

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

Form C-103
Revised August 1, 2011

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

WELL API NO. 30-015-43057
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 27H
9. OGRID Number 229137
10. Pool name or Wildcat Wildcat G-01 S192617K;Glor-Yeso 97788

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 **O**: **160** feet from the **SOUTH** line and **1790** feet from the **EAST** line
Section **8** Township **19S** Range **26E** NMPM County **EDDY**

11. Elevation (Show whether DR, RKB, RT, GR, etc.)
3372'

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

NOTICE OF INTENTION TO:	SUBSEQUENT REPORT OF:
PERFORM REMEDIAL WORK ☐	REMEDIAL WORK ☐
TEMPORARILY ABANDON ☐	ALTERING CASING ☐
PULL OR ALTER CASING ☐	COMMENCE DRILLING OPNS. ☐
DOWNHOLE COMMINGLE ☐	P AND A ☐
	CASING/CEMENT JOB ☐
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: 160' FSL & 1790' FEL, Unit O

BHL: 330' FNL & 1650' FEL, Unit B

COG Operating LLC respectfully requests permission to change the SHL:

SHL: 160' FSL & 1850' FEL, Unit O

BHL: 330' FNL & 1650' FEL, Unit B

NM OIL CONSERVATION

ARTESIA DISTRICT

MAY 21 2015

RECEIVED

Reason for changing the SHL is the original location was too close to an existing well.

A revised C-102 and directional plan are attached for your review.

Spud Date:

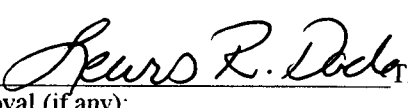
Rig Release Date:

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

SIGNATURE  TITLE **Permitting Tech** DATE **05/19/2015**

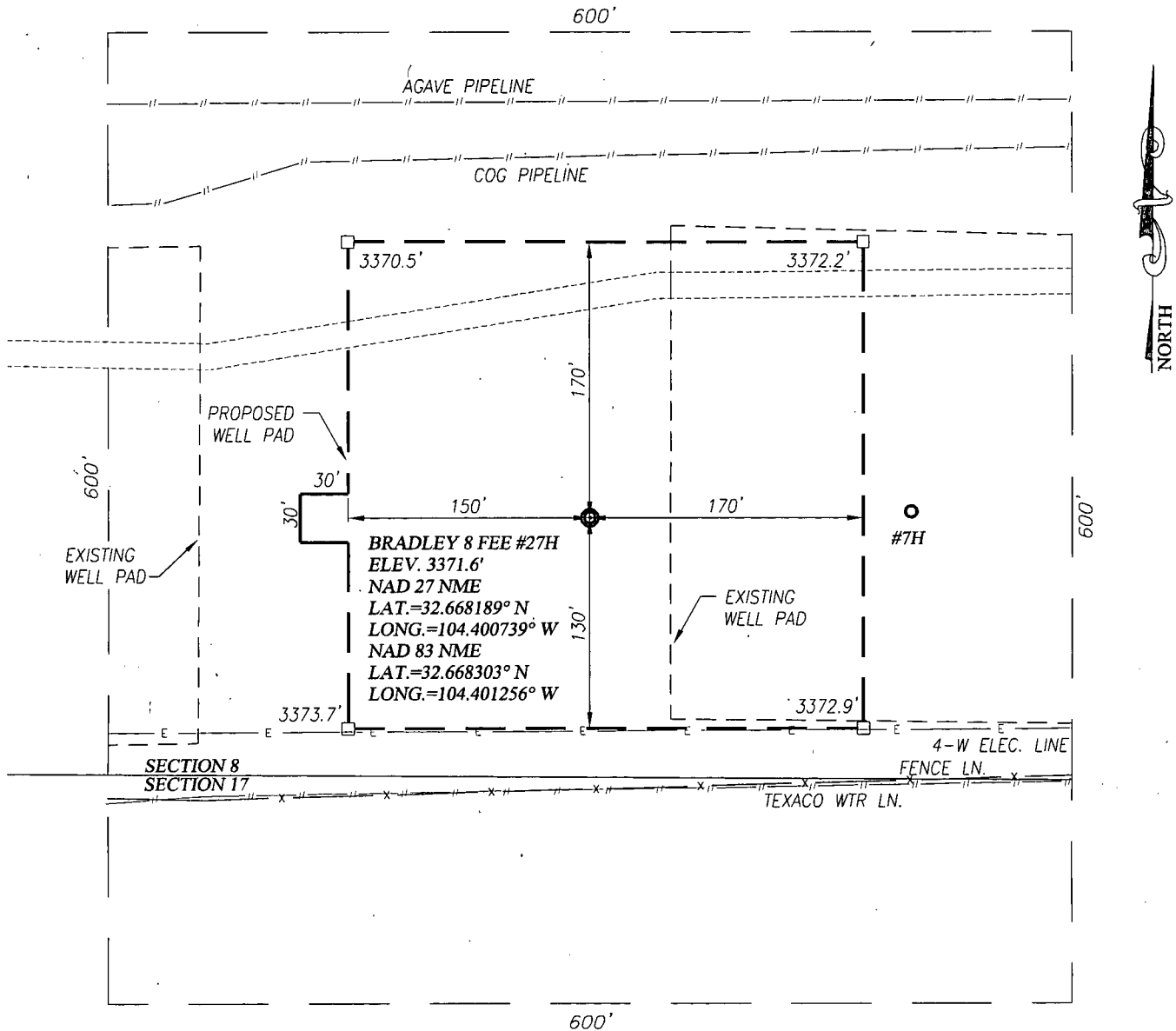
Type or print name **Kelly J. Holly** E-mail address: **kholly@concho.com** PHONE: **432-685-4384**

For State Use Only

APPROVED BY:  TITLE **Dist II Supervisor** DATE **5-22-15**

Conditions of Approval (if any):

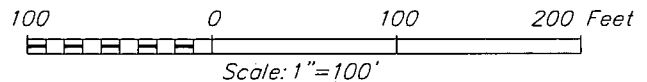
WELL SITE PLAN



NOTE:
1) SEE "TOPOGRAPHIC AND ACCESS
ROAD MAP" FOR PROPOSED ROAD
LOCATION.

DIRECTIONS TO BRADLEY 8 FEE #27H:

FROM THE INTERSECTION OF U.S. HWY. 285 AND CO. RD. 21
ROCKIN R. RED. GO WEST ON CO. RD. 21 APPROX. 0.6 MILES
TURN RIGHT AND GO NORTH APPROX. 0.9 MILES TURN RIGHT
AND GO EAST APPROX. 0.3 MILES TO THIS LOCATION.



