

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

Operator Copy

FORM APPROVED
OMB NO. 1004-0135
Expires: July 31, 2010

SUNDRY NOTICES AND REPORTS ON WELLS
Do not use this form for proposals to drill or to re-enter an abandoned well. Use form 3160-3 (APD) for such proposals.

SUBMIT IN TRIPLICATE - Other instructions on reverse side.

1. Type of Well ☒ Oil Well ☐ Gas Well ☐ Other		5. Lease Serial No. NMLC029415B
2. Name of Operator COG OPERATING LLC Contact: KANICIA CASTILLO E-Mail: kcastillo@conchoresources.com		6. If Indian, Allottee or Tribe Name
3a. Address ONE CONCHO CENTER 600 W ILLINOIS AVENUE MIDLAND, TX 79701	3b. Phone No. (include area code) Ph: 432-685-4332	7. If Unit or CA/Agreement, Name and/or No.
4. Location of Well (Footage, Sec., T., R., M., or Survey Description) Sec 12 T17S R31E SESE 15FSL 819FEL		8. Well Name and No. PUCKETT 12 FEDERAL 7H
		9. API Well No. 30-015-39476-00-S1
		10. Field and Pool, or Exploratory FREN
		11. County or Parish, and State EDDY COUNTY, NM

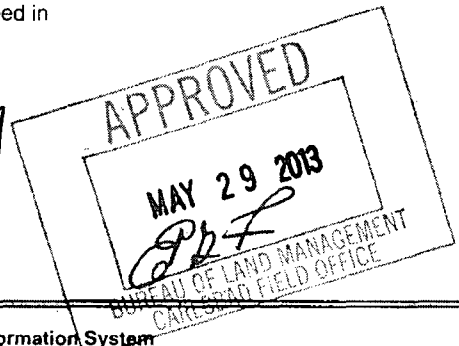
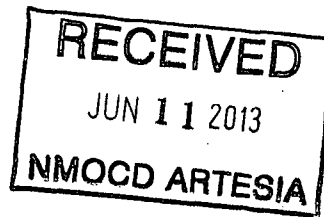
12. CHECK APPROPRIATE BOX(ES) TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA

TYPE OF SUBMISSION	TYPE OF ACTION			
☒ Notice of Intent	☐ Acidize	☐ Deepen	☐ Production (Start/Resume)	☐ Water Shut-Off
☐ Subsequent Report	☐ Alter Casing	☐ Fracture Treat	☐ Reclamation	☐ Well Integrity
☐ Final Abandonment Notice	☐ Casing Repair	☐ New Construction	☐ Recomplete	☒ Other
	☐ Change Plans	☐ Plug and Abandon	☐ Temporarily Abandon	Drilling Operations
	☐ Convert to Injection	☐ Plug Back	☐ Water Disposal	

13. Describe Proposed or Completed Operation (clearly state all pertinent details, including estimated starting date of any proposed work and approximate duration thereof. If the proposal is to deepen directionally or recomple horizontally, give subsurface locations and measured and true vertical depths of all pertinent markers and zones. Attach the Bond under which the work will be performed or provide the Bond No. on file with BLM/BIA. Required subsequent reports shall be filed within 30 days following completion of the involved operations. If the operation results in a multiple completion or recomple in a new interval, a Form 3160-4 shall be filed once testing has been completed. Final Abandonment Notices shall be filed only after all requirements, including reclamation, have been completed, and the operator has determined that the site is ready for final inspection.)

COG Operating LLC requests approval to drill and complete a second lateral in the Puckett 12 Federal Com #7. This re-entry will originate in the Yeso and will finish in the Yeso described in the attached drilling procedure and directional plan.

SEE ATTACHED FOR
CONDITIONS OF APPROVAL



14. I hereby certify that the foregoing is true and correct. Electronic Submission #207057 verified by the BLM Well Information System For COG OPERATING LLC, sent to the Carlsbad Committed to AFMSS for processing by JOHNNY DICKERSON on 05/10/2013 (13JLD0785SE)	
Name (Printed/Typed) KANICIA CASTILLO	Title PREPARER
Signature (Electronic Submission)	Date 05/09/2013

THIS SPACE FOR FEDERAL OR STATE OFFICE USE

Approved By EDWARD FERNANDEZ	Title PETROLEUM ENGINEER	Date 05/29/2013
Conditions of approval, if any, are attached. Approval of this notice does not warrant or certify that the applicant holds legal or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations thereon.		Office Carlsbad

Title 18 U.S.C. Section 1001 and Title 43 U.S.C. Section 1212, make it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

**** BLM REVISED ** BLM REVISED ** BLM REVISED ** BLM REVISED ** BLM REVISED ****

CONDITIONS OF APPROVAL

Sundry dated 05/09/2013

**COG Operating LLC
NMLC029415B
Puckett 12 Federal 7H
30-015-39476
Section 12, T. 17 S., R 31 E., NMPM
Eddy County, New Mexico**

- 1. Surface disturbance beyond the existing pad must have prior approval.**
- 2. Closed loop system required.**
- 3. H2S monitoring equipment should be onsite for personnel protection from surrounding oil operations. Operator should not encounter H2S while deepening.**
- 4. Variance for liner top fluid entry and not testing seal also approved based on NMOCD classification of formations in this area as the Yeso group - Pool 26770.**
- 5. Variance of proposed liner tie back is approved in order to have access to bottom lateral.**
- 6. All blowout preventer (BOP) and related equipment (BOPE) shall comply with well control requirements as described in Onshore Oil and Gas Order No. 2 and API RP 53 Sec. 17.**
- 7. 2000 (2M) BOP to be used. All blowout preventer (BOP) and related equipment (BOPE) shall comply with reasonable well control requirements. A two ram system with a blind ram and a pipe ram designed for the size of the work string shall be adequate. Tapered work strings will require an additional pipe ram. The manifold shall comply with Onshore Oil and Gas Order #2 Attachment I (2M Diagrams of Choke Manifold Equipment). The accumulator system shall have an immediately available power source to close the rams and retain 200 psi above pre-charge. The pre-charge test shall follow requirements in Onshore Order #2.**
- 8. The appropriate BLM office shall be notified a minimum of 4 hours in advance for a representative to witness BOP/BOPE testing.**
- 9. All waste (i.e. drilling fluids, trash, salts, chemicals, sewage, gray water, etc.) created as a result of drilling operations and completion operations shall be safely contained and disposed of properly at a waste disposal facility. No waste material or fluid shall be disposed of on the well location or surrounding area. Porto-johns and trash containers will be on-location during fracturing operations or any other crew-intensive operations.**
- 10. Steel tanks to be used.**
- 11. Work to be completed in 90 days**
- 12. Subsequent sundry and completion report required when work is complete.**

EGF 052413

Puckett 12 Federal #7H MIDDLE LATERAL PROGRAM

1. Estimated Tops of Important Geologic Markers

Yeso Group +/- 5317'

2. Estimated Depths of Anticipated Fresh Water, 132'.

This re-entry originates in the Yeso and will finish in the Yeso. The entire Yeso group is an oil and gas bearing interval.

3. Casing Program

Hole Size	Interval	OD Casing	Weight	Grade**	Jt./Condition	Burst/collapse/tension
6-1/8"	5645'-10858'	4.5"	13.5#	L-80	LTC/New	3.98/4.09/3.21 (L80)

4. Cement Program

4.5" Liner: No cement planned; external packers will be used for stimulation isolation.

NOTE: COG OPERATING LLC REQUESTS A VARIANCE TO THE LINER TOP FLUID ENTRY OR PRESSURE TEST BECAUSE THE NEW LATERAL WILL BE COMPLETED IN THE SAME ZONE AS THE CURRENT PERFS AND THE ENTIRE INTERVAL IS RECOGNIZED BY THE OCD AS ONE INTERVAL (YESO). AS PER ONSHORE ORDER NO. 2 SECT III: REQUIREMENTS, PART B. CASING AND CEMENTING REQUIREMENTS, SUBPART b. "NO TEST SHALL BE REQUIRED FOR LINERS THAT DO NOT INCORPORATE OR NEED A SEAL MECHANISM." COG BELIEVES WE MEET THE CRITERIA TO NOT BE REQUIRED TESTING THE LINER TOP BECAUSE THERE IS NO NEED FOR A SEAL MECHANISM.

NOTE: COG OPERATING LLC REQUESTS A VARIANCE TO THE 200' MINIMUM TIE BACK TO THE PRODUCTION CASING BECAUSE THE BOTTOM LATERAL IS PRODUCTIVE FROM THE YESO BELOW THIS PROPOSED LATERAL, COG DESIRES TO NOT COVER THAT OR MAKE IT INACCESSIBLE WITH A LINER OVERLAP.

5. Minimum Specifications for Pressure Control

The BOP equipment will be a 2000 psi double ram type hydraulically operated preventer. This equipment will be nipped up to a 7-1/16" 3K flange. The pipe rams are located above blind rams. The BOP is tested to 2000 psi prior to drilling new formation. Access to the annulus will be through the valves on the 7-1/16" casing head.

6. Types and Characteristics of the Proposed Mud System

This well will be drilled from the window that is cut in the 7" casing to TD of lateral with FW/CBW drilling mud. Visual or electronic mud monitoring equipment shall be in place to detect volume changes indicating loss or gain of circulating fluid volumes.

7. Auxiliary Well Control and Monitoring Equipment

- A. A full opening drill pipe-stabbing valve with proper drill pipe connections will be on the rig floor at all times.

8. Logging, Testing, and Coring Program

- A. The electric logging program will consist of MWD GR, which will be run from TD to 7" production casing sidetrack.
- B. No drill stem tests.

- C. No conventional coring anticipated.
- D. Further testing procedures will be determined after the 4-1/2" casing has been run to TD, based on drill shows and log evaluation.

9. Abnormal Conditions, Pressure, Temperatures, and Potential Hazards

No abnormal pressures or temperatures are anticipated. The estimated bottomhole temperature at TD is 96 degrees and the estimated maximum bottomhole pressure is 2700 psig. The drilling starts in the Yeso and ends in the Yeso. The section of Yeso being drilled has very low permeability (less than 1 md).

10. Anticipated Starting Date and Duration of Operations

There will be no road or location work required as this is an existing well location. Once commenced, drilling operations should be finished in approximately 20 days. If the well is productive, an additional 30-90 days will be required for completion and testing before a decision is made to remove the whipstock and RBP separating the laterals, to commingle the production from the two laterals.

11. Centralizer Program

Centralizers will not be run or required due to the lack of cement and the centralizing nature of the external casing packers.

12. Summary Drilling and Completion Program

Preparatory/2ND Lateral Procedure

1. Pull test anchors. MIRU pulling unit.
2. TOH with production equipment (tally and stand back tubing) and LD.
3. PU 6-1/8" bit and scraper, TIH to 6000'. TOH.
4. RU wireline. Run GR/CCL correlation log from 5900' to 5200'.
5. Set RBP at +/- 6000'. RU pump truck, test casing and RBP to 1000 psi for 30 minutes. TIH OE, spot 15' sand on RBP. TOH, LD tubing, RD BOPE, RD pulling unit.
6. MIRU Key or Basic workover rig & horizontal package. NU hydraulic 6" 2M double BOP w/2-7/8" pipe rams on top & blind rams on bottom. Wellhead has 7-1/16" 3M series flanged connection. Move in and rig up pumps, closed loop solids control equipment, power swivel, frac tanks, generators, pipe racks, and other equipment. Use rig pump to test BOP, casing & RBP to 500 psi for 30 minutes, close blind rams in BOP and test BOP above rams to 2000/250 psi for 30 minutes and document on report.
7. PU & TIH w/spacer, anchor, retrievable whipstock (3° slide), starting mill, & UBHO on workstring. (Line up UBHO & whipstock face on surface. Gyro stinger should be inserted into UBHO to check for compatibility and orientation.) TIH to within 20' of setting depth. Pull up to next connection & RU Gyro. Take check shot & orient whipstock while working out all torque.
8. If orientation is satisfactory, set anchor (bottom of anchor 2' above casing collar, at approximately 5700'). Pull 5,000# upstrain to check anchor set, then set down 20-30,000#

weight to shear running bolt. RD Gyro.

