

2 District I

1625 N. French Dr., Hobbs, NM 88240

District II

811 S. First St., Artesia, NM 88210

District III

1000 Rio Brazos Rd., Aztec, NM 87410

District IV

1220 S. St. Francis Dr., Santa Fe, NM 87505

State of New Mexico

Energy, Minerals & Natural Resources

Oil Conservation Division

1220 South St. Francis Dr.

Santa Fe, NM 87505

Form C-104

Revised August 1, 2011

Submit one copy to appropriate District Office

AMENDED REPORT

I. REQUEST FOR ALLOWABLE AND AUTHORIZATION TO TRANSPORT

¹ Operator name and Address COG Operating LLC 2208 W. Main Street Artesia, NM 88210			² OGRID Number 229137			
			³ Reason for Filing Code/ Effective Date NW			
⁴ API Number 30-025-45656		⁵ Pool Name Dogie Draw; Wolfcamp			⁶ Pool Code 17980	
⁷ Property Code 326533		⁸ Property Name Pitchblende 19 30 Federal			⁹ Well Number 208H	

II. ¹⁰ Surface Location

Ul or lot no. A	Section 19	Township 25S	Range 35E	Lot Idn	Feet from the 450	North/South Line North	Feet from the 660	East/West line East	County Lea
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¹¹ Bottom Hole Location

Ul or lot no. H	Section 30	Township 25S	Range 35E	Lot Idn	Feet from the 2569	North/South Line North	Feet from the 726	East/West line East	County Lea
¹² Lse Code F	¹³ Producing Method Code		¹⁴ Gas Connection Date		¹⁵ C-129 Permit Number	¹⁶ C-129 Effective Date		¹⁷ C-129 Expiration Date	

III. Oil and Gas Transporters

¹⁸ Transporter OGRID	¹⁹ Transporter Name and Address	²⁰ O/G/W
	ACC	O
298751	Lucid 3100 McKinnon Ste 800 Dallas, TX 75201	G
278421	Holly Refining and Marketing PO Box 159 Artesia, NM 88210	O

IV. Well Completion Data

²¹ Spud Date 1/6/20	²² Ready Date 10/24/20	²³ TD 20,214'	²⁴ PBTD 20,130'	²⁵ Perforations 12,865-20,105'	²⁶ DHC, MC
²⁷ Hole Size		²⁸ Casing & Tubing Size		²⁹ Depth Set	³⁰ Sacks Cement
14 3/4"		10 3/4"		1025'	793
8 3/4"		7 5/8"		12,013'	1375
6 3/4"		5 1/2"		20,200'	1600
		2 7/8"		11,719'	

V. Well Test Data

³¹ Date New Oil 11/13/20	³² Gas Delivery Date 11/13/20	³³ Test Date 11/13/20	³⁴ Test Length 24 Hrs	³⁵ Tbg. Pressure 4400#	³⁶ Csg. Pressure 1750#
³⁷ Choke Size 19/64	³⁸ Oil 889	³⁹ Water 3334	⁴⁰ Gas 1042		⁴¹ Test Method Flowing
⁴² I hereby certify that the rules of the Oil Conservation Division have been complied with and that the information given above is true and complete to the best of my knowledge and belief. Signature: <i>Amanda Avery</i>			OIL CONSERVATION DIVISION Approved by: KURT SIMMONS		
Printed name: Amanda Avery			Title: NM OCD, SANTA FE		
Title: Regulatory Analyst			Approval Date: 04/15/2021		
E-mail Address:					
Date: 11/30/2020		Phone: 575-748-6962			

Released to Imaging: 4/15/2021 11:21:41 AM

DISTRICT I
1625 N. FRENCH DR., HOBBS, NM 88240
Phone: (575) 393-6161 Fax: (575) 393-0720

DISTRICT II
511 S. FIRST ST., ARTESIA, NM 88210
Phone: (575) 746-1283 Fax: (575) 746-9720

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) 476-3460 Fax: (505) 476-3462

State of New Mexico
Energy, Minerals & Natural Resources Department
OIL CONSERVATION DIVISION
1220 SOUTH ST. FRANCIS DR.
Santa Fe, New Mexico 87505

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

☒ AMENDED REPORT

As Drilled

WELL LOCATION AND ACREAGE DEDICATION PLAT

API Number 30-025-45656	Pool Code 17980	Pool Name Dogie Draw; Wolfcamp
Property Code 326533	Property Name PITCHBLEND FEDERAL 19-30	Well Number 208H
OGRID No. 229137	Operator Name COG OPERATING, LLC	Elevation 3331.0'

Surface Location

UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
A	19	25-S	35-E		450	NORTH	660	EAST	LEA

Bottom Hole Location If Different From Surface

UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
H	30	25-S	35		2569	NORTH	726	EAST	LEA
Dedicated Acres 240	Joint or Infill	Consolidation Code	Order No.						

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

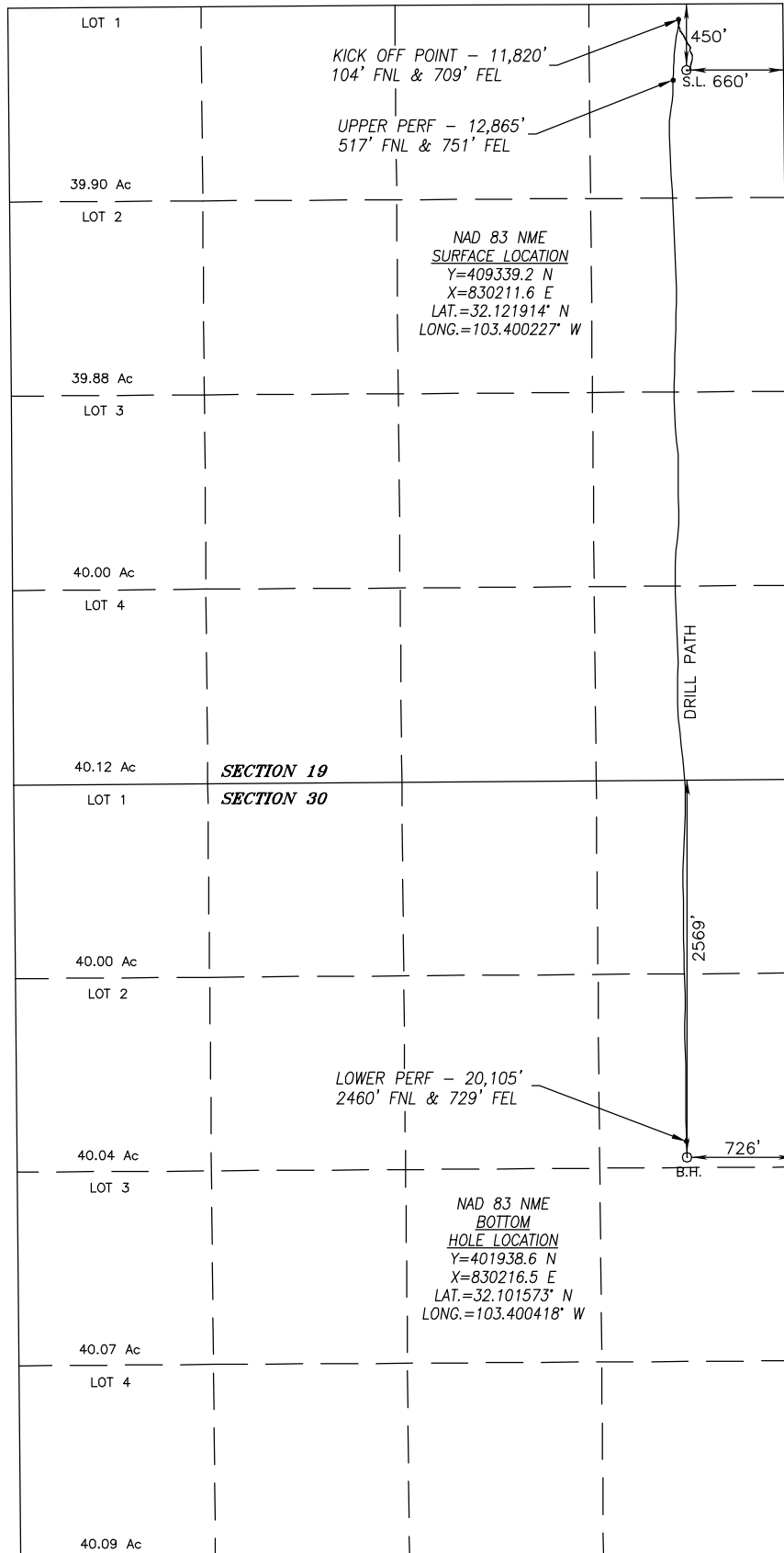
SEE PAGE 2

PAGE 1 OF 2

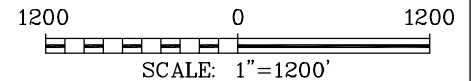
W.O. #20-1338

DRAWN BY: WN

Property Code 326533	Property Name PITCHBLENDE FEDERAL 19-30	Well Number 208H
OGRID No. 229137	Operator Name COG OPERATING, LLC	Elevation 3331.0'



SURFACE INFO AND BOREPATH SHOWN HEREON IS BASED ON DIRECTIONAL SURVEY REPORT PROVIDED BY COG OPERATING, LLC FOR THE PITCHBLENDE FEDERAL 19-30 #208H SUPPLIED TO HARCROW SURVEYING, LLC ON OCTOBER 7, 2020



OPERATOR CERTIFICATION

I hereby certify that the information herein is true and complete to the best of my knowledge and belief, and that this organization either owns a working interest or unleased mineral interest in the land including the proposed bottom hole location or has a right to drill this well at this location pursuant to a contract with an owner of such mineral or working interest, or to a voluntary pooling agreement or a compulsory pooling order heretofore entered by the division.

Amanda Avery 1/16/20

Signature Date

Amanda Avery

Printed Name

aavery@concho.com

E-mail Address

SURVEYOR CERTIFICATION

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.

