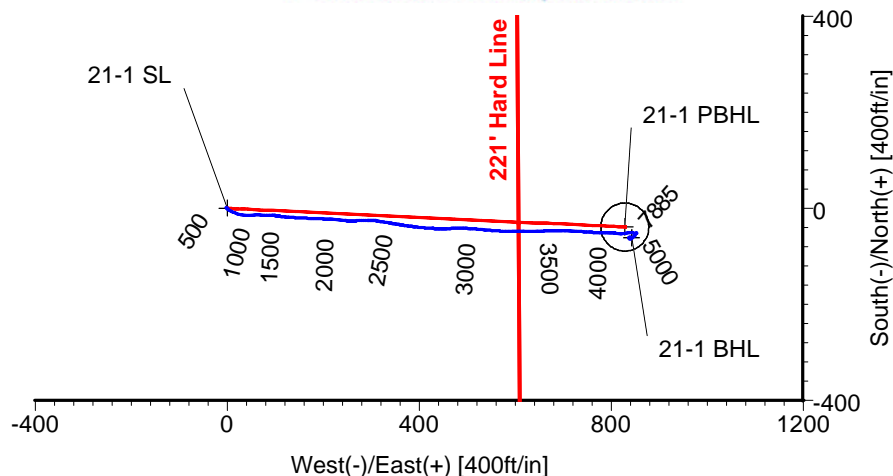
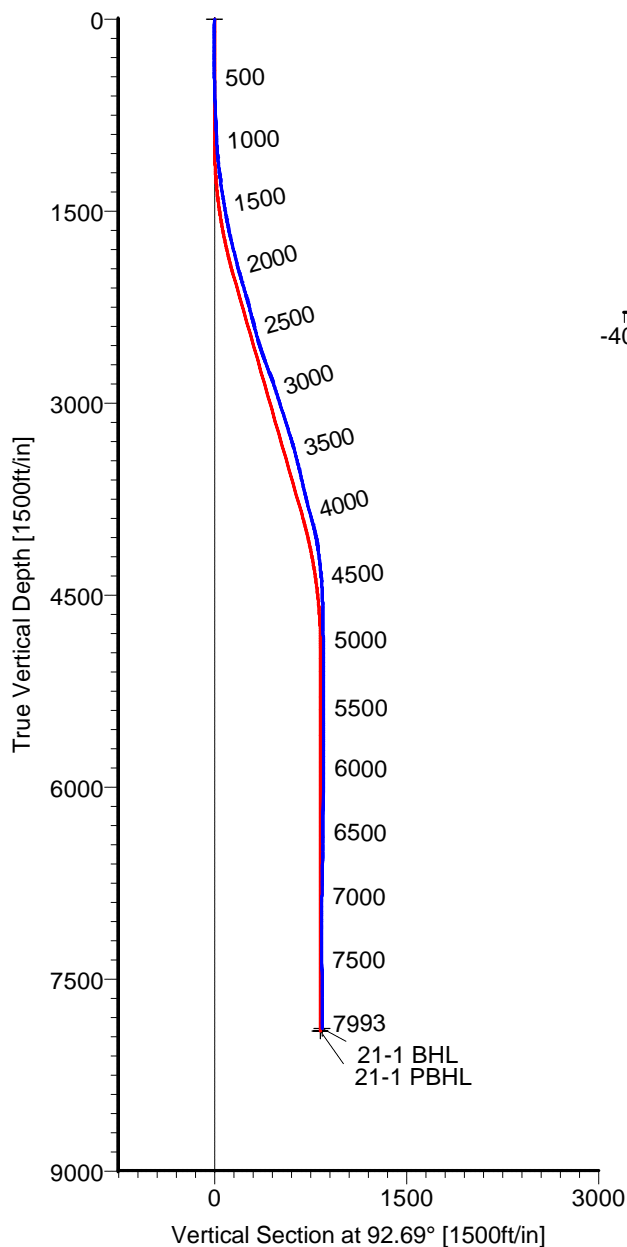


ANADARKO PETROLEUM

Field: Weld County, CO
Site: Bernhardt 3-1 Pad
Well: #21-1
Wellpath: Original Hole



