

HOBBS OCD

JUL 18 2019

FORM APPROVED  
OMB No. 1004-0137  
Expires: January 31, 2018

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF LAND MANAGEMENT

RECEIVED

APPLICATION FOR PERMIT TO DRILL OR REENTER

1a. Type of work: <input checked="" type="checkbox"/> DRILL <input type="checkbox"/> REENTER		5. Lease Serial No. NMNM125658
1b. Type of Well: <input checked="" type="checkbox"/> Oil Well <input type="checkbox"/> Gas Well <input type="checkbox"/> Other		6. If Indian, Allottee or Tribe Name
1c. Type of Completion: <input type="checkbox"/> Hydraulic Fracturing <input checked="" type="checkbox"/> Single Zone <input type="checkbox"/> Multiple Zone		7. If Unit or CA Agreement, Name and No.
2. Name of Operator COG OPERATING LLC (229137)		8. Lease Name and Well No. FEZ FEDERAL COM 607H (722742)
3a. Address 600 West Illinois Ave Midland TX 79701	3b. Phone No. (include area code) (432)683-7443	9. API Well No. 30-04-46242 (98098)
4. Location of Well (Report location clearly and in accordance with any State requirements. *) At surface SWSE / 330 FSL / 2330 FEL / LAT 32.138544 / LONG -103.37146 At proposed prod. zone LOT 2 / 50 FNL / 2220 FEL / LAT 32.16659 / LONG -103.371083		10. Field and Pool, or Exploratory WC-025 G-09 S243532M / WOLFBONE
11. Sec., T. R. M. or Blk. and Survey or Area SEC 9 / T25S / R35E / NMP		
14. Distance in miles and direction from nearest town or post office* 9 miles		12. County or Parish LEA
13. State NM		
15. Distance from proposed* location to nearest property or lease line, ft. (Also to nearest drig. unit line, if any) 50 feet	16. No of acres in lease 640	17. Spacing Unit dedicated to this well 641.64
18. Distance from proposed location* to nearest well, drilling, completed, applied for, on this lease, ft. 30 feet	19. Proposed Depth 12281 feet / 22524 feet	20. BLM/BIA Bond No. in file FED: NMB000215
21. Elevations (Show whether DF, KDB, RT, GL, etc.) 3242 feet	22. Approximate date work will start* 10/01/2019	23. Estimated duration 30 days
24. Attachments		

The following, completed in accordance with the requirements of Onshore Oil and Gas Order No. 1, and the Hydraulic Fracturing rule per 43 CFR 3162.3-3 (as applicable)

- |  |   |
|--|---|
| 1. Well plat certified by a registered surveyor.   | 4. Bond to cover the operations unless covered by an existing bond on file (see Item 20 above). |
| 2. A Drilling Plan.  | 5. Operator certification.  |
| 3. A Surface Use Plan (if the location is on National Forest System Lands, the SUPO must be filed with the appropriate Forest Service Office). | 6. Such other site specific information and/or plans as may be requested by the BLM.            |

25. Signature (Electronic Submission)	Name (Printed/Typed) Mayte Reyes / Ph: (575)748-6945	Date 04/08/2019
Title Regulatory Analyst		
Approved by (Signature) (Electronic Submission)	Name (Printed/Typed) Cody Layton / Ph: (575)234-5959	Date 07/16/2019
Title Assistant Field Manager Lands & Minerals		
Office CARLSBAD		

Application approval 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.

Conditions of approval, if any, are attached.

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.

GCD Rec 07/18/19

APPROVED WITH CONDITIONS

KZ  
07/19/19

## INSTRUCTIONS

**GENERAL:** This form is designed for submitting proposals to perform certain well operations, as indicated on Federal and Indian lands and leases for action by appropriate Federal agencies, pursuant to applicable Federal laws and regulations. Any necessary special instructions concerning the use of this form and the number of copies to be submitted, particularly with regard to local, area, or regional procedures and practices, either are shown below or will be issued by, or may be obtained from local Federal offices.

**ITEM 1:** If the proposal is to redrill to the same reservoir at a different subsurface location or to a new reservoir, use this form with appropriate notations. Consult applicable Federal regulations concerning subsequent work proposals or reports on the well.

**ITEM 4:** Locations on Federal or Indian land should be described in accordance with Federal requirements. Consult local Federal offices for specific instructions.

**ITEM 14:** Needed only when location of well cannot readily be found by road from the land or lease description. A plat, or plats, separate or on the reverse side, showing the roads to, and the surveyed location of, the well, and any other required information, should be furnished when required by Federal agency offices.

**ITEMS 15 AND 18:** If well is to be, or has been directionally drilled, give distances for subsurface location of hole in any present or objective productive zone.

**ITEM 22:** Consult applicable Federal regulations, or appropriate officials, concerning approval of the proposal before operations are started.

**ITEM 24:** If the proposal will involve hydraulic fracturing operations, you must comply with 43 CFR 3162.3-3, including providing information about the protection of usable water. Operators should provide the best available information about all formations containing water and their depths. This information could include data and interpretation of resistivity logs run on nearby wells. Information may also be obtained from state or tribal regulatory agencies and from local BLM offices.

## NOTICES

The Privacy Act of 1974 and regulation in 43 CFR 2.48(d) provide that you be furnished the following information in connection with information required by this application.

**AUTHORITY:** 30 U.S.C. 181 et seq., 25 U.S.C. 396; 43 CFR 3160

**PRINCIPAL PURPOSES:** The information will be used to: (1) process and evaluate your application for a permit to drill a new oil, gas, or service well or to reenter a plugged and abandoned well; and (2) document, for administrative use, information for the management, disposal and use of National Resource Lands and resources including (a) analyzing your proposal to discover and extract the Federal or Indian resources encountered; (b) reviewing procedures and equipment and the projected impact on the land involved; and (c) evaluating the effects of the proposed operation on the surface and subsurface water and other environmental impacts.

**ROUTINE USE:** Information from the record and/or the record will be transferred to appropriate Federal, State, and local or foreign agencies, when relevant to civil, criminal or regulatory investigations or prosecution, in connection with congressional inquiries and for regulatory responsibilities.

**EFFECT OF NOT PROVIDING INFORMATION:** Filing of this application and disclosure of the information is mandatory only if you elect to initiate a drilling or reentry operation on an oil and gas lease.

The Paperwork Reduction Act of 1995 requires us to inform you that:

The BLM connects this information to an evaluation of the technical, safety, and environmental factors involved with drilling for oil and/or gas on Federal and Indian oil and gas leases. This information will be used to analyze and approve applications. Response to this request is mandatory only if the operator elects to initiate drilling or reentry operations on an oil and gas lease. The BLM would like you to know that you do not have to respond to this or any other Federal agency-sponsored information collection unless it displays a currently valid OMB control number.

**BURDEN HOURS STATEMENT:** Public reporting burden for this form is estimated to average 8 hours per response, including the time for reviewing instructions, gathering and maintaining data, and completing and reviewing the form. Direct comments regarding the burden estimate or any other aspect of this form to U.S. Department of the Interior, Bureau of Land Management (1004-0137), Bureau Information Connection Clearance Officer (WO-630), 1849 C Street, N.W., Mail Stop 401 LS, Washington, D.C. 20240.

## Additional Operator Remarks

### Location of Well

1. SHL: SWSE / 330 FSL / 2330 FEL / TWSP: 25S / RANGE: 35E / SECTION: 9 / LAT: 32.138544 / LONG: -103.37146 ( TVD: 0 feet, MD: 0 feet )  
PPP: SWSE / 100 FSL / 2220 FEL / TWSP: 25S / RANGE: 35E / SECTION: 9 / LAT: 32.137912 / LONG: -103.371106 ( TVD: 2895 feet, MD: 2900 feet )  
PPP: SWNE / 2641 FSL / 2220 FEL / TWSP: 25S / RANGE: 35E / SECTION: 9 / LAT: 32.144895 / LONG: -103.3711 ( TVD: 12237 feet, MD: 14900 feet )  
BHL: LOT 2 / 50 FNL / 2220 FEL / TWSP: 25S / RANGE: 35E / SECTION: 4 / LAT: 32.16659 / LONG: -103.371083 ( TVD: 12281 feet, MD: 22524 feet )

### BLM Point of Contact

Name: Priscilla Perez

Title: Legal Instruments Examiner

Phone: 5752345934

Email: pperez@blm.gov

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## **Review and Appeal Rights**

A person contesting a decision shall request a State Director review. This request must be filed within 20 working days of receipt of the Notice with the appropriate State Director (see 43 CFR 3165.3). The State Director review decision may be appealed to the Interior Board of Land Appeals, 801 North Quincy Street, Suite 300, Arlington, VA 22203 (see 43 CFR 3165.4). Contact the above listed Bureau of Land Management office for further information.

**CONFIDENTIAL**



U.S. Department of the Interior  
BUREAU OF LAND MANAGEMENT

## APD Print Report

07/17/2019

APD ID: 10400040676

Submission Date: 04/08/2019

Operator Name: COG OPERATING LLC

Federal/Indian APD: FED

Well Name: FEZ FEDERAL COM

Well Number: 607H

[Show Final Text](#)

Well Type: OIL WELL

Well Work Type: Drill

### Application

#### Section 1 - General

APD ID: 10400040676

Tie to previous NOS?

Submission Date: 04/08/2019

BLM Office: CARLSBAD

User: Mayte Reyes

Title: Regulatory Analyst

Federal/Indian APD: FED

Is the first lease penetrated for production Federal or Indian? FED

Lease number: NMNM125658

Lease Acres: 640

Surface access agreement in place?

Allotted?

Reservation:

Agreement in place? NO

Federal or Indian agreement:

Agreement number:

Agreement name:

Keep application confidential? YES

Permitting Agent? NO

APD Operator: COG OPERATING LLC

Operator letter of designation:

#### Operator Info

Operator Organization Name: COG OPERATING LLC

Operator Address: 600 West Illinois Ave

Zip: 79701

Operator PO Box:

Operator City: Midland

State: TX

Operator Phone: (432)683-7443

Operator Internet Address: RODOM@CONCHO.COM

#### Section 2 - Well Information

Well in Master Development Plan? NO

Master Development Plan name:

Well in Master SUPO? NO

Master SUPO name:

Well in Master Drilling Plan? NO

Master Drilling Plan name:

Operator Name: COG OPERATING LLC

Well Name: FEZ FEDERAL COM

Well Number: 607H

Well Name: FEZ FEDERAL COM

Well Number: 607H

Well API Number:

Field/Pool or Exploratory? Field and Pool

Field Name: WC-025 G-09  
S243532M

Pool Name: WOLFBONE

Is the proposed well in an area containing other mineral resources? USEABLE WATER

Describe other minerals:

Is the proposed well in a Helium production area? N

Use Existing Well Pad? NO

New surface disturbance?