COG OPERATING, LLC

**BRADLEY 8 FEE #27H WELL
LOCATED 160 FEET FROM THE SOUTH LINE
AND 1850 FEET FROM THE EAST LINE OF SECTION 8,
TOWNSHIP 19 SOUTH, RANGE 26 EAST, N.M.P.M.,
EDDY COUNTY, NEW MEXICO**

Survey Date: 05/12/15	CAD Date: 5/13/15	Drawn By: LSL
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W.O. No.: 15110568	Rev: . .	Rel. W.O.: 14111378	Sheet 1 of 1
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PROVIDING SURVEYING SERVICES
SINCE 1946

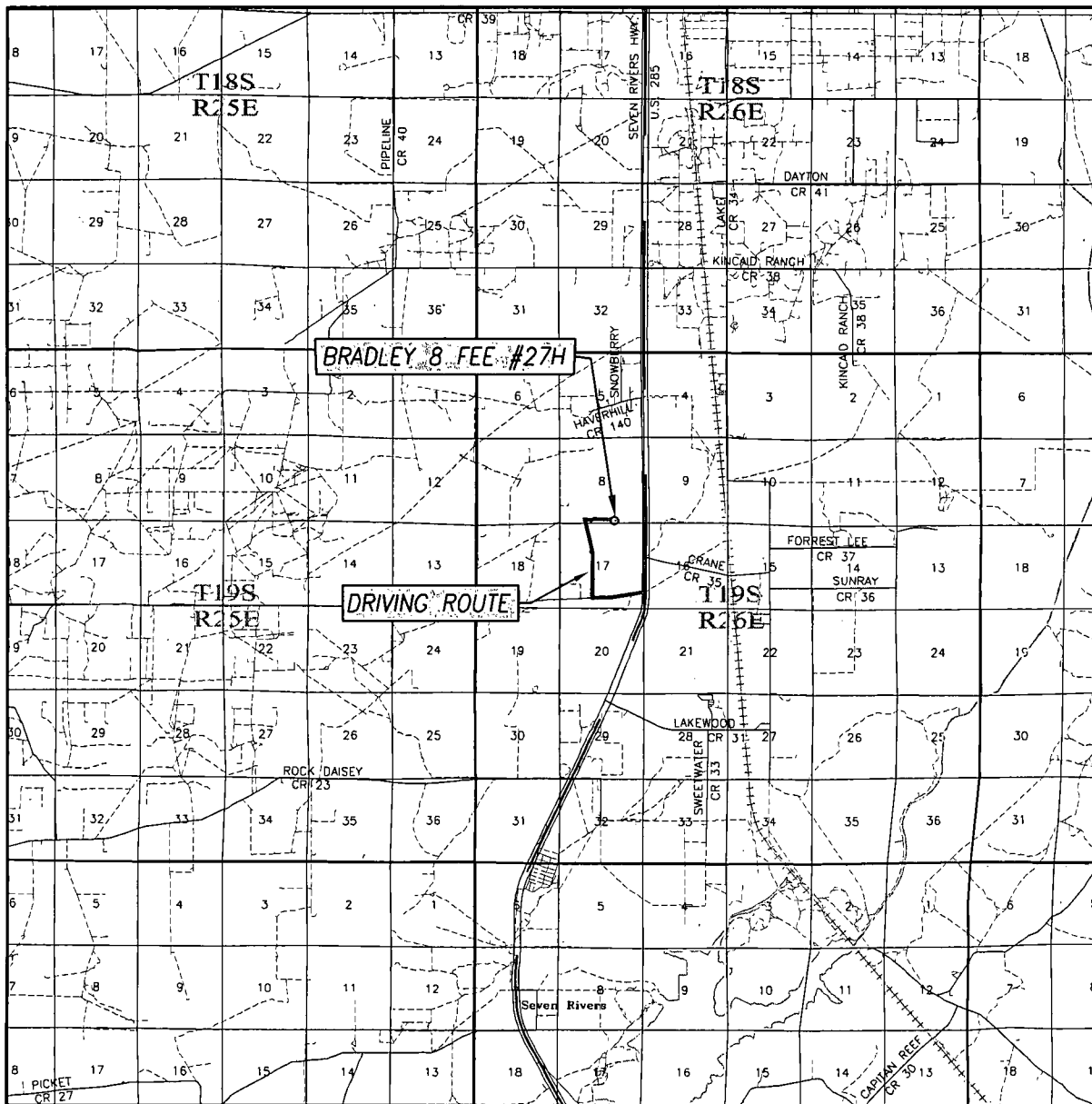
JOHN WEST SURVEYING COMPANY

412 N. DAL PASO HOBBS, N.M. 88240

(575) 393-3117 www.jwsc.biz

TBPLS# 10021000

VICINITY MAP



SCALE: 1" = 2 MILES

DRIVING ROUTE: SEE TOPOGRAPHIC AND ACCESS ROAD MAP

SEC. 8 TWP. 19-S RGE. 26-E

SURVEY N.M.P.M.

COUNTY EDDY STATE NEW MEXICO

DESCRIPTION 160' FSL & 1850' FEL

ELEVATION 3372'