DEC. 5, 2019/FEB. 27, 2020

Date of Survey/Date of Geographic Survey

Signature & Seal of Professional Surveyor



Chad Harcrow 10/8/20

Certificate No. CHAD HARCROW 17777

PAGE 2 OF 2

W.O. #20-1338

DRAWN BY: WN



COG Operating LLC

**Lea County, NM (NAD27 NME)
Pitchblende Federal Com 19-30
208H**

OH / 66080

Design: Surveys (McVay 8)

Standard Survey Report

27 February, 2020





Survey Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well 208H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	RKB @ 3357.00usft (McVay 8)
Site:	Pitchblende Federal Com 19-30	MD Reference:	RKB @ 3357.00usft (McVay 8)
Well:	208H	North Reference:	Grid
Wellbore:	OH / 66080	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (McVay 8)	Database:	USA Compass

Project	Lea 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	Pitchblende Federal Com 19-30		
Site Position:		Northing:	409,281.10 usft
From:	Map	Easting:	789,024.90 usft
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "
		Latitude:	32° 7' 18.437355 N
		Longitude:	103° 23' 59.139439 W
		Grid Convergence:	0.50 °

Well	208H		
Well Position	+N/-S	0.00 usft	Northing: 409,281.10 usft
	+E/-W	0.00 usft	Easting: 789,024.90 usft
Position Uncertainty	1.00 usft	Wellhead Elevation:	usft
		Latitude:	32° 7' 18.437355 N
		Longitude:	103° 23' 59.139439 W
		Ground Level:	3,331.00 usft

Wellbore	OH / 66080		
Magnetics	Model Name	Sample Date	Declination (°)
	MVHD	2/5/2020	6.52
			Dip Angle (°) 59.73
			Field Strength (nT) 47,678.77587638

Design	Surveys (McVay 8)		
Audit Notes:			
Version:	1.0	Phase:	ACTUAL
		Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)
	0.00	0.00	0.00
			Direction (°) 180.15

Survey Program	Date 2/27/2020		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name
100.00	11,883.81	SDI - Gyros (OH / 66080)	Scientific Keeper
11,883.81	20,214.00	Gordon MWD Surveys (OH / 66080)	MWD+IFR1+FDIR
			Description
			Scientific Drilling Intl. Standard Wireline Keeper
			OWSG MWD + IFR1 + FDIR Correction

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	0.63	132.24	100.00	-0.37	0.41	0.37	0.63	0.63	0.00	
125.00	0.57	128.66	125.00	-0.54	0.61	0.54	0.28	-0.24	-14.32	
150.00	0.61	135.89	150.00	-0.71	0.80	0.71	0.34	0.16	28.92	
175.00	0.55	131.42	174.99	-0.89	0.98	0.89	0.30	-0.24	-17.88	
200.00	0.64	150.50	199.99	-1.09	1.14	1.09	0.87	0.36	76.32	
225.00	0.48	135.52	224.99	-1.28	1.28	1.28	0.86	-0.64	-59.92	
250.00	0.61	161.01	249.99	-1.49	1.40	1.48	1.09	0.52	101.96	
275.00	0.45	150.57	274.99	-1.70	1.49	1.69	0.74	-0.64	-41.76	
300.00	0.34	131.56	299.99	-1.83	1.59	1.83	0.68	-0.44	-76.04	



Survey Report



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Site:	Pitchblende Federal Com 19-30	MD Reference:	RKB @ 3357.00usft (McVay 8)
Well:	208H	North Reference:	Grid
Wellbore:	OH / 66080	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (McVay 8)	Database:	USA Compass

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)
325.00	0.27	110.01	324.99	-1.90	1.70	1.90	0.53	-0.28	-86.20
350.00	0.33	96.57	349.99	-1.93	1.83	1.92	0.37	0.24	-53.76
375.00	0.35	88.01	374.99	-1.93	1.98	1.93	0.22	0.08	-34.24
400.00	0.43	95.18	399.99	-1.94	2.15	1.94	0.37	0.32	28.68
425.00	0.37	98.00	424.99	-1.96	2.32	1.95	0.25	-0.24	11.28
450.00	0.29	103.12	449.99	-1.99	2.46	1.98	0.34	-0.32	20.48
475.00	0.22	68.46	474.99	-1.98	2.57	1.98	0.66	-0.28	-138.64
500.00	0.20	99.96	499.99	-1.97	2.66	1.97	0.46	-0.08	126.00
525.00	0.21	71.97	524.99	-1.97	2.74	1.96	0.40	0.04	-111.96
550.00	0.13	66.94	549.99	-1.94	2.81	1.93	0.33	-0.32	-20.12
575.00	0.25	21.80	574.99	-1.88	2.86	1.87	0.73	0.48	-180.56
600.00	0.31	21.20	599.98	-1.77	2.90	1.76	0.24	0.24	-2.40
625.00	0.42	18.02	624.98	-1.62	2.96	1.61	0.45	0.44	-12.72
650.00	0.42	23.47	649.98	-1.44	3.02	1.44	0.16	0.00	21.80
675.00	0.42	37.07	674.98	-1.29	3.11	1.28	0.40	0.00	54.40
700.00	0.34	50.56	699.98	-1.17	3.22	1.16	0.48	-0.32	53.96
725.00	0.28	57.54	724.98	-1.09	3.33	1.08	0.28	-0.24	27.92
750.00	0.22	49.52	749.98	-1.02	3.42	1.01	0.28	-0.24	-32.08
775.00	0.25	29.75	774.98	-0.94	3.48	0.94	0.34	0.12	-79.08
800.00	0.33	21.76	799.98	-0.83	3.54	0.82	0.36	0.32	-31.96
825.00	0.41	44.89	824.98	-0.70	3.63	0.69	0.67	0.32	92.52
850.00	0.45	62.86	849.98	-0.59	3.78	0.58	0.56	0.16	71.88
875.00	0.54	63.47	874.98	-0.49	3.97	0.48	0.36	0.36	2.44
900.00	0.54	82.85	899.98	-0.43	4.19	0.42	0.73	0.00	77.52
925.00	0.55	87.65	924.98	-0.41	4.43	0.40	0.19	0.04	19.20
950.00	0.56	89.71	949.98	-0.40	4.67	0.39	0.09	0.04	8.24
975.00	0.56	101.25	974.97	-0.43	4.91	0.41	0.45	0.00	46.16
1,000.00	0.47	111.76	999.97	-0.49	5.13	0.47	0.52	-0.36	42.04
1,025.00	0.39	101.98	1,024.97	-0.54	5.31	0.53	0.43	-0.32	-39.12
1,050.00	0.41	95.59	1,049.97	-0.57	5.48	0.55	0.20	0.08	-25.56
1,075.00	0.42	81.56	1,074.97	-0.56	5.66	0.55	0.41	0.04	-56.12
1,100.00	0.54	94.26	1,099.97	-0.56	5.87	0.54	0.64	0.48	50.80
1,125.00	0.56	94.41	1,124.97	-0.58	6.11	0.56	0.08	0.08	0.60
1,150.00	0.68	112.21	1,149.97	-0.64	6.37	0.63	0.90	0.48	71.20
1,175.00	0.66	99.61	1,174.97	-0.72	6.65	0.71	0.59	-0.08	-50.40
1,200.00	0.71	125.18	1,199.96	-0.84	6.91	0.82	1.23	0.20	102.28
1,225.00	0.59	109.99	1,224.96	-0.97	7.16	0.95	0.84	-0.48	-60.76
1,250.00	0.53	99.16	1,249.96	-1.03	7.40	1.01	0.49	-0.24	-43.32
1,275.00	0.63	101.10	1,274.96	-1.08	7.65	1.06	0.41	0.40	7.76
1,300.00	0.72	106.60	1,299.96	-1.15	7.93	1.13	0.44	0.36	22.00
1,325.00	0.68	114.26	1,324.96	-1.25	8.22	1.23	0.41	-0.16	30.64
1,350.00	0.57	107.17	1,349.96	-1.35	8.47	1.33	0.54	-0.44	-28.36
1,375.00	0.52	99.55	1,374.95	-1.41	8.70	1.38	0.35	-0.20	-30.48



Survey Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well 208H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	RKB @ 3357.00usft (McVay 8)
Site:	Pitchblende Federal Com 19-30	MD Reference:	RKB @ 3357.00usft (McVay 8)
Well:	208H	North Reference:	Grid
Wellbore:	OH / 66080	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (McVay 8)	Database:	USA Compass

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)
1,400.00	0.63	98.12	1,399.95	-1.45	8.95	1.42	0.44	0.44	-5.72
1,425.00	0.74	100.93	1,424.95	-1.50	9.24	1.47	0.46	0.44	11.24
1,450.00	0.68	118.99	1,449.95	-1.60	9.53	1.57	0.92	-0.24	72.24
1,475.00	0.56	100.01	1,474.95	-1.69	9.78	1.67	0.94	-0.48	-75.92
1,500.00	0.58	87.31	1,499.95	-1.71	10.03	1.68	0.51	0.08	-50.80
1,525.00	0.71	111.84	1,524.95	-1.76	10.30	1.73	1.21	0.52	98.12
1,550.00	0.76	100.75	1,549.94	-1.85	10.61	1.82	0.60	0.20	-44.36
1,575.00	0.66	114.81	1,574.94	-1.94	10.90	1.91	0.80	-0.40	56.24
1,600.00	0.51	114.74	1,599.94	-2.05	11.13	2.02	0.60	-0.60	-0.28
1,625.00	0.58	87.52	1,624.94	-2.09	11.36	2.06	1.06	0.28	-108.88
1,650.00	0.46	96.19	1,649.94	-2.09	11.59	2.06	0.57	-0.48	34.68
1,675.00	0.49	126.67	1,674.94	-2.17	11.77	2.14	1.01	0.12	121.92
1,700.00	0.64	100.35	1,699.94	-2.26	11.99	2.22	1.18	0.60	-105.28
1,725.00	0.61	106.66	1,724.93	-2.32	12.26	2.29	0.30	-0.12	25.24
1,750.00	0.63	123.39	1,749.93	-2.43	12.50	2.40	0.73	0.08	66.92
1,775.00	0.49	117.31	1,774.93	-2.56	12.71	2.52	0.61	-0.56	-24.32
1,800.00	0.54	91.18	1,799.93	-2.61	12.92	2.57	0.95	0.20	-104.52
1,825.00	0.71	103.68	1,824.93	-2.65	13.19	2.61	0.87	0.68	50.00
1,850.00	0.64	121.56	1,849.93	-2.76	13.46	2.72	0.88	-0.28	71.52
1,875.00	0.56	124.51	1,874.93	-2.90	13.68	2.86	0.34	-0.32	11.80
1,900.00	0.46	95.41	1,899.93	-2.98	13.88	2.94	1.10	-0.40	-116.40
1,925.00	0.61	92.65	1,924.92	-2.99	14.11	2.96	0.61	0.60	-11.04
1,950.00	0.62	110.05	1,949.92	-3.05	14.37	3.01	0.75	0.04	69.60
1,975.00	0.47	113.53	1,974.92	-3.13	14.60	3.10	0.61	-0.60	13.92
2,000.00	0.53	89.85	1,999.92	-3.17	14.81	3.14	0.85	0.24	-94.72
2,025.00	0.66	100.47	2,024.92	-3.20	15.06	3.16	0.68	0.52	42.48
2,050.00	0.65	118.54	2,049.92	-3.29	15.33	3.25	0.82	-0.04	72.28
2,075.00	0.57	120.80	2,074.92	-3.43	15.56	3.38	0.33	-0.32	9.04
2,100.00	0.50	115.27	2,099.92	-3.54	15.77	3.49	0.35	-0.28	-22.12
2,125.00	0.52	112.74	2,124.91	-3.63	15.97	3.58	0.12	0.08	-10.12
2,150.00	0.54	88.21	2,149.91	-3.67	16.19	3.62	0.90	0.08	-98.12
2,175.00	0.64	100.63	2,174.91	-3.69	16.45	3.65	0.65	0.40	49.68
2,200.00	0.67	104.60	2,199.91	-3.75	16.72	3.71	0.22	0.12	15.88
2,225.00	0.68	110.33	2,224.91	-3.84	17.01	3.79	0.27	0.04	22.92
2,250.00	0.66	113.15	2,249.91	-3.95	17.28	3.90	0.15	-0.08	11.28
2,275.00	0.62	120.48	2,274.91	-4.07	17.53	4.03	0.36	-0.16	29.32
2,300.00	0.64	107.28	2,299.90	-4.18	17.78	4.14	0.58	0.08	-52.80
2,325.00	0.61	101.98	2,324.90	-4.25	18.04	4.20	0.26	-0.12	-21.20
2,350.00	0.52	98.52	2,349.90	-4.30	18.28	4.25	0.38	-0.36	-13.84
2,375.00	0.57	88.88	2,374.90	-4.31	18.52	4.26	0.42	0.20	-38.56
2,400.00	0.78	79.28	2,399.90	-4.28	18.81	4.23	0.95	0.84	-38.40
2,425.00	0.78	90.09	2,424.90	-4.25	19.15	4.19	0.59	0.00	43.24
2,450.00	0.73	64.71	2,449.89	-4.18	19.46	4.13	1.34	-0.20	-101.52



