

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF LAND MANAGEMENT

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.*

5. Lease Serial No.  
NMLC028731B

6. If Indian, Allottee or Tribe Name

7. If Unit or CA/Agreement, Name and/or No.

**SUBMIT IN TRIPLICATE - Other instructions on reverse side.**

1. Type of Well

☒ Oil Well ☐ Gas Well ☐ Other

8. Well Name and No.  
DODD FEDERAL UNIT 578

2. Name of Operator  
COG OPERATING LLC

Contact: KELLY J HOLLY  
E-Mail: kholly@concho.com

9. API Well No.  
30-015-40751

3a. Address  
600 W ILLINOIS AVE  
MIDLAND, TX 79701

3b. Phone No. (include area code)  
Ph: 432-685-4384

10. Field and Pool, or Exploratory  
DODD:GLORIETA UPPER YESO

4. Location of Well (Footage, Sec., T., R., M., or Survey Description)

Sec 10 T17S R29E Mer NMP SWSE 142FSL 2280FEL

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			
<input checked="" type="checkbox"/> Notice of Intent	<input type="checkbox"/> Acidize	<input type="checkbox"/> Deepen	<input type="checkbox"/> Production (Start/Resume)	<input type="checkbox"/> Water Shut-Off
<input type="checkbox"/> Subsequent Report	<input type="checkbox"/> Alter Casing	<input type="checkbox"/> Fracture Treat	<input type="checkbox"/> Reclamation	<input type="checkbox"/> Well Integrity
<input type="checkbox"/> Final Abandonment Notice	<input type="checkbox"/> Casing Repair	<input type="checkbox"/> New Construction	<input type="checkbox"/> Recomplete	<input checked="" type="checkbox"/> Other
	<input type="checkbox"/> Change Plans	<input type="checkbox"/> Plug and Abandon	<input type="checkbox"/> Temporarily Abandon	Change to Original A
	<input type="checkbox"/> Convert to Injection	<input type="checkbox"/> Plug Back	<input type="checkbox"/> Water Disposal	PD

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 recompleat 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 recompleat 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 submitted APD for this well at this location:  
SHL: 142' FSL & 2280' FEL, UL O

COG Operating LLC respectfully requests permission to change the SHL and add a BHL as follows:  
SHL: 560' FSL & 2330' FEL, UL O  
BHL: 330' FSL & 2310' FEL, UL O

Reason for SHL and BHL change is to avoid a recently built pipeline.

A revised C-102, Interim Reclamation, 1 mile map, H2S Diagram, Flowline, Surface Use Plan, and Directional Plan are attached.

Surface: All previously approved COAs applies. Indradahal 8/11/14

Accepted for record  
NMOCD  
NM OIL CONSERVATION  
ARTESIA DISTRICT

AUG 11 2014

RECEIVED

14. I hereby certify that the foregoing is true and correct.

Electronic Submission #242776 verified by the BLM Well Information System  
For COG OPERATING LLC, sent to the Carlsbad  
Committed to AFMSS for processing by LINDA DENNISTON on 05/06/2014 ()

Name (Printed/Typed) KELLY J HOLLY

Title PERMITTING TECH

Signature (Electronic Submission)

Date 04/21/2014

**THIS SPACE FOR FEDERAL OR STATE OFFICE USE**

Approved By /s/ STEPHEN J. CAFFEY

Title

AUG - 7 2014

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

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.

**\*\* OPERATOR-SUBMITTED \*\* OPERATOR-SUBMITTED \*\* OPERATOR-SUBMITTED \*\***

*Surface Use Plan*  
*COG Operating, LLC*  
*Dodd Federal Unit #578*  
*SL: 560' FSL & 2330' FEL      UL O*  
*BHL: 330' FSL & 2310' FEL      UL O*  
*Section 10, T-17-S, R-29-E*  
*Eddy County, New Mexico*

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I hereby certify that I, or persons under my direct supervision, have inspected the drill site and access road proposed herein; that I am familiar with the conditions that presently exist; that I have full knowledge of State and Federal laws applicable to this operation; that the statements made in this APD package are, to the best of my knowledge, true and correct; and that the work associated with the operations proposed herein will be performed in conformity with this APD package and the terms and conditions under which it is approved. I also certify that I, or COG Operating, LLC, am responsible for the operations conducted under this application. These statements are subject to the provisions of 18 U.S.C. 1001 for the filing of false statements. Executed this 11th day of April, 2014.

Signed: \_\_\_\_\_

*Carl Bird*

Printed Name: Carl Bird

Position: Drilling Engineer

Address: One Concho Center, 600 W. Illinois, Midland, Texas 79701

Telephone: (432) 683-7443

Field Representative (if not above signatory): Same

E-mail: cbird@concho.com

**District I**  
1625 N. French Dr., Hobbs, NM 88240  
Phone: (575) 393-6151 Fax: (575) 393-0720

**District II**  
511 S. First St., Artesia, NM 88210  
Phone: (575) 748-1293 Fax: (575) 746-9720

**District III**  
1900 Rio Brazos Road, Aztec, NM 87410  
Phone: (505) 334-6173 Fax: (505) 334-6170

**District IV**  
1220 S. St. Francis Dr., Santa Fe, NM 87505  
Phone: (505) 476-3160 Fax: (505) 476-3442

State of New Mexico  
Energy, Minerals & Natural Resources Department  
OIL CONSERVATION DIVISION  
1220 South St. Francis Dr.  
Santa Fe, NM 87505

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

☐ AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

<sup>1</sup> API Number 30-015-40751	<sup>2</sup> Pool Code 97917	<sup>3</sup> Pool Name Dodd; Glorieta - Upper Yeso
<sup>4</sup> Property Code 308195	<sup>5</sup> Property Name DODD FEDERAL UNIT	<sup>6</sup> Well Number 578
<sup>7</sup> OGRID No. 229137	<sup>8</sup> Operator Name COG OPERATING, LLC	<sup>9</sup> Elevation 3590'

<sup>10</sup> Surface Location

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
0	10	17-S	29-E		560	SOUTH	2330	EAST	EDDY

<sup>11</sup> Bottom Hole Location If Different From Surface

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
0	10	17-S	29-E		330	SOUTH	2310	EAST	EDDY

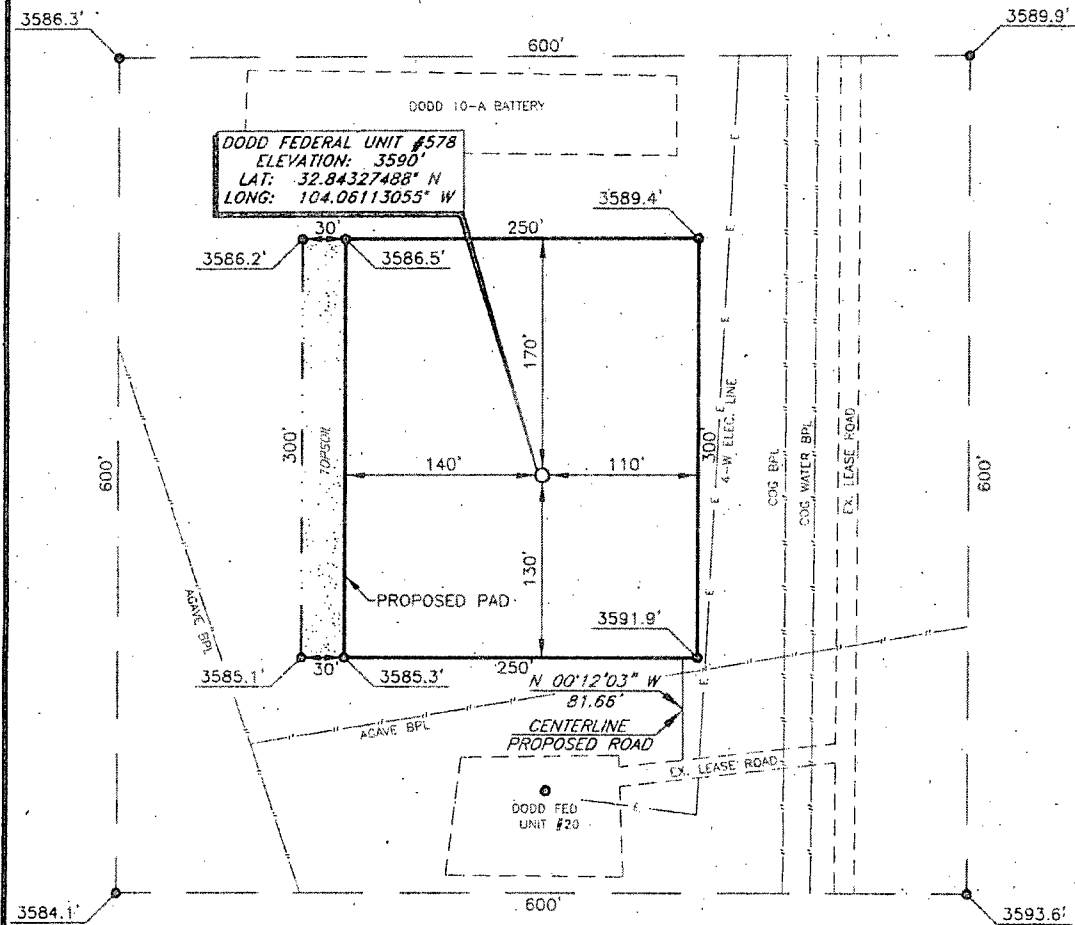
<sup>12</sup> Dedicated Acres 40	<sup>13</sup> Joint or Infill	<sup>14</sup> Consolidation Code	<sup>15</sup> Order No.
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No allowable will be assigned to this completion until all interests have been consolidated or a non-standard unit has been approved by the division.

