

Submit 1 Copy To Appropriate District Office:

District I - (575) 393-6161
1625 N. French Dr., Hobbs, NM 88240
District II - (575) 748-1283
811 S. First St., Artesia, NM 88210
District III - (505) 334-6178
1000 Rio Brazos Rd., Aztec, NM 87410
District IV - (505) 476-3460
1220 S. St. Francis Dr., Santa Fe, NM 87505

State of New Mexico
Energy, Minerals and Natural Resources

OIL CONSERVATION DIVISION
1220 South St. Francis Dr.
Santa Fe, NM 87505

Form C-103
Revised August 1, 2011.

WELL API NO. 30-015-39811
5. Indicate Type of Lease. STATE ☐ FEE ☒
6. State Oil & Gas Lease No.
7. Lease Name or Unit Agreement Name Bradley 8 Fee
8. Well Number 2H
9. OGRID Number 229137
10. Pool name or Wildcat Atoka, Glorieta Yeso 3250 6-01 5192617K: 6L-4050
11. Elevation (Show whether DR, RKB, RT, GR, etc.) 3374'

SUNDRY NOTICES AND REPORTS ON WELLS
(DO NOT USE THIS FORM FOR PROPOSALS TO DRILL OR TO DEEPEN OR PLUG BACK TO A DIFFERENT RESERVOIR. USE "APPLICATION FOR PERMIT" (FORM C-101) FOR SUCH PROPOSALS.)

1. Type of Well: Oil Well ☒ Gas Well ☐ Other ☐

2. Name of Operator
COG Operating LLC

3. Address of Operator
One Concho Center - 600 W Illinois Ave. Midland, TX 79701

4. Well Location
Unit Letter: **N** 150 feet from the **SOUTH** line and **1700** feet from the **WEST** line
Section **8** Township **19S** Range **26E** NMPM County **EDDY**

11. Elevation (Show whether DR, RKB, RT, GR, etc.)
3374'

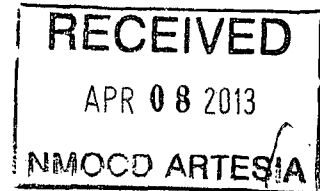
12. Check Appropriate Box to Indicate Nature of Notice, Report or Other Data

NOTICE OF INTENTION TO:		SUBSEQUENT REPORT OF:	
PERFORM REMEDIAL WORK ☐	PLUG AND ABANDON ☐	REMEDIAL WORK ☐	ALTERING CASING ☐
TEMPORARILY ABANDON ☐	CHANGE PLANS ☐	COMMENCE DRILLING OPNS. ☐	P AND A ☐
PULL OR ALTER CASING ☐	MULTIPLE COMPL ☐	CASING/CEMENT JOB ☐	
DOWNHOLE COMMINGLE ☐			
OTHER: Change SHL ☒		OTHER: ☐	

13. Describe proposed or completed operations. (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work). SEE RULE 19.15.7.14 NMAC. For Multiple Completions: Attach wellbore diagram of proposed completion or recompletion.

COG Operating LLC submitted APD for this well at this location:
SHL: 150' FSL 1700' FWL, Unit N
BHL: 330' FNL 1646' FWL, Unit C

COG Operating LLC respectfully requests permission to add a BHL:
SHL: 150' FSL 1800' FWL, Unit N
BHL: 330' FNL 1646' FWL, Unit C



Reason for changing the SHL is due to a pipeline running through the old location.

A revised C-102, directional plan and anti-collision report are attached for your review.

Spud Date:

Rig Release Date:

I hereby certify that the information above is true and complete to the best of my knowledge and belief.

SIGNATURE [Signature] TITLE Permitting Tech DATE 04/08/2013

Type or print name: Kelly J. Holly E-mail address: kholly@concho.com PHONE: 432-685-4384

For State Use Only

APPROVED BY T. C. Shepard TITLE Geologist DATE 4/8/2013

Conditions of Approval (if any):

Provide new survey + plat

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State of New Mexico
Energy, Minerals and Natural Resources

OIL CONSERVATION DIVISION
1220 South St. Francis Dr.
Santa Fe, NM 87505

Amended

Form C-103

Revised August 1, 2011

WELL API NO. 30-015-39811
5. Indicate Type of Lease STATE ☐ FEE ☒
6. State Oil & Gas Lease No.
7. Lease Name or Unit Agreement Name Bradley 8 Fee
8. Well Number 2H
9. OGRID Number 229137
10. Pool name or Wildcat Atoka, Glorieta Yeso 3250

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1. Type of Well: Oil Well ☒ Gas Well ☐ Other ☐	
2. Name of Operator COG Operating LLC	
3. Address of Operator One Concho Center - 600 W Illinois Ave Midland, TX 79701	
4. Well Location Unit Letter N 150 feet from the SOUTH line and 1700 feet from the WEST line Section 8 Township 19S Range 26E NMPM County EDDY	
11. Elevation (Show whether DR, RKB, RT, GR, etc.) 3374'	

12. Check Appropriate Box to Indicate Nature of Notice, Report or Other Data

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TEMPORARILY ABANDON ☐	CHANGE PLANS ☐	COMMENCE DRILLING OPNS. ☐	P AND A ☐
PULL OR ALTER CASING ☐	MULTIPLE COMPL ☐	CASING/CEMENT JOB ☐	
DOWNHOLE COMMINGLE ☐			
OTHER: Change SHL ☒		OTHER: ☐	

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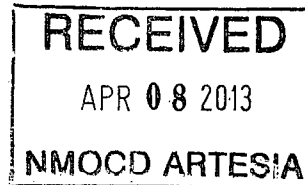
COG Operating respectfully requests permission to change the TVD & MD:

From: 2750' TVD & 7385' MD
To: 3063' TVD & 7721' MD

A revised C-102, directional plan and anti-collision report are attached for your review.

Spud Date:

Rig Release Date:



I hereby certify that the information above is true and complete to the best of my knowledge and belief.

SIGNATURE *[Signature]* TITLE Permitting Tech DATE 04/08/2013

Type or print name Kelly J. Holly E-mail address: kholly@concho.com PHONE: 432-685-4384

For State Use Only

APPROVED BY: *[Signature]* TITLE Geologist DATE 4/8/2013



COG Operating LLC

Eddy County, New Mexico (NAD 27 NME)
Bradley 8 Fee #2H

Wellbore #1 / Job #1310409

Plan: Plan #2 04-04-13

Surface: 150' FSL, 1800' FWL, Sec 8, T19S, R26E, Unit N

PP: 330' FSL, 1695' FWL, Sec 8, T19S, R26E, Unit N

BHL: 330' FNL, 1646' FWL, Sec 8, T19S, R26E, Unit C

Standard Planning Report

05 April, 2013



PHOENIX
TECHNOLOGY SERVICES



Phoenix Technology Services
Planning Report



Database:	GCR DB	Local Co-ordinate Reference:	Well #2H
Company:	COG Operating LLC	TVD Reference:	KB @ 3386.00usft (JW 4)
Project:	Eddy County, New Mexico (NAD:27 NME)	MD Reference:	KB @ 3386.00usft (JW 4)
Site:	Bradley 8 Fee	North Reference:	Grid
Well:	#2H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1 / Job #1310409		
Design:	Plan #2 04-04-13		

Project	Eddy County, New Mexico (NAD:27 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	Bradley 8 Fee		
Site Position:		Northing:	606,797.50 usft
From:	Map	Easting:	478,847.80 usft
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "
		Latitude:	32° 40' 5.404816 N
		Longitude:	104° 24' 7.453861 W
		Grid Convergence:	-0.04 °

Well	#2H		
Well Position	+N/-S	7.30 usft	Northing:
	+E/-W	-1,229.30 usft	Easting:
Position Uncertainty	0.00 usft	Wellhead Elevation:	Ground Level:
			3,374.00 usft

Wellbore	Wellbore #1 / Job #1310409		
Magnetics	Model Name	Sample Date	Declination
	IGRF2010_14	04/05/13	(°)
			7.78
			Dip Angle
			(°)
			60.41
			Field Strength
			(nT)
			48,610

Design	Plan #2 04-04-13		
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
			(°)
			357.29

Plan Sections										
Measured	Inclination	Azimuth	Vertical	+N/-S	+E/-W	Dogleg	Build	Turn	TFO	Target
Depth	(°)	(°)	Depth	(usft)	(usft)	Rate	Rate	Rate	(°)	
(usft)			(usft)			(°/100usft)	(°/100usft)	(°/100usft)		
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2,579.64	0.00	0.00	2,579.64	0.00	0.00	0.00	0.00	0.00	0.00	
3,402.36	90.50	357.29	3,100.49	524.83	-24.82	11.00	11.00	0.00	357.29	
7,720.92	90.50	357.29	3,062.80	4,838.40	-228.80	0.00	0.00	0.00	0.00	PBHL-Bradley 8 #2H



Phoenix Technology Services
Planning Report



Database: GCR DB
Company: COG Operating LLC
Project: Eddy County, New Mexico (NAD 27 NME)
Site: Bradley 8 Fee
Well: #2H
Wellbore: Wellbore #1 / Job #1310409
Design: Plan #2 04-04-13

Local Co-ordinate Reference: Well #2H
TVD Reference: KB @ 3386.00usft (JW 4)
MD Reference: KB @ 3386.00usft (JW 4)
North Reference: Grid
Survey Calculation Method: Minimum Curvature

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
2,579.64	0.00	0.00	2,579.64	0.00	0.00	0.00	0.00	0.00	0.00
KOP Start Build 11.00									
2,580.00	0.04	357.29	2,580.00	0.00	0.00	0.00	11.00	11.00	0.00
2,590.00	1.14	357.29	2,590.00	0.10	0.00	0.10	11.00	11.00	0.00
2,600.00	2.24	357.29	2,599.99	0.40	-0.02	0.40	11.00	11.00	0.00
2,610.00	3.34	357.29	2,609.98	0.88	-0.04	0.88	11.00	11.00	0.00
2,620.00	4.44	357.29	2,619.96	1.56	-0.07	1.56	11.00	11.00	0.00
2,630.00	5.54	357.29	2,629.92	2.43	-0.11	2.43	11.00	11.00	0.00
2,640.00	6.64	357.29	2,639.87	3.49	-0.17	3.49	11.00	11.00	0.00
2,650.00	7.74	357.29	2,649.79	4.74	-0.22	4.75	11.00	11.00	0.00
2,660.00	8.84	357.29	2,659.68	6.18	-0.29	6.19	11.00	11.00	0.00
2,670.00	9.94	357.29	2,669.55	7.81	-0.37	7.82	11.00	11.00	0.00
2,680.00	11.04	357.29	2,679.38	9.63	-0.46	9.64	11.00	11.00	0.00
2,690.00	12.14	357.29	2,689.18	11.64	-0.55	11.65	11.00	11.00	0.00
2,700.00	13.24	357.29	2,698.93	13.83	-0.65	13.85	11.00	11.00	0.00
2,710.00	14.34	357.29	2,708.64	16.21	-0.77	16.23	11.00	11.00	0.00
2,720.00	15.44	357.29	2,718.31	18.78	-0.89	18.80	11.00	11.00	0.00
2,730.00	16.54	357.29	2,727.92	21.53	-1.02	21.55	11.00	11.00	0.00
2,740.00	17.64	357.29	2,737.48	24.46	-1.16	24.49	11.00	11.00	0.00
2,750.00	18.74	357.29	2,746.98	27.58	-1.30	27.61	11.00	11.00	0.00
2,760.00	19.84	357.29	2,756.42	30.88	-1.46	30.92	11.00	11.00	0.00
2,770.00	20.94	357.29	2,765.79	34.36	-1.62	34.40	11.00	11.00	0.00
2,780.00	22.04	357.29	2,775.10	38.02	-1.80	38.06	11.00	11.00	0.00
2,790.00	23.14	357.29	2,784.33	41.86	-1.98	41.91	11.00	11.00	0.00
2,800.00	24.24	357.29	2,793.48	45.87	-2.17	45.92	11.00	11.00	0.00
2,810.00	25.34	357.29	2,802.56	50.06	-2.37	50.12	11.00	11.00	0.00
2,820.00	26.44	357.29	2,811.56	54.42	-2.57	54.48	11.00	11.00	0.00
2,830.00	27.54	357.29	2,820.47	58.96	-2.79	59.02	11.00	11.00	0.00
2,840.00	28.64	357.29	2,829.29	63.66	-3.01	63.73	11.00	11.00	0.00
2,850.00	29.74	357.29	2,838.02	68.53	-3.24	68.61	11.00	11.00	0.00
2,860.00	30.84	357.29	2,846.66	73.57	-3.48	73.65	11.00	11.00	0.00
2,870.00	31.94	357.29	2,855.19	78.77	-3.72	78.86	11.00	11.00	0.00
2,880.00	33.04	357.29	2,863.63	84.14	-3.98	84.23	11.00	11.00	0.00
2,890.00	34.14	357.29	2,871.96	89.66	-4.24	89.76	11.00	11.00	0.00
2,900.00	35.24	357.29	2,880.18	95.35	-4.51	95.45	11.00	11.00	0.00
2,910.00	36.34	357.29	2,888.29	101.19	-4.79	101.30	11.00	11.00	0.00
2,920.00	37.44	357.29	2,896.29	107.19	-5.07	107.31	11.00	11.00	0.00
2,930.00	38.54	357.29	2,904.17	113.33	-5.36	113.46	11.00	11.00	0.00
2,940.00	39.64	357.29	2,911.93	119.63	-5.66	119.77	11.00	11.00	0.00
2,950.00	40.74	357.29	2,919.57	126.08	-5.96	126.22	11.00	11.00	0.00
2,960.00	41.84	357.29	2,927.08	132.67	-6.27	132.82	11.00	11.00	0.00
2,970.00	42.94	357.29	2,934.47	139.40	-6.59	139.56	11.00	11.00	0.00
2,980.00	44.04	357.29	2,941.72	146.28	-6.92	146.44	11.00	11.00	0.00
2,990.00	45.14	357.29	2,948.85	153.29	-7.25	153.46	11.00	11.00	0.00
3,000.00	46.24	357.29	2,955.83	160.44	-7.59	160.62	11.00	11.00	0.00
3,010.00	47.34	357.29	2,962.68	167.72	-7.93	167.91	11.00	11.00	0.00
3,020.00	48.44	357.29	2,969.38	175.13	-8.28	175.32	11.00	11.00	0.00
3,026.48	49.15	357.29	2,973.65	180.00	-8.51	180.20	11.00	11.00	0.00
PP-Bradley 8 #2H									
3,030.00	49.54	357.29	2,975.95	182.67	-8.64	182.87	11.00	11.00	0.00
3,040.00	50.64	357.29	2,982.36	190.33	-9.00	190.54	11.00	11.00	0.00
3,050.00	51.74	357.29	2,988.63	198.11	-9.37	198.33	11.00	11.00	0.00
3,060.00	52.84	357.29	2,994.74	206.01	-9.74	206.24	11.00	11.00	0.00



