

15-25466

COG OPERATING

Grayburg Jackson
Eddy County, NM
GJ West Coop #73
VH - Job #32K11121417

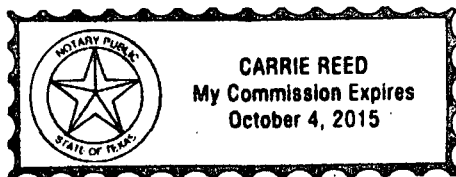
Survey: Gyro

SDI Standard Survey Report

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

Notarized this date 5th of December, 2012.

Notary Signature
County of Midland
State of Texas



Scientific Drilling

Scientific Drilling International, Inc.
SDI Standard Survey Report



Company:	COG OPERATING	Local Co-ordinate Reference:	Well GJ West Coop #73
Project:	Grayburg Jackson	TVD Reference:	WELL @ 0.00usft (Original Well Elev)
Site:	Eddy County, NM	MD Reference:	WELL @ 0.00usft (Original Well Elev)
Well:	GJ West Coop #73	North Reference:	Grid
Wellbore:	VH - Job #32K11121417	Survey Calculation Method:	Minimum Curvature
Design:	VH - Job #32K11121417	Database:	EDM-Regulatory

Project	Grayburg Jackson		
Map System:	US State Plane 1927 (Exact solution)	System Datum:	Mean Sea Level
Geo Datum:	NAD 1927 (NADCON CONUS)		
Map Zone:	New Mexico East 3001		

Site	Eddy County, NM		
Site Position:		Northing:	665,097.06 usft
From:	Lat/Long	Easting:	601,778.12 usft
Position Uncertainty:	0.00 usft	Slot Radius:	0"
		Latitude:	32° 49' 40.800 N
		Longitude:	104° 0' 7.200 W
		Grid Convergence:	0.18 °

Well	GJ West Coop #73, Directional		
Well Position	+N/-S	0.00 usft	Northing: 659,640.93 usft
	+E/-W	0.00 usft	Easting: 578,556.19 usft
Position Uncertainty	0.00 usft	Wellhead Elevation:	usft
		Latitude:	32° 48' 47.448 N
		Longitude:	104° 4' 39.504 W
		Ground Level:	0.00 usft

Wellbore	VH - Job #32K11121417				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	11/20/12	7.69	60.61	48,797

Design	VH - Job #32K11121417			
Audit Notes:				
Version:	1.0	Phase:	ACTUAL	Tie On Depth: 0.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.00	0.00	0.00	40.09

Survey Program	Date	12/07/12			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
100.00	5,409.00	Gyro (VH - Job #32K11121417)	Keeper	Keeper Gyro	

Survey								
Measured Depth (usft)	Inclination (°)	Azimuth (°)	True Vertical Depth	North/South (usft)	East/West (usft)	Closure Azimuth (°)	Closure Distance (usft)	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100.00	0.41	331.41	100.00	0.31	-0.17	331.41	0.36	0.36
200.00	0.37	276.51	200.00	0.66	-0.66	315.07	0.94	0.94
300.00	0.31	269.41	300.00	0.70	-1.25	299.12	1.44	1.44
400.00	0.08	306.12	399.99	0.74	-1.58	294.99	1.74	1.74
500.00	0.41	68.32	499.99	0.91	-1.31	304.89	1.59	1.59
600.00	0.48	65.61	599.99	1.22	-0.59	334.06	1.35	1.35
700.00	0.52	59.23	699.99	1.62	0.18	6.34	1.63	1.63
800.00	0.50	65.84	799.98	2.03	0.97	25.48	2.25	2.25
900.00	0.41	66.06	899.98	2.36	1.69	35.71	2.90	2.90
1,000.00	0.26	57.16	999.98	2.62	2.21	40.12	3.43	3.43
1,100.00	0.27	52.57	1,099.98	2.89	2.59	41.85	3.88	3.88

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Wellbore:	VH - Job #32K11121417	Survey Calculation Method:	Minimum Curvature
Design:	VH - Job #32K11121417	Database:	EDM-Regulatory