<p><b>16</b></p> <p><b>GEODETIC DATA</b> NAD 27 GRID - NM EAST</p> <p><b>SURFACE LOCATION</b> N - 670602.3 E - 583600.2 LAT: 32.84327488° N LONG: 104.06113055° W</p> <p><b>CORNER DATA</b> NAD 27 GRID - NM EAST</p> <p>A: FND 1/2" REBAR N - 670039.5 E - 580643.6</p> <p>B: FND USGLO BC 1914 N - 672681.7 E - 580629.9</p> <p>C: FND USGLO BC 1914 N - 675321.9 E - 580628.5</p> <p>D: FND USGLO BC 1914 N - 675323.7 E - 583274.5</p> <p>E: FND 1/2" RBR N - 675329.9 E - 585912.5</p> <p>F: FND USGLO BC 1914 N - 672688.8 E - 585919.9</p> <p>G: FND 5/8" REBAR W/ AC ALLEG N - 670044.8 E - 585932.4</p> <p>S 05°16'29" E (GRID) 230.96' (HORIZ.)</p> <p>SEE DETAIL "A"</p> <p>2330'</p> <p>2310'</p> <p>560'</p> <p>330'</p> <p>3566.3'</p> <p>600'</p> <p>3589.9'</p> <p>3584.1'</p> <p>3593.6'</p> <p>600'</p> <p>S. L.</p> <p>DETAIL "A"</p>	<p><b>17 OPERATOR CERTIFICATION</b> I hereby certify that the information contained herein is true and complete to the best of my knowledge and belief, and that this organization either owns a working interest or retained mineral interest in the land including the proposed bottom hole location or has a right to drill this well on this location pursuant to a contract with an owner of such a mineral or working interest, or to a voluntary pooling agreement or a compulsory pooling order heretofore entered by the division.</p> <p><i>Kelly J. Holly</i> Signature 4-16-14 Date</p> <p>Kelly J. Holly Printed Name</p> <p>kholly@concho.com E-mail Address</p> <p><b>18 SURVEYOR CERTIFICATION</b> I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my belief.</p> <p>9/30/13 Date of Survey</p> <p><i>Robert M. Howett</i> Signature and Seal of Professional Surveyor</p> <p>19680 Certificate Number</p> <p>ROBERT M. HOWETT NEW MEXICO 19680 PROFESSIONAL SURVEYOR</p>
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# COG OPERATING, LLC

Dodd Federal Unit #578  
(560' FSL & 2330' FEL)  
Section 10, T-17-S, R-29-E,  
N. M. P. M., Eddy Co., New Mexico



## DIRECTIONS TO LOCATION

From the intersection of U.S. Hwy. #82 and CR-214 (Barnoval Draw):

Go North on CR-214 approx. 1.5 mile.

Turn right on a lease road and go East approx. 0.5 mile.

Turn left and go North approx. 0.1 mile to the Dodd Federal Unit #20.

The location is approx. 225 feet North of the existing well location.

SCALE: 1" = 100'  
0 50 100

BEARINGS ARE  
NAD 27 GRID - NW EAST  
DISTANCES ARE  
GROUND.

PROSPERITY CONSULTANTS, LLC



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NO.	REVISION	DATE
JOB NO.: LS130262		
DWG. NO.: 130262PAD		

2251 Double Creek Drive, Suite 602, Round Rock, Texas 78664

o (512) 992-2087 f (512) 251-2518

SCALE: 1" = 100'

