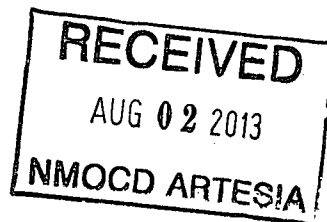


30-015-31019

COG OPERATING

Loco Hills Paddock
Eddy County, NM
Imperial State #4
VH - Job #320213-KW-213



Survey: Gyro

SDI Standard Survey Report

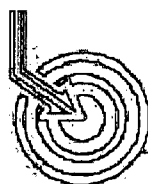
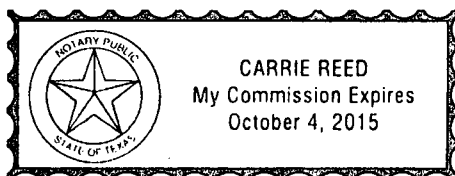
This survey is correct to the best of my knowledge and is supported by actual field data.

[Signature]

Notarized this date 1st of April, 2013.

[Signature]

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 Imperial State #4
Project:	Loco Hills Paddock	TVD Reference:	WELL @ 0.00usft (Original Well Elev)
Site:	Eddy County, NM	MD Reference:	WELL @ 0.00usft (Original Well Elev)
Well:	Imperial State #4	North Reference:	True
Wellbore:	VH - Job #320213-KW-213	Survey Calculation Method:	Minimum Curvature
Design:	VH - Job #320213-KW-213	Database:	EDM-Regulatory

Project	Loco Hills Paddock		
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:	667,685.64 usft	Latitude: 32° 50' 6.000 N
From:	Lat/Long	Easting:	614,363.49 usft	Longitude: 103° 57' 39.600 W
Position Uncertainty:	0.00 usft	Slot Radius:	0"	Grid Convergence: 0.20 °

Well	Imperial State #4, Vertical			
Well Position	+N/-S	0.00 usft	Northing:	666,942.12 usft
	+E/-W	0.00 usft	Easting:	609,758.63 usft
Position Uncertainty	0.00 usft	Wellhead Elevation:	usft	Ground Level: 0.00 usft

Wellbore	VH - Job #320213-KW-213				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	03/27/13	7.60	60.64	48,786

Design	VH - Job #320213-KW-213			
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	258.41

Survey Program	Date	04/06/13		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
100.00	5,770.00	Gyro (VH - Job #320213-KW-213)	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	0.14	154.45	100.00	-0.11	0.05	154.45	0.12	
200.00	0.39	251.40	200.00	-0.33	-0.22	213.43	0.39	
300.00	0.68	237.13	299.99	-0.76	-1.04	233.81	1.29	
400.00	1.03	223.82	399.98	-1.73	-2.16	231.29	2.77	
500.00	1.19	222.87	499.96	-3.14	-3.49	228.01	4.69	
600.00	1.25	219.38	599.94	-4.74	-4.89	225.85	6.81	
700.00	1.23	226.31	699.92	-6.33	-6.35	225.12	8.97	
800.00	1.13	251.82	799.90	-7.38	-8.07	227.56	10.93	
900.00	1.13	268.97	899.88	-7.70	-9.99	232.37	12.61	
1,000.00	1.16	290.82	999.86	-7.36	-11.92	238.31	14.01	
1,100.00	1.47	283.35	1,099.83	-6.70	-14.12	244.59	15.63	