OPERATOR COG OPERATING, LLC

LEASE BRADLEY 8 FEE



PROVIDING SURVEYING SERVICES
SINCE 1946

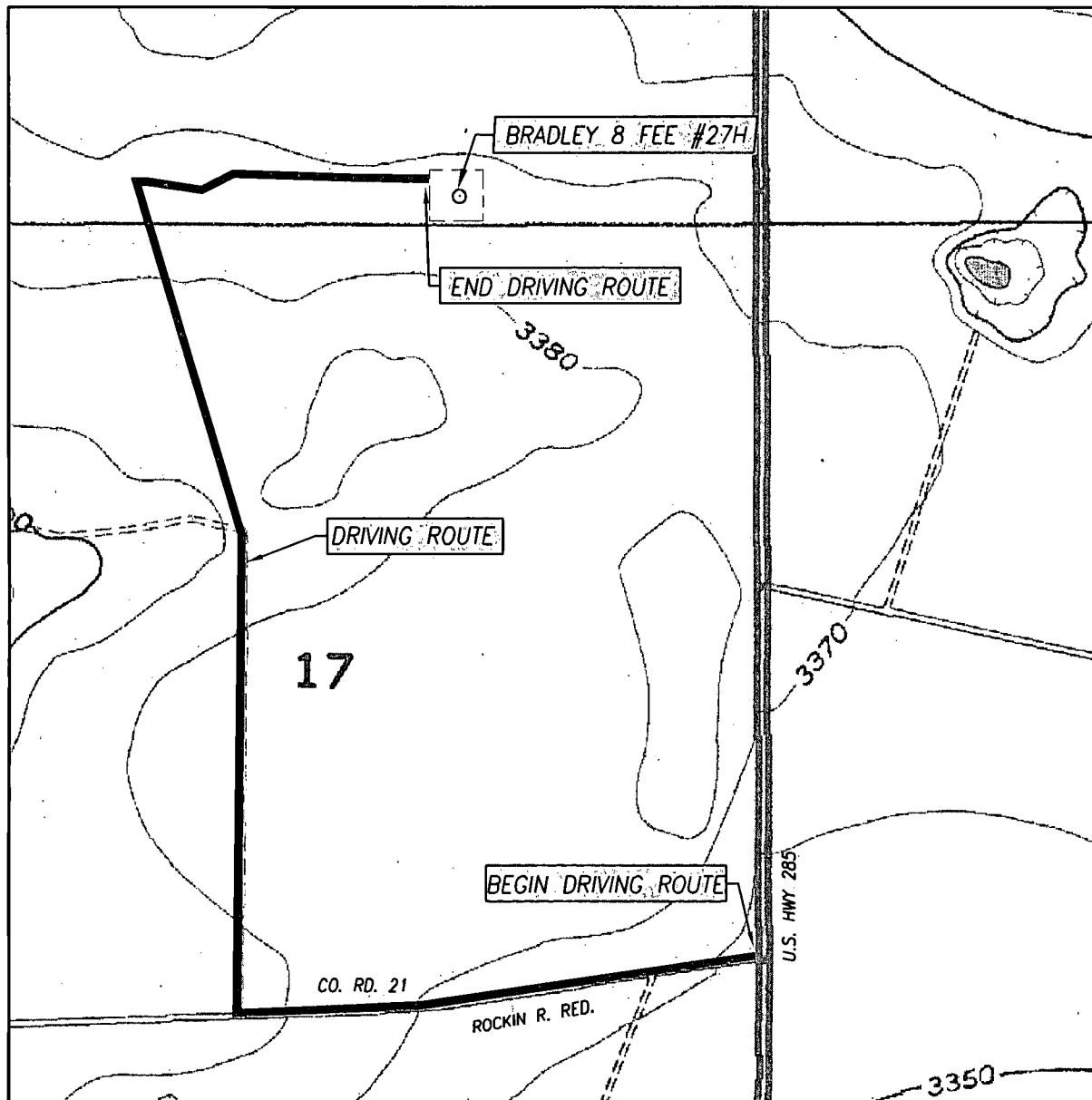
JOHN WEST SURVEYING COMPANY

412 N. DAL PASO HOBBS, N.M. 88240

(575) 393-3117 www.jwsc.biz

TBPLS# 10021000

TOPOGRAPHIC AND ACCESS ROAD MAP



SCALE: 1" = 1000'

CONTOUR INTERVAL:
DAYTON, N.M. - 10'

SEC. 8 TWP. 19-S RGE. 26-E

SURVEY N.M.P.M.

COUNTY EDDY STATE NEW MEXICO

DESCRIPTION 160' FSL & 1850' FEL

ELEVATION 3372'

OPERATOR COG OPERATING, LLC

LEASE BRADLEY 8 FEE

U.S.G.S. TOPOGRAPHIC MAP
DAYTON, N.M.

DIRECTIONS TO BRADLEY 8 FEE #27H:

FROM THE INTERSECTION OF U.S. HWY. 285 AND CO. RD. 21 ROCKIN R. RED. GO WEST ON CO. RD. 21 APPROX. 0.6 MILES TURN RIGHT AND GO NORTH APPROX. 0.9 MILES TURN RIGHT AND GO EAST APPROX. 0.3 MILES TO THIS LOCATION.



PROVIDING SURVEYING SERVICES
SINCE 1946

JOHN WEST SURVEYING COMPANY

412 N. DAL PASO HOBBS, N.M. 88240

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TBPLS# 10021000



NM OIL CONSERVATION
ARTESIA DISTRICT

MAY 21 2015

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COG Operating LLC

Eddy County, NM (NAD27 NME)

Bradley 8 Fee

#27H

WB1

Plan: Plan #2 05-18-15

Surface: 160' FSL, 1850' FEL, Sec 8, T19S, R26E, Unit O

PP: 330' FSL, 1810' FEL, Sec 8, T19S, R26E, Unit O

BHL: 330' FNL, 1650' FEL, Sec 8, T19S, R26E, Unit B

Standard Planning Report

18 May, 2015





Planning Report



Database:	Compass 5000 GCR	Local Co-ordinate Reference:	Well #27H
Company:	COG Operating LLC	TVD Reference:	KB @ 3390.00usft (Silver Oak 3)
Project:	Eddy County, NM (NAD27 NME)	MD Reference:	KB @ 3390.00usft (Silver Oak 3)
Site:	Bradley 8 Fee	North Reference:	Grid
Well:	#27H	Survey Calculation Method:	Minimum Curvature
Wellbore:	WB1		
Design:	Plan #2.05-18-15		

Project:	Eddy 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:	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' 5.40482 N
		Longitude:	104° 24' 7.45386 W
		Grid Convergence:	-0.04 °

Well:	#27H		
Well Position	+N/-S	7.40 usft	Northing:
	+E/-W	409.90 usft	Easting:
Position Uncertainty	0.00 usft	Wellhead Elevation:	0.00 usft
		Latitude:	32° 40' 5.48064 N
		Longitude:	104° 24' 2.65861 W
		Ground Level:	3,372.00 usft

Wellbore:	WB1		
Magnetics	Model Name	Sample Date	Declination
	HDGM	5/18/2015	7.63
			Dip Angle
			60.55
			Field Strength
			48,415

Design:	Plan #2.05-18-15		
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
			1.16

Plan Sections										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
3,461.70	0.00	0.00	3,461.70	0.00	0.00	0.00	0.00	0.00	0.00	
4,307.15	93.00	12.20	3,981.86	535.75	115.83	11.00	11.00	0.00	12.20	
4,742.93	93.00	359.11	3,958.97	967.86	158.62	3.00	0.00	-3.00	-89.68	
8,619.83	93.00	359.11	3,756.40	4,839.00	98.40	0.00	0.00	0.00	0.00	PBHL-Bradley 8 #27H

Database:	Compass 5000 GCR	Local Co-ordinate Reference:	Well #27H
Company:	COG Operating LLC	TVD Reference:	KB @ 3390'00usft (Silver Oak 3)
Project:	Eddy County, NM (NAD27-NME)	MD Reference:	KB @ 3390'00usft (Silver Oak 3)
Site:	Bradley 8 Fee	North Reference:	Grid
Well:	#27H	Survey Calculation Method:	Minimum Curvature
Wellbore:	WB1		
Design:	Plan #2.05-18-15		

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	
3,461.15	0.00	0.00	3,461.15	0.00	0.00	0.00	0.00	0.00	0.00	
KOP, Start 11°/100' Build										
3,461.70	0.00	0.00	3,461.70	0.00	0.00	0.00	0.00	0.00	0.00	
3,902.48	48.49	12.20	3,851.73	171.67	37.12	172.39	11.00	11.00	0.00	
PP-Bradley 8 #27H v2										
4,299.31	92.14	12.20	3,982.21	528.09	114.18	530.30	11.00	11.00	0.00	
TL, 4010' TVD @ 0 VZ, 93° Inc										
4,306.60	92.94	12.20	3,981.89	535.21	115.72	537.45	11.00	11.00	0.00	
LP, Hold 93° Inc, 0.45° Azm										
4,307.15	93.00	12.20	3,981.86	535.75	115.83	538.00	11.00	11.00	0.00	
4,742.93	93.00	359.11	3,958.97	967.86	158.62	970.89	3.00	0.00	-3.00	
8,603.91	93.00	359.11	3,757.23	4,823.11	98.65	4,824.12	0.00	0.00	0.00	
TD at 8603.91' MD										
8,619.83	93.00	359.11	3,756.40	4,839.00	98.40	4,840.00	0.00	0.00	0.00	
PBHL-Bradley 8 #27H v2										

