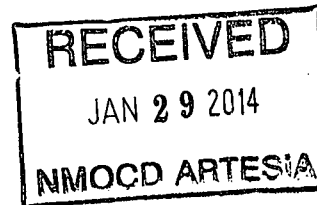


15-25633

COG OPERATING

Grayburg Jackson
Eddy County, NM
GJ West Coop #80
VH - Job #320613-KW-641



Survey: Gyro

SDI Survey Report

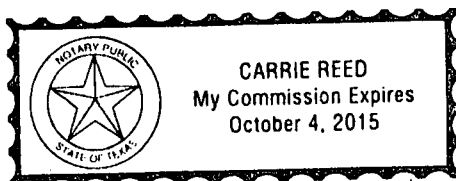
This survey is correct to the best of my knowledge and is supported by actual field data.

Robert

Notarized this date *26th* of *June*, 2013.

Carrie Reed

Notary Signature
County of Midland
State of Texas



SDI
SDI Survey Report

Company:	COG OPERATING	Local Co-ordinate Reference:	Well GJ West Coop #80
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 #80	North Reference:	Grid
Wellbore:	VH - Job #320613-KW-641	Survey Calculation Method:	Minimum Curvature
Design:	VH - Job #320613-KW-641	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:	665,097.1 usft
From:	Lat/Long	Easting:	601,778.1 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 #80, Vertical		
Well Position	+N/-S	0.00 usft	Northing: 659,209.9 usft
	+E/-W	0.00 usft	Easting: 577,832.2 usft
Position Uncertainty	0.00 usft	Wellhead Elevation:	usft
		Latitude:	32° 48' 43.200 N
		Longitude:	104° 4' 48.000 W
		Ground Level:	0.00 usft

Wellbore	VH - Job #320613-KW-641				
Magnetics	Model Name	Sample Date	Declination	Dip Angle	Field Strength
			(°)	(°)	(nT)
	IGRF2010	6/20/2013	7.62	60.59	48,738

Design	VH - Job #320613-KW-641				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W	Direction	
	(usft)	(usft)	(usft)	(°)	
	0.00	0.00	0.00	328.62	

Survey Program	Date 6/26/2013				
From	To	Survey (Wellbore)	Tool Name	Description	
(usft)	(usft)				
100.00	5,403.00	Gyro (VH - Job #320613-KW-641)	Keeper	Keeper Gyro	

Survey								
MD	Inc	Azi (azimuth)	TVD	+FSL/-FNL	+FWL/-FEL	Closure Azimuth	Closure Distance	
(usft)	(°)	(°)	(usft)	(usft)	(usft)	(°)	(usft)	
0.00	0.00	0.00	0.00	-5,887.16	-23,945.96	0.00	0.00	
100.00	0.24	50.13	100.00	-5,887.03	-23,945.80	50.13	0.21	
200.00	0.17	46.51	200.00	-5,886.79	-23,945.54	49.18	0.57	
300.00	0.24	6.72	300.00	-5,886.48	-23,945.40	39.51	0.88	
400.00	0.54	30.05	400.00	-5,885.87	-23,945.14	32.36	1.54	
500.00	0.95	27.42	499.99	-5,884.72	-23,944.53	30.53	2.83	
600.00	1.43	33.25	599.97	-5,882.94	-23,943.46	30.70	4.91	
700.00	1.22	31.68	699.94	-5,880.99	-23,942.22	31.28	7.22	
800.00	0.60	12.76	799.93	-5,879.58	-23,941.54	30.25	8.78	
900.00	0.65	339.63	899.92	-5,878.54	-23,941.62	26.71	9.66	
1,000.00	0.87	303.65	999.91	-5,877.58	-23,942.45	20.13	10.20	
1,100.00	0.82	293.78	1,099.90	-5,876.87	-23,943.74	12.20	10.53	

SDI
SDI Survey Report

Company:	COG OPERATING	Local Co-ordinate Reference:	Well GJ West Coop #80
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 #80	North Reference:	Grid
Wellbore:	VH - Job #320613-KW-641	Survey Calculation Method:	Minimum Curvature
Design:	VH - Job #320613-KW-641	Database:	EDM-Regulatory

