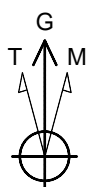


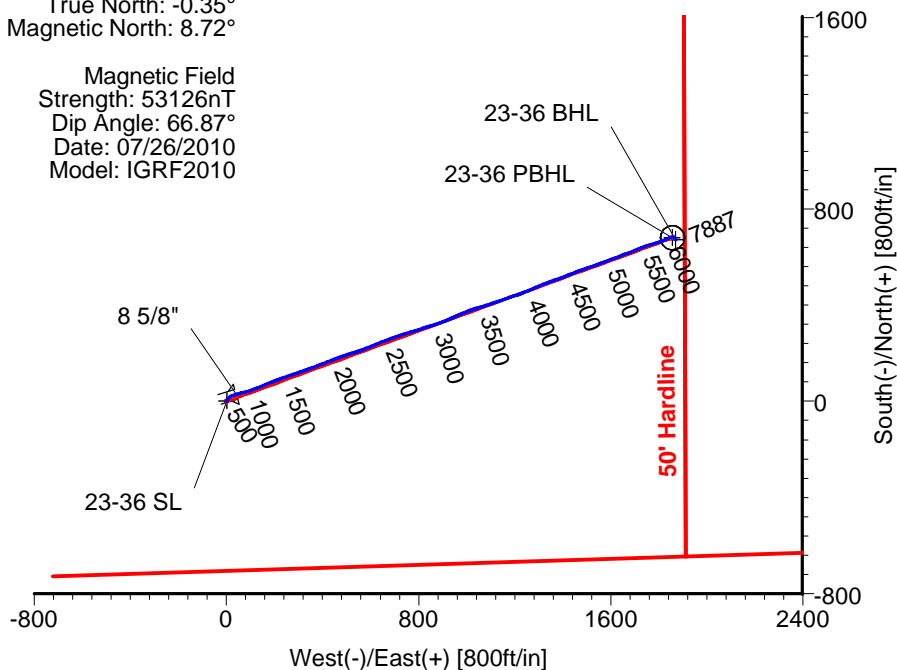
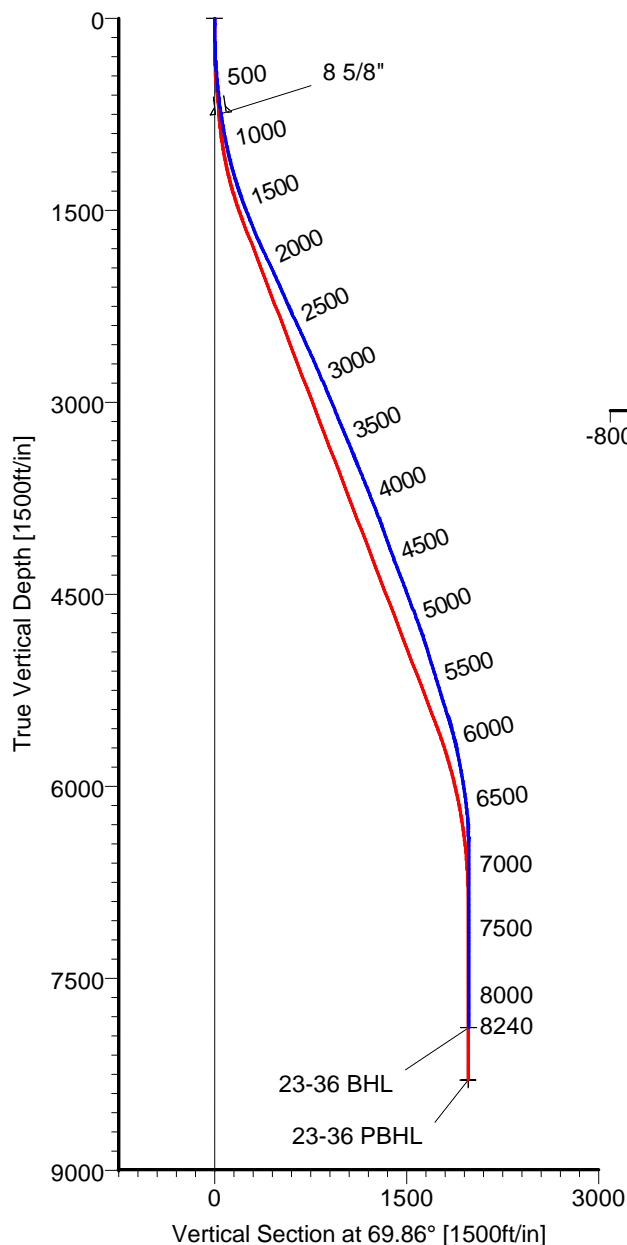
# ANADARKO PETROLEUM