Design Targets										
Target Name	hit/miss target	Dip Angle (°)	Dip Dir (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
PBHL-Bradley 8 #27H v1	- hit/miss target	0.00	360.00	3,756.40	4,839.00	98.40	611,643.90	479,356.10	32° 40' 53.36636 N	104° 24' 1.54324 W
	- plan hits target center									
	- Point									
PP-Bradley 8 #27H v2	- hit/miss target	0.00	0.00	3,850.21	170.00	36.76	606,974.90	479,294.46	32° 40' 7.16314 N	104° 24' 2.22988 W
	- plan misses target center by 0.14usft at 3900.33usft MD (3850.30 TVD, 170.10 N, 36.78 E)									
	- Point									

Formations						
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)	
4,299.31	3,982.21	TL, 4010' TVD @ 0 VZ, 93° Inc		-3.00	1.16	

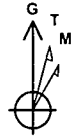
Plan Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment	
		+N/-S (usft)	+E/-W (usft)		
3,461.15	3,461.15	0.00	0.00	KOP, Start 11°/100' Build	
4,306.60	3,981.33	547.99	11.14	LP, Hold 93° Inc, 0.45° Azm	
8,603.91	3,756.42	4,838.53	98.39	TD at 8603.91' MD	



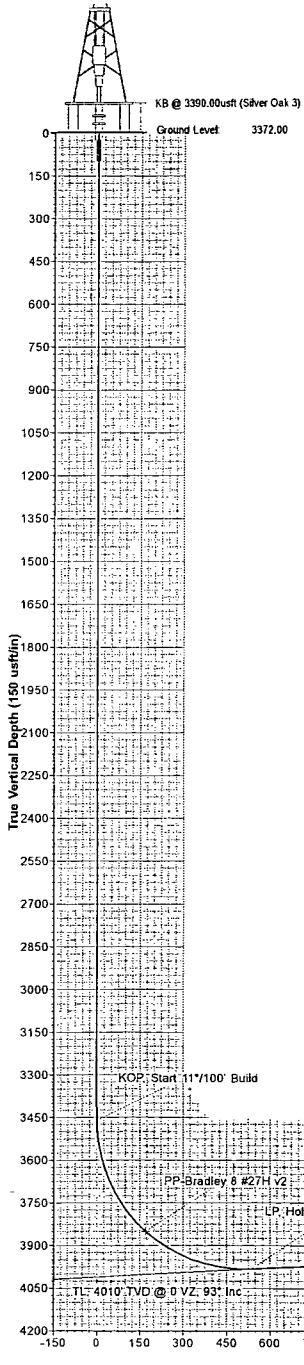
Project: Eddy County, NM (NAD27 NME)
Site: Bradley 8 Fee
Well: #27H
Wellbore: WB1
Design: Plan #2 05-18-15
Rig: Silver Oak 3



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TECHNOLOGY SERVICES



Azimuths to Grid North
True North: 0.04°
Magnetic North: 7.67°
Magnetic Field
Strength: 48415.1nT
Dip Angle: 60.55°
Date: 5/18/2015
Model: HDGM

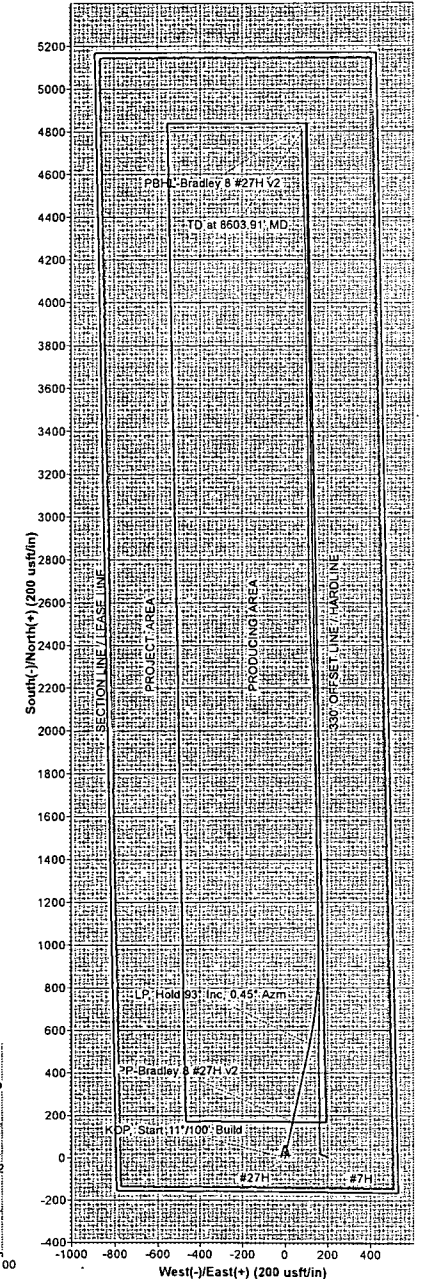
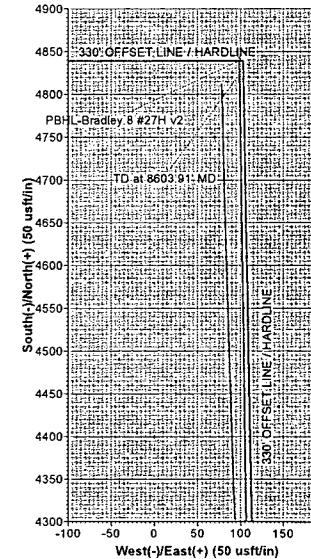
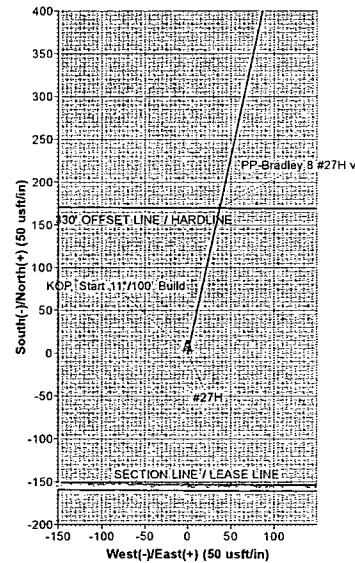


WELL DETAILS										
+N-S	+E-W	North	Ground Level	3372.00	Latitude	Longitude				
0.00	0.00	606804.90	Existing	479257.70	32° 40' 5.48064 N	104° 24' 2.65861 W				

SECTION DETAILS										
Sec	MD	Inc	Azi	TVD	+N-S	+E-W	Dleg	TFace	VSecl	Target
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	3461.70	0.00	0.00	3461.70	0.00	0.00	0.00	0.00	0.00	KOP, Start 11°/100' Build
3	4307.15	93.00	12.20	3881.86	535.75	115.83	11.00	12.20	538.00	LP, Hold 93° Inc, 0.45° Azm
4	4742.93	93.00	358.11	3958.97	967.86	158.62	3.00	-89.68	970.89	
5	8619.83	93.00	359.11	3756.40	4839.00	98.40	0.00	0.00	4840.00	PBHL-Bradley 8 #27H v2