Type of Well Pad: MULTIPLE WELL

Multiple Well Pad Name: FEZ  
FEDERAL COM

Number: 711H, 708H AND  
607H

Well Class: HORIZONTAL

Number of Legs:

Well Work Type: Drill

Well Type: OIL WELL

Describe Well Type:

Well sub-Type: EXPLORATORY (WILDCAT)

Describe sub-type:

Distance to town: 9 Miles

Distance to nearest well: 30 FT

Distance to lease line: 50 FT

Reservoir well spacing assigned acres Measurement: 641.64 Acres

Well plat: COG\_FEZ\_607H\_C102\_20190408090724.pdf

Well work start Date: 10/01/2019

Duration: 30 DAYS

### Section 3 - Well Location Table

Survey Type: RECTANGULAR

Describe Survey Type:

Datum: NAD83

Vertical Datum: NAVD88

Survey number:

	NS-Foot	NS Indicator	EW-Foot	EW Indicator	Twsp	Range	Section	Aliquot/Lot/Tract	Latitude	Longitude	County	State	Meridian	Lease Type	Lease Number	Elevation	MD	TVD
SHL Leg #1	330	FSL	233 0	FEL	25S	35E	9	Aliquot SWSE 4	32.13854 4	- 103.3714 6	LEA	NEW MEXI CO	NEW MEXI CO	F	NMNM 125658	324 2	0	0
KOP Leg #1	330	FSL	233 0	FEL	25S	35E	9	Aliquot SWSE 4	32.13854 4	- 103.3714 6	LEA	NEW MEXI CO	NEW MEXI CO	F	NMNM 125658	324 2	0	0

Operator Name: COG OPERATING LLC

Well Name: FEZ FEDERAL COM

Well Number: 607H

	NS-Foot	NS Indicator	EW-Foot	EW Indicator	Twsp	Range	Section	Aliquot/Lot/Tract	Latitude	Longitude	County	State	Meridian	Lease Type	Lease Number	Elevation	MD	TVD
PPP Leg #1	100	FSL	2220	FEL	25S	35E	9	Aliquot SWSE	32.137912	-103.371106	LEA	NEW MEXI CO	NEW MEXI CO	F	NMNM 125658	347	2900	2895
PPP Leg #1	2641	FSL	2220	FEL	25S	35E	9	Aliquot SWNE	32.144895	-103.3711	LEA	NEW MEXI CO	NEW MEXI CO	F	FEE	-8995	14900	12237
EXIT Leg #1	100	FNL	2220	FEL	25S	35E	4	Lot 2	32.166453	-103.371083	LEA	NEW MEXI CO	NEW MEXI CO	F	FEE	-9039	22474	12281
BHL Leg #1	50	FNL	2220	FEL	25S	35E	4	Lot 2	32.16659	-103.371083	LEA	NEW MEXI CO	NEW MEXI CO	F	FEE	-9039	22524	12281

## Drilling Plan

## Section 1 - Geologic Formations

Formation ID	Formation Name	Elevation	True Vertical Depth	Measured Depth	Lithologies	Mineral Resources	Producing Formation
1	UNKNOWN	3242	0	0		NONE	No
2	RUSTLER	2479	760	760		NONE	No
3	TOP SALT	2134	1105	1105	SALT	NONE	No
4	BASE OF SALT	-1677	4919	4919	ANHYDRITE	NONE	No
5	LAMAR	-2050	5292	5292	LIMESTONE	NATURAL GAS,OIL	No
6	BELL CANYON	-2107	5349	5349		NONE	No
7	CHERRY CANYON	-3018	6260	6260		NATURAL GAS,OIL	No
8	BRUSHY CANYON	-4527	7769	7769		NATURAL GAS,OIL	No
9	BONE SPRING LIME	-5745	8987	8987	SANDSTONE	NATURAL GAS,OIL	No
10	UPPER AVALON SHALE	-5999	9241	9241		NATURAL GAS,OIL	No

**Operator Name:** COG OPERATING LLC

**Well Name:** FEZ FEDERAL COM

**Well Number:** 607H

Formation ID	Formation Name	Elevation	True Vertical Depth	Measured Depth	Lithologies	Mineral Resources	Producing Formation
11	—	-6445	9687	9687		NATURAL GAS,OIL	No
12	BONE SPRING 1ST	-7080	10322	10322		NATURAL GAS,OIL	No
13	BONE SPRING 2ND	-7600	10842	10842		NATURAL GAS,OIL	No
14	BONE SPRING 3RD	-8683	11925	11925		NATURAL GAS,OIL	Yes
15	WOLFCAMP	-9068	12310	12310	SHALE	NATURAL GAS,OIL	No

## Section 2 - Blowout Prevention

**Pressure Rating (PSI):** 10M

**Rating Depth:** 12281

**Equipment:** Annular, Blind Ram, Pipe Ram. Other accessories to the BOP equipment will include a Kelly cock and floor safety valve (inside BOP) and choke lines and choke manifold

**Requesting Variance?** YES

**Variance request:** A 5M variance is requested on a 10M system. (A 5M variance is attached in section 8). A variance is requested for the use of a flexible choke line from the BOP to the choke manifold. See attached for specs and hydrostatic test chart.

**Testing Procedure:** BOP/BOPE will be tested by an independent service company to 250 psi low and the high pressure indicated above per Onshore Order 2 requirements. The System may be upgraded to a higher pressure but still tested to the working pressure listed in the table above. If the system is upgraded all the components installed will be functional and tested. Pipe rams will be operationally checked each 24 hour period. Blind rams will be operationally checked on each trip out of the hole. These checks will be noted on the daily tour sheets.

**Choke Diagram Attachment:**

COG\_Fez\_607H\_10M\_Choke\_20190408105030.pdf

**BOP Diagram Attachment:**

COG\_Fez\_607H\_Flex\_Hose\_20190408105048.pdf

COG\_Fez\_607H\_10M\_BOP\_20190522135417.pdf

**Pressure Rating (PSI):** 5M

**Rating Depth:** 11475

**Equipment:** Annular. Accessories to the BOP equipment will include a Kelly cock and floor safety valve (inside BOP) and choke lines and choke manifold.

**Requesting Variance?** YES

**Variance request:** A variance is requested for the use of a flexible choke line from the BOP to the choke manifold. See attached for specs and hydrostatic test chart.

**Testing Procedure:** BOP/BOPE will be tested by an independent service company to 250 psi low and the high pressure indicated above per Onshore Order 2 requirements. The System may be upgraded to a higher pressure but still tested to the working pressure listed in the table above. If the system is upgraded all the components installed will be functional and tested. Pipe rams will be operationally checked each 24 hour period. Blind rams will be operationally checked on each trip out of the hole. These checks will be noted on the daily tour sheets.



Operator Name: COG OPERATING LLC

Well Name: FEZ FEDERAL COM

Well Number: 607H

**Choke Diagram Attachment:**

COG\_Fez\_607H\_5M\_Choke\_20190408105105.pdf

**BOP Diagram Attachment:**

COG\_Fez\_607H\_5M\_BOP\_20190408105113.pdf

COG\_Fez\_607H\_Flex\_Hose\_20190408105120.pdf

### Section 3 - Casing

Casing ID	String Type	Hole Size	Csg Size	Condition	Standard	Tapered String	Top Set MD	Bottom Set MD	Top Set TVD	Bottom Set TVD	Top Set MSL	Bottom Set MSL	Calculated casing length MD	Grade	Weight	Joint Type	Collapse SF	Burst SF	Joint SF Type	Joint SF	Body SF Type	Body SF
1	SURFACE	17.5	13.375	NEW	API	N	0	1000	0	1000	-9411	-10581	1000	J-55	54.5	STC	2.3	6.87	DRY	8.57	DRY	8.57
2	INTERMEDIATE	14.75	9.625	NEW	API	N	0	11475	0	11475	-9411	-21491	11475	HCL-80	47	OTHER - BTC	1.62	1.09	DRY	2.08	DRY	2.08
3	PRODUCTION	8.75	5.5	NEW	API	N	0	22524	0	12281	-9411	-29318	22524	P-110	23	OTHER - BTC	1.82	2.15	DRY	2.56	DRY	2.56

**Casing Attachments**

Casing ID: 1 String Type: SURFACE

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

COG\_FEZ\_607H\_Casing\_Prog\_20190408105447.pdf



**Well Number: 607H**

String Type	Lead/Tail	Stage Tool Depth	Top MD	Bottom MD	Quantity(sx)	Yield	Density	Cu Ft	Excess%	Cement type	Additives
INTERMEDIATE	Lead					2.8					
INTERMEDIATE	Tail										
PRODUCTION	Lead										
PRODUCTION	Tail										

[illegible]

**Operator Name:** COG OPERATING LLC

**Well Name:** FEZ FEDERAL COM

**Well Number:** 607H

### **Section 6 - Test, Logging, Coring**

**List of production tests including testing procedures, equipment and safety measures:**

None planned

**List of open and cased hole logs run in the well:**

CNL,GR

**Coring operation description for the well:**

None planned

### **Section 7 - Pressure**

**Anticipated Bottom Hole Pressure:** 7985

**Anticipated Surface Pressure:** 5283.18

**Anticipated Bottom Hole Temperature(F):** 180

**Anticipated abnormal pressures, temperatures, or potential geologic hazards?** NO

**Describe:**

**Contingency Plans geohazards description:**

**Contingency Plans geohazards attachment:**

**Hydrogen Sulfide drilling operations plan required?** YES

**Hydrogen sulfide drilling operations plan:**

COG\_Fez\_607H\_H2S\_Schem\_20190408110120.pdf

COG\_Fez\_607H\_H2S\_SUP\_20190408110215.pdf

### **Section 8 - Other Information**

**Proposed horizontal/directional/multi-lateral plan submission:**

COG\_Fez\_607H\_Direct\_Plan\_20190408110234.pdf

COG\_Fez\_607H\_AC\_Report\_20190408110242.pdf

**Other proposed operations facets description:**

Drilling program attached.

GCP Attached.

5M Variance attached.

Cementing program attached.

