



NM OIL CONSERVATION
ARTESIA DISTRICT

DEC 08 2014

RECEIVED

September 22, 2014

Concho Resources, Inc.
One Concho Center
600 W. Illinois Avenue
Midland, Texas 79701

Attn: Kanicia Castillo

RE: **Sherman 4 Fee No. 002H**

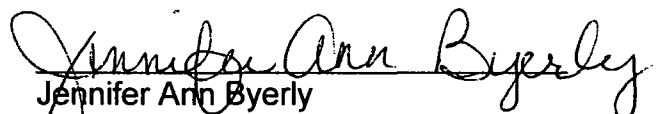
Please find enclosed a copy of the survey from 0.00' to 2,395.00' ran on the above referenced well.

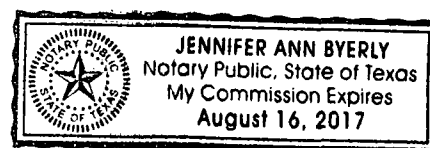
Sincerely,

Keith Havelka
Operations

STATE OF TEXAS §
 §
COUNTY OF NUECES §

This instrument was acknowledged before me on the 22 day of September A.D., 2014, by Keith Havelka.


Jennifer Ann Byerly
Notary Public, State of Texas





Company: COG Operating, LLC (Concho)
Lease/Well: Sherman 4 Fee/No. 002H
Location: C 4 19S 26 E C 330 N 1650 W Eddy
Rig Name: Silver Oak #3
State/County: New Mexico/Eddy
Latitude: 32.68, Longitude: -104.39
GRID North is 0.03 Degrees West of True North
VS-Azi: 0.02 Degrees