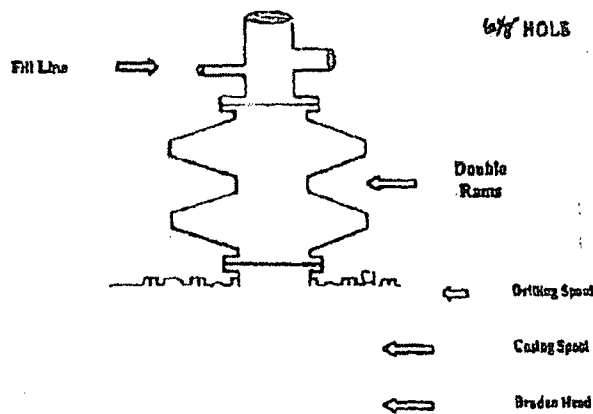
9. After obtaining free torque, record Pick-Up & Slack-Off weights. Make starting cut through casing wall (approximately 30" total). Sweep with high viscosity polymer pills (if needed) to clean hole. Install two (2) or more ditch magnets at flowline. TOH.
10. TIH with window mill, watermelon mill, & string mill on workstring. Mill window from 5560' to 5660', plus 5' of open hole (KOP - +/-5600')(or depth required by directional company). Circulate hole clean. TOH. (Trip & ream through finished window several times to make sure it is fully open. Check mill gauges after laying down.) Fax in the fisherman's diagram of the window. Verify that the depths on the diagram match the depths on the morning report.
11. PU 6-1/8" bit, downhole motor, muleshoe (UBHO sub), (2) monel drill collars (Install MWD probe inside NMDC and obtain offset), XO flow sub, & muleshoe sub f/gyro on workstring. Surface test motor and MWD. TIH to btm filling pipe as necessary.
12. PU swivel and establish circulation (130 gpm). RU Gyro. Time drill away from casing using continuous readout gyro for checking well path and tool face. Magnetic interference may occur, particularly while motor is in the window. If necessary, use gyro single shots for drilling away from casing. Once MWD readouts can function without magnetic influence from casing, RD Gyro & drill remaining curve at 164-200 GPM to EOC ($\pm 6,457'$ MD 6,150' TVD) using MWD.
13. Build curve at $11.0^\circ/100'$ BUR to planned inclination of 91.0° and azimuth (after gyro correction) of 184.65° . Survey as needed to ensure curve is built according to plan. Sweep hole with high viscosity polymer pills (if needed) for good hole cleaning. Sweep hole at least once per day.
14. At EOC, TOH. PU & TIH w/6-1/8" **PDC** bit, downhole motor, muleshoe (UBHO sub), (2) monel drill collars (Install MWD probe inside NMDC and obtain offset) & XO flow sub on 3-1/2" drill pipe or PH-6 workstring. TIH very carefully with bit through the casing window to prevent bit damage. Ream curve as necessary to remove any severe "kinks" or doglegs.
15. Drill the lateral section with the angle hold motor in the oriented and rotary mode as necessary. Drill at 91.0° inclination, 184.65° azimuth for a total of 5015' vertical section at lease line (estimated to be at 10,768' MD, 6,075' TVD). Take surveys every 30' or as needed to maintain inclination and direction.
16. At TD, circ hole clean. Make reamer runs as required. TOH, LD DP and tools.
17. Run 4.5" 13.5 # L-80 EUE 8rd LTC casing with external casing packer at 5630', PBR/top of liner at 5610', drill pipe to surface. Cement 4 1/2" liner from 10768' to 5610' with 215 sacks of acid soluble cement (15#/gal, 2.60 cu.ft./sk)-- 15% excess. Set external casing packer, release drill pipe from liner, circulate excess cement off of liner top, trip out of hole with drill pipe. TIH w/7" RBP on drill pipe and set RBP at 5000'. TOH w/drill pipe.
18. ND BOPE, NU WH w/cap.
19. RDMO rig.

Completion Procedure

1. MIRU PU. NU BOPE. Retrieve 7" RBP @ +/-5000'. Install 7" x 4 1/2" window isolation assembly.
2. TCP (tubing conveyed perforating gun) perforate toe (1st stage) of upper lateral. ND BOPE. NU frac stack. RDMO PU.
3. RU frac equipment /WL equipment. Fracture stimulate lateral in 10 stages using plug and perf method. RD frac/WL Equipment.
4. Flow well back up casing to recover load.
5. MIRU PU. NU BOPE. Drill out frac plugs and clean out lateral to PBTD.
6. Install pumping equipment. Put upper lateral on production to test.
7. MIRU PU. NUBOPE. Pull pumping equipment.
8. Retrieve whipstock. Retrieve RPB @ +/- 5775'.
9. Install pumping equipment and put well on production with both laterals commingled.
10. Report production test results.

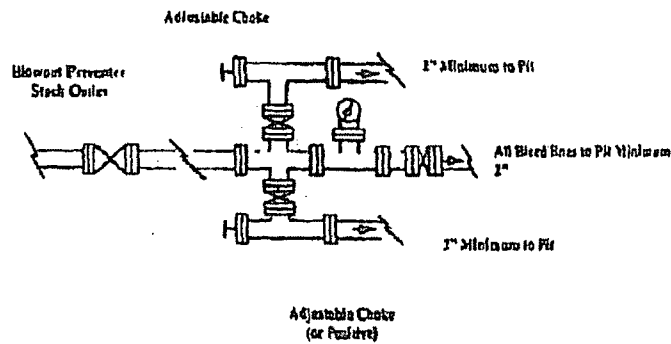
COG Operating LLC

BOPE and Choke Schematic



Minimum 4" Nodal choke and Mill Bore

Choke Manifold Requirement (2000 psi WP)
No Annular Required



NOTES REGARDING THE BLOWOUT PREVENTERS

Blower Drilling Rig
Eddy County, New Mexico

1. Drilling nipple to be so constructed that it can be removed without use of a welder through rotary table opening, with minimum I.D. equal to preventer bore.
2. Wear ring to be properly installed in head.
3. Blow out preventer and all fittings must be in good condition, 3000 psi WP minimum.
4. All fittings to be flanged.
5. Safety valve must be available on rig floor at all times with proper connections, valve to be full 2000 psi WP minimum.
6. All choke and kill lines to be securely anchored especially ends of choke lines.
7. Equipment through which bit must pass shall be at least as large as the diameter of the casing being drilled through.
8. Kelly cock on Kelly.
9. Extension wrenches and hand wheels to be properly installed.
10. Blow out preventer control to be located as close to driller's position as feasible.
11. Blow out preventer closing equipment to include minimum 40-gallon accumulator, two independent sources of pump power on each line and maintain all API specifications.

**Puckett 12 Federal #7H
Blinbry/Paddock Horizontal
Eddy County, New Mexico**

<u>Surface</u>	<u>Lateral Terminus</u>
15' FSL	330' FNL
819' FEL	990' FEL
S-12	S-12
T17S, R31E	

Proposed Wellbore

API: 30-015-39476

**KB: 14'
GL: 3965'**

Bit Size: 17-1/2"

13-3/8" 48# H40/J55 STC @ 748'
Torque 3220

350 ex C w/ 2% CaCl2, 4% gel 13.5 ppg, 1.74 cf/sk
480' ex C w/ 2% CaCl2 14.8 ppg, 1.35 cf/sk
320 sacks CIRCULATED TO SURFACE

Bit Size: 12-1/4"

9-5/8" 40# J55 LTC @ 2032'

300 ex 50:50:10 Poz:C:gel w/ 5 pps LCM-1
5% NaCl, 11.8 ppg, 2.45 cf/sk
200 ex C w/ 2% CaCl2 14.8 ppg, 1.34 cf/sk
TOC 440', 1" w/ 134 ex to surf, circ 29 ex

Middle Blinbry: KOP @ 5615'
Liner Hanger/Pkr @ 5630';
Landing point @ 6457' MD, 6150' TVD
TD 10858' MD, 6073' TVD
91° inclination, 358.14° azm, vertical section 4939'

Rustler @ 687'

Base of Salt @ 1788'

Yates @ 2029'

Queen @ 2989'

San Andres @ 3743'

Glorietta @ 5243'

Yeso @ 5323'

PRODUCTION HOLE MUD:
CBW: 8.8-9.5 ppg; FV 26-29, WL
NC (5678'-10858')

Bit Size: 6-1/8"

4-1/2" 13.5# L80 LTC LSA 5688' - 10858'
w/ Peak packers and sleeves for 15 stage completion

Bit Size: Vertical & Curve & Lateral - 8-3/4"

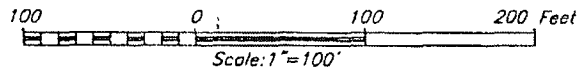
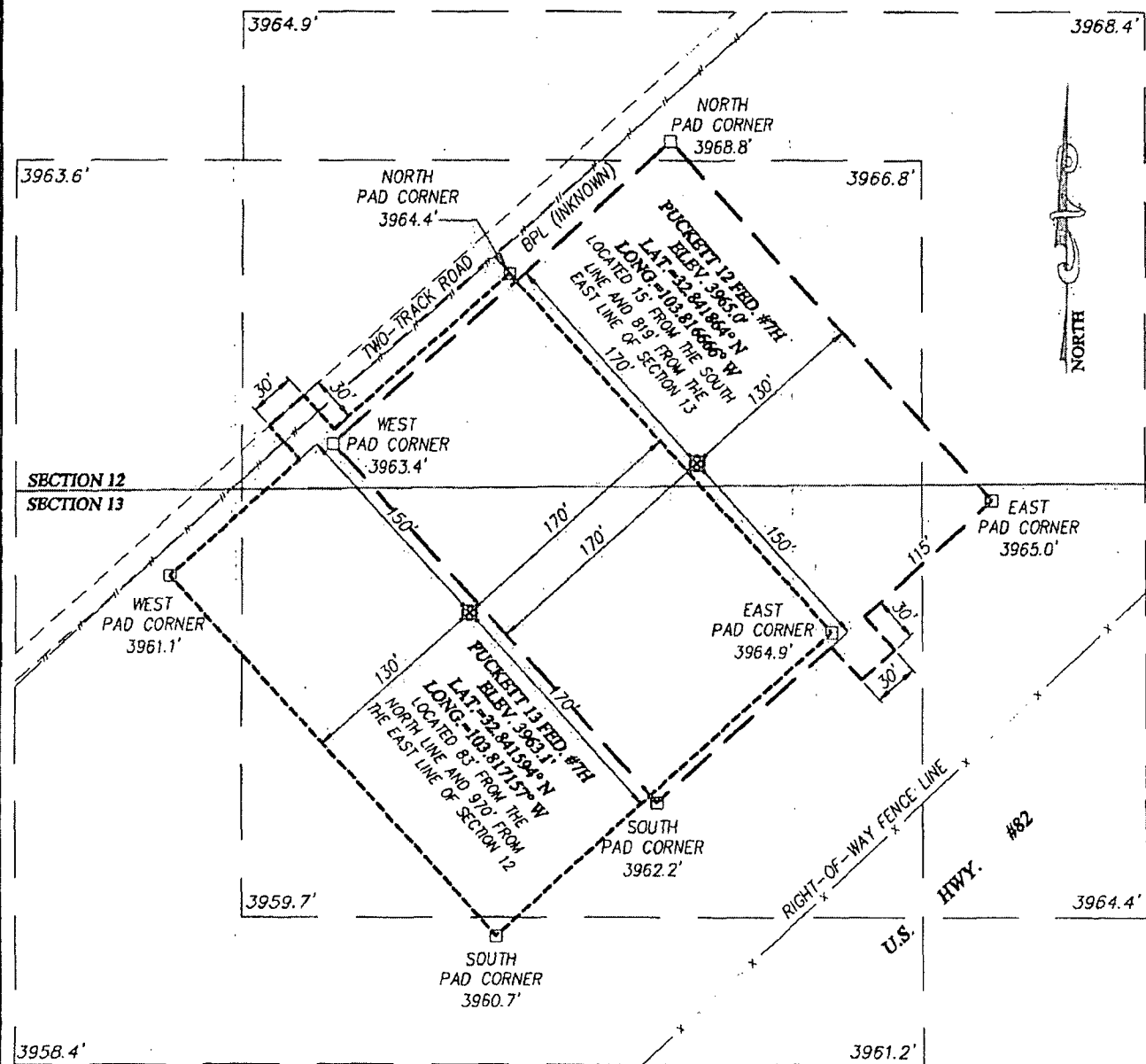
~5,173' VS Lateral 178.3° AZ

TAPERED STRING 7" 28# L80 LTC @ 5965'; 5-1/2" 17# L80 5965' -11,481' 600 ex 35:65:6 followed by 400 ex 75:25 followed by 800 ex Acid Soluble TOC (by CBL) at 400'

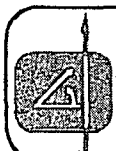
11,498' MD, 6522' TVD

*Revision
see step #17
& completion
Procedure*

SECTIONS 12 & 13, TOWNSHIP 17 SOUTH, RANGE 31 EAST, N.M.P.M.
 EDDY COUNTY NEW MEXICO



DIRECTIONS TO LOCATION
 FROM THE INTERSECTION OF U.S. HWY. #82 AND CO. RD. #224
 (RIPPLE RD.), GO NORTHEAST ON U.S. HWY. #82 APPROX. 0.6 MILES.
 TURN LEFT AND GO NORTHWEST ON TWO-TRACK RD. 0.1 MILES. TURN
 RIGHT AND GO NORTHEAST APPROX. 0.2 MILES. THESE LOCATION
 STAKES ARE APPROX. 200-220 FEET SOUTHEAST OF TWO-TRACK RD.