DESIGN TARGET DETAILS										
Name	TVD	+N-S	+E-W	North	East	Latitude	Longitude	Shape		
PBHL-Bradley 8 #27H v2	3756.40	4839.00	98.40	611643.90	479356.10	32° 40' 53.36636 N	104° 24' 1.54324 W	Point	plan hits target center	
PP-Bradley 8 #27H v2	3850.21	170.00	36.76	606974.90	479294.46	32° 40' 7.16314 N	104° 24' 2.22988 W	Point	plan hits target center	

LEGEND	
—	#7H, WB1 / Job #1513074, Surveys (Silver Oak 3) V0
—	Plan #2 05-18-15





NM OIL CONSERVATION
ARTESIA DISTRICT
MAY 21 2015

RECEIVED

COG Operating LLC

Eddy County, NM (NAD27 NME)

Bradley 8 Fee

#27H

WB1

Plan #2 05-18-15

Anticollision Report

18 May, 2015



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Anticollision Report



Company:	COG Operating, LLC	Local Co-ordinate Reference:	Well #27H
Project:	Eddy County, NM (NAD27, NME)	TVD Reference:	KB @ 3390.00usft (Silver Oak 3)
Reference Site:	Bradley 8 Fee	MD Reference:	KB @ 3390.00usft (Silver Oak 3)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	#27H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at:	2.00 sigma
Reference Wellbore:	WB1	Database:	Compass 5000 GCR
Reference Design:	Plan #2 05-18-15	Offset TVD Reference:	Offset Datum

Reference:	Plan #2 05-18-15		
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 5/18/2015		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
0.00	8,619.83	Plan #2 05-18-15 (WB1)	PHX+MWD+IGRF	PHX+MWD+IGRF v3: standard declination

Site Name	Reference Measured Depth (usft)	Offset Measured Depth (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Separation Factor	Warning
Offet Well - Wellbore - Design						
Bradley 8 Fee						
#7H - WB1 / Job #1513074 - Surveys (Silver Oak 3)	2,433.40	2,434.75	166.61	152.07	11.463	CC, ES
#7H - WB1 / Job #1513074 - Surveys (Silver Oak 3)	8,619.83	7,582.66	790.76	584.35	3.831	SF

Offset Design:		Bradley 8 Fee - #7H - WB1 / Job #1513074 - Surveys (Silver Oak 3)										Offset Site Error:		0.00 usft
Survey Program:		100-NS-GYRO-MS-2412-PHX+MWD+IGRF										Offset Well Error:		0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface	Offset Wellbore Centre		Distance		Minimum Separation	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)				
0.00	0.00	1.01	1.01	0.00	0.00	88.91	3.80	199.90	199.94					
100.00	100.00	102.32	102.32	0.15	0.12	88.90	3.84	199.56	199.60	199.33	0.26	761.364		
200.00	200.00	202.82	202.82	0.51	0.38	88.92	3.74	198.77	198.82	197.93	0.88	225.140		
300.00	300.00	304.49	304.48	0.86	0.64	88.88	3.86	197.39	197.46	195.95	1.51	131.145		
400.00	400.00	404.39	404.35	1.22	0.89	88.62	4.73	195.65	195.73	193.62	2.12	92.484		
500.00	500.00	505.35	505.29	1.58	1.15	88.30	5.75	193.61	193.74	191.01	2.73	70.875		
600.00	600.00	604.39	604.30	1.94	1.40	87.81	7.32	191.61	191.77	188.43	3.34	57.416		
700.00	700.00	703.75	703.63	2.30	1.65	87.28	9.04	190.01	190.24	186.29	3.95	48.215		
800.00	800.00	804.53	804.39	2.66	1.91	86.80	10.52	188.32	188.64	184.08	4.56	41.333		
900.00	900.00	904.81	904.64	3.01	2.17	86.37	11.83	186.36	186.77	181.58	5.19	36.013		
1,000.00	1,000.00	1,004.89	1,004.69	3.37	2.44	86.04	12.75	184.32	184.80	178.98	5.81	31.804		
1,100.00	1,100.00	1,104.85	1,104.63	3.73	2.70	85.84	13.27	182.28	182.80	176.37	6.43	28.423		
1,200.00	1,200.00	1,204.35	1,204.11	4.09	2.96	85.68	13.64	180.41	180.95	173.90	7.05	25.664		
1,300.00	1,300.00	1,304.64	1,304.39	4.45	3.22	85.56	13.88	178.56	179.13	171.46	7.67	23.354		
1,400.00	1,400.00	1,403.87	1,403.60	4.81	3.48	85.48	13.98	176.89	177.46	169.17	8.29	21.417		
1,500.00	1,500.00	1,503.37	1,503.08	5.17	3.74	85.40	14.13	175.56	176.14	167.24	8.90	19.781		
1,600.00	1,600.00	1,603.55	1,603.27	5.52	4.00	85.29	14.37	174.29	174.89	165.36	9.53	18.357		
1,700.00	1,700.00	1,702.71	1,702.41	5.88	4.27	85.15	14.70	173.22	173.85	163.70	10.15	17.130		
1,800.00	1,800.00	1,803.13	1,802.83	6.24	4.53	85.01	15.05	172.24	172.91	162.13	10.77	16.049		
1,900.00	1,900.00	1,902.98	1,902.67	6.60	4.80	84.86	15.41	171.19	171.89	160.49	11.40	15.082		
2,000.00	2,000.00	2,002.70	2,002.38	6.96	5.06	84.66	15.92	170.25	171.00	158.98	12.02	14.230		
2,100.00	2,100.00	2,102.63	2,102.31	7.32	5.32	84.39	16.63	169.40	170.22	157.59	12.63	13.476		
2,200.00	2,200.00	2,203.66	2,203.33	7.67	5.58	84.13	17.30	168.23	169.13	155.88	13.25	12.762		
2,300.00	2,300.00	2,303.59	2,303.24	8.03	5.84	83.78	18.18	166.76	167.76	153.89	13.87	12.092		
2,400.00	2,400.00	2,402.50	2,402.15	8.39	6.01	83.46	18.99	165.66	166.74	152.34	14.40	11.580		

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



Anticollision Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well #27H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	KB @ 3390.00usft (Silver Oak 3)
Reference Site:	Bradley 8 Fee	MD Reference:	KB @ 3390.00usft (Silver Oak 3)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	#27H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore:	WB1	Database:	Compass 5000 GCR
Reference Design:	Plan #2 05-18-15	Offset TVD Reference:	Offset Datum