DATE: 9/30/13

SURVEYED BY: GB/SM

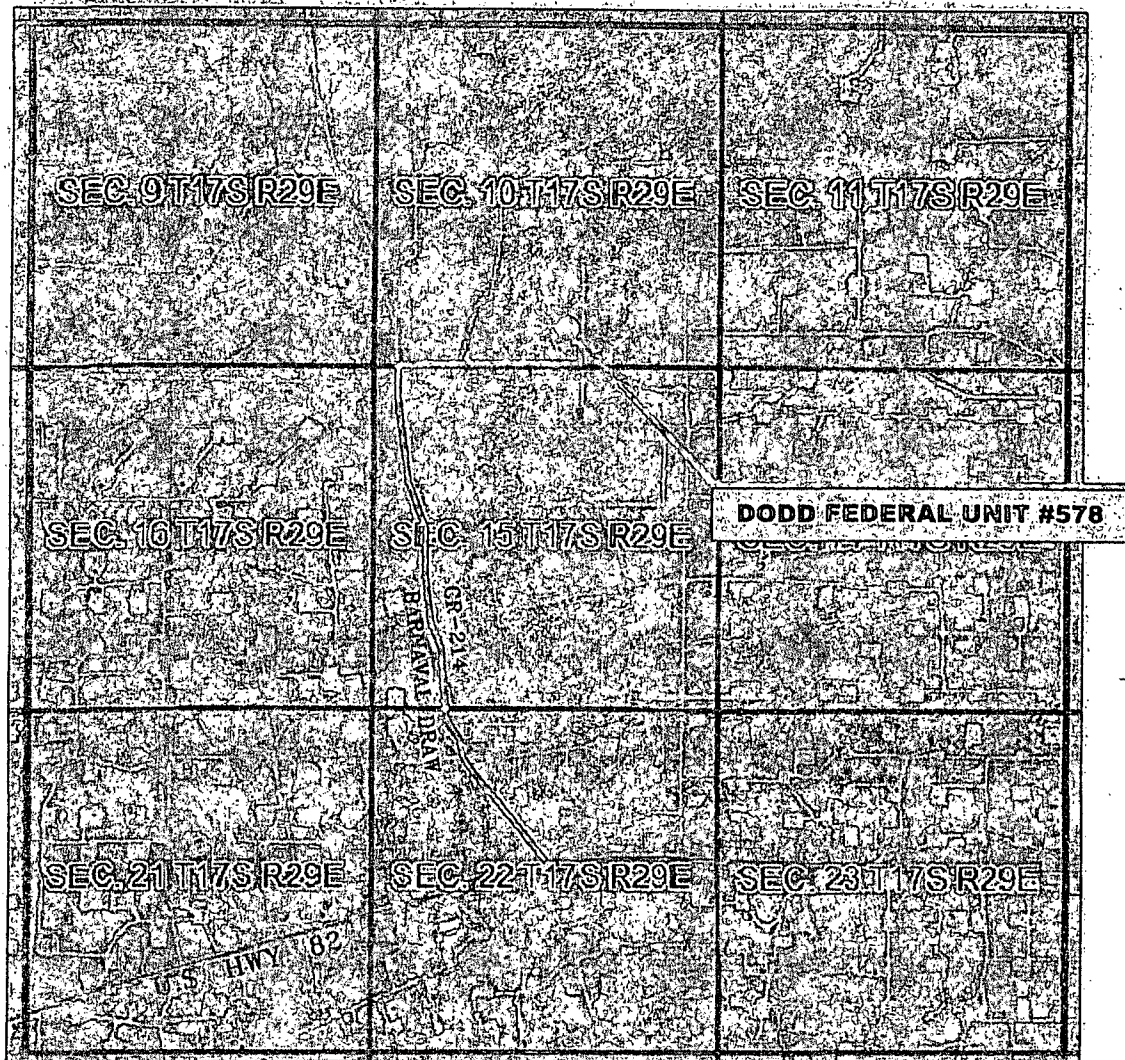
DRAWN BY: AF

APPROVED BY: LWS

SHEET : 1 OF 1

# VICINITY MAP

NOT TO SCALE



SECTION 10, TWP. 17 SOUTH, RGE. 29 EAST,  
N. M. P. M., EDDY COUNTY, NEW MEXICO

OPERATOR: COG Operating, LLC  
LEASE: Dodd Federal Unit  
WELL NO.: 578

LOCATION: 560' FSL & 2330' FEL  
ELEVATION: 3590'

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NO.	REVISION	DATE
JOB NO.: LS130262		
DWG. NO.: 130262VM		

PROSPERITY CONSULTANTS, LLC

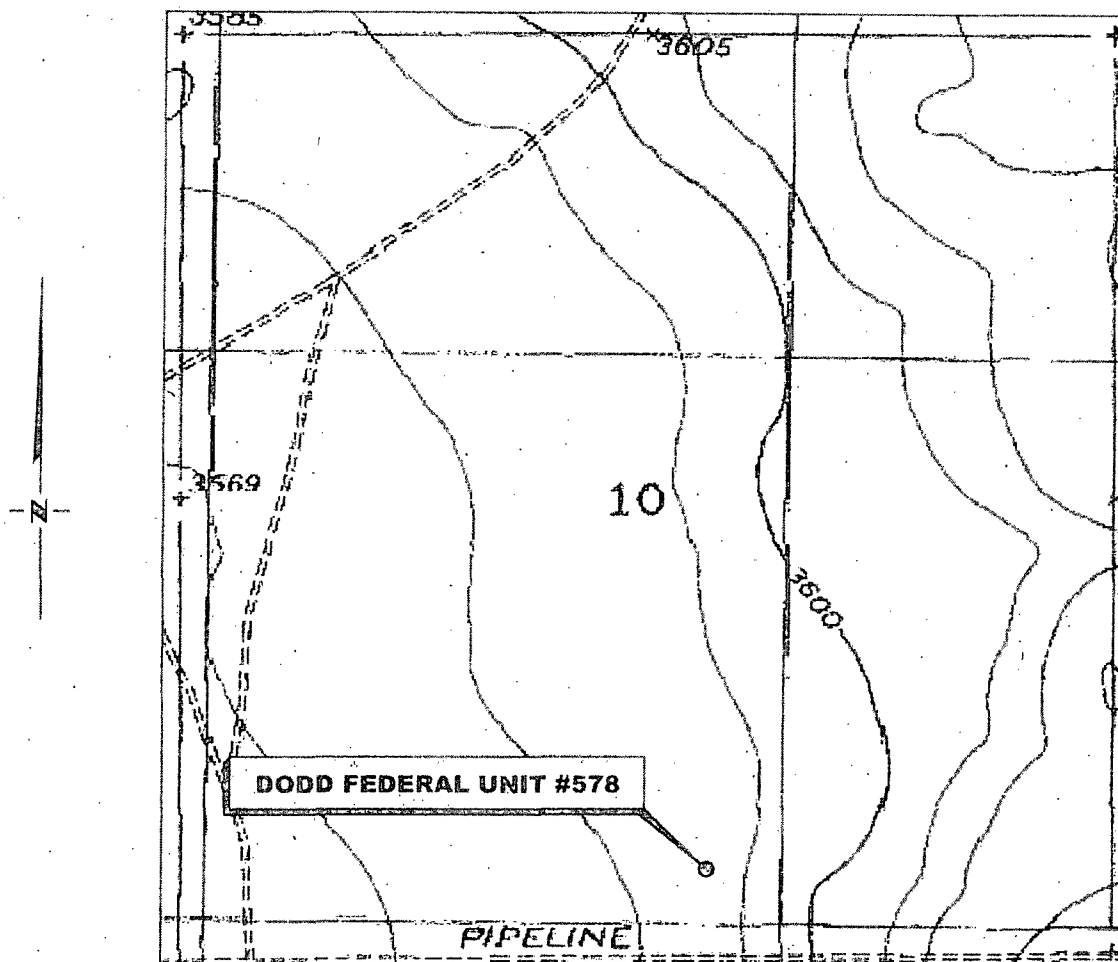


2251 Double Creek Drive, Suite 602, Round Rock, Texas 78664

o (512) 992-2087 f (512) 251-2518

SCALE: N.T.S.
DATE: 9/30/13
SURVEYED BY: GB/SM
DRAWN BY: AF
APPROVED BY: LWB
SHEET : 1 OF 1

# LOCATION VERIFICATION MAP



SECTION 10, TWP. 17 SOUTH, RGE. 29 EAST,  
N. M. P. M., EDDY COUNTY, NEW MEXICO

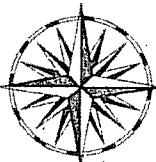
OPERATOR: COG Operating, LLC  
LEASE: Dodd Federal Unit  
WELL NO.: 578  
ELEVATION: 3590'

LOCATION: 560' FSL & 2330' FEL  
CONTOUR INTERVAL: 10'  
USGS TOPO. SOURCE MAP:  
Red Lake SE, NM (P.E. 1985)

Copyright 2012 - All Rights Reserved

NO.	REVISION	DATE
JOB NO.:	LS130262	
DWG. NO.:	130262LVM	

PROSPERITY CONSULTANTS, LLC

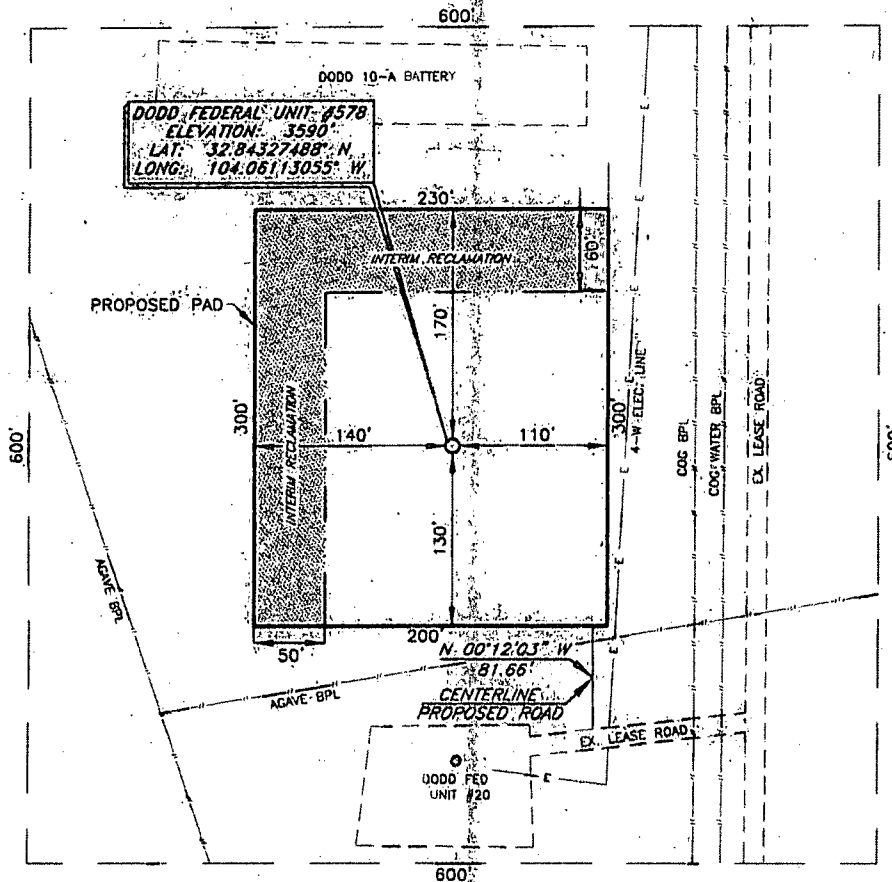


2251 Double Creek Drive, Suite 602, Round Rock, Texas 78664

o (512) 992-2087 f (512) 251-2518

SCALE: 1" = 1000'  
DATE: 9/30/13  
SURVEYED BY: GB/SM  
DRAWN BY: AF  
APPROVED BY: LWB  
SHEET : 1 OF 1

**COG OPERATING, LLC**  
**Interim Reclamation**  
**Dodd Federal Unit #578**  
**(560' FSL & 2330' FEL)**  
**Section 10, T-17-S, R-29-E,**  
**N. M. P. M., Eddy Co., New Mexico**



