

Certificate No. GARY G. EDSON 12641
RONALD L. EDSON 3239



COG Operating LLC

Eddy County, NM (NAN27 NME)

Kiowa State #3

Kiowa State #3

OH

Plan: Plan #1 - 7-7/8" Hole

SHL = 1425' FNL & 1520' FEL

BHL = 1700' FNL & 1700' FEL

Paddock Top = 1700' FNL & 1700' FEL @ 3200' TVD

Standard Planning Report

14 January, 2011





Scientific Drilling
Planning Report



Database:	EDM-Julio	Local Co-ordinate Reference:	Site Kiowa State #3
Company:	COG Operating LLC	TVD Reference:	GL Elev. @ 3629.00usft
Project:	Eddy County, NM (NAN27 NME)	MD Reference:	GL Elev. @ 3629.00usft
Site:	Kiowa State #3	North Reference:	Grid
Well:	Kiowa State #3	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #1 - 7-7/8" Hole		

Project	Eddy County, NM (NAN27 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	Kiowa State #3		
Site Position:		Northing:	652,506.50 usft
From:	Map	Easting:	532,368.20 usft
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "
		Latitude:	32° 47' 37.630 N
		Longitude:	104° 13' 40.802 W
		Grid Convergence:	0.06 °

Well	Kiowa State #3		
Well Position	+N/-S	0.00 usft	Northing:
	+E/-W	0.00 usft	Easting:
Position Uncertainty	0.00 usft	Wellhead Elevation:	Ground Level:
			3,629.00 usft

Wellbore	OH
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Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	2011/01/14	7.98	60.61	48,926

Design	Plan #1 - 7-7/8" Hole		
Audit Notes:			
Version:	Phase:	PLAN	Tie On Depth:
			0.00
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W
	(usft)	(usft)	(usft)
	0.00	0.00	0.00
			Direction (°)
			213.10

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	
950.00	0.00	0.00	950.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,492.77	10.86	213.10	1,489.53	-42.95	-27.99	2.00	2.00	0.00	213.10	
2,685.05	10.86	213.10	2,660.47	-231.05	-150.61	0.00	0.00	0.00	0.00	
3,227.82	0.00	0.00	3,200.00	-274.00	-178.60	2.00	-2.00	0.00	180.00	TG1-Kiowa #3
4,877.82	0.00	0.00	4,850.00	-274.00	-178.60	0.00	0.00	0.00	0.00	PBHL-Kiowa #3



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Well:	Kiowa State #3	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #1 - 7-7/8" Hole		

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
North HL-Kiowa #3 - West HL-Kiowa #3									
850.00	0.00	0.00	850.00	0.00	0.00	0.00	0.00	0.00	0.00
8-5/8" Casing									
950.00	0.00	0.00	950.00	0.00	0.00	0.00	0.00	0.00	0.00
KOP Start Build 2.00°/100'									
1,000.00	1.00	213.10	1,000.00	-0.37	-0.24	0.44	2.00	2.00	0.00
1,100.00	3.00	213.10	1,099.93	-3.29	-2.14	3.93	2.00	2.00	0.00
1,200.00	5.00	213.10	1,199.68	-9.13	-5.95	10.90	2.00	2.00	0.00
1,300.00	7.00	213.10	1,299.13	-17.89	-11.66	21.35	2.00	2.00	0.00
1,400.00	9.00	213.10	1,398.15	-29.55	-19.26	35.27	2.00	2.00	0.00
1,492.77	10.86	213.10	1,489.53	-42.95	-27.99	51.26	2.00	2.00	0.00
EOC hold 10.86°									
1,500.00	10.86	213.10	1,496.63	-44.09	-28.74	52.63	0.00	0.00	0.00
1,600.00	10.86	213.10	1,594.84	-59.86	-39.02	71.46	0.00	0.00	0.00
1,700.00	10.86	213.10	1,693.05	-75.64	-49.30	90.29	0.00	0.00	0.00
1,800.00	10.86	213.10	1,791.26	-91.42	-59.59	109.12	0.00	0.00	0.00
1,900.00	10.86	213.10	1,889.47	-107.20	-69.87	127.96	0.00	0.00	0.00
2,000.00	10.86	213.10	1,987.68	-122.97	-80.16	146.79	0.00	0.00	0.00
2,100.00	10.86	213.10	2,085.89	-138.75	-90.44	165.62	0.00	0.00	0.00
2,200.00	10.86	213.10	2,184.10	-154.53	-100.72	184.46	0.00	0.00	0.00
2,300.00	10.86	213.10	2,282.31	-170.30	-111.01	203.29	0.00	0.00	0.00
2,400.00	10.86	213.10	2,380.52	-186.08	-121.29	222.12	0.00	0.00	0.00
2,500.00	10.86	213.10	2,478.74	-201.86	-131.58	240.96	0.00	0.00	0.00
2,600.00	10.86	213.10	2,576.95	-217.64	-141.86	259.79	0.00	0.00	0.00
2,685.05	10.86	213.10	2,660.47	-231.05	-150.61	275.81	0.00	0.00	0.00
Start Drop 2.00°/100'									
2,700.00	10.56	213.10	2,675.16	-233.38	-152.12	278.58	2.00	-2.00	0.00
2,800.00	8.56	213.10	2,773.77	-247.29	-161.19	295.18	2.00	-2.00	0.00
2,900.00	6.56	213.10	2,872.90	-258.30	-168.37	308.33	2.00	-2.00	0.00
3,000.00	4.56	213.10	2,972.42	-266.42	-173.66	318.02	2.00	-2.00	0.00
3,100.00	2.56	213.10	3,072.22	-271.61	-177.04	324.22	2.00	-2.00	0.00
3,200.00	0.56	213.10	3,172.18	-273.89	-178.53	326.93	2.00	-2.00	0.00
3,227.82	0.00	0.00	3,200.00	-274.00	-178.60	327.07	2.00	-2.00	528.09
EOC hold 0.00° - TG1-Kiowa #3									
4,877.82	0.00	0.00	4,850.00	-274.00	-178.60	327.07	0.00	0.00	0.00
PBHL-Kiowa #3									



