



May 7, 2015

30-015-42785

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

Attn: Kanicia Castillo

RE: **Bose Ikard 4 State Com 27H**

Please find enclosed a copy of the survey from 0' to 3930' ran on the above referenced well.

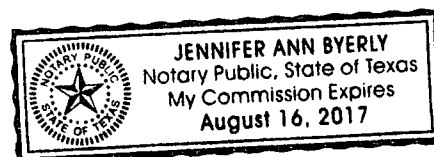
Sincerely,

Keith Havelka
Operations

STATE OF TEXAS §
 §
COUNTY OF NUECES §

This instrument was acknowledged before me on the 7 day of May,
A.D., 2015, by Keith Havelka.


Jennifer Ann Byerly
Notary Public, State of Texas



Company: COG Operating
Lease/Well: Bose Ikard 4 State Com /27H



Rig Name: United Rig 43
State/County: New Mexico /Eddy
VS-Azi: 0.00 Degrees
Latitude: 32.85894, Longitude: -104.08681
Grid Convergence Applied = -0.13 degs (NAD 27)
Grid North = True North -0.13 degs



NM OIL CONSERVATION
ARTESIA DISTRICT
JUN 26 2015
RECEIVED

Depth Reference : R.K.B=12.5 Ft

DRILLOG HA GYRO SURVEY CALCULATIONS
Filename: ...4 state com well 27h-de_01.ut
Minimum Curvature Method
Report Date/Time: 5/7/2015 / 14:25

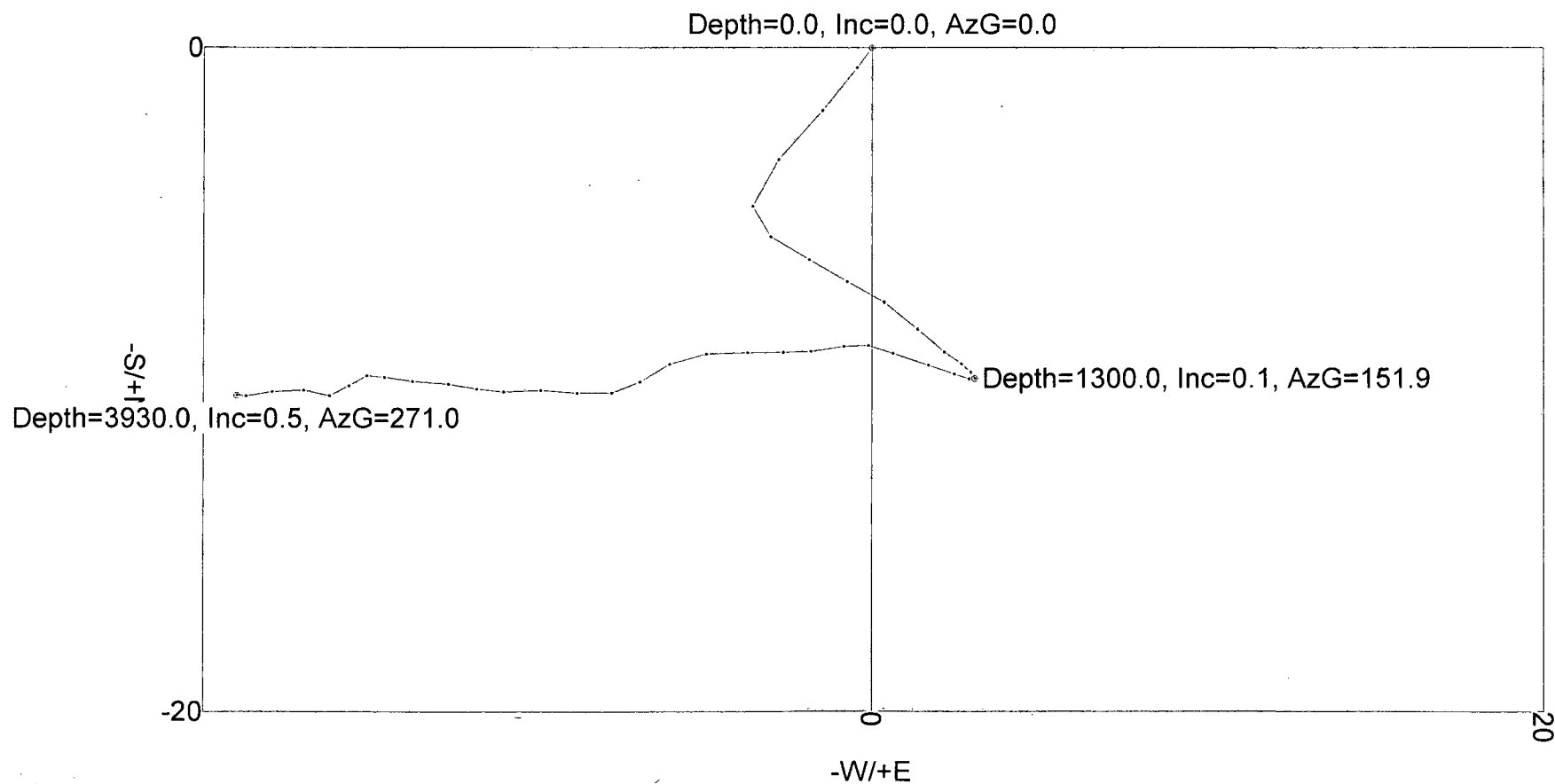
VES Survey International
(432) 563-5444
West Texas
Surveyor: Javier Estrada
Bose Ikard 4 State Com 27H / API 30-015-42785