Azimuths to Grid North
True North: -0.43°
Magnetic North: 8.63°

Magnetic Field
Strength: 53251nT
Dip Angle: 67.03°
Date: 5/5/2010
Model: IGRF2010

LEGEND

— #21-1, Original Hole, Plan #1
— Original Hole

TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Latitude	Longitude	Shape
21-1 SL	0.00	0.00	0.00	40°20'42.219N	104°50'28.765W	Point
21-1 BHL	7885.07	-61.45	842.44	40°20'41.550N	104°50'17.890W	Point
21-1 PBHL	7907.00	-38.91	828.14	40°20'41.774N	104°50'18.073W	Circle (Radius: 50)

Wellpath: (#21-1/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

Company: ANADARKO PETROLEUM		Date: 5/31/2010	Time: 10:04:31	Page: 1
Field: Weld County, CO		Co-ordinate(NE) Reference: Well: #21-1, Grid North		
Site: Bernhardt 3-1 Pad		Vertical (TVD) Reference: 4826'GL+13'KB 4839.0		
Well: #21-1		Section (VS) Reference: Well (0.00N,0.00E,92.69Azi)		
Wellpath: Original Hole		Survey Calculation Method: Minimum Curvature Db: Sybase		

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

Site: Bernhardt 3-1 Pad	
Site Position:	Northing: 1369310.76 ft
From: Geographic	Easting: 3183596.38 ft
Position Uncertainty: 0.00 ft	Latitude: 40 20 43.008 N
Ground Level: 4826.00 ft	Longitude: 104 50 28.824 W
	North Reference: Grid
	Grid Convergence: 0.43 deg

Well: #21-1	Slot Name: 21-1
Well Position: +N/-S -79.79 ft	Latitude: 40 20 42.219 N
+E/-W 5.18 ft	Longitude: 104 50 28.765 W
Position Uncertainty: 0.00 ft	

Wellpath: Original Hole		Drilled From: Surface
Current Datum: 4826'GL+13'KB	Height: 4839.00 ft	Tie-on Depth: 0.00 ft
Magnetic Data: 5/5/2010		Above System Datum: Mean Sea Level
Field Strength: 53251 nT		Declination: 9.05 deg
Vertical Section: Depth From (TVD)	+N/-S	Mag Dip Angle: 67.03 deg
ft	ft	+E/-W
		ft
		Direction
		deg
0.00	0.00	0.00
		92.69

Survey Program for Definitive Wellpath			Version: 0	
Date: 5/31/2010	Validated: No	Survey	Toolcode	Tool Name
Actual From	To			
ft	ft			
47.00	7948.00	Survey #1 (47.00-7948.00)	MWD	Std MWD
7993.00	7993.00	Survey #2 (7993.00-7993.00)	Project	Projection

Survey										
MD	Incl	Azim	TVD	+N/-S	+E/-W	VS	DLS	Build	Turn	Tool/Comment
ft	deg	deg	ft	ft	ft	ft	deg/100ft	deg/100ft	deg/100ft	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	TIE LINE
47.00	0.30	292.40	47.00	0.05	-0.11	-0.12	0.64	0.64	0.00	MWD
139.00	0.70	315.60	139.00	0.54	-0.73	-0.75	0.48	0.43	25.22	MWD
229.00	1.00	276.90	228.99	1.03	-1.89	-1.94	0.70	0.33	-43.00	MWD
320.00	0.50	180.30	319.98	0.73	-2.68	-2.72	1.28	-0.55	-106.15	MWD
428.00	1.60	125.80	427.96	-0.63	-1.46	-1.43	1.27	1.02	-50.46	MWD
519.00	1.80	121.20	518.92	-2.11	0.79	0.89	0.27	0.22	-5.05	MWD
609.00	2.30	117.70	608.87	-3.68	3.60	3.77	0.57	0.56	-3.89	MWD
700.00	2.30	118.40	699.79	-5.40	6.82	7.07	0.03	0.00	0.77	MWD
745.00	2.60	116.30	744.75	-6.28	8.53	8.81	0.70	0.67	-4.67	MWD
919.00	2.80	115.60	918.56	-9.87	15.90	16.35	0.12	0.11	-0.40	MWD
1009.00	3.70	102.90	1008.41	-11.46	20.71	21.23	1.27	1.00	-14.11	MWD
1100.00	5.50	99.80	1099.12	-12.86	27.87	28.45	2.00	1.98	-3.41	MWD
1190.00	6.70	98.70	1188.61	-14.39	37.31	37.95	1.34	1.33	-1.22	MWD
1280.00	8.50	84.30	1277.82	-14.52	49.12	49.75	2.90	2.00	-16.00	MWD
1370.00	8.50	90.30	1366.83	-13.90	62.39	62.98	0.98	0.00	6.67	MWD
1460.00	9.30	92.30	1455.75	-14.23	76.31	76.90	0.95	0.89	2.22	MWD
1551.00	10.10	91.70	1545.45	-14.76	91.63	92.23	0.89	0.88	-0.66	MWD
1641.00	11.80	99.10	1633.81	-16.45	108.61	109.26	2.45	1.89	8.22	MWD
1731.00	13.40	94.10	1721.64	-18.65	128.10	128.84	2.15	1.78	-5.56	MWD
1819.00	13.90	92.00	1807.16	-19.75	148.84	149.60	0.80	0.57	-2.39	MWD
1909.00	14.30	94.50	1894.45	-21.00	170.72	171.52	0.81	0.44	2.78	MWD

