



Scientific Drilling International Survey Report

Company: COG RESOURCES		Date: 09/08/2009	Time: 16:00:45	Page: 1
Field: Loco Hills Paddock		Co-ordinate(NE) Reference:	Site: Eddy County, NM, True North	
Site: Eddy County, NM		Vertical (TVD) Reference:	SITE 0.0	
Well: Polaris B Federal #3		Section (VS) Reference:	Well (0.00N,0.00E,174.58Azi)	
Wellpath: VH - Job #32K0909345		Survey Calculation Method:	Minimum Curvature Db: Sybase	

Survey: 09/08/09	Start Date: 09/08/2009
Company: Scientific Drilling Internatio	Engineer: Garza w/Halliburton
Tool: Keeper, Keeper Gyro	Tied-to: From Surface

Site: Eddy County, NM

Site Position:	Northing:	ft	Latitude:
From: Local Only	Easting:	ft	Longitude:
Position Uncertainty: 0.00 ft			North Reference: True
Ground Level: 0.00 ft			Grid Convergence: deg

Survey

MD ft	Incl deg	Azim deg	TVD ft	VS ft	N/S ft	E/W ft	DLS deg/100ft	ChD ft	ChsA deg
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.00
100.00	0.24	76.82	100.00	-0.03	0.05	0.20	0.24	0.21	76.82
200.00	0.72	108.27	200.00	0.20	-0.10	1.00	0.53	1.01	95.77
300.00	0.73	110.31	299.99	0.72	-0.52	2.20	0.03	2.26	103.30
400.00	0.71	101.54	399.98	1.18	-0.86	3.40	0.11	3.51	104.26
500.00	0.90	93.25	499.97	1.48	-1.03	4.79	0.22	4.90	102.16
600.00	1.13	85.47	599.95	1.61	-1.00	6.56	0.27	6.64	98.66
700.00	1.13	74.23	699.94	1.45	-0.65	8.49	0.22	8.52	94.40
800.00	1.17	75.34	799.92	1.11	-0.13	10.43	0.05	10.43	90.70
900.00	1.86	73.62	899.88	0.64	0.59	12.97	0.69	12.99	87.40
1000.00	1.83	75.14	999.83	0.07	1.46	16.07	0.06	16.14	84.83
1100.00	1.68	78.59	1099.78	-0.35	2.16	19.06	0.18	19.18	83.55
1200.00	1.49	89.46	1199.74	-0.39	2.46	21.79	0.35	21.93	83.57
1300.00	1.41	95.04	1299.71	-0.06	2.36	24.32	0.16	24.43	84.45
1400.00	1.06	117.98	1399.69	0.68	1.82	26.36	0.60	26.42	86.05
1500.00	1.01	129.67	1499.67	1.81	0.82	27.86	0.22	27.87	88.31
1600.00	0.99	152.95	1599.66	3.24	-0.51	28.93	0.40	28.93	91.01
1700.00	1.01	155.67	1699.64	4.87	-2.08	29.68	0.05	29.76	94.01
1800.00	1.08	175.21	1799.63	6.65	-3.82	30.12	0.36	30.37	97.23
1900.00	1.27	187.66	1899.60	8.67	-5.86	30.06	0.32	30.62	101.03
2000.00	1.40	195.07	1999.58	10.90	-8.14	29.59	0.22	30.69	105.38
2100.00	1.41	194.39	2099.55	13.20	-10.51	28.97	0.02	30.81	109.94
2200.00	1.59	192.07	2199.51	15.68	-13.06	28.37	0.19	31.23	114.72
2300.00	1.72	192.55	2299.47	18.43	-15.88	27.75	0.13	31.98	119.78
2400.00	1.72	193.34	2399.43	21.28	-18.81	27.08	0.02	32.97	124.78
2500.00	1.85	193.69	2499.38	24.22	-21.83	26.35	0.13	34.22	129.64
2600.00	1.86	195.40	2599.33	27.27	-24.97	25.54	0.06	35.72	134.35
2700.00	1.87	197.61	2699.27	30.29	-28.09	24.62	0.07	37.35	138.77
2800.00	1.99	197.48	2799.22	33.39	-31.30	23.60	0.12	39.20	142.98
2900.00	1.90	196.14	2899.16	36.53	-34.55	22.62	0.10	41.29	146.79
3000.00	1.92	194.15	2999.10	39.65	-37.76	21.75	0.07	43.58	150.06
3100.00	1.77	196.05	3099.05	42.66	-40.87	20.91	0.16	45.91	152.90
3200.00	1.79	195.37	3199.00	45.56	-43.86	20.07	0.03	48.24	155.41
3300.00	1.71	195.99	3298.96	48.41	-46.80	19.25	0.08	50.60	157.65
3400.00	1.71	200.68	3398.91	51.14	-49.63	18.31	0.14	52.90	159.75
3500.00	1.78	202.15	3498.86	53.86	-52.47	17.20	0.08	55.21	161.85
3600.00	1.54	204.71	3598.82	56.39	-55.13	16.05	0.25	57.41	163.77
3700.00	1.44	205.55	3698.79	58.63	-57.48	14.94	0.10	59.39	165.43
3800.00	1.09	206.45	3798.76	60.52	-59.47	13.98	0.35	61.09	166.77
3900.00	1.07	210.09	3898.75	62.09	-61.12	13.09	0.07	62.51	167.91
4000.00	1.15	219.94	3998.73	63.55	-62.70	11.98	0.21	63.84	169.19
4100.00	1.21	222.81	4098.71	64.96	-64.25	10.61	0.08	65.12	170.62



