



February 4, 2015

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

1542404

Attn: Kanicia Castillo

RE: **Bose Ikard 4 State Com 18H**

Please find enclosed a copy of the survey from 0' to 3400' ran on the above referenced well.

Sincerely,

Keith Havelka
Operations

NM OIL CONSERVATION
ARTESIA DISTRICT

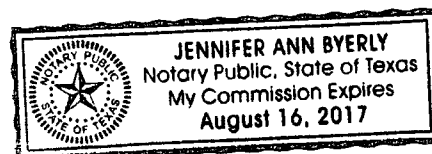
MAR 30 2015

STATE OF TEXAS §
 §
COUNTY OF NUECES §

RECEIVED

This instrument was acknowledged before me on the 4 day of Feb,
A.D., 2015, by Keith Havelka.


Jennifer Ann Byerly
Notary Public, State of Texas





Company: Concho
Lease/Well: Bose Ikard 4 State Com/18H
Location:
Rig Name: United 43
State/County: New Mexico /Eddy
Latitude: 32.86, Longitude: -104.09
GRID North is 0.13 Degrees East of True North
VS-Azi: 0.00 Degrees



Depth Reference : 12.5 FT

DRILLOG HA GYRO SURVEY CALCULATIONS

Filename: ...kard 4 state com 18h-de_01.ut

Minimum Curvature Method

Report Date/Time: 2/4/2015 / 14:49

VES Survey International

(432) 563-5444

West Texas

Surveyor: Javier Estrada

Bose Ikard 4 State Com 18H / API 30-015-42404

NM OIL CONSERVATION
ARTESIA DISTRICT

MAR 30 2015

RECEIVED

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	0.21	289.25	100.00	0.06	-0.17	0.06	0.19	289.25	0.21
200.00	0.39	246.82	200.00	-0.01	-0.66	-0.01	0.66	269.06	0.27
300.00	0.19	216.40	300.00	-0.28	-1.07	-0.28	1.10	255.55	0.24
400.00	0.16	164.72	400.00	-0.54	-1.13	-0.54	1.25	244.43	0.15
500.00	1.01	112.79	499.99	-1.01	-0.28	-1.01	1.05	195.61	0.92
600.00	1.17	79.84	599.97	-1.17	1.53	-1.17	1.93	127.50	0.64
700.00	0.85	82.33	699.96	-0.89	3.26	-0.89	3.39	105.32	0.32
800.00	0.81	83.51	799.95	-0.72	4.70	-0.72	4.75	98.66	0.04
900.00	0.85	81.19	899.94	-0.52	6.13	-0.52	6.15	94.88	0.05
1000.00	0.76	78.14	999.93	-0.27	7.51	-0.27	7.51	92.09	0.10
1100.00	0.65	81.98	1099.92	-0.06	8.72	-0.06	8.72	90.39	0.12
1200.00	0.26	56.94	1199.92	0.14	9.47	0.14	9.47	89.13	0.43
1300.00	0.42	54.76	1299.92	0.48	9.96	0.48	9.97	87.25	0.16
1400.00	0.30	47.04	1399.91	0.87	10.45	0.87	10.49	85.24	0.12
1500.00	0.23	51.93	1499.91	1.18	10.80	1.18	10.87	83.79	0.08
1600.00	0.06	43.26	1599.91	1.34	11.00	1.34	11.08	83.06	0.17
1700.00	0.25	12.29	1699.91	1.59	11.08	1.59	11.20	81.81	0.20
1800.00	0.47	0.02	1799.91	2.22	11.13	2.22	11.35	78.70	0.23

