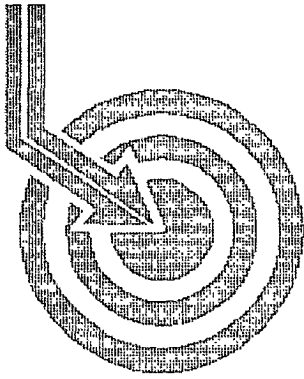




Scientific Drilling

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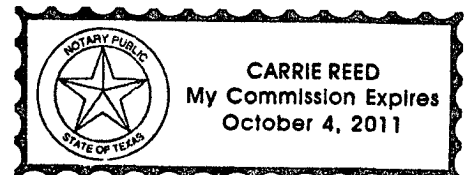
Field: Grayburg Jackson
Site: Eddy County, NM
Well: GJ West Coop #114
Wellpath: VH - Job #32K0909368
Survey: 09/17/09

This survey is correct to the best of my knowledge
and is supported by actual field data.

Luhan.....Company Representative

Notorized this date 1st of October, 2009.

Carrie Reed
Notary Signature
County of Midland
State of Texas





Scientific Drilling International

COP Survey Report

Company: COG RESOURCES	Date: 09/21/2009	Time: 16:18:39	Page: 1
Field: Grayburg Jackson	Co-ordinate(NE) Reference:	Site: Eddy County, NM, Grid North	
Site: Eddy County, NM	Vertical (TVD) Reference:	SITE 0.0	
Well: GJ West Coop #114	Section (VS) Reference:	Well (0.00N,0.00E,201.33Azi)	
Wellpath: VH - Job #32K0909368	Survey Calculation Method:	Minimum Curvature	Db: Sybase

Survey: 09/17/09	Start Date: 09/17/2009
Company: Scientific Drilling Internatio	Engineer: Madrid 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: Grid
Ground Level: 0.00 ft		Grid Convergence: deg

Well: GJ West Coop #114	Slot Name:
Well Position: +N/-S 0.00 ft	Latitude:
+E/-W 0.00 ft	Longitude:
Position Uncertainty: 0.00 ft	

Survey

MD ft	Incl deg	Azim deg	TVD ft	VS ft	N/S ft	E/W ft	DLS deg/100ft	ClsD ft	ClsA deg
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100.00	0.39	298.94	100.00	-0.05	0.16	-0.30	0.39	0.34	298.94
200.00	0.59	230.12	200.00	0.36	0.00	-0.99	0.58	0.99	269.96
300.00	0.65	232.93	299.99	1.30	-0.67	-1.84	0.07	1.96	249.90
400.00	0.64	227.05	399.98	2.28	-1.40	-2.70	0.07	3.04	242.67
500.00	0.45	201.93	499.98	3.18	-2.14	-3.26	0.30	3.90	236.68
600.00	0.33	151.90	599.98	3.76	-2.76	-3.27	0.35	4.28	229.82
700.00	0.40	141.51	699.98	4.12	-3.29	-2.91	0.10	4.39	221.56
800.00	0.58	156.41	799.97	4.65	-4.02	-2.49	0.22	4.73	211.79
900.00	0.70	150.64	899.97	5.40	-5.02	-1.99	0.14	5.40	201.64
1000.00	0.61	159.71	999.96	6.18	-6.05	-1.51	0.14	6.24	193.99
1100.00	0.61	173.19	1099.95	7.05	-7.08	-1.26	0.14	7.19	190.09
1200.00	0.45	177.20	1199.95	7.88	-8.00	-1.18	0.16	8.09	188.37
1300.00	0.35	205.03	1299.95	8.54	-8.67	-1.29	0.22	8.76	188.45
1400.00	0.52	228.30	1399.94	9.25	-9.25	-1.76	0.24	9.41	190.75
1500.00	0.68	249.89	1499.94	10.05	-9.75	-2.65	0.27	10.11	195.21
1600.00	0.71	263.67	1599.93	10.73	-10.03	-3.82	0.17	10.73	200.88
1700.00	0.84	256.93	1699.92	11.43	-10.26	-5.15	0.16	11.48	206.68
1800.00	0.89	247.14	1799.91	12.39	-10.73	-6.58	0.16	12.59	211.54
1900.00	0.94	241.08	1899.90	13.56	-11.42	-8.02	0.11	13.96	215.06
2000.00	1.07	229.73	1999.88	15.01	-12.43	-9.45	0.24	15.61	217.25
2100.00	1.10	225.06	2099.86	16.71	-13.71	-10.84	0.09	17.48	218.34
2200.00	1.18	227.56	2199.85	18.51	-15.08	-12.28	0.09	19.45	219.16
2300.00	1.21	225.47	2299.82	20.40	-16.51	-13.79	0.05	21.52	219.87
2400.00	1.24	219.22	2399.80	22.39	-18.09	-15.23	0.14	23.65	220.09
2500.00	1.24	216.64	2499.78	24.47	-19.80	-16.56	0.06	25.81	219.91
2600.00	1.28	215.12	2599.75	26.60	-21.58	-17.85	0.05	28.01	219.59
2700.00	1.29	218.39	2699.73	28.76	-23.38	-19.19	0.07	30.24	219.38
2800.00	1.00	227.14	2799.71	30.62	-24.85	-20.53	0.34	32.23	219.55
2900.00	1.07	235.62	2899.69	32.18	-25.97	-21.94	0.17	34.00	220.18
3000.00	0.96	233.61	2999.68	33.65	-27.00	-23.38	0.12	35.72	220.89
3100.00	0.96	237.20	3099.66	35.04	-27.95	-24.76	0.06	37.34	221.54
3200.00	0.72	239.21	3199.65	36.22	-28.72	-26.00	0.24	38.75	222.15
3300.00	0.82	220.26	3299.64	37.39	-29.59	-27.01	0.27	40.06	222.38
3400.00	0.82	219.75	3399.63	38.75	-30.69	-27.93	0.01	41.49	222.30
3500.00	0.62	204.98	3499.62	39.96	-31.73	-28.61	0.27	42.73	222.04
3600.00	0.53	201.71	3599.62	40.97	-32.65	-29.01	0.10	43.68	221.62