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Well: Polaris B Federal #3
Wellpath: VH - Job #32K0909345

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Co-ordinate(NE) Reference: Site: Eddy County, NM, True North
Vertical (TVD) Reference: SITE 0.0
Section (VS) Reference: Well (0.00N,0.00E,174.58Azi)
Survey Calculation Method: Minimum Curvature Db: Sybase

Survey

MD ft	Incl deg	Azim deg	TVD ft	VS ft	N/S ft	E/W ft	DLS deg/100ft	ClsD ft	ClsA deg
4200.00	1.31	220.70	4198.68	66.46	-65.89	9.15	0.11	66.52	172.09
4300.00	1.11	221.64	4298.66	67.91	-67.48	7.76	0.20	67.92	173.44
4400.00	1.08	229.85	4398.64	69.11	-68.81	6.40	0.16	69.11	174.69
4500.00	0.90	218.93	4498.63	70.20	-70.03	5.18	0.26	70.22	175.77
4600.00	0.79	206.68	4598.62	71.35	-71.25	4.38	0.21	71.39	176.48
4700.00	0.53	194.62	4698.61	72.37	-72.32	3.95	0.29	72.43	176.87
4800.00	0.63	203.80	4798.60	73.28	-73.27	3.62	0.14	73.36	177.17
4900.00	0.68	182.78	4898.60	74.35	-74.36	3.37	0.24	74.44	177.41
5000.00	0.57	186.68	4998.59	75.42	-75.45	3.28	0.12	75.52	177.51
5100.00	0.62	187.43	5098.59	76.44	-76.48	3.15	0.05	76.55	177.64
5200.00	0.36	181.03	5198.58	77.28	-77.33	3.07	0.27	77.39	177.72
5300.00	0.52	151.35	5298.58	78.01	-78.04	3.29	0.27	78.11	177.59
5400.00	0.47	118.51	5398.58	78.65	-78.64	3.86	0.28	78.73	177.19
5500.00	0.59	133.02	5498.57	79.27	-79.19	4.60	0.18	79.32	176.67
5600.00	0.71	153.60	5598.57	80.23	-80.09	5.25	0.26	80.26	176.25
5700.00	1.08	148.16	5698.55	81.65	-81.45	6.03	0.38	81.67	175.77
5800.00	0.97	152.45	5798.54	83.28	-83.00	6.91	0.13	83.29	175.24
5900.00	1.01	143.15	5898.52	84.82	-84.45	7.84	0.17	84.82	174.70
5920.00	0.92	144.08	5918.52	85.11	-84.73	8.03	0.46	85.11	174.58