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Project:	Eddy County, NM (NAN27 NME)	MD Reference:	GL Elev. @ 3629.00usft
Site:	Kiowa State #3	North Reference:	Grid
Well:	Kiowa State #3	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #1 - 7-7/8" Hole		

Design Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
North HL-Kiowa #3 - plan misses target center by 258.29usft at 0.00usft MD (0.00 TVD, 0.00 N, 0.00 E) - Rectangle (sides W200.00 H0.00 D0.00)	0.00	0.00	0.00	-224.00	-128.60	652,282.50	532,239.60	32° 47' 35.415 N	104° 13' 42.311 W
West HL-Kiowa #3 - plan misses target center by 258.29usft at 0.00usft MD (0.00 TVD, 0.00 N, 0.00 E) - Rectangle (sides W0.00 H200.00 D0.00)	0.00	0.00	0.00	-224.00	-128.60	652,282.50	532,239.60	32° 47' 35.415 N	104° 13' 42.311 W
TG1-Kiowa #3 - plan hits target center - Circle (radius 50.00)	0.00	0.00	3,200.00	-274.00	-178.60	652,232.50	532,189.60	32° 47' 34.920 N	104° 13' 42.897 W
PBHL-Kiowa #3 - plan hits target center - Circle (radius 50.00)	0.00	0.00	4,850.00	-274.00	-178.60	652,232.50	532,189.60	32° 47' 34.920 N	104° 13' 42.897 W