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	0.86	216.52	100.00	-0.60	-0.45	-0.60	0.75	216.52	0.86
200.00	1.02	219.91	199.98	-1.89	-1.47	-1.89	2.39	217.79	0.18
300.00	1.23	223.09	299.96	-3.36	-2.78	-3.36	4.36	219.53	0.22
400.00	0.71	184.45	399.95	-4.77	-3.56	-4.77	5.95	216.73	0.81
500.00	0.77	116.34	499.94	-5.69	-3.01	-5.69	6.43	207.86	0.83
600.00	0.76	125.53	599.93	-6.37	-1.86	-6.37	6.64	196.29	0.12
700.00	0.73	114.64	699.93	-7.03	-0.74	-7.03	7.07	186.01	0.15
800.00	0.72	124.51	799.92	-7.65	0.36	-7.65	7.66	177.30	0.13
900.00	0.76	133.55	899.91	-8.47	1.36	-8.47	8.58	170.85	0.12
1000.00	0.44	126.82	999.90	-9.16	2.16	-9.16	9.41	166.75	0.33
1100.00	0.26	124.68	1099.90	-9.52	2.66	-9.52	9.88	164.42	0.18
1200.00	0.16	142.56	1199.90	-9.76	2.93	-9.76	10.19	163.30	0.12
1300.00	0.10	151.92	1299.90	-9.95	3.06	-9.95	10.41	162.93	0.06
1400.00	0.25	285.24	1399.90	-9.97	2.88	-9.97	10.38	163.87	0.33
1500.00	0.28	293.90	1499.90	-9.82	2.45	-9.82	10.12	166.00	0.05
1600.00	0.65	286.50	1599.90	-9.56	1.68	-9.56	9.70	170.03	0.38