Survey							
MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	+FSL/-FNL (usft)	+FWL/-FEL (usft)	Closure Azimuth (°)	Closure Distance (usft)
1,200.00	0.76	283.57	1,199.89	-5,876.43	-23,945.04	4.93	10.77
1,300.00	0.78	280.12	1,299.88	-5,876.15	-23,946.35	357.98	11.02
1,400.00	0.66	280.78	1,399.87	-5,875.93	-23,947.59	351.77	11.35
1,500.00	0.45	281.69	1,499.87	-5,875.74	-23,948.54	347.30	11.71
1,600.00	0.46	282.48	1,599.87	-5,875.57	-23,949.32	343.87	12.07
1,700.00	0.50	260.44	1,699.86	-5,875.56	-23,950.14	340.22	12.33
1,800.00	0.41	242.05	1,799.86	-5,875.80	-23,950.88	336.59	12.38
1,900.00	0.38	232.89	1,899.86	-5,876.17	-23,951.47	333.43	12.30
2,000.00	0.39	270.61	1,999.86	-5,876.36	-23,952.07	330.52	12.41
2,100.00	0.63	273.66	2,099.85	-5,876.32	-23,952.96	327.17	12.90
2,200.00	0.65	275.98	2,199.85	-5,876.23	-23,954.07	323.44	13.61
2,300.00	0.71	277.77	2,299.84	-5,876.09	-23,955.25	320.03	14.45
2,400.00	0.59	276.99	2,399.83	-5,875.94	-23,956.37	317.15	15.31
2,500.00	0.60	285.70	2,499.83	-5,875.74	-23,957.39	315.00	16.16
2,600.00	0.61	282.47	2,599.82	-5,875.48	-23,958.41	313.18	17.07
2,700.00	0.62	292.88	2,699.82	-5,875.16	-23,959.43	311.72	18.04
2,800.00	0.58	295.23	2,799.81	-5,874.73	-23,960.39	310.76	19.04
2,900.00	0.66	292.78	2,899.80	-5,874.29	-23,961.38	309.87	20.08
3,000.00	0.87	290.86	2,999.80	-5,873.80	-23,962.62	308.75	21.35
3,100.00	0.95	307.62	3,099.78	-5,873.02	-23,963.98	308.13	22.91
3,200.00	0.71	324.51	3,199.77	-5,872.01	-23,965.00	308.52	24.33
3,300.00	0.57	333.85	3,299.77	-5,871.06	-23,965.58	309.39	25.38
3,400.00	0.49	4.15	3,399.76	-5,870.19	-23,965.77	310.61	26.08
3,500.00	0.38	3.79	3,499.76	-5,869.43	-23,965.71	311.92	26.54
3,600.00	0.34	355.83	3,599.76	-5,868.80	-23,965.71	312.91	26.97
3,700.00	0.33	355.54	3,699.76	-5,868.22	-23,965.76	313.75	27.40
3,800.00	0.27	356.77	3,799.75	-5,867.70	-23,965.79	314.47	27.79
3,900.00	0.27	338.00	3,899.75	-5,867.24	-23,965.90	314.99	28.18
4,000.00	0.54	346.27	3,999.75	-5,866.57	-23,966.10	315.66	28.80
4,100.00	0.63	331.07	4,099.75	-5,865.63	-23,966.47	316.40	29.74
4,200.00	0.80	336.83	4,199.74	-5,864.50	-23,967.01	317.11	30.93
4,300.00	0.43	2.30	4,299.73	-5,863.49	-23,967.27	318.01	31.85
4,400.00	0.19	18.52	4,399.73	-5,862.96	-23,967.21	318.74	32.21
4,500.00	0.14	191.45	4,499.73	-5,862.92	-23,967.18	318.82	32.21
4,600.00	0.18	268.35	4,599.73	-5,863.04	-23,967.36	318.43	32.24
4,700.00	0.22	290.82	4,699.73	-5,862.98	-23,967.69	318.06	32.51
4,800.00	0.43	20.17	4,799.73	-5,862.56	-23,967.74	318.49	32.86
4,900.00	0.43	40.46	4,899.73	-5,861.92	-23,967.37	319.70	33.10
5,000.00	0.70	57.79	4,999.72	-5,861.31	-23,966.61	321.39	33.09
5,100.00	0.75	21.06	5,099.71	-5,860.37	-23,965.86	323.40	33.37
5,200.00	0.69	25.12	5,199.70	-5,859.22	-23,965.37	325.23	34.02
5,300.00	0.69	32.11	5,299.70	-5,858.16	-23,964.79	327.01	34.58
5,400.00	0.53	30.89	5,399.69	-5,857.26	-23,964.24	328.58	35.05
5,403.00	0.48	61.42	5,402.69	-5,857.24	-23,964.22	328.62	35.05