Offset Design: Bradley 8 Fee - #7H - WB1 / Job #1513074 - Surveys (Silver Oak 3)														Offset Site Error: 0.00 usft	
Survey Program: 100-NS-GYRO-MS-2412-PHX-MWD-IGRF														Offset Well Error: 0.00 usft	
Reference		Offset		Semi-Major Axis		Highside Toolface (°)	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)					
2,433.40	2,433.40	2,434.75	2,434.40	8.51	6.02	83.34	19.34	165.48	166.61	152.07	14.53	11.463	CC, ES		
2,500.00	2,500.00	2,498.55	2,497.97	8.75	6.04	81.68	24.18	165.41	167.20	152.41	14.79	11.302			
2,600.00	2,600.00	2,592.58	2,589.60	9.11	6.11	74.78	44.85	164.82	171.20	155.98	15.22	11.251			
2,700.00	2,700.00	2,678.72	2,670.22	9.47	6.22	65.37	74.96	163.46	182.45	166.76	15.68	11.633			
2,800.00	2,800.00	2,758.00	2,741.24	9.83	6.44	55.89	110.14	162.62	205.29	189.03	16.26	12.624			
2,900.00	2,900.00	2,828.08	2,801.23	10.18	6.74	48.16	146.31	163.40	240.95	224.03	16.93	14.237			
3,000.00	3,000.00	2,893.44	2,854.40	10.54	7.13	41.68	184.28	164.07	287.00	269.33	17.67	16.241			
3,100.00	3,100.00	2,946.00	2,893.81	10.90	7.53	36.77	219.02	163.67	343.06	324.62	18.43	18.611			
3,200.00	3,200.00	2,986.05	2,921.35	11.26	7.91	33.30	248.08	162.93	407.79	388.62	19.17	21.273			
3,300.00	3,300.00	3,020.27	2,942.86	11.62	8.28	30.56	274.67	162.18	479.60	459.70	19.89	24.108			
3,400.00	3,400.00	3,051.06	2,960.71	11.98	8.64	28.32	299.74	161.55	556.59	535.98	20.61	27.000			
3,461.70	3,461.70	3,073.00	2,972.60	12.20	8.91	26.86	318.18	161.12	606.13	585.02	21.11	28.714			
3,500.00	3,499.97	3,073.00	2,972.60	12.34	8.91	13.31	318.18	161.12	636.71	615.46	21.25	29.967			
3,550.00	3,549.58	3,091.79	2,982.17	12.52	9.16	11.01	334.34	160.72	674.81	653.13	21.68	31.126			
3,600.00	3,598.38	3,104.00	2,988.07	12.70	9.33	9.51	345.03	160.42	710.82	688.79	22.02	32.275			
3,650.00	3,645.93	3,120.55	2,995.65	12.87	9.57	8.17	359.73	159.96	744.54	722.10	22.44	33.182			
3,700.00	3,691.77	3,136.00	3,002.27	13.05	9.79	7.13	373.68	159.49	775.88	753.04	22.84	33.966			
3,750.00	3,735.50	3,151.19	3,008.37	13.25	10.02	6.29	387.58	159.02	804.73	781.45	23.28	34.574			
3,800.00	3,776.71	3,168.00	3,014.64	13.47	10.28	5.55	403.17	158.51	830.96	807.21	23.75	34.982			
3,850.00	3,815.02	3,184.57	3,020.37	13.72	10.55	4.94	418.72	158.06	854.49	830.22	24.27	35.208			
3,900.00	3,850.08	3,199.00	3,024.99	14.00	10.78	4.47	432.38	157.72	875.20	850.41	24.79	35.312			
3,950.00	3,881.55	3,219.55	3,030.99	14.33	11.12	3.96	452.03	157.42	893.01	867.56	25.45	35.085			
4,000.00	3,909.17	3,231.00	3,034.03	14.70	11.32	3.68	463.07	157.38	907.96	881.95	26.01	34.902			
4,050.00	3,932.66	3,251.23	3,038.73	15.12	11.66	3.31	482.74	157.50	919.96	893.18	26.78	34.351			
4,100.00	3,951.82	3,262.00	3,040.87	15.58	11.85	3.12	493.30	157.67	929.17	901.74	27.44	33.868			
4,150.00	3,966.46	3,294.00	3,045.87	16.10	12.42	2.70	524.89	158.39	935.43	906.91	28.52	32.802			
4,200.00	3,976.46	3,303.00	3,046.94	16.66	12.58	2.58	533.82	158.64	938.42	909.18	29.24	32.094			
4,250.00	3,981.71	3,326.52	3,049.18	17.26	13.01	2.33	557.22	159.41	938.38	908.12	30.26	31.006			
4,300.00	3,982.18	3,357.91	3,051.51	17.89	13.58	2.01	588.50	160.56	934.73	903.26	31.48	29.697			
4,307.15	3,981.86	3,362.87	3,051.83	17.99	13.67	1.96	593.45	160.74	933.89	902.23	31.66	29.496			
4,400.00	3,976.99	3,413.87	3,054.03	19.27	14.63	1.57	644.38	161.74	924.56	890.66	33.90	27.273			
4,500.00	3,971.73	3,486.46	3,054.17	20.75	16.03	0.95	716.97	161.31	918.71	881.93	36.79	24.975			
4,600.00	3,966.46	3,572.40	3,052.63	22.32	17.73	0.40	802.89	160.61	915.12	875.08	40.04	22.854			
4,700.00	3,961.22	3,683.98	3,050.28	23.94	19.96	0.03	914.43	159.18	912.00	868.10	43.91	20.772			
4,742.93	3,958.97	3,726.64	3,049.80	24.66	20.83	-0.04	957.08	158.23	910.23	864.74	45.49	20.010			
4,800.00	3,955.99	3,781.81	3,049.09	25.63	21.96	-0.06	1,012.23	157.04	907.98	860.40	47.58	19.082			
4,900.00	3,950.76	3,879.00	3,047.57	27.37	23.95	-0.08	1,109.40	155.17	904.32	853.00	51.33	17.619			
5,000.00	3,945.54	3,976.75	3,045.77	29.17	25.98	-0.09	1,207.11	153.46	900.93	845.78	55.15	16.337			
5,100.00	3,940.31	4,073.27	3,043.73	31.01	27.98	-0.10	1,303.59	151.78	897.82	838.82	59.00	15.218			
5,200.00	3,935.09	4,167.30	3,041.23	32.89	29.95	-0.09	1,397.58	150.51	895.26	832.41	62.84	14.246			
5,300.00	3,929.86	4,266.00	3,038.20	34.81	32.01	-0.05	1,496.23	149.68	893.10	826.28	66.82	13.367			
5,400.00	3,924.64	4,369.96	3,035.08	36.74	34.19	0.01	1,600.15	148.92	890.87	819.94	70.93	12.559			
5,500.00	3,919.41	4,480.89	3,032.95	38.70	36.53	-0.02	1,711.03	146.74	887.55	812.32	75.23	11.798			
5,600.00	3,914.19	4,583.44	3,031.65	40.68	38.70	-0.06	1,813.55	144.47	883.60	804.22	79.38	11.132			
5,700.00	3,908.96	4,684.20	3,030.57	42.67	40.83	-0.06	1,914.29	142.95	879.44	795.94	83.50	10.532			
5,800.00	3,903.74	4,785.90	3,029.56	44.68	42.99	-0.07	2,015.97	141.32	875.21	787.54	87.67	9.983			
5,900.00	3,898.51	4,879.96	3,028.66	46.70	44.99	-0.19	2,109.97	137.94	870.96	779.27	91.69	9.499			
6,000.00	3,893.29	4,973.02	3,026.77	48.73	46.99	-0.41	2,202.88	133.19	867.77	772.05	95.72	9.066			
6,100.00	3,888.06	5,071.55	3,024.40	50.77	49.10	-0.66	2,301.25	127.91	864.99	765.11	99.88	8.660			
6,200.00	3,882.84	5,169.54	3,021.94	52.82	51.21	-0.91	2,399.06	122.65	862.32	758.29	104.04	8.289			
6,300.00	3,877.61	5,271.67	3,019.23	54.88	53.41	-1.16	2,501.01	117.31	859.82	751.53	108.29	7.940			
6,400.00	3,872.39	5,374.47	3,016.92	56.94	55.61	-1.26	2,603.75	114.36	856.87	744.32	112.55	7.613			