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
1700.00	0.63	291.02	1699.89	-9.20	0.63	-9.20	9.22	176.11	0.06
1800.00	0.26	282.51	1799.89	-8.96	-0.11	-8.96	8.96	180.68	0.37
1900.00	0.58	260.75	1899.88	-8.99	-0.83	-8.99	9.03	185.29	0.35
2000.00	0.55	261.99	1999.88	-9.14	-1.81	-9.14	9.31	191.18	0.04
2100.00	0.42	276.00	2099.88	-9.16	-2.64	-9.16	9.54	196.05	0.17
2200.00	0.81	265.82	2199.87	-9.18	-3.70	-9.18	9.90	201.98	0.41
2300.00	0.62	270.88	2299.86	-9.22	-4.95	-9.22	10.46	208.21	0.21
2400.00	0.73	240.76	2399.85	-9.52	-6.04	-9.52	11.28	212.38	0.37
2500.00	0.46	234.44	2499.85	-10.07	-6.92	-10.07	12.22	214.51	0.28
2600.00	0.61	259.48	2599.85	-10.40	-7.77	-10.40	12.98	216.78	0.28
2700.00	0.59	280.13	2699.84	-10.40	-8.80	-10.40	13.63	220.23	0.22
2800.00	0.66	269.09	2799.83	-10.32	-9.88	-10.32	14.29	223.74	0.14
2900.00	0.64	266.58	2899.83	-10.37	-11.01	-10.37	15.12	226.73	0.03
3000.00	0.31	296.45	2999.82	-10.28	-11.82	-10.28	15.66	228.99	0.40
3100.00	0.71	272.14	3099.82	-10.13	-12.68	-10.13	16.23	231.37	0.44
3200.00	0.55	277.63	3199.81	-10.05	-13.77	-10.05	17.04	233.89	0.17
3300.00	0.43	278.15	3299.81	-9.93	-14.61	-9.93	17.67	235.81	0.11
3400.00	0.18	270.39	3399.81	-9.87	-15.14	-9.87	18.08	236.89	0.26
3500.00	0.57	231.73	3499.81	-10.18	-15.69	-10.18	18.70	237.02	0.44
3600.00	0.22	272.25	3599.80	-10.48	-16.27	-10.48	19.36	237.22	0.42
3700.00	0.68	285.73	3699.80	-10.31	-17.04	-10.31	19.91	238.82	0.46
3800.00	0.48	241.41	3799.80	-10.35	-17.98	-10.35	20.74	240.06	0.47
3900.00	0.46	279.93	3899.79	-10.49	-18.74	-10.49	21.48	240.77	0.31
3930.00	0.55	271.03	3929.79	-10.46	-19.00	-10.46	21.69	241.17	0.39



VES Survey International
(432) 563-5444
West Texas
Surveyor: Javier Estrada
Bose Ikard 4 State Com 27H / API 30-015-42785



WELL NAME AND NUMBER Bose Ikard 4 State Com No. 7H
 LOCATION Section 4, T17S, R29E, Unit M, 990 FSL, 330 FWL, Eddy County
 OPERATOR COG Operating LLC
 DRILLING CONTRACTOR United Drilling, Inc.

The undersigned hereby certifies that he is an authorized representative of the drilling contractor who drilled the above described well and had conducted deviation test and obtained the following results:

Degrees @ Depth	Degrees @ Depth	Degrees @ Depth
1.2° @ 333'	39.3° @ 4404'	90.9° @ 5127'
.7° @ 628'	42.6° @ 4436'	90.9° @ 5221'
.7° @ 865'	46.2° @ 4467'	90.7° @ 5316'
.1° @ 1105'	49.0° @ 4499'	90.5° @ 5411'
.3° @ 1362'	52.2° @ 4530'	90.5° @ 5505'
.3° @ 1771'	54.8° @ 4562'	90.4° @ 5694'
.8° @ 2117'	57.9° @ 4593'	90.5° @ 5788'
.4° @ 2400'	64.6° @ 4656'	90.4° @ 5883'
.5° @ 2710'	68.0° @ 4688'	90.5° @ 5977'
.6° @ 2994'	70.7° @ 4719'	90.5° @ 6072'
.4° @ 3345'	73.9° @ 4751'	90.5° @ 6166'
.4° @ 3595'	77.1° @ 4782'	91.4° @ 6261'
.6° @ 3979'	80.0° @ 4813'	91.2° @ 6355'
.4° @ 4026'	82.5° @ 4845'	91.3° @ 6450'
.7° @ 4058'	85.0° @ 4876'	91.3° @ 6544'
3.4° @ 4155'	88.0° @ 4908'	91.1° @ 6639'
11.2° @ 4152'	89.1° @ 4938'	90.7° @ 6729'
15.3° @ 4184'	90.7° @ 5032'	90.8° @ 6827'

NM OIL CONSERVATION
 ARTESIA DISTRICT
 JUN 26 2015

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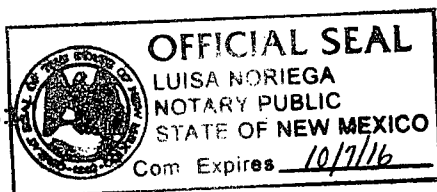
Drilling Contractor- UNITED DRILLING, INC.