**Other proposed operations facets attachment:**

COG\_Fez\_607H\_GCP\_20190408110255.pdf

COG\_Fez\_607H\_Drilling\_Prog\_20190408110304.pdf

**Other Variance attachment:**

COG\_5M\_Variance\_Well\_Plan\_20190314081725.pdf

**Operator Name:** COG OPERATING LLC

**Well Name:** FEZ FEDERAL COM

**Well Number:** 607H

SUPO

### Section 1 - Existing Roads

**Will existing roads be used?** YES

**Existing Road Map:**

COG\_Fez\_607H\_Existing\_Rd\_20190408110652.pdf

**Existing Road Purpose:** ACCESS

**Row(s) Exist?** NO

**ROW ID(s)**

**ID:**

**Do the existing roads need to be improved?** NO

**Existing Road Improvement Description:**

**Existing Road Improvement Attachment:**

### Section 2 - New or Reconstructed Access Roads

**Will new roads be needed?** YES

**New Road Map:**

COG\_Fez\_607H\_Rd\_Maps\_Plats\_20190408154927.pdf

**New road type:** TWO-TRACK

**Length:** 61.2

Feet

**Width (ft.):** 30

**Max slope (%):** 33

**Max grade (%):** 1

**Army Corp of Engineers (ACOE) permit required?** NO

**ACOE Permit Number(s):**

**New road travel width:** 20

**New road access erosion control:** Water will be diverted where necessary to avoid ponding, prevent erosion, maintain good drainage, and to be consistent with local drainage patterns.

**New road access plan or profile prepared?** NO

**New road access plan attachment:**

**Access road engineering design?** NO

**Access road engineering design attachment:**

**Access surfacing type:** OTHER

**Operator Name:** COG OPERATING LLC

**Well Name:** FEZ FEDERAL COM

**Well Number:** 607H

**Access topsoil source:** ONSITE

**Access surfacing type description:** Caliche

**Access onsite topsoil source depth:** 6

**Offsite topsoil source description:**

**Onsite topsoil removal process:** Blading

**Access other construction information:** No turnouts are planned. Re-routing access road around proposed well location.

**Access miscellaneous information:**

**Number of access turnouts:**

**Access turnout map:**

### **Drainage Control**

**New road drainage crossing:** OTHER

**Drainage Control comments:** None necessary.

**Road Drainage Control Structures (DCS) description:** None needed.

**Road Drainage Control Structures (DCS) attachment:**

### **Access Additional Attachments**

**Additional Attachment(s):**

### **Section 3 - Location of Existing Wells**

**Existing Wells Map?** YES

**Attach Well map:**

COG\_Fez\_607H\_1Mile\_Data\_20190408111330.pdf

**Existing Wells description:**

### **Section 4 - Location of Existing and/or Proposed Production Facilities**

**Submit or defer a Proposed Production Facilities plan?** SUBMIT

**Production Facilities description:** The Fez Federal 9P Central Tank Battery (CTB) is proposed in Section 9, T25S, R35E. Production from each of the 9 producing wells will be sent to the proposed Fez Federal 9P CTB. We plan to install 9 buried 4" FP 601HT production flowlines from each wellhead to the inlet manifold of the proposed CTB; the route for these flowlines will follow the "Mainline" route as shown in the attached plat. We will also install 1 buried 6" poly line for gas lift supply from the CTB to each production well pad; the route for this gas lift line will follow the "Mainline" route as shown in the attached plat. We will also install 1 buried 10" poly line for produced water transfer from the CTB to an existing pipeline connection in Section 16; this line will follow the "Mainline" route as shown in the attached plat.

**Production Facilities map:**

COG\_Fez\_607H\_CTB\_Flowlines\_20190408111348.pdf

COG\_Fez\_607H\_CTB\_Layout\_20190408111438.pdf

**Operator Name:** COG OPERATING LLC

**Well Name:** FEZ FEDERAL COM

**Well Number:** 607H

## Section 5 - Location and Types of Water Supply

### Water Source Table

**Water source use type:** INTERMEDIATE/PRODUCTION CASING

**Water source type:** OTHER

**Describe type:** Brine

**Source latitude:**

**Source longitude:**

**Source datum:**

**Water source permit type:** PRIVATE CONTRACT

**Source land ownership:** COMMERCIAL

**Water source transport method:** TRUCKING

**Source transportation land ownership:** COMMERCIAL

**Water source volume (barrels):** 30000

**Source volume (acre-feet):** 3.866793

**Source volume (gal):** 1260000

**Water source use type:** STIMULATION, SURFACE CASING

**Water source type:** OTHER

**Describe type:** Fresh Water

**Source latitude:**

**Source longitude:**

**Source datum:**

**Water source permit type:** PRIVATE CONTRACT

**Source land ownership:** PRIVATE

**Water source transport method:** PIPELINE

**Source transportation land ownership:** PRIVATE

**Water source volume (barrels):** 450000

**Source volume (acre-feet):** 58.001892

**Source volume (gal):** 18900000

**Water source and transportation map:**

COG\_Fez\_607H\_BrineH2O\_20190408111500.pdf

COG\_Fez\_607H\_Fresh\_H2O\_20190408111544.pdf

**Water source comments:** Fresh water will be obtained from Fez Fee Frac Pond located in Section 8, T25S, R35E. Brine water will be obtained from the Salty Dog Brine station located in Section 5. T19S. R36E.

**New water well?** NO

### New Water Well Info

**Well latitude:**

**Well Longitude:**

**Well datum:**

**Well target aquifer:**

**Est. depth to top of aquifer(ft):**

**Est thickness of aquifer:**

**Operator Name:** COG OPERATING LLC

**Well Name:** FEZ FEDERAL COM

**Well Number:** 607H

**Aquifer comments:**

**Aquifer documentation:**

**Well depth (ft):**

**Well casing type:**

**Well casing outside diameter (in.):**

**Well casing inside diameter (in.):**

**New water well casing?**

**Used casing source:**

**Drilling method:**

**Drill material:**

**Grout material:**

**Grout depth:**

**Casing length (ft.):**

**Casing top depth (ft.):**

**Well Production type:**

**Completion Method:**

**Water well additional information:**

**State appropriation permit:**

**Additional information attachment:**

## **Section 6 - Construction Materials**

**Construction Materials description:** Caliche will be obtained from the actual well site if available. If not available onsite, caliche will be hauled from Quail Ranch LLC (CONCHO) caliche pit located in Section 6, T24S, R35E. Phone # (575) 748-6940 or Bert Madera caliche pit located in Section 6, T25S, R35E. Phone 575-631-4444.

**Construction Materials source location attachment:**

## **Section 7 - Methods for Handling Waste**

**Waste type:** DRILLING

**Waste content description:** Drilling fluids and produced oil and water during drilling and completion operations

**Amount of waste:** 6000 barrels

**Waste disposal frequency :** One Time Only

**Safe containment description:** All drilling waste will be stored safely and disposed of properly

**Safe containmant attachment:**

**Waste disposal type:** HAUL TO COMMERCIAL FACILITY **Disposal location ownership:** COMMERCIAL

**Disposal type description:**

**Disposal location description:** Trucked to an approved disposal facility

**Waste type:** SEWAGE

**Waste content description:** Human waste and gray water

**Amount of waste:** 250 gallons

**Waste disposal frequency :** Weekly

**Safe containment description:** Waste will be properly contained and disposed of properly at a state approved disposal facility



**Operator Name:** COG OPERATING LLC

**Well Name:** FEZ FEDERAL COM

**Well Number:** 607H

**Safe containmant attachment:**

**Waste disposal type:** HAUL TO COMMERCIAL FACILITY **Disposal location ownership:** COMMERCIAL

**Disposal type description:**

**Disposal location description:** Trucked to an approved disposal facility

**Waste type:** GARBAGE

**Waste content description:** Garbage and trash produced during drilling and completion operations

**Amount of waste:** 125 pounds

**Waste disposal frequency :** Weekly

**Safe containment description:** Garbage and trash produced during drilling and completion operations will be collected in a trash container and disposed of properly at a state approved disposal facility

**Safe containmant attachment:**

**Waste disposal type:** HAUL TO COMMERCIAL FACILITY **Disposal location ownership:** COMMERCIAL

**Disposal type description:**

**Disposal location description:** Trucked to an approved disposal facility

**Reserve Pit**

**Reserve Pit being used?** NO

**Temporary disposal of produced water into reserve pit?**

**Reserve pit length (ft.)** **Reserve pit width (ft.)**

**Reserve pit depth (ft.)** **Reserve pit volume (cu. yd.)**

**Is at least 50% of the reserve pit in cut?**

**Reserve pit liner**

**Reserve pit liner specifications and installation description**

**Cuttings Area**

**Cuttings Area being used?** NO

**Are you storing cuttings on location?** YES

**Description of cuttings location** Roll off cuttings containers on tracks

**Cuttings area length (ft.)** **Cuttings area width (ft.)**

**Cuttings area depth (ft.)** **Cuttings area volume (cu. yd.)**

**Is at least 50% of the cuttings area in cut?**

**Operator Name:** COG OPERATING LLC

**Well Name:** FEZ FEDERAL COM

**Well Number:** 607H

**WCuttings area liner**

**Cuttings area liner specifications and installation description**

## **Section 8 - Ancillary Facilities**

**Are you requesting any Ancillary Facilities?:** NO

**Ancillary Facilities attachment:**

**Comments:** GCP Attached.

## **Section 9 - Well Site Layout**

**Well Site Layout Diagram:**

COG\_Fez\_607H\_Layout\_20190408111611.pdf

COG\_Fez\_607H\_CTB\_Layout\_20190408111620.pdf

COG\_Fez\_607H\_CTB\_Flowlines\_20190408111629.pdf

**Comments:** The Fez Federal 9P Central Tank Battery (CTB) is proposed in Section 9, T25S, R35E. Production from each of the 9 producing wells will be sent to the proposed Fez Federal 9P CTB. We plan to install 9 buried 4" FP 601HT production flowlines from each wellhead to the inlet manifold of the proposed CTB; the route for these flowlines will follow the "Mainline" route as shown in the attached plat. We will also install 1 buried 6" poly line for gas lift supply from the CTB to each production well pad; the route for this gas lift line will follow the "Mainline" route as shown in the attached plat. We will also install 1 buried 10" poly line for produced water transfer from the CTB to an existing pipeline connection in Section 16; this line will follow the "Mainline" route as shown in the attached plat.

## **Section 10 - Plans for Surface Reclamation**

**Recontouring attachment:**

COG\_Fez\_607H\_Reclamation\_20190408112011.pdf

**Drainage/Erosion control construction:** Immediately following construction straw waddles will be placed as necessary at the well site to reduce to reduce sediment impacts to fragile/sensitive soils.