Casing Points

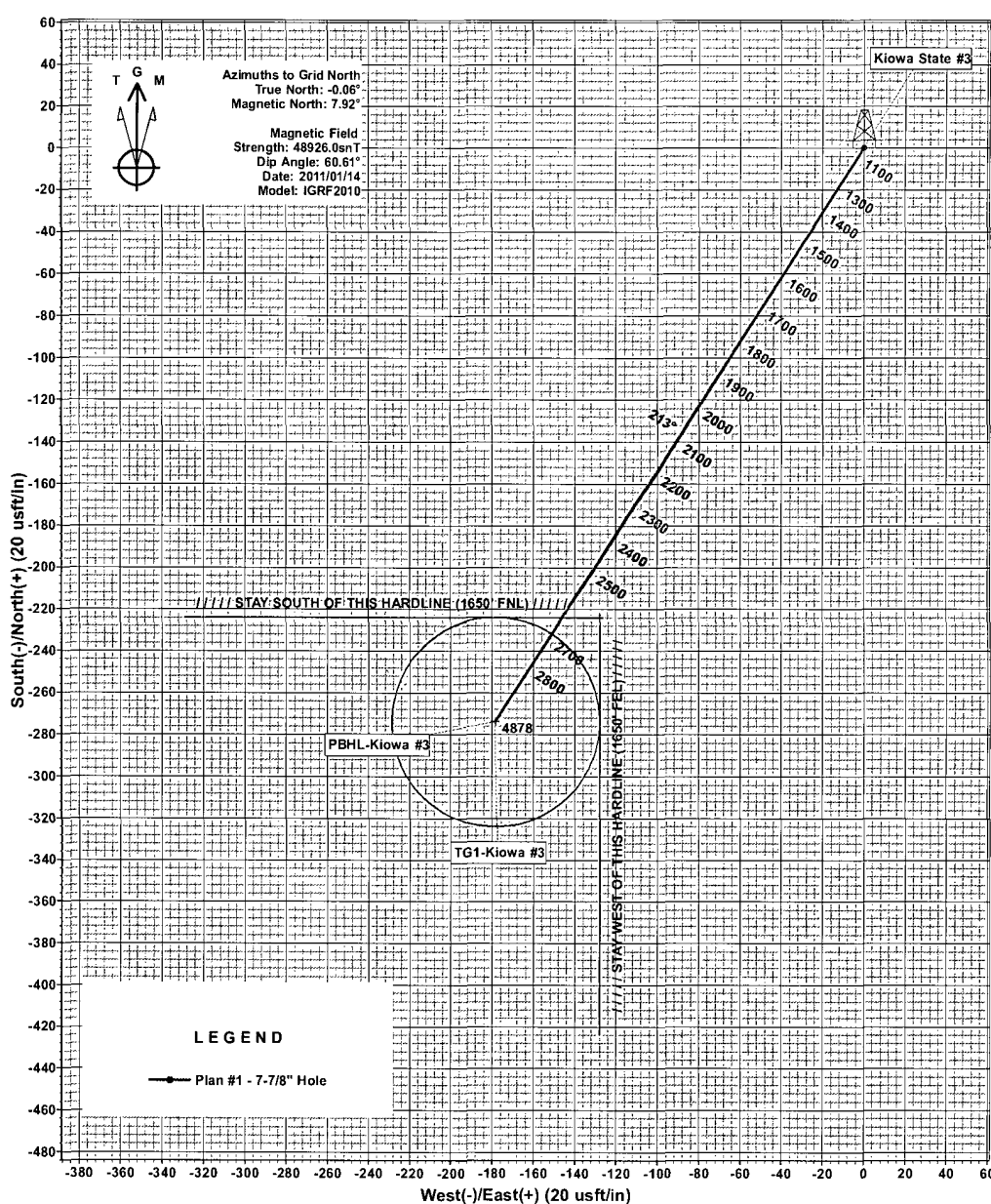
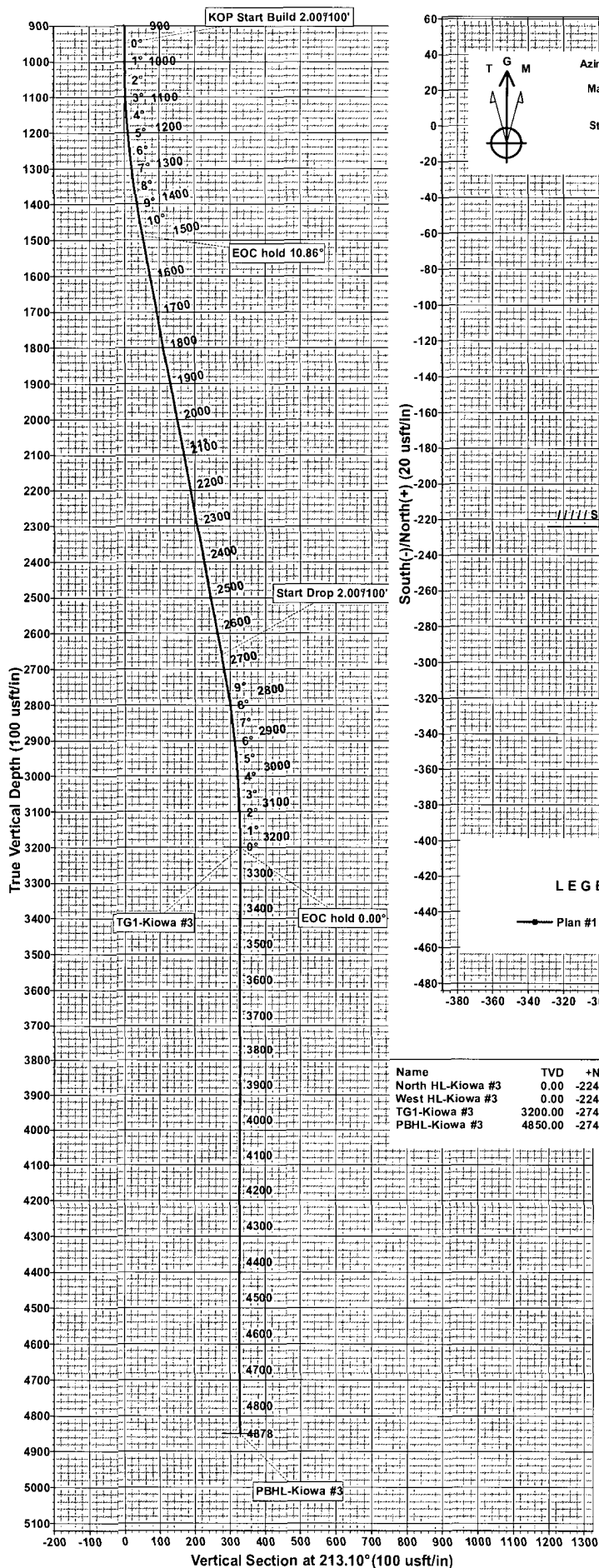
Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
850.00	850.00	8-5/8" Casing	8-5/8	12-1/4

