



Company: Concho
Lease/Well: Black Pearl 1 Federal/3H

Rig Name: Pioneer 20
State/County: New Mexico/Lea
Latitude: 32.61, Longitude: -103.52
GRID North is 0.44 Degrees East of True North
VS-Azi: 0.00 Degrees



Depth Reference : RKB: 17'

DRILLOG HA GYRO SURVEY CALCULATIONS

Filename: gyro survey.ut
Minimum Curvature Method
Report Date/Time: 2/4/2015 / 14:37

VES Survey International
Midland, TX
(432)-563-5444
Surveyor: Tim Dillon
Black Pearl 1 Federal 3H / API 30-025-42294

HOBBS OGD
MAR 30 2015
RECEIVED

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Vertical Section FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	****
100.00	0.16	244.81	100.00	-0.06	-0.12	-0.06	0.14	244.81	0.16
200.00	0.19	40.39	200.00	0.01	-0.14	0.01	0.14	274.37	0.34
300.00	0.12	332.49	300.00	0.23	-0.08	0.23	0.25	340.87	0.18
400.00	0.13	266.14	400.00	0.32	-0.24	0.32	0.40	322.85	0.14
500.00	0.18	230.49	500.00	0.21	-0.47	0.21	0.52	294.09	0.11
600.00	0.26	227.62	600.00	-0.04	-0.76	-0.04	0.76	267.16	0.08
700.00	0.21	173.17	700.00	-0.37	-0.90	-0.37	0.97	247.61	0.22
800.00	0.25	165.29	800.00	-0.77	-0.82	-0.77	1.13	227.04	0.05
900.00	0.16	148.76	900.00	-1.10	-0.70	-1.10	1.30	212.40	0.11
1000.00	0.05	89.16	1000.00	-1.21	-0.58	-1.21	1.35	205.69	0.14
1100.00	0.25	239.29	1100.00	-1.33	-0.74	-1.33	1.52	208.98	0.30
1200.00	0.13	125.82	1200.00	-1.51	-0.83	-1.51	1.72	208.96	0.33
1300.00	0.28	298.51	1299.99	-1.46	-0.96	-1.46	1.74	213.29	0.41
1400.00	0.37	294.93	1399.99	-1.21	-1.46	-1.21	1.89	230.48	0.09
1500.00	0.10	187.65	1499.99	-1.16	-1.76	-1.16	2.11	236.65	0.41
1600.00	0.31	254.53	1599.99	-1.32	-2.03	-1.32	2.43	237.00	0.28
1700.00	0.34	235.30	1699.99	-1.56	-2.53	-1.56	2.98	238.39	0.11
1800.00	0.31	180.47	1799.99	-2.00	-2.78	-2.00	3.42	234.30	0.30