**DIRECTIONS TO LOCATION**

From the intersection of U.S. Hwy. #82 and CR-214 (Barnaval Draw):

Go North on CR-214 approx. 1.5 mile.

Turn right on a lease road and go East approx. 0.5 mile.

Turn left and go North approx. 0.1 mile to the Dodd Federal Unit #20.

The location is approx. 225 feet North of the existing well location.

SCALE: 1" = 100'  
 0 50 100  
 BEARINGS ARE  
 MAG. 27° 00' 00" N. EAST  
 DISTANCES ARE  
 GROUND

Copyright 2012 - All Rights Reserved

PROSPERITY CONSULTANTS, LLC

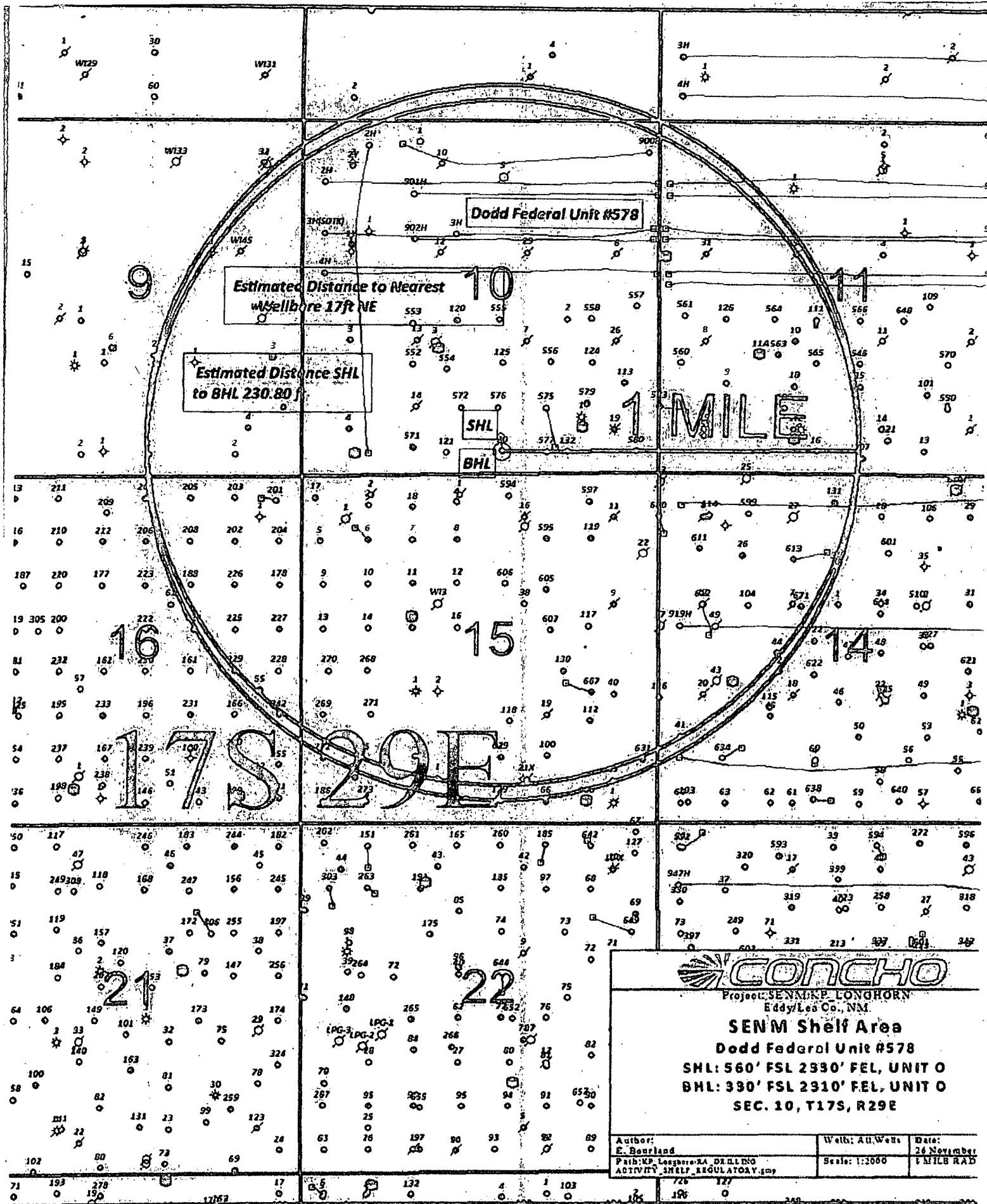


NO.	REVISION	DATE
JOB NO:	LS130262	
DWG NO:	130262REC	

2251 Double Creek Drive, Suite 602, Round Rock, Texas 78664

o (512) 992-2087 f (512) 251-2518

SCALE: 1" = 100'
DATE: 9/30/13
SURVEYED BY: GB/SM
DRAWN BY: AF
APPROVED BY: LWB
SHEET: 1 OF 1

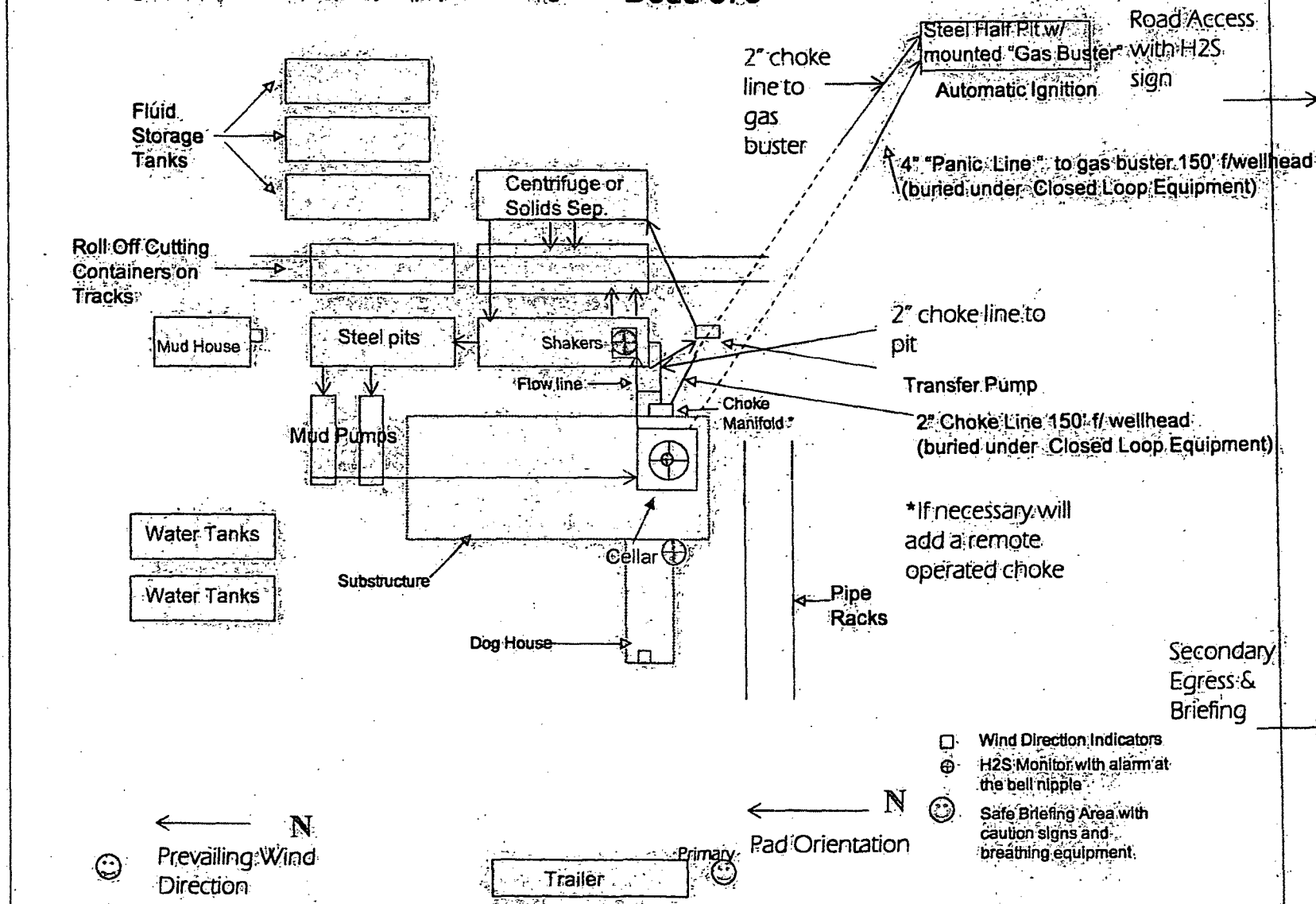


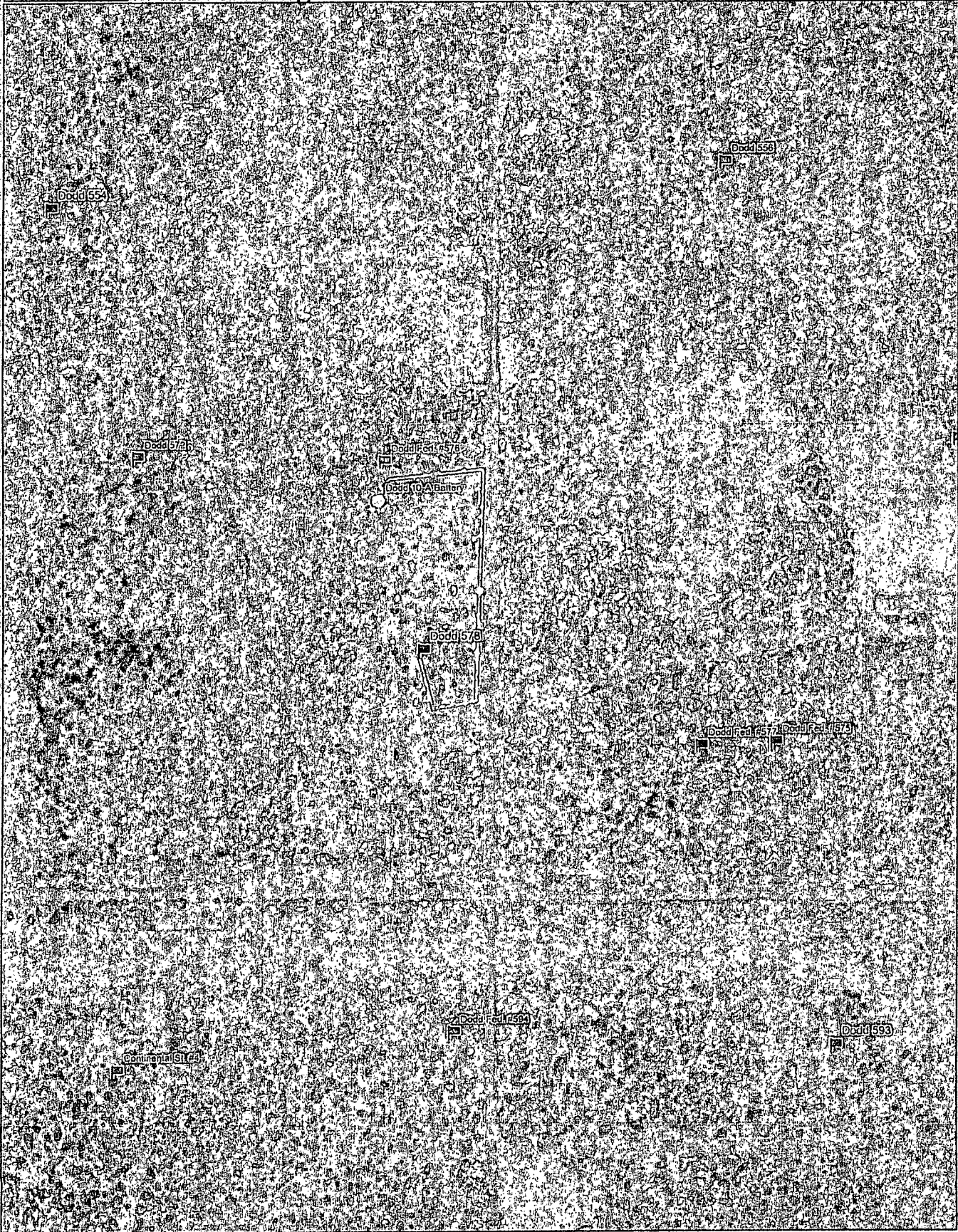
COG Operating LLC

Drilling Location - H2S Safety Equipment Diagram

EXHIBIT 8-

Dodd 578





# Surface Use & Operating Plan

## Dodd Federal Unit #578

- Surface Tenant: Bogle Farms, Lewis Derrick, P O Box 441, Artesia, NM 88211.
- New Road: approx. 81.66'
- Flow Line: approx. 0.2
- Facilities: Dodd 10-A Federal Tank Battery

### Well Site Information

V Door: South

Topsoil: West

Interim Reclamation: North/West

### Notes

-230.96' move to avoid electric line, pipelines, existing wells

Onsite: 9/26/2012

Tanner Nygren (BLM), Caden Jameson (COG), Gary Box (P.C)

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## **SURFACE USE AND OPERATING PLAN**

### **1. Existing & Proposed Access Roads**

- A. The well site survey and elevation plat for the proposed well is attached with this application. It was staked by Prosperity Consultants, LLC, Midland, TX.
