

District I1625 N. French Dr., Hobbs, NM 88240
Phone:(575) 393-6161 Fax:(575) 393-0720**District II**811 S. First St., Artesia, NM 88210
Phone:(575) 748-1283 Fax:(575) 748-9720**District III**1000 Rio Brazos Rd., Aztec, NM 87410
Phone:(505) 334-6178 Fax:(505) 334-6170**District IV**1220 S. St Francis Dr., Santa Fe, NM 87505
Phone:(505) 476-3470 Fax:(505) 476-3462

State of New Mexico
Energy, Minerals and Natural Resources
Oil Conservation Division

Oil Conservation Division

1220 S. St Francis Dr.

Santa Fe, NM 87505

Form C-101

August 1, 2011

Permit 194543

ARTESIA DISTRICT

NOV 05 2014

RECEIVED

APPLICATION FOR PERMIT TO DRILL, RE-ENTER, DEEPEN, PLUGBACK, OR ADD A ZONE

1. Operator Name and Address COG OPERATING LLC One Concho Center Midland, TX 79701		2. OGRID Number 229137
4. Property Code 313320		3. API Number 30-015-42785
5. Property Name BOSE IKARD 4 STATE COM		6. Well No. 007H

7. Surface Location

UL - Lot	Section	Township	Range	Lot Idn	Feet From	N/S Line	Feet From	E/W Line	County
M	4	17S	29E		990	S	330	W	EDDY

8. Proposed Bottom Hole Location

UL - Lot	Section	Township	Range	Lot Idn	Feet From	N/S Line	Feet From	E/W Line	County
P	4	17S	29E	P	990	S	330	E	Eddy

9. Pool Information

EMPIRE; GLORIETA-YESO, EAST	96610
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Additional Well Information

11. Work Type New Well	12. Well Type OIL	13. Cable/Rotary	14. Lease Type Private	15. Ground Level Elevation 3599
16. Multiple N	17. Proposed Depth 8975	18. Formation Yeso Formation	19. Contractor	20. Spud Date 1/30/2015
Depth to Ground water 110		Distance from nearest fresh water well > 1000		Distance to nearest surface water > 1000

☒ We will be using a closed-loop system in lieu of lined pits**21. Proposed Casing and Cement Program**

Type	Hole Size	Casing Size	Casing Weight/ft	Setting Depth	Sacks of Cement	Estimated TOC
Surf	17.5	13.375	48	350	400	0
Int1	12.25	9.625	40	900	400	
Prod	7.875	5.5	17	8975	1400	0
Int2	8.75	5.5	17	4907	0	

Casing/Cement Program: Additional Comments

COG proposes to drill a 17 1/2" hole to 350' with 8.5ppg, 28 viscosity fresh water system. Set 13 3/8" casing and cement to surface. Drill a 12 1/4" hole to 900' with a 10 ppg, 30 viscosity brine water mud system. Set 9 5/8" casing and cement to surface. Drill an 8 3/4" hole to 4079' MD and kick off and drill an 8 3/4" curve to 4907' MD. Drill a 7-7/8" lateral to new BHL at 4529' TVD, 8975' MD. Run a 5 1/2" 17# L-80 casing to TD cement to surface.

22. Proposed Blowout Prevention Program

Type	Working Pressure	Test Pressure	Manufacturer
Double Ram	2000	2000	

23. I hereby certify that the information given above is true and complete to the best of my knowledge and belief.
 I further certify I have complied with 19.15.14.9 (A) NMAC ☐ and/or 19.15.14.9 (B) NMAC ☐, if applicable.