MAR 31 2015

mm

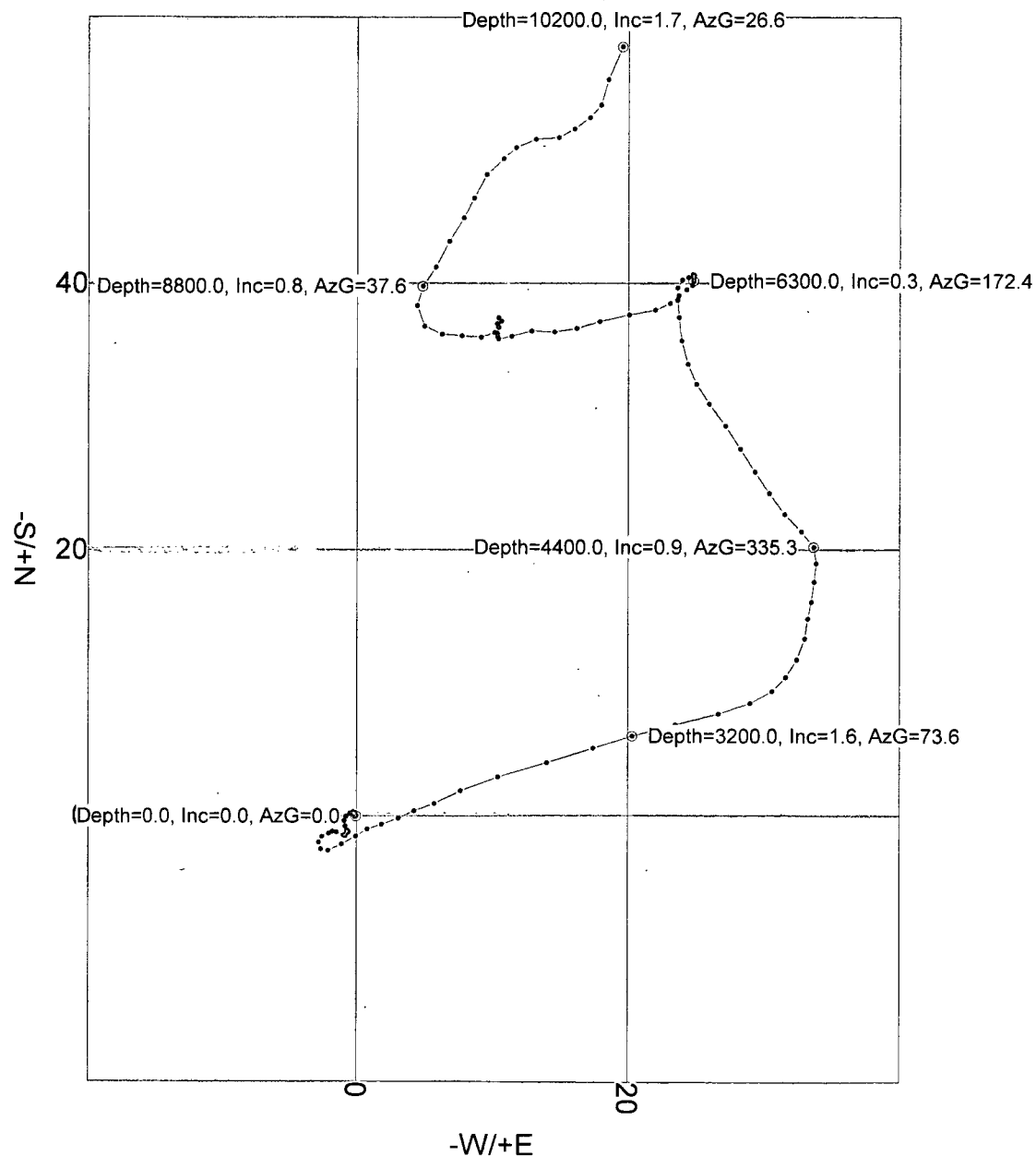
Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Vertical Section FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
1900.00	0.32	147.13	1899.99	-2.50	-2.63	-2.50	3.63	226.39	0.18
2000.00	0.47	70.79	1999.99	-2.60	-2.08	-2.60	3.33	218.67	0.51
2100.00	0.79	60.82	2099.98	-2.13	-1.09	-2.13	2.39	207.10	0.34
2200.00	0.57	59.01	2199.97	-1.54	-0.06	-1.54	1.54	182.23	0.22
2300.00	0.59	57.30	2299.97	-1.00	0.80	-1.00	1.28	141.53	0.02
2400.00	0.71	83.50	2399.96	-0.66	1.85	-0.66	1.96	109.55	0.32
2500.00	0.83	56.11	2499.95	-0.18	3.07	-0.18	3.07	93.42	0.38
2600.00	0.65	75.96	2599.94	0.36	4.22	0.36	4.24	85.15	0.31
2700.00	1.16	65.26	2699.93	0.92	5.69	0.92	5.77	80.83	0.53
2800.00	1.33	62.66	2799.91	1.87	7.64	1.87	7.87	76.21	0.18
2900.00	2.07	73.60	2899.86	2.92	10.41	2.92	10.81	74.33	0.81
3000.00	2.22	73.27	2999.79	3.99	13.99	3.99	14.55	74.10	0.14
3100.00	1.89	71.36	3099.73	5.07	17.41	5.07	18.13	73.76	0.34
3200.00	1.63	73.56	3199.68	6.00	20.34	6.00	21.20	73.56	0.26
3300.00	2.12	76.38	3299.63	6.84	23.50	6.84	24.47	73.78	0.49
3400.00	1.60	73.82	3399.57	7.66	26.64	7.66	27.72	73.95	0.52
3500.00	1.23	67.21	3499.54	8.47	28.97	8.47	30.18	73.71	0.41
3600.00	0.92	53.31	3599.53	9.36	30.60	9.36	32.00	72.99	0.40