Survey							
Measured Depth (usft)	Inclination (°)	Azimuth (°)	True Vertical Depth	North/South (usft)	East/West (usft)	Closure Azimuth (°)	Closure Distance (usft)
1,200.00	0.28	23.79	1,199.98	3.26	2.87	41.43	4.34
1,300.00	0.26	346.64	1,299.98	3.70	2.92	38.28	4.71
1,400.00	0.26	340.43	1,399.97	4.14	2.79	34.02	4.99
1,500.00	0.19	323.72	1,499.97	4.48	2.62	30.28	5.19
1,600.00	0.21	309.71	1,599.97	4.73	2.38	26.68	5.30
1,700.00	0.24	297.20	1,699.97	4.95	2.05	22.53	5.35
1,800.00	0.32	281.48	1,799.97	5.10	1.59	17.34	5.34
1,900.00	0.53	277.76	1,899.97	5.22	0.86	9.36	5.29
2,000.00	0.67	273.32	1,999.96	5.31	-0.18	358.03	5.32
2,100.00	0.88	279.77	2,099.95	5.48	-1.52	344.46	5.68
2,200.00	0.79	265.57	2,199.94	5.55	-2.97	331.89	6.30
2,300.00	0.63	271.11	2,299.94	5.51	-4.20	322.66	6.93
2,400.00	0.77	287.14	2,399.93	5.72	-5.40	316.67	7.86
2,500.00	0.91	281.95	2,499.92	6.08	-6.81	311.75	9.13
2,600.00	0.86	267.47	2,599.91	6.21	-8.34	306.68	10.40
2,700.00	0.59	303.96	2,699.90	6.47	-9.52	304.20	11.51
2,800.00	0.79	299.38	2,799.89	7.09	-10.55	303.93	12.71
2,900.00	0.61	288.69	2,899.88	7.60	-11.65	303.12	13.91
3,000.00	0.59	294.96	2,999.88	7.99	-12.62	302.34	14.94
3,100.00	0.73	277.90	3,099.87	8.29	-13.72	301.16	16.03
3,200.00	0.49	294.70	3,199.87	8.56	-14.74	300.15	17.05
3,300.00	0.60	287.16	3,299.86	8.89	-15.63	299.65	17.98
3,400.00	0.27	259.25	3,399.86	9.00	-16.36	298.83	18.67
3,500.00	0.26	237.17	3,499.86	8.84	-16.78	297.77	18.97
3,600.00	0.18	125.90	3,599.86	8.62	-16.85	297.11	18.92
3,700.00	0.06	91.41	3,699.86	8.53	-16.67	297.10	18.72
3,800.00	0.40	100.71	3,799.85	8.46	-16.27	297.48	18.34
3,900.00	0.36	77.90	3,899.85	8.46	-15.62	298.45	17.77
4,000.00	0.41	107.43	3,999.85	8.42	-14.97	299.36	17.18
4,100.00	0.84	99.26	4,099.84	8.20	-13.91	300.52	16.14
4,200.00	1.15	95.26	4,199.83	7.99	-12.18	303.25	14.57
4,300.00	1.30	109.07	4,299.81	7.53	-10.11	306.65	12.61
4,400.00	1.53	87.70	4,399.78	7.21	-7.71	313.09	10.55
4,500.00	1.67	72.40	4,499.74	7.70	-4.98	327.10	9.17
4,600.00	1.48	69.64	4,599.70	8.59	-2.38	344.49	8.92
4,700.00	1.35	72.69	4,699.67	9.39	-0.05	359.70	9.39
4,800.00	1.67	52.99	4,799.64	10.62	2.24	11.91	10.85
4,900.00	2.05	47.95	4,899.58	12.69	4.73	20.44	13.55
5,000.00	1.42	60.06	4,999.54	14.51	7.13	26.18	16.17
5,100.00	1.71	65.14	5,099.50	15.76	9.56	31.25	18.43
5,200.00	1.68	54.82	5,199.46	17.23	12.11	35.11	21.06
5,300.00	1.40	60.25	5,299.42	18.68	14.37	37.57	23.57
5,400.00	1.49	63.76	5,399.39	19.86	16.60	39.89	25.88
5,409.00	1.60	60.82	5,408.38	19.97	16.81	40.09	26.11

