

# ANADARKO PETROLEUM

Field: Weld County, CO  
Site: Wittemeyr 17-2 Pad  
Well: 24-2  
Wellpath: Original Hole

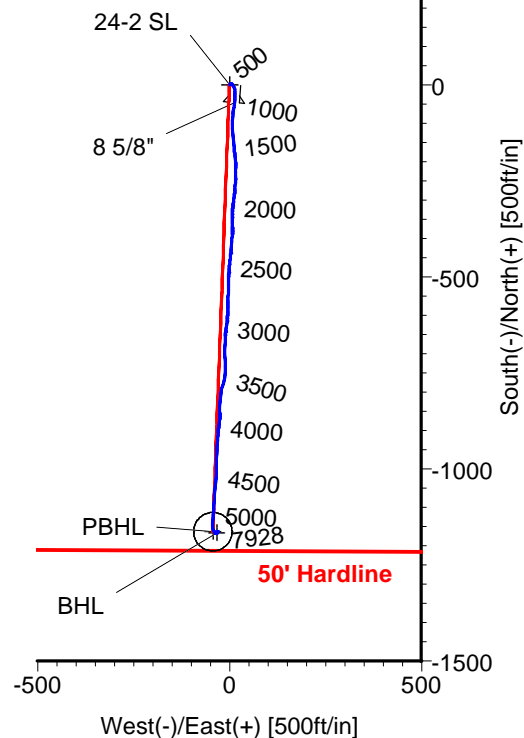
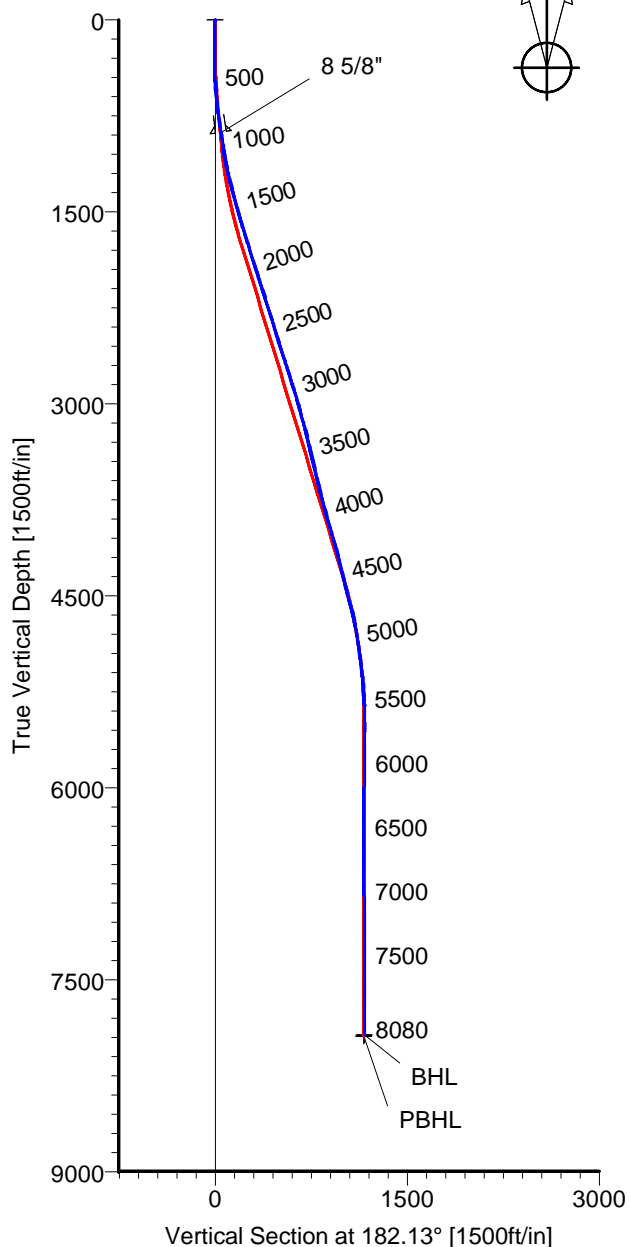


500



Azimuths to Grid North  
True North:  $-0.42^{\circ}$   
Magnetic North:  $8.64^{\circ}$

Magnetic Field  
Strength: 53167nT  
Dip Angle:  $66.89^{\circ}$   
Date: 04/01/2010  
Model: IGRF2010