Survey Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well 208H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	RKB @ 3357.00usft (McVay 8)
Site:	Pitchblende Federal Com 19-30	MD Reference:	RKB @ 3357.00usft (McVay 8)
Well:	208H	North Reference:	Grid
Wellbore:	OH / 66080	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (McVay 8)	Database:	USA Compass

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)
2,475.00	1.76	21.74	2,474.89	-3.75	19.75	3.70	5.29	4.12	-171.88
2,500.00	2.27	15.37	2,499.87	-2.92	20.02	2.87	2.22	2.04	-25.48
2,525.00	2.26	13.92	2,524.85	-1.96	20.27	1.91	0.23	-0.04	-5.80
2,550.00	2.43	15.10	2,549.83	-0.97	20.53	0.92	0.71	0.68	4.72
2,575.00	2.46	17.89	2,574.81	0.05	20.83	-0.10	0.49	0.12	11.16
2,600.00	2.42	17.76	2,599.79	1.06	21.16	-1.12	0.16	-0.16	-0.52
2,625.00	2.54	18.01	2,624.76	2.09	21.49	-2.15	0.48	0.48	1.00
2,650.00	2.61	21.59	2,649.74	3.15	21.87	-3.21	0.70	0.28	14.32
2,675.00	2.59	24.64	2,674.71	4.19	22.31	-4.25	0.56	-0.08	12.20
2,700.00	2.63	25.15	2,699.69	5.22	22.79	-5.28	0.19	0.16	2.04
2,725.00	2.75	24.50	2,724.66	6.29	23.29	-6.35	0.50	0.48	-2.60
2,750.00	2.84	28.70	2,749.63	7.38	23.83	-7.44	0.89	0.36	16.80
2,775.00	2.66	25.71	2,774.60	8.44	24.38	-8.51	0.92	-0.72	-11.96
2,800.00	2.77	23.94	2,799.57	9.52	24.88	-9.58	0.55	0.44	-7.08
2,825.00	2.86	24.55	2,824.54	10.64	25.38	-10.70	0.38	0.36	2.44
2,850.00	2.90	26.13	2,849.51	11.77	25.92	-11.84	0.36	0.16	6.32
2,875.00	2.75	28.74	2,874.48	12.87	26.49	-12.94	0.79	-0.60	10.44
2,900.00	2.82	24.49	2,899.45	13.95	27.03	-14.02	0.87	0.28	-17.00
2,925.00	2.92	21.45	2,924.42	15.10	27.52	-15.18	0.73	0.40	-12.16
2,950.00	3.06	14.14	2,949.39	16.34	27.91	-16.42	1.62	0.56	-29.24
2,975.00	3.38	3.53	2,974.35	17.73	28.12	-17.80	2.70	1.28	-42.44
3,000.00	3.40	359.20	2,999.30	19.20	28.16	-19.28	1.03	0.08	-17.32
3,025.00	3.39	2.04	3,024.26	20.68	28.17	-20.76	0.67	-0.04	11.36
3,050.00	3.36	359.48	3,049.22	22.15	28.19	-22.23	0.61	-0.12	-10.24
3,075.00	3.41	358.55	3,074.17	23.63	28.17	-23.70	0.30	0.20	-3.72
3,100.00	3.40	358.66	3,099.13	25.11	28.13	-25.19	0.05	-0.04	0.44
3,125.00	3.61	3.80	3,124.08	26.64	28.17	-26.72	1.51	0.84	20.56
3,150.00	3.45	7.11	3,149.03	28.17	28.31	-28.25	1.04	-0.64	13.24
3,175.00	3.66	7.98	3,173.99	29.71	28.51	-29.78	0.87	0.84	3.48
3,200.00	3.65	9.53	3,198.93	31.28	28.76	-31.36	0.40	-0.04	6.20
3,225.00	3.81	12.22	3,223.88	32.88	29.06	-32.96	0.95	0.64	10.76
3,250.00	3.84	12.21	3,248.83	34.51	29.42	-34.59	0.12	0.12	-0.04
3,275.00	3.90	11.55	3,273.77	36.16	29.77	-36.24	0.30	0.24	-2.64
3,300.00	3.73	12.83	3,298.71	37.79	30.12	-37.87	0.76	-0.68	5.12
3,325.00	3.96	10.97	3,323.66	39.43	30.46	-39.51	1.05	0.92	-7.44
3,350.00	4.07	11.47	3,348.60	41.15	30.80	-41.23	0.46	0.44	2.00
3,375.00	4.13	13.37	3,373.53	42.89	31.19	-42.97	0.59	0.24	7.60
3,400.00	4.36	16.84	3,398.46	44.68	31.67	-44.76	1.38	0.92	13.88
3,425.00	4.34	18.73	3,423.39	46.48	32.25	-46.57	0.58	-0.08	7.56
3,450.00	4.57	18.35	3,448.32	48.32	32.87	-48.41	0.93	0.92	-1.52
3,475.00	4.68	18.92	3,473.23	50.23	33.51	-50.32	0.48	0.44	2.28
3,500.00	4.78	19.70	3,498.15	52.18	34.19	-52.27	0.48	0.40	3.12
3,525.00	4.90	20.33	3,523.06	54.16	34.91	-54.25	0.52	0.48	2.52
3,550.00	4.97	20.42	3,547.97	56.18	35.66	-56.27	0.28	0.28	0.36



Survey Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well 208H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	RKB @ 3357.00usft (McVay 8)
Site:	Pitchblende Federal Com 19-30	MD Reference:	RKB @ 3357.00usft (McVay 8)
Well:	208H	North Reference:	Grid
Wellbore:	OH / 66080	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (McVay 8)	Database:	USA Compass

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)
3,575.00	4.96	19.72	3,572.87	58.21	36.41	-58.30	0.25	-0.04	-2.80
3,600.00	5.08	20.11	3,597.78	60.27	37.15	-60.36	0.50	0.48	1.56
3,625.00	4.84	12.86	3,622.68	62.33	37.77	-62.43	2.68	-0.96	-29.00
3,650.00	4.81	5.60	3,647.60	64.40	38.10	-64.50	2.44	-0.12	-29.04
3,675.00	4.92	4.78	3,672.51	66.52	38.29	-66.62	0.52	0.44	-3.28
3,700.00	4.99	6.27	3,697.41	68.67	38.50	-68.77	0.59	0.28	5.96
3,725.00	4.80	6.72	3,722.32	70.78	38.74	-70.89	0.78	-0.76	1.80
3,750.00	4.71	5.53	3,747.24	72.84	38.96	-72.95	0.53	-0.36	-4.76
3,775.00	4.84	6.30	3,772.15	74.91	39.18	-75.02	0.58	0.52	3.08
3,800.00	4.77	7.95	3,797.06	76.99	39.44	-77.10	0.62	-0.28	6.60
3,825.00	4.40	8.61	3,821.98	78.97	39.73	-79.07	1.49	-1.48	2.64
3,850.00	4.48	7.55	3,846.91	80.89	40.00	-80.99	0.46	0.32	-4.24
3,875.00	4.47	8.50	3,871.83	82.82	40.27	-82.92	0.30	-0.04	3.80
3,900.00	4.19	8.97	3,896.76	84.68	40.56	-84.79	1.13	-1.12	1.88
3,925.00	4.05	8.58	3,921.69	86.46	40.83	-86.57	0.57	-0.56	-1.56
3,950.00	4.09	6.95	3,946.63	88.22	41.07	-88.32	0.49	0.16	-6.52
3,975.00	4.15	7.68	3,971.57	90.00	41.30	-90.11	0.32	0.24	2.92
4,000.00	3.89	8.18	3,996.50	91.73	41.54	-91.84	1.05	-1.04	2.00
4,025.00	3.98	5.64	4,021.45	93.44	41.75	-93.55	0.78	0.36	-10.16
4,050.00	3.98	3.86	4,046.38	95.17	41.89	-95.28	0.49	0.00	-7.12
4,075.00	3.83	351.61	4,071.33	96.86	41.83	-96.97	3.38	-0.60	-49.00
4,100.00	4.42	337.37	4,096.26	98.57	41.33	-98.68	4.71	2.36	-56.96
4,125.00	4.59	335.03	4,121.19	100.37	40.54	-100.47	1.00	0.68	-9.36
4,150.00	4.32	332.07	4,146.11	102.11	39.68	-102.21	1.42	-1.08	-11.84
4,175.00	4.47	332.80	4,171.04	103.81	38.79	-103.91	0.64	0.60	2.92
4,200.00	4.60	333.83	4,195.96	105.57	37.90	-105.67	0.61	0.52	4.12
4,225.00	4.41	336.24	4,220.88	107.35	37.08	-107.45	1.07	-0.76	9.64
4,250.00	4.22	334.31	4,245.81	109.06	36.29	-109.15	0.96	-0.76	-7.72
4,275.00	4.21	333.18	4,270.74	110.71	35.48	-110.80	0.33	-0.04	-4.52
4,300.00	4.31	334.08	4,295.67	112.37	34.65	-112.46	0.48	0.40	3.60
4,325.00	4.27	333.20	4,320.60	114.05	33.82	-114.14	0.31	-0.16	-3.52
4,350.00	4.27	334.93	4,345.53	115.72	33.01	-115.81	0.52	0.00	6.92
4,375.00	4.18	335.03	4,370.47	117.39	32.23	-117.47	0.36	-0.36	0.40
4,400.00	4.17	333.50	4,395.40	119.03	31.44	-119.11	0.45	-0.04	-6.12
4,425.00	4.03	330.19	4,420.34	120.61	30.60	-120.68	1.10	-0.56	-13.24
4,450.00	4.00	327.64	4,445.27	122.10	29.69	-122.18	0.72	-0.12	-10.20
4,475.00	3.92	325.85	4,470.22	123.55	28.75	-123.62	0.59	-0.32	-7.16
4,500.00	3.84	327.40	4,495.16	124.96	27.82	-125.03	0.53	-0.32	6.20
4,525.00	3.68	329.99	4,520.10	126.36	26.96	-126.43	0.93	-0.64	10.36
4,550.00	3.26	330.94	4,545.06	127.68	26.22	-127.74	1.70	-1.68	3.80
4,575.00	3.05	335.42	4,570.02	128.90	25.59	-128.97	1.29	-0.84	17.92
4,600.00	2.92	338.28	4,594.99	130.10	25.08	-130.16	0.79	-0.52	11.44
4,625.00	2.73	347.28	4,619.96	131.27	24.72	-131.34	1.93	-0.76	36.00