By: *Angel Salazar*
 (Angel Salazar)

Title: Vice President

Subscribed and sworn to before me this 12th day of May 2015.

My Commission Expires



Luisa Noriega
 Notary Public
Charles *NM*
 County State

WELL NAME AND NUMBER Bose Ikard 4 State Com No. 7H
 LOCATION Section 4, T17S, R29E, Unit M, 990 FSL, 330 FWL, Eddy County
 OPERATOR COG Operating LLC
 DRILLING CONTRACTOR United Drilling, Inc.

The undersigned hereby certifies that he is an authorized representative of the drilling contractor who drilled the above described well and had conducted deviation test and obtained the following results:

Degrees @ Depth	Degrees @ Depth	Degrees @ Depth
90.4° @ 6921'		
89.9° @ 7016'		
91.6° @ 7109'		
91.9° @ 7203'		
92.0° @ 7298'		
91.5° @ 7392'		
91.5° @ 7487'		
91.5° @ 7581'		
91.6° @ 7676'		
91.8° @ 7770'		
91.2° @ 7959'		
91.3° @ 8054'		
91.6° @ 8148'		
90.1° @ 8243'		
90.3° @ 8337'		
90.9° @ 8526'		
91.0° @ 8810'		
91.2° @ 8874'		

Drilling Contractor- UNITED DRILLING, INC.

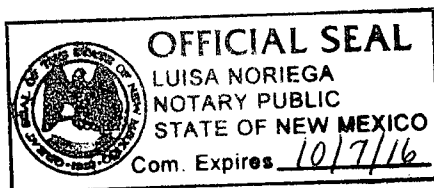
NM OIL CONSERVATION
 ARTESIA DISTRICT
 JUN 26 2015

By: Angel Salazar
 (Angel Salazar)

Title: Vice President

RECEIVED Described and sworn to before me this 12th day of May 2015.

My Commission Expires:



Luisa Noriega
 Notary Public
Chaves NM
 County State



COG Operating LLC

Eddy County, NM

Bose Ikard 4 State Com #27H

SHL: 990' FSL, 330' FWL, Sec 4, T17S, R29E, Unit M

EOC: 4907.7' MD, 4600.0' TVD, 15.3' S, 530.9' E, 530.9' VS

BHL: 970' FSL, 350' FEL, Sec 4, T17S, R29E, Unit P

Design: BHL: 970' FSL, 350' FEL, Sec 4, T17S, R29E, Unit P

Standard Survey Report

10 May, 2015





TDS
Survey Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Site: Bose Ikard 4 State Com #27H
Project:	Eddy County, NM	TVD Reference:	KB @ 3611.0usft (United 43)
Site:	Bose Ikard 4 State Com #27H	MD Reference:	KB @ 3611.0usft (United 43)
Well:	SHL: 990' FSL: 330' FWL: Sec 4, T17S, R29E, Unit M	North Reference:	Grid
Wellbore:	BHL: 970' FSL: 350' FEL: Sec 4, T17S, R29E, Unit P	Survey Calculation Method:	Minimum Curvature
Design:	BHL: 970' FSL: 350' FEL: Sec 4, T17S, R29E, Unit P	Database:	EDM 5000.1 Single User Db

Project:	Eddy County, NM		
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		Bose Ikard 4 State Com #27H			
Site Position:		Northing:	676,281.00 usft	Latitude:	32° 51' 32.174 N
From:	Map	Easting:	575,701.30 usft	Longitude:	104° 5' 12.501 W
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.13 °

Well:	SHL: 990' FSL: 330' FWL: Sec 4, T17S, R29E, Unit M					
Well Position	+N/-S	0.0 usft	Northing:	676,281.00 usft	Latitude:	32° 51' 32.174 N
	+E/-W	0.0 usft	Easting:	575,701.30 usft	Longitude:	104° 5' 12.501 W
Position Uncertainty		0.0 usft	Wellhead Elevation:	0.0 usft	Ground Level:	3,599.0 usft