## CASING DETAILS

No.	TVD	MD	Name	Size
1	877.74	881.00	8 5/8"	8.620

## LEGEND

— 24-2,Original Hole,Plan #1  
— Original Hole

## TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Latitude	Longitude	Shape
24-2 SL	0.00	0.00	0.00	40°10'13.368N	104°51'10.188W	Point
BHL	7927.91	-1165.86	-33.24	40°10'01.849N	104°51'10.726W	Point
PBHL	7938.00	-1163.46	-43.27	40°10'01.874N	104°51'10.855W	Circle (Radius: 50)

Wellpath: (24-2/Original Hole)

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

Created By: Ivonne Gonzalez

Date: 06/15/2010



DIRECTIONAL  
DRILLING SERVICES

# Allis-Chalmers Energy, Inc.

## Survey Report

<b>Company:</b> ANADARKO PETROLEUM		<b>Date:</b> 06/15/2010	<b>Time:</b> 11:17:15	<b>Page:</b> 1
<b>Field:</b> Weld County, CO		<b>Co-ordinate(NE) Reference:</b> Well: 24-2, Grid North		
<b>Site:</b> Wittemeyr 17-2 Pad		<b>Vertical (TVD) Reference:</b> Est. 4841'GL+16'KB 4857.0		
<b>Well:</b> 24-2		<b>Section (VS) Reference:</b> Well (0.00N,0.00E,182.13Azi)		
<b>Wellpath:</b> Original Hole		<b>Survey Calculation Method:</b> Minimum Curvature <b>Db:</b> Adapti		

<b>Field:</b> Weld County, CO	
<b>Map System:</b> US State Plane Coordinate System 1983	<b>Map Zone:</b> Colorado, Northern Zone
<b>Geo Datum:</b> GRS 1980	<b>Coordinate System:</b> Well Centre
<b>Sys Datum:</b> Mean Sea Level	<b>Geomagnetic Model:</b> IGRF2010

<b>Site:</b> Wittemeyr 17-2 Pad centered on the 24-2	
<b>Site Position:</b>	<b>Northing:</b> 1305574.98 ft
<b>From:</b> Geographic	<b>Latitude:</b> 40 10 13.368 N
<b>Position Uncertainty:</b> 0.00 ft	<b>Longitude:</b> 104 51 10.188 W
<b>Ground Level:</b> 4841.00 ft	<b>North Reference:</b> Grid
	<b>Grid Convergence:</b> 0.42 deg

<b>Well:</b> 24-2	<b>Slot Name:</b> 24-2
<b>Well Position:</b> +N/-S 0.00 ft	<b>Latitude:</b> 40 10 13.368 N
+E/-W 0.00 ft	<b>Longitude:</b> 104 51 10.188 W
<b>Position Uncertainty:</b> 0.00 ft	

<b>Wellpath:</b> Original Hole		<b>Drilled From:</b> Surface
<b>Current Datum:</b> Est. 4841'GL+16'KB	<b>Height:</b> 4857.00 ft	<b>Tie-on Depth:</b> 0.00 ft
<b>Magnetic Data:</b> 04/01/2010		<b>Above System Datum:</b> Mean Sea Level
<b>Field Strength:</b> 53167 nT		<b>Declination:</b> 9.06 deg
<b>Vertical Section: Depth From (TVD)</b>	+N/-S	<b>Mag Dip Angle:</b> 66.89 deg
ft	ft	<b>+E/-W</b>
		<b>Direction</b>
		deg
0.00	0.00	0.00 182.13

