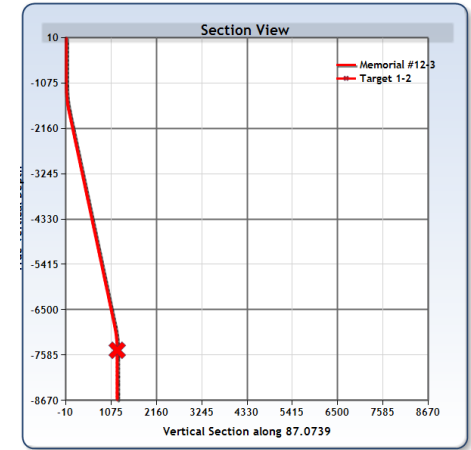
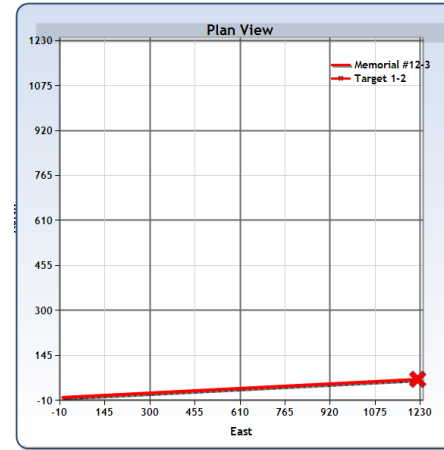


**Company:** Sovereign Operating Co., LLC  
**Well Name:** Memorial #12-3  
**Location:** SENE Sec. 4 T1S R68W  
**Info:** BHL: SENW Sec. 3 T1S R68W  
**Info:** North Reference is True North  
**Vertical Section Calculated on an Azimuth of:** 0.0000  
**Survey Calculation method:** Minimum Curvature  
**File Name:** Memorial #12-3, Directional Surveys, 07-26-12.sr6



#	Depth Feet	Inc Degrees	Azimuth Degrees	TVD Feet	North Feet	East Feet	SubSea Feet	Section Feet	Dogleg /100 ft	BldRate /100 ft	Trnrate /100 ft	Comment
0	0.00	0.00	87.07	0.00	0.00	0.00	5227.00	0.00	0.00	0.00	0.00	
1	100.00	0.00	87.07	100.00	0.00	0.00	5127.00	0.00	0.00	0.00	0.00	
2	200.00	0.00	87.07	200.00	0.00	0.00	5027.00	0.00	0.00	0.00	0.00	
3	300.00	0.00	87.07	300.00	0.00	0.00	4927.00	0.00	0.00	0.00	0.00	
4	400.00	0.00	87.07	400.00	0.00	0.00	4827.00	0.00	0.00	0.00	0.00	
5	500.00	0.00	87.07	500.00	0.00	0.00	4727.00	0.00	0.00	0.00	0.00	
6	600.00	0.00	87.07	600.00	0.00	0.00	4627.00	0.00	0.00	0.00	0.00	
7	700.00	0.00	87.07	700.00	0.00	0.00	4527.00	0.00	0.00	0.00	0.00	
8	800.00	0.00	87.07	800.00	0.00	0.00	4427.00	0.00	0.00	0.00	0.00	
9	900.00	0.00	87.07	900.00	0.00	0.00	4327.00	0.00	0.00	0.00	0.00	
10	1000.00	0.00	87.07	1000.00	0.00	0.00	4227.00	0.00	0.00	0.00	0.00	
11	1100.00	0.00	87.07	1100.00	0.00	0.00	4127.00	0.00	0.00	0.00	0.00	
KOP, B.G.=2°/100'												
12	1125.00	0.00	87.07	1125.00	0.00	0.00	4102.00	0.00	0.00	0.00	0.00	
13	1200.00	1.50	87.07	1199.99	0.05	0.98	4027.01	0.05	2.00	2.00	0.00	
14	1300.00	3.50	87.07	1299.89	0.27	5.34	3927.11	0.27	2.00	2.00	0.00	
15	1400.00	5.50	87.07	1399.58	0.67	13.17	3827.42	0.67	2.00	2.00	0.00	

Peterson Energy Management, Inc.  
 2154 W. Eisenhower Blvd.  
 Loveland CO, 80537  
 P: 970-669-7411 F: 970-669-4077  
 C.L.D.