Survey Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well 208H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	RKB @ 3357.00usft (McVay 8)
Site:	Pitchblende Federal Com 19-30	MD Reference:	RKB @ 3357.00usft (McVay 8)
Well:	208H	North Reference:	Grid
Wellbore:	OH / 66080	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (McVay 8)	Database:	USA Compass

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	2.54	354.27	4,644.93	132.40	24.53	-132.47	1.49	-0.76	27.96
4,675.00	2.41	357.78	4,669.91	133.48	24.45	-133.54	0.80	-0.52	14.04
4,700.00	2.46	3.61	4,694.88	134.54	24.47	-134.60	1.01	0.20	23.32
4,725.00	2.39	11.72	4,719.86	135.59	24.61	-135.65	1.40	-0.28	32.44
4,750.00	2.08	19.76	4,744.84	136.52	24.87	-136.59	1.76	-1.24	32.16
4,775.00	2.19	15.93	4,769.83	137.41	25.15	-137.48	0.72	0.44	-15.32
4,800.00	2.31	20.18	4,794.81	138.34	25.46	-138.41	0.82	0.48	17.00
4,825.00	2.19	13.78	4,819.79	139.28	25.74	-139.35	1.11	-0.48	-25.60
4,850.00	2.47	353.27	4,844.77	140.28	25.79	-140.34	3.50	1.12	-82.04
4,875.00	2.66	345.31	4,869.74	141.37	25.58	-141.44	1.61	0.76	-31.84
4,900.00	2.51	343.50	4,894.72	142.46	25.28	-142.53	0.68	-0.60	-7.24
4,925.00	2.59	347.02	4,919.69	143.54	25.00	-143.60	0.70	0.32	14.08
4,950.00	2.41	351.95	4,944.67	144.61	24.80	-144.67	1.12	-0.72	19.72
4,975.00	2.20	2.31	4,969.65	145.61	24.74	-145.67	1.86	-0.84	41.44
5,000.00	2.24	17.39	4,994.63	146.55	24.91	-146.62	2.34	0.16	60.32
5,025.00	2.10	22.91	5,019.61	147.44	25.23	-147.51	1.01	-0.56	22.08
5,050.00	2.13	27.37	5,044.59	148.27	25.63	-148.34	0.67	0.12	17.84
5,075.00	2.10	35.88	5,069.58	149.06	26.11	-149.13	1.26	-0.12	34.04
5,100.00	2.27	44.11	5,094.56	149.78	26.72	-149.85	1.43	0.68	32.92
5,125.00	2.17	49.42	5,119.54	150.45	27.42	-150.52	0.91	-0.40	21.24
5,150.00	2.06	51.09	5,144.52	151.04	28.13	-151.11	0.50	-0.44	6.68
5,175.00	2.09	48.52	5,169.51	151.62	28.82	-151.70	0.39	0.12	-10.28
5,200.00	1.81	40.15	5,194.49	152.23	29.42	-152.30	1.59	-1.12	-33.48
5,225.00	1.64	354.72	5,219.48	152.88	29.64	-152.96	5.36	-0.68	-181.72
5,250.00	2.35	330.35	5,244.47	153.69	29.36	-153.76	4.36	2.84	-97.48
5,275.00	2.06	329.98	5,269.45	154.52	28.88	-154.60	1.16	-1.16	-1.48
5,300.00	2.08	326.27	5,294.43	155.29	28.40	-155.36	0.54	0.08	-14.84
5,325.00	2.10	324.70	5,319.42	156.04	27.88	-156.11	0.24	0.08	-6.28
5,350.00	1.85	324.14	5,344.40	156.74	27.38	-156.81	1.00	-1.00	-2.24
5,375.00	1.89	320.57	5,369.39	157.38	26.88	-157.45	0.49	0.16	-14.28
5,400.00	1.80	319.22	5,394.37	158.00	26.37	-158.07	0.40	-0.36	-5.40
5,425.00	1.86	320.00	5,419.36	158.61	25.85	-158.68	0.26	0.24	3.12
5,450.00	1.96	322.45	5,444.35	159.26	25.33	-159.32	0.52	0.40	9.80
5,475.00	1.70	321.21	5,469.34	159.89	24.84	-159.95	1.05	-1.04	-4.96
5,500.00	1.72	325.53	5,494.32	160.48	24.39	-160.55	0.52	0.08	17.28
5,525.00	1.74	320.90	5,519.31	161.09	23.94	-161.15	0.56	0.08	-18.52
5,550.00	1.87	324.03	5,544.30	161.71	23.46	-161.77	0.65	0.52	12.52
5,575.00	1.73	328.20	5,569.29	162.36	23.02	-162.42	0.77	-0.56	16.68
5,600.00	1.64	327.09	5,594.28	162.98	22.63	-163.04	0.38	-0.36	-4.44
5,625.00	1.70	330.20	5,619.27	163.61	22.25	-163.66	0.43	0.24	12.44
5,650.00	1.60	327.66	5,644.26	164.22	21.88	-164.28	0.50	-0.40	-10.16
5,675.00	1.54	322.12	5,669.25	164.78	21.49	-164.84	0.65	-0.24	-22.16
5,700.00	1.61	323.49	5,694.24	165.33	21.07	-165.39	0.32	0.28	5.48



Survey Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well 208H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	RKB @ 3357.00usft (McVay 8)
Site:	Pitchblende Federal Com 19-30	MD Reference:	RKB @ 3357.00usft (McVay 8)
Well:	208H	North Reference:	Grid
Wellbore:	OH / 66080	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (McVay 8)	Database:	USA Compass

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)
5,725.00	1.58	317.86	5,719.23	165.87	20.63	-165.92	0.64	-0.12	-22.52
5,750.00	1.65	322.62	5,744.22	166.41	20.18	-166.46	0.61	0.28	19.04
5,775.00	1.71	323.52	5,769.21	167.00	19.74	-167.05	0.26	0.24	3.60
5,800.00	1.60	315.65	5,794.20	167.55	19.27	-167.60	1.01	-0.44	-31.48
5,825.00	1.82	322.58	5,819.19	168.11	18.79	-168.16	1.21	0.88	27.72
5,850.00	1.85	327.94	5,844.17	168.77	18.33	-168.82	0.70	0.12	21.44
5,875.00	1.73	327.21	5,869.16	169.43	17.92	-169.47	0.49	-0.48	-2.92
5,900.00	1.63	320.53	5,894.15	170.02	17.48	-170.06	0.88	-0.40	-26.72
5,925.00	1.51	324.30	5,919.14	170.56	17.07	-170.60	0.63	-0.48	15.08
5,950.00	1.43	321.76	5,944.13	171.07	16.68	-171.12	0.41	-0.32	-10.16
5,975.00	1.62	323.07	5,969.12	171.60	16.28	-171.64	0.77	0.76	5.24
6,000.00	1.54	326.34	5,994.11	172.16	15.88	-172.20	0.48	-0.32	13.08
6,025.00	1.38	323.06	6,019.11	172.68	15.51	-172.72	0.72	-0.64	-13.12
6,050.00	1.44	320.13	6,044.10	173.16	15.13	-173.20	0.38	0.24	-11.72
6,075.00	1.41	313.68	6,069.09	173.62	14.70	-173.66	0.65	-0.12	-25.80
6,100.00	1.64	326.07	6,094.08	174.13	14.28	-174.16	1.60	0.92	49.56
6,125.00	1.36	322.85	6,119.07	174.66	13.90	-174.70	1.17	-1.12	-12.88
6,150.00	1.42	316.99	6,144.07	175.12	13.51	-175.16	0.62	0.24	-23.44
6,175.00	1.53	319.51	6,169.06	175.60	13.08	-175.64	0.51	0.44	10.08
6,200.00	1.52	325.47	6,194.05	176.13	12.68	-176.16	0.64	-0.04	23.84
6,225.00	1.35	320.64	6,219.04	176.63	12.31	-176.66	0.83	-0.68	-19.32
6,250.00	1.31	323.51	6,244.03	177.09	11.95	-177.12	0.31	-0.16	11.48
6,275.00	1.30	316.35	6,269.03	177.52	11.58	-177.55	0.65	-0.04	-28.64
6,300.00	1.22	327.79	6,294.02	177.95	11.25	-177.98	1.05	-0.32	45.76
6,325.00	1.08	314.77	6,319.02	178.35	10.94	-178.37	1.18	-0.56	-52.08
6,350.00	1.40	321.04	6,344.01	178.75	10.58	-178.78	1.39	1.28	25.08
6,375.00	1.09	326.38	6,369.00	179.18	10.25	-179.21	1.32	-1.24	21.36
6,400.00	1.13	319.15	6,394.00	179.57	9.96	-179.59	0.58	0.16	-28.92
6,425.00	1.00	326.77	6,419.00	179.94	9.68	-179.96	0.77	-0.52	30.48
6,450.00	1.07	316.38	6,443.99	180.29	9.40	-180.31	0.80	0.28	-41.56
6,475.00	1.12	329.32	6,468.99	180.67	9.11	-180.69	1.01	0.20	51.76
6,500.00	0.96	320.75	6,493.98	181.04	8.86	-181.06	0.89	-0.64	-34.28
6,525.00	1.10	318.03	6,518.98	181.38	8.56	-181.40	0.59	0.56	-10.88
6,550.00	1.13	327.88	6,543.97	181.77	8.27	-181.79	0.78	0.12	39.40
6,575.00	1.08	324.14	6,568.97	182.17	8.00	-182.19	0.35	-0.20	-14.96
6,600.00	1.10	322.58	6,593.96	182.55	7.72	-182.57	0.14	0.08	-6.24
6,625.00	1.01	333.02	6,618.96	182.94	7.47	-182.96	0.85	-0.36	41.76
6,650.00	0.93	329.70	6,643.96	183.31	7.27	-183.33	0.39	-0.32	-13.28
6,675.00	0.90	321.35	6,668.95	183.64	7.05	-183.65	0.55	-0.12	-33.40
6,700.00	0.99	320.56	6,693.95	183.96	6.79	-183.97	0.36	0.36	-3.16
6,725.00	1.03	325.74	6,718.95	184.31	6.52	-184.33	0.40	0.16	20.72
6,750.00	0.91	329.09	6,743.94	184.67	6.29	-184.68	0.53	-0.48	13.40
6,775.00	0.85	323.76	6,768.94	184.99	6.08	-185.00	0.41	-0.24	-21.32
6,800.00	0.90	325.38	6,793.94	185.30	5.86	-185.31	0.22	0.20	6.48