**Drainage/Erosion control reclamation:** West 50'

**Operator Name:** COG OPERATING LLC

**Well Name:** FEZ FEDERAL COM

**Well Number:** 607H

<b>Well pad proposed disturbance (acres):</b> 3.67	<b>Well pad interim reclamation (acres):</b> 0.15	<b>Well pad long term disturbance (acres):</b> 3.35
<b>Road proposed disturbance (acres):</b> 0.13	<b>Road interim reclamation (acres):</b> 0.13	<b>Road long term disturbance (acres):</b> 0.13
<b>Powerline proposed disturbance (acres):</b> 0	<b>Powerline interim reclamation (acres):</b> 0	<b>Powerline long term disturbance (acres):</b> 0
<b>Pipeline proposed disturbance (acres):</b> 0.04	<b>Pipeline interim reclamation (acres):</b> 0.04	<b>Pipeline long term disturbance (acres):</b> 0.04
<b>Other proposed disturbance (acres):</b> 5.74	<b>Other interim reclamation (acres):</b> 5.74	<b>Other long term disturbance (acres):</b> 5.74
<b>Total proposed disturbance:</b> 9.58	<b>Total interim reclamation:</b> 6.06	<b>Total long term disturbance:</b> 9.26

**Disturbance Comments:**

**Reconstruction method:** New construction of pad.

**Topsoil redistribution:** West 50'

**Soil treatment:** None

**Existing Vegetation at the well pad:** Shinnery Oak/Mesquite grassland

**Existing Vegetation at the well pad attachment:**

**Existing Vegetation Community at the road:** Shinnery Oak/Mesquite grassland

**Existing Vegetation Community at the road attachment:**

**Existing Vegetation Community at the pipeline:** Shinnery Oak/Mesquite grassland

**Existing Vegetation Community at the pipeline attachment:**

**Existing Vegetation Community at other disturbances:** N/A

**Existing Vegetation Community at other disturbances attachment:**

**Non native seed used?** NO

**Non native seed description:**

**Seedling transplant description:**

**Will seedlings be transplanted for this project?** NO

**Seedling transplant description attachment:**

**Will seed be harvested for use in site reclamation?** NO

**Seed harvest description:**

**Seed harvest description attachment:**

**Operator Name:** COG OPERATING LLC

**Well Name:** FEZ FEDERAL COM

**Well Number:** 607H

**Seed Management**

**Seed Table**

**Seed type:**

**Seed source:**

**Seed name:**

**Source name:**

**Source address:**

**Source phone:**

**Seed cultivar:**

**Seed use location:**

**PLS pounds per acre:**

**Proposed seeding season:**

**Seed Summary**

**Total pounds/Acre:**

<b>Seed Type</b>	<b>Pounds/Acre</b>
------------------	--------------------

**Seed reclamation attachment:**

**Operator Contact/Responsible Official Contact Info**

**First Name:** Gerald

**Last Name:** Herrera

**Phone:** (432)260-7399

**Email:** gherrera@concho.com

**Seedbed prep:**

**Seed BMP:**

**Seed method:**

**Existing invasive species?** NO

**Existing invasive species treatment description:**

**Existing invasive species treatment attachment:**

**Weed treatment plan description:** N/A

**Weed treatment plan attachment:**

**Monitoring plan description:** N/A

**Monitoring plan attachment:**

**Success standards:** N/A

**Pit closure description:** N/A

**Pit closure attachment:**

**Operator Name:** COG OPERATING LLC

**Well Name:** FEZ FEDERAL COM

**Well Number:** 607H

**Section 11 - Surface Ownership**

**Disturbance type:** WELL PAD

[Redacted]

**USFS Region:**

**USFS Forest/Grassland:**

**USFS Ranger District:**

[Redacted]

**Surface use plan certification document:**

[Redacted]

**Operator Name:** COG OPERATING LLC

**Well Name:** FEZ FEDERAL COM

**Well Number:** 607H

## Section 12 - Other Information

**Right of Way needed?** NO

**Use APD as ROW?**

**ROW Type(s):**

### ROW Applications

**SUPO Additional Information:** SUP attached.

**Use a previously conducted onsite?** YES

**Previous Onsite information:** Onsite completed on 10/09/2018 by Gerald Herrera (COG) and Jeff Robertson (BLM).

### Other SUPO Attachment

COG\_FEZ\_607H\_C102\_20190408112055.pdf  
COG\_Fez\_607H\_1Mile\_Data\_20190408112105.pdf  
COG\_Fez\_607H\_BrineH2O\_20190408112116.pdf  
COG\_Fez\_607H\_Closed\_Loop\_20190408112128.pdf  
COG\_Fez\_607H\_CTB\_Flowlines\_20190408112153.pdf  
COG\_Fez\_607H\_CTB\_Layout\_20190408112202.pdf  
COG\_Fez\_607H\_Existing\_Rd\_20190408154948.pdf  
COG\_Fez\_607H\_Fresh\_H2O\_20190408155001.pdf  
COG\_Fez\_607H\_Layout\_20190408155012.pdf  
COG\_Fez\_607H\_Rd\_Maps\_Plats\_20190408155023.pdf  
COG\_Fez\_607H\_Reclamation\_20190408155034.pdf  
COG\_Fez\_607H\_SUP\_20190408155042.pdf

PWD

**Operator Name:** COG OPERATING LLC

**Well Name:** FEZ FEDERAL COM

**Well Number:** 607H

## **Section 1 - General**

**Would you like to address long-term produced water disposal?** NO

## **Section 2 - Lined Pits**

**Would you like to utilize Lined Pit PWD options?** NO

**Produced Water Disposal (PWD) Location:**

**PWD surface owner:**

**PWD disturbance (acres):**

**Lined pit PWD on or off channel:**

**Lined pit PWD discharge volume (bbl/day):**

**Lined pit specifications:**

**Pit liner description:**

**Pit liner manufacturers information:**

**Precipitated solids disposal:**

**Describe precipitated solids disposal:**

**Precipitated solids disposal permit:**

**Lined pit precipitated solids disposal schedule:**

**Lined pit precipitated solids disposal schedule attachment:**

**Lined pit reclamation description:**

**Lined pit reclamation attachment:**

**Leak detection system description:**

**Leak detection system attachment:**

**Lined pit Monitor description:**

**Lined pit Monitor attachment:**

**Lined pit: do you have a reclamation bond for the pit?**

**Is the reclamation bond a rider under the BLM bond?**

**Operator Name:** COG OPERATING LLC

**Well Name:** FEZ FEDERAL COM

**Well Number:** 607H

**Lined pit bond number:**

**Lined pit bond amount:**

**Additional bond information attachment:**

### **Section 3 - Unlined Pits**

**Would you like to utilize Unlined Pit PWD options?** NO

**Produced Water Disposal (PWD) Location:**

**PWD surface owner:**

**PWD disturbance (acres):**

**Unlined pit PWD on or off channel:**

**Unlined pit PWD discharge volume (bbl/day):**

**Unlined pit specifications:**

**Precipitated solids disposal:**

**Describe precipitated solids disposal:**

**Precipitated solids disposal permit:**

**Unlined pit precipitated solids disposal schedule:**

**Unlined pit precipitated solids disposal schedule attachment:**

**Unlined pit reclamation description:**

**Unlined pit reclamation attachment:**

**Unlined pit Monitor description:**

**Unlined pit Monitor attachment:**

**Do you propose to put the produced water to beneficial use?**

**Beneficial use user confirmation:**

**Estimated depth of the shallowest aquifer (feet):**

**Does the produced water have an annual average Total Dissolved Solids (TDS) concentration equal to or less than that of the existing water to be protected?**

**TDS lab results:**

**Geologic and hydrologic evidence:**

**State authorization:**

**Unlined Produced Water Pit Estimated percolation:**

**Unlined pit: do you have a reclamation bond for the pit?**

**Is the reclamation bond a rider under the BLM bond?**

**Unlined pit bond number:**

**Unlined pit bond amount:**

**Additional bond information attachment:**



**Operator Name:** COG OPERATING LLC

**Well Name:** FEZ FEDERAL COM

**Well Number:** 607H

#### **Section 4 - Injection**

**Would you like to utilize Injection PWD options?** NO

**Produced Water Disposal (PWD) Location:**

**PWD surface owner:**

**PWD disturbance (acres):**

**Injection PWD discharge volume (bbl/day):**

**Injection well mineral owner:**

**Injection well type:**

**Injection well number:**

**Injection well name:**

**Assigned injection well API number?**

**Injection well API number:**

**Injection well new surface disturbance (acres):**

**Minerals protection information:**

**Mineral protection attachment:**

**Underground Injection Control (UIC) Permit?**

**UIC Permit attachment:**

#### **Section 5 - Surface Discharge**

**Would you like to utilize Surface Discharge PWD options?** NO

**Produced Water Disposal (PWD) Location:**

**PWD surface owner:**

**PWD disturbance (acres):**

**Surface discharge PWD discharge volume (bbl/day):**

**Surface Discharge NPDES Permit?**

**Surface Discharge NPDES Permit attachment:**

**Surface Discharge site facilities information:**

**Surface discharge site facilities map:**

#### **Section 6 - Other**

**Would you like to utilize Other PWD options?** NO

**Produced Water Disposal (PWD) Location:**

**PWD surface owner:**

**PWD disturbance (acres):**

**Other PWD discharge volume (bbl/day):**

**Other PWD type description:**

**Operator Name:** COG OPERATING LLC

**Well Name:** FEZ FEDERAL COM

**Well Number:** 607H

**Other PWD type attachment:**

**Have other regulatory requirements been met?**

**Other regulatory requirements attachment:**

## Bond Info

### Bond Information

**Federal/Indian APD:** FED

**BLM Bond number:** NMB000215

**BIA Bond number:**

**Do you have a reclamation bond?** NO

**Is the reclamation bond a rider under the BLM bond?**

**Is the reclamation bond BLM or Forest Service?**

**BLM reclamation bond number:**

**Forest Service reclamation bond number:**

**Forest Service reclamation bond attachment:**

**Reclamation bond number:**

**Reclamation bond amount:**

**Reclamation bond rider amount:**

**Additional reclamation bond information attachment:**

## Operator Certification

### Operator Certification

*I hereby certify that I, or someone under my direct supervision, have inspected the drill site and access route proposed herein; that I am familiar with the conditions which currently 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 the company I represent, 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.*