Scientific Drilling International

COP Survey Report

Company: COG RESOURCES	Date: 09/21/2009	Time: 16:18:39	Page: 2
Field: Grayburg Jackson	Co-ordinate(NE) Reference:	Site: Eddy County, NM; Grid North	
Site: Eddy County, NM	Vertical (TVD) Reference:	SITE 0.0	
Well: GJ West Coop #114	Section (VS) Reference:	Well (0.00N,0.00E,201.33Azi)	
Wellpath: VH - Job #32K0909368	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
3700.00	0.72	202.68	3699.61	42.06	-33.66	-29.43	0.19	44.71	221.16
3800.00	0.69	194.63	3799.61	43.28	-34.82	-29.82	0.10	45.84	220.58
3900.00	0.57	167.08	3899.60	44.29	-35.89	-29.86	0.32	46.69	219.76
4000.00	0.71	169.05	3999.59	45.23	-36.98	-29.63	0.14	47.39	218.70
4100.00	1.17	182.37	4099.58	46.72	-38.61	-29.56	0.51	48.62	217.43
4200.00	1.39	182.67	4199.55	48.83	-40.84	-29.66	0.22	50.47	215.98
4300.00	2.02	169.97	4299.51	51.49	-43.79	-29.41	0.73	52.75	213.88
4400.00	1.78	173.08	4399.46	54.36	-47.07	-28.91	0.26	55.24	211.56
4500.00	1.64	168.24	4499.41	56.93	-50.01	-28.43	0.20	57.53	209.62
4600.00	1.59	167.61	4599.37	59.28	-52.76	-27.84	0.05	59.66	207.82
4700.00	1.48	173.43	4699.34	61.57	-55.40	-27.40	0.19	61.81	206.31
4800.00	1.37	174.34	4799.30	63.78	-57.88	-27.13	0.11	63.92	205.12
4900.00	1.30	185.03	4899.28	65.93	-60.19	-27.11	0.26	66.02	204.25
5000.00	1.30	185.29	4999.25	68.11	-62.45	-27.32	0.01	68.17	203.62
5100.00	1.45	182.01	5099.22	70.40	-64.85	-27.47	0.17	70.43	202.95
5200.00	1.35	192.31	5199.19	72.75	-67.26	-27.76	0.27	72.77	202.43
5300.00	1.53	193.64	5299.16	75.24	-69.71	-28.33	0.18	75.25	202.11
5400.00	1.61	183.32	5399.12	77.90	-72.41	-28.72	0.29	77.90	201.64
5476.00	1.53	196.56	5475.10	79.93	-74.45	-29.08	0.49	79.93	201.33