<b>Survey Program for Definitive Wellpath</b>			<b>Version:</b> 0	
<b>Date:</b> 06/15/2010	<b>Validated:</b> No	<b>Survey</b>	<b>Toolcode</b>	<b>Tool Name</b>
<b>Actual From</b> ft	<b>To</b> ft			
262.00	8035.00	Survey #1 (262.00-8035.00)	MWD	Std MWD
8080.00	8080.00	Survey #2 (8080.00-8080.00)	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
262.00	1.20	41.80	261.98	2.05	1.83	-2.11	0.46	0.46	0.00	MWD
291.00	1.20	51.30	290.97	2.46	2.27	-2.54	0.69	0.00	32.76	MWD
319.00	1.20	69.50	318.97	2.75	2.77	-2.85	1.36	0.00	65.00	MWD
349.00	1.60	87.10	348.96	2.88	3.48	-3.01	1.94	1.33	58.67	MWD
378.00	1.90	101.90	377.95	2.80	4.36	-2.96	1.86	1.03	51.03	MWD
409.00	2.60	118.80	408.92	2.36	5.48	-2.56	3.09	2.26	54.52	MWD
440.00	3.30	132.50	439.88	1.41	6.75	-1.66	3.19	2.26	44.19	MWD
469.00	4.10	133.50	468.82	0.14	8.12	-0.44	2.77	2.76	3.45	MWD
499.00	4.40	141.30	498.74	-1.50	9.62	1.14	2.17	1.00	26.00	MWD
560.00	5.80	159.20	559.50	-6.21	12.17	5.75	3.45	2.30	29.34	MWD
591.00	5.80	160.90	590.34	-9.15	13.24	8.65	0.55	0.00	5.48	MWD
622.00	6.20	169.40	621.17	-12.28	14.06	11.75	3.14	1.29	27.42	MWD
652.00	6.50	176.10	650.99	-15.56	14.48	15.02	2.66	1.00	22.33	MWD
683.00	7.20	177.10	681.77	-19.26	14.69	18.70	2.29	2.26	3.23	MWD
714.00	7.60	181.70	712.51	-23.24	14.73	22.68	2.30	1.29	14.84	MWD
776.00	8.50	185.20	773.90	-31.91	14.20	31.36	1.65	1.45	5.65	MWD
831.00	8.60	184.80	828.29	-40.05	13.48	39.52	0.21	0.18	-0.73	MWD
881.00	8.32	184.80	877.74	-47.38	12.87	46.87	0.56	-0.56	0.00	8 5/8"
921.00	8.10	184.80	917.33	-53.08	12.39	52.58	0.56	-0.56	0.00	MWD
953.00	7.90	189.10	949.02	-57.49	11.85	57.01	1.97	-0.62	13.44	MWD
984.00	6.90	190.80	979.76	-61.43	11.17	60.97	3.30	-3.23	5.48	MWD