Allis-Chalmers Energy, Inc.

Survey Report

Company: ANADARKO PETROLEUM Field: Weld County, CO Site: Bernhardt 3-1 Pad Well: #21-1 Wellpath: Original Hole	Date: 5/31/2010 Time: 10:04:31 Page: 2 Co-ordinate(NE) Reference: Well: #21-1, Grid North Vertical (TVD) Reference: 4826'GL+13'KB 4839.0 Section (VS) Reference: Well (0.00N,0.00E,92.69Azi) 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
1999.00	15.50	90.30	1981.42	-21.93	193.83	194.64	1.79	1.33	-4.67	MWD
2089.00	16.90	95.50	2067.85	-23.25	218.88	219.73	2.24	1.56	5.78	MWD
2179.00	15.70	95.50	2154.23	-25.67	244.02	244.96	1.33	-1.33	0.00	MWD
2269.00	15.10	86.10	2241.01	-26.04	267.84	268.77	2.85	-0.67	-10.44	MWD
2359.00	14.30	88.50	2328.07	-24.95	290.65	291.50	1.12	-0.89	2.67	MWD
2449.00	15.10	98.70	2415.13	-26.43	313.35	314.25	3.01	0.89	11.33	MWD
2539.00	15.80	100.10	2501.88	-30.35	337.00	338.06	0.88	0.78	1.56	MWD
2630.00	18.30	99.10	2588.88	-34.79	363.31	364.54	2.77	2.75	-1.10	MWD
2721.00	20.80	96.50	2674.62	-38.88	393.48	394.87	2.91	2.75	-2.86	MWD
2810.00	21.50	93.80	2757.63	-41.75	425.45	426.94	1.35	0.79	-3.03	MWD
2900.00	19.00	87.80	2842.07	-42.28	456.56	458.04	3.61	-2.78	-6.67	MWD
2990.00	17.80	89.90	2927.47	-41.69	484.95	486.38	1.52	-1.33	2.33	MWD
3081.00	18.10	94.50	3014.04	-42.78	512.96	514.40	1.59	0.33	5.05	MWD
3170.00	17.70	95.90	3098.74	-45.25	540.20	541.73	0.66	-0.45	1.57	MWD
3260.00	17.20	92.70	3184.60	-47.28	567.10	568.69	1.20	-0.56	-3.56	MWD
3351.00	17.10	88.90	3271.55	-47.66	593.92	595.50	1.24	-0.11	-4.18	MWD
3441.00	15.10	89.90	3358.02	-47.39	618.87	620.41	2.24	-2.22	1.11	MWD
3531.00	15.10	91.00	3444.91	-47.57	642.31	643.84	0.32	0.00	1.22	MWD
3622.00	13.70	85.70	3533.05	-46.97	664.91	666.39	2.11	-1.54	-5.82	MWD
3711.00	12.50	89.60	3619.74	-46.11	685.06	686.47	1.67	-1.35	4.38	MWD
3801.00	13.60	93.40	3707.41	-46.67	705.36	706.77	1.55	1.22	4.22	MWD
3892.00	15.50	93.40	3795.49	-48.03	728.18	729.63	2.09	2.09	0.00	MWD
3982.00	15.10	93.80	3882.30	-49.52	751.88	753.38	0.46	-0.44	0.44	MWD
4072.00	13.40	92.00	3969.53	-50.66	774.00	775.53	1.95	-1.89	-2.00	MWD
4162.00	11.10	89.20	4057.47	-50.90	793.09	794.60	2.64	-2.56	-3.11	MWD
4253.00	7.90	97.00	4147.22	-51.54	808.06	809.59	3.78	-3.52	8.57	MWD