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	0.35	353.63	1899.91	2.94	11.10	2.94	11.48	75.18	0.13
2000.00	0.46	346.99	1999.90	3.63	10.97	3.63	11.56	71.72	0.12
2100.00	0.29	331.36	2099.90	4.24	10.76	4.24	11.57	68.51	0.19
2200.00	0.52	310.34	2199.90	4.75	10.29	4.75	11.34	65.21	0.27
2300.00	0.74	329.45	2299.89	5.60	9.62	5.60	11.13	59.77	0.30
2400.00	0.18	16.83	2399.89	6.31	9.34	6.31	11.27	55.93	0.63
2500.00	0.66	14.52	2499.89	7.03	9.53	7.03	11.84	53.59	0.48
2600.00	0.46	345.87	2599.88	7.98	9.57	7.98	12.46	50.19	0.34
2700.00	0.56	351.67	2699.88	8.85	9.41	8.85	12.92	46.74	0.11
2800.00	0.84	20.63	2799.87	10.02	9.59	10.02	13.87	43.77	0.44
2900.00	0.69	0.65	2899.86	11.30	9.86	11.30	15.00	41.09	0.30
3000.00	1.03	12.26	2999.85	12.78	10.06	12.78	16.26	38.19	0.38
3100.00	1.14	26.72	3099.83	14.54	10.69	14.54	18.05	36.32	0.29
3200.00	1.16	19.19	3199.81	16.39	11.47	16.39	20.01	34.99	0.15
3300.00	1.08	2.84	3299.79	18.28	11.85	18.28	21.79	32.95	0.33
3400.00	1.21	359.94	3399.77	20.28	11.90	20.28	23.51	30.40	0.15



