

COG OPERATING

Empire, Yeso East
Eddy County, NM
White Star Federal #25
VH - Job #32K12121486

Survey: Gyro

SDI Standard Survey Report

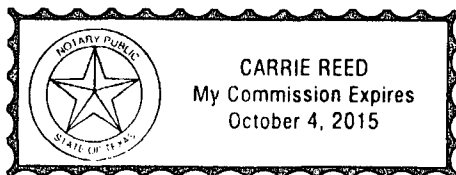
This survey is correct to the best of my knowledge and is supported by actual field data.

Reharta

Notarized this date 17th of December, 2012.

Carrie Reed

Notary Signature
County of Midland
State of Texas



Scientific Drilling International, Inc.
SDI Standard Survey Report



Company:	COG OPERATING	Local Co-ordinate Reference:	Well White Star Federal #25
Project:	Empire, Yeso East	TVD Reference:	WELL @ 0.00usft (Original Well Elev)
Site:	Eddy County, NM	MD Reference:	WELL @ 0.00usft (Original Well Elev)
Well:	White Star Federal #25	North Reference:	Grid
Wellbore:	VH - Job #32K12121486	Survey Calculation Method:	Minimum Curvature
Design:	VH - Job #32K12121486	Database:	EDM-Regulatory

Project	Empire, Yeso East		
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:	667,566.74 usft	Latitude:	32° 50' 6.025 N	
From:	Lat/Long	Easting:	572,079.69 usft	Longitude:	104° 5' 55.187 W
Position Uncertainty:	0.00 usft	Slot Radius:	0"	Grid Convergence:	0.13 °

Well	White Star Federal #25, Vertical					
Well Position	+N/-S	0.00 usft	Northing:	673,599.87 usft	Latitude:	32° 48' 36.000 N
	+E/-W	0.00 usft	Easting:	1,493,931.79 usft	Longitude:	101° 5' 56.400 W
Position Uncertainty	0.00 usft		Wellhead Elevation:	usft	Ground Level:	0.00 usft

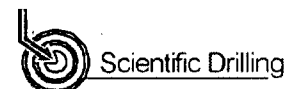
Wellbore	VH - Job #32K12121486				
Magnetics	Model Name	Sample Date	Declination	Dip Angle	Field Strength
	IGRF2010	12/11/12	(°) 6.22	(°) 61.09	(nT) 49,091

Design	VH - Job #32K12121486				
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	298.49	

Survey Program	Date	12/16/12		
From	To	Survey (Wellbore)	Tool Name	Description
(usft)	(usft)			
100.00	5,451.00	Gyro (VH - Job #32K12121486)	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
100.00	0.24	241.35	100.00	-0.10	-0.18	241.35	0.21
200.00	0.30	279.53	200.00	-0.16	-0.63	255.87	0.65
300.00	0.34	286.73	300.00	-0.03	-1.17	268.59	1.17
400.00	0.43	267.85	399.99	0.04	-1.83	271.34	1.83
500.00	0.68	271.13	499.99	0.04	-2.80	270.82	2.80
600.00	0.69	265.19	599.98	0.00	-3.99	270.02	3.99
700.00	0.45	279.44	699.98	0.02	-4.98	270.18	4.98
800.00	0.85	279.87	799.97	0.21	-6.09	271.94	6.10
900.00	0.74	286.11	899.96	0.51	-7.45	273.94	7.46
1,000.00	0.78	319.02	999.95	1.21	-8.51	278.07	8.60
1,100.00	0.62	347.73	1,099.95	2.25	-9.07	283.92	9.35