4343.00	6.90	95.50	4236.47	-52.81	819.58	821.16	1.13	-1.11	-1.67	MWD
4433.00	5.90	81.10	4325.91	-52.62	829.53	831.09	2.09	-1.11	-16.00	MWD
4524.00	3.90	74.50	4416.57	-51.07	837.14	838.61	2.28	-2.20	-7.25	MWD
4614.00	2.30	87.10	4506.44	-50.16	841.89	843.32	1.92	-1.78	14.00	MWD
4704.00	1.20	125.80	4596.40	-50.62	844.46	845.90	1.73	-1.22	43.00	MWD
4882.00	1.20	118.00	4774.36	-52.58	847.62	849.15	0.09	0.00	-4.38	MWD
5063.00	0.70	63.90	4955.34	-52.99	850.28	851.83	0.54	-0.28	-29.89	MWD
5240.00	0.30	31.20	5132.33	-52.11	851.49	853.00	0.27	-0.23	-18.47	MWD
5419.00	0.20	31.60	5311.33	-51.45	851.90	853.38	0.06	-0.06	0.22	MWD
5600.00	0.20	21.40	5492.33	-50.88	852.18	853.63	0.02	0.00	-5.64	MWD
5781.00	1.10	210.90	5673.32	-52.08	851.40	852.91	0.72	0.50	-94.20	MWD
5960.00	0.80	206.00	5852.30	-54.68	849.97	851.60	0.17	-0.17	-2.74	MWD
6138.00	0.80	215.80	6030.28	-56.80	848.70	850.43	0.08	0.00	5.51	MWD
6318.00	0.80	216.10	6210.26	-58.84	847.23	849.05	0.00	0.00	0.17	MWD
6494.00	0.80	232.30	6386.24	-60.58	845.53	847.44	0.13	0.00	9.20	MWD
6674.00	1.10	233.00	6566.22	-62.39	843.16	845.15	0.17	0.17	0.39	MWD
6852.00	1.40	238.30	6744.18	-64.56	839.94	842.05	0.18	0.17	2.98	MWD
7030.00	1.20	316.00	6922.14	-64.36	836.80	838.89	0.92	-0.11	43.65	MWD
7211.00	0.90	11.50	7103.12	-61.60	835.76	837.73	0.56	-0.17	30.66	MWD
7391.00	0.50	81.10	7283.11	-60.10	836.82	838.72	0.48	-0.22	38.67	MWD
7572.00	0.40	87.50	7464.10	-59.95	838.23	840.12	0.06	-0.06	3.54	MWD
7753.00	0.70	99.40	7645.09	-60.10	839.95	841.85	0.18	0.17	6.57	MWD
7948.00	0.70	131.40	7840.08	-61.08	842.02	843.96	0.20	0.00	16.41	MWD
7993.00	0.70	131.40	7885.07	-61.45	842.44	844.39	0.00	0.00	0.00	21-1 BHL

Survey Report

Page: 3

Co-ordinate(NE) Reference: Well: #21-1, Grid North

Vertical (TVD) Reference: 4826'GL+13'KB 4839.0

Section (VS) Reference: Well (0.00N,0.00E,92.69Azi)

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

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
21-1 SL			0.00	0.00	0.00	1369230.973	183601.56	40	20	42.219 N	104	50	28.765 W
21-1 BHL			7885.07	-61.45	842.44	1369169.523	184444.00	40	20	41.550 N	104	50	17.890 W
21-1 PBHL			7907.00	-38.91	828.14	1369192.063	184429.70	40	20	41.774 N	104	50	18.073 W
-Circle (Radius: 50)													