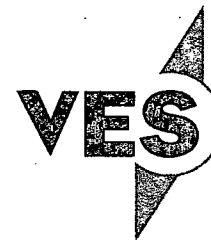
VES Survey International

(432) 563-5444

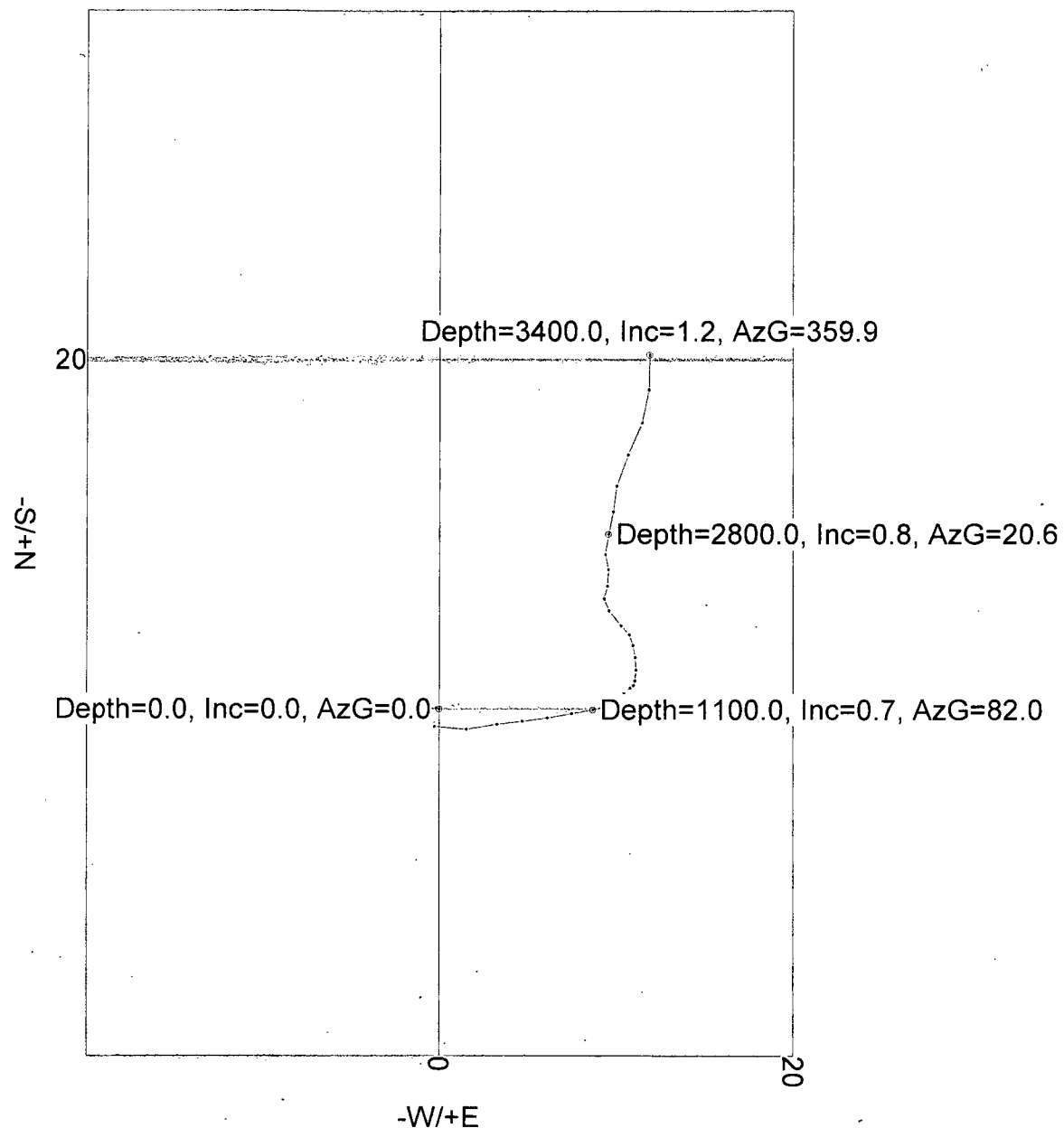
West Texas

Surveyor: Javier Estrada

Bose Ikard 4 State Com 18H / API 30-015-42404



SURVEY
INTERNATIONAL



-W/+E
VES Survey Date: 1/20/2015

MAR 30 2015

1 of 2

WELL NAME AND NUMBER Bose Ikard 4 State Com No. 18H **RECEIVED**
LOCATION Section 4, T17S, R29E, Unit M, 330 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
.4° @ 458'	9.2° @ 3725'	78.9° @ 4355'
1.6° @ 675'	13.1° @ 3757'	83.4° @ 4386'
1.1° @ 864'	16.9° @ 3788'	91.0° @ 4634'
.4° @ 1215'	24.7° @ 3851'	90.6° @ 4729'
.2° @ 1531'	28.4° @ 3882'	90.2° @ 4823'
.6° @ 1845'	31.9° @ 3914'	90.8° @ 5107'
.5° @ 2148'	35.1° @ 3945'	91.2° @ 5201'
.5° @ 2450'	38.5° @ 3977'	91.6° @ 5296'
.9° @ 2745'	4.2° @ 4008'	91.5° @ 5391'
.6° @ 3092'	46.0° @ 4040'	91.6° @ 5485'
.9° @ 3499'	49.9° @ 4071'	91.5° @ 5580'
1.3° @ 3505'	53.2° @ 4103'	91.4° @ 5675'
1.2° @ 3536'	56.8° @ 4134'	90.9° @ 5770'
1.2° @ 3578'	60.2° @ 4166'	90.5° @ 5864'
1.2° @ 3599'	63.3° @ 4197'	90.0° @ 5959'
1.5° @ 3631'	66.2° @ 4229'	90.1° @ 6053'
3.1° @ 3662'	69.1° @ 4260'	91.3° @ 6148'
5.8° @ 3693'	75.2° @ 4323'	91.0° @ 6242'

Drilling Contractor- UNITED DRILLING, INC.

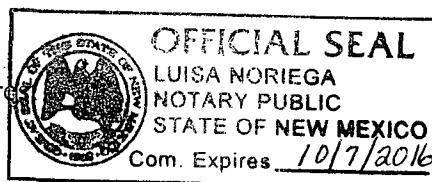
By: Ramon Gonzalez
(Ramon Gonzalez)

Title: Superintendent

Subscribed and sworn to before me this 29th day of January 2015.