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Well:	White Star Federal #25	North Reference:	Grid
Wellbore:	VH - Job #32K12121486	Survey Calculation Method:	Minimum Curvature
Design:	VH - Job #32K12121486	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	1.12	335.42	1,199.93	3.67	-9.60	290.91	10.27	
1,300.00	1.18	327.01	1,299.91	5.42	-10.56	297.16	11.87	
1,400.00	1.18	312.55	1,399.89	6.98	-11.88	300.43	13.78	
1,500.00	1.35	316.07	1,499.87	8.52	-13.46	302.35	15.93	
1,600.00	1.51	314.78	1,599.84	10.30	-15.21	304.11	18.37	
1,700.00	1.57	313.88	1,699.80	12.18	-17.13	305.40	21.02	
1,800.00	1.46	319.12	1,799.77	14.09	-18.95	306.63	23.62	
1,900.00	1.84	316.72	1,899.73	16.22	-20.89	307.83	26.45	
2,000.00	2.02	316.30	1,999.67	18.67	-23.21	308.81	29.78	
2,100.00	2.22	318.86	2,099.60	21.40	-25.70	309.78	33.44	
2,200.00	2.20	314.18	2,199.53	24.19	-28.35	310.48	37.27	
2,300.00	2.44	317.96	2,299.44	27.11	-31.15	311.04	41.30	
2,400.00	2.18	317.76	2,399.36	30.10	-33.85	311.64	45.30	
2,500.00	2.36	319.58	2,499.28	33.08	-36.47	312.21	49.23	
2,600.00	2.50	318.78	2,599.19	36.29	-39.24	312.76	53.45	
2,700.00	2.40	303.76	2,699.10	39.09	-42.42	312.66	57.68	
2,800.00	2.20	311.36	2,799.02	41.52	-45.60	312.32	61.67	
2,900.00	1.96	301.02	2,898.96	43.67	-48.51	312.00	65.27	
3,000.00	1.97	301.44	2,998.90	45.45	-51.44	311.46	68.64	
3,100.00	1.93	299.88	3,098.84	47.18	-54.36	310.96	71.98	
3,200.00	1.96	299.35	3,198.78	48.86	-57.32	310.45	75.32	
3,300.00	2.11	308.34	3,298.72	50.84	-60.25	310.16	78.83	
3,400.00	2.52	304.51	3,398.64	53.23	-63.51	309.97	82.86	
3,500.00	2.54	295.10	3,498.54	55.41	-67.32	309.46	87.20	
3,600.00	2.68	298.86	3,598.44	57.48	-71.38	308.85	91.65	
3,700.00	2.94	296.89	3,698.32	59.77	-75.71	308.29	96.46	
3,800.00	2.72	298.94	3,798.20	62.08	-80.08	307.78	101.32	
3,900.00	2.94	310.38	3,898.07	64.89	-84.11	307.65	106.23	
4,000.00	3.03	308.83	3,997.94	68.21	-88.12	307.74	111.43	
4,100.00	3.09	301.48	4,097.80	71.27	-92.48	307.62	116.75	
4,200.00	3.15	301.46	4,197.65	74.11	-97.12	307.35	122.17	
4,300.00	3.09	304.79	4,297.50	77.08	-101.68	307.17	127.59	
4,400.00	3.16	304.29	4,397.35	80.18	-106.17	307.06	133.04	
4,500.00	3.30	300.02	4,497.19	83.17	-110.94	306.86	138.65	
4,600.00	3.29	301.18	4,597.03	86.09	-115.88	306.61	144.36	
4,700.00	3.61	296.83	4,696.85	89.00	-121.15	306.30	150.32	
4,800.00	4.82	284.98	4,796.58	91.51	-128.01	305.56	157.36	
4,900.00	4.22	280.90	4,896.26	93.29	-135.69	304.51	164.66	
5,000.00	3.73	274.67	4,996.02	94.25	-142.54	303.47	170.88	
5,100.00	3.78	266.67	5,095.81	94.32	-149.07	302.32	176.41	
5,200.00	3.03	260.25	5,195.63	93.68	-154.97	301.15	181.09	
5,300.00	2.90	252.24	5,295.50	92.46	-159.98	300.03	184.78	
5,400.00	2.45	251.60	5,395.39	91.02	-164.42	298.97	187.93	
5,451.00	2.26	249.29	5,446.35	90.32	-166.40	298.49	189.33	