Depth Reference : 17 Feet

DRILLOG HA GYRO SURVEY CALCULATIONS

Filename: gyro survey.ut

Minimum Curvature Method

Report Date/Time: 9/22/2014 / 10:16

VES Survey International

Fort Worth, Texas

817-718-1320

Surveyor: Jason Wilson

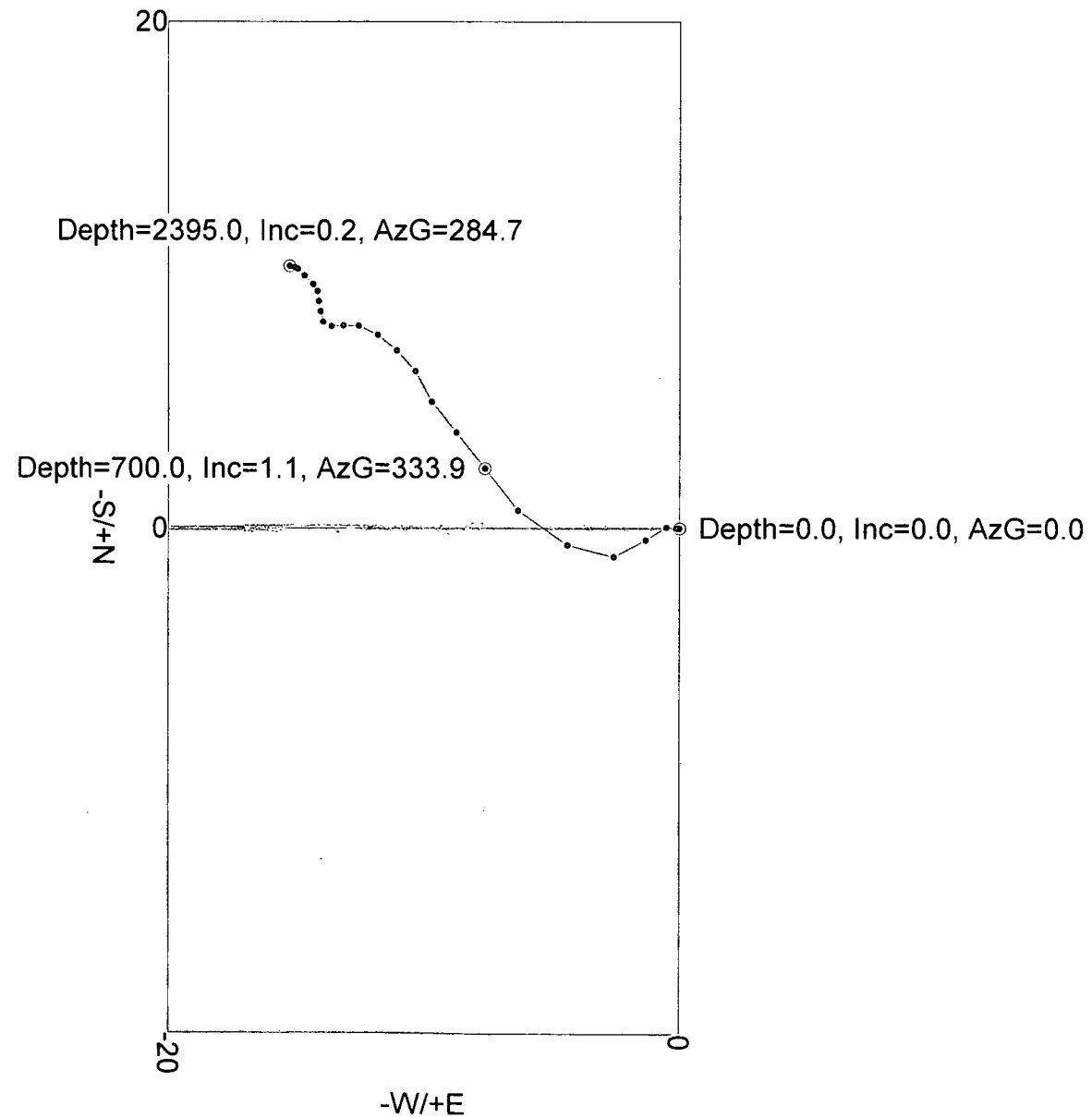
Sherman 4 Fee No. 002H / API 30-015-42204

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Vertical Section FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	****
100.00	0.12	275.69	100.00	0.01	-0.10	0.01	0.10	275.69	0.12
200.00	0.36	272.88	200.00	0.04	-0.52	0.04	0.52	274.01	0.24
300.00	0.84	224.67	299.99	-0.47	-1.35	-0.47	1.43	250.77	0.66
400.00	0.85	259.07	399.98	-1.13	-2.59	-1.13	2.83	246.40	0.50
500.00	1.41	299.81	499.97	-0.66	-4.39	-0.67	4.44	261.40	0.94
600.00	1.32	311.72	599.94	0.71	-6.31	0.71	6.35	276.43	0.30
700.00	1.13	333.86	699.91	2.37	-7.61	2.36	7.97	287.28	0.51
800.00	0.99	309.04	799.90	3.80	-8.71	3.80	9.51	293.55	0.48
900.00	0.82	335.13	899.89	4.99	-9.69	4.99	10.90	297.27	0.44
1000.00	0.74	329.88	999.88	6.21	-10.32	6.20	12.04	301.04	0.11
1100.00	0.55	302.58	1099.87	7.03	-11.05	7.02	13.09	302.46	0.36
1200.00	0.56	316.31	1199.87	7.64	-11.79	7.64	14.05	302.95	0.13
1300.00	0.47	270.78	1299.86	8.00	-12.54	8.00	14.87	302.54	0.41
1400.00	0.21	271.99	1399.86	8.01	-13.13	8.01	15.39	301.39	0.26
1500.00	0.33	261.79	1499.86	7.98	-13.60	7.97	15.77	300.39	0.13
1600.00	0.26	347.64	1599.86	8.16	-13.94	8.16	16.15	300.35	0.41
1700.00	0.22	344.44	1699.86	8.57	-14.04	8.56	16.44	301.40	0.05
1800.00	0.26	355.96	1799.86	8.98	-14.10	8.97	16.72	302.47	0.07