Survey Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well 208H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	RKB @ 3357.00usft (McVay 8)
Site:	Pitchblende Federal Com 19-30	MD Reference:	RKB @ 3357.00usft (McVay 8)
Well:	208H	North Reference:	Grid
Wellbore:	OH / 66080	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (McVay 8)	Database:	USA Compass

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)
6,825.00	1.00	326.73	6,818.93	185.64	5.63	-185.65	0.41	0.40	5.40
6,850.00	1.36	330.23	6,843.93	186.08	5.36	-186.09	1.47	1.44	14.00
6,875.00	1.66	334.68	6,868.92	186.67	5.06	-186.68	1.29	1.20	17.80
6,900.00	1.70	333.74	6,893.91	187.33	4.74	-187.34	0.19	0.16	-3.76
6,925.00	1.80	334.29	6,918.90	188.01	4.41	-188.02	0.41	0.40	2.20
6,950.00	1.74	338.83	6,943.89	188.72	4.10	-188.73	0.61	-0.24	18.16
6,975.00	1.82	339.86	6,968.87	189.45	3.83	-189.46	0.34	0.32	4.12
7,000.00	1.53	338.39	6,993.86	190.13	3.57	-190.14	1.17	-1.16	-5.88
7,025.00	1.63	336.91	7,018.85	190.77	3.30	-190.77	0.43	0.40	-5.92
7,050.00	1.60	336.11	7,043.84	191.41	3.02	-191.42	0.15	-0.12	-3.20
7,075.00	1.59	335.84	7,068.83	192.05	2.74	-192.05	0.05	-0.04	-1.08
7,100.00	1.61	331.59	7,093.82	192.67	2.43	-192.68	0.48	0.08	-17.00
7,125.00	1.60	326.86	7,118.81	193.27	2.07	-193.28	0.53	-0.04	-18.92
7,150.00	1.49	324.99	7,143.80	193.83	1.70	-193.84	0.48	-0.44	-7.48
7,175.00	1.53	326.33	7,168.80	194.38	1.32	-194.38	0.21	0.16	5.36
7,200.00	1.57	325.70	7,193.79	194.94	0.95	-194.94	0.17	0.16	-2.52
7,225.00	1.52	325.58	7,218.78	195.49	0.57	-195.50	0.20	-0.20	-0.48
7,250.00	1.59	324.12	7,243.77	196.05	0.17	-196.05	0.32	0.28	-5.84
7,275.00	1.78	324.30	7,268.76	196.65	-0.26	-196.64	0.76	0.76	0.72
7,300.00	2.23	332.78	7,293.74	197.39	-0.70	-197.39	2.15	1.80	33.92
7,325.00	2.82	338.53	7,318.72	198.40	-1.15	-198.39	2.57	2.36	23.00
7,350.00	2.96	336.97	7,343.69	199.56	-1.63	-199.56	0.64	0.56	-6.24
7,375.00	3.14	338.95	7,368.65	200.80	-2.13	-200.79	0.83	0.72	7.92
7,400.00	2.89	339.35	7,393.62	202.03	-2.60	-202.02	1.00	-1.00	1.60
7,425.00	2.99	336.05	7,418.58	203.21	-3.08	-203.20	0.79	0.40	-13.20
7,450.00	3.11	337.21	7,443.55	204.43	-3.61	-204.42	0.54	0.48	4.64
7,475.00	2.92	339.57	7,468.51	205.65	-4.10	-205.64	0.91	-0.76	9.44
7,500.00	2.86	337.59	7,493.48	206.83	-4.56	-206.82	0.47	-0.24	-7.92
7,525.00	2.98	337.48	7,518.45	208.00	-5.04	-207.99	0.48	0.48	-0.44
7,550.00	2.83	339.52	7,543.42	209.18	-5.51	-209.17	0.73	-0.60	8.16
7,575.00	2.73	337.25	7,568.39	210.31	-5.95	-210.29	0.59	-0.40	-9.08
7,600.00	2.73	336.30	7,593.36	211.40	-6.42	-211.39	0.18	0.00	-3.80
7,625.00	2.51	339.32	7,618.33	212.46	-6.86	-212.44	1.04	-0.88	12.08
7,650.00	2.33	335.25	7,643.31	213.44	-7.26	-213.42	1.00	-0.72	-16.28
7,675.00	2.43	333.26	7,668.29	214.37	-7.71	-214.35	0.52	0.40	-7.96
7,700.00	2.49	337.85	7,693.27	215.35	-8.16	-215.32	0.82	0.24	18.36
7,725.00	2.23	335.95	7,718.25	216.29	-8.56	-216.27	1.09	-1.04	-7.60
7,750.00	2.27	332.14	7,743.23	217.18	-8.99	-217.15	0.62	0.16	-15.24
7,775.00	2.41	332.62	7,768.21	218.08	-9.46	-218.05	0.57	0.56	1.92
7,800.00	2.30	336.44	7,793.18	219.01	-9.90	-218.98	0.77	-0.44	15.28
7,825.00	2.15	335.74	7,818.17	219.89	-10.30	-219.87	0.61	-0.60	-2.80
7,850.00	2.15	333.55	7,843.15	220.74	-10.70	-220.71	0.33	0.00	-8.76
7,875.00	2.07	331.78	7,868.13	221.56	-11.12	-221.53	0.41	-0.32	-7.08



Survey Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well 208H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	RKB @ 3357.00usft (McVay 8)
Site:	Pitchblende Federal Com 19-30	MD Reference:	RKB @ 3357.00usft (McVay 8)
Well:	208H	North Reference:	Grid
Wellbore:	OH / 66080	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (McVay 8)	Database:	USA Compass

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)
7,900.00	2.07	329.75	7,893.11	222.35	-11.56	-222.32	0.29	0.00	-8.12
7,925.00	2.17	329.42	7,918.10	223.14	-12.03	-223.11	0.40	0.40	-1.32
7,950.00	2.22	331.63	7,943.08	223.98	-12.50	-223.94	0.39	0.20	8.84
7,975.00	2.04	334.03	7,968.06	224.80	-12.93	-224.77	0.80	-0.72	9.60
8,000.00	1.90	328.48	7,993.05	225.56	-13.34	-225.52	0.95	-0.56	-22.20
8,025.00	1.93	327.94	8,018.03	226.27	-13.78	-226.23	0.14	0.12	-2.16
8,050.00	1.96	329.90	8,043.02	226.99	-14.22	-226.96	0.29	0.12	7.84
8,075.00	1.66	333.75	8,068.01	227.69	-14.59	-227.65	1.29	-1.20	15.40
8,100.00	1.63	331.82	8,093.00	228.33	-14.92	-228.29	0.25	-0.12	-7.72
8,125.00	1.91	330.36	8,117.98	229.00	-15.29	-228.96	1.13	1.12	-5.84
8,150.00	2.29	330.20	8,142.97	229.80	-15.75	-229.76	1.52	1.52	-0.64
8,175.00	2.51	330.71	8,167.94	230.71	-16.26	-230.67	0.88	0.88	2.04
8,200.00	2.45	329.81	8,192.92	231.65	-16.80	-231.60	0.29	-0.24	-3.60
8,225.00	2.46	328.11	8,217.90	232.57	-17.35	-232.52	0.29	0.04	-6.80
8,250.00	2.54	328.57	8,242.87	233.49	-17.92	-233.45	0.33	0.32	1.84
8,275.00	2.25	327.98	8,267.85	234.38	-18.47	-234.33	1.16	-1.16	-2.36
8,300.00	2.20	325.63	8,292.83	235.20	-19.00	-235.14	0.42	-0.20	-9.40
8,325.00	2.25	327.00	8,317.82	236.00	-19.54	-235.95	0.29	0.20	5.48
8,350.00	2.16	328.19	8,342.80	236.81	-20.06	-236.76	0.40	-0.36	4.76
8,375.00	2.15	327.32	8,367.78	237.61	-20.56	-237.56	0.14	-0.04	-3.48
8,400.00	2.20	324.58	8,392.76	238.40	-21.09	-238.34	0.46	0.20	-10.96
8,425.00	2.56	328.83	8,417.74	239.26	-21.66	-239.21	1.60	1.44	17.00
8,450.00	3.57	323.97	8,442.70	240.37	-22.40	-240.31	4.17	4.04	-19.44
8,475.00	3.80	324.65	8,467.65	241.68	-23.34	-241.61	0.94	0.92	2.72
8,500.00	3.95	325.47	8,492.59	243.06	-24.31	-243.00	0.64	0.60	3.28
8,525.00	3.61	326.26	8,517.54	244.43	-25.23	-244.36	1.38	-1.36	3.16
8,550.00	3.47	325.05	8,542.49	245.70	-26.10	-245.63	0.63	-0.56	-4.84
8,575.00	3.27	324.12	8,567.45	246.90	-26.96	-246.83	0.83	-0.80	-3.72
8,600.00	3.14	326.54	8,592.41	248.05	-27.75	-247.97	0.75	-0.52	9.68
8,625.00	2.92	324.81	8,617.38	249.14	-28.50	-249.06	0.95	-0.88	-6.92
8,650.00	2.96	323.42	8,642.34	250.18	-29.25	-250.10	0.33	0.16	-5.56
8,675.00	2.80	325.64	8,667.31	251.20	-29.98	-251.12	0.78	-0.64	8.88
8,700.00	2.50	326.60	8,692.28	252.16	-30.62	-252.08	1.21	-1.20	3.84
8,725.00	2.20	326.42	8,717.26	253.01	-31.19	-252.93	1.20	-1.20	-0.72
8,750.00	2.02	320.81	8,742.25	253.76	-31.73	-253.67	1.10	-0.72	-22.44
8,775.00	2.02	320.56	8,767.23	254.44	-32.29	-254.35	0.04	0.00	-1.00
8,800.00	2.08	322.37	8,792.21	255.14	-32.85	-255.05	0.35	0.24	7.24
8,825.00	2.01	321.55	8,817.20	255.84	-33.40	-255.75	0.30	-0.28	-3.28
8,850.00	2.07	321.51	8,842.18	256.54	-33.95	-256.45	0.24	0.24	-0.16
8,875.00	2.05	325.28	8,867.17	257.26	-34.48	-257.17	0.55	-0.08	15.08
8,900.00	2.46	321.95	8,892.15	258.05	-35.07	-257.95	1.72	1.64	-13.32
8,925.00	2.73	320.26	8,917.12	258.93	-35.78	-258.83	1.12	1.08	-6.76
8,950.00	2.71	319.19	8,942.09	259.83	-36.55	-259.74	0.22	-0.08	-4.28