- B. All roads to the location are shown in the Vicinity Map. The existing lease roads are illustrated and are adequate for travel during drilling and production operations. Upgrading existing roads prior to drilling the well will be done where necessary. The road route to the well site is depicted in Vicinity Map. The road highlighted in the Vicinity Map will be used to access the well.
- C. Directions to location: See Vicinity Map.
- D. Routine grading and maintenance of existing roads will be conducted as necessary to maintain their condition as long as any operations continue on this lease. Roads will be maintained according to specifications in section 2A of this Surface Use and Operating Plan.

### **2. Proposed Access Road:**

The Elevation Plat shows that 81.66' of new access road will be required for this location. If any road is required it will be constructed as follows:

- A. The maximum width of the running surface will be 14'. The road will be crowned, ditched and constructed of 6" rolled and compacted caliche. Ditches will be at 3:1 slope and 4 feet wide. Water will be diverted where necessary to avoid ponding, prevent erosion, maintain good drainage, and to be consistent with local drainage patterns.
- B. The average grade will be less than 1%.
- C. No turnouts are planned.
- D. No culverts, cattle guard, gates, low water crossings or fence cuts are necessary.
- E. Surfacing material will consist of native caliche. Caliche will be obtained from the actual well site if available. If not available onsite, caliche will be hauled from the nearest BLM approved caliche pit.

**3. Location of Existing Well:**

The 1-mile Map shows all existing wells within a one-mile radius of this well.

As shown on this plat there are numerous wells producing from the San Andres and Yeso formations.