Signature: 

Printed Name:

Kelly Holly

Title:

Permitting Tech

Email Address:

kholly@concho.com

Date:

11-4-14

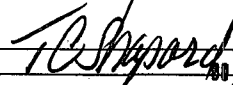
Phone:

432

685-4384

OIL CONSERVATION DIVISION

Approved By:



Title:

Geologist

Approved Date:

11-6-2014

Conditions of Approval Attached

Expiration Date:

11-6-2016

District I
 1025 N. French Dr., Hobbs, NM 88249
 Phone (505) 393-5161 Fax (505) 393-7320
 District II
 811 S. First St., Artesia, NM 88210
 Phone (505) 746-1265 Fax (505) 746-9220
 District III
 1000 Rio Brazos Road, Aztec, NM 87410
 Phone (505) 344-5179 Fax (505) 344-6170
 District IV
 1220 S. St. Francis Dr., Santa Fe, NM 87505
 Phone (505) 476-9460 Fax (505) 476-9462

State of New Mexico
 Energy, Minerals & Natural Resources Department
OIL CONSERVATION DIVISION
 1220 South St. Francis Dr.
 Santa Fe, NM 87505

Form C-102
 Revised August 1, 2011
 Submit one copy to appropriate
 District Office
☐ AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

¹ API Number 30-015- 42785	² Pool Code 96610	³ Pool Name Empire; Glorieta Yeso East
⁴ Property Code 313320	⁵ Property Name BOSE IKARD 4 STATE COM -	
⁶ UGRID No. 229137	⁷ Operator Name COG OPERATING, LLC	⁸ Well Number 7H
		⁹ Elevation 3599'

" Surface Location

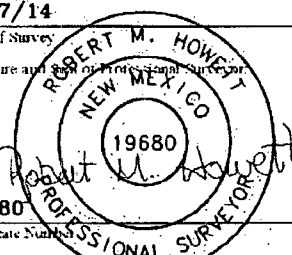
Tr. or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
M	4	17-S	29-E		990	SOUTH	330	WEST	EDDY

" Bottom Hole Location If Different From Surface

Tr. or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
P	4	17-S	29-E		990	SOUTH	330	EAST	EDDY

¹² Dedicated Acres 160	¹³ Joint or Infill	¹⁴ Consolidation Code	¹⁵ Order No.
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No allowable will be assigned to this completion until all interests have been consolidated or a non-standard unit has been approved by the division.

GEODETIC DATA NAD 27 GRID - NM EAST SURFACE LOCATION N 676281.0 E 575701.3 LAT: 32.65693717° N LONG: 104.08680592° W BOTTOM LOCATION N 676309.5 E 560297.9 CORNER DATA NAD 27 GRID - NM EAST A: SET REBAR. W/RPC. LS(9680) HOWETT N 675259.3 - E 575371.1 B: FND BRASS CAP 1914 N 677928.7 - E 575371.9 C: FND BRASS CAP 1914 N 680590.6 - E 575358.9 D: FND BRASS CAP 1914 N 680585.3 - E 577994.0 E: FND BRASS CAP 1914 N 680595.6 - E 580627.0 F: FND BRASS CAP 1914 N 677960.0 - E 580626.8 G: FND BRASS CAP 1914 N 675321.9 - E 580622.5 H: FND BRASS CAP 1914 N 675304.6 - E 577999.2 330' S.L. N 29°32'40" E (GRID) - 4597.88' (HORIZ.) B.H. 330' Producing Area Project Area	"OPERATOR CERTIFICATION <i>I hereby certify that the information contained herein is true and complete to the best of my knowledge and belief, and that this information either was a working interest or otherwise interest in the land including the proposed bottom hole location or has a right to drill into well or this location is subject to a contract with or in favor of such a mineral or working interest, or to a voluntary pooling agreement or a compulsory pooling agreement as required by the division.</i> 10-23-14 Date <i>Kelly J. Holly</i> Signature Kelly J. Holly Printed Name kholly@concho.com E-mail Address "SURVEYOR CERTIFICATION <i>I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my belief.</i> 2/27/14 Date of Survey <i>Robert M. Howett</i> Signature and Seal of Professional Surveyor  19680 Certificate Number
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COG OPERATING, LLC