Field: Weld County, CO  
Site: Vogl 13-36 Pad  
Well: 23-36  
Wellpath: Original Hole



Azimuths to Grid North  
True North:  $-0.35^{\circ}$   
Magnetic North:  $8.72^{\circ}$

Magnetic Field  
Strength: 53126nT  
Dip Angle:  $66.87^{\circ}$   
Date: 07/26/2010  
Model: IGRF2010



## CASING DETAILS

No.	TVD	MD	Name	Size
1	742.52	745.00	8 5/8"	8.625

## LEGEND

- 23-36,Original Hole,Plan #1
- Original Hole

## TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Latitude	Longitude	Shape
23-36 SL	0.00	0.00	0.00	40°10'37.546N	104°57'29.031W	Point
23-36 BHL	7886.98	673.21	1869.57	40°10'44.085N	104°57'04.891W	Point
23-36 PBHL	8295.00	681.36	1857.89	40°10'44.167N	104°57'05.041W	Circle (Radius: 50)

Wellpath: (23-36/Original Hole)

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> Vogl 13-36 Pad <b>Well:</b> 23-36 <b>Wellpath:</b> Original Hole	<b>Date:</b> 09/12/2010 <b>Co-ordinate(NE) Reference:</b> <b>Vertical (TVD) Reference:</b> <b>Section (VS) Reference:</b> <b>Survey Calculation Method:</b>	<b>Time:</b> 09:47:45 <b>Well:</b> 23-36, Grid North <b>4817'GL+13'KB</b> 4830.0 <b>Well (0.00N,0.00E,69.86Azi)</b> <b>Minimum Curvature</b>	<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
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<b>Site:</b> Vogl 13-36 Pad  <b>Site Position:</b> <b>From:</b> Geographic <b>Position Uncertainty:</b> 0.00 ft <b>Ground Level:</b> 4817.00 ft	<b>Northing:</b> 1307840.32 ft <b>Easting:</b> 3151437.43 ft  <b>Latitude:</b> 40 10 37.704 N <b>Longitude:</b> 104 57 29.016 W <b>North Reference:</b> Grid <b>Grid Convergence:</b> 0.35 deg
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<b>Well:</b> 23-36  <b>Well Position:</b> +N/-S -15.98 ft <b>+E/-W</b> -1.05 ft <b>Position Uncertainty:</b> 0.00 ft	<b>Slot Name:</b> 23-36  <b>Latitude:</b> 40 10 37.546 N <b>Longitude:</b> 104 57 29.031 W
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<b>Wellpath:</b> Original Hole  <b>Current Datum:</b> 4817'GL+13'KB <b>Magnetic Data:</b> 07/26/2010 <b>Field Strength:</b> 53126 nT <b>Vertical Section:</b> Depth From (TVD) ft	<b>Drilled From:</b> Surface <b>Tie-on Depth:</b> 0.00 ft <b>Above System Datum:</b> Mean Sea Level <b>Declination:</b> 9.07 deg <b>Mag Dip Angle:</b> 66.87 deg <b>+N/-S</b> ft <b>+E/-W</b> ft <b>Direction</b> deg
0.00	0.00