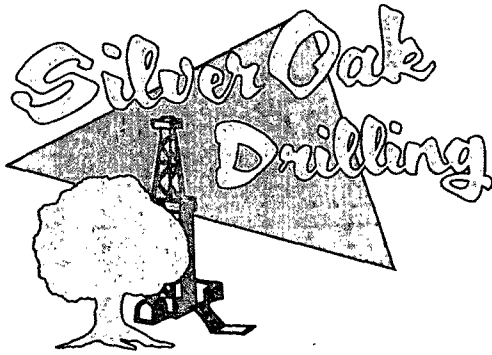
Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Vertical Section FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
1900.00	0.19	345.97	1899.86	9.37	-14.16	9.36	16.98	303.49	0.08
2000.00	0.19	311.42	1999.85	9.64	-14.32	9.64	17.27	303.94	0.11
2100.00	0.35	318.73	2099.85	9.98	-14.65	9.98	17.73	304.26	0.17
2200.00	0.08	304.14	2199.85	10.25	-14.91	10.25	18.10	304.51	0.27
2300.00	0.07	284.34	2299.85	10.31	-15.04	10.30	18.23	304.44	0.03
2395.00	0.18	284.74	2394.85	10.36	-15.24	10.36	18.43	304.21	0.12



VES Survey International
Fort Worth, Texas
817-718-1320
Surveyor: Jason Wilson
Sherman 4 Fee No. 002H / API 30-015-42204



VES Survey Date: 09/14/2014



PO Box 1370
Artesia, NM 88211-1370
(575) 748-1288

September 22, 2014

COG, LLC
One Concho Center
600 W. Illinois Ave.
Midland, TX 79701

RE: Sherman 4 Fee #2H
150' FSL & 1645' FWL
Sec. 4, T19S, R26E
Eddy County, New Mexico

Dear Sir,

The attached is the Deviation Survey for the above captioned well.

Very truly yours,

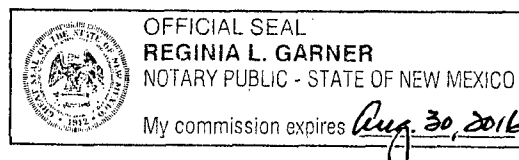
A handwritten signature in black ink, appearing to read "Chris Graham".

Chris Graham
Drilling Superintendent

State of New Mexico }
County of Eddy }

The foregoing was acknowledged before me this 22nd day of September, 2014.

A handwritten signature in black ink, appearing to read "Regina L. Garner".

Notary Public

SHERMAN 4 FEE #2 H

Date	Depth	Deviation	Direction
9/12/2014	202	0.60	0.00
9/12/2014	472	1.00	0.00
9/12/2014	653	1.00	0.00
9/12/2014	902	0.70	0.00
9/12/2014	1183	0.20	0.00
9/14/2014	1460	0.30	0.00
9/14/2014	1926	0.50	0.00
9/15/2014	2431	0.00	350.80
9/15/2014	2493	0.00	271.30
9/15/2014	2524	2.50	354.70
9/15/2014	2555	5.70	356.60
9/15/2014	2586	8.00	357.30
9/15/2014	2617	10.70	357.00
9/15/2014	2648	13.80	356.70
9/15/2014	2680	16.40	357.00
9/15/2014	2742	22.90	357.30
9/15/2014	2773	25.90	358.00
9/15/2014	2805	28.80	359.40
9/15/2014	2836	32.30	0.70
9/15/2014	2867	36.00	1.60
9/15/2014	2898	39.30	2.70
9/15/2014	2929	42.50	3.90
9/16/2014	3147	64.40	4.40
9/16/2014	3178	68.30	4.20
9/16/2014	3209	71.30	3.90
9/16/2014	3240	73.80	3.40
9/16/2014	3271	76.90	2.90
9/16/2014	3303	79.30	2.90
9/16/2014	3385	86.20	4.20
9/16/2014	3416	88.40	4.00
9/16/2014	3448	88.90	4.20
9/16/2014	3479	89.40	4.50
9/16/2014	3510	90.80	3.40
9/16/2014	3541	91.40	2.00
9/16/2014	3572	91.30	0.40
9/16/2014	3603	91.20	358.70
9/16/2014	3634	90.90	357.90
9/16/2014	3697	91.40	358.00
9/17/2014	3979	89.80	359.50
9/17/2014	4073	90.10	359.50
9/17/2014	4167	90.20	359.90
9/17/2014	4261	90.70	359.80
9/17/2014	4355	89.40	359.90