Luisa Noriega
Notary Public

My Commission Expires



Chaves NM
County State

MAR 30 2015

2 of 2

WELL NAME AND NUMBER Bose Ikard 4 State Com No. 18H RECEIVED
LOCATION Section 4, T17S, R29E, Unit M, 330 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
91.1° @ 6337'	90.5° @ 8260'	
91.0° @ 6432'	90.6° @ 8355'	
91.2° @ 6526'		
91.5° @ 6715'		
91.8° @ 6810'		
91.7° @ 6905'		
91.8° @ 6998'		
91.8° @ 7092'		
91.8° @ 7187'		
92.0° @ 7281'		
91.4° @ 7376'		
91.5° @ 7471'		
91.2° @ 7566'		
90.5° @ 7756'		
90.0° @ 7850'		
89.8° @ 7945'		
89.8° @ 8039'		
89.8° @ 8166'		

Drilling Contractor- UNITED DRILLING, INC.

By: Ramon Gonzalez

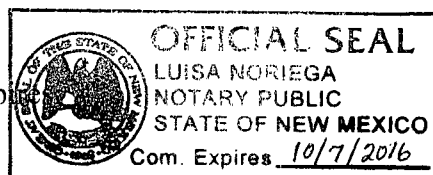
(Ramon Gonzalez)

Title: Superintendent

Subscribed and sworn to before me this 29th day of January 2015.

Luisa Noriega
Notary Public

My Commission Expires



Chaves
County

NM
State



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well Bose Ikard 4 State Com Well No. 18H
Project:	Eddy County, New Mexico	TVD Reference:	RKB=3601+14 @ 3615.00usft (United #43)
Site:	Bose Ikard 4 State Com	MD Reference:	RKB=3601+14 @ 3615.00usft (United #43)
Well:	Bose Ikard 4 State Com Well No. 18H	North Reference:	Grid
Wellbore:	Original hole	Survey Calculation Method:	Minimum Curvature
Design:	Surveys Original hole	Database:	Dbase Nov0914

Project: Eddy County, New Mexico			
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					
Site Position:		Northing:		Latitude:	
From:	Map		675,621.10 usft		32° 51' 25.643949 N
Position Uncertainty:		Easting:		Longitude:	
	0.00 usft		575,701.10 usft		104° 5' 12.521881 W
		Slot Radius:		Grid Convergence:	
			13-3/16 "		0.13 °

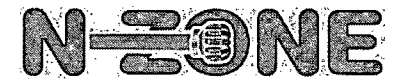
Well	Bose Ikard 4 State Com Well No. 18H Surf Loc: 330 FSL 330 FWL Sect 4-T17s-R29E Unit M					
Well Position	+N-S	0.00 usft	Northing:	675,621.10 usft	Latitude:	32° 51' 25.643949 N
	+E-W	0.00 usft	Easting:	575,701.10 usft	Longitude:	104° 5' 12.521881 W
Position Uncertainty	0.00 usft	Wellhead Elevation:	usft	Ground Level:	3,601.00 usft	

Wellbore	Original hole				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	1/9/2015	7.43	60.59	48,582

Design					Surveys Original hole						
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		89.39			



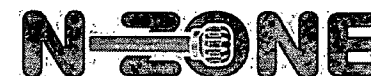
Standard_report



Company:	COG Operating, LLC	Local Co-ordinate Reference:	Well Bose Ikard 4 State Com Well No. 18H
Project:	Eddy County, New Mexico	TVD Reference:	RKB=3601+14 @ 3615.00usft (United #43)
Site:	Bose Ikard 4 State Com	MD Reference:	RKB=3601+14 @ 3615.00usft (United #43)
Well:	Bose Ikard 4 State Com Well No. 18H	North Reference:	Grid
Wellbore:	Original hole	Survey Calculation Method:	Minimum Curvature
Design:	Surveys Original hole	Database:	Dbase Nov0914

Survey Program		Date: 1/27/2015		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
100.00	3,400.00	Gyro (Original hole)	NS-GYRO-MS	North sensing gyrocompassing m/s
3,474.00	8,491.00	MWD (Original hole)	MWD	MWD - Standard