# Allis-Chalmers Energy, Inc.

## Survey Report

**Company:** ANADARKO PETROLEUM

**Field:** Weld County, CO

**Site:** Wittemeyr 17-2 Pad

**Well:** 24-2

**Wellpath:** Original Hole

**Date:** 06/15/2010

**Time:** 11:17:15

**Page:** 2

**Co-ordinate(NE) Reference:** Well: 24-2, Grid North

**Vertical (TVD) Reference:** Est. 4841'GL+16'KB 4857.0

**Section (VS) Reference:** Well (0.00N,0.00E,182.13Azi)

**Survey Calculation Method:** Minimum Curvature

**Db:** 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
1048.00	8.80	187.70	1043.16	-70.06	9.79	69.64	3.04	2.97	-4.84	MWD
1111.00	11.00	187.30	1105.22	-80.79	8.38	80.43	3.49	3.49	-0.63	MWD
1174.00	13.00	183.10	1166.84	-93.83	7.23	93.50	3.46	3.17	-6.67	MWD
1206.00	12.80	182.00	1198.03	-100.97	6.92	100.64	0.99	-0.62	-3.44	MWD
1270.00	13.70	177.50	1260.33	-115.63	7.00	115.29	2.14	1.41	-7.03	MWD
1333.00	15.10	171.10	1321.35	-131.19	8.59	130.78	3.36	2.22	-10.16	MWD
1396.00	16.20	173.90	1382.02	-148.04	10.80	147.53	2.12	1.75	4.44	MWD
1460.00	15.50	175.40	1443.58	-165.44	12.43	164.86	1.27	-1.09	2.34	MWD
1523.00	16.20	172.50	1504.19	-182.54	14.25	181.89	1.68	1.11	-4.60	MWD
1587.00	16.00	177.50	1565.68	-200.21	15.80	199.48	2.19	-0.31	7.81	MWD
1650.00	17.10	181.00	1626.07	-218.14	16.02	217.40	2.36	1.75	5.56	MWD
1713.00	17.60	179.60	1686.21	-236.93	15.93	236.17	1.03	0.79	-2.22	MWD
1777.00	17.40	183.80	1747.25	-256.15	15.36	255.40	2.00	-0.31	6.56	MWD
1840.00	17.20	184.50	1807.40	-274.84	14.00	274.13	0.46	-0.32	1.11	MWD
1903.00	17.20	188.40	1867.58	-293.34	11.91	292.69	1.83	0.00	6.19	MWD
1967.00	18.10	187.30	1928.57	-312.56	9.27	312.00	1.50	1.41	-1.72	MWD
2030.00	17.80	183.10	1988.50	-331.88	7.50	331.38	2.11	-0.48	-6.67	MWD
2094.00	17.20	178.90	2049.54	-351.11	7.16	350.61	2.18	-0.94	-6.56	MWD
2157.00	18.10	178.20	2109.58	-370.21	7.64	369.67	1.47	1.43	-1.11	MWD
2220.00	17.80	184.80	2169.52	-389.59	7.14	389.05	3.26	-0.48	10.48	MWD
2284.00	17.60	183.80	2230.49	-408.99	5.68	408.50	0.57	-0.31	-1.56	MWD
2347.00	17.60	183.80	2290.54	-428.00	4.42	427.54	0.00	0.00	0.00	MWD
2411.00	17.10	187.30	2351.63	-446.99	2.58	446.58	1.81	-0.78	5.47	MWD
2474.00	16.70	185.90	2411.91	-465.18	0.48	464.84	0.91	-0.63	-2.22	MWD
2537.00	17.60	184.50	2472.11	-483.68	-1.20	483.39	1.57	1.43	-2.22	MWD
2601.00	17.10	179.90	2533.20	-502.73	-1.94	502.46	2.28	-0.78	-7.19	MWD
2664.00	17.80	182.00	2593.30	-521.62	-2.26	521.34	1.49	1.11	3.33	MWD
2728.00	18.50	182.40	2654.11	-541.54	-3.03	541.28	1.11	1.09	0.62	MWD
2791.00	18.10	181.70	2713.93	-561.31	-3.74	561.06	0.72	-0.63	-1.11	MWD
2854.00	17.10	181.00	2773.98	-580.35	-4.19	580.11	1.62	-1.59	-1.11	MWD
2917.00	16.50	183.40	2834.29	-598.55	-4.88	598.31	1.46	-0.95	3.81	MWD
2981.00	17.20	187.30	2895.54	-617.00	-6.62	616.82	2.08	1.09	6.09	MWD
3044.00	17.10	187.00	2955.74	-635.44	-8.94	635.33	0.21	-0.16	-0.48	MWD
3108.00	16.20	183.80	3017.06	-653.69	-10.68	653.63	2.01	-1.41	-5.00	MWD
3171.00	15.10	180.60	3077.72	-670.66	-11.34	670.62	2.22	-1.75	-5.08	MWD
3235.00	15.00	182.00	3139.53	-687.27	-11.72	687.23	0.59	-0.16	2.19	MWD
3298.00	14.70	180.70	3200.42	-703.41	-12.10	703.38	0.71	-0.48	-2.06	MWD
3361.00	13.00	175.10	3261.59	-718.47	-11.59	718.40	3.43	-2.70	-8.89	MWD
3425.00	13.90	177.10	3323.84	-733.32	-10.59	733.21	1.58	1.41	3.12	MWD
3488.00	12.70	183.80	3385.15	-747.79	-10.67	747.67	3.10	-1.90	10.63	MWD
3552.00	14.30	190.00	3447.38	-762.59	-12.51	762.53	3.37	2.50	9.69	MWD
3615.00	14.10	197.00	3508.46	-777.59	-16.10	777.66	2.74	-0.32	11.11	MWD
3679.00	13.40	194.00	3570.63	-792.25	-20.17	792.45	1.56	-1.09	-4.69	MWD
3742.00	12.70	187.70	3632.00	-806.19	-22.87	806.49	2.51	-1.11	-10.00	MWD
3806.00	14.80	184.80	3694.17	-821.31	-24.50	821.65	3.45	3.28	-4.53	MWD
3869.00	14.60	179.60	3755.11	-837.27	-25.11	837.63	2.12	-0.32	-8.25	MWD
3933.00	15.00	181.00	3816.98	-853.62	-25.20	853.96	0.84	0.62	2.19	MWD
3997.00	16.90	185.00	3878.52	-871.17	-26.16	871.54	3.43	2.97	6.25	MWD
4059.00	15.80	185.90	3938.01	-888.54	-27.81	888.96	1.82	-1.77	1.45	MWD
4123.00	16.70	184.10	3999.45	-906.38	-29.36	906.85	1.61	1.41	-2.81	MWD
4186.00	16.50	182.70	4059.83	-924.35	-30.43	924.84	0.71	-0.32	-2.22	MWD
4250.00	15.80	185.90	4121.30	-942.09	-31.76	942.62	1.77	-1.09	5.00	MWD
4313.00	14.60	182.40	4182.10	-958.56	-32.97	959.12	2.40	-1.90	-5.56	MWD