<b>Survey Program for Definitive Wellpath</b>			
<b>Date:</b> 09/12/2010	<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>
76.00	8195.00	Survey #1 (76.00-8195.00)	MWD
8240.00	8240.00	Survey #2 (8240.00-8240.00)	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
76.00	1.60	9.40	75.99	1.05	0.17	0.52	2.11	2.11	0.00	MWD
138.00	1.80	18.60	137.96	2.82	0.63	1.56	0.54	0.32	14.84	MWD
198.00	2.30	7.70	197.92	4.91	1.09	2.71	1.05	0.83	-18.17	MWD
259.00	2.80	22.10	258.86	7.50	1.81	4.28	1.33	0.82	23.61	MWD
319.00	3.20	41.80	318.78	10.11	3.48	6.75	1.83	0.67	32.83	MWD
384.00	4.20	47.00	383.65	13.09	6.43	10.54	1.62	1.54	8.00	MWD
475.00	5.30	56.90	474.34	17.65	12.39	17.71	1.50	1.21	10.88	MWD
566.00	6.30	61.80	564.87	22.31	20.31	26.75	1.23	1.10	5.38	MWD
657.00	6.90	75.50	655.27	26.04	30.00	37.13	1.85	0.66	15.05	MWD
695.00	7.40	73.10	692.98	27.32	34.55	41.85	1.53	1.32	-6.32	MWD
785.00	8.60	72.70	782.10	31.01	46.52	54.35	1.33	1.33	-0.44	MWD
878.00	10.40	77.30	873.82	34.92	61.35	69.62	2.10	1.94	4.95	MWD
969.00	11.30	72.40	963.19	39.42	77.86	86.68	1.42	0.99	-5.38	MWD
1060.00	13.00	72.00	1052.15	45.28	96.10	105.81	1.87	1.87	-0.44	MWD
1150.00	14.80	69.50	1139.51	52.43	116.49	127.43	2.11	2.00	-2.78	MWD
1241.00	16.40	70.60	1227.16	60.77	139.50	151.90	1.79	1.76	1.21	MWD
1332.00	17.80	66.00	1314.14	70.70	164.33	178.62	2.14	1.54	-5.05	MWD
1423.00	19.70	69.90	1400.31	81.63	191.44	207.84	2.50	2.09	4.29	MWD
1513.00	21.30	69.50	1484.61	92.57	221.00	239.36	1.78	1.78	-0.44	MWD
1604.00	21.60	71.70	1569.30	103.61	252.38	272.63	0.94	0.33	2.42	MWD
1695.00	22.50	71.30	1653.65	114.46	284.78	306.78	1.00	0.99	-0.44	MWD