Eddy County, NM

Bose Ikard 4 State Com 7H

7H

Lateral

Plan: Plan #1

Standard Planning Report

20 October, 2014

Section Distances

Sec4,T17S,R29E

SHL - Unit M

990'FSL,330'FWL

PBHL - Unit P

990'FSL,330'FEL

Archer

Planning Report

Database:	EDM/R5000.1 MULTI	Local Co-ordinate Reference:	Well: 7H
Company:	COG OPERATING, LLC	TVD Reference:	3599'GL @ 3599'00usft (Planning)
Project:	Eddy County, NM	MD Reference:	3599'GL @ 3599'00usft (Planning)
Site:	Bose Ikard 4 State Com 7H	North Reference:	Grid
Well:	7H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Lateral		
Design:	Plan #1		

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 7H						
Site Position:		Northing:	676,281.00 usft	Latitude:	32° 51' 32.17 N	
From:	Map	Easting:	575,701.30 usft	Longitude:	104° 5' 12.50 W	
Position Uncertainty:		0.00 usft	Slot Radius:	13.200 in	Grid Convergence:	0.13

Well	7H					
Well Position	+N/-S	0.00 usft	Northing:	676,281.00 usft	Latitude:	32° 51' 32.17 N
	+E/-W	0.00 usft	Easting:	575,701.30 usft	Longitude:	104° 5' 12.50 W
Position Uncertainty		0.00 usft	Wellhead Elevation:	0.00 usft	Ground Level:	3,599.00 usft

Wellbore		Lateral			
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	10/17/2014	7.77	60.67	48,506

Design	Plan #1			
Audit Notes:				
Version:	Phase:	PROTOTYPE	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD)	+N/S	+E/W	Direction
	(usft)	(usft)	(usft)	(°)
	0.00	0.00	0.00	89.64

Plan Sections										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/S (usft)	+E/W (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
4,079.21	0.00	0.00	4,079.21	0.00	0.00	0.00	0.00	0.00	0.00	
4,906.48	91.00	93.00	4,600.00	-27.74	529.23	11.00	11.00	0.00	93.00	
5,034.89	91.00	89.15	4,597.76	-30.14	657.58	3.00	0.00	-3.00	-89.97	
8,974.95	91.00	89.15	4,529.02	28.50	4,596.60	0.00	0.00	0.00	0.00	Bose Ikard 7H PBHL

Archer

Planning Report

Database:	EDM-R5000.1;MULTI	Local Co-ordinate Reference:	Well: 7H
Company:	COG OPERATING, LLC	TVD Reference:	3599'GL @ 3599.00usft (Planning)
Project:	Eddy County, NM	MD Reference:	3599'GL @ 3599.00usft (Planning)
Site:	Bose Ikard 4 State Com 7H	North Reference:	Grid
Well:	7H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Lateral		
Design:	Plan: #1		