Survey	MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	D Leg (°/100usft)	V. Sec (usft)	Northing (usft)	Easting (usft)
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	675,621.10	575,701.10
	100.00	0.21	289.25	100.00	0.06	-0.17	0.21	-0.17	675,621.16	575,700.93
Gyro										
	200.00	0.39	246.82	200.00	-0.01	-0.66	0.27	-0.66	675,621.09	575,700.44
	300.00	0.19	216.40	300.00	-0.28	-1.07	0.25	-1.07	675,620.82	575,700.03
	400.00	0.16	164.72	400.00	-0.55	-1.13	0.15	-1.14	675,620.55	575,699.97
	500.00	1.01	112.79	499.99	-1.02	-0.28	0.92	-0.29	675,620.08	575,700.82
	600.00	1.17	79.84	599.97	-1.19	1.54	0.64	1.52	675,619.91	575,702.64
	700.00	0.85	82.33	699.96	-0.91	3.28	0.32	3.27	675,620.19	575,704.38
	800.00	0.81	83.51	799.95	-0.73	4.71	0.04	4.70	675,620.37	575,705.81
	900.00	0.85	81.19	899.94	-0.53	6.15	0.05	6.14	675,620.57	575,707.25
	1,000.00	0.76	78.14	999.93	-0.28	7.53	0.10	7.53	675,620.82	575,708.63
	1,100.00	0.65	81.98	1,099.92	-0.07	8.74	0.12	8.74	675,621.03	575,709.84
	1,200.00	0.26	56.94	1,199.92	0.13	9.49	0.43	9.49	675,621.23	575,710.59
	1,300.00	0.42	54.76	1,299.91	0.47	9.98	0.16	9.99	675,621.57	575,711.08
	1,400.00	0.30	47.04	1,399.91	0.86	10.47	0.13	10.48	675,621.96	575,711.57
	1,500.00	0.23	51.93	1,499.91	1.16	10.82	0.07	10.83	675,622.26	575,711.92
	1,600.00	0.06	43.26	1,599.91	1.32	11.02	0.17	11.03	675,622.42	575,712.12
	1,700.00	0.25	12.29	1,699.91	1.57	11.10	0.20	11.11	675,622.67	575,712.20
	1,800.00	0.47	0.02	1,799.91	2.20	11.15	0.23	11.17	675,623.30	575,712.25
	1,900.00	0.35	353.63	1,899.91	2.91	11.11	0.13	11.14	675,624.01	575,712.21



Company:	COG Operating, LLC	Local Co-ordinate Reference:	Well: Bose Ikard 4 State Com Well No. 18H
Project:	Eddy County, New Mexico	TVD Reference:	RKB=3601+14 @ 3615.00usft (United #43)
Site:	Bose Ikard 4 State Com	MD Reference:	RKB=3601+14 @ 3615.00usft (United #43)
Well:	Bose Ikard 4 State Com Well No. 18H	North Reference:	Grid
Wellbore:	Original hole	Survey Calculation Method:	Minimum Curvature
Design:	Surveys Original hole	Database:	Dbase Nov0914