# Allis-Chalmers Energy, Inc.

## Survey Report

<b>Company:</b> ANADARKO PETROLEUM <b>Field:</b> Weld County, CO <b>Site:</b> Vogl 13-36 Pad <b>Well:</b> 23-36 <b>Wellpath:</b> Original Hole	<b>Date:</b> 09/12/2010 <b>Co-ordinate(NE) Reference:</b> Well: 23-36, Grid North <b>Vertical (TVD) Reference:</b> 4817'GL+13'KB 4830.0 <b>Section (VS) Reference:</b> Well (0.00N,0.00E,69.86Azi) <b>Survey Calculation Method:</b> Minimum Curvature	<b>Time:</b> 09:47:45 <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
1786.00	23.80	70.60	1737.32	126.14	318.59	342.54	1.46	1.43	-0.77	MWD
1876.00	25.30	69.20	1819.18	139.00	353.70	379.93	1.79	1.67	-1.56	MWD
1967.00	25.50	69.50	1901.38	152.76	390.23	418.96	0.26	0.22	0.33	MWD
2058.00	25.50	68.80	1983.52	166.71	426.84	458.14	0.33	0.00	-0.77	MWD
2148.00	24.30	69.20	2065.15	180.29	462.21	496.03	1.35	-1.33	0.44	MWD
2239.00	23.20	72.00	2148.45	192.48	496.76	532.66	1.73	-1.21	3.08	MWD
2330.00	24.30	73.80	2231.74	203.24	531.79	569.26	1.45	1.21	1.98	MWD
2421.00	25.20	69.20	2314.39	215.35	567.89	607.31	2.34	0.99	-5.05	MWD
2512.00	25.50	67.40	2396.63	229.75	604.08	646.25	0.91	0.33	-1.98	MWD
2602.00	24.80	68.50	2478.10	244.12	639.53	684.48	0.94	-0.78	1.22	MWD
2693.00	24.30	69.50	2560.87	257.67	674.83	722.28	0.71	-0.55	1.10	MWD
2784.00	23.80	71.30	2643.97	270.11	709.76	759.36	0.98	-0.55	1.98	MWD
2875.00	23.40	73.10	2727.36	281.25	744.44	795.76	0.91	-0.44	1.98	MWD
2966.00	23.80	72.00	2810.75	292.18	779.19	832.15	0.65	0.44	-1.21	MWD
3057.00	23.10	72.00	2894.23	303.37	813.63	868.34	0.77	-0.77	0.00	MWD
3148.00	22.50	74.50	2978.12	313.54	847.39	903.53	1.25	-0.66	2.75	MWD
3239.00	22.50	71.00	3062.20	323.86	880.63	938.30	1.47	0.00	-3.85	MWD
3329.00	23.10	68.50	3145.17	335.94	913.35	973.17	1.27	0.67	-2.78	MWD
3420.00	23.40	64.30	3228.79	350.32	946.24	1009.00	1.85	0.33	-4.62	MWD
3511.00	22.50	67.80	3312.59	364.74	978.65	1044.39	1.80	-0.99	3.85	MWD
3602.00	21.50	68.80	3396.96	377.35	1010.32	1078.47	1.17	-1.10	1.10	MWD
3693.00	22.50	74.50	3481.34	388.03	1042.65	1112.50	2.59	1.10	6.26	MWD
3785.00	22.40	71.70	3566.37	398.24	1076.25	1147.56	1.17	-0.11	-3.04	MWD
3875.00	22.70	72.40	3649.49	408.88	1109.09	1182.05	0.45	0.33	0.78	MWD
3967.00	21.60	71.30	3734.70	419.67	1142.05	1216.72	1.28	-1.20	-1.20	MWD
4057.00	21.60	71.00	3818.38	430.38	1173.40	1249.84	0.12	0.00	-0.33	MWD
4148.00	21.10	71.30	3903.13	441.08	1204.76	1282.96	0.56	-0.55	0.33	MWD
4239.00	19.20	68.80	3988.56	451.75	1234.22	1314.30	2.29	-2.09	-2.75	MWD
4330.00	19.40	66.00	4074.45	463.31	1261.98	1344.34	1.04	0.22	-3.08	MWD
4421.00	20.20	68.10	4160.07	475.31	1290.37	1375.12	1.18	0.88	2.31	MWD
4512.00	20.80	67.80	4245.31	487.28	1319.90	1406.97	0.67	0.66	-0.33	MWD
4603.00	21.60	69.90	4330.15	499.14	1350.59	1439.87	1.21	0.88	2.31	MWD
4694.00	20.60	70.60	4415.05	510.21	1381.42	1472.63	1.13	-1.10	0.77	MWD
4785.00	20.80	68.50	4500.17	521.45	1411.56	1504.79	0.84	0.22	-2.31	MWD
4875.00	20.60	68.80	4584.36	533.03	1441.19	1536.60	0.25	-0.22	0.33	MWD
4966.00	20.90	70.20	4669.46	544.32	1471.39	1568.83	0.64	0.33	1.54	MWD
5057.00	20.10	70.60	4754.70	555.01	1501.41	1600.70	0.89	-0.88	0.44	MWD
5148.00	18.30	71.30	4840.63	564.79	1529.69	1630.62	1.99	-1.98	0.77	MWD
5239.00	17.10	67.80	4927.33	574.43	1555.61	1658.28	1.76	-1.32	-3.85	MWD
5329.00	16.70	70.60	5013.44	583.72	1580.06	1684.43	1.01	-0.44	3.11	MWD
5420.00	17.60	71.00	5100.39	592.54	1605.40	1711.26	1.00	0.99	0.44	MWD
5511.00	17.10	67.40	5187.26	602.16	1630.76	1738.38	1.30	-0.55	-3.96	MWD
5602.00	16.50	71.30	5274.37	611.45	1655.35	1764.67	1.40	-0.66	4.29	MWD
5692.00	17.60	69.50	5360.42	620.31	1680.21	1791.05	1.36	1.22	-2.00	MWD
5783.00	18.70	68.10	5446.89	630.57	1706.63	1819.39	1.30	1.21	-1.54	MWD
5874.00	15.30	67.40	5533.90	640.63	1731.26	1845.98	3.74	-3.74	-0.77	MWD
5965.00	14.80	74.50	5621.79	648.35	1753.54	1869.56	2.10	-0.55	7.80	MWD
6056.00	12.10	74.80	5710.28	653.96	1773.95	1890.65	2.97	-2.97	0.33	MWD
6147.00	11.10	68.50	5799.43	659.67	1791.31	1908.91	1.77	-1.10	-6.92	MWD
6238.00	10.40	68.50	5888.83	665.89	1807.10	1925.88	0.77	-0.77	0.00	MWD
6329.00	9.20	67.80	5978.50	671.65	1821.48	1941.36	1.33	-1.32	-0.77	MWD
6419.00	7.90	71.00	6067.50	676.38	1833.99	1954.73	1.54	-1.44	3.56	MWD
6510.00	6.30	71.00	6157.80	680.04	1844.62	1965.98	1.76	-1.76	0.00	MWD