Planned 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)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	0.00
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00
400.00	0.00	0.00	400.00	0.00	0.00	0.00	0.00	0.00	0.00
500.00	0.00	0.00	500.00	0.00	0.00	0.00	0.00	0.00	0.00
600.00	0.00	0.00	600.00	0.00	0.00	0.00	0.00	0.00	0.00
700.00	0.00	0.00	700.00	0.00	0.00	0.00	0.00	0.00	0.00
800.00	0.00	0.00	800.00	0.00	0.00	0.00	0.00	0.00	0.00
900.00	0.00	0.00	900.00	0.00	0.00	0.00	0.00	0.00	0.00
1,000.00	0.00	0.00	1,000.00	0.00	0.00	0.00	0.00	0.00	0.00
1,100.00	0.00	0.00	1,100.00	0.00	0.00	0.00	0.00	0.00	0.00
1,200.00	0.00	0.00	1,200.00	0.00	0.00	0.00	0.00	0.00	0.00
1,300.00	0.00	0.00	1,300.00	0.00	0.00	0.00	0.00	0.00	0.00
1,400.00	0.00	0.00	1,400.00	0.00	0.00	0.00	0.00	0.00	0.00
1,500.00	0.00	0.00	1,500.00	0.00	0.00	0.00	0.00	0.00	0.00
1,600.00	0.00	0.00	1,600.00	0.00	0.00	0.00	0.00	0.00	0.00
1,700.00	0.00	0.00	1,700.00	0.00	0.00	0.00	0.00	0.00	0.00
1,800.00	0.00	0.00	1,800.00	0.00	0.00	0.00	0.00	0.00	0.00
1,900.00	0.00	0.00	1,900.00	0.00	0.00	0.00	0.00	0.00	0.00
2,000.00	0.00	0.00	2,000.00	0.00	0.00	0.00	0.00	0.00	0.00
2,100.00	0.00	0.00	2,100.00	0.00	0.00	0.00	0.00	0.00	0.00
2,200.00	0.00	0.00	2,200.00	0.00	0.00	0.00	0.00	0.00	0.00
2,300.00	0.00	0.00	2,300.00	0.00	0.00	0.00	0.00	0.00	0.00
2,400.00	0.00	0.00	2,400.00	0.00	0.00	0.00	0.00	0.00	0.00
2,500.00	0.00	0.00	2,500.00	0.00	0.00	0.00	0.00	0.00	0.00
2,600.00	0.00	0.00	2,600.00	0.00	0.00	0.00	0.00	0.00	0.00
2,700.00	0.00	0.00	2,700.00	0.00	0.00	0.00	0.00	0.00	0.00
2,800.00	0.00	0.00	2,800.00	0.00	0.00	0.00	0.00	0.00	0.00
2,900.00	0.00	0.00	2,900.00	0.00	0.00	0.00	0.00	0.00	0.00
3,000.00	0.00	0.00	3,000.00	0.00	0.00	0.00	0.00	0.00	0.00
3,100.00	0.00	0.00	3,100.00	0.00	0.00	0.00	0.00	0.00	0.00
3,200.00	0.00	0.00	3,200.00	0.00	0.00	0.00	0.00	0.00	0.00
3,300.00	0.00	0.00	3,300.00	0.00	0.00	0.00	0.00	0.00	0.00
3,400.00	0.00	0.00	3,400.00	0.00	0.00	0.00	0.00	0.00	0.00
3,500.00	0.00	0.00	3,500.00	0.00	0.00	0.00	0.00	0.00	0.00
3,600.00	0.00	0.00	3,600.00	0.00	0.00	0.00	0.00	0.00	0.00
3,700.00	0.00	0.00	3,700.00	0.00	0.00	0.00	0.00	0.00	0.00
3,800.00	0.00	0.00	3,800.00	0.00	0.00	0.00	0.00	0.00	0.00
3,900.00	0.00	0.00	3,900.00	0.00	0.00	0.00	0.00	0.00	0.00
4,000.00	0.00	0.00	4,000.00	0.00	0.00	0.00	0.00	0.00	0.00
4,079.21	0.00	0.00	4,079.21	0.00	0.00	0.00	0.00	0.00	0.00
Start Build 11.00									
4,100.00	2.29	93.00	4,099.99	-0.02	0.41	0.41	11.00	11.00	0.00
4,150.00	7.79	93.00	4,149.78	-0.25	4.80	4.79	11.00	11.00	0.00
4,200.00	13.29	93.00	4,198.92	-0.73	13.92	13.92	11.00	11.00	0.00
4,250.00	18.79	93.00	4,246.96	-1.45	27.71	27.70	11.00	11.00	0.00
4,300.00	24.29	93.00	4,293.45	-2.41	46.04	46.02	11.00	11.00	0.00
4,350.00	29.79	93.00	4,337.97	-3.60	68.72	68.70	11.00	11.00	0.00
4,400.00	35.29	93.00	4,380.10	-5.01	95.57	95.54	11.00	11.00	0.00
4,450.00	40.79	93.00	4,419.47	-6.62	126.32	126.28	11.00	11.00	0.00
4,500.00	46.29	93.00	4,455.70	-8.42	160.70	160.65	11.00	11.00	0.00
4,550.00	51.79	93.00	4,488.47	-10.40	198.39	198.33	11.00	11.00	0.00
4,600.00	57.29	93.00	4,517.46	-12.53	239.05	238.96	11.00	11.00	0.00