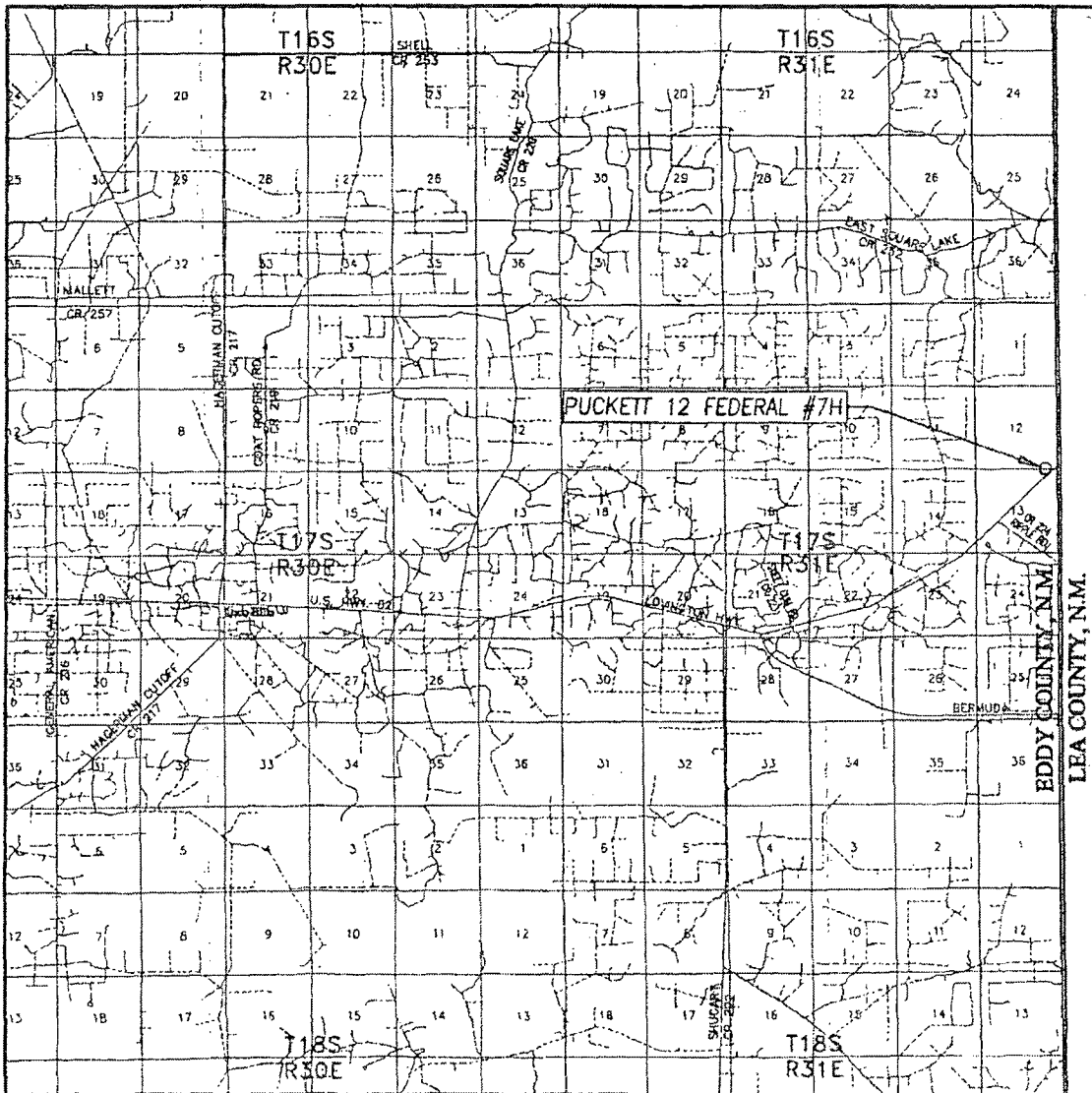
PROVIDING SURVEYING SERVICES
 SINCE 1946
JOHN WEST SURVEYING COMPANY
 412 N. DAL PASO
 HOBBS, N.M. 88240
 (575) 393-3117

COG OPERATING, LLC

PUCKETT 12 FEDERAL #7H & PUCKETT 13 FEDERAL #7H WELLS
 LOCATED IN THE SOUTHEAST QUARTER OF SECTION 12
 AND THE NORTHEAST QUARTER OF SECTION 13
 TOWNSHIP 17 SOUTH, RANGE 31 EAST, N.M.P.M.,
 EDDY COUNTY, NEW MEXICO

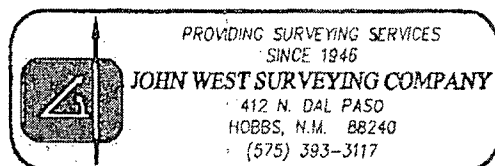
Survey Date: 6/28/11	Sheet 1 of 1 Sheets
W.O. Number: 11.13.1809	Dr By: DSS
Date: 8/17/11	Rel: 11111159 & 11111164
11131809	Scale: 1"=100'

VICINITY MAP

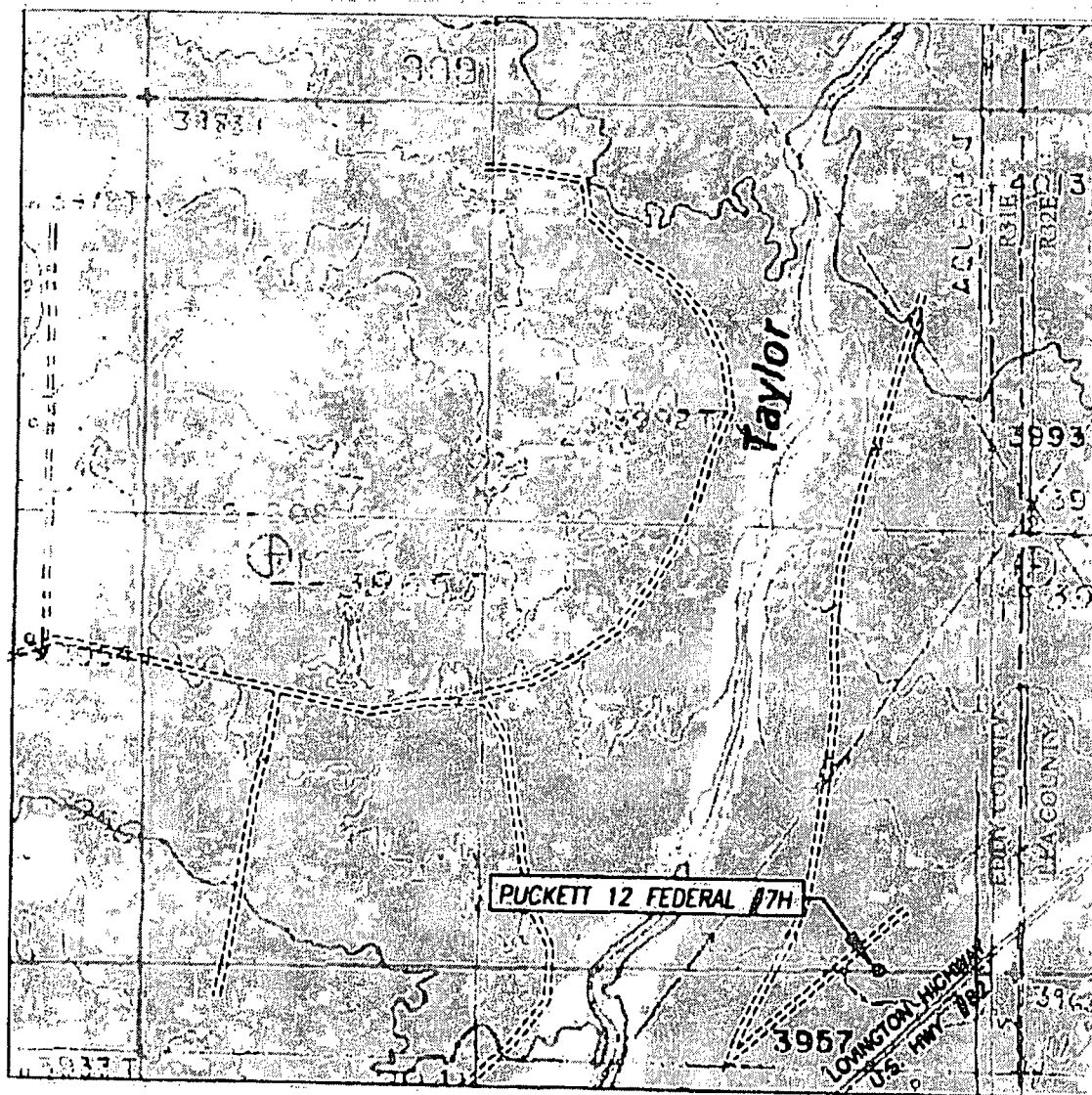


SCALE: 1" = 2 MILES

SEC. 12 TWP. 17-S RGE. 31-E
 SURVEY N.M.P.M.
 COUNTY EDDY STATE NEW MEXICO
 DESCRIPTION 15' FSL & 819' FEL
 ELEVATION 3965'
 OPERATOR COG OPERATING, LLC
 LEASE PUCKETT 12 FEDERAL



LOCATION VERIFICATION MAP



SCALE: 1" = 1000'

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

SEC. 12 TWP. 17-S. RGE. 31-E

SURVEY N.M.P.M.