**NAME:** Mayte Reyes

**Signed on:** 04/03/2019

**Title:** Regulatory Analyst

**Street Address:** 2208 W Main Street

**City:** Artesia

**State:** NM

**Zip:** 88210

**Phone:** (575)748-6945

**Email address:** Mreyes1@concho.com

**Operator Name:** COG OPERATING LLC

**Well Name:** FEZ FEDERAL COM

**Well Number:** 607H

### Field Representative

**Representative Name:** Gerald Herrera

**Street Address:** 2208 West Main Street

**City:** Artesia

**State:** NM

**Zip:** 88210

**Phone:** (575)748-6940

**Email address:** gherrera@concho.com

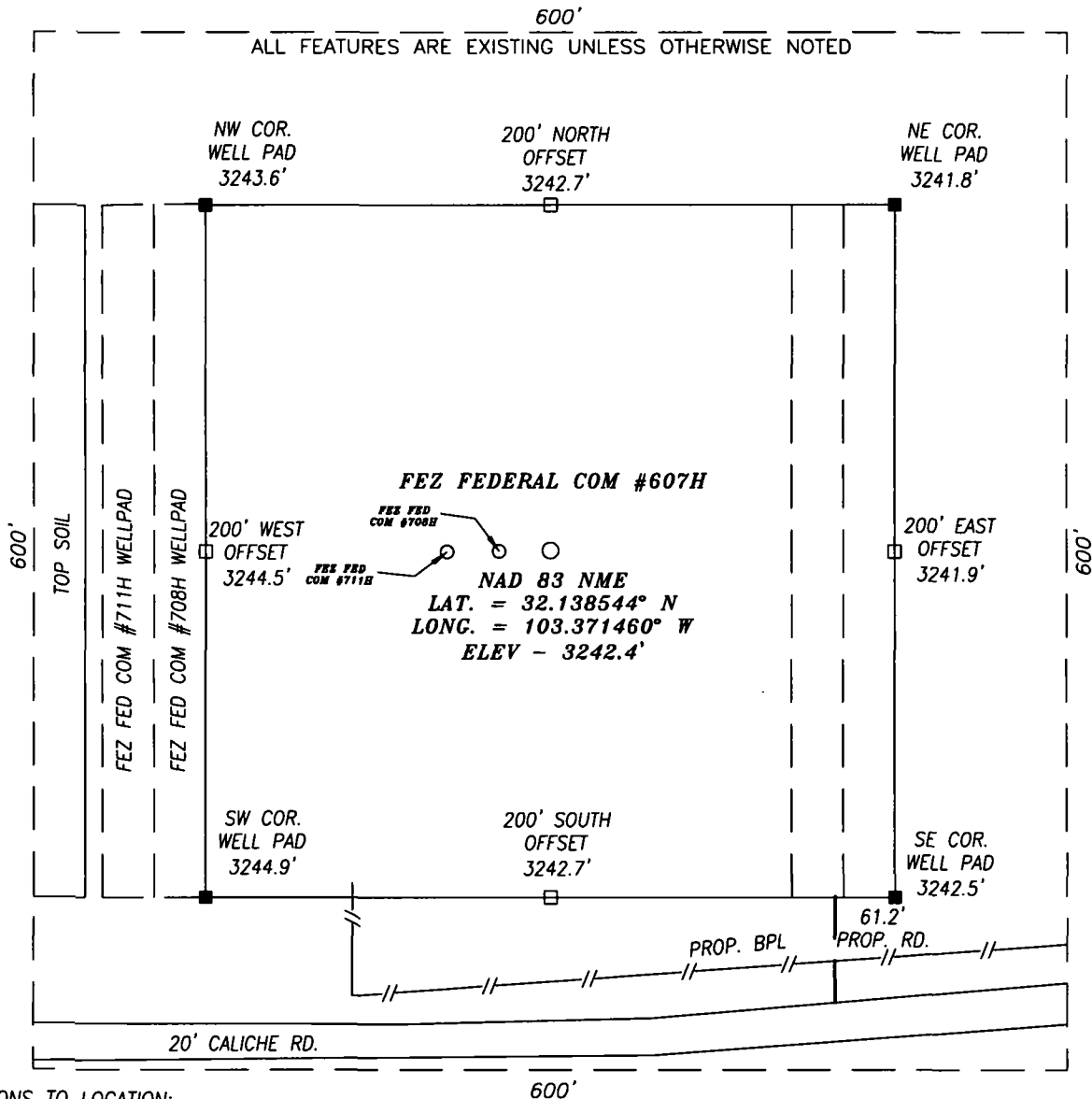
### Payment Info

#### Payment

**APD Fee Payment Method:** PAY.GOV

**pay.gov Tracking ID:** 26GKTH3Q

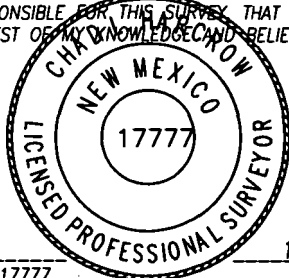
SECTION 9, TOWNSHIP 25 SOUTH, RANGE 35 EAST, N.M.P.M.,  
LEA COUNTY NEW MEXICO



DIRECTIONS TO LOCATION:  
HEADING SOUTHEASTERLY ON HWY. 128 TURN RIGHT (SOUTH) APPROX.  
0.7 MI. PAST MM 38 AND GO APPROX. 1.2 MI.; THEN GO RIGHT  
(SOUTHWESTERLY FOR APPROX. 1 MILE; THEN GO LEFT (SOUTH) FOR  
APPROX. 0.2 MI.; THEN GO LEFT (EAST) FOR APPROX. 1.9 MI.; THEN GO  
RIGHT (SOUTHEAST) AND GO APPROX. 0.1 MI.; THEN GO LEFT EASTERLY  
FROM EXISTING PAD APPROX. 1.0 MI.; THEN GO RIGHT (SOUTHERLY) FOR  
APPOX. 1.0 MI.; THEN GO RIGHT (WESTERLY) FOR APPROX. 0.4 MI.; TO  
THE BEGINNING OF THE PROPOSED ROAD; THE PROPOSED WELL LIES  
APPROX. 290 FEET NORTHWEST.

CERTIFICATION

I, CHAD HARCROW, A NEW MEXICO REGISTERED PROFESSIONAL SURVEYOR CERTIFY  
THAT I DIRECTED AND AM RESPONSIBLE FOR THIS SURVEY THAT THIS SURVEY IS  
TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF.



Chad Harcrow

CHAD HARCROW N.M.P.S. NO. 17777

1/8/19  
DATE

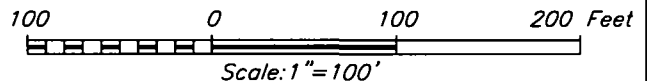
HARCROW SURVEYING, LLC

2314 W. MAIN ST, ARTESIA, N.M. 88210

PH: (575) 746-2158 FAX: (575) 746-2158

Texas Firm No. 10194089

c.harcrow@harcrowsurveying.com



COG OPERATING, LLC

FEZ FEDERAL COM #607H  
LOCATED 330 FEET FROM THE SOUTH LINE  
AND 2330 FEET FROM THE EAST LINE OF SECTION 9,  
TOWNSHIP 25 SOUTH, RANGE 35 EAST, N.M.P.M.,  
LEA COUNTY, NEW MEXICO

SURVEY DATE: NOVEMBER 14, 2018

PAGE: 1 OF 1

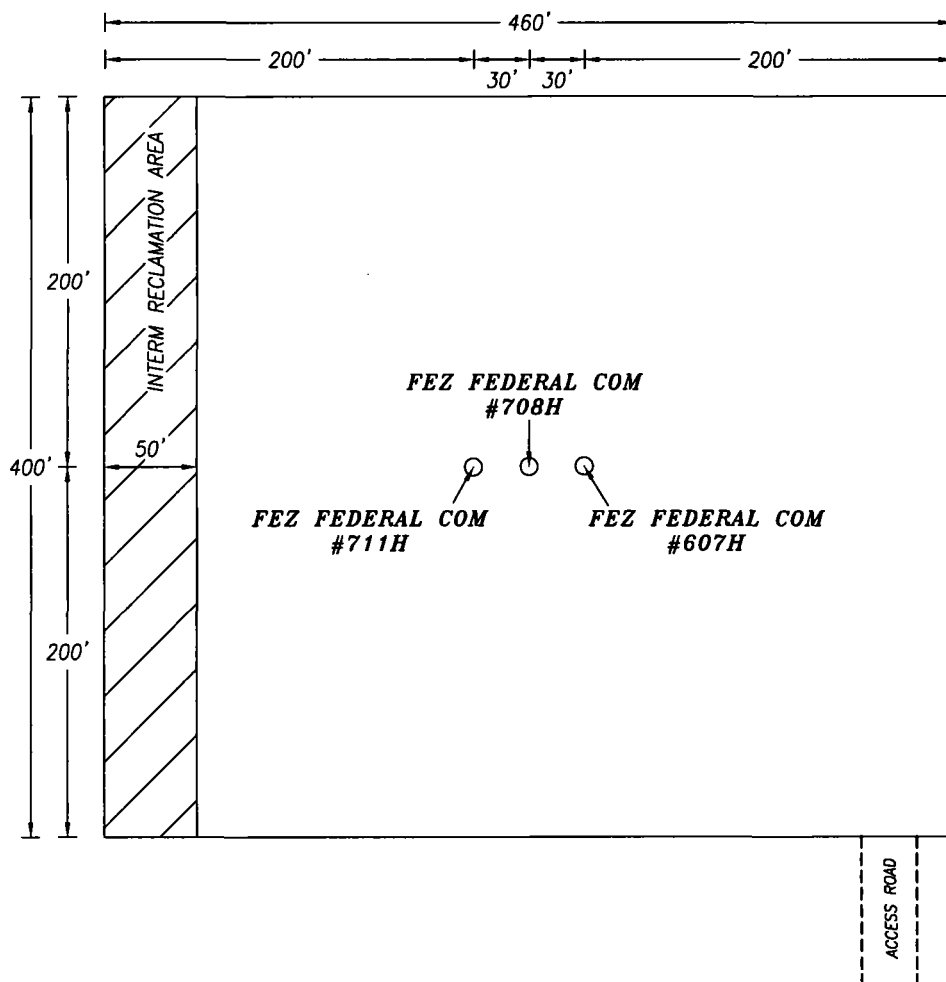
DRAFTING DATE: DECEMBER 5, 2018

APPROVED BY: CH

DRAWN BY: VD

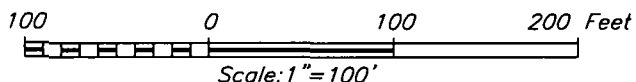
FILE: 18-1353

**RECLAMATION AND FACILITY DIAGRAM – PRODUCTION FACILITIES DIAGRAM**  
**COG OPERATING, LLC**  
**SECTION 9, TOWNSHIP 25 SOUTH, RANGE 35 EAST, N.M.P.M.,**  
**LEA COUNTY, NEW MEXICO.**



