.31	MWD
2194.00	10.60	241.70	2185.74	-74.81	-134.85	153.84	0.95	0.66	-3.85	MWD
2284.00	11.40	244.20	2274.08	-82.61	-150.15	171.00	1.03	0.89	2.78	MWD
2375.00	12.50	245.60	2363.11	-90.59	-167.22	189.84	1.25	1.21	1.54	MWD
2465.00	14.30	248.40	2450.66	-98.70	-186.42	210.68	2.13	2.00	3.11	MWD
2556.00	14.30	248.00	2538.84	-107.05	-207.29	233.12	0.11	0.00	-0.44	MWD
2647.00	14.10	247.00	2627.06	-115.59	-227.91	255.42	0.35	-0.22	-1.10	MWD
2738.00	14.30	249.10	2715.28	-123.93	-248.62	277.70	0.61	0.22	2.31	MWD
2829.00	13.50	247.70	2803.61	-131.97	-268.94	299.52	0.95	-0.88	-1.54	MWD
2920.00	14.10	247.00	2891.98	-140.33	-288.97	321.21	0.68	0.66	-0.77	MWD
3010.00	13.50	247.00	2979.39	-148.72	-308.74	342.66	0.67	-0.67	0.00	MWD
3101.00	13.20	246.30	3067.93	-157.05	-328.03	363.67	0.37	-0.33	-0.77	MWD
3192.00	13.40	248.70	3156.49	-165.06	-347.37	384.58	0.65	0.22	2.64	MWD
3283.00	13.00	246.30	3245.08	-173.00	-366.56	405.33	0.75	-0.44	-2.64	MWD
3374.00	12.50	246.30	3333.84	-181.07	-384.95	425.41	0.55	-0.55	0.00	MWD
3465.00	13.20	244.90	3422.56	-189.44	-403.38	445.65	0.84	0.77	-1.54	MWD
3555.00	12.70	245.20	3510.27	-197.95	-421.66	465.81	0.56	-0.56	0.33	MWD
3646.00	13.50	247.30	3598.90	-206.24	-440.54	486.43	1.02	0.88	2.31	MWD
3739.00	12.80	259.60	3689.48	-212.29	-460.70	507.25	3.10	-0.75	13.23	MWD
3830.00	11.60	288.10	3778.50	-211.27	-479.32	523.70	6.68	-1.32	31.32	MWD
3920.00	9.90	280.00	3866.93	-207.11	-495.55	536.64	2.52	-1.89	-9.00	MWD
4012.00	8.80	262.80	3957.72	-206.62	-510.32	549.81	3.25	-1.20	-18.70	MWD
4102.00	8.60	254.40	4046.69	-209.29	-523.63	563.01	1.43	-0.22	-9.33	MWD
4193.00	9.20	242.80	4136.60	-214.45	-536.66	576.99	2.08	0.66	-12.75	MWD
4284.00	9.70	238.20	4226.37	-221.81	-549.64	591.87	0.99	0.55	-5.05	MWD
4375.00	9.30	245.60	4316.12	-228.89	-562.85	606.84	1.41	-0.44	8.13	MWD
4465.00	10.00	241.40	4404.85	-235.64	-576.34	621.91	1.10	0.78	-4.67	MWD
4557.00	9.20	246.60	4495.56	-242.38	-590.10	637.23	1.28	-0.87	5.65	MWD
4647.00	9.30	234.70	4584.40	-249.44	-602.64	651.58	2.12	0.11	-13.22	MWD
4738.00	9.30	233.60	4674.20	-258.05	-614.56	666.03	0.20	0.00	-1.21	MWD
4829.00	10.70	240.00	4763.82	-266.64	-627.80	681.65	1.96	1.54	7.03	MWD
4920.00	9.70	238.60	4853.38	-274.86	-641.66	697.69	1.13	-1.10	-1.54	MWD
5011.00	8.80	243.50	4943.20	-281.96	-654.43	712.27	1.31	-0.99	5.38	MWD
5101.00	7.60	245.60	5032.28	-287.49	-666.01	725.10	1.37	-1.33	2.33	MWD
5192.00	6.90	244.90	5122.55	-292.30	-676.44	736.58	0.78	-0.77	-0.77	MWD
5282.00	6.90	244.20	5211.90	-296.94	-686.20	747.39	0.09	0.00	-0.78	MWD
5373.00	5.80	248.00	5302.34	-301.04	-695.39	757.45	1.29	-1.21	4.18	MWD
5464.00	5.50	243.80	5392.90	-304.69	-703.57	766.40	0.56	-0.33	-4.62	MWD
5555.00	4.90	244.50	5483.52	-308.29	-710.99	774.65	0.66	-0.66	0.77	MWD
5588.01	4.65	245.19	5516.42	-309.46	-713.47	777.40	0.79	-0.77	2.09	Top of Fish
5646.00	4.20	246.60	5574.23	-311.29	-717.55	781.87	0.79	-0.77	2.43	MWD
5736.00	3.70	241.70	5664.02	-313.97	-723.13	788.06	0.67	-0.56	-5.44	MWD
5827.00	3.50	245.20	5754.84	-316.53	-728.24	793.77	0.33	-0.22	3.85	MWD
5918.00	2.80	240.00	5845.70	-318.81	-732.69	798.76	0.83	-0.77	-5.71	MWD
6009.00	2.80	248.00	5936.59	-320.75	-736.67	803.20	0.43	0.00	8.79	MWD
6100.00	2.50	250.20	6027.50	-322.26	-740.60	807.39	0.35	-0.33	2.42	MWD
6190.00	2.10	245.90	6117.42	-323.59	-743.95	811.00	0.48	-0.44	-4.78	MWD
6281.00	1.90	245.60	6208.37	-324.90	-746.85	814.17	0.22	-0.22	-0.33	MWD
6372.00	1.80	264.20	6299.32	-325.67	-749.64	817.03	0.67	-0.11	20.44	MWD
6462.00	0.90	198.90	6389.30	-326.48	-751.28	818.85	1.82	-1.00	-72.56	MWD
6599.00	0.50	233.30	6526.29	-327.85	-752.11	820.19	0.41	-0.29	25.11	MWD