COUNTY EDDY STATE NEW MEXICO

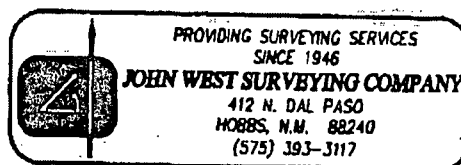
DESCRIPTION 15' FSL & 819' FEL

ELEVATION 3965'

OPERATOR COG OPERATING, LLC

LEASE PUCKETT 12 FEDERAL

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



Plan Proposal

FOR

COG Operating, LLC
Puckett 12 Federal #7H (Dual Hz)
Eddy Co., NM

Design #2

Presented By:

Aaron Bager
Account Manager

Bret Wolford
Well Planner

SHL
15' FSL & 819' FEL
Penetration Point
130' FSL & 866' FEL
PBHL
130' FNU & 990' FEL
Sec 12-T17S-R31E

Archer



COG Operating, LLC

Eddy County(NM27E)

Sec.12-T17S-R31E

Puckett 12 Federal #7H

Wellbore #2 (Dual Hz)

Plan: Design #2

Standard Planning Report

16 April, 2013

Archer

COMPASS

Archer
Planning Report

Archer

Database:	EDM 5000.1 Single User Db	Local Coordinates Reference:	Well Puckett 12 Fed 67H
Company:	COG Operating, LLC	AD Reference:	WELL @ 3979.00usf
Project:	Eddy County (NM27E)	UD Reference:	WELL @ 3979.00usf
Site:	Sec.12-T17S-R31E	North Reference:	Grid
Well:	Puckett 12 Fed 67H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #2 (Dust Hd)		
Design:	Design #2		

Project:	Eddy County (NM27E)		
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:	Sec.12-T17S-R31E		
Site Position:		Northing:	670,399.300 usf
From:	Map	Easting:	659,913.500 usf
Position Uncertainty:	0.00 usf	Grid Radius:	13-3/16"
		Grid Convergence:	0.28 "

Well:	Puckett 12 Fed 67H		
Well Position:	+N-S -29.90 usf	Northing:	670,399.400 usf
	+E-W -226.00 usf	Easting:	659,664.500 usf
Position Uncertainty:	0.00 usf	Wellhead Elevation:	usf
		Ground Level:	3,965.00 usf

Wellbore:	Wellbore #2 (Dust Hd)		
Measurement:	Model Name	Sample Date	Direction
	IGRF2010	04/15/13	7.52
			60.87
			48.773

Design:	Design #2		
Audit Notes:			
Version:	Phase:	PLAN	Tie On Depth: 5,615.00
Vertical Section:	Depth From (TVD):	MD-S	MD-W
	(usf)	(usf)	(usf)
	0.00	2.00	0.00
			357.60

Measured Depth (usf)	Uncertainty (")	Asimuth (")	Vertical Depth (usf)	+N-S (usf)	+E-W (usf)	Dogleg Rate (1/100usf)	Bore Rate (1/100usf)	Turn Rate (1/100usf)	TFO (")	Target
5,615.00	0.70	12.60	5,614.19	7.10	-39.33	0.00	0.00	0.00	0.00	
6,835.12	0.58	0.75	5,834.30	7.32	-39.30	0.94	-0.88	-58.91	-142.64	
6,457.29	91.00	358.14	6,150.00	638.99	-56.27	11.00	11.00	-0.32	-2.61	Puckett 12 Fed 67H F
10,857.80	91.00	358.14	6,073.20	4,934.50	-189.10	0.00	0.00	0.00	0.00	Puckett 12 Fed 67H F

COMPASS

Archer
Planning Report

Archer

Database:	EDM 5000.1 Single User DB	Local Coordinate Reference:	Well Puckett 12 Federal #7H
Company:	COG Operating, LLC	TVD Reference:	WELL @ 3978.000ft
Project:	Eddy County (NMZ/NE)	WGS Reference:	WELL @ 3978.000ft
Site:	Sec 12-T17S-R31E	North Reference:	Grid
Well:	Puckett 12 Federal #7H	Survey Collection Method:	Minimum Curvature
Wellbore:	Wellbore #2 (Dual Mod)		
Design:	Design #2		

Measured Depth (feet)	Inclination (°)	Azimuth (°)	Vertical Depth (feet)	WGS (feet)	EDM (feet)	Vertical Section (feet)	Dip Angle (°)	Rate (ft/1000ft)	Rate (ft/1000ft)	Rate (ft/1000ft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100.00	0.78	184.84	100.00	-0.84	0.18	-0.85	0.78	0.00	0.00	0.00
200.00	0.72	170.85	199.99	-1.80	0.45	-1.92	0.08	-0.04	6.01	
300.00	0.86	181.33	299.99	-3.27	0.54	-3.29	0.20	0.14	10.68	
400.00	0.78	188.13	399.97	-4.89	0.42	-4.71	0.13	-0.08	6.80	
500.00	0.83	189.63	499.96	-6.08	0.20	-6.08	0.06	0.05	1.70	
600.00	0.75	184.24	599.95	-7.43	-0.08	-7.42	0.10	-0.08	4.41	
700.00	0.78	229.43	699.94	-8.49	-0.74	-8.46	0.48	0.01	35.18	
800.00	0.27	258.08	799.94	-8.98	-1.48	-8.92	0.53	-0.43	26.85	
900.00	0.18	178.63	899.94	-9.20	-1.71	-9.12	0.29	-0.09	-78.25	
1,000.00	0.43	197.43	999.94	-9.71	-1.82	-9.83	0.28	0.25	17.60	
1,100.00	0.54	210.41	1,099.93	-10.48	-2.17	-10.38	0.15	0.11	12.98	
1,200.00	0.27	285.58	1,199.93	-10.90	-2.84	-10.79	0.44	-0.27	55.15	
1,300.00	0.81	102.24	1,299.93	-11.03	-2.38	-10.93	0.87	0.34	-163.32	
1,500.00	0.48	114.13	1,499.92	-11.80	-0.55	-11.57	0.08	-0.08	5.94	
1,600.00	0.48	114.13	1,599.92	-11.94	0.21	-11.94	0.00	0.00	0.00	
1,700.00	0.71	87.10	1,699.91	-12.19	1.21	-12.23	0.29	0.23	-17.03	
1,800.00	0.74	64.71	1,799.90	-11.99	2.41	-12.08	0.41	0.03	-32.38	
1,900.00	1.04	59.49	1,899.89	-11.25	3.77	-11.40	0.31	0.30	-5.22	
2,000.00	1.00	88.40	1,999.87	-10.47	5.37	-10.68	0.18	-0.04	8.91	
2,100.00	0.82	73.85	2,099.86	-10.00	6.70	-10.26	0.39	-0.38	5.55	
2,200.00	0.33	88.99	2,199.86	-9.84	7.51	-10.13	0.31	-0.29	13.04	
2,300.00	0.84	99.91	2,299.86	-9.92	8.34	-10.23	0.33	0.31	12.82	
2,400.00	0.48	103.15	2,399.85	-10.11	8.29	-10.47	0.18	-0.18	3.24	
2,500.00	0.30	139.85	2,499.86	-10.40	9.85	-10.78	0.29	-0.18	38.50	
2,600.00	0.25	203.27	2,599.85	-10.80	9.93	-11.19	0.29	-0.05	63.62	
2,700.00	0.48	224.35	2,699.85	-11.30	9.55	-11.87	0.28	0.23	21.08	
2,800.00	0.82	237.81	2,799.84	-11.86	8.80	-12.23	0.19	0.14	13.56	
2,900.00	0.89	253.81	2,899.83	-12.38	7.59	-12.88	0.34	0.27	15.90	
3,000.00	1.10	257.05	2,999.82	-12.82	5.91	-13.05	0.22	0.21	3.24	
3,100.00	1.19	257.45	3,099.80	-13.26	3.88	-13.41	0.09	0.08	0.40	
3,200.00	1.15	260.23	3,199.78	-13.68	1.98	-13.72	0.07	-0.04	2.78	
3,300.00	1.37	257.98	3,299.75	-14.07	-0.20	-14.05	0.23	0.22	-2.25	
3,400.00	1.33	261.79	3,399.73	-14.49	-2.51	-14.38	0.10	-0.04	3.81	
3,500.00	1.48	260.09	3,499.70	-14.87	-4.82	-14.66	0.14	0.13	-1.70	
3,600.00	1.38	265.98	3,599.67	-15.18	-7.37	-14.87	0.17	-0.08	5.89	
3,700.00	1.41	271.29	3,699.64	-15.23	-8.81	-14.83	0.13	0.03	5.31	
3,800.00	1.85	282.51	3,799.60	-14.88	-12.81	-14.34	0.84	0.44	11.22	
3,900.00	1.58	290.27	3,899.55	-14.04	-15.46	-13.40	0.37	-0.29	7.78	
4,000.00	1.50	285.85	3,899.51	-12.87	-17.97	-12.24	0.15	0.00	5.38	
4,100.00	1.80	298.89	4,099.48	-11.78	-20.44	-10.82	0.05	0.04	1.04	
4,200.00	1.56	295.03	4,199.44	-10.58	-22.82	-9.63	0.07	-0.05	-1.88	
4,300.00	1.41	295.87	4,299.41	-9.45	-25.25	-8.42	0.14	-0.14	0.84	
4,400.00	1.27	311.22	4,399.38	-8.18	-27.19	-7.08	0.38	-0.14	15.35	
4,500.00	1.38	312.87	4,499.35	-6.84	-28.91	-5.47	0.11	0.11	1.45	
4,600.00	1.42	311.30	4,599.32	-5.00	-30.72	-3.76	0.05	0.04	-1.37	
4,700.00	1.32	307.89	4,699.28	-3.48	-32.57	-2.17	0.13	-0.10	-3.81	
4,800.00	1.15	318.41	4,799.27	-2.01	-34.13	-0.84	0.30	-0.17	11.72	
4,900.00	1.11	317.70	4,899.25	-0.54	-35.43	0.88	0.05	-0.04	-1.71	
5,000.00	0.93	322.53	4,999.23	0.82	-36.58	2.30	0.20	-0.18	4.83	
5,100.00	0.81	315.75	5,099.22	1.87	-37.57	3.49	0.16	-0.12	-8.78	
5,200.00	0.75	313.77	5,199.21	2.83	-38.53	4.48	0.07	-0.08	-1.98	
5,300.00	0.58	323.93	5,299.21	3.78	-39.29	5.38	0.22	-0.19	10.16	
5,400.00	0.70	358.13	5,399.20	4.79	-39.82	6.38	0.37	0.14	32.20	

400040

Archer
Planning Report

Archer

Database:	EDM 5000.1 Single User Db	Local Coordinate Reference:	Well Puckett 12 Federal #78
Company:	COG Operating, LLC	TV2 Reference:	WELL @ 2479 DUAL
Project:	Edley County (NAZTE)	MD Reference:	WELL @ 2479 DUAL
State:	SEC.12-T1TS-R31E	North Reference:	Grid
Well:	Puckett 12 Federal #78	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #2 (Dual Rd)		
Design:	Design #2		