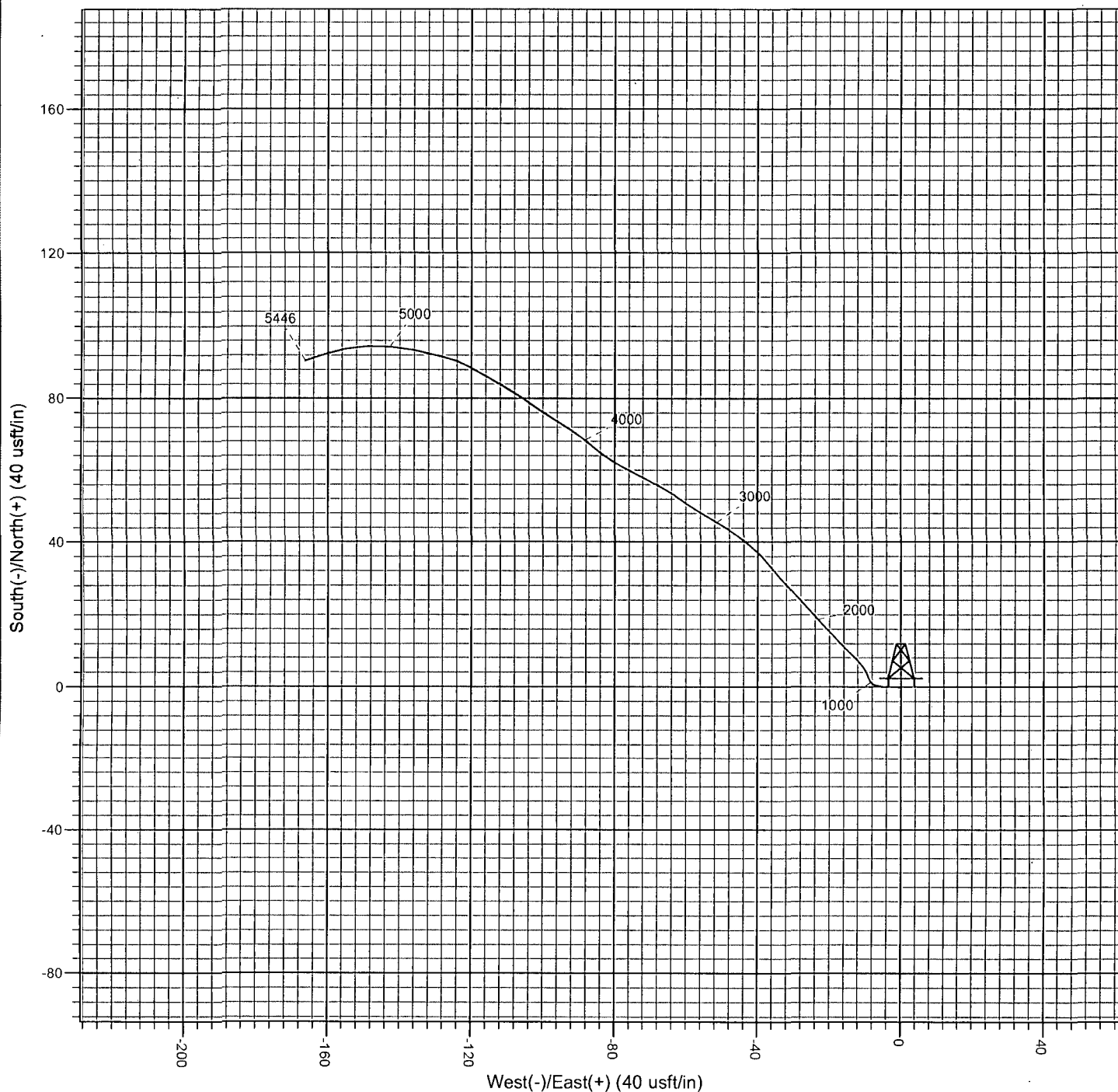


Scientific Drilling

Project: Empire, Yeso East
Eddy County, NM
Well: White Star Federal #25
Wellbore: VH - Job #32K12121486
Design: VH - Job #32K12121486

WELL DETAILS: White Star Federal #25
WELL @ 0.00usft (Original Well Elev)

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.00	0.00	673599.87	1493931.79	32° 48' 36.000 N	101° 5' 56.400 W	



PROJECT DETAILS: Empire, Yeso East	SITE DETAILS: Eddy County, NM
Geodetic System: US State Plane 1927 (Exact solution)	Site Centre Latitude: 32° 50' 6.025 N
Datum: NAD 1927 (NADCON CONUS)	Longitude: 104° 5' 55.187 W
Ellipsoid: Clarke 1866	Positional Uncertainty: 0.00
Zone: New Mexico East 3001	Convergence: 0.13
System Datum: Mean Sea Level	Local North: Grid