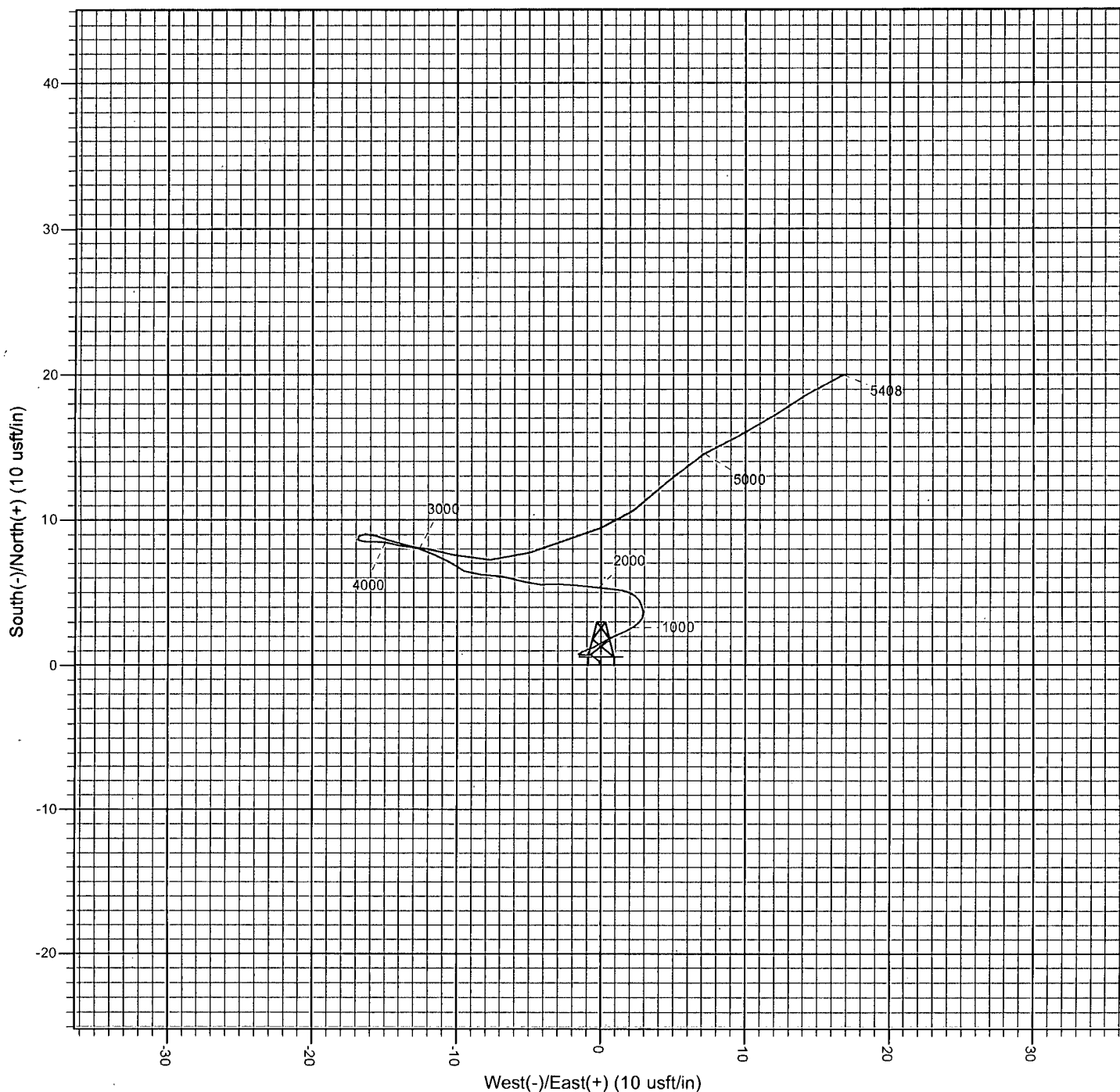


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Project: Grayburg Jackson
Eddy County, NM
Well: GJ West Coop #73
Wellbore: VH - Job #32K11121417
Design: VH - Job #32K11121417

WELL DETAILS: GJ West Coop #73
WELL @ 0.00usft (Original Well Elev)
Ground Level: 0.00

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.00	0.00	659640.93	578556.19	32° 48' 47.448 N	104° 4' 39.504 W	



PROJECT DETAILS: Grayburg Jackson	SITE DETAILS: Eddy County, NM
Geodetic System: US State Plane 1927 (Exact solution)	Site Centre Latitude: 32° 49' 40.800 N
Datum: NAD 1927 (NADCON CONUS)	Longitude: 104° 0' 7.200 W
Ellipsoid: Clarke 1866	Positional Uncertainty: 0.00
Zone: New Mexico East 3001	Convergence: 0.18
System Datum: Mean Sea Level	Local North: Grid