Phoenix Technology Services
Planning Report



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Wellbore: Wellbore #1 / Job #1310409
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TVD Reference: KB @ 3386.00usft (JW 4)
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North Reference: Grid
Survey Calculation Method: Minimum Curvature

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)
3,070.00	53.94	357.29	3,000.71	214.03	-10.12	214.27	11.00	11.00	0.00
3,080.00	55.04	357.29	3,006.52	222.16	-10.51	222.41	11.00	11.00	0.00
3,090.00	56.14	357.29	3,012.17	230.40	-10.90	230.66	11.00	11.00	0.00
3,100.00	57.24	357.29	3,017.66	238.75	-11.29	239.02	11.00	11.00	0.00
3,110.00	58.34	357.29	3,022.99	247.20	-11.69	247.48	11.00	11.00	0.00
3,120.00	59.44	357.29	3,028.16	255.75	-12.09	256.04	11.00	11.00	0.00
3,130.00	60.54	357.29	3,033.16	264.40	-12.50	264.70	11.00	11.00	0.00
3,140.00	61.64	357.29	3,037.99	273.15	-12.92	273.45	11.00	11.00	0.00
3,150.00	62.74	357.29	3,042.66	281.98	-13.33	282.30	11.00	11.00	0.00
3,160.00	63.84	357.29	3,047.15	290.91	-13.76	291.23	11.00	11.00	0.00
3,170.00	64.94	357.29	3,051.47	299.91	-14.18	300.25	11.00	11.00	0.00
3,180.00	66.04	357.29	3,055.62	309.00	-14.61	309.35	11.00	11.00	0.00
3,190.00	67.14	357.29	3,059.60	318.17	-15.05	318.52	11.00	11.00	0.00
3,200.00	68.24	357.29	3,063.39	327.41	-15.48	327.77	11.00	11.00	0.00
3,210.00	69.34	357.29	3,067.01	336.72	-15.92	337.10	11.00	11.00	0.00
3,220.00	70.44	357.29	3,070.45	346.10	-16.37	346.49	11.00	11.00	0.00
3,230.00	71.54	357.29	3,073.70	355.54	-16.81	355.94	11.00	11.00	0.00
3,240.00	72.64	357.29	3,076.78	365.05	-17.26	365.46	11.00	11.00	0.00
3,250.00	73.74	357.29	3,079.67	374.61	-17.71	375.03	11.00	11.00	0.00
3,260.00	74.84	357.29	3,082.38	384.23	-18.17	384.66	11.00	11.00	0.00
3,270.00	75.94	357.29	3,084.90	393.89	-18.63	394.33	11.00	11.00	0.00
3,280.00	77.04	357.29	3,087.24	403.60	-19.09	404.06	11.00	11.00	0.00
3,290.00	78.14	357.29	3,089.39	413.36	-19.55	413.82	11.00	11.00	0.00
3,300.00	79.24	357.29	3,091.35	423.15	-20.01	423.63	11.00	11.00	0.00
3,310.00	80.34	357.29	3,093.12	432.99	-20.48	433.47	11.00	11.00	0.00
3,320.00	81.44	357.29	3,094.70	442.85	-20.94	443.34	11.00	11.00	0.00
3,330.00	82.54	357.29	3,096.10	452.74	-21.41	453.25	11.00	11.00	0.00
3,340.00	83.64	357.29	3,097.30	462.66	-21.88	463.17	11.00	11.00	0.00
3,350.00	84.74	357.29	3,098.31	472.59	-22.35	473.12	11.00	11.00	0.00
3,360.00	85.84	357.29	3,099.13	482.55	-22.82	483.09	11.00	11.00	0.00
3,370.00	86.94	357.29	3,099.76	492.52	-23.29	493.07	11.00	11.00	0.00
3,380.00	88.04	357.29	3,100.20	502.50	-23.76	503.06	11.00	11.00	0.00
3,390.00	89.14	357.29	3,100.45	512.48	-24.23	513.05	11.00	11.00	0.00
3,393.80	89.56	357.29	3,100.49	516.28	-24.41	516.86	11.00	11.00	0.00
TL, 3105' TVD @ 90.5° Inc, 0.0 VS									
3,400.00	90.24	357.29	3,100.50	522.47	-24.71	523.05	11.00	11.00	0.00
3,402.36	90.50	357.29	3,100.49	524.83	-24.82	525.42	11.00	11.00	0.00
LP Start 4318.56 hold at 3402.36 MD									
3,410.00	90.50	357.29	3,100.42	532.46	-25.18	533.05	0.00	0.00	0.00
3,420.00	90.50	357.29	3,100.33	542.45	-25.65	543.05	0.00	0.00	0.00
3,430.00	90.50	357.29	3,100.24	552.44	-26.12	553.05	0.00	0.00	0.00
3,440.00	90.50	357.29	3,100.16	562.42	-26.60	563.05	0.00	0.00	0.00
3,450.00	90.50	357.29	3,100.07	572.41	-27.07	573.05	0.00	0.00	0.00
3,460.00	90.50	357.29	3,099.98	582.40	-27.54	583.05	0.00	0.00	0.00
3,470.00	90.50	357.29	3,099.90	592.39	-28.01	593.05	0.00	0.00	0.00
3,480.00	90.50	357.29	3,099.81	602.38	-28.49	603.05	0.00	0.00	0.00
3,490.00	90.50	357.29	3,099.72	612.37	-28.96	613.05	0.00	0.00	0.00
3,500.00	90.50	357.29	3,099.63	622.35	-29.43	623.05	0.00	0.00	0.00
3,510.00	90.50	357.29	3,099.55	632.34	-29.90	633.05	0.00	0.00	0.00
3,520.00	90.50	357.29	3,099.46	642.33	-30.37	643.05	0.00	0.00	0.00
3,530.00	90.50	357.29	3,099.37	652.32	-30.85	653.05	0.00	0.00	0.00
3,540.00	90.50	357.29	3,099.28	662.31	-31.32	663.05	0.00	0.00	0.00
3,550.00	90.50	357.29	3,099.20	672.30	-31.79	673.05	0.00	0.00	0.00
3,560.00	90.50	357.29	3,099.11	682.29	-32.26	683.05	0.00	0.00	0.00



Phoenix Technology Services
Planning Report



Database: GCR DB
Company: COG Operating LLC
Project: Eddy County, New Mexico (NAD 27-NME)
Site: Bradley 8 Fee
Well: #2H
Wellbore: Wellbore #1 / Job #1310409
Design: Plan #2 04-04-13

Local Co-ordinate Reference: Well #2H
TVD Reference: KB @ 3386.00usft (JW 4)
MD Reference: KB @ 3386.00usft (JW 4)
North Reference: Grid
Survey Calculation Method: Minimum Curvature

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)
3,570.00	90.50	357.29	3,099.02	692.27	-32.74	693.05	0.00	0.00	0.00
3,580.00	90.50	357.29	3,098.94	702.26	-33.21	703.05	0.00	0.00	0.00
3,590.00	90.50	357.29	3,098.85	712.25	-33.68	713.05	0.00	0.00	0.00
3,600.00	90.50	357.29	3,098.76	722.24	-34.15	723.05	0.00	0.00	0.00
3,610.00	90.50	357.29	3,098.67	732.23	-34.63	733.05	0.00	0.00	0.00
3,620.00	90.50	357.29	3,098.59	742.22	-35.10	743.05	0.00	0.00	0.00
3,630.00	90.50	357.29	3,098.50	752.20	-35.57	753.05	0.00	0.00	0.00
3,640.00	90.50	357.29	3,098.41	762.19	-36.04	763.04	0.00	0.00	0.00
3,650.00	90.50	357.29	3,098.33	772.18	-36.52	773.04	0.00	0.00	0.00
3,660.00	90.50	357.29	3,098.24	782.17	-36.99	783.04	0.00	0.00	0.00
3,670.00	90.50	357.29	3,098.15	792.16	-37.46	793.04	0.00	0.00	0.00
3,680.00	90.50	357.29	3,098.06	802.15	-37.93	803.04	0.00	0.00	0.00
3,690.00	90.50	357.29	3,097.98	812.14	-38.40	813.04	0.00	0.00	0.00
3,700.00	90.50	357.29	3,097.89	822.12	-38.88	823.04	0.00	0.00	0.00
3,710.00	90.50	357.29	3,097.80	832.11	-39.35	833.04	0.00	0.00	0.00
3,720.00	90.50	357.29	3,097.71	842.10	-39.82	843.04	0.00	0.00	0.00
3,730.00	90.50	357.29	3,097.63	852.09	-40.29	853.04	0.00	0.00	0.00
3,740.00	90.50	357.29	3,097.54	862.08	-40.77	863.04	0.00	0.00	0.00
3,750.00	90.50	357.29	3,097.45	872.07	-41.24	873.04	0.00	0.00	0.00
3,760.00	90.50	357.29	3,097.37	882.05	-41.71	883.04	0.00	0.00	0.00
3,770.00	90.50	357.29	3,097.28	892.04	-42.18	893.04	0.00	0.00	0.00
3,780.00	90.50	357.29	3,097.19	902.03	-42.66	903.04	0.00	0.00	0.00
3,790.00	90.50	357.29	3,097.10	912.02	-43.13	913.04	0.00	0.00	0.00
3,800.00	90.50	357.29	3,097.02	922.01	-43.60	923.04	0.00	0.00	0.00
3,810.00	90.50	357.29	3,096.93	932.00	-44.07	933.04	0.00	0.00	0.00
3,820.00	90.50	357.29	3,096.84	941.99	-44.54	943.04	0.00	0.00	0.00
3,830.00	90.50	357.29	3,096.75	951.97	-45.02	953.04	0.00	0.00	0.00
3,840.00	90.50	357.29	3,096.67	961.96	-45.49	963.04	0.00	0.00	0.00
3,850.00	90.50	357.29	3,096.58	971.95	-45.96	973.04	0.00	0.00	0.00
3,860.00	90.50	357.29	3,096.49	981.94	-46.43	983.04	0.00	0.00	0.00
3,870.00	90.50	357.29	3,096.41	991.93	-46.91	993.04	0.00	0.00	0.00
3,880.00	90.50	357.29	3,096.32	1,001.92	-47.38	1,003.04	0.00	0.00	0.00
3,890.00	90.50	357.29	3,096.23	1,011.90	-47.85	1,013.04	0.00	0.00	0.00
3,900.00	90.50	357.29	3,096.14	1,021.89	-48.32	1,023.03	0.00	0.00	0.00
3,910.00	90.50	357.29	3,096.06	1,031.88	-48.80	1,033.03	0.00	0.00	0.00
3,920.00	90.50	357.29	3,095.97	1,041.87	-49.27	1,043.03	0.00	0.00	0.00
3,930.00	90.50	357.29	3,095.88	1,051.86	-49.74	1,053.03	0.00	0.00	0.00
3,940.00	90.50	357.29	3,095.79	1,061.85	-50.21	1,063.03	0.00	0.00	0.00
3,950.00	90.50	357.29	3,095.71	1,071.84	-50.69	1,073.03	0.00	0.00	0.00
3,960.00	90.50	357.29	3,095.62	1,081.82	-51.16	1,083.03	0.00	0.00	0.00
3,970.00	90.50	357.29	3,095.53	1,091.81	-51.63	1,093.03	0.00	0.00	0.00
3,980.00	90.50	357.29	3,095.45	1,101.80	-52.10	1,103.03	0.00	0.00	0.00
3,990.00	90.50	357.29	3,095.36	1,111.79	-52.57	1,113.03	0.00	0.00	0.00
4,000.00	90.50	357.29	3,095.27	1,121.78	-53.05	1,123.03	0.00	0.00	0.00
4,010.00	90.50	357.29	3,095.18	1,131.77	-53.52	1,133.03	0.00	0.00	0.00
4,020.00	90.50	357.29	3,095.10	1,141.75	-53.99	1,143.03	0.00	0.00	0.00
4,030.00	90.50	357.29	3,095.01	1,151.74	-54.46	1,153.03	0.00	0.00	0.00
4,040.00	90.50	357.29	3,094.92	1,161.73	-54.94	1,163.03	0.00	0.00	0.00
4,050.00	90.50	357.29	3,094.83	1,171.72	-55.41	1,173.03	0.00	0.00	0.00
4,060.00	90.50	357.29	3,094.75	1,181.71	-55.88	1,183.03	0.00	0.00	0.00
4,070.00	90.50	357.29	3,094.66	1,191.70	-56.35	1,193.03	0.00	0.00	0.00
4,080.00	90.50	357.29	3,094.57	1,201.69	-56.83	1,203.03	0.00	0.00	0.00
4,090.00	90.50	357.29	3,094.49	1,211.67	-57.30	1,213.03	0.00	0.00	0.00
4,100.00	90.50	357.29	3,094.40	1,221.66	-57.77	1,223.03	0.00	0.00	0.00