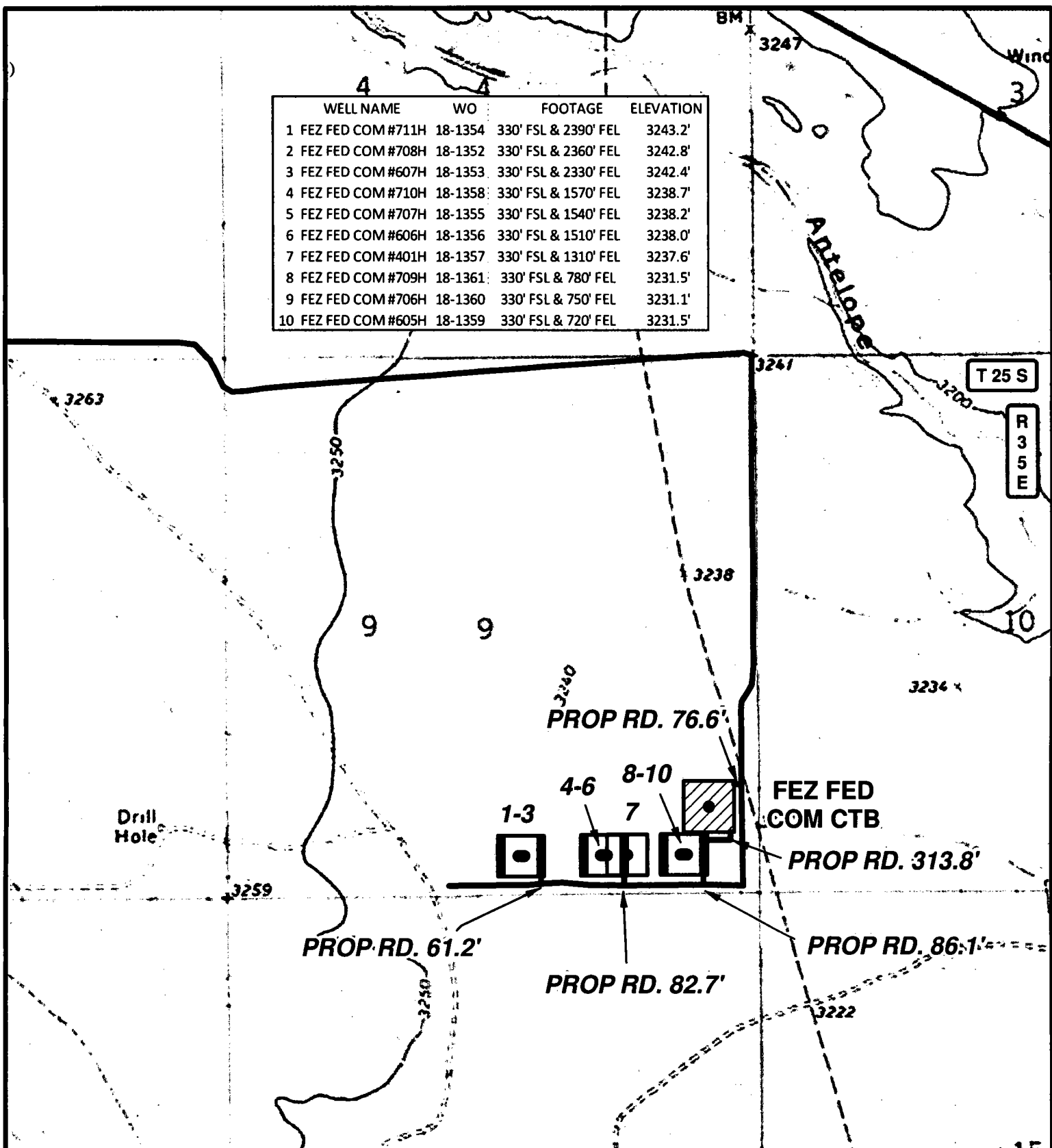
FEZ FEDERAL COM #711H, NAD 83 NME, LATITUDE: 32.138543° N, LONGITUDE: 103.371654° W  
 FEZ FEDERAL COM #708H, NAD 83 NME, LATITUDE: 32.138544° N, LONGITUDE: 103.371557° W  
 FEZ FEDERAL COM #607H, NAD 83 NME, LATITUDE: 32.138544° N, LONGITUDE: 103.371460° W

**HARCROW SURVEYING, LLC**  
 2314 W. MAIN ST, ARTESIA, N.M. 88210  
 PH: (575) 746-2158  
 c.harcrow@harcrowsurveying.com



COG OPERATING, LLC	
SURVEY DATE: OCT. 12, 2018	RECLAMATION
DRAFTING DATE: MAR. 13, 2019	PAGE: 1 OF 1
APPROVED BY: CH	DRAWN BY: WN
FILE: 19-330	

WELL NAME	WO	FOOTAGE	ELEVATION
1 FEZ FED COM #711H	18-1354	330' FSL & 2390' FEL	3243.2'
2 FEZ FED COM #708H	18-1352	330' FSL & 2360' FEL	3242.8'
3 FEZ FED COM #607H	18-1353	330' FSL & 2330' FEL	3242.4'
4 FEZ FED COM #710H	18-1358	330' FSL & 1570' FEL	3238.7'
5 FEZ FED COM #707H	18-1355	330' FSL & 1540' FEL	3238.2'
6 FEZ FED COM #606H	18-1356	330' FSL & 1510' FEL	3238.0'
7 FEZ FED COM #401H	18-1357	330' FSL & 1310' FEL	3237.6'
8 FEZ FED COM #709H	18-1361	330' FSL & 780' FEL	3231.5'
9 FEZ FED COM #706H	18-1360	330' FSL & 750' FEL	3231.1'
10 FEZ FED COM #605H	18-1359	330' FSL & 720' FEL	3231.5'



#### LEGEND

- WELL
- WELLPAD
- EXISTING ROAD
- - - PROPOSED ROAD
- ▨ TANKBATTERY

#### FEZ FEDERAL COM WELLS AND CENTRAL TANKBATTERY

SECTION: 9 TOWNSHIP: 25 S. RANGE: 35 E.  
 STATE: NEW MEXICO COUNTY: LEA SURVEY: N.M.P.M.  
 W.O. # 18-(1352-1361) LEASE: FEZ FED COM

0 2,500 FEET

0 0.075 0.15 0.3 Miles

1 IN = 1,250 FT

LOCATION OVERVIEW

TOPO

12/10/2018

**CONCHO**

COG OPERATING, LLC



**HARCROW SURVEYING, LLC.**  
 2314 W. MAIN ST, ARTESIA, NM 88210  
 PH: (575) 746-2158 FAX: (575) 746-2158  
 TEXAS FIRM NO. 10194089  
 c.harcrow@harcrowsurveying.com

WELL NAME	WO	FOOTAGE	ELEVATION
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10 FEZ FED COM #605H	18-1359	330' FSL & 720' FEL	3231.5'

05

03

09

08

10

PROP RD. 76.6'

1-3 4-6 8-10  
7

FEZ FED  
COM CTB

PROP RD. 313.8'

PROP RD. 61.2'

PROP RD. 82.7'

PROP RD. 86.1'

17

16

15

## LEGEND

- WELL
- WELLPAD
- EXISTING ROAD
- PROPOSED ROAD
- ▨ TANKBATTERY

## FEZ FEDERAL COM WELLS AND CENTRAL TANKBATTERY

SECTION: 9 TOWNSHIP: 25 S. RANGE: 35 E.

STATE: NEW MEXICO COUNTY: LEA SURVEY: N.M.P.M

W.O. # 18-(1352-1361) LEASE: FEZ FED COM

0 2,500 FEET

0 0.075 0.15 0.3 Miles

1 IN = 1,250 FT

LOCATION OVERVIEW

IMAGERY

12/10/2018

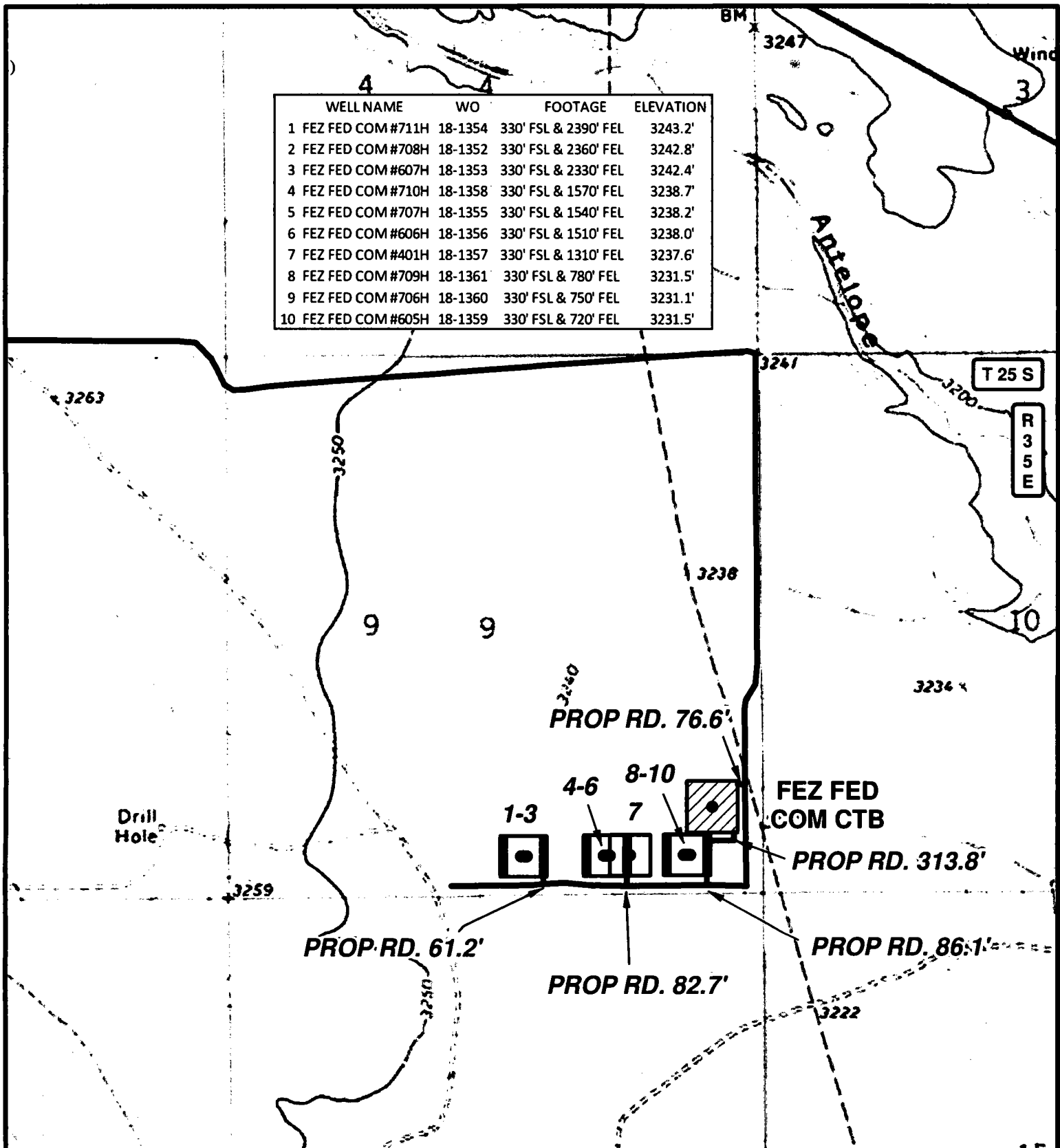
CONCHO

COG OPERATING, LLC



HARCROW SURVEYING, LLC.  
2314 W. MAIN ST. ARTESIA, NM 88210  
PH: (575) 746-2158 FAX: (575) 746-2158  
TEXAS FIRM NO. 10194089  
c.harcrow@harcrowsurveying.com