**4. Location of Existing and/or Proposed Facilities:**

- A. COG Operating LLC does operate a production facility on this lease.
- B. If the well is productive, contemplated facilities will be as follows:
  - 1) Production will be sent to the Dodd 10-A Federal Tank Battery to be located in Section 10 at the Dodd Federal Unit #576 well location. The facility location is shown in Exhibit #1.
  - 2) The tank battery and facilities including all flow lines and piping will be installed according to API specifications.
  - 3) Any additional caliche will be obtained from the actual well site. If caliche does not exist or is not plentiful from the well site, the caliche will be hauled from a BLM approved caliche pit. Any additional construction materials will be purchased from contractors.
  - 4) Proposed flow lines, will follow an archaeologically approved route to the Dodd 10-A Federal Tank Battery to be located in Section 10 at the Dodd Federal Unit #576 well location @ approximately 990' FSL & 2370' FEL in Section 10 of Township 17 South Range 29 East. The flowline will be SDR 7 3" poly line laid on the surface and will be approximately 0.2 mile in length. See Exhibit #1.
  - 5) It will be necessary to run electric power if this well is productive. Power will be provided by CVE and they will submit a separate plan and ROW for service to the well location.
  - 6) If the well is productive, rehabilitation plans will include the following:
    - o The original topsoil from the well site will be returned to the location, and the site will be re-contoured as close as possible to the original site.

**5. Location and Type of Water Supply:**

The well will be drilled with combination brine and fresh water mud system as outlined in the drilling program. The water will be obtained from commercial water stations in the area and hauled to location by transport truck over the existing and proposed access roads shown in Vicinity Map. If a commercial fresh water source is nearby, fast line may be laid along existing road ROW's and fresh water pumped to the well. No water well will be drilled on the location.

**6. Source of Construction Materials and Location "Turn-Over" Procedure:**

Obtaining caliche: The primary way of obtaining caliche to build locations and roads will be by "turning over" the location. This means, caliche will be obtained from the actual well sight. A caliche permit will be obtained from BLM prior to pushing up any caliche. 2400 cu. Yards is max amount of caliche needed for pad and roads. Amount will vary for each pad. The procedure below has been approved by BLM personnel:

- A. The top 6 inches of topsoil is pushed off and stockpiled along the side of the location.**
- B. An approximate 120' X 120' area is used within the proposed well site to remove caliche.**
- C. Subsoil is removed and piled alongside the 120' by 120' area within the pad site.**
- D. When caliche is found, material will be stock piled within the pad site to build the location and road.**
- E. Then subsoil is pushed back in the hole and caliche is spread accordingly across entire location and road.**
- F. Once well is drilled, the stock piled top soil will be used for interim reclamation and spread along areas where caliche is picked up and the location size is reduced. Neither caliche nor subsoil will be stock piled outside of the well pad. Topsoil will be stockpiled along the edge of the pad as depicted in attached plat.**
  - In the event that no caliche is found onsite, caliche will be hauled in from a BLM approved caliche pit.

**7. Methods of Handling Water Disposal:**

- A. The well will be drilled utilizing a closed loop mud system. Drill cuttings will be held in roll-off style mud boxes and taken to an NMOCD approved disposal site.
- B. Drilling fluids will be contained in steel mud pits.
- C. Water produced from the well during completion will be held temporarily in steel tanks and then taken to an NMOCD approved commercial disposal facility.
- D. Garbage and trash produced during drilling or completion operations will be collected in a trash bin and hauled to an approved landfill. No toxic waste or hazardous chemicals will be produced by this operation.
- E. Human waste and grey water will need to be properly contained and disposed of. Proper disposal and elimination of waste and grey water may include but are not limited to portable septic systems and/or portable waste gathering systems (i.e. portable toilets).
- F. After the rig is moved out and the well is either completed or abandoned, all waste materials will be cleaned up within 30 days. In the event of a dry hole only a dry hole marker will remain.

**8. Ancillary Facilities:**

No airstrip, campsite or other facilities will be built as a result of the operation on this well.

**9. Well Site Layout:**

- A. The drill pad layout, with elevations staked by Prosperity Consultants, LLC, is shown in the Elevation Plat. Dimensions of the pad and pits are shown on the Rig Layout. V door direction is South. Topsoil, if available, will be stockpiled per BLM specifications. Because the pad is almost level no major cuts will be required.
- B. The Rig Layout Closed-Loop exhibit shows the proposed orientation of closed loop system and access road. No permanent living facilities are planned, but a temporary foreman/toolpusher's trailer will be on location during the drilling operations.

**10. Plans for Restoration of the Surface:**

- A. Interim Reclamation will take place after the well has been completed. The pad will be downsized by reclaiming the areas not needed for production operations. The portions of the pad that are not needed for production operations will be re-contoured to its original state as much as possible. The caliche that is removed will be reused to either build another pad site or for road repairs within the lease. The stockpiled topsoil will then be spread out reclaimed area and reseeded with a BLM approved seed mixture. In the event that the well must be worked over or maintained, it may be necessary to drive, park, and/or operate machinery on reclaimed land. This area will be repaired or reclaimed after work is complete.
- B. Final Reclamation: Upon plugging and abandoning the well all caliche for well pad and lease road will be removed and surface will be recountoured to reflect its surroundings as much as possible. Caliche will be recycled for road repair or reused for another well pad within the lease. If any topsoil remains, it will be spread out and the area will be re-seeded with a BLM approved mixture and re-vegetated as per BLM orders.

**11. Surface Ownership:**

- A. The surface is owned by the U.S. Government and is administered by the Bureau of Land Management. The surface is multiple uses with the primary uses of the region for grazing of livestock and the production of oil and gas.
- B. The surface tenant is Bogle Farms, Lewis Derrick, P.O. Box 441, Artesia, NM 88211.
- C. The proposed road routes and surface location will be restored as directed by the BLM

*Surface Use Plan*  
*COG Operating, LLC*  
*Dodd Federal Unit #578*  
*SL: 560' FSL & 2330' FEL      UL O*  
*BHL: 330' FSL & 2310' FEL      UL O*  
*Section 10, T-17-S, R-29-E*  
*Eddy County, New Mexico*

---

**12. Other Information:**

- A. The area around the well site is grassland and the topsoil is sandy. The vegetation is moderately sparse with native prairie grasses, some mesquite and shinnery oak. No wildlife was observed but it is likely that mule deer, rabbits, coyotes and rodents traverse the area.
- B. There is no permanent or live water in the immediate area.
- C. There are no dwellings within 2 miles of this location.
- D. If needed, a Cultural Resources Examination is being prepared by Boone Arch Services of New Mexico, LLC. Carlsbad, NM, 88220. 506 E Chapman Rd. , phone # 575.887.7667 and the results will be forwarded to your office in the near future. Otherwise, COG will be participating in the Permian Basin MOA Program.

**13. Bond Coverage:**

Bond Coverage is Nationwide Bond # 000215

**14. Lessee's and Operator's Representative:**

The COG Operating LLC representative responsible for assuring compliance with the surface use plan is as follows:

Jim Evans	Ray Peterson
Drilling Superintendent	Drilling Manager
COG Operating LLC	COG Operating LLC
One Concho Center	One Concho Center
600 W. Illinois	600 W. Illinois
Midland, TX 79701	Midland, TX 79701
Phone (432) 685-4304 (office)	Phone (432) 685-4304 (office)
(432) 221-0346 (business)	(432) 818-2254 (business)



Project: Eddy County, NM (NAD 27 NME)  
Site: Dodd Federal Unit  
Well: #578  
Wellbore: WB1  
Design: Plan #1 03-19-14



PHOENIX  
TECHNOLOGY SERVICES



Azimuths to Grid North  
True North: -0.15°  
Magnetic North: 7.37°  
Magnetic Field  
Strength: 48657.6nT  
Dip Angle: 60.61°  
Date: 03/19/2014  
Model: IGRF2010\_14

WELL DETAILS									
	+N-S	+E-W	Northing	Ground Level Easting	Latitude	Longitude			
	0.00	0.00	670602.30	583600.20	32° 50' 35.78957 N	104° 3' 40.06966 W			