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SDI Standard Survey Report



Company:	COG OPERATING	Local Co-ordinate Reference:	Well Imperial State #4
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Site:	Eddy County, NM	MD Reference:	WELL @ 0.00usft (Original Well Elev)
Well:	Imperial State #4	North Reference:	True
Wellbore:	VH - Job #320213-KW-213	Survey Calculation Method:	Minimum Curvature
Design:	VH - Job #320213-KW-213	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	1.39	284.45	1,199.80	-6.11	-16.54	249.74	17.63
1,300.00	1.43	283.73	1,299.77	-5.51	-18.93	253.78	19.71
1,400.00	1.25	281.90	1,399.74	-4.99	-21.20	256.77	21.78
1,500.00	1.10	281.05	1,499.72	-4.58	-23.21	258.85	23.66
1,600.00	0.86	284.48	1,599.71	-4.21	-24.88	260.41	25.24
1,700.00	0.72	287.23	1,699.70	-3.83	-26.21	261.68	26.49
1,800.00	0.72	271.89	1,799.69	-3.62	-27.44	262.47	27.68
1,900.00	0.85	280.86	1,899.68	-3.46	-28.79	263.14	29.00
2,000.00	0.82	271.80	1,999.67	-3.30	-30.24	263.77	30.42
2,100.00	0.67	258.23	2,099.66	-3.40	-31.53	263.85	31.71
2,200.00	0.75	259.99	2,199.66	-3.63	-32.74	263.67	32.94
2,300.00	1.01	258.98	2,299.64	-3.91	-34.25	263.48	34.47
2,400.00	1.02	261.63	2,399.63	-4.21	-36.00	263.33	36.24
2,500.00	1.02	252.92	2,499.61	-4.60	-37.73	263.04	38.01
2,600.00	0.98	261.46	2,599.60	-4.99	-39.43	262.78	39.74
2,700.00	1.12	249.76	2,699.58	-5.46	-41.19	262.45	41.55
2,800.00	0.92	241.04	2,799.56	-6.18	-42.81	261.78	43.25
2,900.00	0.76	236.14	2,899.55	-6.94	-44.06	261.05	44.60
3,000.00	1.01	237.08	2,999.54	-7.79	-45.35	260.25	46.02
3,100.00	0.95	239.19	3,099.53	-8.69	-46.80	259.48	47.60
3,200.00	0.78	228.21	3,199.52	-9.57	-48.02	258.73	48.97
3,300.00	0.65	230.08	3,299.51	-10.39	-48.96	258.02	50.06
3,400.00	0.77	240.05	3,399.50	-11.09	-49.98	257.49	51.20
3,500.00	0.99	261.96	3,499.49	-11.55	-51.42	257.35	52.70
3,600.00	0.89	267.74	3,599.47	-11.70	-53.05	257.57	54.33
3,700.00	0.76	292.14	3,699.46	-11.48	-54.44	258.09	55.64
3,800.00	0.81	283.21	3,799.46	-11.07	-55.74	258.77	56.83
3,900.00	0.62	276.46	3,899.45	-10.84	-56.97	259.22	57.99
4,000.00	0.45	272.02	3,999.44	-10.77	-57.90	259.46	58.89
4,100.00	0.47	279.27	4,099.44	-10.69	-58.70	259.68	59.66
4,200.00	0.80	257.89	4,199.43	-10.77	-59.78	259.79	60.75
4,300.00	1.15	238.28	4,299.42	-11.44	-61.32	259.43	62.38
4,400.00	1.20	225.74	4,399.40	-12.70	-62.92	258.59	64.19
4,500.00	1.29	228.18	4,499.37	-14.18	-64.51	257.60	66.05
4,600.00	0.73	228.94	4,599.36	-15.35	-65.83	256.87	67.60
4,700.00	0.77	235.98	4,699.35	-16.15	-66.87	256.42	68.79
4,800.00	0.73	281.96	4,799.34	-16.39	-68.05	256.46	70.00
4,900.00	0.56	273.79	4,899.34	-16.23	-69.16	256.80	71.04
5,000.00	0.69	302.49	4,999.33	-15.87	-70.16	257.25	71.93
5,100.00	0.46	272.01	5,099.33	-15.53	-71.06	257.67	72.74
5,200.00	0.17	317.00	5,199.32	-15.41	-71.57	257.85	73.21
5,300.00	0.52	263.62	5,299.32	-15.35	-72.12	257.98	73.74
5,400.00	0.55	267.06	5,399.32	-15.43	-73.05	258.07	74.66
5,500.00	0.70	265.77	5,499.31	-15.50	-74.14	258.19	75.74

Scientific Drilling International, Inc.
SDI Standard Survey Report



Company:	COG OPERATING	Local Co-ordinate Reference:	Well Imperial State #4
Project:	Loco Hills Paddock	TVD Reference:	WELL @ 0.00usft (Original Well Elev)
Site:	Eddy County, NM	MD Reference:	WELL @ 0.00usft (Original Well Elev)
Well:	Imperial State #4	North Reference:	True
Wellbore:	VH - Job #320213-KW-213	Survey Calculation Method:	Minimum Curvature
Design:	VH - Job #320213-KW-213	Database:	EDM-Regulatory

Survey							
Measured Depth (usft)	Inclination (°)	Azimuth (°)	True Vertical Depth	North/South (usft)	East/West (usft)	Closure Azimuth (°)	Closure Distance (usft)
5,600.00	0.63	272.41	5,599.31	-15.52	-75.30	258.35	76.88
5,700.00	0.56	256.27	5,699.30	-15.61	-76.32	258.44	77.90
5,770.00	0.31	249.91	5,769.30	-15.76	-76.83	258.41	78.43