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



Anticollision Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well #27H
Project:	Eddy County, NM(NAD27,NME)	TVD Reference:	KB @ 3390.00usft (Silver Oak 3)
Reference Site:	Bradley 8 Fee	MD Reference:	KB @ 3390.00usft (Silver Oak 3)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	#27H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	WB1	Database:	Compass 5000 GCR
Reference Design:	Plan #2.05-18-15	Offset TVD Reference:	Offset Datum

Offset Design Bradley 8 Fee - #7H - WB1 / Job #1513074 - Surveys (Silver Oak 3)													Offset Site Error: 0.00 usft	
Survey Program: 100-NS-GYRO-MS-2412-PHX-MWD-IGRF													Offset Well Error: 0.00 usft	
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation	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)				
6,500.00	3,867.16	5,476.20	3,014.85	59.01	57.78	-1.28	2,705.43	112.49	853.69	736.90	116.79	7.310		
6,600.00	3,861.94	5,575.16	3,012.88	61.09	59.88	-1.26	2,804.37	111.40	850.44	729.47	120.97	7.030		
6,700.00	3,856.71	5,672.32	3,010.71	63.17	61.95	-1.21	2,901.50	110.62	847.43	722.32	125.11	6.773		
6,800.00	3,851.49	5,769.32	3,008.20	65.25	64.01	-1.15	2,998.47	110.15	844.77	715.51	129.26	6.535		
6,900.00	3,846.26	5,869.13	3,005.42	67.34	66.13	-1.04	3,098.24	110.13	842.31	708.84	133.46	6.311		
7,000.00	3,841.04	5,980.34	3,003.16	69.43	68.49	-0.99	3,209.43	109.26	839.08	701.16	137.92	6.084		
7,100.00	3,835.81	6,077.71	3,001.68	71.52	70.57	-0.98	3,306.77	107.94	835.38	693.28	142.10	5.879		
7,200.00	3,830.59	6,170.95	2,999.67	73.62	72.56	-0.98	3,399.97	106.48	832.31	686.12	146.18	5.694		
7,300.00	3,825.36	6,270.79	2,996.92	75.72	74.70	-1.00	3,499.76	104.74	829.84	679.42	150.42	5.517		
7,400.00	3,820.14	6,382.06	2,995.18	77.82	77.07	-1.01	3,611.00	102.97	826.15	671.25	154.90	5.333		
7,500.00	3,814.91	6,477.97	2,993.85	79.93	79.12	-0.99	3,706.90	101.75	822.30	663.25	159.05	5.170		
7,600.00	3,809.69	6,571.68	2,991.94	82.04	81.12	-0.97	3,800.59	100.71	819.11	655.95	163.16	5.020		
7,700.00	3,804.46	6,674.10	2,989.24	84.14	83.31	-0.95	3,902.96	99.46	816.52	649.06	167.45	4.876		
7,800.00	3,799.24	6,776.17	2,987.59	86.26	85.48	-0.87	4,005.01	99.07	812.88	641.14	171.74	4.733		
7,900.00	3,794.01	6,874.90	2,985.41	88.37	87.58	-0.76	4,103.72	99.08	809.84	633.89	175.95	4.603		
8,000.00	3,788.79	6,974.04	2,983.52	90.48	89.70	-0.77	4,202.83	97.50	806.52	626.34	180.19	4.476		
8,100.00	3,783.56	7,068.55	2,981.23	92.60	91.74	-0.92	4,297.25	93.98	803.75	619.41	184.34	4.360		
8,200.00	3,778.34	7,172.45	2,978.44	94.72	93.98	-1.10	4,401.02	89.90	801.26	612.57	188.69	4.246		
8,300.00	3,773.11	7,272.73	2,976.26	96.83	96.13	-1.21	4,501.23	86.83	798.23	605.27	192.97	4.137		
8,400.00	3,767.89	7,370.06	2,973.93	98.95	98.23	-1.32	4,598.49	83.84	795.44	598.26	197.18	4.034		
8,500.00	3,762.66	7,467.19	2,971.25	101.07	100.31	-1.42	4,695.54	80.96	793.00	591.61	201.39	3.938		
8,600.00	3,757.44	7,562.84	2,968.10	103.20	102.37	-1.50	4,791.10	78.45	791.10	585.54	205.56	3.848		
8,619.83	3,756.40	7,582.66	2,967.40	103.62	102.79	-1.51	4,810.91	77.96	790.76	584.35	206.41	3.831 SF		