SECTION DETAILS									
Sec	MD	Inc	Azi	TVD	+N-S	+E-W	Dleg	TFace	Vsect
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	1150.00	0.00	0.00	1150.00	0.00	0.00	0.00	0.00	0.00
3	1390.24	4.80	173.01	1389.95	-9.99	1.22	2.00	173.01	10.07
4	3793.77	4.80	173.01	3785.05	-209.82	25.71	0.00	0.00	211.39
5	4034.01	0.00	0.00	4025.00	-219.81	26.93	2.00	180.00	221.45
6	5009.01	0.00	0.00	5000.00	-219.81	26.93	0.00	0.00	221.45

Annotation

KOP 2.00°/100' Build  
Hold 4.80° Inc, 173.01° Azm  
Begin 2.00°/100' Drop  
Begin Vertical Hold  
TD at 5009.01  
TG1-Dodd Fed #578  
PBHL-Dodd Fed #578

DESIGN TARGET DETAILS									
Name	TVD	+N-S	+E-W	Northing	Easting	Latitude	Longitude	Shape	
TG1-Dodd Fed #578	4025.00	-219.81	26.93	670382.49	583627.13	32° 50' 33.61380 N	104° 3' 39.76063 W	Point	
PBHL-Dodd Fed #578	5000.00	-219.81	26.93	670382.49	583627.13	32° 50' 33.61380 N	104° 3' 39.76063 W	Circle (Radius: 10.00)	

- plan hits target center  
- plan hits target center

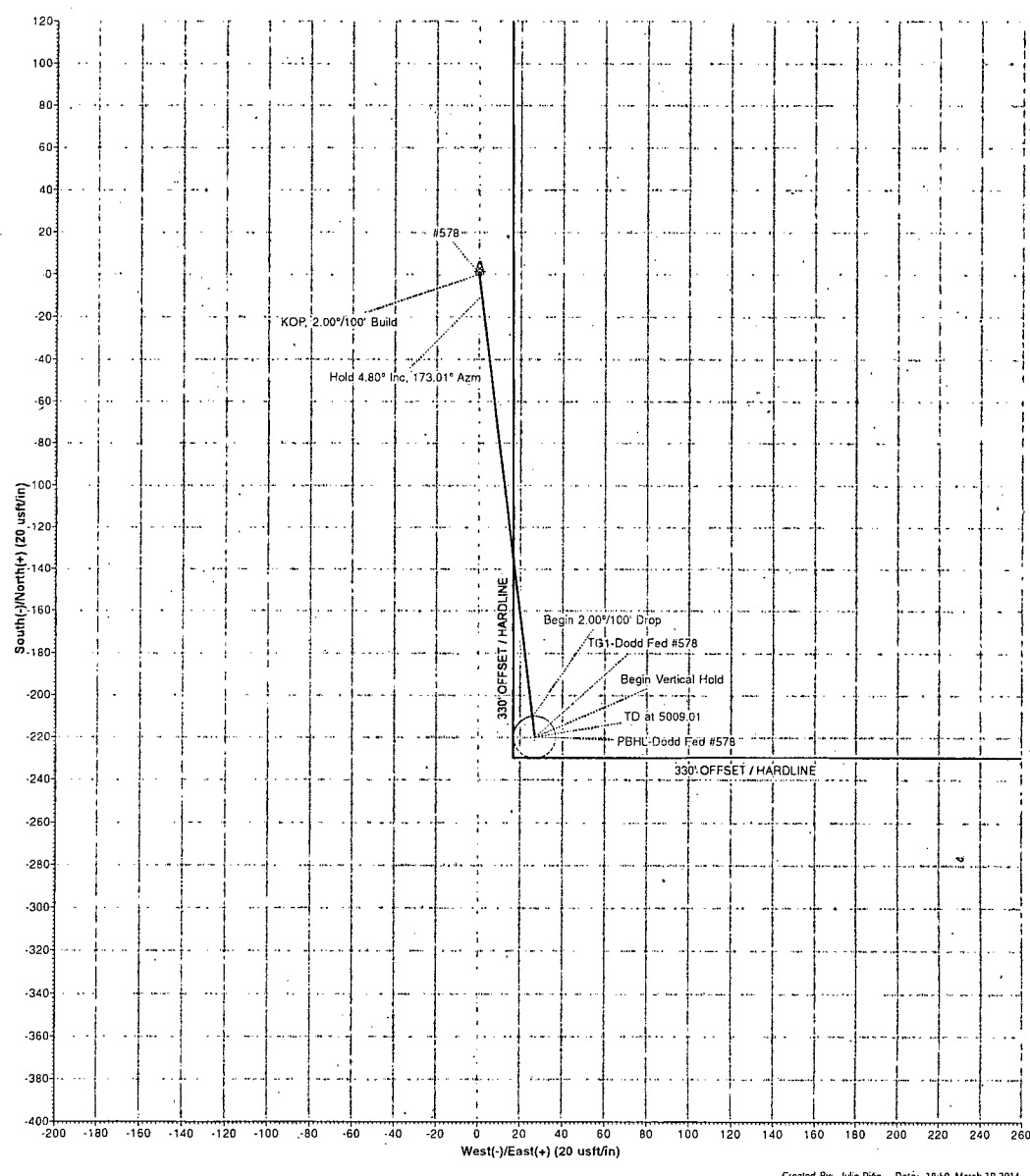
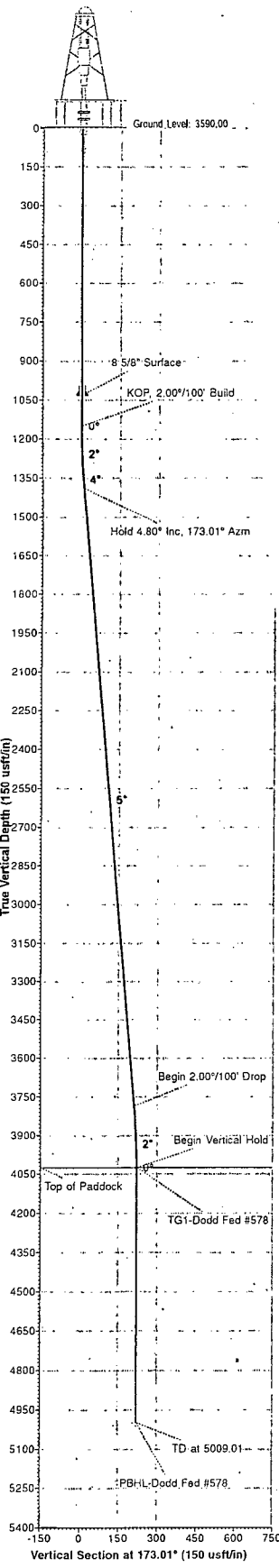
LEGEND

— Plan #1 03-19-14

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 #578, Grid North  
Latitude: 32° 50' 35.78957 N  
Longitude: 104° 3' 40.06966 W  
Grid East: 583600.20  
Grid North: 670602.30  
Scale Factor: 1.000  
Geomagnetic Model: IGRF2010\_14  
Sample Date: 19-Mar-14  
Magnetic Declination: 7.52°  
Dip Angle from Horizontal: 60.61°  
Magnetic Field Strength: 48658  
To convert a Magnetic Direction to a Grid Direction, Add 7.37°  
To convert a Magnetic Direction to a True Direction, Add 7.52° East  
To convert a True Direction to a Grid Direction, Subtract 0.15°

FORMATION TOP DETAILS				
TVDPath	MDPath	Formation	DipAngle	DipDir
4025.00	4034.01	Top of Paddock	0.00	0.00

CASING DETAILS			
TVD	MD	Name	Size
1031.00	1031.00	8 5/8" Surface	8-5/8





## **COG Operating LLC**

**Eddy County, NM (NAD 27 NME)**

**Dodd Federal Unit**

**#578**

**WB1**

**Plan: Plan #1 03-19-14**

**Surface: 560' FSL, 2330' FEL, Sec 10, T17S, R29E, Unit O**

**BHL: 340' FSL, 2300' FEL, Sec 10, T17S, R29E, Unit O**

## **Standard Survey Report**

**19 March, 2014**



**PHOENIX**  
TECHNOLOGY SERVICES



Phoenix Technology Services  
Survey Report



Company:	COG Operating, LLC	Local Co-ordinate Reference:	Well #578
Project:	Eddy County, NM (NAD 27 NME)	TVD Reference:	GL @ 3590.00usft
Site:	Dodd Federal Unit	MD Reference:	GL @ 3590.00usft
Well:	#578	North Reference:	Grid
Wellbore:	WB1	Survey Calculation Method:	Minimum Curvature
Design:	Plan #1 03-19-14	Database:	GCR DB