Archer Planning Report

Database:	EDM R5000.1 MULTI	Local Co-ordinate Reference:	Well 7H
Company:	COG OPERATING LLC	TVD Reference:	3599'GL @ 3599.00usft (Planning)
Project:	Eddy County NM	MD Reference:	3599'GL @ 3599.00usft (Planning)
Site:	Bose Ikard 4 State Com 7H	North Reference:	Grid
Well:	7H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Lateral		
Design:	Plan #1		

Planned 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)
4,650.00	62.79	93.00	4,542.43	-14.79	282.29	282.19	11.00	11.00	0.00
4,700.00	68.29	93.00	4,563.12	-17.18	327.72	327.61	11.00	11.00	0.00
4,750.00	73.79	93.00	4,579.37	-19.65	374.92	374.79	11.00	11.00	0.00
4,800.00	79.29	93.00	4,591.00	-22.19	423.46	423.32	11.00	11.00	0.00
4,850.00	84.79	93.00	4,597.93	-24.78	472.90	472.73	11.00	11.00	0.00
4,900.00	90.29	93.00	4,600.07	-27.40	522.76	522.58	11.00	11.00	0.00
4,906.48	91.00	93.00	4,600.00	-27.74	529.23	529.05	11.00	11.00	0.00
Start DLS 3.00 TFO 89.97									
5,000.00	91.00	90.19	4,598.37	-30.34	622.69	622.49	3.00	0.00	-3.00
5,034.89	91.00	89.15	4,597.76	-30.14	657.58	657.38	3.00	0.00	-3.00
Start 3940.06 hold at 5034.89 MD									
5,100.00	91.00	89.15	4,596.62	-29.17	722.67	722.47	0.00	0.00	0.00
5,200.00	91.00	89.15	4,594.88	-27.68	822.64	822.46	0.00	0.00	0.00
5,300.00	91.00	89.15	4,593.13	-26.20	922.62	922.44	0.00	0.00	0.00
5,400.00	91.00	89.15	4,591.39	-24.71	1,022.59	1,022.42	0.00	0.00	0.00
5,500.00	91.00	89.15	4,589.65	-23.22	1,122.56	1,122.40	0.00	0.00	0.00
5,600.00	91.00	89.15	4,587.90	-21.73	1,222.54	1,222.38	0.00	0.00	0.00
5,700.00	91.00	89.15	4,586.16	-20.24	1,322.51	1,322.36	0.00	0.00	0.00
5,800.00	91.00	89.15	4,584.41	-18.75	1,422.48	1,422.34	0.00	0.00	0.00
5,900.00	91.00	89.15	4,582.67	-17.27	1,522.46	1,522.32	0.00	0.00	0.00
6,000.00	91.00	89.15	4,580.92	-15.78	1,622.43	1,622.30	0.00	0.00	0.00
6,100.00	91.00	89.15	4,579.18	-14.29	1,722.41	1,722.28	0.00	0.00	0.00
6,200.00	91.00	89.15	4,577.43	-12.80	1,822.38	1,822.27	0.00	0.00	0.00
6,300.00	91.00	89.15	4,575.69	-11.31	1,922.35	1,922.25	0.00	0.00	0.00
6,400.00	91.00	89.15	4,573.94	-9.82	2,022.33	2,022.23	0.00	0.00	0.00
6,500.00	91.00	89.15	4,572.20	-8.34	2,122.30	2,122.21	0.00	0.00	0.00