Phoenix Technology Services
Planning Report



Database: GCR DB
Company: COG Operating LLC
Project: Eddy County, New Mexico (NAD 27 NME)
Site: Bradley 8 Fee
Well: #2H
Wellbore: Wellbore #1 / Job #1310409
Design: Plan #2 04-04-13

Local Co-ordinate Reference:
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MD Reference: KB @ 3386.00usft (JW 4)
North Reference: Grid
Survey Calculation Method: Minimum Curvature

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)
4,110.00	90.50	357.29	3,094.31	1,231.65	-58.24	1,233.03	0.00	0.00	0.00
4,120.00	90.50	357.29	3,094.22	1,241.64	-58.72	1,243.03	0.00	0.00	0.00
4,130.00	90.50	357.29	3,094.14	1,251.63	-59.19	1,253.03	0.00	0.00	0.00
4,140.00	90.50	357.29	3,094.05	1,261.62	-59.66	1,263.03	0.00	0.00	0.00
4,150.00	90.50	357.29	3,093.96	1,271.60	-60.13	1,273.03	0.00	0.00	0.00
4,160.00	90.50	357.29	3,093.87	1,281.59	-60.60	1,283.02	0.00	0.00	0.00
4,170.00	90.50	357.29	3,093.79	1,291.58	-61.08	1,293.02	0.00	0.00	0.00
4,180.00	90.50	357.29	3,093.70	1,301.57	-61.55	1,303.02	0.00	0.00	0.00
4,190.00	90.50	357.29	3,093.61	1,311.56	-62.02	1,313.02	0.00	0.00	0.00
4,200.00	90.50	357.29	3,093.53	1,321.55	-62.49	1,323.02	0.00	0.00	0.00
4,210.00	90.50	357.29	3,093.44	1,331.54	-62.97	1,333.02	0.00	0.00	0.00
4,220.00	90.50	357.29	3,093.35	1,341.52	-63.44	1,343.02	0.00	0.00	0.00
4,230.00	90.50	357.29	3,093.26	1,351.51	-63.91	1,353.02	0.00	0.00	0.00
4,240.00	90.50	357.29	3,093.18	1,361.50	-64.38	1,363.02	0.00	0.00	0.00
4,250.00	90.50	357.29	3,093.09	1,371.49	-64.86	1,373.02	0.00	0.00	0.00
4,260.00	90.50	357.29	3,093.00	1,381.48	-65.33	1,383.02	0.00	0.00	0.00
4,270.00	90.50	357.29	3,092.91	1,391.47	-65.80	1,393.02	0.00	0.00	0.00
4,280.00	90.50	357.29	3,092.83	1,401.45	-66.27	1,403.02	0.00	0.00	0.00
4,290.00	90.50	357.29	3,092.74	1,411.44	-66.74	1,413.02	0.00	0.00	0.00
4,300.00	90.50	357.29	3,092.65	1,421.43	-67.22	1,423.02	0.00	0.00	0.00
4,310.00	90.50	357.29	3,092.57	1,431.42	-67.69	1,433.02	0.00	0.00	0.00
4,320.00	90.50	357.29	3,092.48	1,441.41	-68.16	1,443.02	0.00	0.00	0.00
4,330.00	90.50	357.29	3,092.39	1,451.40	-68.63	1,453.02	0.00	0.00	0.00
4,340.00	90.50	357.29	3,092.30	1,461.38	-69.11	1,463.02	0.00	0.00	0.00
4,350.00	90.50	357.29	3,092.22	1,471.37	-69.58	1,473.02	0.00	0.00	0.00
4,360.00	90.50	357.29	3,092.13	1,481.36	-70.05	1,483.02	0.00	0.00	0.00
4,370.00	90.50	357.29	3,092.04	1,491.35	-70.52	1,493.02	0.00	0.00	0.00
4,380.00	90.50	357.29	3,091.95	1,501.34	-71.00	1,503.02	0.00	0.00	0.00
4,390.00	90.50	357.29	3,091.87	1,511.33	-71.47	1,513.02	0.00	0.00	0.00
4,400.00	90.50	357.29	3,091.78	1,521.32	-71.94	1,523.02	0.00	0.00	0.00
4,410.00	90.50	357.29	3,091.69	1,531.30	-72.41	1,533.02	0.00	0.00	0.00
4,420.00	90.50	357.29	3,091.61	1,541.29	-72.89	1,543.01	0.00	0.00	0.00
4,430.00	90.50	357.29	3,091.52	1,551.28	-73.36	1,553.01	0.00	0.00	0.00
4,440.00	90.50	357.29	3,091.43	1,561.27	-73.83	1,563.01	0.00	0.00	0.00
4,450.00	90.50	357.29	3,091.34	1,571.26	-74.30	1,573.01	0.00	0.00	0.00
4,460.00	90.50	357.29	3,091.26	1,581.25	-74.77	1,583.01	0.00	0.00	0.00
4,470.00	90.50	357.29	3,091.17	1,591.23	-75.25	1,593.01	0.00	0.00	0.00
4,480.00	90.50	357.29	3,091.08	1,601.22	-75.72	1,603.01	0.00	0.00	0.00
4,490.00	90.50	357.29	3,090.99	1,611.21	-76.19	1,613.01	0.00	0.00	0.00
4,500.00	90.50	357.29	3,090.91	1,621.20	-76.66	1,623.01	0.00	0.00	0.00
4,510.00	90.50	357.29	3,090.82	1,631.19	-77.14	1,633.01	0.00	0.00	0.00
4,520.00	90.50	357.29	3,090.73	1,641.18	-77.61	1,643.01	0.00	0.00	0.00
4,530.00	90.50	357.29	3,090.65	1,651.17	-78.08	1,653.01	0.00	0.00	0.00
4,540.00	90.50	357.29	3,090.56	1,661.15	-78.55	1,663.01	0.00	0.00	0.00
4,550.00	90.50	357.29	3,090.47	1,671.14	-79.03	1,673.01	0.00	0.00	0.00
4,560.00	90.50	357.29	3,090.38	1,681.13	-79.50	1,683.01	0.00	0.00	0.00
4,570.00	90.50	357.29	3,090.30	1,691.12	-79.97	1,693.01	0.00	0.00	0.00
4,580.00	90.50	357.29	3,090.21	1,701.11	-80.44	1,703.01	0.00	0.00	0.00
4,590.00	90.50	357.29	3,090.12	1,711.10	-80.91	1,713.01	0.00	0.00	0.00
4,600.00	90.50	357.29	3,090.03	1,721.08	-81.39	1,723.01	0.00	0.00	0.00
4,610.00	90.50	357.29	3,089.95	1,731.07	-81.86	1,733.01	0.00	0.00	0.00
4,620.00	90.50	357.29	3,089.86	1,741.06	-82.33	1,743.01	0.00	0.00	0.00
4,630.00	90.50	357.29	3,089.77	1,751.05	-82.80	1,753.01	0.00	0.00	0.00
4,640.00	90.50	357.29	3,089.69	1,761.04	-83.28	1,763.01	0.00	0.00	0.00



Phoenix Technology Services
Planning Report



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Site: Bradley 8 Fee
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Local Co-ordinate Reference: Well #2H
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Survey Calculation Method: Minimum Curvature

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	90.50	357.29	3,089.60	1,771.03	-83.75	1,773.01	0.00	0.00	0.00
4,660.00	90.50	357.29	3,089.51	1,781.02	-84.22	1,783.01	0.00	0.00	0.00
4,670.00	90.50	357.29	3,089.42	1,791.00	-84.69	1,793.01	0.00	0.00	0.00
4,680.00	90.50	357.29	3,089.34	1,800.99	-85.17	1,803.01	0.00	0.00	0.00
4,690.00	90.50	357.29	3,089.25	1,810.98	-85.64	1,813.00	0.00	0.00	0.00
4,700.00	90.50	357.29	3,089.16	1,820.97	-86.11	1,823.00	0.00	0.00	0.00
4,710.00	90.50	357.29	3,089.07	1,830.96	-86.58	1,833.00	0.00	0.00	0.00
4,720.00	90.50	357.29	3,088.99	1,840.95	-87.06	1,843.00	0.00	0.00	0.00
4,730.00	90.50	357.29	3,088.90	1,850.93	-87.53	1,853.00	0.00	0.00	0.00
4,740.00	90.50	357.29	3,088.81	1,860.92	-88.00	1,863.00	0.00	0.00	0.00
4,750.00	90.50	357.29	3,088.73	1,870.91	-88.47	1,873.00	0.00	0.00	0.00
4,760.00	90.50	357.29	3,088.64	1,880.90	-88.94	1,883.00	0.00	0.00	0.00
4,770.00	90.50	357.29	3,088.55	1,890.89	-89.42	1,893.00	0.00	0.00	0.00
4,780.00	90.50	357.29	3,088.46	1,900.88	-89.89	1,903.00	0.00	0.00	0.00
4,790.00	90.50	357.29	3,088.38	1,910.87	-90.36	1,913.00	0.00	0.00	0.00
4,800.00	90.50	357.29	3,088.29	1,920.85	-90.83	1,923.00	0.00	0.00	0.00
4,810.00	90.50	357.29	3,088.20	1,930.84	-91.31	1,933.00	0.00	0.00	0.00
4,820.00	90.50	357.29	3,088.12	1,940.83	-91.78	1,943.00	0.00	0.00	0.00
4,830.00	90.50	357.29	3,088.03	1,950.82	-92.25	1,953.00	0.00	0.00	0.00
4,840.00	90.50	357.29	3,087.94	1,960.81	-92.72	1,963.00	0.00	0.00	0.00
4,850.00	90.50	357.29	3,087.85	1,970.80	-93.20	1,973.00	0.00	0.00	0.00
4,860.00	90.50	357.29	3,087.77	1,980.78	-93.67	1,983.00	0.00	0.00	0.00
4,870.00	90.50	357.29	3,087.68	1,990.77	-94.14	1,993.00	0.00	0.00	0.00
4,880.00	90.50	357.29	3,087.59	2,000.76	-94.61	2,003.00	0.00	0.00	0.00
4,890.00	90.50	357.29	3,087.50	2,010.75	-95.09	2,013.00	0.00	0.00	0.00
4,900.00	90.50	357.29	3,087.42	2,020.74	-95.56	2,023.00	0.00	0.00	0.00
4,910.00	90.50	357.29	3,087.33	2,030.73	-96.03	2,033.00	0.00	0.00	0.00
4,920.00	90.50	357.29	3,087.24	2,040.72	-96.50	2,043.00	0.00	0.00	0.00
4,930.00	90.50	357.29	3,087.16	2,050.70	-96.97	2,053.00	0.00	0.00	0.00
4,940.00	90.50	357.29	3,087.07	2,060.69	-97.45	2,063.00	0.00	0.00	0.00
4,950.00	90.50	357.29	3,086.98	2,070.68	-97.92	2,072.99	0.00	0.00	0.00
4,960.00	90.50	357.29	3,086.89	2,080.67	-98.39	2,082.99	0.00	0.00	0.00
4,970.00	90.50	357.29	3,086.81	2,090.66	-98.86	2,092.99	0.00	0.00	0.00
4,980.00	90.50	357.29	3,086.72	2,100.65	-99.34	2,102.99	0.00	0.00	0.00
4,990.00	90.50	357.29	3,086.63	2,110.63	-99.81	2,112.99	0.00	0.00	0.00
5,000.00	90.50	357.29	3,086.54	2,120.62	-100.28	2,122.99	0.00	0.00	0.00
5,010.00	90.50	357.29	3,086.46	2,130.61	-100.75	2,132.99	0.00	0.00	0.00
5,020.00	90.50	357.29	3,086.37	2,140.60	-101.23	2,142.99	0.00	0.00	0.00
5,030.00	90.50	357.29	3,086.28	2,150.59	-101.70	2,152.99	0.00	0.00	0.00
5,040.00	90.50	357.29	3,086.20	2,160.58	-102.17	2,162.99	0.00	0.00	0.00
5,050.00	90.50	357.29	3,086.11	2,170.57	-102.64	2,172.99	0.00	0.00	0.00
5,060.00	90.50	357.29	3,086.02	2,180.55	-103.11	2,182.99	0.00	0.00	0.00
5,070.00	90.50	357.29	3,085.93	2,190.54	-103.59	2,192.99	0.00	0.00	0.00
5,080.00	90.50	357.29	3,085.85	2,200.53	-104.06	2,202.99	0.00	0.00	0.00
5,090.00	90.50	357.29	3,085.76	2,210.52	-104.53	2,212.99	0.00	0.00	0.00
5,100.00	90.50	357.29	3,085.67	2,220.51	-105.00	2,222.99	0.00	0.00	0.00
5,110.00	90.50	357.29	3,085.58	2,230.50	-105.48	2,232.99	0.00	0.00	0.00
5,120.00	90.50	357.29	3,085.50	2,240.48	-105.95	2,242.99	0.00	0.00	0.00
5,130.00	90.50	357.29	3,085.41	2,250.47	-106.42	2,252.99	0.00	0.00	0.00
5,140.00	90.50	357.29	3,085.32	2,260.46	-106.89	2,262.99	0.00	0.00	0.00
5,150.00	90.50	357.29	3,085.24	2,270.45	-107.37	2,272.99	0.00	0.00	0.00
5,160.00	90.50	357.29	3,085.15	2,280.44	-107.84	2,282.99	0.00	0.00	0.00
5,170.00	90.50	357.29	3,085.06	2,290.43	-108.31	2,292.99	0.00	0.00	0.00
5,180.00	90.50	357.29	3,084.97	2,300.42	-108.78	2,302.99	0.00	0.00	0.00



Phoenix Technology Services
Planning Report



Database: GCR DB
Company: COG Operating LLC
Project: Eddy County, New Mexico (NAD 27 NME)
Site: Bradley 8 Fee
Well: #2H
Wellbore: Wellbore #1 / Job #1310409
Design: Plan #2 04-04-13

