

COG OPERATING

Rock Spur

Eddy County, NM

Hambone Fee Com #2H

VH - Job #32K0111012

30-015-38318

Survey: Actual

SDI Standard Survey Report



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

Richard

Notarized this date 3rd of February, 2011.

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 Hambone Fee Com #2H
Project:	Rock Spur	TVD Reference:	WELL @ 0.0usft (Original Well Elev)
Site:	Eddy County, NM	MD Reference:	WELL @ 0.0usft (Original Well Elev)
Well:	Hambone Fee Com #2H	North Reference:	Grid
Wellbore:	VH - Job #32K0111012	Survey Calculation Method:	Minimum Curvature
Design:	VH - Job #32K0111012	Database:	EDM-Regulatory

Project	Rock Spur		
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:	389,220.91 usft
From:	Lat/Long	Easting:	599,085.75 usft
Position Uncertainty:	0 0 usft	Slot Radius:	13-3/16"
		Latitude:	32° 4' 10.848 N
		Longitude:	104° 0' 48.438 W
		Grid Convergence:	0 17 °

Well	Hambone Fee Com #2H, Directional (DDC)		
Well Position	+N/-S	0 0 usft	Northing: 389,220.91 usft
	+E/-W	0 0 usft	Easting: 599,085.75 usft
Position Uncertainty	0 0 usft	Wellhead Elevation:	usft
		Latitude:	32° 4' 10.848 N
		Longitude:	104° 0' 48.438 W
		Ground Level:	0.0 usft

Wellbore	VH - Job #32K0111012		
Magnetics	Model Name	Sample Date	Declination
	BGGM2010	1/4/2011	(°) 7 89
			Dip Angle (°) 59.98
			Field Strength (nT) 48,574

Design	VH - Job #32K0111012		
Audit Notes:			
Version:	1 0	Phase:	ACTUAL
		Tie On Depth:	0.0
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W
	(usft)	(usft)	(usft)
	0.0	0 0	0 0
		Direction	(°) 89 83

Survey Program	Date 2/2/2011		
From	To	Survey (Wellbore)	Tool Name
(usft)	(usft)		
100 0	6,491 0	Actual (VH - Job #32K0111012)	Keeper
			Keeper Gyro

Survey	Measured Depth	Inclination	Azimuth	True Vertical	North/South	East/West	Closure Azimuth	Closure Distance
	(usft)	(°)	(°)	Depth	(usft)	(usft)	(°)	(usft)
	0 0	0 00	0 00	0 0	0.0	0 0	0.00	0 0
	100 0	0.76	82.77	100 0	0 1	0.7	82.77	0 7
	200 0	0 77	73.33	200 0	0 4	2 0	79 60	2 0
	300 0	0 75	70.38	300 0	0 8	3 2	76 51	3 3
	400 0	0.73	65 02	400 0	1 3	4 4	74 06	4 6
	500 0	0 69	90.40	500 0	1 5	5 6	74.74	5 8
	600 0	0 71	114.41	600 0	1 3	6 8	79.40	6 9
	700 0	0.84	125.59	699 9	0 6	7 9	85 79	7 9
	800 0	1 43	130 80	799 9	-0.7	9 5	93.98	9 5
	900 0	1 91	137.93	899 9	-2.7	11.5	103 24	11 8
	1,000 0	1 97	143 54	999.8	-5.3	13.7	111.32	14.7
	1,100 0	1 90	148.38	1,099 8	-8 1	15 6	117 59	17 5

Scientific Drilling International, Inc.
SDI Standard Survey Report

Company:	COG OPERATING	Local Co-ordinate Reference:	Well Hambone Fee Com #2H
Project:	Rock Spur	TVD Reference:	WELL @ 0.0usft (Original Well Elev)
Site:	Eddy County, NM	MD Reference:	WELL @ 0.0usft (Original Well Elev)
Well:	Hambone Fee Com #2H	North Reference:	Grid
Wellbore:	VH - Job #32K0111012	Survey Calculation Method:	Minimum Curvature
Design:	VH - Job #32K0111012	Database:	EDM-Regulatory