6,600.00	91.00	89.15	4,570.45	-6.85	2,222.27	2,222.19	0.00	0.00	0.00
6,700.00	91.00	89.15	4,568.71	-5.36	2,322.25	2,322.17	0.00	0.00	0.00
6,800.00	91.00	89.15	4,566.97	-3.87	2,422.22	2,422.15	0.00	0.00	0.00
6,900.00	91.00	89.15	4,565.22	-2.38	2,522.20	2,522.13	0.00	0.00	0.00
7,000.00	91.00	89.15	4,563.48	-0.89	2,622.17	2,622.11	0.00	0.00	0.00
7,100.00	91.00	89.15	4,561.73	0.59	2,722.14	2,722.09	0.00	0.00	0.00
7,200.00	91.00	89.15	4,559.99	2.08	2,822.12	2,822.08	0.00	0.00	0.00
7,300.00	91.00	89.15	4,558.24	3.57	2,922.09	2,922.06	0.00	0.00	0.00
7,400.00	91.00	89.15	4,556.50	5.06	3,022.06	3,022.04	0.00	0.00	0.00
7,500.00	91.00	89.15	4,554.75	6.55	3,122.04	3,122.02	0.00	0.00	0.00
7,600.00	91.00	89.15	4,553.01	8.04	3,222.01	3,222.00	0.00	0.00	0.00
7,700.00	91.00	89.15	4,551.26	9.52	3,321.99	3,321.98	0.00	0.00	0.00
7,800.00	91.00	89.15	4,549.52	11.01	3,421.96	3,421.96	0.00	0.00	0.00
7,900.00	91.00	89.15	4,547.77	12.50	3,521.93	3,521.94	0.00	0.00	0.00
8,000.00	91.00	89.15	4,546.03	13.99	3,621.91	3,621.92	0.00	0.00	0.00
8,100.00	91.00	89.15	4,544.28	15.48	3,721.88	3,721.90	0.00	0.00	0.00
8,200.00	91.00	89.15	4,542.54	16.97	3,821.85	3,821.89	0.00	0.00	0.00
8,300.00	91.00	89.15	4,540.80	18.45	3,921.83	3,921.87	0.00	0.00	0.00
8,400.00	91.00	89.15	4,539.05	19.94	4,021.80	4,021.85	0.00	0.00	0.00
8,500.00	91.00	89.15	4,537.31	21.43	4,121.77	4,121.83	0.00	0.00	0.00
8,600.00	91.00	89.15	4,535.56	22.92	4,221.75	4,221.81	0.00	0.00	0.00
8,700.00	91.00	89.15	4,533.82	24.41	4,321.72	4,321.79	0.00	0.00	0.00
8,800.00	91.00	89.15	4,532.07	25.90	4,421.70	4,421.77	0.00	0.00	0.00
8,900.00	91.00	89.15	4,530.33	27.38	4,521.67	4,521.75	0.00	0.00	0.00
8,974.95	91.00	89.15	4,529.02	28.50	4,596.60	4,596.69	0.00	0.00	0.00
TD at 8974.95									

Archer

Planning Report

Database:	EDM R5000.1 MULTI	Local Co-ordinate Reference:	Well 7H
Company:	COG OPERATING, LLC	TVD Reference:	3599'GL @ 3599.00usft (Planning)
Project:	Eddy County, NM	MD Reference:	3599'GL @ 3599.00usft (Planning)
Site:	Bose Ikard 4 State Com 7H	North Reference:	Grid
Well:	7H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Lateral		
Design:	Plan #1		