Measured	Horizontal	Vertical	Vertical	Vertical	Vertical	Vertical	Vertical	Vertical	Vertical
Depth	Interval	Altitude	Depth	Interval	Interval	Interval	Interval	Interval	Interval
(feet)	(feet)	(feet)	(feet)	(feet)	(feet)	(feet)	(feet)	(feet)	(feet)
5,500.00	0.46	3.20	5,499.20	5.80	-39.84	7.30	0.25	-0.24	7.07
5,521.00	0.70	28.10	5,520.20	6.00	-39.58	7.50	1.57	1.14	109.05
5,552.00	0.70	3.60	5,551.19	8.35	-39.48	7.94	0.88	0.00	-72.58
5,583.00	0.70	15.70	5,582.19	6.73	-39.42	8.31	0.48	0.00	39.05
Tie-In / OH Survey									
5,615.00	0.70	12.60	5,614.18	7.10	-39.33	8.68	0.12	0.00	-8.69
Int. KOP / Start DLS 11.00' TFO -2.61									
5,635.12	0.58	0.75	5,634.30	7.32	-39.30	8.90	0.94	-0.63	-58.91
5,650.00	2.20	358.81	5,646.18	7.88	-39.80	8.20	11.00	11.00	-13.08
5,700.00	7.70	358.32	5,688.88	11.98	-39.42	13.57	11.00	11.00	-0.95
5,750.00	13.20	358.25	5,746.13	21.05	-39.89	22.83	11.00	11.00	-0.18
5,800.00	18.70	358.22	5,796.19	34.78	-40.12	38.37	11.00	11.00	-0.07
5,850.00	24.20	358.20	5,842.71	53.04	-40.89	54.84	11.00	11.00	-0.04
5,900.00	29.70	358.18	5,887.26	75.68	-41.41	77.29	11.00	11.00	-0.02
5,950.00	35.20	358.16	5,928.44	102.48	-42.28	104.10	11.00	11.00	-0.02
6,000.00	40.70	358.17	5,988.85	133.20	-43.24	134.84	11.00	11.00	-0.01
6,050.00	46.20	358.16	6,005.14	167.58	-44.34	189.21	11.00	11.00	-0.01
6,100.00	51.70	358.16	6,037.86	205.23	-45.54	206.90	11.00	11.00	-0.01
6,150.00	57.20	358.16	6,087.02	245.87	-46.85	247.56	11.00	11.00	-0.01
6,200.00	62.70	358.15	6,092.05	288.11	-48.24	290.82	11.00	11.00	-0.01
PP @ 6220' MD									
6,228.00	85.78	358.15	6,104.22	314.31	-49.08	316.03	11.00	11.00	-0.01
6,250.00	88.20	358.15	6,112.82	334.55	-49.71	336.28	11.00	11.00	-0.01
6,300.00	79.70	358.18	6,129.14	381.77	-51.24	383.52	11.00	11.00	-0.01
6,350.00	79.20	358.14	6,140.85	430.33	-52.81	432.11	11.00	11.00	-0.01
6,400.00	84.70	358.14	6,147.85	479.79	-54.41	481.60	11.00	11.00	-0.01
6,450.00	90.20	358.14	6,150.08	529.70	-56.03	531.53	11.00	11.00	0.00
EOP / Stop 1400.00' MD @ 6457.20' MD									
6,457.20	91.00	358.14	6,150.00	538.98	-56.27	538.82	11.00	11.00	0.00
6,500.00	91.00	358.14	6,148.25	578.68	-57.65	581.52	0.00	0.00	0.00
6,600.00	91.00	358.14	6,147.51	678.60	-60.80	681.50	0.00	0.00	0.00
6,700.00	91.00	358.14	6,145.76	778.53	-64.15	781.46	0.00	0.00	0.00
6,800.00	91.00	358.14	6,144.02	878.49	-67.50	881.46	0.00	0.00	0.00
6,900.00	91.00	358.14	6,142.27	978.38	-70.84	981.44	0.00	0.00	0.00
7,000.00	91.00	358.14	6,140.53	1,078.33	-73.88	1,081.43	0.00	0.00	0.00
7,100.00	91.00	358.14	6,138.78	1,178.28	-77.13	1,181.41	0.00	0.00	0.00
7,200.00	91.00	358.14	6,137.04	1,278.19	-80.37	1,281.39	0.00	0.00	0.00
7,300.00	91.00	358.14	6,135.29	1,378.12	-83.82	1,381.37	0.00	0.00	0.00
7,400.00	91.00	358.14	6,133.55	1,478.05	-86.87	1,481.35	0.00	0.00	0.00
7,500.00	91.00	358.14	6,131.80	1,578.98	-90.11	1,581.33	0.00	0.00	0.00
7,600.00	91.00	358.14	6,130.06	1,678.92	-93.36	1,681.32	0.00	0.00	0.00
7,700.00	91.00	358.14	6,128.31	1,778.85	-96.60	1,781.30	0.00	0.00	0.00
7,800.00	91.00	358.14	6,126.57	1,878.78	-99.85	1,881.29	0.00	0.00	0.00
7,900.00	91.00	358.14	6,124.82	1,978.71	-103.10	1,981.28	0.00	0.00	0.00
8,000.00	91.00	358.14	6,123.08	2,078.65	-106.34	2,081.24	0.00	0.00	0.00
8,100.00	91.00	358.14	6,121.33	2,178.58	-109.59	2,181.22	0.00	0.00	0.00
8,200.00	91.00	358.14	6,119.58	2,278.51	-112.83	2,281.21	0.00	0.00	0.00
8,300.00	91.00	358.14	6,117.84	2,378.44	-116.08	2,381.19	0.00	0.00	0.00
8,400.00	91.00	358.14	6,116.10	2,478.37	-119.32	2,481.17	0.00	0.00	0.00
8,500.00	91.00	358.14	6,114.35	2,578.31	-122.57	2,581.15	0.00	0.00	0.00
8,600.00	91.00	358.14	6,112.60	2,678.24	-125.82	2,681.13	0.00	0.00	0.00
8,700.00	91.00	358.14	6,110.86	2,778.17	-129.08	2,781.11	0.00	0.00	0.00
8,800.00	91.00	358.14	6,109.11	2,878.10	-132.31	2,881.10	0.00	0.00	0.00

Database:	EDM 5000.1 Single User Db	Local Coordinate Reference:	Well Puckett 12 Federal #7H
Company:	COG Operating, LLC	TVD Reference:	WELL @ 3078.00usd
Project:	Eddy County NM27E	MD Reference:	WELL @ 3078.00usd
Site:	Sec. 12 T17S R31E	North Reference:	Grid
Well:	Puckett 12 Federal #7H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #2 (Dual Hg)		
Design:	Design #2		

Measured Depth (feet)	Inclination (°)	Azimuth (°)	Vertical Depth (feet)	NE-S (feet)	EW-N (feet)	Vertical Section (feet)	Dogleg Rate (°/100usd)	Build Rate (°/100usd)	Turn Rate (°/100usd)
8,900.00	91.00	358.14	8,107.37	2,978.03	-135.53	2,981.08	0.00	0.00	0.00
9,000.00	91.00	358.14	8,105.82	3,077.97	-136.80	3,081.08	0.00	0.00	0.00
9,100.00	91.00	358.14	8,103.89	3,177.80	-142.05	3,181.04	0.00	0.00	0.00
9,200.00	91.00	358.14	8,102.13	3,277.83	-145.29	3,281.02	0.00	0.00	0.00
9,300.00	91.00	358.14	8,100.39	3,377.78	-148.54	3,381.00	0.00	0.00	0.00
9,400.00	91.00	358.14	8,098.64	3,477.69	-151.78	3,480.99	0.00	0.00	0.00
9,500.00	91.00	358.14	8,096.90	3,577.63	-155.03	3,580.97	0.00	0.00	0.00
9,600.00	91.00	358.14	8,095.15	3,677.58	-158.27	3,680.95	0.00	0.00	0.00
9,700.00	91.00	358.14	8,093.41	3,777.48	-161.52	3,780.93	0.00	0.00	0.00
9,800.00	91.00	358.14	8,091.66	3,877.42	-164.77	3,880.91	0.00	0.00	0.00
9,900.00	91.00	358.14	8,089.92	3,977.36	-168.01	3,980.89	0.00	0.00	0.00
10,000.00	91.00	358.14	8,088.17	4,077.29	-171.26	4,080.88	0.00	0.00	0.00
10,100.00	91.00	358.14	8,086.43	4,177.22	-174.50	4,180.86	0.00	0.00	0.00
10,200.00	91.00	358.14	8,084.68	4,277.15	-177.75	4,280.84	0.00	0.00	0.00
10,300.00	91.00	358.14	8,082.94	4,377.08	-180.99	4,380.82	0.00	0.00	0.00
10,400.00	91.00	358.14	8,081.19	4,477.02	-184.24	4,480.80	0.00	0.00	0.00
10,500.00	91.00	358.14	8,079.45	4,576.95	-187.48	4,580.78	0.00	0.00	0.00
10,600.00	91.00	358.14	8,077.70	4,676.88	-190.73	4,680.77	0.00	0.00	0.00
10,700.00	91.00	358.14	8,075.95	4,776.81	-193.98	4,780.75	0.00	0.00	0.00
10,800.00	91.00	358.14	8,074.21	4,876.74	-197.22	4,880.73	0.00	0.00	0.00
TD at 10857.80 - Puckett 12 Fed #7H PB#16									
10,857.80	91.00	358.14	8,073.20	4,934.50	-199.10	4,938.52	0.00	0.00	0.00

Target Name	Horizontal Target Shape	Mag Azimuth (°)	Mag Dip (°)	TVD (feet)	NE-S (feet)	EW-N (feet)	Northings (feet)	Eastings (feet)	Latitude	Longitude
Puckett 12 Fed #7H PB#16	Plan has target center Point	0.00	0.00	8,073.20	4,934.50	-199.10	675,303.900	650,495.400	32° 51' 19.547" N	103° 49' 2.048" W

Measured Depth (feet)	Vertical Depth (feet)	NE-S (feet)	EW-N (feet)	Comments
5,815.00	5,814.10	7.10	-39.33	Tie-In / CH Survey
5,835.12	5,834.30	7.32	-39.30	Int. KOP / Start DLS 11.00' TFO -2.81
8,228.00	8,104.22	314.31	-48.06	PP @ 8228' MD
8,457.28	8,150.00	538.89	-56.27	EOC / Start 4400.50' hold at 8457.28 MD
10,857.80	8,073.20	4,934.50	-199.10	TD at 10857.80



COG Operating, LLC

**Eddy County(NM27E)
Sec.12-T17S-R31E
Puckett 12 Federal #7H**

**Wellbore #2 (Dual Hz)
Design #2**

Anticollision Report

18 April, 2013

Archer

Company	COG Operating, LLC	Local Office/State Reference:	Wall Puckett 12 Federal #7H
Project	EVIS, Casper NMZT2	AVS Reference:	WELL @ 3670.0000
Reference #1:	656 12 1715-K01E	AD Reference:	WELL @ 3670.0000
City/State:	0.00 us	Arch Reference:	0.00
Reference Work:	Puckett 12 Federal #7H	Survey Calculation Method:	Minimum Curvature
Unit/Type:	0.00 us	Calculations are:	2.00 sigma
Reference #2:	Wellbore #2 (Dual Hz)	Database:	EDM 5000, 1 Single User DB
Reference Design:	Design #2	Obs. TYP Reference:	Reference Data

Reference	Design #2		
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 8,695.88 USF	Error Surface:	Elliptical Conic
Warning Levels Evaluated at:	2.00 Sigma	Casing Method:	Not applied

Survey Tool Programs		Date	GUY 0-13	
From (unit)	To (unit)	Survey (Wellbore)	Tool Name	Description
100.00	5,500.00	Gyro Survey-OH (Wellbore #2 (Dual Hz))	GYD_DP_MS	Gyrodata gyro-compassing and drop
5,521.00	5,815.00	MWD Survey-OH (Wellbore #2 (Dual Hz))	MWD	MWD - Standard
5,815.00	10,857.80	Design #2 (Wellbore #2 (Dual Hz))	MWD	MWD - Standard

Summary						
Site Name	Reference Measured Depth (feet)	Original Measured Depth (feet)	Difference Between Closures (feet)	Between Closures Elapsed Time (hr)	Seepage Factor	Warning
Site 12-175-R11E Orad Well - Wellbore Design						
Puckett 12 Federal B7H - Wellbore #1 - Wellbore #1	5,635.12	5,835.12	0.00	-13.28	0.000	Level 1, CC, ES, SF

[illegible]

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

Company:	COG Operating, LLC	Local Co-ordinate Reference:	Well Puckett 12 Federal #7H
Project:	Eddy County (NM 771)	TVD Reference:	WELL @ 3479 0000
Reference Elev:	Sec 12-T175-R31E	MD Reference:	WELL @ 3479 0000
8 in Error:	0.00 Unit	North Reference:	Grid
Reference Well:	Puckett 12 Federal #7H	Survey Calculation Methods:	Minimum Curvature
Well Error:	0.00 Unit	Output errors are in:	2.00 sigma
Reference Wellbore:	Wellbore #2 (Dual Hnd)	Database:	EDM 5000.1 Single User DB
Reference Design:	Design #2	Output TVD Reference:	Reference Datum