# Allis-Chalmers Energy, Inc.

## Survey Report

**Company:** ANADARKO PETROLEUM  
**Field:** Weld County, CO  
**Site:** Vogl 13-36 Pad  
**Well:** 23-36  
**Wellpath:** Original Hole

<b>Date:</b>	09/12/2010	<b>Time:</b>	09:47:45	<b>Page:</b>	3
<b>Co-ordinate(NE) Reference:</b>	Well: 23-36, Grid North				
<b>Vertical (TVD) Reference:</b>	4817'GL+13'KB 4830.0				
<b>Section (VS) Reference:</b>	Well (0.00N,0.00E,69.86Azi)				
<b>Survey Calculation Method:</b>	Minimum Curvature			<b>Db:</b>	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
6601.00	4.90	73.40	6248.36	682.78	1853.07	1974.85	1.56	-1.54	2.64	MWD
6692.00	2.50	73.10	6339.16	684.47	1858.69	1980.71	2.64	-2.64	-0.33	MWD
6783.00	0.70	100.50	6430.13	684.94	1861.14	1983.17	2.09	-1.98	30.11	MWD
6873.00	0.90	129.30	6520.12	684.40	1862.22	1984.00	0.49	0.22	32.00	MWD
6964.00	1.20	145.10	6611.10	683.16	1863.32	1984.61	0.46	0.33	17.36	MWD
7146.00	1.60	137.40	6793.05	679.73	1866.13	1986.07	0.24	0.22	-4.23	MWD
7328.00	0.90	155.30	6975.00	676.56	1868.45	1987.15	0.44	-0.38	9.84	MWD
7510.00	0.50	297.40	7157.00	675.63	1868.34	1986.73	0.73	-0.22	78.08	MWD
7692.00	0.20	124.40	7338.99	675.81	1867.90	1986.38	0.38	-0.16	-95.05	MWD
7874.00	0.20	125.40	7520.99	675.45	1868.42	1986.74	0.00	0.00	0.55	MWD
8056.00	0.30	153.90	7702.99	674.84	1868.89	1986.97	0.09	0.05	15.66	MWD
8195.00	0.70	158.10	7841.99	673.72	1869.37	1987.03	0.29	0.29	3.02	MWD
8240.00	0.70	158.10	7886.98	673.21	1869.57	1987.05	0.00	0.00	0.00	23-36 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		
23-36 SL			0.00	0.00	0.00	1307824.34	3151436.38	40	10	37.546	N	104	57	29.031	W
23-36 BHL			7886.98	673.21	1869.57	1308497.55	3153305.95	40	10	44.085	N	104	57	4.891	W
23-36 PBHL			8295.00	681.36	1857.89	1308505.70	3153294.27	40	10	44.167	N	104	57	5.041	W
-Circle (Radius: 50)															