Wellbore	BHL: 970' FSL: 350' FEL: Sec 4, T17S, R29E, Unit P				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	4/20/2015	7.40	60.59	48,555

Design:		BHL: 970' FSL: 350' FEL: Sec 4, T.17S, R29E, Unit P			
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)	
	0.0	0.0	0.0	89.90	

Survey Program		Date	5/10/2015		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
100.0	3,930.0	Gyro #1 (BHL: 970' FSL, 350' FEL, Sec 4,	Good_gyro	Good Gyro	
4,026.0	8,947.0	MWD #2 (BHL: 970' FSL, 350' FEL, Sec 4,	MWD	MWD - Standard	

Survey			Wellbore Data							
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)	
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00	
100.0	0.86	216.52	100.0	-0.6	-0.4	-0.4	0.86	0.86	0.00	
200.0	1.02	219.91	200.0	-1.9	-1.5	-1.5	0.17	0.16	3.39	
300.0	1.23	223.09	300.0	-3.4	-2.8	-2.8	0.22	0.21	3.18	
400.0	0.71	184.45	399.9	-4.8	-3.5	-3.6	0.81	-0.52	-38.64	
500.0	0.77	116.34	499.9	-5.7	-3.0	-3.0	0.83	0.06	-68.11	
600.0	0.76	125.53	599.9	-6.4	-1.9	-1.9	0.12	-0.01	9.19	



TDS
Survey Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Site Bose Ikard 4 State Com #27H
Project:	Eddy County NM	TVD Reference:	KB @ 3611.0usft (United 43)
Site:	Bose Ikard 4 State Com #27H	MD Reference:	KB @ 3611.0usft (United 43)
Well:	SHL 990 FSL 330 FWL Sec 4 T17S R29E Unit M	North Reference:	Grid
Wellbore:	BHL 970 FSL 350 FEL Sec 4 T17S R29E Unit P	Survey Calculation Method:	Minimum Curvature
Design:	BHL 970 FSL 350 FEL Sec 4 T17S R29E Unit P	Database:	EDM 5000.1 Single User 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)
700.0	0.73	114.64	699.9	-7.0	-0.7	-0.7	0.14	-0.03	-10.89
800.0	0.72	124.51	799.9	-7.6	0.4	0.3	0.13	-0.01	9.87
900.0	0.76	133.55	899.9	-8.4	1.4	1.3	0.12	0.04	9.04
1,000.0	0.44	126.82	999.9	-9.1	2.1	2.1	0.33	-0.32	-6.73
1,100.0	0.26	124.68	1,099.9	-9.5	2.6	2.6	0.18	-0.18	-2.14
1,200.0	0.16	142.56	1,199.9	-9.7	2.9	2.9	0.12	-0.10	17.88
1,300.0	0.10	151.92	1,299.9	-9.9	3.0	3.0	0.06	-0.06	9.36
1,400.0	0.25	285.24	1,399.9	-9.9	2.9	2.9	0.33	0.15	133.32