Local Co-ordinate Reference:
TVD Reference: KB @ 3386.00usft (JW 4)
MD Reference: KB @ 3386.00usft (JW 4)
North Reference: Grid
Survey Calculation Method: Minimum Curvature

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)
5,190.00	90.50	357.29	3,084.89	2,310.40	-109.26	2,312.99	0.00	0.00	0.00
5,200.00	90.50	357.29	3,084.80	2,320.39	-109.73	2,322.99	0.00	0.00	0.00
5,210.00	90.50	357.29	3,084.71	2,330.38	-110.20	2,332.98	0.00	0.00	0.00
5,220.00	90.50	357.29	3,084.62	2,340.37	-110.67	2,342.98	0.00	0.00	0.00
5,230.00	90.50	357.29	3,084.54	2,350.36	-111.14	2,352.98	0.00	0.00	0.00
5,240.00	90.50	357.29	3,084.45	2,360.35	-111.62	2,362.98	0.00	0.00	0.00
5,250.00	90.50	357.29	3,084.36	2,370.33	-112.09	2,372.98	0.00	0.00	0.00
5,260.00	90.50	357.29	3,084.28	2,380.32	-112.56	2,382.98	0.00	0.00	0.00
5,270.00	90.50	357.29	3,084.19	2,390.31	-113.03	2,392.98	0.00	0.00	0.00
5,280.00	90.50	357.29	3,084.10	2,400.30	-113.51	2,402.98	0.00	0.00	0.00
5,290.00	90.50	357.29	3,084.01	2,410.29	-113.98	2,412.98	0.00	0.00	0.00
5,300.00	90.50	357.29	3,083.93	2,420.28	-114.45	2,422.98	0.00	0.00	0.00
5,310.00	90.50	357.29	3,083.84	2,430.27	-114.92	2,432.98	0.00	0.00	0.00
5,320.00	90.50	357.29	3,083.75	2,440.25	-115.40	2,442.98	0.00	0.00	0.00
5,330.00	90.50	357.29	3,083.66	2,450.24	-115.87	2,452.98	0.00	0.00	0.00
5,340.00	90.50	357.29	3,083.58	2,460.23	-116.34	2,462.98	0.00	0.00	0.00
5,350.00	90.50	357.29	3,083.49	2,470.22	-116.81	2,472.98	0.00	0.00	0.00
5,360.00	90.50	357.29	3,083.40	2,480.21	-117.28	2,482.98	0.00	0.00	0.00
5,370.00	90.50	357.29	3,083.32	2,490.20	-117.76	2,492.98	0.00	0.00	0.00
5,380.00	90.50	357.29	3,083.23	2,500.18	-118.23	2,502.98	0.00	0.00	0.00
5,390.00	90.50	357.29	3,083.14	2,510.17	-118.70	2,512.98	0.00	0.00	0.00
5,400.00	90.50	357.29	3,083.05	2,520.16	-119.17	2,522.98	0.00	0.00	0.00
5,410.00	90.50	357.29	3,082.97	2,530.15	-119.65	2,532.98	0.00	0.00	0.00
5,420.00	90.50	357.29	3,082.88	2,540.14	-120.12	2,542.98	0.00	0.00	0.00
5,430.00	90.50	357.29	3,082.79	2,550.13	-120.59	2,552.98	0.00	0.00	0.00
5,440.00	90.50	357.29	3,082.70	2,560.12	-121.06	2,562.98	0.00	0.00	0.00
5,450.00	90.50	357.29	3,082.62	2,570.10	-121.54	2,572.98	0.00	0.00	0.00
5,460.00	90.50	357.29	3,082.53	2,580.09	-122.01	2,582.98	0.00	0.00	0.00
5,470.00	90.50	357.29	3,082.44	2,590.08	-122.48	2,592.98	0.00	0.00	0.00
5,480.00	90.50	357.29	3,082.36	2,600.07	-122.95	2,602.97	0.00	0.00	0.00
5,490.00	90.50	357.29	3,082.27	2,610.06	-123.43	2,612.97	0.00	0.00	0.00
5,500.00	90.50	357.29	3,082.18	2,620.05	-123.90	2,622.97	0.00	0.00	0.00
5,510.00	90.50	357.29	3,082.09	2,630.03	-124.37	2,632.97	0.00	0.00	0.00
5,520.00	90.50	357.29	3,082.01	2,640.02	-124.84	2,642.97	0.00	0.00	0.00
5,530.00	90.50	357.29	3,081.92	2,650.01	-125.31	2,652.97	0.00	0.00	0.00
5,540.00	90.50	357.29	3,081.83	2,660.00	-125.79	2,662.97	0.00	0.00	0.00
5,550.00	90.50	357.29	3,081.74	2,669.99	-126.26	2,672.97	0.00	0.00	0.00
5,560.00	90.50	357.29	3,081.66	2,679.98	-126.73	2,682.97	0.00	0.00	0.00
5,570.00	90.50	357.29	3,081.57	2,689.97	-127.20	2,692.97	0.00	0.00	0.00
5,580.00	90.50	357.29	3,081.48	2,699.95	-127.68	2,702.97	0.00	0.00	0.00
5,590.00	90.50	357.29	3,081.40	2,709.94	-128.15	2,712.97	0.00	0.00	0.00
5,600.00	90.50	357.29	3,081.31	2,719.93	-128.62	2,722.97	0.00	0.00	0.00
5,610.00	90.50	357.29	3,081.22	2,729.92	-129.09	2,732.97	0.00	0.00	0.00
5,620.00	90.50	357.29	3,081.13	2,739.91	-129.57	2,742.97	0.00	0.00	0.00
5,630.00	90.50	357.29	3,081.05	2,749.90	-130.04	2,752.97	0.00	0.00	0.00
5,640.00	90.50	357.29	3,080.96	2,759.88	-130.51	2,762.97	0.00	0.00	0.00
5,650.00	90.50	357.29	3,080.87	2,769.87	-130.98	2,772.97	0.00	0.00	0.00
5,660.00	90.50	357.29	3,080.78	2,779.86	-131.46	2,782.97	0.00	0.00	0.00
5,670.00	90.50	357.29	3,080.70	2,789.85	-131.93	2,792.97	0.00	0.00	0.00
5,680.00	90.50	357.29	3,080.61	2,799.84	-132.40	2,802.97	0.00	0.00	0.00
5,690.00	90.50	357.29	3,080.52	2,809.83	-132.87	2,812.97	0.00	0.00	0.00
5,700.00	90.50	357.29	3,080.44	2,819.82	-133.34	2,822.97	0.00	0.00	0.00
5,710.00	90.50	357.29	3,080.35	2,829.80	-133.82	2,832.97	0.00	0.00	0.00
5,720.00	90.50	357.29	3,080.26	2,839.79	-134.29	2,842.97	0.00	0.00	0.00



Phoenix Technology Services
Planning Report



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Design: Plan #2 04-04-13

Local Co-ordinate Reference:
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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)
5,730.00	90.50	357.29	3,080.17	2,849.78	-134.76	2,852.97	0.00	0.00	0.00
5,740.00	90.50	357.29	3,080.09	2,859.77	-135.23	2,862.96	0.00	0.00	0.00
5,750.00	90.50	357.29	3,080.00	2,869.76	-135.71	2,872.96	0.00	0.00	0.00
5,760.00	90.50	357.29	3,079.91	2,879.75	-136.18	2,882.96	0.00	0.00	0.00
5,770.00	90.50	357.29	3,079.82	2,889.73	-136.65	2,892.96	0.00	0.00	0.00
5,780.00	90.50	357.29	3,079.74	2,899.72	-137.12	2,902.96	0.00	0.00	0.00
5,790.00	90.50	357.29	3,079.65	2,909.71	-137.60	2,912.96	0.00	0.00	0.00
5,800.00	90.50	357.29	3,079.56	2,919.70	-138.07	2,922.96	0.00	0.00	0.00
5,810.00	90.50	357.29	3,079.48	2,929.69	-138.54	2,932.96	0.00	0.00	0.00
5,820.00	90.50	357.29	3,079.39	2,939.68	-139.01	2,942.96	0.00	0.00	0.00
5,830.00	90.50	357.29	3,079.30	2,949.67	-139.48	2,952.96	0.00	0.00	0.00
5,840.00	90.50	357.29	3,079.21	2,959.65	-139.96	2,962.96	0.00	0.00	0.00
5,850.00	90.50	357.29	3,079.13	2,969.64	-140.43	2,972.96	0.00	0.00	0.00
5,860.00	90.50	357.29	3,079.04	2,979.63	-140.90	2,982.96	0.00	0.00	0.00
5,870.00	90.50	357.29	3,078.95	2,989.62	-141.37	2,992.96	0.00	0.00	0.00
5,880.00	90.50	357.29	3,078.86	2,999.61	-141.85	3,002.96	0.00	0.00	0.00
5,890.00	90.50	357.29	3,078.78	3,009.60	-142.32	3,012.96	0.00	0.00	0.00
5,900.00	90.50	357.29	3,078.69	3,019.58	-142.79	3,022.96	0.00	0.00	0.00
5,910.00	90.50	357.29	3,078.60	3,029.57	-143.26	3,032.96	0.00	0.00	0.00
5,920.00	90.50	357.29	3,078.52	3,039.56	-143.74	3,042.96	0.00	0.00	0.00
5,930.00	90.50	357.29	3,078.43	3,049.55	-144.21	3,052.96	0.00	0.00	0.00
5,940.00	90.50	357.29	3,078.34	3,059.54	-144.68	3,062.96	0.00	0.00	0.00
5,950.00	90.50	357.29	3,078.25	3,069.53	-145.15	3,072.96	0.00	0.00	0.00
5,960.00	90.50	357.29	3,078.17	3,079.52	-145.63	3,082.96	0.00	0.00	0.00
5,970.00	90.50	357.29	3,078.08	3,089.50	-146.10	3,092.96	0.00	0.00	0.00
5,980.00	90.50	357.29	3,077.99	3,099.49	-146.57	3,102.96	0.00	0.00	0.00
5,990.00	90.50	357.29	3,077.90	3,109.48	-147.04	3,112.96	0.00	0.00	0.00
6,000.00	90.50	357.29	3,077.82	3,119.47	-147.51	3,122.95	0.00	0.00	0.00
6,010.00	90.50	357.29	3,077.73	3,129.46	-147.99	3,132.95	0.00	0.00	0.00
6,020.00	90.50	357.29	3,077.64	3,139.45	-148.46	3,142.95	0.00	0.00	0.00
6,030.00	90.50	357.29	3,077.56	3,149.43	-148.93	3,152.95	0.00	0.00	0.00
6,040.00	90.50	357.29	3,077.47	3,159.42	-149.40	3,162.95	0.00	0.00	0.00
6,050.00	90.50	357.29	3,077.38	3,169.41	-149.88	3,172.95	0.00	0.00	0.00
6,060.00	90.50	357.29	3,077.29	3,179.40	-150.35	3,182.95	0.00	0.00	0.00
6,070.00	90.50	357.29	3,077.21	3,189.39	-150.82	3,192.95	0.00	0.00	0.00
6,080.00	90.50	357.29	3,077.12	3,199.38	-151.29	3,202.95	0.00	0.00	0.00
6,090.00	90.50	357.29	3,077.03	3,209.37	-151.77	3,212.95	0.00	0.00	0.00
6,100.00	90.50	357.29	3,076.95	3,219.35	-152.24	3,222.95	0.00	0.00	0.00
6,110.00	90.50	357.29	3,076.86	3,229.34	-152.71	3,232.95	0.00	0.00	0.00
6,120.00	90.50	357.29	3,076.77	3,239.33	-153.18	3,242.95	0.00	0.00	0.00
6,130.00	90.50	357.29	3,076.68	3,249.32	-153.65	3,252.95	0.00	0.00	0.00
6,140.00	90.50	357.29	3,076.60	3,259.31	-154.13	3,262.95	0.00	0.00	0.00
6,150.00	90.50	357.29	3,076.51	3,269.30	-154.60	3,272.95	0.00	0.00	0.00
6,160.00	90.50	357.29	3,076.42	3,279.28	-155.07	3,282.95	0.00	0.00	0.00
6,170.00	90.50	357.29	3,076.33	3,289.27	-155.54	3,292.95	0.00	0.00	0.00
6,180.00	90.50	357.29	3,076.25	3,299.26	-156.02	3,302.95	0.00	0.00	0.00
6,190.00	90.50	357.29	3,076.16	3,309.25	-156.49	3,312.95	0.00	0.00	0.00
6,200.00	90.50	357.29	3,076.07	3,319.24	-156.96	3,322.95	0.00	0.00	0.00
6,210.00	90.50	357.29	3,075.99	3,329.23	-157.43	3,332.95	0.00	0.00	0.00
6,220.00	90.50	357.29	3,075.90	3,339.22	-157.91	3,342.95	0.00	0.00	0.00
6,230.00	90.50	357.29	3,075.81	3,349.20	-158.38	3,352.95	0.00	0.00	0.00
6,240.00	90.50	357.29	3,075.72	3,359.19	-158.85	3,362.95	0.00	0.00	0.00
6,250.00	90.50	357.29	3,075.64	3,369.18	-159.32	3,372.95	0.00	0.00	0.00
6,260.00	90.50	357.29	3,075.55	3,379.17	-159.80	3,382.94	0.00	0.00	0.00