Jul 26, 2012 01:08 PM

#	Depth	Inc	Azimuth	TVD	North	East	SubSea	Section	Dogleg	BldRate	Trnrate	Comment
16	1500.00	7.50	87.07	1498.93	1.25	24.48	3728.07	1.25	2.00	2.00	0.00	
17	1600.00	9.50	87.07	1597.83	2.01	39.24	3629.17	2.01	2.00	2.00	0.00	
18	1700.00	11.50	87.07	1696.15	2.94	57.44	3530.85	2.94	2.00	2.00	0.00	
EOB, Hold 12°												
19	1725.03	12.00	87.07	1720.65	3.20	62.53	3506.35	3.20	2.00	2.00	0.00	
20	1800.00	12.00	87.07	1793.98	3.99	78.09	3433.02	3.99	0.00	0.00	0.00	
21	1900.00	12.00	87.07	1891.80	5.05	98.86	3335.20	5.05	0.00	0.00	0.00	
22	2000.00	12.00	87.07	1989.61	6.11	119.62	3237.39	6.11	0.00	0.00	0.00	
23	2100.00	12.00	87.07	2087.43	7.18	140.39	3139.57	7.18	0.00	0.00	0.00	
24	2200.00	12.00	87.07	2185.24	8.24	161.16	3041.76	8.24	0.00	0.00	0.00	
25	2300.00	12.00	87.07	2283.06	9.30	181.92	2943.94	9.30	0.00	0.00	0.00	
26	2400.00	12.00	87.07	2380.87	10.36	202.69	2846.13	10.36	0.00	0.00	0.00	
27	2500.00	12.00	87.07	2478.69	11.42	223.45	2748.31	11.42	0.00	0.00	0.00	
28	2600.00	12.00	87.07	2576.50	12.48	244.22	2650.50	12.48	0.00	0.00	0.00	
29	2700.00	12.00	87.07	2674.31	13.54	264.98	2552.69	13.54	0.00	0.00	0.00	
30	2800.00	12.00	87.07	2772.13	14.61	285.75	2454.87	14.61	0.00	0.00	0.00	
31	2900.00	12.00	87.07	2869.94	15.67	306.51	2357.06	15.67	0.00	0.00	0.00	
32	3000.00	12.00	87.07	2967.76	16.73	327.28	2259.24	16.73	0.00	0.00	0.00	
33	3100.00	12.00	87.07	3065.57	17.79	348.04	2161.43	17.79	0.00	0.00	0.00	
34	3200.00	12.00	87.07	3163.39	18.85	368.81	2063.61	18.85	0.00	0.00	0.00	
35	3300.00	12.00	87.07	3261.20	19.91	389.57	1965.80	19.91	0.00	0.00	0.00	
36	3400.00	12.00	87.07	3359.02	20.97	410.34	1867.98	20.97	0.00	0.00	0.00	
37	3500.00	12.00	87.07	3456.83	22.04	431.10	1770.17	22.04	0.00	0.00	0.00	
38	3600.00	12.00	87.07	3554.65	23.10	451.87	1672.35	23.10	0.00	0.00	0.00	
39	3700.00	12.00	87.07	3652.46	24.16	472.63	1574.54	24.16	0.00	0.00	0.00	
40	3800.00	12.00	87.07	3750.27	25.22	493.40	1476.73	25.22	0.00	0.00	0.00	
41	3900.00	12.00	87.07	3848.09	26.28	514.16	1378.91	26.28	0.00	0.00	0.00	
42	4000.00	12.00	87.07	3945.90	27.34	534.93	1281.10	27.34	0.00	0.00	0.00	
43	4100.00	12.00	87.07	4043.72	28.40	555.69	1183.28	28.40	0.00	0.00	0.00	
44	4200.00	12.00	87.07	4141.53	29.47	576.46	1085.47	29.47	0.00	0.00	0.00	
45	4300.00	12.00	87.07	4239.35	30.53	597.22	987.65	30.53	0.00	0.00	0.00	
46	4400.00	12.00	87.07	4337.16	31.59	617.99	889.84	31.59	0.00	0.00	0.00	