Date	Depth	Deviation	Direction
9/17/2014	4448	90.30	359.80
9/17/2014	4542	91.10	0.10
9/17/2014	4635	90.90	0.30
9/17/2014	4729	90.90	0.20
9/17/2014	4824	91.00	359.60
9/17/2014	4917	90.30	358.70
9/17/2014	5012	89.80	359.40
9/17/2014	5105	89.80	359.90
9/18/2014	5198	89.90	0.20
9/18/2014	5292	90.60	0.30
9/18/2014	5386	91.00	0.60
9/18/2014	5479	91.80	0.80
9/18/2014	5667	92.10	360.00
9/18/2014	5761	90.60	359.00
9/18/2014	5855	89.30	359.00
9/18/2014	5949	90.00	359.00
9/18/2014	6044	89.70	359.20
9/18/2014	6138	89.80	359.30
9/18/2014	6232	90.50	358.80
9/18/2014	6325	90.50	359.20
9/18/2014	6419	90.60	359.90
9/18/2014	6513	89.60	1.00
9/19/2014	6513	89.60	1.00
9/19/2014	6606	89.90	1.20
9/19/2014	6700	90.80	1.20
9/19/2014	6793	90.60	0.10
9/19/2014	6887	89.70	359.30
9/19/2014	6980	90.60	359.10
9/19/2014	7073	90.20	359.60
9/19/2014	7166	90.10	0.30
9/19/2014	7260	90.90	0.40
9/19/2014	7354	90.90	359.90
9/19/2014	7447	90.40	359.30
9/19/2014	7505	91.30	359.30

EOF



COG Operating LLC

Eddy County, NM (NAD27 NME)

Sherman 4 Fee

#2H

WB1/Job #1411691

Design: Surveys (Silver Oak 3)

Standard Survey Report

20 September, 2014





Phoenix Technology Services
Survey Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well #2H
Project:	Eddy County NM (NAD27-NME)	TVD Reference:	KB @ 3367.00usft (Silver Oak 3)
Site:	Sherman 4 Fee	MD Reference:	KB @ 3367.00usft (Silver Oak 3)
Well:	#2H	North Reference:	Grid
Wellbore:	WB1/Job #1411691	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Silver Oak 3)	Database:	GCR DB

Project	Eddy County NM (NAD27-NME)		
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	Sherman 4 Fee		
Site Position:		Northing:	612,151.80 usft
From:	Map	Easting:	485,212.40 usft
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "
		Latitude:	32° 40' 58.42381 N
		Longitude:	104° 22' 53.02452 W
		Grid Convergence:	-0.03 °

Well	#2H		
Well Position	+N-S	0.00 usft	Northing:
	+E-W	0.00 usft	Easting:
Position Uncertainty	0.00 usft	Wellhead Elevation:	usft
		Latitude:	32° 40' 58.24603 N
		Longitude:	104° 23' 23.08923 W
		Ground Level:	3,349.00 usft

Wellbore	WB1/Job #1411691		
Magnetics	Model Name	Sample Date	Declination
			(°)
	IGRF2010_14	09/10/14	7.60
			Dip Angle
			(°)
			60.39
			Field Strength
			(nT)
			48,479