Survey									
MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	DLeg (°/100usft)	V. Sec (usft)	Northing (usft)	Easting (usft)
2,000.00	0.46	346.99	1,999.90	3.61	10.99	0.12	11.03	675,624.71	575,712.09
2,100.00	0.29	331.36	2,099.90	4.22	10.78	0.20	10.82	675,625.32	575,711.88
2,200.00	0.52	310.34	2,199.90	4.73	10.31	0.27	10.36	675,625.83	575,711.41
2,300.00	0.74	329.45	2,299.89	5.58	9.63	0.30	9.69	675,626.68	575,710.73
2,400.00	0.18	16.83	2,399.89	6.29	9.35	0.63	9.42	675,627.39	575,710.45
2,500.00	0.66	14.52	2,499.89	7.00	9.54	0.48	9.62	675,628.10	575,710.64
2,600.00	0.46	345.87	2,599.88	7.95	9.59	0.34	9.67	675,629.05	575,710.69
2,700.00	0.56	351.67	2,699.88	8.82	9.42	0.11	9.51	675,629.92	575,710.52
2,800.00	0.84	20.63	2,799.87	9.99	9.61	0.44	9.71	675,631.09	575,710.71
2,900.00	0.69	0.65	2,899.86	11.28	9.87	0.30	9.99	675,632.38	575,710.97
3,000.00	1.03	12.26	2,999.85	12.76	10.07	0.38	10.20	675,633.86	575,711.17
3,100.00	1.14	26.72	3,099.83	14.52	10.71	0.29	10.86	675,635.62	575,711.81
3,200.00	1.16	19.19	3,199.81	16.37	11.49	0.15	11.66	675,637.47	575,712.59
3,300.00	1.08	2.84	3,299.79	18.27	11.87	0.33	12.06	675,639.37	575,712.97
3,400.00	1.21	359.94	3,399.77	20.26	11.91	0.14	12.13	675,641.36	575,713.01
3,474.00	1.30	358.50	3,473.76	21.88	11.89	0.13	12.12	675,642.98	575,712.99
MWD surveys									
3,501.00	1.30	356.40	3,500.75	22.49	11.86	0.18	12.10	675,643.59	575,712.96
3,536.00	1.20	358.60	3,535.74	23.26	11.83	0.32	12.08	675,644.36	575,712.93
3,568.00	1.20	357.80	3,567.73	23.93	11.81	0.05	12.06	675,645.03	575,712.91
3,599.00	1.20	358.60	3,598.73	24.58	11.79	0.05	12.05	675,645.68	575,712.89
3,631.00	1.50	32.90	3,630.72	25.26	12.01	2.64	12.27	675,646.36	575,713.11
3,662.00	3.10	63.70	3,661.69	25.97	12.98	6.35	13.25	675,647.07	575,714.08
3,693.00	5.80	75.50	3,692.60	26.74	15.25	9.15	15.53	675,647.84	575,716.35
3,725.00	9.20	79.80	3,724.32	27.60	19.33	10.76	19.62	675,648.70	575,720.43
3,757.00	13.10	84.10	3,755.71	28.42	25.46	12.45	25.76	675,649.52	575,726.56
3,788.00	16.90	88.30	3,785.65	28.92	33.46	12.74	33.77	675,650.02	575,734.56

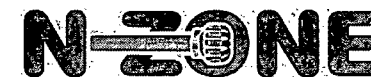


Standard_report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well Bose Ikard 4 State Com Well No 18H
Project:	Eddy County, New Mexico	TVD Reference:	RKB=3601+14 @ 3615.00usft (United #43)
Site:	Bose Ikard 4 State Com	MD Reference:	RKB=3601+14 @ 3615.00usft (United #43)
Well:	Bose Ikard 4 State Com Well No 18H	North Reference:	Grid
Wellbore:	Original hole	Survey Calculation Method:	Minimum Curvature
Design:	Surveys Original hole	Database:	Dbase: Nov0914