Sec 12-T175-R31E - Puckett 12 Federal #7H - Wellbore #1 - Wellbore #1															Offset Log Error	
Survey Name: Wellbore #1															Offset Well Error	
Station	Depth	True	Offset	Offset	Offset	Offset	Offset	Offset	Offset	Offset	Offset	Offset	Offset	Offset	Offset	Offset
Log	Log	Log	Log	Log	Log	Log	Log	Log	Log	Log	Log	Log	Log	Log	Log	Log
2.600.00	2.600.00	2.600.00	2.600.00	1.12	5.13	0.00	-10.40	8.05	0.00	-4.24	8.24	0.00	0.00	0.00	0.00	0.00
2.600.00	2.600.00	2.600.00	2.600.00	1.14	5.25	0.00	-10.86	8.82	0.00	-4.41	8.41	0.00	0.00	0.00	0.00	0.00
2.700.00	2.700.00	2.700.00	2.700.00	1.16	5.25	0.00	-11.30	9.36	0.00	-4.83	8.83	0.00	0.00	0.00	0.00	0.00
2.800.00	2.800.00	2.800.00	2.800.00	1.18	5.78	0.00	-11.88	8.80	0.00	-4.88	8.88	0.00	0.00	0.00	0.00	0.00
2.900.00	2.900.00	2.900.00	2.900.00	1.20	5.99	0.00	-12.58	7.58	0.00	-1.70	7.10	0.00	0.00	0.00	0.00	0.00
3.000.00	3.000.00	3.000.00	3.000.00	1.22	6.21	0.00	-13.62	6.81	0.00	-1.23	7.13	0.00	0.00	0.00	0.00	0.00
3.100.00	3.100.00	3.100.00	3.100.00	1.24	6.42	0.00	-13.26	3.86	0.00	-7.57	7.57	0.00	0.00	0.00	0.00	0.00
3.200.00	3.200.00	3.200.00	3.200.00	1.26	6.62	0.00	-13.68	1.86	0.00	-7.80	7.80	0.00	0.00	0.00	0.00	0.00
3.300.00	3.300.00	3.300.00	3.300.00	1.27	6.84	0.00	-14.07	-4.20	0.00	-8.02	8.02	0.00	0.00	0.00	0.00	0.00
3.400.00	3.400.00	3.400.00	3.400.00	1.29	7.06	0.00	-14.48	-2.81	0.00	-8.29	8.29	0.00	0.00	0.00	0.00	0.00
3.500.00	3.500.00	3.500.00	3.500.00	1.31	7.27	0.00	-14.87	-6.82	0.00	-8.49	8.49	0.00	0.00	0.00	0.00	0.00
3.600.00	3.600.00	3.600.00	3.600.00	1.32	7.48	0.00	-15.18	-7.27	0.00	-8.71	8.71	0.00	0.00	0.00	0.00	0.00
3.700.00	3.700.00	3.700.00	3.700.00	1.34	7.89	0.00	-15.23	-8.81	0.00	-8.84	8.84	0.00	0.00	0.00	0.00	0.00
3.800.00	3.800.00	3.800.00	3.800.00	1.36	7.90	0.00	-16.30	-12.81	0.00	-8.17	8.17	0.00	0.00	0.00	0.00	0.00
3.900.00	3.900.00	3.900.00	3.900.00	1.38	8.71	0.00	-16.40	-8.40	0.00	-8.40	8.40	0.00	0.00	0.00	0.00	0.00
4.000.00	3.999.81	4.000.00	3.999.81	1.39	8.21	0.00	-12.87	-17.87	0.00	-8.82	8.82	0.00	0.00	0.00	0.00	0.00
4.100.00	4.098.48	4.100.00	4.098.48	1.41	8.82	0.00	-11.78	-25.44	0.00	-8.84	8.84	0.00	0.00	0.00	0.00	0.00
4.200.00	4.199.44	4.200.00	4.199.44	1.43	8.73	0.00	-10.86	-22.82	0.00	-10.07	10.07	0.00	0.00	0.00	0.00	0.00
4.300.00	4.299.41	4.300.00	4.299.41	1.44	8.84	0.00	-9.48	-25.25	0.00	-10.29	10.29	0.00	0.00	0.00	0.00	0.00
4.400.00	4.398.88	4.400.00	4.398.88	1.45	9.14	0.00	-8.18	-27.18	0.00	-10.81	10.81	0.00	0.00	0.00	0.00	0.00
4.500.00	4.498.35	4.500.00	4.498.35	1.47	9.35	0.00	-8.84	-28.81	0.00	-10.73	10.73	0.00	0.00	0.00	0.00	0.00
4.600.00	4.598.32	4.600.00	4.598.32	1.48	9.57	0.00	-8.00	-30.72	0.00	-10.88	10.88	0.00	0.00	0.00	0.00	0.00
4.700.00	4.698.28	4.700.00	4.698.28	1.50	9.78	0.00	-7.40	-32.67	0.00	-11.18	11.18	0.00	0.00	0.00	0.00	0.00
4.800.00	4.798.27	4.800.00	4.798.27	1.51	9.80	0.00	-6.81	-34.13	0.00	-11.41	11.41	0.00	0.00	0.00	0.00	0.00
4.900.00	4.898.25	4.900.00	4.898.25	1.53	10.19	0.00	-6.84	-35.42	0.00	-11.63	11.63	0.00	0.00	0.00	0.00	0.00
5.000.00	4.998.23	5.000.00	4.998.23	1.55	10.33	0.00	0.82	-36.88	0.00	-11.83	11.83	0.00	0.00	0.00	0.00	0.00
5.100.00	5.098.22	5.100.00	5.098.22	1.56	10.00	0.00	1.87	-37.87	0.00	-12.08	12.08	0.00	0.00	0.00	0.00	0.00
5.200.00	5.198.21	5.200.00	5.198.21	1.58	10.01	0.00	2.80	-38.33	0.00	-12.21	12.21	0.00	0.00	0.00	0.00	0.00
5.300.00	5.298.21	5.300.00	5.298.21	1.60	11.01	0.00	3.78	-39.26	0.00	-12.59	12.59	0.00	0.00	0.00	0.00	0.00
5.400.00	5.398.20	5.400.00	5.398.20	1.61	11.22	0.00	4.78	-39.82	0.00	-12.76	12.76	0.00	0.00	0.00	0.00	0.00
5.500.00	5.498.20	5.500.00	5.498.20	1.63	11.43	0.00	5.80	-39.84	0.00	-12.87	12.87	0.00	0.00	0.00	0.00	0.00
5.600.00	5.598.20	5.600.00	5.598.20	1.62	11.47	0.00	6.00	-39.88	0.00	-13.04	13.04	0.00	0.00	0.00	0.00	0.00
5.700.00	5.698.20	5.700.00	5.698.20	1.63	11.54	0.00	6.25	-39.88	0.00	-13.08	13.08	0.00	0.00	0.00	0.00	0.00
5.800.00	5.798.20	5.800.00	5.798.20	1.62	11.60	0.00	6.73	-39.82	0.00	-13.17	13.17	0.00	0.00	0.00	0.00	0.00
5.900.00	5.898.20	5.900.00	5.898.20	1.64	11.67	0.00	7.10	-39.30	0.00	-13.24	13.24	0.00	0.00	0.00	0.00	0.00
6.000.00	5.998.20	6.000.00	5.998.20	1.65	11.71	0.00	7.32	-39.30	0.00	-13.28	13.28	0.00	0.00	0.00	0.00	0.00
6.100.00	6.098.20	6.100.00	6.098.20	1.66	11.72	0.00	7.36	-39.30	0.00	-13.27	13.27	0.00	0.00	0.00	0.00	0.00
6.200.00	6.198.20	6.200.00	6.198.20	1.66	11.74	0.00	7.46	-39.21	0.00	-13.10	13.10	0.00	0.00	0.00	0.00	0.00
6.300.00	6.298.20	6.300.00	6.298.20	1.65	11.83	0.00	8.03	-39.34	0.00	-13.47	13.47	0.00	0.00	0.00	0.00	0.00
6.400.00	6.398.20	6.400.00	6.398.20	1.73	11.88	0.00	8.57	-39.25	0.00	-13.49	13.49	0.00	0.00	0.00	0.00	0.00
6.500.00	6.498.20	6.500.00	6.498.20	1.84	12.06	0.00	8.99	-39.16	0.00	-13.41	13.41	0.00	0.00	0.00	0.00	0.00
6.600.00	6.598.20	6.600.00	6.598.20	2.01	12.17	0.00	9.04	-39.28	0.00	-13.28	13.28	0.00	0.00	0.00	0.00	0.00
6.700.00	6.698.20	6.700.00	6.698.20	2.23	12.27	0.00	8.96	-39.27	0.00	-13.27	13.27	0.00	0.00	0.00	0.00	0.00
6.800.00	6.798.20	6.800.00	6.798.20	2.50	12.30	0.00	8.91	-39.28	0.00	-13.21	13.21	0.00	0.00	0.00	0.00	0.00
6.900.00	6.898.20	6.900.00	6.898.20	2.89	12.45	0.00	10.20	-39.29	0.00	-12.88	12.88	0.00	0.00	0.00	0.00	0.00
7.000.00	6.998.20	7.000.00	6.998.20	3.52	12.58	0.00	12.90	-39.26	0.00	-13.13	13.13	0.00	0.00	0.00	0.00	0.00
7.100.00	7.098.20	7.100.00	7.098.20	4.13	12.70	0.00	17.75	-39.76	0.00	-13.21	13.21	0.00	0.00	0.00	0.00	0.00
7.200.00	7.198.20	7.200.00	7.198.20	4.80	12.84	0.00	17.74	-39.74	0.00	-13.20	13.20	0.00	0.00	0.00	0.00	0.00
7.300.00	7.298.20	7.300.00	7.298.20	6.34	12.96	0.00	17.74	-39.68	0.00	-13.17	13.17	0.00	0.00	0.00	0.00	0.00
7.400.00	7.398.20	7.400.00	7.398.20	6.30	12.96	0.00	17.74	-39.68	0.00	-13.17	13.17	0.00	0.00	0.00	0.00	0.00
7.500.00	7.498.20	7.500.00	7.498.20	7.10	12.84	0.00	17.72	-39.72	0.00	-13.18	13.18	0.00	0.00	0.00	0.00	0.00
7.600.00	7.598.20	7.600.00	7.598.20	8.82	12.89	0.00	17.72	-39.66	0.00	-13.17	13.17	0.00	0.00	0.00	0.00	0.00

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

Company:	COG Operating, LLC	Local Co-ordinate Reference:	Well Puckett 12 Federal 97H
Project:	Eddy County (NAC77C)	TVD Reference:	WELL @ 3678.00m
Reference Elevation:	Sec 12-1175-RD1E	MD Reference:	WELL @ 3679.00m
Well Error:	0.00 m	North Reference:	Grid
Reference Well:	Puckett 12 Federal 97H	Barney Reference Method:	Minimum Curvature
Well Error:	0.00 m	Offset errors are in:	2.00 m
Reference Wellbore:	Wellbore 82 (Dust Hq)	Reference:	EDM 5000.1 Single User Db
Reference Design:	Design 82	Offset TVD Reference:	Reference Datum