# Allis-Chalmers Energy, Inc.

## Survey Report

<b>Company:</b> ANADARKO PETROLEUM	<b>Date:</b> 06/15/2010	<b>Time:</b> 11:17:15	<b>Page:</b> 3
<b>Field:</b> Weld County, CO	<b>Co-ordinate(NE) Reference:</b> Well: 24-2, Grid North		
<b>Site:</b> Wittemeyr 17-2 Pad	<b>Vertical (TVD) Reference:</b> Est. 4841'GL+16'KB 4857.0		
<b>Well:</b> 24-2	<b>Section (VS) Reference:</b> Well (0.00N,0.00E,182.13Azi)		
<b>Wellpath:</b> Original Hole	<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
4376.00	13.60	182.00	4243.20	-973.89	-33.56	974.47	1.59	-1.59	-0.63	MWD
4440.00	14.10	179.20	4305.34	-989.21	-33.71	989.78	1.31	0.78	-4.37	MWD
4503.00	12.80	179.60	4366.61	-1003.86	-33.56	1004.42	2.07	-2.06	0.63	MWD
4567.00	13.60	183.10	4428.92	-1018.47	-33.92	1019.02	1.77	1.25	5.47	MWD
4630.00	14.60	187.30	4490.02	-1033.74	-35.33	1034.34	2.27	1.59	6.67	MWD
4693.00	15.80	184.80	4550.82	-1050.16	-37.05	1050.81	2.17	1.90	-3.97	MWD
4757.00	14.40	184.50	4612.61	-1066.78	-38.41	1067.47	2.19	-2.19	-0.47	MWD
4821.00	12.20	186.00	4674.89	-1081.44	-39.74	1082.17	3.48	-3.44	2.34	MWD
4884.00	10.70	182.70	4736.63	-1093.90	-40.71	1094.66	2.60	-2.38	-5.24	MWD
4916.00	9.90	181.70	4768.12	-1099.62	-40.93	1100.38	2.56	-2.50	-3.12	MWD
4947.00	9.20	185.90	4798.69	-1104.75	-41.26	1105.52	3.18	-2.26	13.55	MWD
5043.00	8.30	183.40	4893.57	-1119.30	-42.46	1120.10	1.02	-0.94	-2.60	MWD
5106.00	8.30	181.30	4955.91	-1128.38	-42.84	1129.20	0.48	0.00	-3.33	MWD
5201.00	6.30	185.20	5050.14	-1140.43	-43.46	1141.26	2.17	-2.11	4.11	MWD
5265.00	6.20	183.10	5113.76	-1147.38	-43.97	1148.22	0.39	-0.16	-3.28	MWD
5328.00	4.90	174.70	5176.46	-1153.46	-43.91	1154.29	2.43	-2.06	-13.33	MWD
5391.00	4.60	151.40	5239.25	-1158.35	-42.45	1159.13	3.08	-0.48	-36.98	MWD
5455.00	3.20	157.10	5303.10	-1162.25	-40.52	1162.96	2.27	-2.19	8.91	MWD
5518.00	1.90	149.00	5366.04	-1164.77	-39.30	1165.42	2.14	-2.06	-12.86	MWD
5582.00	1.20	120.50	5430.01	-1166.02	-38.18	1166.63	1.60	-1.09	-44.53	MWD
5645.00	1.20	153.60	5493.00	-1166.94	-37.32	1167.52	1.09	0.00	52.54	MWD
5709.00	0.40	335.30	5557.00	-1167.34	-37.11	1167.91	2.50	-1.25	-278.59	MWD
5804.00	0.90	43.50	5651.99	-1166.50	-36.74	1167.06	0.88	0.53	71.79	MWD
5899.00	0.50	17.10	5746.98	-1165.56	-36.10	1166.10	0.53	-0.42	-27.79	MWD
5993.00	0.50	71.30	5840.98	-1165.04	-35.59	1165.55	0.48	0.00	57.66	MWD
6088.00	1.20	83.20	5935.97	-1164.79	-34.21	1165.25	0.76	0.74	12.53	MWD
6183.00	0.70	44.90	6030.96	-1164.26	-32.81	1164.67	0.82	-0.53	-40.32	MWD
6278.00	0.70	75.50	6125.95	-1163.70	-31.84	1164.08	0.39	0.00	32.21	MWD
6373.00	0.30	33.30	6220.95	-1163.35	-31.14	1163.70	0.55	-0.42	-44.42	MWD
6468.00	0.50	53.00	6315.95	-1162.89	-30.68	1163.23	0.25	0.21	20.74	MWD
6563.00	0.20	243.20	6410.94	-1162.72	-30.49	1163.05	0.73	-0.32	-178.74	MWD
6690.00	0.50	234.10	6537.94	-1163.14	-31.14	1163.49	0.24	0.24	-7.17	MWD
6785.00	0.50	197.50	6632.94	-1163.78	-31.60	1164.15	0.33	0.00	-38.53	MWD
6881.00	0.00	178.20	6728.94	-1164.18	-31.73	1164.55	0.52	-0.52	0.00	MWD
6976.00	0.70	239.00	6823.94	-1164.48	-32.22	1164.87	0.74	0.74	0.00	MWD
7071.00	0.50	189.40	6918.93	-1165.19	-32.79	1165.60	0.56	-0.21	-52.21	MWD
7166.00	0.50	276.30	7013.93	-1165.55	-33.27	1165.98	0.72	0.00	91.47	MWD
7261.00	0.30	186.90	7108.93	-1165.75	-33.71	1166.20	0.61	-0.21	-94.11	MWD
7356.00	0.50	215.10	7203.92	-1166.34	-33.98	1166.79	0.29	0.21	29.68	MWD
7451.00	0.30	26.20	7298.92	-1166.45	-34.11	1166.91	0.84	-0.21	180.11	MWD
7578.00	0.30	162.00	7425.92	-1166.47	-33.86	1166.92	0.44	0.00	106.93	MWD
7673.00	0.30	195.00	7520.92	-1166.95	-33.85	1167.40	0.18	0.00	34.74	MWD
7800.00	0.50	49.80	7647.92	-1166.91	-33.51	1167.35	0.60	0.16	-114.33	MWD
7894.00	0.30	49.80	7741.92	-1166.49	-33.01	1166.91	0.21	-0.21	0.00	MWD
7989.00	0.30	250.90	7836.92	-1166.41	-33.05	1166.83	0.62	0.00	-167.26	MWD
8035.00	0.50	352.90	7882.92	-1166.25	-33.19	1166.68	1.38	0.43	221.74	MWD
8080.00	0.50	352.90	7927.91	-1165.86	-33.24	1166.29	0.00	0.00	0.00	BHL