Survey									
MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	DLeg (°/100usft)	V-Sec (usft)	Northing (usft)	Easting (usft)
3,820.00	21.00	90.30	3,815.91	29.03	43.85	12.97	44.15	675,650.13	575,744.95
3,851.00	24.70	92.10	3,844.47	28.76	55.88	12.15	56.18	675,649.86	575,756.98
3,882.00	28.40	93.70	3,872.20	28.05	69.71	12.16	70.01	675,649.15	575,770.81
3,914.00	31.90	94.90	3,899.86	26.83	85.74	11.10	86.02	675,647.93	575,786.84
3,945.00	35.10	93.70	3,925.71	25.56	102.80	10.54	103.06	675,646.66	575,803.90
3,977.00	38.50	91.90	3,951.33	24.63	121.94	11.15	122.19	675,645.73	575,823.04
4,008.00	42.20	90.50	3,974.95	24.22	142.00	12.29	142.25	675,645.32	575,843.10
4,040.00	46.00	90.00	3,997.93	24.13	164.27	11.92	164.51	675,645.23	575,865.37
4,071.00	49.90	89.70	4,018.69	24.19	187.28	12.60	187.53	675,645.29	575,888.38
4,103.00	53.20	89.40	4,038.59	24.39	212.34	10.34	212.58	675,645.49	575,913.44
4,134.00	56.80	89.40	4,056.36	24.65	237.72	11.61	237.97	675,645.75	575,938.82
4,166.00	60.20	89.30	4,073.08	24.96	265.00	10.63	265.25	675,646.06	575,966.10
4,197.00	63.30	89.40	4,087.75	25.27	292.31	10.00	292.56	675,646.37	575,993.41
4,229.00	66.20	90.10	4,101.40	25.40	321.24	9.28	321.50	675,646.50	576,022.34
4,260.00	69.10	91.50	4,113.19	24.99	349.91	10.24	350.16	675,646.09	576,051.01
4,292.00	72.10	91.00	4,123.82	24.34	380.08	9.49	380.32	675,645.44	576,081.18
4,323.00	75.20	91.00	4,132.54	23.82	409.82	10.00	410.05	675,644.92	576,110.92
4,355.00	78.90	91.50	4,139.71	23.14	440.99	11.66	441.21	675,644.24	576,142.09
4,386.00	83.10	91.50	4,144.56	22.34	471.59	13.55	471.81	675,643.44	576,172.69
4,444.00	91.10	89.70	4,147.49	21.73	529.47	14.14	529.67	675,642.83	576,230.57
4,539.00	91.50	89.10	4,145.34	22.73	624.44	0.76	624.64	675,643.83	576,325.54
4,634.00	91.00	89.00	4,143.26	24.30	719.40	0.54	719.62	675,645.40	576,420.50
4,729.00	90.60	89.20	4,141.94	25.79	814.38	0.47	814.61	675,646.89	576,515.48
4,823.00	90.20	88.60	4,141.28	27.60	908.36	0.77	908.60	675,648.70	576,609.46
4,918.00	89.50	88.30	4,141.53	30.17	1,003.32	0.80	1,003.59	675,651.27	576,704.42
5,012.00	90.20	88.30	4,141.78	32.96	1,097.28	0.74	1,097.57	675,654.06	576,798.38
5,107.00	91.00	89.30	4,140.78	34.95	1,192.25	1.35	1,192.56	675,656.05	576,893.35



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well: Bose Ikard 4 State Com Well No 18H
Project:	Eddy County New Mexico	TVD Reference:	RKB=3601+14 @ 3615.00usft (United #43)
Site:	Bose Ikard 4 State Com	MD Reference:	RKB=3601+14 @ 3615.00usft (United #43)
Well:	Bose Ikard 4 State Com Well No 18H	North Reference:	Grid
Wellbore:	Original hole	Survey Calculation Method:	Minimum Curvature
Design:	Surveys Original hole	Database:	Dbase Nov0914