Offset Design														Offset into drive	
Sec 12-1175-RD1E - Puckett 12 Federal 97H - Wellbore 81 - Wellbore 81														Offset into drive	
Wellbore 81 (Dust Hq)														Offset into drive	
Measured Depth	True Depth	Vertical Depth	Horizontal Depth	Offset	True North	True East	True South	True West	True North	True East	True South	True West	True North	Offset into drive	Offset into drive
8,400.00	8,417.85	8,401.87	8,414.98	9.51	15.93	175.83	363.82	-46.30	367.89	292.89	17.89	18.00		0.00 m	0.00 m
8,450.00	8,450.34	8,412.18	8,440.10	8.80	16.84	174.71	346.16	-46.30	321.17	252.79	17.40	18.40		0.00 m	0.00 m
8,457.28	8,452.80	8,408.18	8,433.34	8.82	16.70	174.28	346.77	-46.43	322.08	252.63	17.48	18.40		0.00 m	0.00 m
8,500.00	8,448.25	8,789.19	8,477.31	18.70	17.00	170.04	830.41	-49.00	331.84	213.84	18.00	18.43		0.00 m	0.00 m
8,600.00	8,447.81	8,909.41	8,487.10	12.81	19.84	86.01	880.16	-42.77	339.88	326.30	18.20	17.54		0.00 m	0.00 m
8,700.00	8,445.78	7,912.87	8,444.82	14.32	21.80	70.72	782.84	-45.11	343.84	328.31	20.88	18.476		0.00 m	0.00 m
8,800.00	8,444.02	7,111.74	8,453.87	18.15	23.04	74.29	842.34	-37.09	341.81	218.72	22.28	15.475		0.00 m	0.00 m
8,900.00	8,442.27	7,208.84	8,446.12	17.98	24.48	88.15	940.15	-49.30	343.04	319.48	23.37	14.862		0.00 m	0.00 m
7,600.00	8,440.83	7,303.48	8,443.48	18.81	25.85	81.43	1,078.05	-41.98	343.13	319.99	25.14	13.728		0.00 m	0.00 m
7,100.00	8,438.78	7,418.48	8,444.25	21.84	27.89	47.84	1,184.95	-43.41	343.83	318.07	26.08	13.877		0.00 m	0.00 m
7,200.00	8,437.04	7,827.80	8,476.72	20.47	29.80	32.81	1,287.91	-48.28	343.00	314.34	28.60	11.862		0.00 m	0.00 m
7,300.00	8,435.39	7,828.65	8,474.88	25.31	31.88	48.18	1,380.73	-70.88	340.94	308.73	32.31	11.219		0.00 m	0.00 m
7,400.00	8,433.64	7,716.74	8,472.30	27.18	33.29	53.89	1,458.84	-73.43	338.18	307.12	32.07	10.677		0.00 m	0.00 m
7,500.00	8,431.80	7,831.18	8,489.10	28.98	35.25	48.38	1,531.20	-75.67	337.82	303.81	33.81	9.963		0.00 m	0.00 m
7,576.71	8,430.48	7,892.05	8,487.00	36.38	36.82	67.77	1,592.05	-79.55	338.90	301.89	36.27	9.885		0.00 m	0.00 m
7,600.00	8,430.09	7,818.49	8,486.68	36.82	38.00	76.12	1,642.90	-77.22	337.09	301.39	36.99	9.413		0.00 m	0.00 m
7,700.00	8,428.31	8,014.80	8,485.56	32.68	38.74	72.20	1,714.87	-77.86	337.84	308.24	37.80	8.883		0.00 m	0.00 m
7,800.00	8,426.57	8,118.10	8,483.21	34.80	40.79	67.29	1,788.04	-77.73	337.49	297.82	38.84	8.527		0.00 m	0.00 m
7,844.10	8,425.80	8,170.89	8,481.84	38.81	41.75	74.85	1,840.81	-77.45	337.27	298.83	40.84	8.288		0.00 m	0.00 m
7,900.00	8,424.82	8,212.80	8,481.29	38.84	42.81	82.84	1,891.82	-77.23	337.42	298.47	41.80	8.130		0.00 m	0.00 m
8,000.00	8,423.00	8,283.18	8,480.88	38.18	44.14	81.89	2,078.09	-77.07	338.85	295.38	43.47	7.789		0.00 m	0.00 m
8,100.00	8,421.23	8,408.33	8,481.02	48.02	45.86	84.04	2,178.25	-78.88	341.29	296.78	45.69	7.503		0.00 m	0.00 m
8,200.00	8,419.59	8,501.28	8,480.84	41.88	47.58	89.80	2,271.18	-77.81	344.83	297.39	47.63	7.268		0.00 m	0.00 m
8,300.00	8,417.84	8,600.82	8,484.88	43.70	48.94	94.18	2,375.85	-80.78	348.58	299.19	48.18	7.047		0.00 m	0.00 m
8,400.00	8,416.10	8,718.22	8,483.88	43.84	51.77	72.83	2,458.90	-84.58	348.35	287.81	51.54	6.778		0.00 m	0.00 m
8,500.00	8,414.36	8,818.18	8,480.26	47.38	53.71	74.40	2,647.78	-88.71	347.70	294.21	53.48	6.800		0.00 m	0.00 m
8,618.20	8,414.05	8,824.23	8,480.84	47.72	54.82	76.57	2,803.83	-86.39	347.81	293.81	55.82	6.478		0.00 m	0.00 m
8,700.00	8,412.80	8,911.07	8,479.84	48.22	56.80	65.92	2,880.59	-82.02	348.51	292.15	58.38	6.296		0.00 m	0.00 m
8,700.00	8,411.88	8,910.11	8,480.20	41.08	57.41	67.83	2,778.85	-87.18	349.80	292.82	67.28	6.128		0.00 m	0.00 m
8,800.00	8,409.11	9,111.42	8,488.28	42.80	58.36	68.28	2,880.75	-101.88	348.82	292.39	68.84	6.828		0.00 m	0.00 m
8,900.00	8,407.37	9,211.83	8,484.42	54.74	61.41	78.24	2,864.15	-106.17	352.33	291.11	61.22	6.755		0.00 m	0.00 m
8,900.00	8,406.82	9,323.25	8,455.81	44.99	63.00	62.34	2,992.36	-110.27	348.84	288.36	63.28	6.557		0.00 m	0.00 m
9,000.00	8,405.84	9,417.12	8,453.88	56.42	64.45	74.19	3,186.12	-112.90	330.12	284.87	68.34	6.286		0.00 m	0.00 m
9,100.00	8,402.15	9,525.00	8,449.87	60.27	67.88	80.30	3,393.07	-117.17	348.84	281.84	67.20	5.183		0.00 m	0.00 m
9,200.00	8,400.29	9,618.87	8,445.84	42.11	69.43	70.09	3,384.86	-118.47	347.83	277.89	69.20	5.004		0.00 m	0.00 m
9,400.00	8,393.84	9,718.59	8,443.83	63.83	71.27	73.06	3,487.34	-118.11	348.07	274.57	71.48	4.842		0.00 m	0.00 m
9,444.91	8,397.68	9,770.96	8,441.83	64.96	72.28	78.11	3,539.87	-119.82	345.87	273.35	73.82	4.783		0.00 m	0.00 m
9,600.00	8,390.80	9,814.82	8,441.13	63.89	73.08	80.89	3,583.34	-120.80	343.89	272.43	73.80	4.704		0.00 m	0.00 m
9,800.00	8,395.15	9,818.84	8,439.24	67.64	74.18	77.23	3,693.82	-122.42	348.04	278.38	75.88	4.872		0.00 m	0.00 m
9,700.00	8,393.41	10,017.47	8,438.78	68.48	77.10	77.39	3,786.12	-122.84	343.94	287.74	77.80	4.437		0.00 m	0.00 m
9,800.00	8,391.86	10,118.07	8,434.27	71.32	78.04	76.29	3,887.88	-123.71	348.33	285.13	80.20	4.308		0.00 m	0.00 m
9,900.00	8,389.82	10,223.83	8,430.15	75.18	81.25	71.41	3,932.40	-133.12	343.49	280.84	82.88	4.181		0.00 m	0.00 m
10,000.00	8,388.17	10,328.64	8,428.83	76.91	82.98	72.38	4,092.08	-124.79	341.29	258.58	84.78	4.026		0.00 m	0.00 m
10,100.00	8,386.43	10,433.45	8,427.74	78.88	84.91	72.13	4,191.58	-123.84	338.15	230.11	87.04	3.886		0.00 m	0.00 m
10,200.00	8,384.68	10,538.27	8,417.45	78.88	86.81	73.83	4,292.56	-127.48	338.80	247.89	88.21	3.772		0.00 m	0.00 m
10,300.00	8,382.94	10,643.09	8,415.57	82.53	89.73	78.58	4,389.29	-128.17	334.86	243.35	91.81	3.654		0.00 m	0.00 m
10,373.24	8,381.60	10,659.70	8,411.84	81.88	90.04	82.18	4,497.82	-128.44	334.80	241.28	93.32	3.585		0.00 m	0.00 m
10,400.00	8,381.19	10,716.27	8,411.12	83.37	90.32	82.38	4,493.48	-133.87	334.63	242.71	93.84	3.672		0.00 m	0.00 m
10,500.00	8,379.45	10,828.24	8,410.28	84.22	93.35	86.81	4,577.24	-128.84	338.81	239.88	96.18	3.491		0.00 m	0.00 m
10,600.00	8,377.70	10,937.72	8,410.82	86.08	94.17	81.83	4,675.80	-131.83	338.41	242.09	98.33	3.412		0.00 m	0.00 m
10,700.00	8,376.85	11,008.46	8,411.71	87.90	96.18	80.31	4,778.49	-134.81	340.81	248.81	100.40	3.385		0.00 m	0.00 m
10,800.00	8,374.31	11,108.98	8,413.24	89.74	98.18	83.81	4,878.84	-137.83	343.81	240.71	102.80	3.348		0.00 m	0.00 m

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

Archer

Archer
Anticollision Report

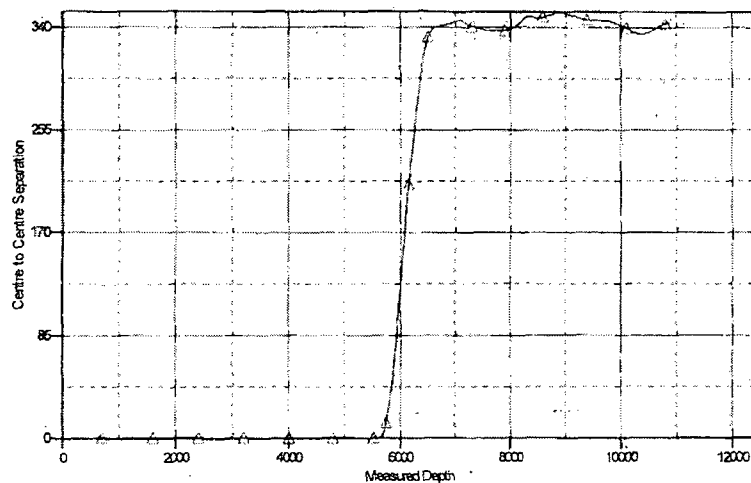
[illegible]

Company:	COG Operating, LLC	Local Co-ordinate Reference:	Well Puckett 12 Federal #7H
Project:	Eddy County NM 27E	TVD Reference:	WELL @ 3979.00usft
Reference Site:	Sec 12-17E-R31E	MD Reference:	WELL @ 3979.00usft
ASA Error:	0.00 usft	North Reference:	Grid
Reference Well:	Puckett 12 Federal #7H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output error, usft:	± 0.00 ft/m
Reference Wellbore:	Wellbore #2 (Dual Fr)	Database:	EDM 5000.1 Single Line DB
Reference Design:	Design #2	Offset (TVD) Reference:	Reference Datum

Reference Depths are relative to WELL @ 3979.00usft
 Offset Depths are relative to Offset Datum
 Central Meridian is 104° 20' 0.000 W

Coordinates are relative to: Puckett 12 Federal #7H
 Coordinate System is US State Plane 1927 (Exact solution), New Mexico East 30
 Grid Convergence at Surface is: 0.28°

Ladder Plot



LEGEND

Well #12 Federal #7H, Wellbore #1, Wellbore #1 V0

Company	COG Operating, LLC	Local Coordinate Reference	Well Puckett 12 Federal #7H
Project	Eddy County (NM27E)	TVD Reference	WELL @ 3979.00usft
Reference Data	Sec 12-1175-R31E	ED Reference	WELL @ 3979.00usft
Site Error	0.00 usft	North Reference	Grid
As Reference Well	Puckett 12 Federal #7H	Survey Calculation Method	Minimum Curvature
WAB Error	0.00 usft	Closest points are at	2.00 sigma
Reference Wellbore	Wellbore #2 (Dual H2)	Distance	EDM 5000.1 Single User DO
Reference Offset	Design #2	Offset TVD Reference	Reference Datum