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	+E/-W (usft)	Comment
950.00	950.00	0.00	0.00	KOP Start Build 2.00°/100'
1,492.77	1,489.53	-42.95	-27.99	EOC hold 10.86°
2,685.05	2,660.47	-231.05	-150.61	Start Drop 2.00°/100'
3,227.82	3,200.00	-274.00	-178.60	EOC hold 0.00°



Scientific Drilling for COG Operating LLC
Site: Eddy County, NM (NAN27 NME)
Well: Kiowa State #3
Wellbore: OH
Design: Plan #1 - 7-7/8" Hole



LEGEND

Plan #1 - 7-7/8" Hole

WELLBORE TARGET DETAILS (MAP CO-ORDINATES)

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Shape
North HL-Kiowa #3	0.00	-224.00	-128.60	652282.50	532239.60	32°47' 35.415 N	104°13' 42.311 W	Rectangle (Sides : L0.00 W200.00)
West HL-Kiowa #3	0.00	-224.00	-128.60	652282.50	532239.60	32°47' 35.415 N	104°13' 42.311 W	Rectangle (Sides: L200.00 W0.00)
TG1-Kiowa #3	3200.00	-274.00	-178.60	652232.50	532189.60	32°47' 34.920 N	104°13' 42.897 W	Circle (Radius: 50.00)
PBHL-Kiowa #3	4850.00	-274.00	-178.60	652232.50	532189.60	32°47' 34.920 N	104°13' 42.897 W	Circle (Radius: 50.00)

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	Target
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	Target
2	950.00	0.00	0.00	950.00	0.00	0.00	0.00	0.00	0.00	0.00
3	1492.77	10.86	213.10	1489.53	-42.95	-27.99	2.00	213.10	51.26	
4	2685.05	10.86	213.10	2660.47	-231.05	-150.61	0.00	0.00	275.81	
5	3227.82	0.00	0.00	3200.00	-274.00	-178.60	2.00	180.00	327.07	TG1-Kiowa #3
6	4877.82	0.00	0.00	4850.00	-274.00	-178.60	0.00	0.00	327.07	PBHL-Kiowa #3

WELL DETAILS: Kiowa State #3

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.00	0.00	652506.50	532368.20	32°47' 37.630 N	104°13' 40.802 W	

PROJECT DETAILS: Eddy County, NM (NAN27 NME)

Plan: Plan #1 - 7-7/8" Hole (Kiowa State #3/OH)

Geodetic System: US State Plane 1927 (Exact solution)	Created By: Julio Pina	Date: 14-Jan-11
Datum: NAD 1927 (NADCON CONUS)	Checked: _____	Date: _____
Ellipsoid: Clarke 1866	Reviewed: _____	Date: _____
Zone: New Mexico East 3001	Approved: _____	Date: _____
System Datum: Mean Sea Level		