Design	Surveys (Silver Oak 3)		
Audit Notes:			
Version:	1.0	Phase:	ACTUAL
		Tie On Depth:	0.00
Vertical Section:	Depth From (TVD)	+N-S	+E-W
	(usft)	(usft)	(usft)
	0.00	0.00	0.00
			Direction
			(°)
			0.02

Survey/Program	Date 09/20/14		
From	To	Survey (Wellbore)	Tool Name
(usft)	(usft)		
100.00	2,395.00	VES Gyro Surveys (WB1/Job #1411691)	NS-GYRO-MS
2,431.00	7,565.00	Phoenix MWD Survey (WB1/Job #1411691)	PHX+MWD+IGRF
			Description
			North sensing gyrocompassing m/s
			PHX+MWD+IGRF v3:standard declination

Survey										
Measured	Inclination	Azimuth	Vertical	+N-S	+E-W	Vertical	Dogleg	Build	Turn	
Depth	(°)	(°)	Depth	(usft)	(usft)	Section	Rate	Rate	Rate	
(usft)			(usft)			(usft)	(°/100usft)	(°/100usft)	(°/100usft)	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
100.00	0.12	275.69	100.00	0.01	-0.10	0.01	0.12	0.12	0.00	
200.00	0.36	272.88	200.00	0.04	-0.52	0.04	0.24	0.24	-2.81	
300.00	0.84	224.67	299.99	-0.47	-1.35	-0.47	0.66	0.48	-48.21	
400.00	0.85	259.07	399.98	-1.13	-2.59	-1.13	0.50	0.01	34.40	
500.00	1.41	299.81	499.97	-0.66	-4.39	-0.66	0.95	0.56	40.74	
600.00	1.32	311.72	599.94	0.72	-6.32	0.72	0.30	-0.09	11.91	
700.00	1.13	333.86	699.91	2.37	-7.61	2.37	0.51	-0.19	22.14	
800.00	0.99	309.04	799.90	3.80	-8.72	3.80	0.48	-0.14	-24.82	
900.00	0.82	335.13	899.89	4.99	-9.69	4.99	0.44	-0.17	26.09	



Phoenix Technology Services
Survey Report



Company:	COG Operating, LLC	Local Co-ordinate Reference:	Well #2H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	KB @ 3367.00usft (Silver Oak 3)
Site:	Sherman 4 Fee	MD Reference:	KB @ 3367.00usft (Silver Oak 3)
Well:	#2H	North Reference:	Grid
Wellbore:	WB1/Job #1411691	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Silver Oak 3)	Database:	GCR DB