Survey Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well 208H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	RKB @ 3357.00usft (McVay 8)
Site:	Pitchblende Federal Com 19-30	MD Reference:	RKB @ 3357.00usft (McVay 8)
Well:	208H	North Reference:	Grid
Wellbore:	OH / 66080	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (McVay 8)	Database:	USA Compass

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)
8,975.00	2.80	319.65	8,967.06	260.75	-37.33	-260.65	0.37	0.36	1.84
9,000.00	2.79	319.63	8,992.03	261.67	-38.12	-261.57	0.04	-0.04	-0.08
9,025.00	2.80	320.48	9,017.00	262.61	-38.90	-262.51	0.17	0.04	3.40
9,050.00	2.55	322.31	9,041.98	263.52	-39.63	-263.42	1.06	-1.00	7.32
9,075.00	2.49	323.67	9,066.95	264.40	-40.29	-264.29	0.34	-0.24	5.44
9,100.00	2.44	325.54	9,091.93	265.27	-40.91	-265.17	0.38	-0.20	7.48
9,125.00	2.27	326.97	9,116.91	266.13	-41.49	-266.02	0.72	-0.68	5.72
9,150.00	2.08	328.63	9,141.89	266.93	-41.99	-266.82	0.80	-0.76	6.64
9,175.00	2.04	326.48	9,166.87	267.69	-42.47	-267.58	0.35	-0.16	-8.60
9,200.00	1.98	325.88	9,191.86	268.42	-42.96	-268.30	0.25	-0.24	-2.40
9,225.00	1.91	331.38	9,216.85	269.14	-43.40	-269.03	0.80	-0.28	22.00
9,250.00	1.77	331.96	9,241.83	269.85	-43.78	-269.73	0.56	-0.56	2.32
9,275.00	1.66	331.09	9,266.82	270.50	-44.14	-270.39	0.45	-0.44	-3.48
9,300.00	1.57	334.54	9,291.81	271.13	-44.46	-271.01	0.53	-0.36	13.80
9,325.00	1.47	339.22	9,316.80	271.74	-44.72	-271.62	0.64	-0.40	18.72
9,350.00	1.28	342.65	9,341.80	272.31	-44.92	-272.19	0.83	-0.76	13.72
9,375.00	1.17	349.57	9,366.79	272.82	-45.05	-272.70	0.74	-0.44	27.68
9,400.00	0.95	359.51	9,391.79	273.28	-45.10	-273.16	1.14	-0.88	39.76
9,425.00	0.91	1.66	9,416.78	273.69	-45.10	-273.57	0.21	-0.16	8.60
9,450.00	0.86	10.22	9,441.78	274.07	-45.06	-273.95	0.56	-0.20	34.24
9,475.00	0.78	9.80	9,466.78	274.42	-44.99	-274.30	0.32	-0.32	-1.68
9,500.00	0.78	6.63	9,491.77	274.76	-44.95	-274.64	0.17	0.00	-12.68
9,525.00	0.77	8.05	9,516.77	275.09	-44.90	-274.98	0.09	-0.04	5.68
9,550.00	0.73	6.93	9,541.77	275.42	-44.86	-275.30	0.17	-0.16	-4.48
9,575.00	0.74	7.73	9,566.77	275.74	-44.82	-275.62	0.06	0.04	3.20
9,600.00	0.69	15.65	9,591.77	276.04	-44.76	-275.92	0.44	-0.20	31.68
9,625.00	0.67	14.70	9,616.76	276.33	-44.68	-276.21	0.09	-0.08	-3.80
9,650.00	0.64	19.25	9,641.76	276.60	-44.60	-276.48	0.24	-0.12	18.20
9,675.00	0.69	17.74	9,666.76	276.88	-44.50	-276.76	0.21	0.20	-6.04
9,700.00	0.72	16.23	9,691.76	277.17	-44.41	-277.05	0.14	0.12	-6.04
9,725.00	0.66	19.47	9,716.76	277.46	-44.32	-277.34	0.29	-0.24	12.96
9,750.00	0.77	10.28	9,741.75	277.76	-44.24	-277.64	0.63	0.44	-36.76
9,775.00	0.72	5.43	9,766.75	278.08	-44.20	-277.96	0.32	-0.20	-19.40
9,800.00	0.90	354.44	9,791.75	278.43	-44.20	-278.32	0.95	0.72	-43.96
9,825.00	0.86	351.05	9,816.75	278.81	-44.25	-278.70	0.26	-0.16	-13.56
9,850.00	0.91	343.12	9,841.74	279.19	-44.34	-279.07	0.53	0.20	-31.72
9,875.00	0.92	340.32	9,866.74	279.57	-44.46	-279.45	0.18	0.04	-11.20
9,900.00	0.94	338.87	9,891.74	279.95	-44.60	-279.83	0.12	0.08	-5.80
9,925.00	0.90	336.71	9,916.73	280.32	-44.76	-280.20	0.21	-0.16	-8.64
9,950.00	0.96	338.64	9,941.73	280.69	-44.91	-280.58	0.27	0.24	7.72
9,975.00	0.89	342.38	9,966.73	281.07	-45.05	-280.96	0.37	-0.28	14.96
10,000.00	0.85	350.60	9,991.73	281.44	-45.13	-281.32	0.52	-0.16	32.88
10,025.00	0.74	345.20	10,016.72	281.78	-45.21	-281.66	0.53	-0.44	-21.60
10,050.00	0.91	350.87	10,041.72	282.13	-45.28	-282.01	0.75	0.68	22.68



Survey Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well 208H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	RKB @ 3357.00usft (McVay 8)
Site:	Pitchblende Federal Com 19-30	MD Reference:	RKB @ 3357.00usft (McVay 8)
Well:	208H	North Reference:	Grid
Wellbore:	OH / 66080	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (McVay 8)	Database:	USA Compass