Reference Depths are relative to WELL @ 3979.00usft

Offset Depths are relative to Offset Datum

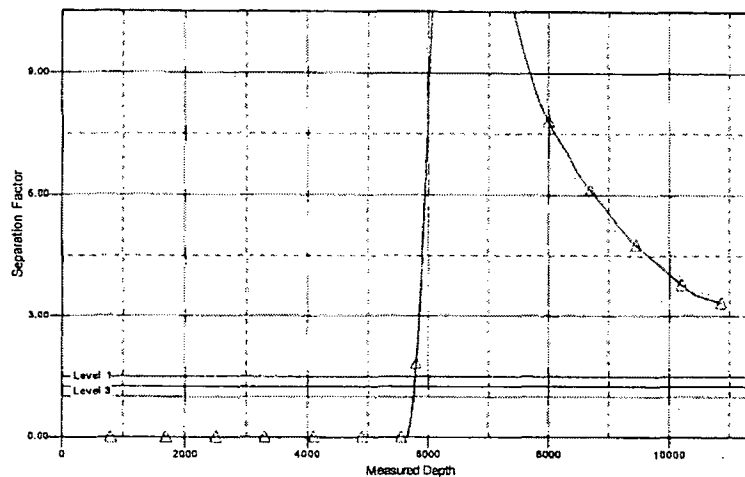
Central Meridian is 104° 20' 0.000 W

Coordinates are relative to: Puckett 12 Federal #7H

Coordinate System is US State Plane 1927 (Exact solution), New Mexico East 30

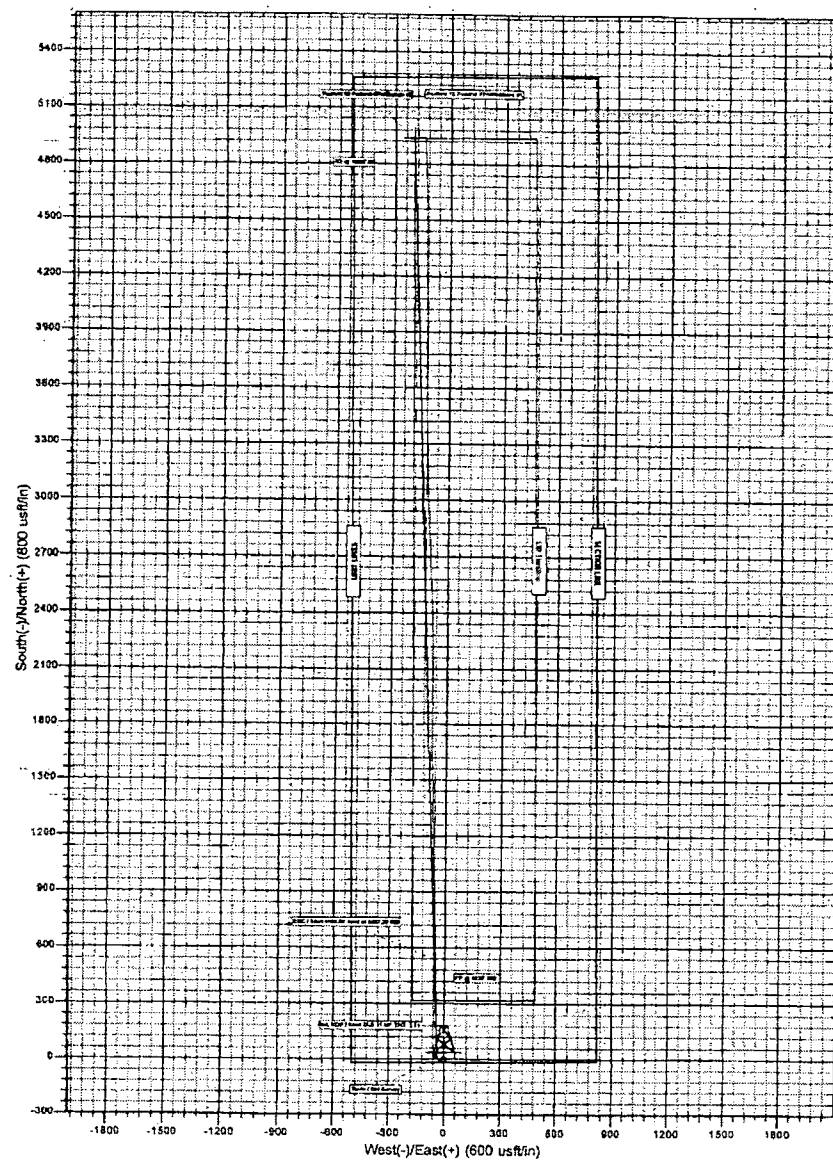
Grid Convergence at Surface is: 0.28'

Separation Factor Plot



LEGEND

Well #12 Federal #7H, Wellbore #1, Wellbore #1 V0





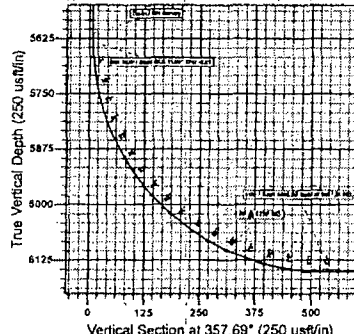
Project: Eddy County(NM37E)
Site: Sec.12-T17S-R31E
Well: Puckett 12 Federal 87H
Wellbore: Wellbore #2 (Dual H2)
Design: Design #2
Lat: 33° 50' 30.711 N
Long: 103° 48' 59.997 W
GL: 3988.00
KB: WELL @ 2979.00uoft

Archer

SECTION DETAILS									
MD	Inc	Azi	TVD	+N-S	-E-W	Dip	Trace	VSec	Annotation
5618.00	0.70	12.50	5618.19	7.19	-35.33	0.25	0.25	0.88	Top of OH Survey
5618.12	0.68	0.75	5618.30	1.32	-39.38	0.94	-112.84	0.90	Inc. TOP / Start DLS 15.00" TVD -3.61
5627.28	81.00	338.14	6186.20	834.90	-84.27	11.30	-3.81	618.81	EOC / Start 4000.00' hold at 5457.28 MD
10487.80	81.00	354.14	8073.70	4134.50	-189.10	9.00	0.00	4338.52	TD at 10487.80

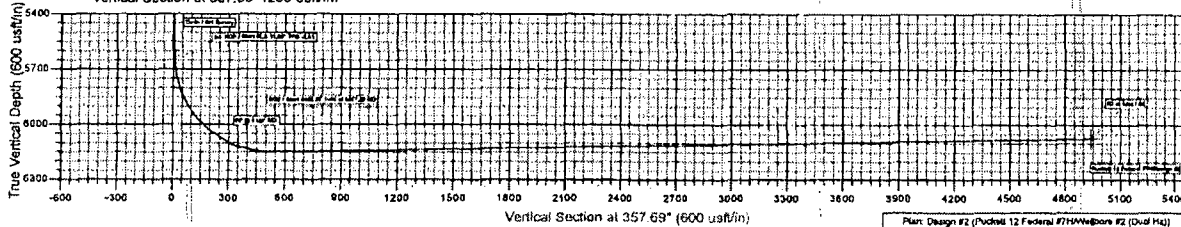
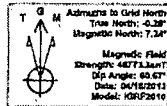
WELL DETAILS: Puckett 12 Federal 87H									
+N-S	+E-W	Ground Level	3988.00	Latitude	Longitude	Spot			
8.00	0.00	Northings	870349.400	33° 50' 30.711 N	103° 48' 59.997 W				

WELLBORE TARGET DETAILS (LAT/LONG)									
Name	TVD	+N-S	+E-W	Latitude	Longitude	Shape			
Puckett 12 Fed 87H PDHL	6073.30	412.8	-189.10	33° 50' 30.711 N	103° 48' 59.997 W				

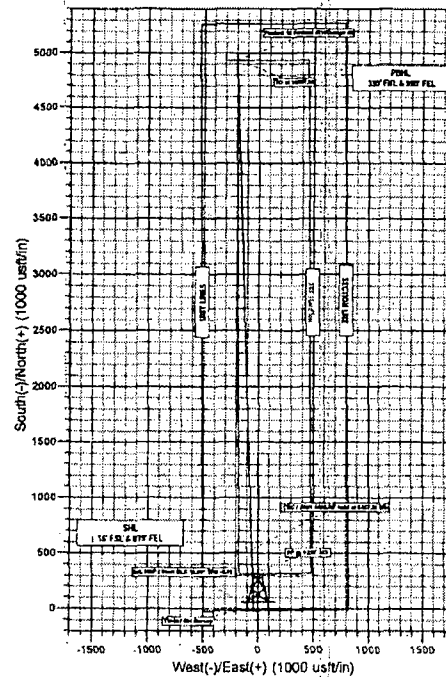


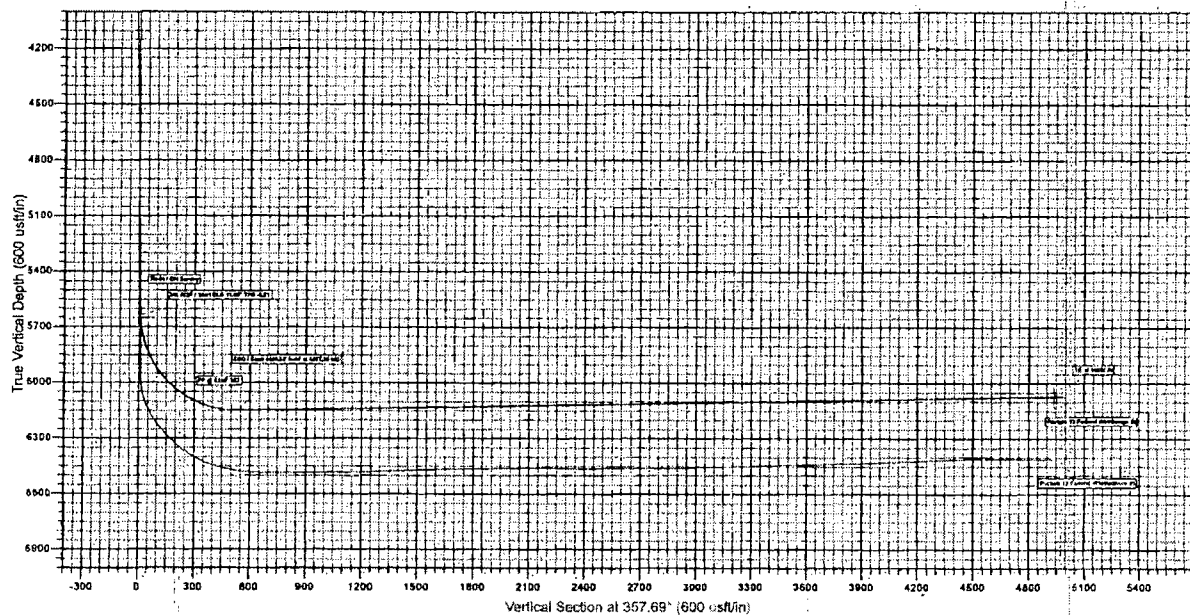
PROJECT DETAILS: Eddy County(NM37E)
Geodetic System: US State Plane 1983 (Exact solution)
Datum: NAD 1983 (NADCON CONUS)
Ellipsoid: Clarke 1866
Zone: New Mexico East 3001
System Datum: Mean Sea Level

SITE DETAILS: Sec.12-T17S-R31E
Site Centre Latitude: 33° 50' 30.711 N
Longitude: 103° 48' 59.997 W
Positional Uncertainty: 0.00
Convergence: 0.28
Local North: Grid



Plan: Design #2 (Puckett 12 Federal 87H Wellbore #2 (Dual H2))
Created By: Dave Welford Date: 14 37, April 16 2013





CONDITIONS OF APPROVAL

Sundry dated 05/09/2013

COG Operating LLC

NMLC029415B

Puckett 12 Federal 7H

30-015-39476

Section 12, T. 17 S., R 31 E., NMPM

Eddy County, New Mexico

- 1. Surface disturbance beyond the existing pad must have prior approval.**
- 2. Closed loop system required.**
- 3. H2S monitoring equipment should be onsite for personnel protection from surrounding oil operations. Operator should not encounter H2S while deepening.**
- 4. Variance for liner top fluid entry and not testing seal also approved based on NMOCD classification of formations in this area as the Yeso group - Pool 26770.**
- 5. Variance of proposed liner tie back is approved in order to have access to bottom lateral.**
- 6. All blowout preventer (BOP) and related equipment (BOPE) shall comply with well control requirements as described in Onshore Oil and Gas Order No. 2 and API RP 53 Sec. 17.**
- 7. 2000 (2M) BOP to be used. All blowout preventer (BOP) and related equipment (BOPE) shall comply with reasonable well control requirements. A two ram system with a blind ram and a pipe ram designed for the size of the work string shall be adequate. Tapered work strings will require an additional pipe ram. The manifold shall comply with Onshore Oil and Gas Order #2 Attachment I (2M Diagrams of Choke Manifold Equipment). The accumulator system shall have an immediately available power source to close the rams and retain 200 psi above pre-charge. The pre-charge test shall follow requirements in Onshore Order #2.**
- 8. The appropriate BLM office shall be notified a minimum of 4 hours in advance for a representative to witness BOP/BOPE testing.**
- 9. All waste (i.e. drilling fluids, trash, salts, chemicals, sewage, gray water, etc.) created as a result of drilling operations and completion operations shall be safely contained and disposed of properly at a waste disposal facility. No waste material or fluid shall be disposed of on the well location or surrounding area. Porto-johns and trash containers will be on-location during fracturing operations or any other crew-intensive operations.**
- 10. Steel tanks to be used.**
- 11. Work to be completed in 90 days**
- 12. Subsequent sundry and completion report required when work is complete.**

EGF 052413