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
1,000.00	0.74	329.88	999.88	6.20	-10.31	6.20	0.11	-0.08	-5.25
1,100.00	0.55	302.58	1,099.87	7.02	-11.04	7.01	0.36	-0.19	-27.30
1,200.00	0.56	316.31	1,199.87	7.63	-11.78	7.63	0.13	0.01	13.73
1,300.00	0.47	270.78	1,299.86	7.99	-12.53	7.98	0.41	-0.09	-45.53
1,400.00	0.21	271.99	1,399.86	8.00	-13.13	8.00	0.26	-0.26	1.21
1,500.00	0.33	261.79	1,499.86	7.97	-13.59	7.96	0.13	0.12	-10.20
1,600.00	0.26	347.64	1,599.86	8.15	-13.93	8.14	0.41	-0.07	85.85
1,700.00	0.22	344.44	1,699.86	8.55	-14.03	8.55	0.04	-0.04	-3.20
1,800.00	0.26	355.96	1,799.86	8.96	-14.10	8.96	0.06	0.04	11.52
1,900.00	0.19	345.97	1,899.86	9.35	-14.15	9.35	0.08	-0.07	-9.99
2,000.00	0.19	311.42	1,999.86	9.62	-14.32	9.62	0.11	0.00	-34.55
2,100.00	0.35	318.73	2,099.85	9.96	-14.64	9.96	0.16	0.16	7.31
2,200.00	0.08	304.14	2,199.85	10.23	-14.90	10.22	0.27	-0.27	-14.59
2,300.00	0.07	284.34	2,299.85	10.28	-15.02	10.28	0.03	-0.01	-19.80
2,395.00	0.18	284.74	2,394.85	10.34	-15.22	10.33	0.12	0.12	0.42
Tie-on to VES Gyro									
2,431.00	0.00	350.80	2,430.85	10.35	-15.27	10.35	0.50	-0.50	0.00
First Phoenix MWD Survey									
2,462.00	0.10	262.50	2,461.85	10.35	-15.30	10.34	0.32	0.32	0.00
2,493.00	0.00	271.30	2,492.85	10.34	-15.33	10.34	0.32	-0.32	0.00
2,524.00	2.50	354.70	2,523.84	11.02	-15.39	11.01	8.06	8.06	0.00
2,555.00	5.70	356.60	2,554.76	13.23	-15.54	13.22	10.33	10.32	6.13
2,586.00	8.00	357.30	2,585.54	16.92	-15.74	16.91	7.42	7.42	2.26
2,617.00	10.70	357.00	2,616.12	21.95	-15.99	21.94	8.71	8.71	-0.97
2,649.00	13.80	356.70	2,647.39	28.73	-16.36	28.72	9.69	9.69	-0.94
2,680.00	16.40	357.00	2,677.32	36.79	-16.81	36.78	8.39	8.39	0.97
2,711.00	19.20	357.40	2,706.83	46.25	-17.27	46.25	9.04	9.03	1.29
2,742.00	22.90	357.30	2,735.76	57.38	-17.78	57.37	11.94	11.94	-0.32
2,773.00	25.90	358.00	2,763.98	70.17	-18.30	70.16	9.72	9.68	2.26
2,805.00	28.80	359.40	2,792.40	84.86	-18.63	84.86	9.28	9.06	4.38
2,836.00	32.30	0.70	2,819.10	100.62	-18.60	100.61	11.49	11.29	4.19
2,867.00	36.00	1.60	2,844.75	118.01	-18.25	118.01	12.05	11.94	2.90
2,898.00	39.30	2.70	2,869.29	136.93	-17.53	136.93	10.86	10.65	3.55
2,929.00	42.50	3.90	2,892.72	157.19	-16.36	157.19	10.63	10.32	3.87
2,960.00	45.80	5.10	2,914.96	178.71	-14.66	178.71	10.98	10.65	3.87
2,992.00	49.10	6.20	2,936.59	202.17	-12.33	202.16	10.62	10.31	3.44
3,023.00	51.80	6.60	2,956.33	225.92	-9.66	225.92	8.77	8.71	1.29
3,054.00	55.00	6.30	2,974.81	250.65	-6.87	250.65	10.35	10.32	-0.97
3,085.00	58.10	5.30	2,991.90	276.38	-4.26	276.38	10.36	10.00	-3.23
3,116.00	61.00	4.90	3,007.61	302.99	-1.89	302.99	9.42	9.35	-1.29
3,147.00	64.40	4.40	3,021.82	330.45	0.35	330.45	11.06	10.97	-1.61
3,178.00	68.30	4.20	3,034.26	358.76	2.47	358.76	12.59	12.58	-0.65
3,209.00	71.30	3.90	3,044.96	387.77	4.53	387.78	9.72	9.68	-0.97



Phoenix Technology Services
Survey Report



Company:	COG Operating, LLC	Local Co-ordinate Reference:	Well: #2H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	KB @ 3367.00usft (Silver Oak 3)
Site:	Sherman 4 Fee	MD Reference:	KB @ 3367.00usft (Silver Oak 3)
Well:	#2H	North Reference:	Grid
Wellbore:	WB1/Job #1411691	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Silver Oak 3)	Database:	GCR DB