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)
10,075.00	0.84	354.00	10,066.72	282.51	-45.33	-282.39	0.34	-0.28	12.52
10,100.00	0.78	350.52	10,091.71	282.86	-45.38	-282.74	0.31	-0.24	-13.92
10,125.00	0.79	346.92	10,116.71	283.20	-45.44	-283.08	0.20	0.04	-14.40
10,150.00	0.92	349.14	10,141.71	283.56	-45.52	-283.44	0.54	0.52	8.88
10,175.00	1.02	347.18	10,166.71	283.98	-45.61	-283.86	0.42	0.40	-7.84
10,200.00	1.20	345.94	10,191.70	284.45	-45.72	-284.33	0.73	0.72	-4.96
10,225.00	1.37	345.15	10,216.70	284.99	-45.86	-284.87	0.68	0.68	-3.16
10,250.00	1.46	342.68	10,241.69	285.58	-46.03	-285.46	0.43	0.36	-9.88
10,275.00	1.57	341.87	10,266.68	286.21	-46.23	-286.09	0.45	0.44	-3.24
10,300.00	1.71	342.20	10,291.67	286.89	-46.45	-286.77	0.56	0.56	1.32
10,325.00	1.81	336.02	10,316.66	287.61	-46.73	-287.49	0.86	0.40	-24.72
10,350.00	1.97	332.32	10,341.64	288.35	-47.09	-288.23	0.80	0.64	-14.80
10,375.00	2.12	328.83	10,366.63	289.13	-47.53	-289.00	0.78	0.60	-13.96
10,400.00	2.14	327.42	10,391.61	289.92	-48.02	-289.79	0.22	0.08	-5.64
10,425.00	2.18	325.77	10,416.59	290.70	-48.54	-290.57	0.30	0.16	-6.60
10,450.00	2.37	325.23	10,441.57	291.52	-49.10	-291.39	0.76	0.76	-2.16
10,475.00	2.13	326.36	10,466.55	292.33	-49.65	-292.20	0.98	-0.96	4.52
10,500.00	2.10	330.40	10,491.54	293.12	-50.14	-292.98	0.61	-0.12	16.16
10,525.00	1.95	331.41	10,516.52	293.89	-50.56	-293.75	0.62	-0.60	4.04
10,550.00	1.78	333.58	10,541.51	294.61	-50.94	-294.48	0.74	-0.68	8.68
10,575.00	1.76	339.97	10,566.50	295.32	-51.25	-295.18	0.79	-0.08	25.56
10,600.00	1.85	348.51	10,591.48	296.07	-51.46	-295.94	1.13	0.36	34.16
10,625.00	1.96	354.17	10,616.47	296.89	-51.58	-296.76	0.87	0.44	22.64
10,650.00	2.14	353.95	10,641.45	297.78	-51.67	-297.65	0.72	0.72	-0.88
10,675.00	1.89	353.11	10,666.44	298.66	-51.77	-298.52	1.01	-1.00	-3.36
10,700.00	2.09	356.45	10,691.42	299.52	-51.85	-299.39	0.92	0.80	13.36
10,725.00	2.09	358.09	10,716.41	300.43	-51.89	-300.30	0.24	0.00	6.56
10,750.00	2.09	354.80	10,741.39	301.34	-51.95	-301.21	0.48	0.00	-13.16
10,775.00	2.19	353.58	10,766.37	302.27	-52.04	-302.13	0.44	0.40	-4.88
10,800.00	2.24	354.30	10,791.35	303.23	-52.15	-303.09	0.23	0.20	2.88
10,825.00	2.17	357.30	10,816.33	304.19	-52.22	-304.05	0.54	-0.28	12.00
10,850.00	2.13	353.15	10,841.32	305.12	-52.30	-304.99	0.64	-0.16	-16.60
10,875.00	2.32	354.91	10,866.30	306.09	-52.40	-305.95	0.81	0.76	7.04
10,900.00	2.27	351.41	10,891.28	307.08	-52.51	-306.94	0.60	-0.20	-14.00
10,925.00	2.20	351.76	10,916.26	308.05	-52.66	-307.91	0.29	-0.28	1.40
10,950.00	2.32	351.80	10,941.24	309.02	-52.80	-308.88	0.48	0.48	0.16
10,975.00	2.40	350.82	10,966.22	310.04	-52.95	-309.90	0.36	0.32	-3.92
11,000.00	2.39	350.65	10,991.20	311.07	-53.12	-310.93	0.05	-0.04	-0.68
11,025.00	2.40	346.43	11,016.17	312.10	-53.33	-311.95	0.71	0.04	-16.88
11,050.00	2.45	345.86	11,041.15	313.12	-53.58	-312.98	0.22	0.20	-2.28
11,075.00	2.51	345.33	11,066.13	314.17	-53.85	-314.03	0.26	0.24	-2.12
11,100.00	2.45	345.40	11,091.11	315.22	-54.13	-315.07	0.24	-0.24	0.28
11,125.00	2.55	344.64	11,116.08	316.27	-54.41	-316.13	0.42	0.40	-3.04



Survey Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well 208H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	RKB @ 3357.00usft (McVay 8)
Site:	Pitchblende Federal Com 19-30	MD Reference:	RKB @ 3357.00usft (McVay 8)
Well:	208H	North Reference:	Grid
Wellbore:	OH / 66080	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (McVay 8)	Database:	USA Compass

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)
11,150.00	2.50	346.49	11,141.06	317.34	-54.68	-317.19	0.38	-0.20	7.40
11,175.00	2.58	342.99	11,166.03	318.40	-54.97	-318.26	0.70	0.32	-14.00
11,200.00	2.50	345.02	11,191.01	319.47	-55.28	-319.32	0.48	-0.32	8.12
11,225.00	2.59	348.55	11,215.98	320.55	-55.53	-320.40	0.72	0.36	14.12
11,250.00	2.51	349.69	11,240.96	321.64	-55.74	-321.50	0.38	-0.32	4.56
11,275.00	2.40	355.25	11,265.94	322.70	-55.88	-322.55	1.05	-0.44	22.24
11,300.00	2.50	357.65	11,290.91	323.77	-55.95	-323.62	0.57	0.40	9.60
11,325.00	2.54	354.83	11,315.89	324.87	-56.02	-324.72	0.52	0.16	-11.28
11,350.00	2.71	356.70	11,340.86	326.01	-56.11	-325.86	0.76	0.68	7.48
11,375.00	2.56	359.82	11,365.84	327.16	-56.14	-327.01	0.83	-0.60	12.48
11,400.00	2.28	3.13	11,390.81	328.21	-56.12	-328.06	1.25	-1.12	13.24
11,425.00	3.11	358.90	11,415.79	329.38	-56.10	-329.24	3.41	3.32	-16.92
11,450.00	2.94	359.80	11,440.75	330.70	-56.12	-330.56	0.71	-0.68	3.60
11,475.00	2.83	0.28	11,465.72	331.96	-56.12	-331.81	0.45	-0.44	1.92
11,500.00	2.84	2.07	11,490.69	333.20	-56.09	-333.05	0.36	0.04	7.16
11,525.00	2.62	5.62	11,515.66	334.39	-56.01	-334.24	1.11	-0.88	14.20
11,550.00	2.55	5.64	11,540.64	335.51	-55.90	-335.36	0.28	-0.28	0.08
11,575.00	2.50	8.29	11,565.61	336.60	-55.77	-336.45	0.51	-0.20	10.60
11,600.00	2.46	11.47	11,590.59	337.67	-55.58	-337.52	0.57	-0.16	12.72
11,625.00	2.50	12.36	11,615.56	338.72	-55.36	-338.58	0.22	0.16	3.56
11,650.00	2.51	15.43	11,640.54	339.79	-55.10	-339.64	0.54	0.04	12.28
11,675.00	2.43	15.04	11,665.52	340.82	-54.81	-340.68	0.33	-0.32	-1.56
11,700.00	2.30	17.50	11,690.50	341.81	-54.53	-341.67	0.66	-0.52	9.84
11,725.00	2.17	20.08	11,715.48	342.74	-54.21	-342.59	0.66	-0.52	10.32
11,750.00	2.01	21.77	11,740.46	343.59	-53.89	-343.45	0.69	-0.64	6.76
11,775.00	2.13	24.91	11,765.44	344.42	-53.53	-344.28	0.66	0.48	12.56
11,800.00	2.04	31.89	11,790.43	345.22	-53.10	-345.08	1.08	-0.36	27.92
11,825.00	1.99	39.34	11,815.41	345.93	-52.59	-345.79	1.07	-0.20	29.80
11,850.00	1.97	46.60	11,840.40	346.56	-52.00	-346.42	1.01	-0.08	29.04
11,875.00	1.89	47.23	11,865.38	347.14	-51.39	-347.00	0.33	-0.32	2.52
11,883.81	1.86	47.47	11,874.19	347.33	-51.17	-347.20	0.35	-0.34	2.72
Tie In									
11,969.00	1.72	70.40	11,959.34	348.70	-48.95	-348.57	0.85	-0.16	26.92
First Gordon MWD Survey									
12,106.00	1.15	89.54	12,096.30	349.40	-45.64	-349.28	0.54	-0.42	13.97
12,169.00	2.37	166.77	12,159.27	348.13	-44.71	-348.02	3.80	1.94	122.59
12,201.00	5.11	177.59	12,191.20	346.06	-44.50	-345.95	8.80	8.56	33.81
12,232.00	9.36	184.11	12,221.95	342.17	-44.62	-342.05	13.94	13.71	21.03
12,264.00	13.82	185.93	12,253.29	335.77	-45.20	-335.65	13.98	13.94	5.69
12,295.00	17.45	188.94	12,283.13	327.49	-46.31	-327.37	11.99	11.71	9.71
12,327.00	21.23	191.51	12,313.32	317.07	-48.21	-316.94	12.11	11.81	8.03
12,359.00	25.35	192.96	12,342.71	304.71	-50.90	-304.58	13.00	12.88	4.53
12,390.00	29.67	192.35	12,370.20	290.74	-54.03	-290.60	13.96	13.94	-1.97
12,438.00	35.40	192.73	12,410.65	265.56	-59.64	-265.40	11.95	11.94	0.79



Survey Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well 208H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	RKB @ 3357.00usft (McVay 8)
Site:	Pitchblende Federal Com 19-30	MD Reference:	RKB @ 3357.00usft (McVay 8)
Well:	208H	North Reference:	Grid
Wellbore:	OH / 66080	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (McVay 8)	Database:	USA Compass