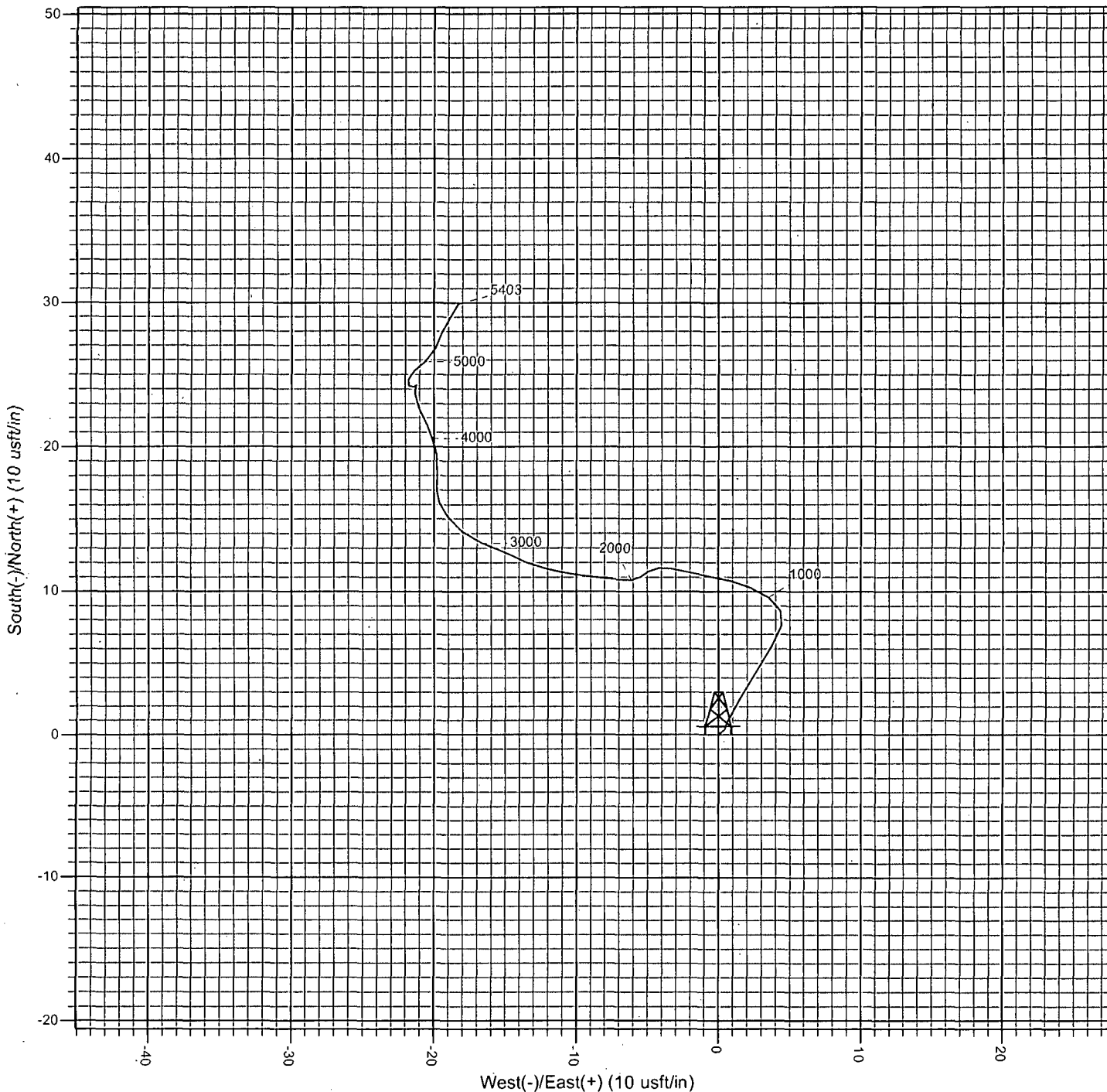


Scientific Drilling

Project: Grayburg Jackson
Eddy County, NM
Well: GJ West Coop #80
Wellbore: VH - Job #320613-KW-641
Design: VH - Job #320613-KW-641

WELL DETAILS: GJ West Coop #80
WELL @ 0.00usft (Original Well Elev)

+N/-S	+E/-W	Northing	Ground Level:	Easting	Latitude	Longitude	Slot
0.00	0.00	659209.9	0.00	577832.2	32° 48' 43.200 N	104° 4' 48.000 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