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Planning Report



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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)
6,270.00	90.50	357.29	3,075.46	3,389.16	-160.27	3,392.94	0.00	0.00	0.00
6,280.00	90.50	357.29	3,075.37	3,399.15	-160.74	3,402.94	0.00	0.00	0.00
6,290.00	90.50	357.29	3,075.29	3,409.13	-161.21	3,412.94	0.00	0.00	0.00
6,300.00	90.50	357.29	3,075.20	3,419.12	-161.68	3,422.94	0.00	0.00	0.00
6,310.00	90.50	357.29	3,075.11	3,429.11	-162.16	3,432.94	0.00	0.00	0.00
6,320.00	90.50	357.29	3,075.03	3,439.10	-162.63	3,442.94	0.00	0.00	0.00
6,330.00	90.50	357.29	3,074.94	3,449.09	-163.10	3,452.94	0.00	0.00	0.00
6,340.00	90.50	357.29	3,074.85	3,459.08	-163.57	3,462.94	0.00	0.00	0.00
6,350.00	90.50	357.29	3,074.76	3,469.06	-164.05	3,472.94	0.00	0.00	0.00
6,360.00	90.50	357.29	3,074.68	3,479.05	-164.52	3,482.94	0.00	0.00	0.00
6,370.00	90.50	357.29	3,074.59	3,489.04	-164.99	3,492.94	0.00	0.00	0.00
6,380.00	90.50	357.29	3,074.50	3,499.03	-165.46	3,502.94	0.00	0.00	0.00
6,390.00	90.50	357.29	3,074.41	3,509.02	-165.94	3,512.94	0.00	0.00	0.00
6,400.00	90.50	357.29	3,074.33	3,519.01	-166.41	3,522.94	0.00	0.00	0.00
6,410.00	90.50	357.29	3,074.24	3,529.00	-166.88	3,532.94	0.00	0.00	0.00
6,420.00	90.50	357.29	3,074.15	3,538.98	-167.35	3,542.94	0.00	0.00	0.00
6,430.00	90.50	357.29	3,074.07	3,548.97	-167.83	3,552.94	0.00	0.00	0.00
6,440.00	90.50	357.29	3,073.98	3,558.96	-168.30	3,562.94	0.00	0.00	0.00
6,450.00	90.50	357.29	3,073.89	3,568.95	-168.77	3,572.94	0.00	0.00	0.00
6,460.00	90.50	357.29	3,073.80	3,578.94	-169.24	3,582.94	0.00	0.00	0.00
6,470.00	90.50	357.29	3,073.72	3,588.93	-169.71	3,592.94	0.00	0.00	0.00
6,480.00	90.50	357.29	3,073.63	3,598.91	-170.19	3,602.94	0.00	0.00	0.00
6,490.00	90.50	357.29	3,073.54	3,608.90	-170.66	3,612.94	0.00	0.00	0.00
6,500.00	90.50	357.29	3,073.45	3,618.89	-171.13	3,622.94	0.00	0.00	0.00
6,510.00	90.50	357.29	3,073.37	3,628.88	-171.60	3,632.94	0.00	0.00	0.00
6,520.00	90.50	357.29	3,073.28	3,638.87	-172.08	3,642.94	0.00	0.00	0.00
6,530.00	90.50	357.29	3,073.19	3,648.86	-172.55	3,652.93	0.00	0.00	0.00
6,540.00	90.50	357.29	3,073.11	3,658.85	-173.02	3,662.93	0.00	0.00	0.00
6,550.00	90.50	357.29	3,073.02	3,668.83	-173.49	3,672.93	0.00	0.00	0.00
6,560.00	90.50	357.29	3,072.93	3,678.82	-173.97	3,682.93	0.00	0.00	0.00
6,570.00	90.50	357.29	3,072.84	3,688.81	-174.44	3,692.93	0.00	0.00	0.00
6,580.00	90.50	357.29	3,072.76	3,698.80	-174.91	3,702.93	0.00	0.00	0.00
6,590.00	90.50	357.29	3,072.67	3,708.79	-175.38	3,712.93	0.00	0.00	0.00
6,600.00	90.50	357.29	3,072.58	3,718.78	-175.85	3,722.93	0.00	0.00	0.00
6,610.00	90.50	357.29	3,072.49	3,728.76	-176.33	3,732.93	0.00	0.00	0.00
6,620.00	90.50	357.29	3,072.41	3,738.75	-176.80	3,742.93	0.00	0.00	0.00
6,630.00	90.50	357.29	3,072.32	3,748.74	-177.27	3,752.93	0.00	0.00	0.00
6,640.00	90.50	357.29	3,072.23	3,758.73	-177.74	3,762.93	0.00	0.00	0.00
6,650.00	90.50	357.29	3,072.15	3,768.72	-178.22	3,772.93	0.00	0.00	0.00
6,660.00	90.50	357.29	3,072.06	3,778.71	-178.69	3,782.93	0.00	0.00	0.00
6,670.00	90.50	357.29	3,071.97	3,788.70	-179.16	3,792.93	0.00	0.00	0.00
6,680.00	90.50	357.29	3,071.88	3,798.68	-179.63	3,802.93	0.00	0.00	0.00
6,690.00	90.50	357.29	3,071.80	3,808.67	-180.11	3,812.93	0.00	0.00	0.00
6,700.00	90.50	357.29	3,071.71	3,818.66	-180.58	3,822.93	0.00	0.00	0.00
6,710.00	90.50	357.29	3,071.62	3,828.65	-181.05	3,832.93	0.00	0.00	0.00
6,720.00	90.50	357.29	3,071.53	3,838.64	-181.52	3,842.93	0.00	0.00	0.00
6,730.00	90.50	357.29	3,071.45	3,848.63	-182.00	3,852.93	0.00	0.00	0.00
6,740.00	90.50	357.29	3,071.36	3,858.61	-182.47	3,862.93	0.00	0.00	0.00
6,750.00	90.50	357.29	3,071.27	3,868.60	-182.94	3,872.93	0.00	0.00	0.00
6,760.00	90.50	357.29	3,071.19	3,878.59	-183.41	3,882.93	0.00	0.00	0.00
6,770.00	90.50	357.29	3,071.10	3,888.58	-183.88	3,892.93	0.00	0.00	0.00
6,780.00	90.50	357.29	3,071.01	3,898.57	-184.36	3,902.93	0.00	0.00	0.00
6,790.00	90.50	357.29	3,070.92	3,908.56	-184.83	3,912.92	0.00	0.00	0.00
6,800.00	90.50	357.29	3,070.84	3,918.55	-185.30	3,922.92	0.00	0.00	0.00



Phoenix Technology Services
Planning Report



Database: GCR DB
Company: COG Operating LLC
Project: Eddy County, New Mexico (NAD 27 NME)
Site: Bradley 8 Fee
Well: #2H
Wellbore: Wellbore #1 / Job #1310409
Design: Plan #2. 04-04-13

Local Co-ordinate Reference: Well #2H
TVD Reference: KB @ 3386.00usft (JW 4)
MD Reference: KB @ 3386.00usft (JW 4)
North Reference: Grid
Survey Calculation Method: Minimum Curvature

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)
6,810.00	90.50	357.29	3,070.75	3,928.53	-185.77	3,932.92	0.00	0.00	0.00
6,820.00	90.50	357.29	3,070.66	3,938.52	-186.25	3,942.92	0.00	0.00	0.00
6,830.00	90.50	357.29	3,070.57	3,948.51	-186.72	3,952.92	0.00	0.00	0.00
6,840.00	90.50	357.29	3,070.49	3,958.50	-187.19	3,962.92	0.00	0.00	0.00
6,850.00	90.50	357.29	3,070.40	3,968.49	-187.66	3,972.92	0.00	0.00	0.00
6,860.00	90.50	357.29	3,070.31	3,978.48	-188.14	3,982.92	0.00	0.00	0.00
6,870.00	90.50	357.29	3,070.23	3,988.46	-188.61	3,992.92	0.00	0.00	0.00
6,880.00	90.50	357.29	3,070.14	3,998.45	-189.08	4,002.92	0.00	0.00	0.00
6,890.00	90.50	357.29	3,070.05	4,008.44	-189.55	4,012.92	0.00	0.00	0.00
6,900.00	90.50	357.29	3,069.96	4,018.43	-190.02	4,022.92	0.00	0.00	0.00
6,910.00	90.50	357.29	3,069.88	4,028.42	-190.50	4,032.92	0.00	0.00	0.00
6,920.00	90.50	357.29	3,069.79	4,038.41	-190.97	4,042.92	0.00	0.00	0.00
6,930.00	90.50	357.29	3,069.70	4,048.40	-191.44	4,052.92	0.00	0.00	0.00
6,940.00	90.50	357.29	3,069.61	4,058.38	-191.91	4,062.92	0.00	0.00	0.00
6,950.00	90.50	357.29	3,069.53	4,068.37	-192.39	4,072.92	0.00	0.00	0.00
6,960.00	90.50	357.29	3,069.44	4,078.36	-192.86	4,082.92	0.00	0.00	0.00
6,970.00	90.50	357.29	3,069.35	4,088.35	-193.33	4,092.92	0.00	0.00	0.00
6,980.00	90.50	357.29	3,069.27	4,098.34	-193.80	4,102.92	0.00	0.00	0.00
6,990.00	90.50	357.29	3,069.18	4,108.33	-194.28	4,112.92	0.00	0.00	0.00
7,000.00	90.50	357.29	3,069.09	4,118.31	-194.75	4,122.92	0.00	0.00	0.00
7,010.00	90.50	357.29	3,069.00	4,128.30	-195.22	4,132.92	0.00	0.00	0.00
7,020.00	90.50	357.29	3,068.92	4,138.29	-195.69	4,142.92	0.00	0.00	0.00
7,030.00	90.50	357.29	3,068.83	4,148.28	-196.17	4,152.92	0.00	0.00	0.00
7,040.00	90.50	357.29	3,068.74	4,158.27	-196.64	4,162.92	0.00	0.00	0.00
7,050.00	90.50	357.29	3,068.65	4,168.26	-197.11	4,172.91	0.00	0.00	0.00
7,060.00	90.50	357.29	3,068.57	4,178.25	-197.58	4,182.91	0.00	0.00	0.00
7,070.00	90.50	357.29	3,068.48	4,188.23	-198.05	4,192.91	0.00	0.00	0.00
7,080.00	90.50	357.29	3,068.39	4,198.22	-198.53	4,202.91	0.00	0.00	0.00
7,090.00	90.50	357.29	3,068.31	4,208.21	-199.00	4,212.91	0.00	0.00	0.00
7,100.00	90.50	357.29	3,068.22	4,218.20	-199.47	4,222.91	0.00	0.00	0.00
7,110.00	90.50	357.29	3,068.13	4,228.19	-199.94	4,232.91	0.00	0.00	0.00
7,120.00	90.50	357.29	3,068.04	4,238.18	-200.42	4,242.91	0.00	0.00	0.00
7,130.00	90.50	357.29	3,067.96	4,248.16	-200.89	4,252.91	0.00	0.00	0.00
7,140.00	90.50	357.29	3,067.87	4,258.15	-201.36	4,262.91	0.00	0.00	0.00
7,150.00	90.50	357.29	3,067.78	4,268.14	-201.83	4,272.91	0.00	0.00	0.00
7,160.00	90.50	357.29	3,067.69	4,278.13	-202.31	4,282.91	0.00	0.00	0.00
7,170.00	90.50	357.29	3,067.61	4,288.12	-202.78	4,292.91	0.00	0.00	0.00
7,180.00	90.50	357.29	3,067.52	4,298.11	-203.25	4,302.91	0.00	0.00	0.00
7,190.00	90.50	357.29	3,067.43	4,308.10	-203.72	4,312.91	0.00	0.00	0.00
7,200.00	90.50	357.29	3,067.35	4,318.08	-204.20	4,322.91	0.00	0.00	0.00
7,210.00	90.50	357.29	3,067.26	4,328.07	-204.67	4,332.91	0.00	0.00	0.00
7,220.00	90.50	357.29	3,067.17	4,338.06	-205.14	4,342.91	0.00	0.00	0.00
7,230.00	90.50	357.29	3,067.08	4,348.05	-205.61	4,352.91	0.00	0.00	0.00
7,240.00	90.50	357.29	3,067.00	4,358.04	-206.08	4,362.91	0.00	0.00	0.00
7,250.00	90.50	357.29	3,066.91	4,368.03	-206.56	4,372.91	0.00	0.00	0.00
7,260.00	90.50	357.29	3,066.82	4,378.01	-207.03	4,382.91	0.00	0.00	0.00
7,270.00	90.50	357.29	3,066.74	4,388.00	-207.50	4,392.91	0.00	0.00	0.00
7,280.00	90.50	357.29	3,066.65	4,397.99	-207.97	4,402.91	0.00	0.00	0.00
7,290.00	90.50	357.29	3,066.56	4,407.98	-208.45	4,412.91	0.00	0.00	0.00
7,300.00	90.50	357.29	3,066.47	4,417.97	-208.92	4,422.91	0.00	0.00	0.00
7,310.00	90.50	357.29	3,066.39	4,427.96	-209.39	4,432.91	0.00	0.00	0.00
7,320.00	90.50	357.29	3,066.30	4,437.95	-209.86	4,442.90	0.00	0.00	0.00
7,330.00	90.50	357.29	3,066.21	4,447.93	-210.34	4,452.90	0.00	0.00	0.00
7,340.00	90.50	357.29	3,066.12	4,457.92	-210.81	4,462.90	0.00	0.00	0.00



Phoenix Technology Services
Planning Report



Database: GCR DB
Company: COG Operating LLC
Project: Eddy County, New Mexico (NAD 27 NME)
Site: Bradley 8 Fee
Well: #2H
Wellbore: Wellbore #1 / Job #1310409
Design: Plan #2 04-04-13

Local Co-ordinate Reference:
TVD Reference: KB @ 3386.00usft (JW 4)
MD Reference: KB @ 3386.00usft (JW 4)
North Reference: Grid
Survey Calculation Method: Minimum Curvature