1,500.0	0.28	293.90	1,499.9	-9.8	2.4	2.4	0.05	0.03	8.66
1,600.0	0.65	286.50	1,599.9	-9.5	1.7	1.7	0.37	0.37	-7.40
1,700.0	0.63	291.02	1,699.9	-9.2	0.6	0.6	0.05	-0.02	4.52
1,800.0	0.26	282.51	1,799.9	-8.9	-0.1	-0.1	0.37	-0.37	-8.51
1,900.0	0.58	260.75	1,899.9	-8.9	-0.8	-0.9	0.35	0.32	-21.76
2,000.0	0.55	261.99	1,999.9	-9.1	-1.8	-1.8	0.03	-0.03	1.24
2,100.0	0.42	276.00	2,099.9	-9.1	-2.7	-2.7	0.18	-0.13	14.01
2,200.0	0.81	265.82	2,199.9	-9.1	-3.7	-3.7	0.40	0.39	-10.18
2,300.0	0.62	270.88	2,299.9	-9.2	-5.0	-5.0	0.20	-0.19	5.06
2,400.0	0.73	240.76	2,399.9	-9.5	-6.1	-6.1	0.37	0.11	-30.12
2,500.0	0.46	234.44	2,499.8	-10.0	-7.0	-7.0	0.28	-0.27	-6.32
2,600.0	0.61	259.48	2,599.8	-10.4	-7.8	-7.8	0.27	0.15	25.04
2,700.0	0.59	280.13	2,699.8	-10.4	-8.8	-8.9	0.22	-0.02	20.65
2,800.0	0.66	269.09	2,799.8	-10.3	-9.9	-9.9	0.14	0.07	-11.04
2,900.0	0.64	266.58	2,899.8	-10.3	-11.0	-11.1	0.03	-0.02	-2.51
3,000.0	0.31	296.45	2,999.8	-10.2	-11.8	-11.9	0.40	-0.33	29.87
3,100.0	0.71	272.14	3,099.8	-10.1	-12.7	-12.7	0.45	0.40	-24.31
3,200.0	0.55	277.63	3,199.8	-10.0	-13.8	-13.8	0.17	-0.16	5.49
3,300.0	0.43	278.15	3,299.8	-9.9	-14.7	-14.7	0.12	-0.12	0.52
3,400.0	0.18	270.39	3,399.8	-9.8	-15.2	-15.2	0.25	-0.25	-7.76
3,500.0	0.57	231.73	3,499.8	-10.1	-15.7	-15.7	0.44	0.39	-38.66
3,600.0	0.22	272.25	3,599.8	-10.4	-16.3	-16.3	0.43	-0.35	40.52
3,700.0	0.68	285.73	3,699.8	-10.3	-17.1	-17.1	0.47	0.46	13.48
3,800.0	0.48	241.41	3,799.8	-10.3	-18.0	-18.0	0.48	-0.20	-44.32
3,900.0	0.46	279.93	3,899.8	-10.4	-18.8	-18.8	0.31	-0.02	38.52
3,930.0	0.55	271.03	3,929.8	-10.4	-19.0	-19.1	0.40	0.30	-29.67
Tie-In to VES Gyro									
4,026.0	0.40	253.40	4,025.8	-10.5	-19.8	-19.8	0.22	-0.16	-18.36
4,058.0	0.70	124.90	4,057.8	-10.7	-19.8	-19.8	3.12	0.94	-401.56
4,089.0	3.40	106.70	4,088.8	-11.0	-18.7	-18.8	8.85	8.71	-58.71
4,121.0	7.20	103.20	4,120.6	-11.8	-15.9	-15.9	11.91	11.88	-10.94
4,152.0	11.20	100.50	4,151.2	-12.8	-11.0	-11.0	12.97	12.90	-8.71
4,184.0	15.30	97.90	4,182.4	-13.9	-3.8	-3.8	12.94	12.81	-8.13
4,215.0	19.30	96.50	4,212.0	-15.0	5.4	5.3	12.97	12.90	-4.52