Design Targets									
Target Name	hit/miss target	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude Longitude
Bose Ikard 7H Surface		0.00	0.00	0.00	0.00	0.00	676,281.00	575,701.30	32° 51' 32.17 N 104° 5' 12.50 W
- plan hits target center									
- Point									
Bose Ikard 7H PBHL		0.00	0.00	4,529.02	28.50	4,596.60	676,309.50	580,297.90	32° 51' 32.35 N 104° 4' 18.61 W
- plan hits target center									
- Point									

Plan Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates			
		+N/-S (usft)	+E/-W (usft)	Comment	
4,079.21	4,079.21	0.00	0.00	Start Build 11.00	
4,906.48	4,600.00	-27.74	529.23	Start DLS 3.00 TFO -89.97	
5,034.89	4,597.76	-30.14	657.58	Start 3940.06 hold at 5034.89 MD	
8,974.95	4,529.02	28.50	4,596.60	TD at 8974.95	

COG OPERATING, LLC

Field: Eddy County, NM
Site: Bose Ikard 4 State Com 7H
Well: 7H
Wellbore: Lateral
Plan: Plan #1



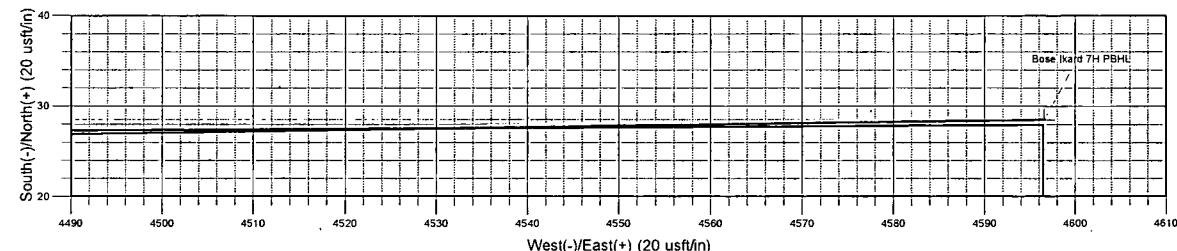
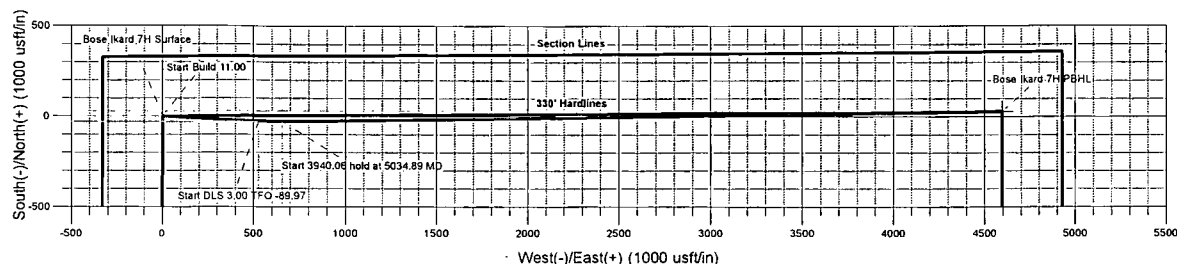
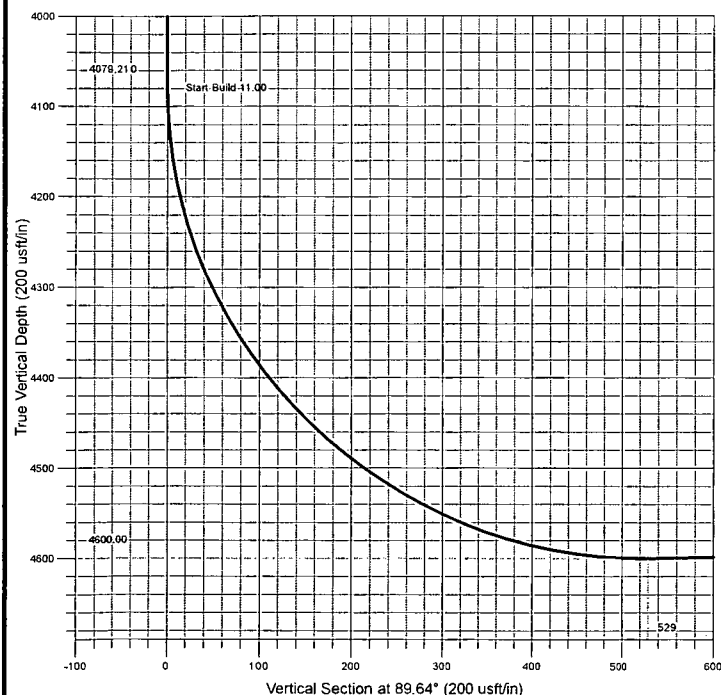
Section Distances