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)
7,350.00	90.50	357.29	3,066.04	4,467.91	-211.28	4,472.90	0.00	0.00	0.00
7,360.00	90.50	357.29	3,065.95	4,477.90	-211.75	4,482.90	0.00	0.00	0.00
7,370.00	90.50	357.29	3,065.86	4,487.89	-212.22	4,492.90	0.00	0.00	0.00
7,380.00	90.50	357.29	3,065.78	4,497.88	-212.70	4,502.90	0.00	0.00	0.00
7,390.00	90.50	357.29	3,065.69	4,507.86	-213.17	4,512.90	0.00	0.00	0.00
7,400.00	90.50	357.29	3,065.60	4,517.85	-213.64	4,522.90	0.00	0.00	0.00
7,410.00	90.50	357.29	3,065.51	4,527.84	-214.11	4,532.90	0.00	0.00	0.00
7,420.00	90.50	357.29	3,065.43	4,537.83	-214.59	4,542.90	0.00	0.00	0.00
7,430.00	90.50	357.29	3,065.34	4,547.82	-215.06	4,552.90	0.00	0.00	0.00
7,440.00	90.50	357.29	3,065.25	4,557.81	-215.53	4,562.90	0.00	0.00	0.00
7,450.00	90.50	357.29	3,065.16	4,567.80	-216.00	4,572.90	0.00	0.00	0.00
7,460.00	90.50	357.29	3,065.08	4,577.78	-216.48	4,582.90	0.00	0.00	0.00
7,470.00	90.50	357.29	3,064.99	4,587.77	-216.95	4,592.90	0.00	0.00	0.00
7,480.00	90.50	357.29	3,064.90	4,597.76	-217.42	4,602.90	0.00	0.00	0.00
7,490.00	90.50	357.29	3,064.82	4,607.75	-217.89	4,612.90	0.00	0.00	0.00
7,500.00	90.50	357.29	3,064.73	4,617.74	-218.37	4,622.90	0.00	0.00	0.00
7,510.00	90.50	357.29	3,064.64	4,627.73	-218.84	4,632.90	0.00	0.00	0.00
7,520.00	90.50	357.29	3,064.55	4,637.71	-219.31	4,642.90	0.00	0.00	0.00
7,530.00	90.50	357.29	3,064.47	4,647.70	-219.78	4,652.90	0.00	0.00	0.00
7,540.00	90.50	357.29	3,064.38	4,657.69	-220.25	4,662.90	0.00	0.00	0.00
7,550.00	90.50	357.29	3,064.29	4,667.68	-220.73	4,672.90	0.00	0.00	0.00
7,560.00	90.50	357.29	3,064.20	4,677.67	-221.20	4,682.90	0.00	0.00	0.00
7,570.00	90.50	357.29	3,064.12	4,687.66	-221.67	4,692.90	0.00	0.00	0.00
7,580.00	90.50	357.29	3,064.03	4,697.65	-222.14	4,702.89	0.00	0.00	0.00
7,590.00	90.50	357.29	3,063.94	4,707.63	-222.62	4,712.89	0.00	0.00	0.00
7,600.00	90.50	357.29	3,063.86	4,717.62	-223.09	4,722.89	0.00	0.00	0.00
7,610.00	90.50	357.29	3,063.77	4,727.61	-223.56	4,732.89	0.00	0.00	0.00
7,620.00	90.50	357.29	3,063.68	4,737.60	-224.03	4,742.89	0.00	0.00	0.00
7,630.00	90.50	357.29	3,063.59	4,747.59	-224.51	4,752.89	0.00	0.00	0.00
7,640.00	90.50	357.29	3,063.51	4,757.58	-224.98	4,762.89	0.00	0.00	0.00
7,650.00	90.50	357.29	3,063.42	4,767.56	-225.45	4,772.89	0.00	0.00	0.00
7,660.00	90.50	357.29	3,063.33	4,777.55	-225.92	4,782.89	0.00	0.00	0.00
7,670.00	90.50	357.29	3,063.24	4,787.54	-226.39	4,792.89	0.00	0.00	0.00
7,680.00	90.50	357.29	3,063.16	4,797.53	-226.87	4,802.89	0.00	0.00	0.00
7,690.00	90.50	357.29	3,063.07	4,807.52	-227.34	4,812.89	0.00	0.00	0.00
7,700.00	90.50	357.29	3,062.98	4,817.51	-227.81	4,822.89	0.00	0.00	0.00
7,710.00	90.50	357.29	3,062.90	4,827.50	-228.28	4,832.89	0.00	0.00	0.00
7,720.00	90.50	357.29	3,062.81	4,837.48	-228.76	4,842.89	0.00	0.00	0.00
7,720.92	90.50	357.29	3,062.80	4,838.40	-228.80	4,843.81	0.00	0.00	0.00

TD at 7720.92 - PBHL-Bradley 8 #2H



Phoenix Technology Services
Planning Report



Database:	GCR DB	Local Co-ordinate Reference:	Well #2H
Company:	COG Operating LLC.	TVD Reference:	KB @ 3386.00usft (JW 4)
Project:	Eddy County, New Mexico (NAD 27 NME)	MD Reference:	KB @ 3386.00usft (JW 4)
Site:	Bradley 8 Fee	North Reference:	Grid
Well:	#2H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1 / Job #1310409		
Design:	Plan #2 04-04-13		

Design Targets									
Target Name	Dip Angle	Dip Dir.	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
- hit/miss target	(°)	(°)	(usft)	(usft)	(usft)	(usft)	(usft)		
- Shape									
PP-Bradley 8 #2H	0.00	0.00	2,973.65	180.00	-8.51	606,984.80	477,609.99	32° 40' 7.250110 N 104° 24' 21.936179 W	
- plan hits target center									
- Point									
PBHL-Bradley 8 #2H	0.00	360.00	3,062.80	4,838.40	-228.80	611,643.20	477,389.70	32° 40' 53.346540 N 104° 24' 24.551019 W	
- plan hits target center									
- Point									

Formations					
Measured Depth	Vertical Depth	Name	Lithology	Dip	Dip Direction
(usft)	(usft)			(°)	(°)
3,393.80	3,100.49	TL, 3105' TVD @ 90.5° Inc, 0.0 VS		-0.50	358.47

Plan Annotations				
Measured Depth	Vertical Depth	Local Coordinates		Comment
(usft)	(usft)	+N/-S (usft)	+E/-W (usft)	
2,579.64	2,579.64	0.00	0.00	KOP Start Build 11.00
3,402.36	3,100.49	524.83	-24.82	LP Start 4318.56 hold at 3402.36 MD
7,720.92	3,062.80	4,838.40	-228.80	TD at 7720.92



Project: Eddy County, New Mexico (NAD 27 NME)
Site: Bradley 8 Fee
Well: #2H
Wellbore: Wellbore #1 / Job #1310409
Design: Plan #2 04-04-13



PHOENIX
TECHNOLOGY SERVICES



Azimuths to Grid North
True North: 0.04°
Magnetic North: 7.82°
Magnetic Field
Strength: 48510.45nT
Dip Angle: 60.41°
Date: 04/05/2013
Model: IGRF2010_14

WELL DETAILS

	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
Ground Level:			3374.00			
	0.00	0.00	606804.80	477618.50	32° 40' 5.468948 N	104° 24' 21.835157 W

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	IFace	VSet	Target	Annotation
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	2579.64	0.00	0.00	2579.64	0.00	0.00	0.00	0.00	0.00	0.00	KOP Start Build 11.00
3	3402.36	90.50	357.29	3100.49	524.83	-24.82	11.00	357.29	525.42		LP Start 4318.56 hold at 3402.36 MD
4	7720.92	90.50	357.29	3062.80	4838.40	-228.80	0.00	0.00	4843.81	PBHL-Bradley 8 #2H	TD at 7720.92

DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Shape
PP-Bradley 8 #2H	2573.65	160.00	-8.51	606984.80	477609.99	32° 40' 7.250110 N	104° 24' 21.936179 W	Point
plan hits target center				3062.80	4838.40			
PBHL-Bradley 8 #2H			-228.80	611643.20	477389.70	32° 40' 53.346540 N	104° 24' 24.551019 W	Point
plan hits target center								

SITE DETAILS: Bradley 8 Fee

Site Centre Northing: 606797.50
Easting: 478847.80

Positional Uncertainty: 0.00
Convergence: -0.04
Local North: Grid

Map System: US State Plane 1927 (Exact solution)
Datum: NAD 1927 (NADCON CONUS)
Ellipsoid: Clarke 1866
Zone Name: New Mexico East 3001

Local Origin: Well #2H, Grid North

Latitude: 32° 40' 5.468948 N
Longitude: 104° 24' 21.835157 W

Grid East: 477618.50
Grid North: 606804.80
Scale Factor: 1.000

Geomagnetic Model: IGRF2010_14
Sample Date: 05-Apr-13
Magnetic Declination: 7.78°
Dip Angle from Horizontal: 60.41°
Magnetic Field Strength: 48510

To convert a Magnetic Direction to a Grid Direction, Add 7.82°
To convert a Magnetic Direction to a True Direction, Add 7.78° East
To convert a True Direction to a Grid Direction, Add 0.04°

PROJECT DETAILS: Eddy County, New Mexico (NAD 27 NME)

Geodetic System: US State Plane 1927 (Exact solution)
Datum: NAD 1927 (NADCON CONUS)
Ellipsoid: Clarke 1866
Zone: New Mexico East 3001

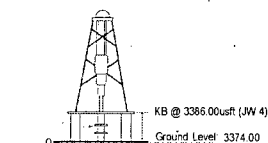
System Datum: Mean Sea Level

FORMATION TOP DETAILS

TVDPath	MDPath	Formation	DipAngle	DipDir
3100.49	3393.80	TL 3105 TVD @ 90.5° Inc. 0.0 VS	-0.50	358.47

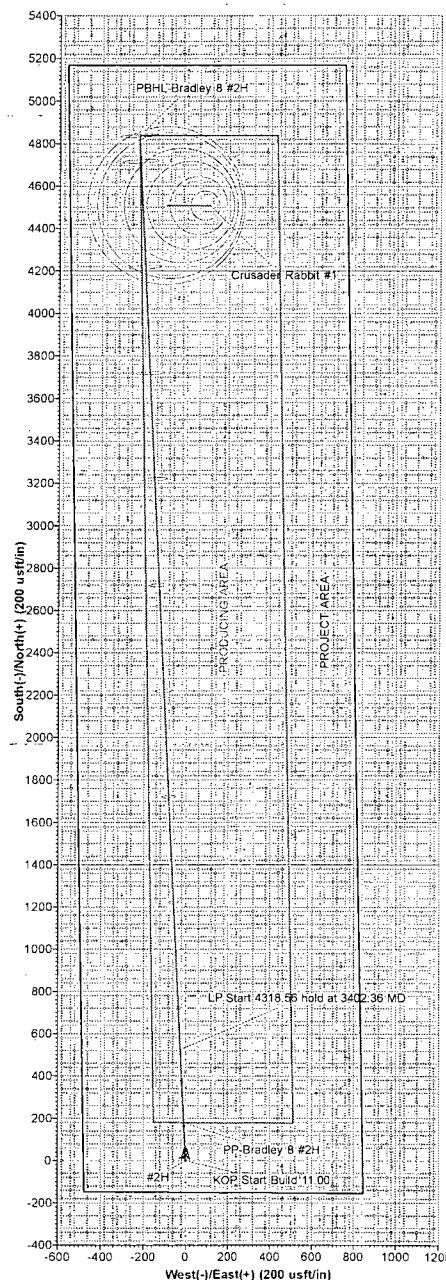
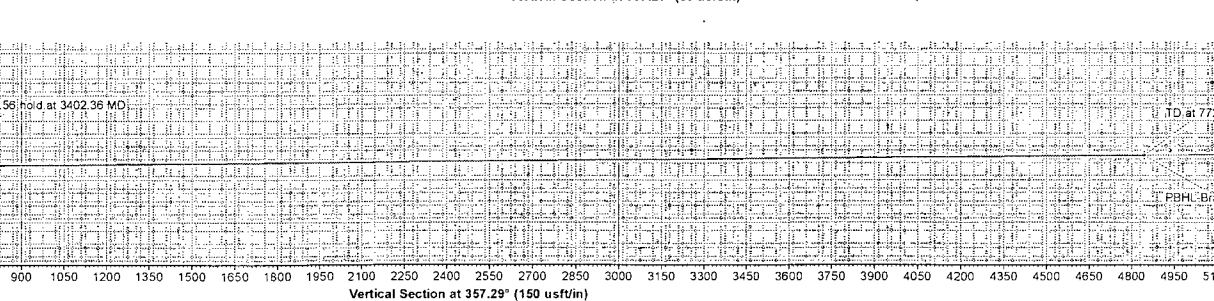
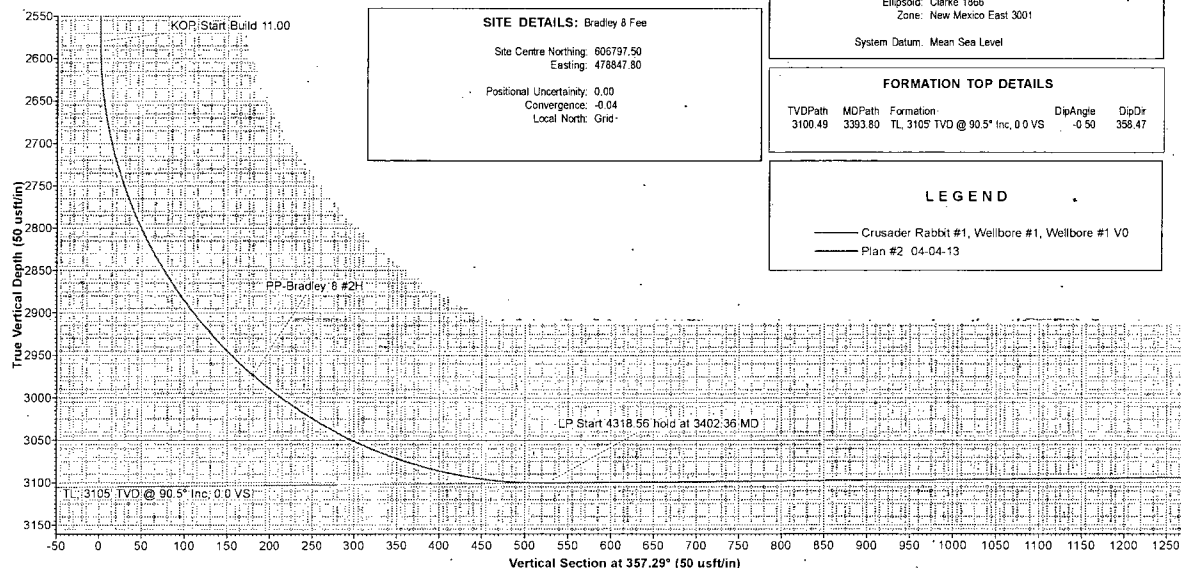
LEGEND