Project	Eddy County, NM (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	Dodd Federal Unit		
Site Position:		Northing:	669,009.70 usft
From:	Map	Easting:	585,704.90 usft
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "
		Latitude:	32° 50' 19.97600 N
		Longitude:	104° 3' 15.44871 W
		Grid Convergence:	0.15 °

Well	#578		
Well Position	+N-S	0.00 usft	Northing:
	+E-W	0.00 usft	Easting:
Position Uncertainty	0.00 usft	Wellhead Elevation:	usft
		Latitude:	32° 50' 35.78957 N
		Longitude:	104° 3' 40.06966 W
		Ground Level:	3,590.00 usft

Wellbore	WB1		
Magnetics	Model Name	Sample Date	Declination
			(°)
	IGRF2010_14	03/19/14	7.52
			Dip Angle
			(°)
			60.61
			Field Strength
			(nT)
			48,658

Design	Plan #1 03-19-14		
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
			(°)
			173.01

Survey Tool/Program	Date 03/19/14		
From	To	Survey (Wellbore)	Tool Name
(usft)	(usft)		
0.00	5,008.94	Plan #1 03-19-14 (WB1)	MWD
			Description
			MWD - Standard

Planned Survey									
Measured Depth	Inclination	Azimuth	Vertical Depth	+N-S	+E-W	Vertical Section	Dogleg Rate	Build Rate	Turn Rate
(usft)	(°)	(°)	(usft)	(usft)	(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
1,031.00	0.00	0.00	1,031.00	0.00	0.00	0.00	0.00	0.00	0.00
8 5/8" Surface									
1,150.00	0.00	0.00	1,150.00	0.00	0.00	0.00	0.00	0.00	0.00
KOP: 2.00°/100' Build									
1,200.00	1.00	173.01	1,200.00	-0.43	0.05	0.44	2.00	2.00	0.00
1,300.00	3.00	173.01	1,299.93	-3.90	0.48	3.93	2.00	2.00	0.00
1,390.24	4.80	173.01	1,389.96	-9.99	1.22	10.07	2.00	2.00	0.00
Hold 4.80° Inc: 173.01° Azm									
1,400.00	4.80	173.01	1,399.68	-10.80	1.32	10.88	0.00	0.00	0.00



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Project:	Eddy County, NM (NAD 27 NME)	TVD Reference:	GL @ 3590.00usft
Site:	Dodd Federal Unit	MD Reference:	GL @ 3590.00usft
Well:	#578	North Reference:	Grid
Wellbore:	WB1	Survey Calculation Method:	Minimum Curvature
Design:	Plan #1 03-19-14	Database:	GCR DB

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)	
1,500.00	4.80	173.01	1,499.33	-19.12	2.34	19.26	0.00	0.00	0.00	
1,600.00	4.80	173.01	1,598.98	-27.43	3.36	27.64	0.00	0.00	0.00	
1,700.00	4.80	173.01	1,698.63	-35.75	4.38	36.01	0.00	0.00	0.00	
1,800.00	4.80	173.01	1,798.28	-44.06	5.40	44.39	0.00	0.00	0.00	
1,900.00	4.80	173.01	1,897.93	-52.37	6.42	52.76	0.00	0.00	0.00	
2,000.00	4.80	173.01	1,997.58	-60.69	7.44	61.14	0.00	0.00	0.00	
2,100.00	4.80	173.01	2,097.22	-69.00	8.45	69.52	0.00	0.00	0.00	
2,200.00	4.80	173.01	2,196.87	-77.31	9.47	77.89	0.00	0.00	0.00	
2,300.00	4.80	173.01	2,296.52	-85.63	10.49	86.27	0.00	0.00	0.00	
2,400.00	4.80	173.01	2,396.17	-93.94	11.51	94.64	0.00	0.00	0.00	
2,500.00	4.80	173.01	2,495.82	-102.26	12.53	103.02	0.00	0.00	0.00	
2,600.00	4.80	173.01	2,595.47	-110.57	13.55	111.40	0.00	0.00	0.00	
2,700.00	4.80	173.01	2,695.12	-118.88	14.57	119.77	0.00	0.00	0.00	
2,800.00	4.80	173.01	2,794.76	-127.20	15.58	128.15	0.00	0.00	0.00	
2,900.00	4.80	173.01	2,894.41	-135.51	16.60	136.52	0.00	0.00	0.00	
3,000.00	4.80	173.01	2,994.06	-143.82	17.62	144.90	0.00	0.00	0.00	
3,100.00	4.80	173.01	3,093.71	-152.14	18.64	153.28	0.00	0.00	0.00	
3,200.00	4.80	173.01	3,193.36	-160.45	19.66	161.65	0.00	0.00	0.00	
3,300.00	4.80	173.01	3,293.01	-168.77	20.68	170.03	0.00	0.00	0.00	
3,400.00	4.80	173.01	3,392.66	-177.08	21.70	178.40	0.00	0.00	0.00	
3,500.00	4.80	173.01	3,492.30	-185.39	22.71	186.78	0.00	0.00	0.00	
3,600.00	4.80	173.01	3,591.95	-193.71	23.73	195.16	0.00	0.00	0.00	
3,700.00	4.80	173.01	3,691.60	-202.02	24.75	203.53	0.00	0.00	0.00	
3,793.77	4.80	173.01	3,785.04	-209.82	25.71	211.39	0.00	0.00	0.00	
Begin 2.00°/100' Drop										
3,800.00	4.68	173.01	3,791.25	-210.33	25.77	211.90	2.00	-2.00	0.00	
3,900.00	2.68	173.01	3,891.04	-216.70	26.55	218.32	2.00	-2.00	0.00	
4,000.00	0.68	173.01	3,990.99	-219.61	26.91	221.25	2.00	-2.00	0.00	
4,034.01	0.00	0.00	4,025.00	-219.81	26.93	221.45	2.00	-2.00	0.00	
Begin Vertical Hold - Top of Paddock - TG1-Dodd Fed #578										
5,009.01	0.00	0.00	5,000.00	-219.81	26.93	221.45	0.00	0.00	0.00	
TD at 5009.01 - PBHL-Dodd Fed #578										



Phoenix Technology Services  
Survey Report



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Site:	Dodd Federal Unit	MD Reference:	GL @ 3590.00usft
Well:	#578	North Reference:	Grid
Wellbore:	WB1	Survey Calculation Method:	Minimum Curvature
Design:	Plan #1 03-19-14	Database:	GCR DB

Design Targets										
Target Name	Hit/miss target Shape	Dip Angle (°)	Dip Dir (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
TG1-Dodd Fed #578		0.00	0.00	4,025.00	-219.81	26.93	670,382.49	583,627.13	32° 50' 33.61380 N	104° 3' 39.76063 W
- plan hits target center - Point										
PBHL-Dodd Fed #578		0.00	0.00	5,000.00	-219.81	26.93	670,382.49	583,627.13	32° 50' 33.61380 N	104° 3' 39.76063 W
- plan hits target center - Circle (radius 10.00)										

Casing Points					
Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")	
1,031.00	1,031.00	8 5/8" Surface	8-5/8	12-1/4	

Formations					
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
4,034.01	4,025.00	Top of Paddock		0.00	0.00

Plan Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment	
		+N/-S (usft)	+E/-W (usft)		
1150	1150	0	0	KOP, 2.00°/100' Build	
1390	1390	-10	1	Hold 4.80° Inc, 173.01° Azm	
3794	3785	-210	26	Begin 2.00°/100' Drop	
4034	4025	-220	27	Begin Vertical Hold	
5009	5000	-220	27	TD at 5009.01	

Checked By: \_\_\_\_\_ Approved By: \_\_\_\_\_ Date: \_\_\_\_\_