TDS
Survey Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Site Bose Ikard 4 State Com #27H
Project:	Eddy County, NM	TVD Reference:	KB @ 3611.0usft (United 43)
Site:	Bose Ikard 4 State Com #27H	MD Reference:	KB @ 3611.0usft (United 43)
Well:	SHL 990 FSL 330 FWL Sec 4 T17S R29E Unit M	North Reference:	Grid
Wellbore:	BHL 970 FSL 350 FEL Sec 4 T17S R29E Unit P	Survey Calculation Method:	Minimum Curvature
Design:	BHL 970 FSL 350 FEL Sec 4 T17S R29E Unit P	Database:	EDM 5000.1 Single User 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)
4,247.0	23.30	95.40	4,241.8	-16.2	16.9	16.9	12.56	12.50	-3.44
4,278.0	26.80	92.80	4,269.8	-17.2	30.0	30.0	11.83	11.29	-8.39
4,309.0	30.10	88.60	4,297.1	-17.3	44.8	44.7	12.44	10.65	-13.55
4,341.0	33.30	87.90	4,324.3	-16.8	61.6	61.5	10.07	10.00	-2.19
4,372.0	36.00	89.00	4,349.8	-16.3	79.2	79.2	8.94	8.71	3.55
4,404.0	39.30	89.80	4,375.2	-16.1	98.7	98.7	10.42	10.31	2.50
4,436.0	42.60	90.10	4,399.3	-16.1	119.7	119.7	10.33	10.31	0.94
4,467.0	46.20	89.80	4,421.5	-16.1	141.4	141.4	11.63	11.61	-0.97
4,499.0	49.00	88.60	4,443.0	-15.7	165.0	165.0	9.18	8.75	-3.75
4,530.0	52.20	88.70	4,462.7	-15.2	189.0	188.9	10.33	10.32	0.32
4,562.0	54.80	90.50	4,481.7	-15.0	214.7	214.7	9.30	8.13	5.63
4,593.0	57.90	92.50	4,498.9	-15.7	240.5	240.4	11.35	10.00	6.45
4,625.0	61.20	93.90	4,515.1	-17.2	268.0	268.0	10.98	10.31	4.38
4,656.0	64.60	94.50	4,529.3	-19.3	295.5	295.5	11.10	10.97	1.94
4,688.0	68.00	93.80	4,542.1	-21.4	324.8	324.7	10.81	10.63	-2.19
4,719.0	70.70	93.00	4,553.0	-23.1	353.7	353.7	9.04	8.71	-2.58
4,751.0	73.90	92.20	4,562.8	-24.5	384.2	384.1	10.28	10.00	-2.50
4,782.0	77.10	92.00	4,570.5	-25.6	414.1	414.1	10.34	10.32	-0.65
4,813.0	80.00	91.10	4,576.7	-26.4	444.5	444.5	9.78	9.35	-2.90
4,845.0	82.50	89.00	4,581.6	-26.4	476.1	476.1	10.15	7.81	-6.56
4,876.0	85.00	87.60	4,584.9	-25.5	506.9	506.9	9.23	8.06	-4.52
4,908.0	88.00	87.20	4,586.9	-24.1	538.8	538.8	9.46	9.38	-1.25
4,938.0	89.10	86.20	4,587.6	-22.3	568.8	568.7	4.95	3.67	-3.33
5,032.0	90.70	88.10	4,587.8	-17.7	662.7	662.6	2.64	1.70	2.02
5,127.0	90.90	89.60	4,586.5	-15.8	757.6	757.6	1.59	0.21	1.58
5,221.0	90.90	89.50	4,585.0	-15.0	851.6	851.6	0.11	0.00	-0.11
5,316.0	90.70	89.30	4,583.7	-14.0	946.6	946.6	0.30	-0.21	-0.21
5,411.0	90.50	89.00	4,582.7	-12.6	1,041.6	1,041.6	0.38	-0.21	-0.32
5,505.0	90.50	89.10	4,581.9	-11.1	1,135.6	1,135.5	0.11	0.00	0.11
5,599.0	90.50	88.70	4,581.0	-9.2	1,229.5	1,229.5	0.43	0.00	-0.43
5,694.0	90.40	89.30	4,580.3	-7.6	1,324.5	1,324.5	0.64	-0.11	0.63
5,788.0	90.50	90.90	4,579.6	-7.8	1,418.5	1,418.5	1.71	0.11	1.70
5,883.0	90.40	90.60	4,578.8	-9.0	1,513.5	1,513.5	0.33	-0.11	-0.32
5,977.0	90.50	90.30	4,578.1	-9.7	1,607.5	1,607.5	0.34	0.11	-0.32
6,072.0	90.50	90.00	4,577.2	-10.0	1,702.5	1,702.5	0.32	0.00	-0.32
6,166.0	90.50	89.40	4,576.4	-9.5	1,796.5	1,796.5	0.64	0.00	-0.64
6,261.0	91.40	90.00	4,574.9	-9.0	1,891.5	1,891.5	1.14	0.95	0.63
6,355.0	91.20	89.80	4,572.7	-8.8	1,985.5	1,985.4	0.30	-0.21	-0.21
6,450.0	91.30	89.70	4,570.6	-8.4	2,080.4	2,080.4	0.15	0.11	-0.11
6,544.0	91.30	89.60	4,568.5	-7.8	2,174.4	2,174.4	0.11	0.00	-0.11
6,639.0	91.10	89.50	4,566.5	-7.1	2,269.4	2,269.4	0.24	-0.21	-0.11
6,729.0	90.70	90.00	4,565.1	-6.7	2,359.4	2,359.3	0.71	-0.44	0.56