#	Depth	Inc	Azimuth	TVD	North	East	SubSea	Section	Dogleg	BldRate	Trnrate	Comment
47	4500.00	12.00	87.07	4434.98	32.65	638.75	792.02	32.65	0.00	0.00	0.00	
48	4600.00	12.00	87.07	4532.79	33.71	659.52	694.21	33.71	0.00	0.00	0.00	
49	4700.00	12.00	87.07	4630.61	34.77	680.28	596.39	34.77	0.00	0.00	0.00	
50	4800.00	12.00	87.07	4728.42	35.83	701.05	498.58	35.83	0.00	0.00	0.00	
51	4900.00	12.00	87.07	4826.23	36.90	721.81	400.77	36.90	0.00	0.00	0.00	
52	5000.00	12.00	87.07	4924.05	37.96	742.58	302.95	37.96	0.00	0.00	0.00	
53	5100.00	12.00	87.07	5021.86	39.02	763.34	205.14	39.02	0.00	0.00	0.00	
54	5200.00	12.00	87.07	5119.68	40.08	784.11	107.32	40.08	0.00	0.00	0.00	
55	5300.00	12.00	87.07	5217.49	41.14	804.87	9.51	41.14	0.00	0.00	0.00	
56	5400.00	12.00	87.07	5315.31	42.20	825.64	-88.31	42.20	0.00	0.00	0.00	
57	5500.00	12.00	87.07	5413.12	43.26	846.40	-186.12	43.26	0.00	0.00	0.00	
58	5600.00	12.00	87.07	5510.94	44.32	867.17	-283.94	44.32	0.00	0.00	0.00	
59	5700.00	12.00	87.07	5608.75	45.39	887.93	-381.75	45.39	0.00	0.00	0.00	
60	5800.00	12.00	87.07	5706.57	46.45	908.70	-479.57	46.45	0.00	0.00	0.00	
61	5900.00	12.00	87.07	5804.38	47.51	929.46	-577.38	47.51	0.00	0.00	0.00	
62	6000.00	12.00	87.07	5902.19	48.57	950.23	-675.19	48.57	0.00	0.00	0.00	
63	6100.00	12.00	87.07	6000.01	49.63	970.99	-773.01	49.63	0.00	0.00	0.00	
64	6200.00	12.00	87.07	6097.82	50.69	991.76	-870.82	50.69	0.00	0.00	0.00	
65	6300.00	12.00	87.07	6195.64	51.75	1012.52	-968.64	51.75	0.00	0.00	0.00	
66	6400.00	12.00	87.07	6293.45	52.82	1033.29	-1066.45	52.82	0.00	0.00	0.00	
67	6500.00	12.00	87.07	6391.27	53.88	1054.05	-1164.27	53.88	0.00	0.00	0.00	
68	6600.00	12.00	87.07	6489.08	54.94	1074.82	-1262.08	54.94	0.00	0.00	0.00	
69	6700.00	12.00	87.07	6586.90	56.00	1095.58	-1359.90	56.00	0.00	0.00	0.00	
70	6800.00	12.00	87.07	6684.71	57.06	1116.35	-1457.71	57.06	0.00	0.00	0.00	
71	6900.00	12.00	87.07	6782.53	58.12	1137.11	-1555.53	58.12	0.00	0.00	0.00	
TOD, D.G.=2°/100'												
72	6996.13	12.00	87.07	6876.55	59.14	1157.08	-1649.55	59.14	0.00	0.00	0.00	
73	7000.00	11.92	87.07	6880.34	59.18	1157.88	-1653.34	59.18	2.00	2.00	0.00	
74	7100.00	9.92	87.07	6978.52	60.15	1176.80	-1751.52	60.15	2.00	2.00	0.00	
75	7200.00	7.92	87.07	7077.31	60.94	1192.29	-1850.31	60.94	2.00	2.00	0.00	
76	7300.00	5.92	87.07	7176.57	61.56	1204.33	-1949.57	61.56	2.00	2.00	0.00	
77	7400.00	3.92	87.07	7276.20	62.00	1212.90	-2049.20	62.00	2.00	2.00	0.00	



#	Depth	Inc	Azimuth	TVD	North	East	SubSea	Section	Dogleg	BldRate	Trnrate	Comment
78	7500.00	1.92	87.07	7376.07	62.26	1217.99	-2149.07	62.26	2.00	2.00	0.00	
<b>EOD, Hold 0°</b>												
79	7596.16	0.00	87.07	7472.21	62.34	1219.60	-2245.21	62.34	2.00	2.00	0.00	
80	7600.00	0.00	87.07	7476.05	62.34	1219.60	-2249.05	62.34	0.00	0.00	0.00	
81	7700.00	0.00	87.07	7576.05	62.34	1219.60	-2349.05	62.34	0.00	0.00	0.00	
<b>Int</b>	7745.95	0.00	87.07	7622.00	62.34	1219.60	-2395.00	62.34	---	---	---	
<b>NBRR</b>												
83	7800.00	0.00	87.07	7676.05	62.34	1219.60	-2449.05	62.34	0.00	0.00	0.00	
84	7900.00	0.00	87.07	7776.05	62.34	1219.60	-2549.05	62.34	0.00	0.00	0.00	
85	8000.00	0.00	87.07	7876.05	62.34	1219.60	-2649.05	62.34	0.00	0.00	0.00	
86	8100.00	0.00	87.07	7976.05	62.34	1219.60	-2749.05	62.34	0.00	0.00	0.00	
<b>Int</b>	8194.95	0.00	87.07	8071.00	62.34	1219.60	-2844.00	62.34	---	---	---	
<b>CODL</b>												
88	8200.00	0.00	87.07	8076.05	62.34	1219.60	-2849.05	62.34	0.00	0.00	0.00	
89	8300.00	0.00	87.07	8176.05	62.34	1219.60	-2949.05	62.34	0.00	0.00	0.00	
90	8364.95	0.00	87.07	8241.00	62.34	1219.60	-3014.00	62.34	0.00	0.00	0.00	
91	8400.00	0.00	87.07	8276.05	62.34	1219.60	-3049.05	62.34	0.00	0.00	0.00	
92	8500.00	0.00	87.07	8376.05	62.34	1219.60	-3149.05	62.34	0.00	0.00	0.00	
93	8600.00	0.00	87.07	8476.05	62.34	1219.60	-3249.05	62.34	0.00	0.00	0.00	
<b>Int</b>	8624.95	0.00	87.07	8501.00	62.34	1219.60	-3274.00	62.34	---	---	---	
<b>JSND</b>												
95	8700.00	0.00	87.07	8576.05	62.34	1219.60	-3349.05	62.34	0.00	0.00	0.00	
96	8774.95	0.00	87.07	8651.00	62.34	1219.60	-3424.00	62.34	0.00	0.00	0.00	

Closure is 1221.1948 feet on an Azimuth of 87.0739