Survey							
Measured Depth (usft)	Inclination (°)	Azimuth (°)	True Vertical Depth	North/South (usft)	East/West (usft)	Closure Azimuth (°)	Closure Distance (usft)
1,200.0	1.93	156.86	1,199.7	-11.1	17.1	122.98	20.4
1,300.0	2.05	162.53	1,299.7	-14.3	18.3	128.11	23.2
1,400.0	2.32	170.46	1,399.6	-18.0	19.2	133.29	26.3
1,500.0	2.67	176.78	1,499.5	-22.4	19.6	138.74	29.7
1,600.0	3.16	183.17	1,599.4	-27.4	19.6	144.47	33.7
1,700.0	3.72	190.26	1,699.2	-33.4	18.9	150.53	38.3
1,800.0	3.65	191.24	1,799.0	-39.7	17.7	156.01	43.5
1,900.0	2.86	190.30	1,898.8	-45.3	16.6	159.86	48.2
2,000.0	2.06	180.94	1,998.7	-49.5	16.1	161.96	52.1
2,100.0	1.79	142.79	2,098.7	-52.6	17.0	162.04	55.3
2,200.0	1.54	137.80	2,198.6	-54.8	18.9	160.98	58.0
2,300.0	1.51	138.76	2,298.6	-56.8	20.7	160.01	60.4
2,400.0	1.84	123.64	2,398.5	-58.7	22.9	158.71	63.0
2,500.0	2.65	115.33	2,498.5	-60.6	26.3	156.53	66.0
2,600.0	2.69	113.37	2,598.4	-62.5	30.5	153.95	69.5
2,700.0	2.64	117.15	2,698.2	-64.5	34.7	151.68	73.2
2,800.0	2.33	123.40	2,798.2	-66.6	38.5	149.99	76.9
2,900.0	2.11	123.09	2,898.1	-68.7	41.7	148.75	80.4
3,000.0	1.63	121.10	2,998.0	-70.5	44.5	147.74	83.4
3,100.0	1.60	119.35	3,098.0	-71.9	46.9	146.88	85.9
3,200.0	1.42	118.02	3,198.0	-73.2	49.2	146.07	88.2
3,300.0	1.41	124.16	3,297.9	-74.4	51.3	145.41	90.4
3,400.0	1.16	127.98	3,397.9	-75.8	53.2	144.94	92.5
3,500.0	0.95	129.36	3,497.9	-76.9	54.6	144.63	94.3
3,600.0	0.84	138.35	3,597.9	-78.0	55.7	144.45	95.8
3,700.0	0.72	144.75	3,697.9	-79.0	56.6	144.41	97.2
3,800.0	0.66	145.54	3,797.9	-80.0	57.3	144.42	98.4
3,900.0	0.49	154.39	3,897.8	-80.9	57.8	144.47	99.4
4,000.0	0.45	146.88	3,997.8	-81.6	58.2	144.52	100.2
4,100.0	0.43	149.40	4,097.8	-82.3	58.6	144.54	101.0
4,200.0	0.38	165.84	4,197.8	-82.9	58.9	144.63	101.7
4,300.0	0.47	151.59	4,297.8	-83.6	59.1	144.73	102.4
4,400.0	0.39	175.50	4,397.8	-84.3	59.3	144.85	103.1
4,500.0	0.46	188.08	4,497.8	-85.0	59.3	145.10	103.7
4,600.0	0.45	192.74	4,597.8	-85.8	59.2	145.41	104.2
4,700.0	0.46	195.44	4,697.8	-86.6	59.0	145.73	104.8
4,800.0	0.53	187.10	4,797.8	-87.4	58.8	146.07	105.4
4,900.0	0.57	185.82	4,897.8	-88.4	58.7	146.40	106.1
5,000.0	0.83	187.87	4,997.8	-89.6	58.6	146.83	107.0
5,100.0	0.88	184.46	5,097.8	-91.1	58.4	147.33	108.2
5,200.0	0.98	200.23	5,197.8	-92.6	58.0	147.93	109.3
5,300.0	0.96	207.30	5,297.8	-94.2	57.4	148.65	110.3
5,400.0	0.98	211.60	5,397.8	-95.7	56.5	149.42	111.1
5,500.0	1.09	200.69	5,497.7	-97.3	55.7	150.18	112.1

Scientific Drilling International, Inc.
SDI Standard Survey Report

Company:	COG-OPERATING	Local Co-ordinate Reference:	Well Hambone Fee Com #2H
Project:	Rock Spur	TVD Reference:	WELL @ 0.0usft (Original Well Elev)
Site:	Eddy County, NM	MD Reference:	WELL @ 0.0usft (Original Well Elev)
Well:	Hambone Fee Com #2H	North Reference:	Grid
Wellbore:	VH - Job #32K0111012	Survey Calculation Method:	Minimum Curvature
Design:	VH - Job #32K0111012	Database:	EDM-Regulatory

Survey							
Measured Depth (usft)	Inclination (°)	Azimuth (°)	True Vertical Depth	North/South (usft)	East/West (usft)	Closure Azimuth (°)	Closure Distance (usft)
5,600.0	1.26	199.69	5,597.7	-99.2	55.0	150.97	113.4
5,700.0	1.13	205.15	5,697.7	-101.1	54.3	151.79	114.8
5,800.0	1.23	201.35	5,797.7	-103.0	53.4	152.58	116.1
5,900.0	1.43	204.07	5,897.6	-105.2	52.5	153.45	117.6
6,000.0	1.58	206.62	5,997.6	-107.5	51.4	154.44	119.2
6,100.0	1.62	209.07	6,097.6	-110.0	50.1	155.51	120.9
6,200.0	1.88	211.78	6,197.5	-112.6	48.6	156.68	122.6
6,300.0	1.84	219.38	6,297.5	-115.3	46.7	157.95	124.4
6,400.0	1.92	218.02	6,397.4	-117.8	44.6	159.25	126.0
6,491.0	2.05	218.98	6,488.4	-120.3	42.7	160.47	127.6