3700.00	0.78	31.81	3699.52	10.42	31.60	10.42	33.28	71.75	0.34
3800.00	0.98	30.38	3799.50	11.74	32.40	11.74	34.46	70.08	0.20
3900.00	0.98	10.84	3899.49	13.32	32.99	13.32	35.58	68.01	0.33
4000.00	0.74	5.40	3999.48	14.80	33.21	14.80	36.36	65.98	0.25
4100.00	0.75	17.47	4099.47	16.07	33.47	16.07	37.13	64.36	0.16
4200.00	1.00	0.75	4199.46	17.57	33.68	17.57	37.99	62.45	0.36
4300.00	0.62	15.81	4299.45	18.97	33.84	18.97	38.79	60.73	0.44
4400.00	0.88	335.26	4399.44	20.19	33.66	20.19	39.25	59.05	0.58
4500.00	0.86	308.22	4499.43	21.35	32.75	21.35	39.09	56.90	0.41
4600.00	1.21	323.61	4599.41	22.67	31.53	22.67	38.83	54.29	0.44
4700.00	1.01	324.13	4699.39	24.23	30.39	24.23	38.87	51.43	0.20
4800.00	1.21	327.89	4799.37	25.84	29.31	25.84	39.07	48.61	0.21
4900.00	1.13	328.19	4899.35	27.56	28.23	27.56	39.46	45.69	0.08
5000.00	1.23	327.02	4999.33	29.30	27.13	29.30	39.93	42.79	0.11
5100.00	1.10	321.48	5099.31	30.96	25.95	30.96	40.39	39.97	0.18
5200.00	0.94	333.98	5199.30	32.45	24.99	32.45	40.95	37.60	0.27
5300.00	0.93	340.92	5299.28	33.95	24.36	33.95	41.79	35.67	0.11
5400.00	1.16	349.23	5399.27	35.71	23.91	35.71	42.97	33.81	0.27
5500.00	0.86	359.74	5499.25	37.45	23.72	37.45	44.33	32.35	0.35
5600.00	0.63	350.08	5599.24	38.74	23.62	38.74	45.37	31.37	0.25
5700.00	0.46	12.17	5699.24	39.67	23.61	39.67	46.17	30.76	0.27