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
3,240.00	73.80	3.40	3,054.25	417.28	6.41	417.29	8.21	8.06	-1.61
3,271.00	76.90	2.90	3,062.09	447.23	8.06	447.23	10.12	10.00	-1.61
3,303.00	79.30	2.90	3,068.69	478.50	9.64	478.50	7.50	7.50	0.00
3,334.00	81.40	3.20	3,073.89	509.01	11.27	509.02	6.84	6.77	0.97
3,365.00	84.50	3.90	3,077.69	539.72	13.17	539.72	10.25	10.00	2.26
3,385.00	86.20	4.20	3,079.31	559.60	14.58	559.61	8.63	8.50	1.50
3,416.00	88.40	4.00	3,080.77	590.48	16.79	590.49	7.13	7.10	-0.65
3,447.00	88.90	4.20	3,081.50	621.40	19.01	621.40	1.74	1.61	0.65
3,479.00	89.40	4.50	3,081.98	653.30	21.44	653.31	1.82	1.56	0.94
3,510.00	90.80	3.40	3,081.93	684.23	23.57	684.23	5.74	4.52	-3.55
3,541.00	91.40	2.00	3,081.33	715.18	25.03	715.19	4.91	1.94	-4.52
3,572.00	91.30	0.40	3,080.60	746.17	25.68	746.18	5.17	-0.32	-5.16
3,603.00	91.20	358.70	3,079.92	777.16	25.44	777.17	5.49	-0.32	-5.48
3,634.00	90.90	357.90	3,079.36	808.14	24.52	808.15	2.76	-0.97	-2.58
3,697.00	91.40	358.00	3,078.09	871.09	22.26	871.09	0.81	0.79	0.16
3,792.00	90.50	357.80	3,076.52	966.01	18.78	966.02	0.97	-0.95	-0.21
3,885.00	90.10	358.30	3,076.03	1,058.95	15.62	1,058.96	0.69	-0.43	0.54
3,979.00	89.80	359.50	3,076.11	1,152.93	13.81	1,152.94	1.32	-0.32	1.28
4,073.00	90.10	359.50	3,076.19	1,246.93	12.99	1,246.93	0.32	0.32	0.00
4,167.00	90.20	359.90	3,075.95	1,340.93	12.50	1,340.93	0.44	0.11	0.43
4,261.00	90.70	359.80	3,075.21	1,434.92	12.26	1,434.93	0.54	0.53	-0.11
4,355.00	89.40	359.90	3,075.13	1,528.92	12.01	1,528.93	1.39	-1.38	0.11
4,449.00	90.30	359.80	3,075.37	1,622.92	11.76	1,622.92	0.96	0.96	-0.11
4,542.00	91.10	0.10	3,074.24	1,715.91	11.68	1,715.92	0.92	0.86	0.32
4,635.00	90.90	0.30	3,072.61	1,808.90	12.01	1,808.90	0.30	-0.22	0.22
4,729.00	90.90	0.20	3,071.14	1,902.89	12.42	1,902.89	0.11	0.00	-0.11
4,824.00	91.00	359.60	3,069.56	1,997.87	12.25	1,997.88	0.64	0.11	-0.63
4,917.00	90.30	358.70	3,068.51	2,090.85	10.87	2,090.86	1.23	-0.75	-0.97
5,012.00	89.80	359.40	3,068.42	2,185.84	9.30	2,185.84	0.91	-0.53	0.74
5,105.00	89.80	359.90	3,068.75	2,278.84	8.73	2,278.84	0.54	0.00	0.54
5,198.00	89.90	0.20	3,068.99	2,371.84	8.81	2,371.84	0.34	0.11	0.32
5,292.00	90.50	0.30	3,068.66	2,465.84	9.22	2,465.84	0.65	0.64	0.11
5,386.00	91.00	0.60	3,067.43	2,559.82	9.96	2,559.83	0.62	0.53	0.32
5,479.00	91.80	0.80	3,065.16	2,652.79	11.09	2,652.79	0.89	0.86	0.22
5,573.00	91.90	0.50	3,062.13	2,746.73	12.16	2,746.74	0.34	0.11	-0.32
5,667.00	92.10	0.00	3,058.85	2,840.67	12.57	2,840.68	0.57	0.21	-0.53
5,761.00	90.60	359.00	3,056.63	2,934.64	11.75	2,934.65	1.92	-1.60	-1.06
5,855.00	89.30	359.00	3,056.71	3,028.62	10.11	3,028.63	1.38	-1.38	0.00
5,949.00	90.00	359.00	3,057.29	3,122.61	8.47	3,122.61	0.74	0.74	0.00
6,044.00	89.70	359.20	3,057.54	3,217.60	6.98	3,217.60	0.38	-0.32	0.21
6,138.00	89.80	359.30	3,057.95	3,311.59	5.75	3,311.59	0.15	0.11	0.11
6,232.00	90.50	358.80	3,057.70	3,405.57	4.19	3,405.57	0.92	0.74	-0.53
6,325.00	90.50	359.20	3,056.89	3,498.56	2.56	3,498.56	0.43	0.00	0.43
6,419.00	90.60	359.90	3,055.99	3,592.55	1.83	3,592.55	0.75	0.11	0.74