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



Anticollision Report

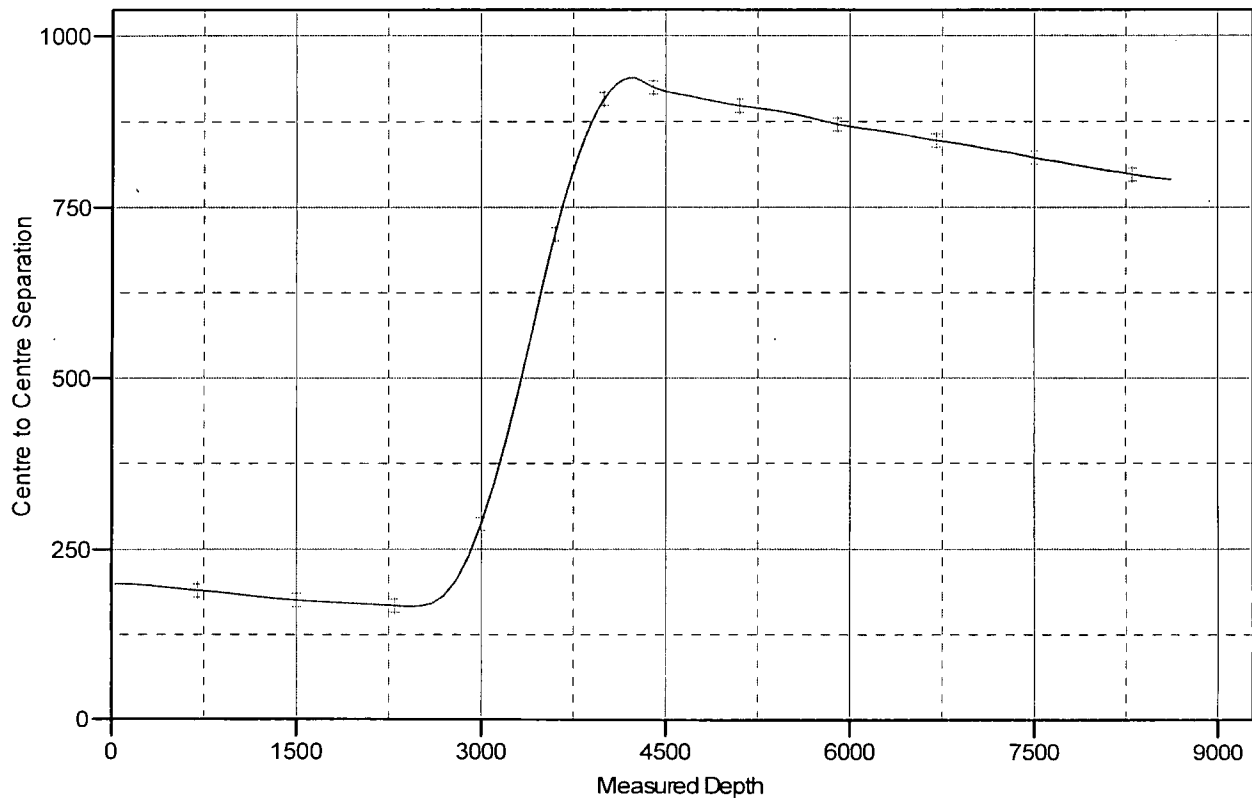


Company:	COG Operating, LLC	Local Co-ordinate Reference:	Well: #27H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	KB @ 3390.00usft (Silver Oak 3)
Reference Site:	Bradley 8 Fee	MD Reference:	KB @ 3390.00usft (Silver Oak 3)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	#27H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at:	2.00 sigma
Reference Wellbore:	WB1	Database:	Compass 5000 GCR
Reference Design:	Plan #2 05-18-15	Offset TVD Reference:	Offset Datum

Reference Depths are relative to KB @ 3390.00usft (Silver Oak 3)
Offset Depths are relative to Offset Datum
Central Meridian is 104° 19' 60.00000 W

Coordinates are relative to: #27H
Coordinate System is US State Plane 1927 (Exact solution), New Mexico East 30
Grid Convergence at Surface is: -0.04°

Ladder Plot



LEGEND

#7H, WB1 / Job #1513074, Surveys (Silver Oak 3) V0

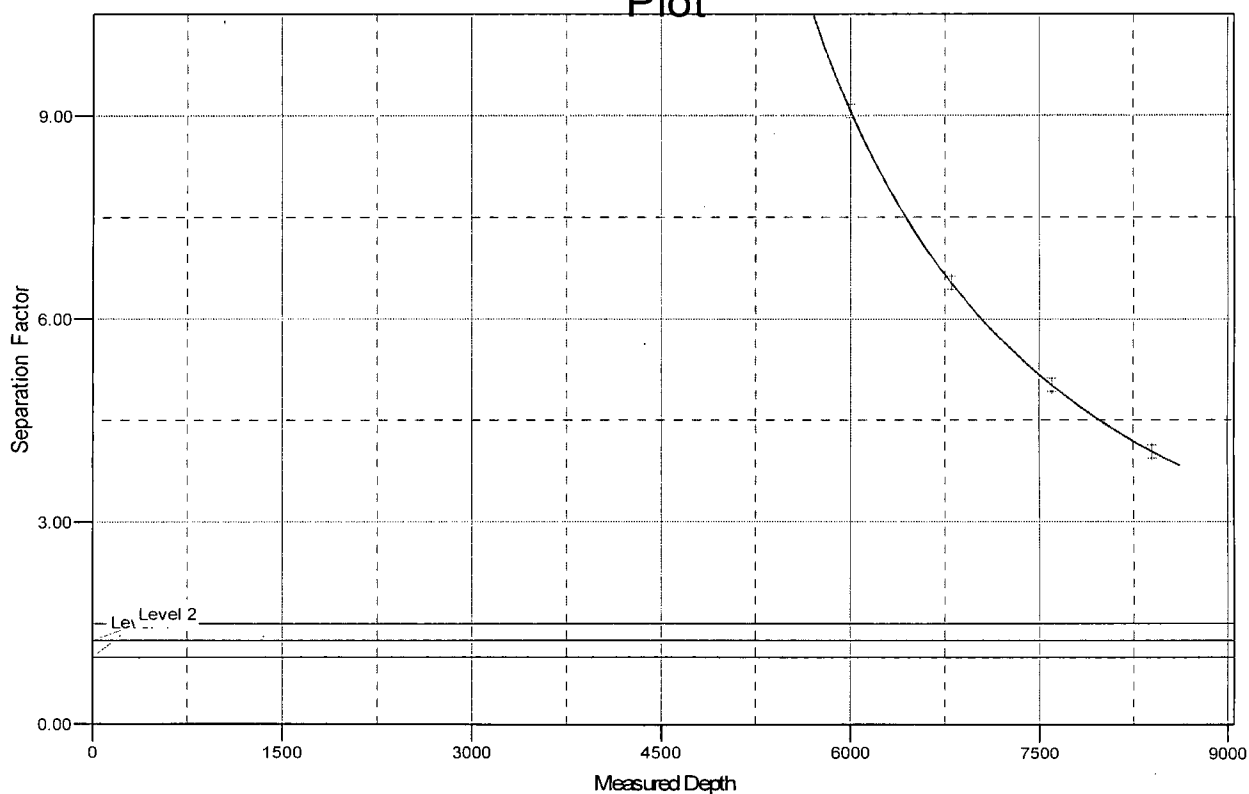


Company:	COG Operating, LLC	Local/Co-ordinate Reference:	Well #27H
Project:	Eddy County, NM (NAD27, NME)	TVD Reference:	KB @ 3390.00usft (Silver Oak 3)
Reference Site:	Bradley 8 Fee	MD Reference:	KB @ 3390.00usft (Silver Oak 3)
Site Error:	0.00:usft	North Reference:	Grid
Reference Well:	#27H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00:usft	Output errors are at	2.00 sigma
Reference Wellbore:	WB1	Database:	Compass 5000 GCR
Reference Design:	Plan #2.05-18-15	Offset TVD Reference:	Offset Datum

Reference Depths are relative to KB @ 3390.00usft (Silver Oak 3)
Offset Depths are relative to Offset Datum
Central Meridian is 104° 19' 60.00000 W

Coordinates are relative to: #27H
Coordinate System is US State Plane 1927 (Exact solution), New Mexico East 30
Grid Convergence at Surface is: -0.04°

Separation Factor Plot



LEGEND

#7H, WB1 / Job #1513074, Surveys (Silver Oak 3) V0