— Crusader Rabbit #1, Wellbore #1, Wellbore #1 V0
— Plan #2 04-04-13



KB @ 3386.00usft (JW 4)

Ground Level 3374.00





COG Operating LLC

Eddy County, New Mexico (NAD 27 NME)

Bradley 8 Fee

#2H

Wellbore #1 / Job #1310409

Plan #2 04-04-13

Anticollision Report

05 April, 2013



PHOENIX
TECHNOLOGY SERVICES



Phoenix Technology Services
Anticollision Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well #2H
Project:	Eddy County, New Mexico (NAD 27 NME)	TVD Reference:	KB @ 3386.00usft (JW 4)
Reference Site:	Bradley 8 Fee	MD Reference:	KB @ 3386.00usft (JW 4)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	#2H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2:00 sigma
Reference Wellbore	Wellbore #1 / Job #1310409	Database:	GCR DB
Reference Design:	Plan #2 04-04-13	Offset TVD Reference:	Offset Datum

Reference	Plan #2 04-04-13		
Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
Interpolation Method:	Stations	Error Model:	ISCWSA
Depth Range:	Unlimited	Scan Method:	Closest Approach 3D
Results Limited by:	Maximum center-center distance of 9,999.98 usft	Error Surface:	Circular Conic
Warning Levels Evaluated at:	2.00 Sigma	Casing Method:	Not applied

Survey Tool Program		Date	04/05/13	
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
0.00	7,720.92	Plan #2 04-04-13 (Wellbore #1 / Job #131	MWD	MWD - Standard

Summary	Reference Measured Depth (usft)	Offset Measured Depth (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Separation Factor	Warning
Site Name						
Offset Well - Wellbore - Design						
Bradley 8 Fee						
Crusader Rabbit #1 - Wellbore #1 - Wellbore #1	7,377.41	3,073.54	272.36	73.41	1.369	Level 3, CC, ES, SF

Offset Design		Bradley 8 Fee - Crusader Rabbit #1 - Wellbore #1 - Wellbore #1										Offset Site Error:		0.00 usft
Survey Program:		370-UNKNOWN										Offset Well Error:		0.00 usft
Reference		Offset		Semi Major Axis			Distance							
Measured	Vertical	Measured	Vertical	Reference	Offset	Highside	Offset Wellbore Centre		Between	Between	Minimum	Separation	Warning	
Depth (usft)	Depth (usft)	Depth (usft)	Depth (usft)			Toolface (°)	+N/-S (usft)	+E/-W (usft)	Centres (usft)	Ellipses (usft)	Separation (usft)	Factor		
0.00	0.00	1.00	1.00	0.00	0.02	1.34	4,508.20	105.50	4,509.43					
100.00	100.00	101.38	101.38	0.10	2.03	1.34	4,508.20	105.32	4,509.43	4,507.30	2.13	2,119.301		
200.00	200.00	201.75	201.75	0.32	4.04	1.33	4,508.20	104.78	4,509.42	4,505.06	4.36	1,034.006		
300.00	300.00	302.12	302.11	0.55	6.05	1.32	4,508.20	103.89	4,509.40	4,502.80	6.59	683.829		
400.00	400.00	402.36	402.34	0.77	8.70	1.30	4,508.20	102.65	4,509.37	4,499.90	9.47	476.044		
500.00	500.00	502.35	502.33	1.00	12.70	1.29	4,508.20	101.35	4,509.34	4,495.64	13.70	329.164		
600.00	600.00	602.34	602.31	1.22	16.70	1.27	4,508.20	100.04	4,509.31	4,491.38	17.93	251.550		
700.00	700.00	702.33	702.29	1.45	20.71	1.25	4,508.20	98.73	4,509.28	4,487.13	22.15	203.553		
800.00	800.00	802.32	802.28	1.67	24.71	1.24	4,508.20	97.42	4,509.25	4,482.87	26.38	170.936		
900.00	900.00	902.40	902.34	1.90	28.71	1.22	4,508.20	96.06	4,509.22	4,478.61	30.61	147.309		
1,000.00	1,000.00	1,002.47	1,002.41	2.12	32.72	1.20	4,508.20	94.62	4,509.19	4,474.35	34.84	129.420		
1,100.00	1,100.00	1,102.54	1,102.46	2.35	36.73	1.18	4,508.20	93.09	4,509.16	4,470.09	39.07	115.406		
1,200.00	1,200.00	1,202.61	1,202.52	2.57	40.73	1.16	4,508.20	91.47	4,509.13	4,465.83	43.30	104.130		
1,300.00	1,300.00	1,302.67	1,302.56	2.80	44.74	1.14	4,508.20	89.77	4,509.09	4,461.56	47.53	94.862		
1,400.00	1,400.00	1,402.53	1,402.41	3.02	48.73	1.12	4,508.20	88.10	4,509.06	4,457.31	51.76	87.123		
1,500.00	1,500.00	1,502.39	1,502.25	3.25	52.73	1.10	4,508.20	86.58	4,509.03	4,453.05	55.98	80.550		
1,600.00	1,600.00	1,602.26	1,602.12	3.47	56.73	1.08	4,508.20	85.21	4,509.01	4,448.80	60.20	74.900		
1,700.00	1,700.00	1,702.25	1,702.10	3.70	60.73	1.07	4,508.20	83.90	4,508.98	4,444.55	64.43	69.986		
1,800.00	1,800.00	1,802.24	1,802.08	3.92	64.73	1.05	4,508.20	82.59	4,508.96	4,440.30	68.65	65.677		
1,900.00	1,900.00	1,902.23	1,902.06	4.14	68.74	1.03	4,508.20	81.28	4,508.93	4,436.05	72.88	61.867		
2,000.00	2,000.00	2,002.29	2,002.11	4.37	72.74	1.02	4,508.20	79.94	4,508.91	4,431.80	77.11	58.473		
2,100.00	2,100.00	2,102.34	2,102.16	4.59	76.75	1.00	4,508.20	78.50	4,508.88	4,427.54	81.34	55.432		
2,200.00	2,200.00	2,202.40	2,202.20	4.82	80.75	0.98	4,508.20	76.99	4,508.86	4,423.29	85.57	52.691		
2,300.00	2,300.00	2,302.45	2,302.24	5.04	84.76	0.96	4,508.20	75.38	4,508.83	4,419.03	89.80	50.209		
2,400.00	2,400.00	2,402.50	2,402.28	5.27	88.76	0.94	4,508.20	73.69	4,508.80	4,414.77	94.03	47.950		
2,500.00	2,500.00	2,502.56	2,502.32	5.49	92.77	0.91	4,508.20	71.90	4,508.77	4,410.51	98.26	45.885		

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation



Phoenix Technology Services
Anticollision Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well #2H
Project:	Eddy County, New Mexico (NAD 27 NME)	TVD Reference:	KB @ 3386.00usft (JW 4)
Reference Site:	Bradley 8 Fee	MD Reference:	KB @ 3386.00usft (JW 4)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	#2H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1 / Job #1310409	Database:	GCR DB
Reference Design:	Plan #2 04-04-13	Offset TVD Reference:	Offset Datum

Offset Design														Offset Site Error:	0.00 usft
Survey Program: 370-UNKNOWN														Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Tooface (")	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning		
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/S (usft)	+E/W (usft)	Between Centres (usft)	Between Ellipses (usft)					
2,579.64	2,579.64	2,582.24	2,581.99	5.67	95.96	0.89	4,508.20	70.40	4,508.75	4,407.12	101.63	44.363			
2,600.00	2,599.99	2,602.62	2,602.36	5.72	96.78	3.60	4,508.20	70.01	4,508.35	4,405.85	102.50	43.986			
2,650.00	2,649.79	2,652.44	2,652.17	5.84	98.77	3.62	4,508.20	69.03	4,503.99	4,399.39	104.61	43.056			
2,700.00	2,698.93	2,701.62	2,701.34	5.96	100.74	3.68	4,508.20	68.03	4,494.90	4,388.19	106.70	42.126			
2,750.00	2,746.98	2,749.70	2,749.42	6.09	102.67	3.78	4,508.20	67.03	4,481.14	4,372.38	108.76	41.204			
2,800.00	2,793.48	2,796.25	2,795.95	6.22	104.53	3.93	4,508.20	66.04	4,462.85	4,352.10	110.75	40.297			
2,850.00	2,838.02	2,840.85	2,840.54	6.35	106.32	4.13	4,508.20	65.07	4,440.20	4,327.53	112.67	39.409			
2,900.00	2,880.18	2,883.09	2,882.77	6.53	108.01	4.40	4,508.20	64.11	4,413.39	4,298.84	114.54	38.530			
2,950.00	2,919.57	2,922.57	2,922.24	6.77	109.59	4.76	4,508.20	63.18	4,382.67	4,266.30	116.36	37.663			
3,000.00	2,955.83	2,958.92	2,958.57	7.07	111.05	5.24	4,508.20	62.29	4,348.32	4,230.21	118.12	36.814			
3,050.00	2,988.63	2,991.80	2,991.45	7.43	112.37	5.88	4,508.20	61.46	4,310.67	4,190.88	119.79	35.984			
3,100.00	3,017.66	3,020.88	3,020.52	7.85	113.53	6.77	4,508.20	60.70	4,270.06	4,148.67	121.39	35.177			
3,150.00	3,042.66	3,045.84	3,045.47	8.35	114.53	8.05	4,508.20	60.07	4,226.86	4,103.97	122.88	34.398			
3,200.00	3,063.39	3,066.55	3,066.17	8.91	115.36	10.00	4,508.20	59.57	4,181.47	4,057.20	124.27	33.649			
3,250.00	3,079.67	3,082.82	3,082.44	9.52	116.01	13.27	4,508.20	59.19	4,134.30	4,008.77	125.54	32.933			
3,300.00	3,091.35	3,094.50	3,094.12	10.19	116.48	19.69	4,508.20	58.93	4,085.81	3,959.14	126.67	32.255			
3,350.00	3,098.31	3,101.49	3,101.10	10.90	116.76	36.48	4,508.20	58.77	4,036.42	3,908.77	127.66	31.620			
3,402.36	3,100.49	3,103.71	3,103.32	11.67	116.85	97.66	4,508.20	58.72	3,984.25	3,855.73	128.52	31.002			
3,500.00	3,099.63	3,102.96	3,102.58	13.17	116.82	97.50	4,508.20	58.74	3,886.85	3,756.85	129.99	29.901			
3,600.00	3,098.76	3,102.20	3,101.81	14.78	116.79	97.34	4,508.20	58.76	3,787.10	3,655.53	131.57	28.783			
3,700.00	3,097.89	3,101.43	3,101.05	16.45	116.76	97.19	4,508.20	58.77	3,687.37	3,554.16	133.21	27.682			
3,800.00	3,097.02	3,100.67	3,100.28	18.15	116.73	97.03	4,508.20	58.79	3,587.65	3,452.78	134.87	26.600			
3,900.00	3,096.14	3,099.90	3,099.52	19.87	116.70	96.87	4,508.20	58.81	3,487.95	3,351.38	136.57	25.540			
4,000.00	3,095.27	3,098.14	3,098.75	21.62	116.67	96.71	4,508.20	58.82	3,388.27	3,249.98	138.29	24.502			
4,100.00	3,094.40	3,098.38	3,097.99	23.38	116.64	96.55	4,508.20	58.84	3,288.61	3,148.59	140.02	23.487			
4,200.00	3,093.53	3,097.61	3,097.23	25.16	116.61	96.39	4,508.20	58.86	3,188.96	3,047.20	141.76	22.495			
4,300.00	3,092.65	3,096.85	3,096.47	26.94	116.57	96.23	4,508.20	58.87	3,089.34	2,945.83	143.52	21.526			
4,400.00	3,091.78	3,096.09	3,095.70	28.74	116.54	96.07	4,508.20	58.89	2,989.75	2,844.47	145.28	20.579			
4,500.00	3,090.91	3,095.33	3,094.94	30.54	116.51	95.91	4,508.20	58.91	2,890.18	2,743.13	147.05	19.654			
4,600.00	3,090.03	3,094.56	3,094.18	32.35	116.48	95.75	4,508.20	58.93	2,790.65	2,641.82	148.83	18.751			
4,700.00	3,089.16	3,093.80	3,093.42	34.16	116.45	95.59	4,508.20	58.94	2,691.14	2,540.53	150.61	17.868			
4,800.00	3,088.29	3,093.04	3,092.66	35.97	116.42	95.43	4,508.20	58.96	2,591.68	2,439.29	152.40	17.006			
4,900.00	3,087.42	3,092.28	3,091.90	37.79	116.39	95.27	4,508.20	58.98	2,492.26	2,338.08	154.18	16.164			
5,000.00	3,086.54	3,091.52	3,091.14	39.61	116.36	95.12	4,508.20	58.99	2,392.89	2,236.91	155.98	15.341			
5,100.00	3,085.67	3,090.76	3,090.38	41.44	116.33	94.96	4,508.20	59.01	2,293.57	2,135.80	157.77	14.537			
5,200.00	3,084.80	3,090.00	3,089.62	43.27	116.30	94.80	4,508.20	59.03	2,194.31	2,034.74	159.57	13.752			
5,300.00	3,083.93	3,089.24	3,088.86	45.09	116.27	94.64	4,508.20	59.05	2,095.12	1,933.76	161.36	12.984			
5,400.00	3,083.05	3,088.48	3,088.10	46.92	116.24	94.48	4,508.20	59.06	1,996.02	1,832.85	163.16	12.233			
5,500.00	3,082.18	3,087.72	3,087.34	48.76	116.21	94.32	4,508.20	59.08	1,897.00	1,732.04	164.97	11.499			
5,600.00	3,081.31	3,086.96	3,086.58	50.59	116.18	94.16	4,508.20	59.10	1,798.10	1,631.33	166.77	10.782			
5,700.00	3,080.44	3,086.21	3,085.82	52.43	116.15	94.00	4,508.20	59.11	1,699.32	1,530.75	168.57	10.081			
5,800.00	3,079.56	3,085.45	3,085.07	54.26	116.12	93.84	4,508.20	59.13	1,600.70	1,430.32	170.38	9.395			
5,900.00	3,078.69	3,084.69	3,084.31	56.10	116.09	93.68	4,508.20	59.15	1,502.26	1,330.07	172.19	8.725			
6,000.00	3,077.82	3,083.93	3,083.55	57.94	116.06	93.52	4,508.20	59.17	1,404.03	1,230.04	173.99	8.069			
6,100.00	3,076.95	3,083.18	3,082.79	59.77	116.03	93.37	4,508.20	59.18	1,306.08	1,130.28	175.80	7.429			
6,200.00	3,076.07	3,082.42	3,082.04	61.61	116.00	93.21	4,508.20	59.20	1,208.46	1,030.85	177.61	6.804			
6,300.00	3,075.20	3,081.66	3,081.28	63.45	115.97	93.05	4,508.20	59.22	1,111.27	931.85	179.42	6.194			
6,400.00	3,074.33	3,080.91	3,080.53	65.29	115.94	92.89	4,508.20	59.24	1,014.62	833.39	181.23	5.598			
6,500.00	3,073.45	3,080.15	3,079.77	67.14	115.91	92.73	4,508.20	59.25	918.68	735.64	183.04	5.019			
6,600.00	3,072.58	3,079.40	3,079.02	68.98	115.88	92.57	4,508.20	59.27	823.71	638.86	184.85	4.456			
6,700.00	3,071.71	3,078.64	3,078.26	70.82	115.85	92.41	4,508.20	59.29	730.09	543.42	186.66	3.911			
6,800.00	3,070.84	3,077.89	3,077.51	72.66	115.82	92.25	4,508.20	59.31	638.40	449.92	188.48	3.387			