Phoenix Technology Services
Survey Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well: #2H
Project:	Eddy County NM (NAD27 NME)	TVD Reference:	KB @ 3367.00usft (Silver Oak 3)
Site:	Sherman 4 Fee	MD Reference:	KB @ 3367.00usft (Silver Oak 3)
Well:	#2H	North Reference:	Grid
Wellbore:	WB1/Job #1411691	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Silver Oak 3)	Database:	GCR DB

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
6,513.00	89.60	1.00	3,055.82	3,686.54	2.56	3,686.54	1.58	-1.06	1.17
6,606.00	89.90	1.20	3,056.23	3,779.52	4.35	3,779.52	0.39	0.32	0.22
6,700.00	90.80	1.20	3,055.65	3,873.50	6.32	3,873.50	0.96	0.96	0.00
6,793.00	90.60	0.10	3,054.52	3,966.49	7.37	3,966.49	1.20	-0.22	-1.18
6,887.00	89.70	359.30	3,054.27	4,060.48	6.88	4,060.48	1.28	-0.96	-0.85
6,980.00	90.60	359.10	3,054.03	4,153.47	5.58	4,153.47	0.99	0.97	-0.22
7,073.00	90.20	359.60	3,053.38	4,246.46	4.53	4,246.46	0.69	-0.43	0.54
7,166.00	90.10	0.30	3,053.14	4,339.46	4.45	4,339.46	0.76	-0.11	0.75
7,260.00	90.90	0.40	3,052.32	4,433.46	5.02	4,433.46	0.86	0.85	0.11
7,354.00	90.90	359.90	3,050.84	4,527.44	5.27	4,527.45	0.53	0.00	-0.53
7,447.00	90.40	359.30	3,049.78	4,620.43	4.62	4,620.44	0.84	-0.54	-0.65
7,505.00	91.30	359.30	3,048.92	4,678.42	3.91	4,678.42	1.55	1.55	0.00
Last Phoenix MWD Survey									
7,565.00	91.30	359.30	3,047.56	4,738.40	3.18	4,738.40	0.00	0.00	0.00
Projection to TD									

Design Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
2,395.00	2,394.85	10.34	-15.22	Tie-on to VES Gyro
2,431.00	2,430.85	10.35	-15.27	First Phoenix MWD Survey
7,505.00	3,048.92	4,678.42	3.91	Last Phoenix MWD Survey
7,565.00	3,047.56	4,738.40	3.18	Projection to TD

Checked By: _____	Approved By: _____	Date: _____
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