TDS
Survey Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Site Bose Ikard 4 State Com #27H
Project:	Eddy County, NM	TVD Reference:	KB @ 3611.0usft (United 43)
Site:	Bose Ikard 4 State Com #27H	MD Reference:	KB @ 3611.0usft (United 43)
Well:	SHL 990' FSL 330' FWL Sec 4 T17S R29E Unit M	North Reference:	Grid
Wellbore:	BHL 970' FSL 350' FEL Sec 4 T17S R29E Unit P	Survey Calculation Method:	Minimum Curvature
Design:	BHL 970' FSL 350' FEL Sec 4 T17S R29E Unit P	Database:	EDM 5000.1 Single User 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)
6,827.0	90.80	90.20	4,563.8	-6.9	2,457.4	2,457.3	0.23	0.10	0.20
6,921.0	90.40	89.80	4,562.8	-6.9	2,551.4	2,551.3	0.60	-0.43	-0.43
7,016.0	89.90	90.10	4,562.6	-6.8	2,646.3	2,646.3	0.61	-0.53	0.32
7,109.0	91.60	89.20	4,561.4	-6.2	2,739.3	2,739.3	2.07	1.83	-0.97
7,203.0	91.90	88.40	4,558.5	-4.3	2,833.3	2,833.3	0.91	0.32	-0.85
7,298.0	92.00	88.70	4,555.3	-1.9	2,928.2	2,928.2	0.33	0.11	0.32
7,392.0	91.50	89.20	4,552.4	-0.1	3,022.1	3,022.1	0.75	-0.53	0.53
7,487.0	91.50	89.20	4,549.9	1.2	3,117.1	3,117.1	0.00	0.00	0.00
7,581.0	91.50	89.10	4,547.5	2.6	3,211.0	3,211.0	0.11	0.00	-0.11
7,676.0	91.60	88.80	4,544.9	4.3	3,306.0	3,306.0	0.33	0.11	-0.32
7,770.0	91.80	89.50	4,542.1	5.7	3,399.9	3,399.9	0.77	0.21	0.74
7,865.0	92.00	89.30	4,538.9	6.7	3,494.9	3,494.9	0.30	0.21	-0.21
7,959.0	91.20	90.30	4,536.3	7.0	3,588.8	3,588.8	1.36	-0.85	1.06
8,054.0	91.30	89.90	4,534.3	6.9	3,683.8	3,683.8	0.43	0.11	-0.42
8,148.0	91.60	89.50	4,531.9	7.4	3,777.8	3,777.8	0.53	0.32	-0.43
8,243.0	90.10	91.00	4,530.5	7.0	3,872.8	3,872.8	2.23	-1.58	1.58
8,337.0	90.30	90.70	4,530.1	5.6	3,966.8	3,966.8	0.38	0.21	-0.32
8,432.0	90.70	90.10	4,529.3	4.9	4,061.8	4,061.8	0.76	0.42	-0.63
8,526.0	90.90	90.10	4,528.0	4.7	4,155.7	4,155.7	0.21	0.21	0.00
8,621.0	90.70	90.30	4,526.7	4.4	4,250.7	4,250.7	0.30	-0.21	0.21
8,715.0	90.80	90.00	4,525.4	4.2	4,344.7	4,344.7	0.34	0.11	-0.32
8,810.0	91.00	89.60	4,523.9	4.5	4,439.7	4,439.7	0.47	0.21	-0.42
8,874.0	91.20	89.50	4,522.7	5.0	4,503.7	4,503.7	0.35	0.31	-0.16
Final MWD Survey									
8,947.0	91.20	89.50	4,521.2	5.6	4,576.7	4,576.7	0.00	0.00	0.00
Projection to Bit/TD									

Design Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
3,930.0	3,929.8	-10.4	-19.0	Tie-In to VES Gyro
8,874.0	4,522.7	5.0	4,503.7	Final MWD Survey
8,947.0	4,521.2	5.6	4,576.7	Projection to Bit/TD

Checked By: _____ Approved By: _____ Date: _____