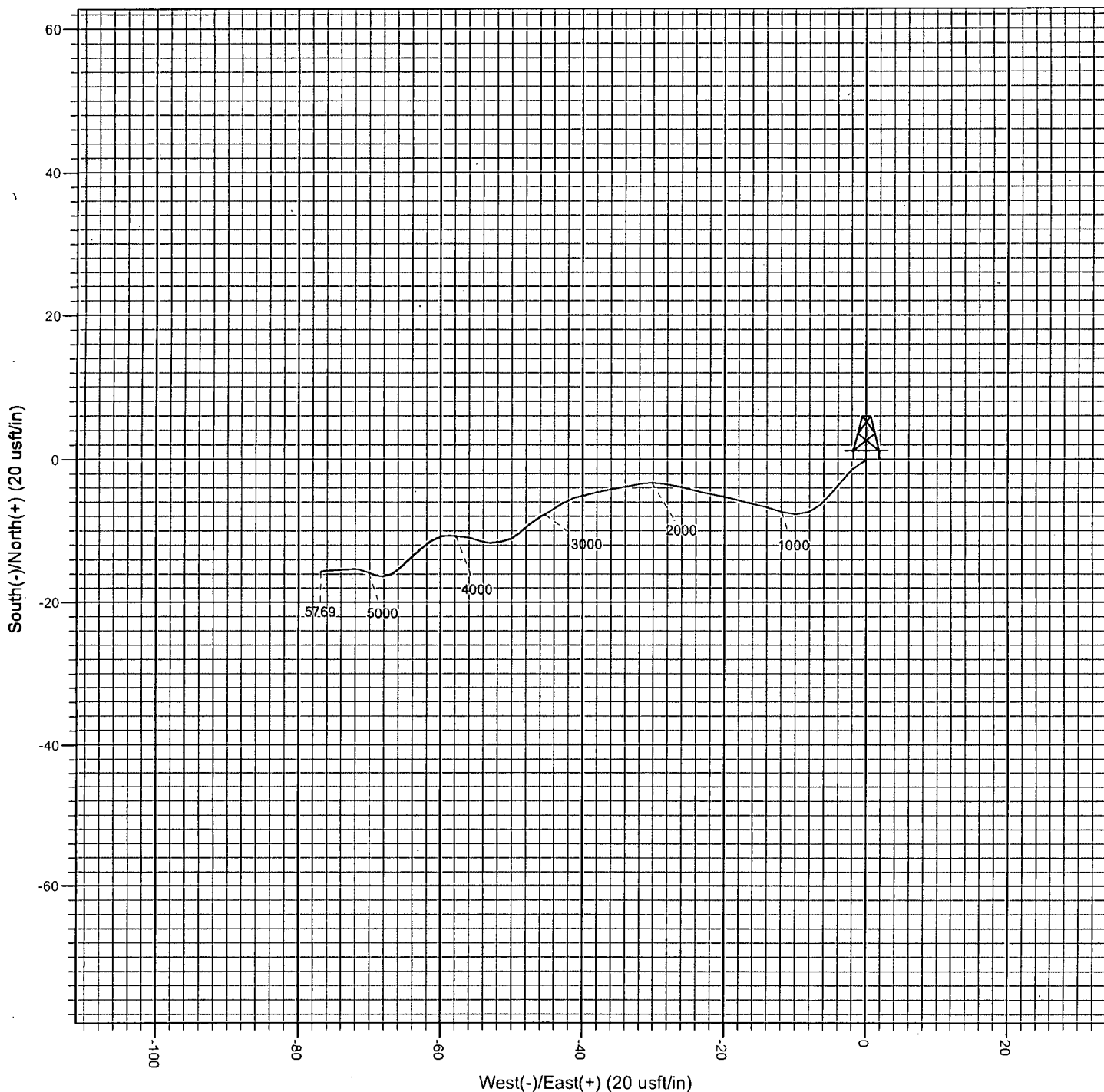


Scientific Drilling

Project: Loco Hills Paddock
Eddy County, NM
Well: Imperial State #4
Wellbore: VH - Job #320213-KW-213
Design: VH - Job #320213-KW-213

WELL DETAILS: Imperial State #4
WELL @ 0.00usft (Original Well Elev)
Ground Level: 0.00

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.00	0.00	666942.12	609758.63	32° 49' 58.800 N	103° 58' 33.600 W	



PROJECT DETAILS: Loco Hills Paddock	SITE DETAILS: Eddy County, NM
Geodetic System: US State Plane 1927 (Exact solution)	Site Centre Latitude: 32° 50' 6.000 N
Datum: NAD 1927 (NADCON CONUS)	Longitude: 103° 57' 39.600 W
Ellipsoid: Clarke 1866	Positional Uncertainty: 0.00
Zone: New Mexico East 3001	Convergence: 0.20
System Datum: Mean Sea Level	Local North: True