WELL NAME	WO	FOOTAGE	ELEVATION
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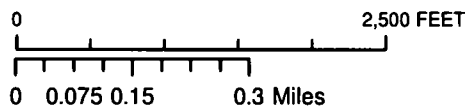


# LEGEND

- WELL
- WELLPAD
- EXISTING ROAD
- - - PROPOSED ROAD
- ▨ TANK BATTERY
- PRIVATE
- STATE OF NM
- US BLM

## FEZ FEDERAL COM WELLS AND CENTRAL TANKBATTERY

SECTION: 9 TOWNSHIP: 25 S. RANGE: 35 E.  
STATE: NEW MEXICO COUNTY: LEA SURVEY: N.M.P.M.  
W.O. # 18-(1352-1361) LEASE: FEZ FED COM



1 IN = 1,250 FT

LOCATION OVERVIEW

LAND STATUS

12/10/2018

**CONCHO**

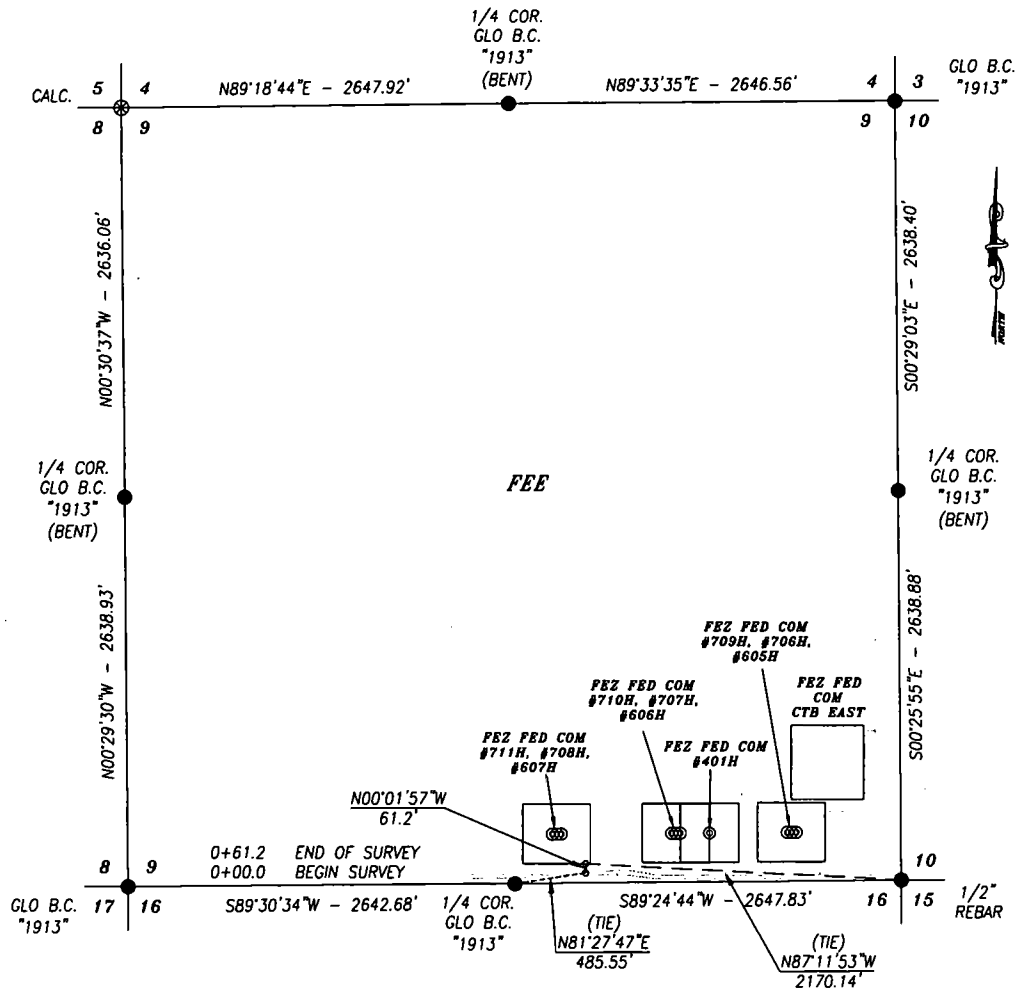
COG OPERATING, LLC

**HARCROW SURVEYING, LLC.**  
2314 W. MAIN ST, ARTESIA, NM 88210  
PH: (575) 746-2158 FAX: (575) 746-2158  
TEXAS FIRM NO. 10194089  
c.harcrow@harcrowsurveying.com



# ROAD PLAT COG OPERATING, LLC

ACCESS ROAD FOR THE "FEZ FEDERAL COM #711H, #708H, & #607H" WELLPAD IN  
SECTION 9, TOWNSHIP 25 SOUTH, RANGE 35 EAST, N.M.P.M.,  
LEA COUNTY, NEW MEXICO.



## DESCRIPTION

A STRIP OF LAND 30.0 FEET WIDE AND 61.2 FEET OR 3.71 RODS OR 0.012 MILES IN LENGTH CROSSING FEE LAND IN SECTION 9, TOWNSHIP 25 SOUTH, RANGE 35 EAST, LEA COUNTY, NEW MEXICO AND BEING 15.0 FEET LEFT AND 15.0 FEET RIGHT OF THE ABOVE PLATTED CENTERLINE SURVEY.

### BASIS OF BEARING:

BEARINGS SHOWN HEREON ARE MERCATOR GRID AND CONFORM TO THE NEW MEXICO COORDINATE SYSTEM "NEW MEXICO EAST ZONE" NORTH AMERICAN DATUM 1983. DISTANCES ARE SURFACE VALUES.

### CERTIFICATION

I, CHAD HARCROW, A NEW MEXICO REGISTERED PROFESSIONAL SURVEYOR CERTIFY THAT I DIRECTED AND AM RESPONSIBLE FOR THIS SURVEY, THAT THIS SURVEY IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF, AND THIS SURVEY AND PLAT MEET THE MINIMUM STANDARDS FOR SURVEYING IN NEW MEXICO.