### Targets

Name	Description Dip.	Dir.	TVD ft	+N/-S ft	+E/-W ft	Map Northing ft	Map Easting ft	<---- Latitude ----><--- Longitude --->		
24-2 SL			0.00	0.00	0.00	1305574.983180858.79	40 10 13.368 N	104 51 10.188 W		
BHL			7927.91	-1165.86	-33.24	1304409.123180825.55	40 10 1.849 N	104 51 10.726 W		

# Allis-Chalmers Energy, Inc.

## Survey Report

<b>Company:</b> ANADARKO PETROLEUM <b>Field:</b> Weld County, CO <b>Site:</b> Wittemeyr 17-2 Pad <b>Well:</b> 24-2 <b>Wellpath:</b> Original Hole	<b>Date:</b> 06/15/2010 <b>Time:</b> 11:17:15 <b>Page:</b> 4 <b>Co-ordinate(NE) Reference:</b> Well: 24-2, Grid North <b>Vertical (TVD) Reference:</b> Est. 4841'GL+16'KB 4857.0 <b>Section (VS) Reference:</b> Well (0.00N,0.00E,182.13Azi) <b>Survey Calculation Method:</b> Minimum Curvature <b>Db:</b> Adapti
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### 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
PBHL -Circle (Radius: 50)			7938.00	-1163.46	-43.27	1304411.533	180815.51	40	10	1.874	N	104	51 10.855 W

### Casing Points

MD ft	TVD ft	Diameter in	Hole Size in	Name
881.00	877.74	8.620	9.870	8 5/8"