Sec4.T17S.R29E
SHL - Unit M
990°FSL,330°FWL
PBHL - Unit P
990°FSL,330°FEL



Azimuths to Grid North
True North: -0.13°
Magnetic North: 7.63°

Magnetic Field
Strength: 48506.0snT
Dip Angle: 60.67°
Date: 10/17/2014
Model: HDGM

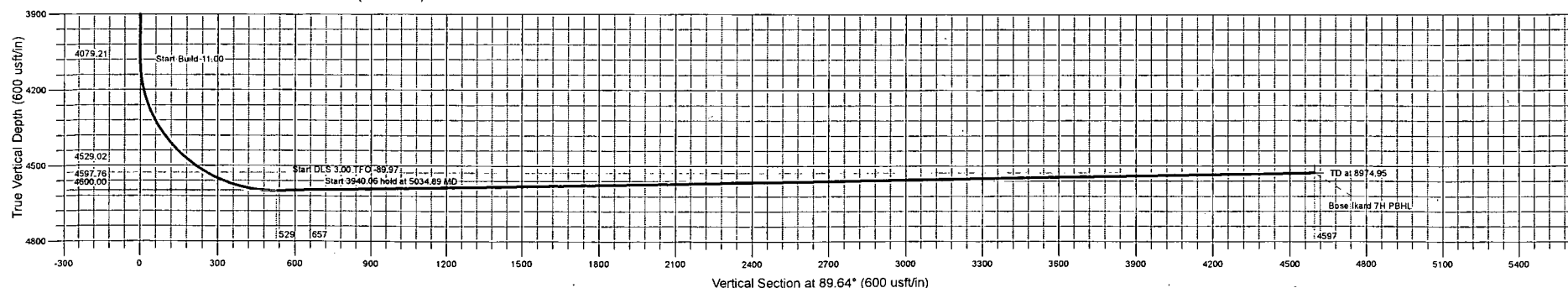


TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Shape
Bose Ikard 7H Surface	0.00	0.00	0.00	676281.00	575701.30	32° 51' 32.17 N	104° 5' 12.50 W	Point
Bose Ikard 7H PBHL	4529.02	28.50	4596.60	676309.50	580297.90	32° 51' 32.35 N	104° 4' 18.61 W	Point

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VFace	Target
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	4079.21	0.00	0.00	4079.21	0.00	0.00	0.00	0.00	0.00	
3	4906.48	91.00	93.00	4600.00	-27.74	529.23	11.00	93.00	529.05	
4	5034.89	91.00	89.15	4597.76	-30.14	657.58	3.00	-89.97	657.38	
5	8974.95	91.00	89.15	4529.02	28.50	4596.60	0.00	0.00	4596.69	Bose Ikard 7H PBHL



Archer

ARCHER DIRECTIONAL DRILLING SERVICES
12101 Cutten Rd. Houston, Texas 77066
Phone: 281-301-2600 Fax: 281-301-2795

Design: Plan #1 (7H/Lateral)
Created By: Ivonne Gonzalez
Date: 17:04, October 20 2014