Survey									
MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	EW (usft)	DLeg (°/100usft)	V. Sec (usft)	Northing (usft)	Easting (usft)
5,201.00	91.20	90.30	4,138.98	35.27	1,286.23	1.08	1,286.54	675,656.37	576,987.33
5,296.00	91.60	90.10	4,136.66	34.94	1,381.21	0.47	1,381.50	675,656.04	577,082.31
5,391.00	91.50	90.00	4,134.09	34.86	1,476.17	0.15	1,476.46	675,655.96	577,177.27
5,485.00	91.60	89.60	4,131.54	35.19	1,570.14	0.44	1,570.42	675,656.29	577,271.24
5,580.00	91.50	89.20	4,128.97	36.18	1,665.09	0.43	1,665.39	675,657.28	577,366.19
5,675.00	91.40	88.80	4,126.57	37.84	1,760.05	0.43	1,760.35	675,658.94	577,461.15
5,770.00	90.90	89.70	4,124.66	39.08	1,855.02	1.08	1,855.33	675,660.18	577,556.12
5,864.00	90.50	89.30	4,123.52	39.90	1,949.01	0.60	1,949.32	675,661.00	577,650.11
5,959.00	90.00	88.80	4,123.10	41.48	2,044.00	0.74	2,044.32	675,662.58	577,745.10
6,053.00	90.10	90.40	4,123.02	42.13	2,137.99	1.71	2,138.32	675,663.23	577,839.09
6,148.00	91.30	90.00	4,121.86	41.80	2,232.98	1.33	2,233.30	675,662.90	577,934.08
6,242.00	91.00	90.60	4,119.97	41.31	2,326.96	0.71	2,327.27	675,662.41	578,028.06
6,337.00	91.10	90.80	4,118.23	40.15	2,421.94	0.24	2,422.23	675,661.25	578,123.04
6,432.00	91.00	90.10	4,116.49	39.40	2,516.92	0.74	2,517.19	675,660.50	578,218.02
6,526.00	91.20	89.90	4,114.69	39.40	2,610.90	0.30	2,611.17	675,660.50	578,312.00
6,621.00	91.40	89.80	4,112.53	39.65	2,705.88	0.24	2,706.14	675,660.75	578,406.98
6,715.00	91.50	89.90	4,110.15	39.90	2,799.84	0.15	2,800.11	675,661.00	578,500.94
6,810.00	91.80	90.00	4,107.42	39.98	2,894.81	0.33	2,895.07	675,661.08	578,595.91
6,905.00	91.70	89.80	4,104.51	40.15	2,989.76	0.24	2,990.02	675,661.25	578,690.86
6,998.00	91.80	89.80	4,101.67	40.47	3,082.72	0.11	3,082.97	675,661.57	578,783.82
7,092.00	91.80	89.60	4,098.72	40.96	3,176.67	0.21	3,176.93	675,662.06	578,877.77
7,187.00	91.80	89.50	4,095.74	41.71	3,271.62	0.11	3,271.88	675,662.81	578,972.72
7,281.00	91.40	89.60	4,093.11	42.45	3,365.58	0.44	3,365.84	675,663.55	579,066.68
7,375.97	91.40	89.50	4,090.79	43.19	3,460.52	0.11	3,460.78	675,664.29	579,161.62
7,471.00	91.50	89.40	4,088.39	44.11	3,555.51	0.15	3,555.78	675,665.21	579,256.61
7,566.00	91.20	89.40	4,086.15	45.10	3,650.48	0.32	3,650.75	675,666.20	579,351.58
7,661.00	91.30	89.30	4,084.08	46.18	3,745.45	0.15	3,745.73	675,667.28	579,446.55



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well Bose Ikard 4 State Com Well No. 18H
Project:	Eddy County, New Mexico	TVD Reference:	RKB=3601+14' @ 3615.00usft (United #43)
Site:	Bose Ikard 4 State Com	MD Reference:	RKB=3601+14' @ 3615.00usft (United #43)
Well:	Bose Ikard 4 State Com Well No. 18H	North Reference:	Grid
Wellbore:	Original hole	Survey Calculation Method:	Minimum Curvature
Design:	Surveys Original hole	Database:	Dbase Nov09.14

Survey										
MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	DLeg (°/100usft)	V. Sec (usft)	Northing (usft)	Easting (usft)	
7,756.00	90.50	89.00	4,082.59	47.59	3,840.43	0.90	3,840.72	675,668.69	579,541.53	
7,850.00	90.00	88.20	4,082.18	49.88	3,934.40	1.00	3,934.71	675,670.98	579,635.50	
7,945.00	89.80	88.00	4,082.34	53.03	4,029.35	0.30	4,029.68	675,674.13	579,730.45	
8,039.00	89.80	89.50	4,082.67	55.08	4,123.32	1.60	4,123.67	675,676.18	579,824.42	
8,166.00	89.80	90.30	4,083.11	55.30	4,250.32	0.63	4,250.67	675,676.40	579,951.42	
8,260.00	90.50	89.50	4,082.87	55.47	4,344.32	1.13	4,344.66	675,676.57	580,045.42	
8,355.00	90.60	89.50	4,081.95	56.30	4,439.31	0.11	4,439.66	675,677.40	580,140.41	
8,491.00	90.60	89.50	4,080.53	57.48	4,575.30	0.00	4,575.65	675,678.58	580,276.40	
Survey projected to 8491.00 MD										

Design Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N-S (usft)	+E-W (usft)	
100.00	100.00	0.06	-0.17	Gyro
3,474.00	3,473.76	21.88	11.89	MWD surveys
8,491.00	4,080.53	57.48	4,575.30	Survey projected to 8491.00 MD