# Allis-Chalmers Energy, Inc.

## Survey Report

**Company:** ANADARKO PETROLEUM  
**Field:** Weld County, CO  
**Site:** Varra 16-32 Pad  
**Well:** 37-32  
**Wellpath:** Sidetrack

**Date:** 02/06/2011      **Time:** 08:07:18      **Page:** 3

**Co-ordinate(NE) Reference:** Well: 37-32, Grid North

**Vertical (TVD) Reference:** SITE 4848.0

**Section (VS) Reference:** Well (0.00N,0.00E,244.97Azi)

**Survey Calculation Method:** Minimum Curvature      **Db:** Sybase

## 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
6735.00	1.10	293.70	6662.28	-327.68	-753.78	821.63	0.70	0.44	44.41	MWD
6871.00	0.70	20.20	6798.27	-326.38	-754.69	821.90	0.93	-0.29	63.60	MWD
7007.00	0.20	221.70	6934.26	-325.78	-754.56	821.53	0.65	-0.37	-116.54	MWD
7143.00	0.40	112.30	7070.26	-326.13	-754.28	821.42	0.37	0.15	-80.44	MWD
7279.00	1.20	211.50	7206.25	-327.53	-754.58	822.29	0.97	0.59	72.94	MWD
7416.00	1.90	113.00	7343.22	-329.64	-753.24	821.97	1.75	0.51	-71.90	MWD
7552.00	3.20	104.30	7479.08	-331.46	-747.49	817.52	0.99	0.96	-6.40	MWD
7688.00	2.50	96.90	7614.91	-332.75	-740.86	812.07	0.58	-0.51	-5.44	MWD
7824.00	2.10	102.10	7750.80	-333.63	-735.48	807.57	0.33	-0.29	3.82	MWD
8020.00	2.10	102.10	7946.67	-335.13	-728.46	801.84	0.00	0.00	0.00	37-32 ST BHL

## Targets

[illegible]