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)
12,485.00	39.59	193.76	12,447.93	237.72	-66.21	-237.54	9.01	8.91	2.19
12,533.00	43.12	188.89	12,483.97	206.64	-72.38	-206.45	9.95	7.35	-10.15
12,580.00	48.73	184.99	12,516.65	173.14	-76.41	-172.94	13.34	11.94	-8.30
12,628.00	51.42	185.41	12,547.45	136.48	-79.75	-136.27	5.64	5.60	0.88
12,675.00	50.92	184.13	12,576.93	100.00	-82.79	-99.78	2.37	-1.06	-2.72
12,723.00	56.80	183.88	12,605.22	61.35	-85.50	-61.12	12.26	12.25	-0.52
12,769.00	63.73	182.98	12,628.02	21.50	-87.87	-21.27	15.16	15.07	-1.96
12,817.00	68.64	181.75	12,647.40	-22.36	-89.68	22.60	10.49	10.23	-2.56
12,864.00	72.89	180.72	12,662.88	-66.72	-90.63	66.96	9.28	9.04	-2.19
12,912.00	75.87	180.94	12,675.80	-112.94	-91.30	113.17	6.22	6.21	0.46
12,959.00	79.70	183.10	12,685.75	-158.83	-92.92	159.07	9.30	8.15	4.60
13,007.00	85.96	186.64	12,691.74	-206.25	-96.97	206.51	14.95	13.04	7.38
13,054.00	91.15	188.79	12,692.92	-252.79	-103.28	253.06	11.95	11.04	4.57
13,148.00	90.14	183.98	12,691.86	-346.18	-113.73	346.47	5.23	-1.07	-5.12
13,243.00	89.51	178.84	12,692.15	-441.11	-116.06	441.42	5.45	-0.66	-5.41
13,337.00	89.82	178.01	12,692.70	-535.08	-113.48	535.37	0.94	0.33	-0.88
13,431.00	88.20	176.93	12,694.33	-628.97	-109.33	629.25	2.07	-1.72	-1.15
13,526.00	87.09	175.99	12,698.23	-723.70	-103.47	723.97	1.53	-1.17	-0.99
13,621.00	89.24	176.94	12,701.27	-818.47	-97.62	818.72	2.47	2.26	1.00
13,716.00	89.04	177.85	12,702.70	-913.36	-93.30	913.60	0.98	-0.21	0.96
13,810.00	88.66	176.69	12,704.58	-1,007.23	-88.82	1,007.46	1.30	-0.40	-1.23
13,905.00	90.14	177.15	12,705.58	-1,102.08	-83.72	1,102.30	1.63	1.56	0.48
14,000.00	92.89	177.57	12,703.07	-1,196.94	-79.35	1,197.14	2.93	2.89	0.44
14,094.00	91.74	178.21	12,699.27	-1,290.80	-75.89	1,290.99	1.40	-1.22	0.68
14,189.00	87.46	175.64	12,699.93	-1,385.63	-70.80	1,385.81	5.25	-4.51	-2.71
14,284.00	91.92	180.75	12,700.45	-1,480.52	-67.81	1,480.70	7.14	4.69	5.38
14,379.00	88.98	180.17	12,699.70	-1,575.51	-68.57	1,575.68	3.15	-3.09	-0.61
14,474.00	88.88	182.18	12,701.48	-1,670.47	-70.52	1,670.65	2.12	-0.11	2.12
14,568.00	87.72	181.71	12,704.27	-1,764.37	-73.70	1,764.56	1.33	-1.23	-0.50
14,663.00	91.07	181.62	12,705.27	-1,859.31	-76.46	1,859.50	3.53	3.53	-0.09
14,758.00	91.82	181.47	12,702.87	-1,954.24	-79.03	1,954.44	0.81	0.79	-0.16
14,852.00	89.80	180.64	12,701.54	-2,048.21	-80.76	2,048.42	2.32	-2.15	-0.88
14,948.00	92.43	180.85	12,699.68	-2,144.18	-82.00	2,144.39	2.75	2.74	0.22
15,042.00	89.17	179.67	12,698.36	-2,238.15	-82.43	2,238.36	3.69	-3.47	-1.26
15,137.00	90.93	178.79	12,698.28	-2,333.14	-81.15	2,333.35	2.07	1.85	-0.93
15,233.00	90.25	176.58	12,697.29	-2,429.05	-77.28	2,429.24	2.41	-0.71	-2.30
15,327.00	88.49	171.81	12,698.33	-2,522.53	-67.77	2,522.70	5.41	-1.87	-5.07
15,422.00	90.70	174.94	12,699.00	-2,616.88	-56.81	2,617.02	4.03	2.33	3.29
15,516.00	89.61	181.70	12,698.74	-2,710.78	-54.06	2,710.91	7.28	-1.16	7.19
15,610.00	88.09	180.50	12,700.63	-2,804.74	-55.87	2,804.88	2.06	-1.62	-1.28
15,704.00	88.36	179.29	12,703.54	-2,898.69	-55.69	2,898.83	1.32	0.29	-1.29
15,798.00	86.34	177.90	12,707.89	-2,992.56	-53.39	2,992.69	2.61	-2.15	-1.48
15,893.00	87.15	181.43	12,713.28	-3,087.39	-52.84	3,087.52	3.81	0.85	3.72



Survey Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well 208H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	RKB @ 3357.00usft (McVay 8)
Site:	Pitchblende Federal Com 19-30	MD Reference:	RKB @ 3357.00usft (McVay 8)
Well:	208H	North Reference:	Grid
Wellbore:	OH / 66080	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (McVay 8)	Database:	USA Compass

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)	
15,988.00	87.81	187.78	12,717.46	-3,181.94	-60.46	3,182.09	6.71	0.69	6.68	
16,082.00	87.40	184.27	12,721.39	-3,275.32	-70.31	3,275.50	3.76	-0.44	-3.73	
16,176.00	88.36	181.98	12,724.87	-3,369.11	-75.43	3,369.30	2.64	1.02	-2.44	
16,271.00	90.11	180.54	12,726.14	-3,464.08	-77.52	3,464.27	2.39	1.84	-1.52	
16,367.00	93.05	177.73	12,723.49	-3,560.01	-76.07	3,560.19	4.24	3.06	-2.93	
16,461.00	94.59	177.26	12,717.23	-3,653.71	-71.97	3,653.88	1.71	1.64	-0.50	
16,556.00	95.20	177.12	12,709.12	-3,748.25	-67.33	3,748.41	0.66	0.64	-0.15	
16,651.00	92.34	177.02	12,702.88	-3,842.91	-62.49	3,843.06	3.01	-3.01	-0.11	
16,745.00	91.67	178.10	12,699.59	-3,936.76	-58.49	3,936.90	1.35	-0.71	1.15	
16,840.00	91.91	180.93	12,696.62	-4,031.70	-57.69	4,031.84	2.99	0.25	2.98	
16,935.00	92.71	180.25	12,692.79	-4,126.62	-58.66	4,126.76	1.10	0.84	-0.72	
17,029.00	93.66	181.28	12,687.57	-4,220.46	-59.92	4,220.60	1.49	1.01	1.10	
17,123.00	94.17	179.41	12,681.15	-4,314.24	-60.48	4,314.38	2.06	0.54	-1.99	
17,217.00	89.54	173.29	12,678.11	-4,407.93	-54.50	4,408.05	8.16	-4.93	-6.51	
17,312.00	90.05	174.62	12,678.45	-4,502.39	-44.49	4,502.50	1.50	0.54	1.40	
17,407.00	90.99	175.18	12,677.58	-4,597.01	-36.05	4,597.09	1.15	0.99	0.59	
17,501.00	88.44	171.68	12,678.05	-4,690.37	-25.30	4,690.42	4.61	-2.71	-3.72	
17,596.00	89.09	175.26	12,680.10	-4,784.72	-14.50	4,784.74	3.83	0.68	3.77	
17,691.00	91.04	177.74	12,679.99	-4,879.53	-8.70	4,879.54	3.32	2.05	2.61	
17,786.00	90.55	179.68	12,678.67	-4,974.49	-6.56	4,974.49	2.11	-0.52	2.04	
17,880.00	90.10	182.56	12,678.14	-5,068.46	-8.40	5,068.47	3.10	-0.48	3.06	
17,976.00	89.99	181.89	12,678.07	-5,164.39	-12.13	5,164.40	0.71	-0.11	-0.70	
18,070.00	89.34	180.90	12,678.61	-5,258.36	-14.41	5,258.38	1.26	-0.69	-1.05	
18,166.00	91.37	183.69	12,678.02	-5,354.26	-18.26	5,354.29	3.59	2.11	2.91	
18,261.00	90.92	181.03	12,676.12	-5,449.16	-22.17	5,449.20	2.84	-0.47	-2.80	
18,355.00	93.43	179.56	12,672.55	-5,543.08	-22.65	5,543.12	3.09	2.67	-1.56	
18,450.00	94.66	179.29	12,665.85	-5,637.83	-21.70	5,637.87	1.33	1.29	-0.28	
18,544.00	94.74	179.38	12,658.15	-5,731.51	-20.61	5,731.55	0.13	0.09	0.10	
18,639.00	92.56	179.17	12,652.10	-5,826.31	-19.42	5,826.34	2.31	-2.29	-0.22	
18,733.00	89.40	179.11	12,650.50	-5,920.27	-18.00	5,920.30	3.36	-3.36	-0.06	
18,827.00	89.15	178.90	12,651.69	-6,014.25	-16.37	6,014.27	0.35	-0.27	-0.22	
18,922.00	87.81	178.81	12,654.20	-6,109.19	-14.47	6,109.21	1.41	-1.41	-0.09	
19,017.00	87.52	178.45	12,658.08	-6,204.09	-12.21	6,204.10	0.49	-0.31	-0.38	
19,111.00	87.78	178.60	12,661.93	-6,297.98	-9.79	6,297.98	0.32	0.28	0.16	
19,206.00	90.73	180.91	12,663.17	-6,392.95	-9.38	6,392.95	3.94	3.11	2.43	
19,301.00	92.40	180.70	12,660.57	-6,487.90	-10.72	6,487.91	1.77	1.76	-0.22	
19,395.00	90.65	179.06	12,658.07	-6,581.86	-10.52	6,581.87	2.55	-1.86	-1.74	
19,490.00	89.67	177.96	12,657.80	-6,676.83	-8.05	6,676.82	1.55	-1.03	-1.16	
19,585.00	89.01	179.28	12,658.90	-6,771.79	-5.76	6,771.78	1.55	-0.69	1.39	
19,680.00	89.19	179.74	12,660.39	-6,866.77	-4.95	6,866.76	0.52	0.19	0.48	
19,774.00	88.95	179.29	12,661.92	-6,960.76	-4.15	6,960.75	0.54	-0.26	-0.48	
19,869.00	89.98	179.14	12,662.80	-7,055.74	-2.85	7,055.73	1.10	1.08	-0.16	
19,963.00	92.84	180.46	12,660.49	-7,149.70	-2.52	7,149.69	3.35	3.04	1.40	



Survey Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well 208H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	RKB @ 3357.00usft (McVay 8)
Site:	Pitchblende Federal Com 19-30	MD Reference:	RKB @ 3357.00usft (McVay 8)
Well:	208H	North Reference:	Grid
Wellbore:	OH / 66080	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (McVay 8)	Database:	USA Compass

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)	
20,058.00	91.94	178.14	12,656.53	-7,244.61	-1.36	7,244.58	2.62	-0.95	-2.44	
20,152.00	92.06	177.70	12,653.25	-7,338.49	2.05	7,338.46	0.48	0.13	-0.47	
Final Gordon MWD Survey										
20,185.06	92.06	177.70	12,652.06	-7,371.50	3.37	7,371.46	0.00	0.00	0.00	
LTP:20185' MD										
20,214.00	92.06	177.70	12,651.02	-7,400.40	4.53	7,400.36	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)		
11,883.81	11,874.19	347.33	-51.17	Tie In	
11,969.00	11,959.34	348.70	-48.95	First Gordon MWD Survey	
20,152.00	12,653.25	-7,338.49	2.05	Final Gordon MWD Survey	
20,185.06	12,652.06	-7,371.50	3.37	LTP:20185' MD	
20,214.00	12,651.02	-7,400.40	4.53	Projection to TD	

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State of New Mexico
Energy, Minerals and Natural Resources
Oil Conservation Division
1220 S. St Francis Dr.
Santa Fe, NM 87505

CONDITIONS

Action 21266

CONDITIONS OF APPROVAL

Operator:	COG OPERATING LLC	600 W Illinois Ave	Midland, TX79701	OGRID:	229137	Action Number:	21266	Action Type:	C-104C
OCD Reviewer									Condition
ksimmons									None