Project: Rock Spur
Eddy County, NM
Well: Hambone Fee Com #2H
Wellbore: VH - Job #32K0111012
Design: VH - Job #32K0111012

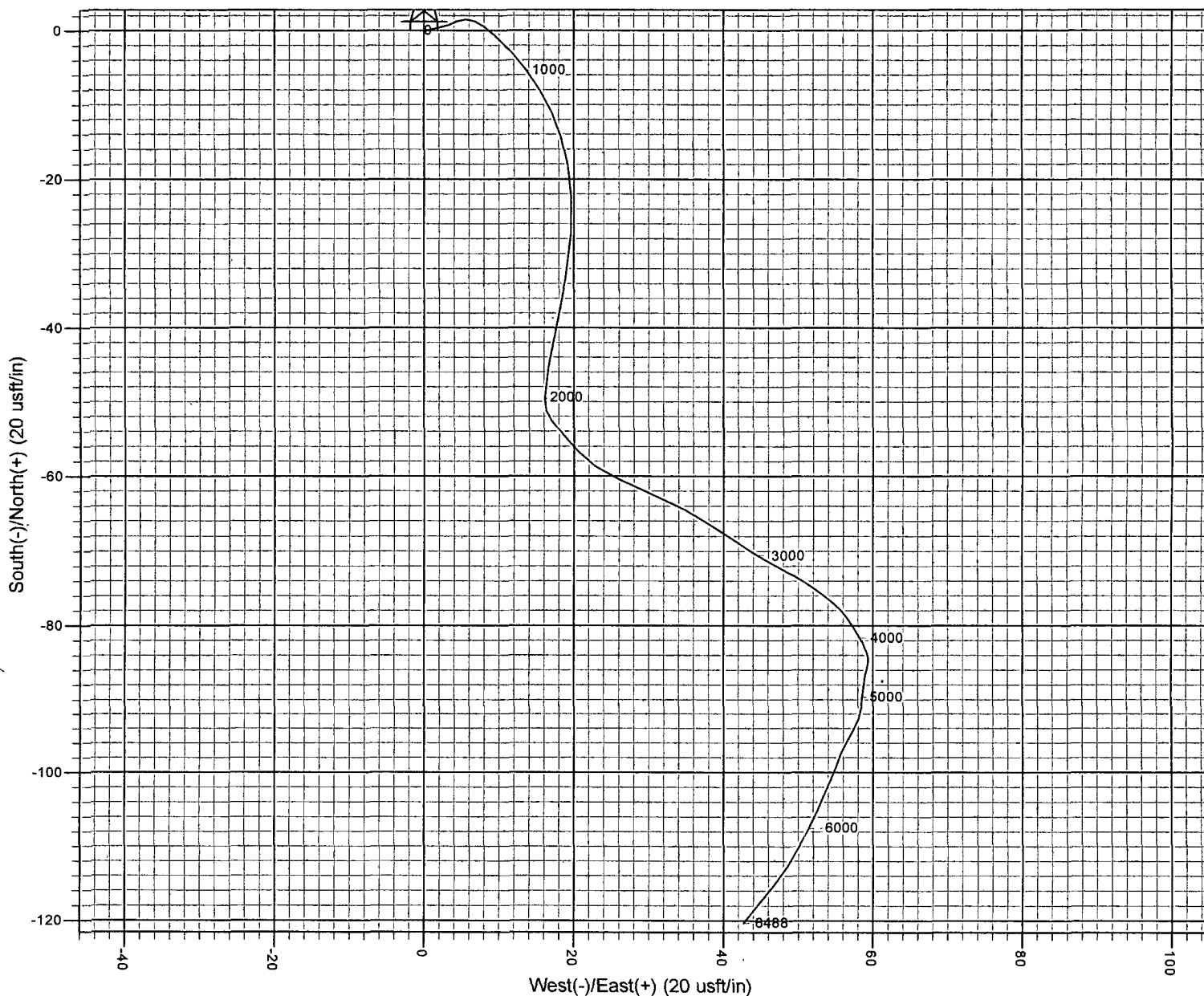


Azimuths to Grid North
True North: -0.17°
Magnetic North: 7.72°

Magnetic Field
Strength: 48573.6snT
Dip Angle: 59.98°
Date: 1/4/2011
Model: BGGM2010

WELL DETAILS: Hambone Fee Com #2H
WELL @ 0.0usft (Original Well Elev)
Ground Level: 0 0

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.0	0.0	389220.91	599085.75	32° 4' 10.848 N	104° 0' 48.438 W	



PROJECT DETAILS: Rock Spur
Geodetic System: US State Plane 1927 (Exact solution)
Datum: NAD 1927 (NADCON CONUS)
Ellipsoid: Clarke 1866
Zone: New Mexico East 3001
System Datum: Mean Sea Level

SITE DETAILS: Eddy County, NM
Site Centre Latitude: 32° 4' 10.848 N
Longitude: 104° 0' 48.438 W
Positional Uncertainty: 0.0
Convergence: 0.17
Local North: Grid