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Vertical Section FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
5800.00	0.36	51.74	5799.24	40.26	23.94	40.26	46.84	30.74	0.29
5900.00	0.23	90.06	5899.23	40.46	24.39	40.46	47.24	31.08	0.23
6000.00	0.30	32.08	5999.23	40.68	24.73	40.68	47.60	31.29	0.26
6100.00	0.31	186.31	6099.23	40.63	24.84	40.63	47.62	31.44	0.59
6200.00	0.06	327.19	6199.23	40.41	24.78	40.41	47.40	31.52	0.36
6300.00	0.31	172.37	6299.23	40.19	24.78	40.19	47.21	31.66	0.36
6400.00	0.18	242.91	6399.23	39.85	24.68	39.85	46.87	31.77	0.30
6500.00	0.40	229.13	6499.23	39.55	24.27	39.55	46.40	31.54	0.22
6600.00	0.44	233.33	6599.23	39.09	23.71	39.09	45.72	31.23	0.05
6700.00	0.55	220.86	6699.22	38.50	23.08	38.50	44.89	30.95	0.16
6800.00	0.92	260.69	6799.22	38.00	21.98	38.00	43.90	30.04	0.61
6900.00	1.33	258.03	6899.20	37.63	20.05	37.63	42.64	28.05	0.41
7000.00	1.24	256.66	6999.17	37.14	17.86	37.14	41.22	25.69	0.10
7100.00	0.82	247.31	7099.16	36.62	16.16	36.62	40.03	23.81	0.45
7200.00	1.13	270.58	7199.14	36.36	14.51	36.36	39.14	21.76	0.50
7300.00	0.78	275.30	7299.13	36.43	12.84	36.43	38.63	19.42	0.36
7400.00	1.05	239.47	7399.11	36.02	11.37	36.02	37.78	17.51	0.62
7500.00	0.38	323.51	7499.11	35.82	10.38	35.82	37.29	16.16	1.08
7600.00	0.18	127.63	7599.11	35.99	10.31	35.99	37.44	15.98	0.55
7700.00	0.41	339.60	7699.11	36.23	10.30	36.23	37.67	15.87	0.57
7800.00	0.30	58.27	7799.11	36.71	10.40	36.71	38.15	15.81	0.46
7900.00	0.37	357.84	7899.10	37.17	10.60	37.17	38.65	15.92	0.34
8000.00	0.24	254.93	7999.10	37.44	10.39	37.44	38.85	15.50	0.49
8100.00	0.49	166.35	8099.10	36.97	10.28	36.97	38.37	15.54	0.54
8200.00	0.44	231.31	8199.10	36.31	10.08	36.31	37.69	15.52	0.50
8300.00	0.80	261.07	8299.09	35.96	9.10	35.96	37.10	14.19	0.47
8400.00	0.85	286.27	8399.08	36.06	7.69	36.06	36.88	12.04	0.36
8500.00	0.88	263.02	8499.07	36.18	6.21	36.18	36.71	9.74	0.35
8600.00	0.99	323.05	8599.06	36.77	4.93	36.77	37.10	7.63	0.94
8700.00	1.00	358.23	8699.05	38.33	4.38	38.33	38.58	6.53	0.60
8800.00	0.84	37.61	8799.03	39.79	4.81	39.79	40.08	6.89	0.64
8900.00	1.12	30.70	8899.02	41.21	5.76	41.21	41.61	7.95	0.30
9000.00	1.38	24.57	8999.00	43.14	6.75	43.14	43.67	8.90	0.29
9100.00	1.02	40.68	9098.97	44.91	7.83	44.91	45.59	9.89	0.49
9200.00	0.96	11.96	9198.96	46.40	8.58	46.40	47.19	10.48	0.49
9300.00	1.39	39.05	9298.94	48.16	9.52	48.16	49.09	11.18	0.69
9400.00	0.61	60.97	9398.92	49.36	10.75	49.36	50.51	12.29	0.85
9500.00	0.83	38.97	9498.92	50.18	11.67	50.18	51.52	13.10	0.35
9600.00	1.14	85.19	9598.90	50.83	13.12	50.83	52.49	14.47	0.82

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Vertical Section FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
9700.00	0.81	87.48	9698.89	50.94	14.81	50.94	53.05	16.21	0.33
9800.00	0.88	35.99	9798.88	51.59	15.97	51.59	54.01	17.20	0.74
9900.00	0.83	71.52	9898.87	52.44	17.11	52.44	55.16	18.07	0.52
10000.00	0.83	11.23	9998.86	53.39	17.94	53.39	56.32	18.58	0.84
10100.00	1.44	18.90	10098.84	55.29	18.49	55.29	58.30	18.49	0.62
10200.00	1.66	26.64	10198.80	57.77	19.55	57.77	60.99	18.69	0.31



VES Survey International
Midland, TX
(432)-563-5444
Surveyor: Tim Dillon
Black Pearl 1 Federal 3H / API 30-025-42294



V.E.S. Survey Date: 1/26/2015