CC - Min centre to center distance or covergent point, SF - min separation factor, ES - min ellipse separation



Phoenix Technology Services
Anticollision Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well #2H
Project:	Eddy County, New Mexico (NAD 27 NME)	TVD Reference:	KB @ 3386.00usft (JW 4)
Reference Site:	Bradley 8 Fee	MD Reference:	KB @ 3386.00usft (JW 4)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	#2H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1 / Job #1310409	Database:	GCR DB
Reference Design:	Plan #2 04-04-13	Offset TVD Reference:	Offset Datum

Offset Design													Offset Site Error:		0.00 usft
Survey Program: 370-UNKNOWN													Offset Well Error:		0.00 usft
Reference		Offset		Semi Major Axis			Distance							Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor			
6,900.00	3,069.96	3,077.13	3,076.75	74.51	115.78	92.09	4,508.20	59.32	549.62	359.33	190.29	2.888			
7,000.00	3,069.09	3,076.38	3,076.00	76.35	115.75	91.94	4,508.20	59.34	465.41	273.31	192.10	2.423			
7,100.00	3,068.22	3,075.63	3,075.25	78.19	115.72	91.78	4,508.20	59.36	388.75	194.84	193.92	2.005			
7,200.00	3,067.35	3,074.87	3,074.49	80.04	115.69	91.62	4,508.20	59.38	325.04	129.31	195.73	1.661			
7,300.00	3,066.47	3,074.12	3,073.74	81.88	115.66	91.46	4,508.20	59.39	283.15	85.60	197.55	1.433	Level 3		
7,377.41	3,065.80	3,073.54	3,073.16	83.31	115.64	91.34	4,508.20	59.41	272.36	73.41	198.95	1.369	Level 3, CC, ES, SF		
7,400.00	3,065.60	3,073.37	3,072.99	83.73	115.63	91.30	4,508.20	59.41	273.30	73.94	199.36	1.371	Level 3		
7,500.00	3,064.73	3,072.61	3,072.24	85.57	115.60	91.14	4,508.20	59.43	298.68	97.51	201.18	1.485	Level 3		
7,600.00	3,063.86	3,071.86	3,071.48	87.42	115.57	90.99	4,508.20	59.45	351.75	148.76	202.99	1.733			
7,700.00	3,062.98	3,071.11	3,070.73	89.26	115.54	90.83	4,508.20	59.46	422.19	217.38	204.81	2.061			
7,720.92	3,062.80	3,070.95	3,070.58	89.65	115.54	90.79	4,508.20	59.47	438.38	233.19	205.19	2.136			

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation



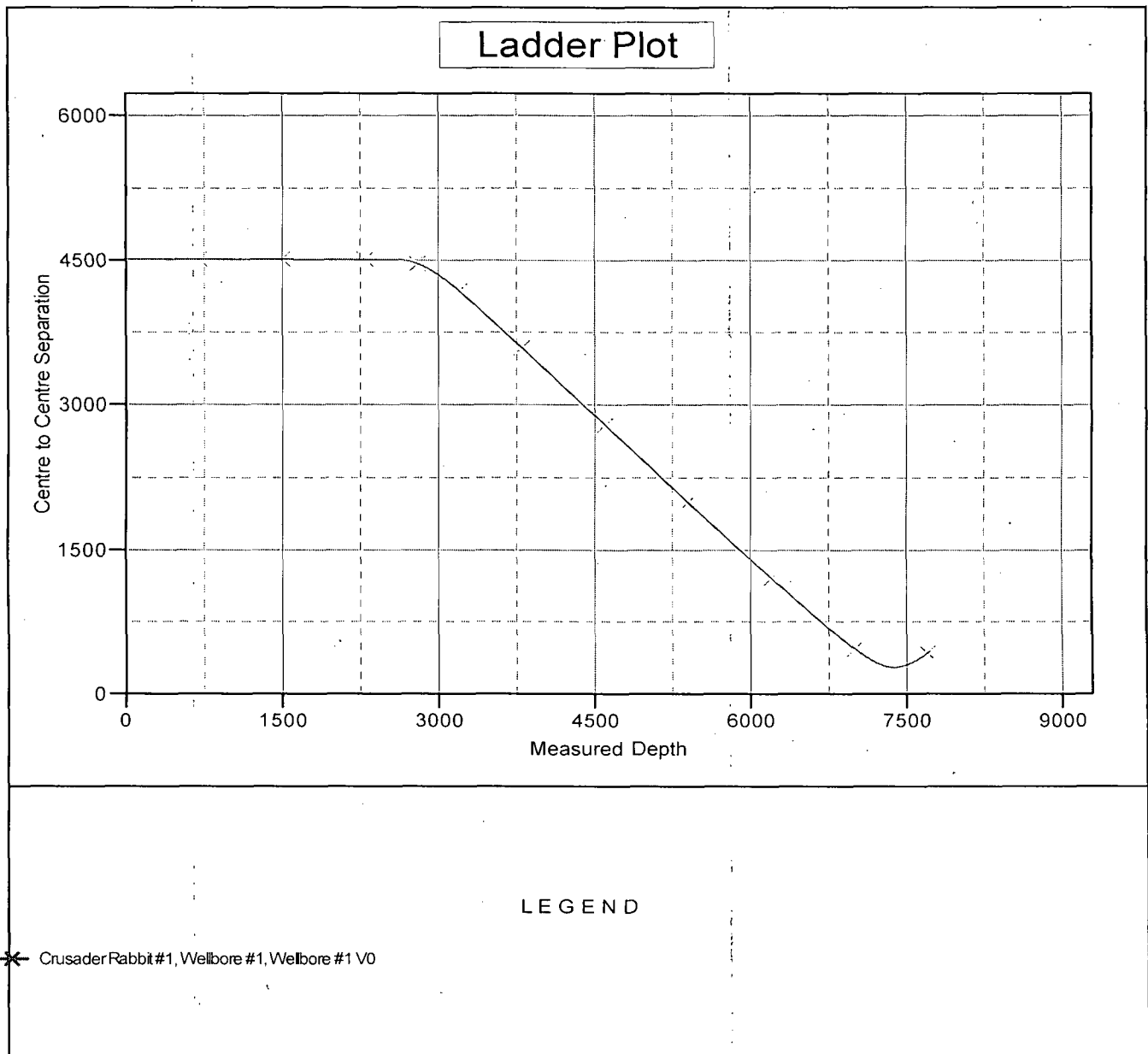
Phoenix Technology Services
Anticollision Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well #2H
Project:	Eddy County, New Mexico (NAD 27 NME)	TVD Reference:	KB @ 3386.00usft (JW 4)
Reference Site:	Bradley 8 Fee	MD Reference:	KB @ 3386.00usft (JW 4)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	#2H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1 / Job #1310409	Database:	GCR DB
Reference Design:	Plan #2 04-04-13	Offset TVD Reference:	Offset Datum

Reference Depths are relative to KB @ 3386.00usft (JW 4)
Offset Depths are relative to Offset Datum
Central Meridian is 104° 19' 60.000000 W

Coordinates are relative to: #2H
Coordinate System is US State Plane 1927 (Exact solution), New Mexico East 30
Grid Convergence at Surface is: -0.04°



CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation



Phoenix Technology Services
Anticollision Report



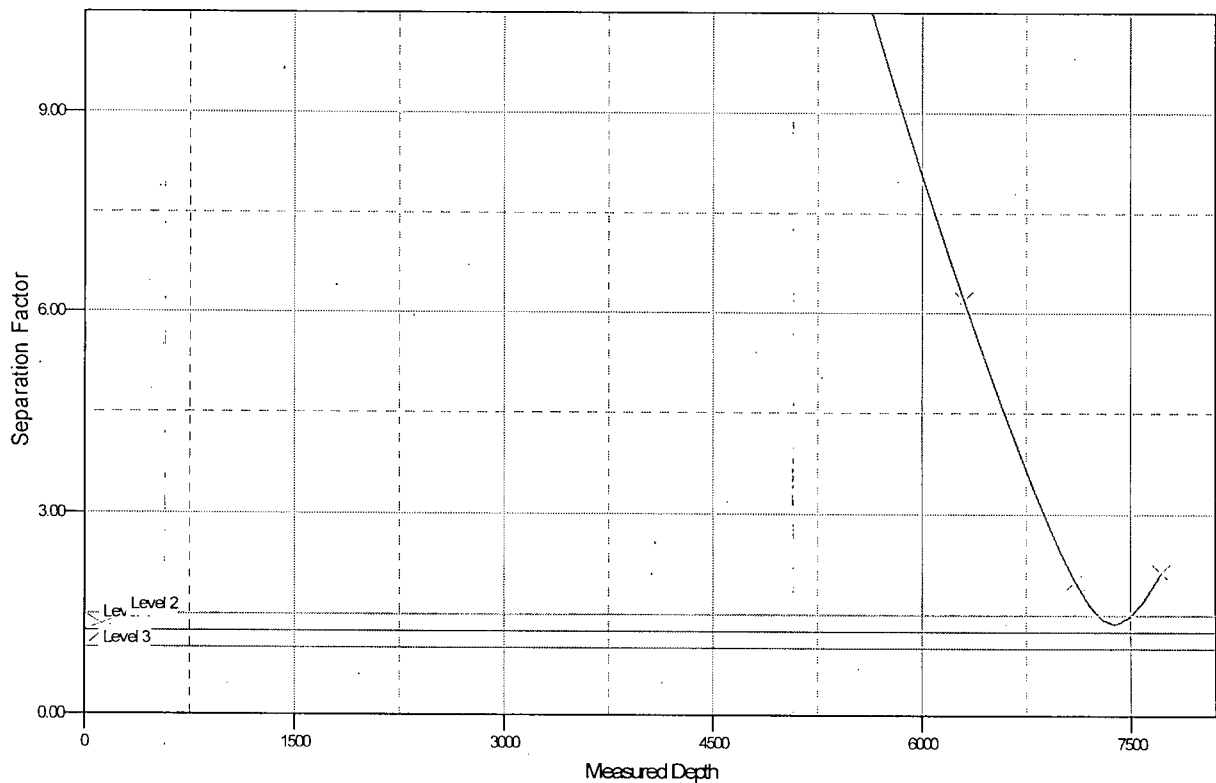
Company: COG Operating LLC
Project: Eddy County, New Mexico (NAD 27 NME)
Reference Site: Bradley 8 Fee
Site Error: 0.00 usft
Reference Well: #2H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1 / Job #1310409
Reference Design: Plan #2 04-04-13

Local Co-ordinate Reference: Well #2H
TVD Reference: KB @ 3386.00usft (JW 4)
MD Reference: KB @ 3386.00usft (JW 4)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: GCR DB
Offset TVD Reference: Offset Datum

Reference Depths are relative to KB @ 3386.00usft (JW 4)
Offset Depths are relative to Offset Datum
Central Meridian is 104° 19' 60.000000 W

Coordinates are relative to: #2H
Coordinate System is US State Plane 1927 (Exact solution), New Mexico East 30
Grid Convergence at Surface is: -0.04°

Separation Factor Plot



LEGEND

* Crusader Rabbit #1, Wellbore #1, Wellbore #1 V0