*Chad Harcrow*  
CHAD HARCROW N.M.P.S. NO. 17777

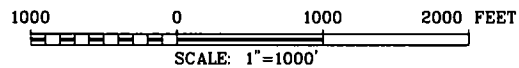
3/15/19  
DATE

### HARCROW SURVEYING, LLC

2314 W. MAIN ST, ARTESIA, N.M. 88210

PH: (575) 746-2158

c.harcrow@harcrowsurveying.com



## COG OPERATING, LLC

SURVEY OF A PROPOSED ROAD LOCATED IN  
SECTION 9, TOWNSHIP 25 SOUTH, RANGE 35 EAST,  
NMPM, LEA COUNTY, NEW MEXICO

SURVEY DATE: OCT. 31, 2018	ROAD
DRAFTING DATE: MAR. 13, 2019	PAGE 1 OF 1
APPROVED BY: CH	DRAWN BY: WN
FILE: 19-330	

T 25 S

R  
3  
5  
E

09

10

FEZ FED COM  
#709H, #706H, #605H

FEZ FED  
COM/CTB EAST

76.6'  
PROP. ROAD

FEZ FED COM  
#710H, #707H, #606H

FEZ FED  
COM #401H

FEZ FED COM  
#711H, #708H, #607H

313.6'  
PROP. ROAD

61.2'  
PROP. ROAD

83.3'  
PROP. ROAD

84.7'  
PROP. ROAD

86.1'  
PROP. ROAD

16

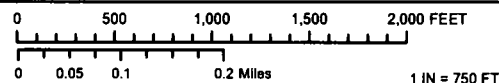
15

**LEGEND**

- WELL
- WELLPAD
- ACCESS ROAD

**FEZ FEDERAL COM ACCESS ROADS**

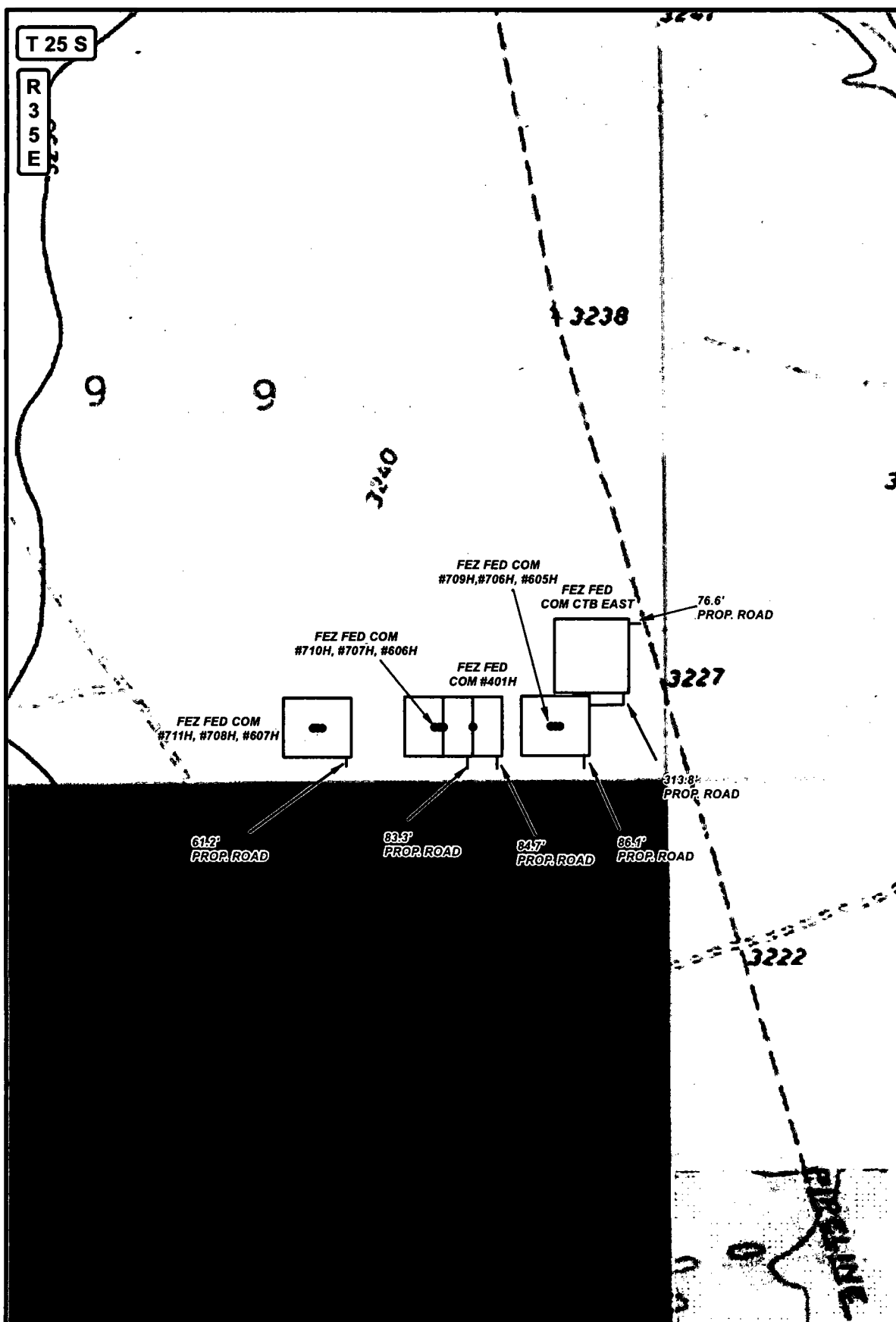
SECTION: 9 TOWNSHIP: 25 S. RANGE: 35 E.  
STATE: NEW MEXICO COUNTY: LEA SURVEY: N.M.P.M.  
W.O. # 19-329-330 LEASE: FEZ FED COM



ACCESS ROAD MAP IMAGERY 3/12/2019 W.N.

**CONCHO**  
COG OPERATING, LLC

**HARCROW SURVEYING, LLC.**  
2314 W. MAIN ST, ARTESIA, NM 88210  
PH: (575) 746-2158 FAX: (575) 746-2158  
c.harcrow@harcrowsurveying.com



**LEGEND**

- WELL
- WELLPAD
- ACCESS ROAD
- PRIVATE
- STATE OF NM
- US BLM

FEZ FEDERAL COM ACCESS ROADS

SECTION: 9	TOWNSHIP: 25 S.	RANGE: 35 E.
STATE: NEW MEXICO	COUNTY: LEA	SURVEY: N.M.P.M
W.O. # 19-329-330		LEASE: FEZ FED COM

0 500 1,000 1,500 2,000 FEET

0 0.05 0.1 0.2 Miles

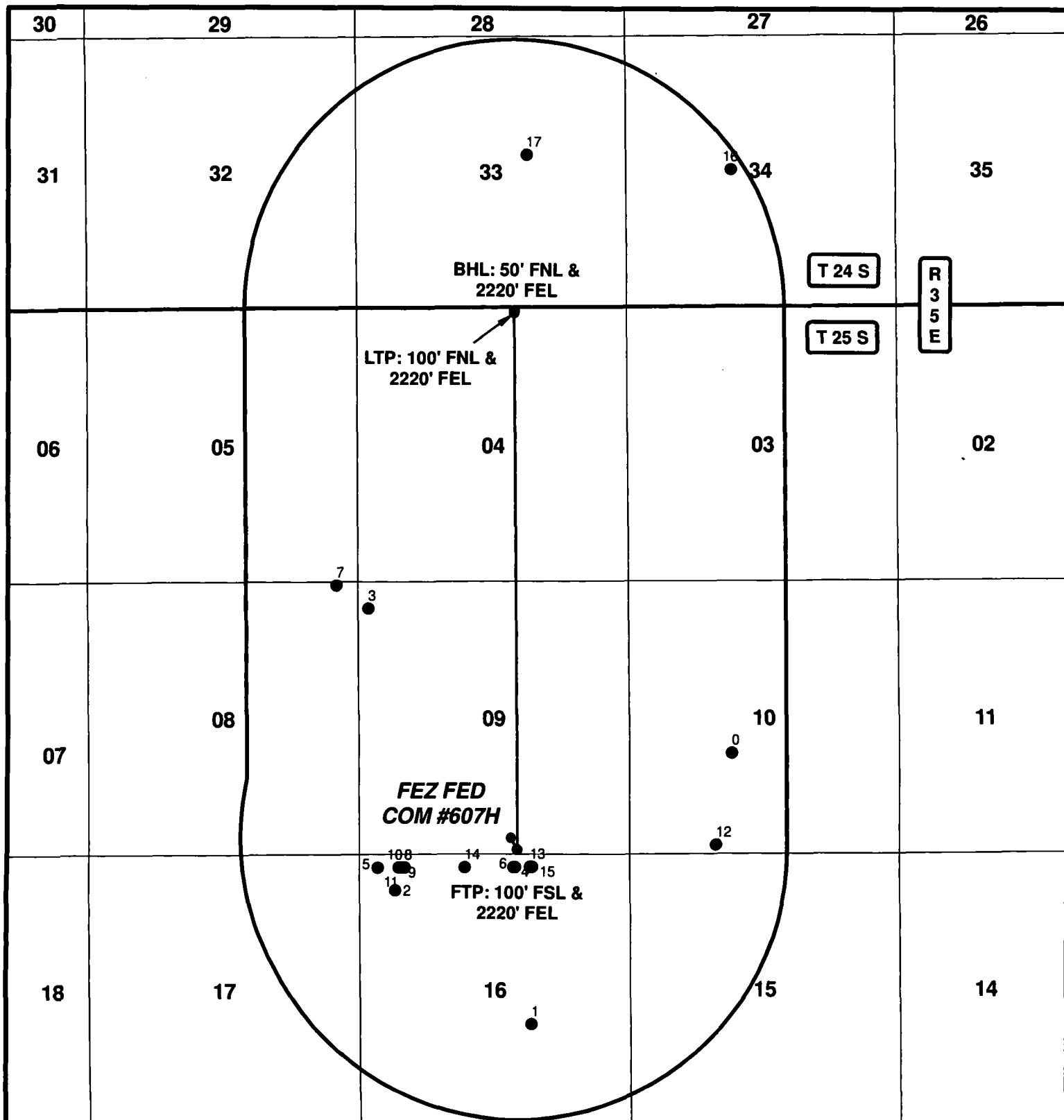
1 IN = 750 FT

ACCESS ROAD MAP
LAND STATUS
3/12/2019
W.N.

**CONCHO**

COG OPERATING, LLC

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 c.harcrow@harcrowsurveying.com



DATA FOR "WELLS WITHIN 1 MI." IS TAKEN FROM THE NEW MEXICO EMNRD WEBSITE. THE DATA HAS BEEN UPDATED THROUGH JUNE 30, 2018.

### LEGEND

- WELL
- BOTTOMHOLE
- WELLS WITHIN 1 MI.
- 1 MI. BUFFER

### FEZ FEDERAL COM #607H

SEC: 9	TWP: 25 S.	RGE: 35 E.	ELEVATION: 3242.4'
STATE: NEW MEXICO	COUNTY: LEA	330' FSL & 2330' FEL	
W.O. # 18-1353	LEASE: FEZ FED COM	SURVEY: N.M.P.M	

0 2,500 5,000 FEET

0 0.175 0.35 0.7 Miles

1 IN = 2,500 FT

1 MILE MAP

11/5/2018

V.D.

**CONCHO**

COG OPERATING, LLC



**HARCROW SURVEYING, LLC.**  
 2314 W. MAIN ST, ARTESIA, NM 88210  
 PH: (575) 746-2158 FAX: (575) 746-2158  
 TEXAS FIRM NO. 10194089  
 c.harcrow@harcrowsurveying.com

## FEZ FEDERAL COM #607H 1 MILE DATA

FID	WELL_NAME	OPERATOR	API	SECTION	TOWNSHIP	RANGE	FTG_NS	NS_CD	FTG_EW	EW_CD	LATITUDE	LONGITUDE	COMPL_STAT
0	OXY BANANA GIRL FEDERAL 002	COG OPERATING LLC	3002535322	10	25.0S	35E	1980 S		1980 W		32.143033	-103.357475	Active
1	RAINBOW 16 STATE COM 001	ROBERT E. LANDRETH	3002539719	16	25.0S	35E	1980 S		1980 E		32.128558	-103.370252	Plugged
2	RAINBOW 16 STATE 002	ROBERT E. LANDRETH	3002539720	16	25.0S	35E	660 N		660 W		32.135798	-103.378787	Plugged
3	FEZ FEE 011H	COG OPERATING LLC	3002542347	9	25.0S	35E	480 N		190 W		32.150758	-103.380377	New (Not drilled or compl)
4	WHEATFIELD 16 STATE 701H	EOG RESOURCES INC	3002542520	16	25.0S	35E	230 N		2300 E		32.136994	-103.371312	New (Not drilled or compl)
5	WHITE FALCON 16 STATE 001H	COG OPERATING LLC	3002542757	16	25.0S	35E	230 N		330 W		32.136982	-103.379864	New (Not drilled or compl)
6	WHEATFIELD 16 STATE 702C	EOG RESOURCES INC	3002542787	16	25.0S	35E	231 N		2270 E		32.136991	-103.371214	New (Not drilled or compl)
7	DEERSTALKER FEDERAL COM 001H	COG OPERATING LLC	3002543279	8	25.0S	35E	25 N		430 E		32.15201	-103.382395	New (Not drilled or compl)
8	WHITE FALCON 16 STATE COM 012H	COG OPERATING LLC	3002543697	16	25.0S	35E	226 N		852 W		32.13699	-103.378169	New (Not drilled or compl)
9	WHITE FALCON 16 STATE 013H	COG OPERATING LLC	3002543698	16	25.0S	35E	226 N		772 W		32.13699	-103.378429	New (Not drilled or compl)
10	WHITE FALCON 16 STATE COM 023H	COG OPERATING LLC	3002543699	16	25.0S	35E	226 N		812 W		32.13699	-103.378299	New (Not drilled or compl)
11	WHITE FALCON 16 STATE COM 024H	COG OPERATING LLC	3002543700	16	25.0S	35E	226 N		732 W		32.136991	-103.378559	New (Not drilled or compl)
12	MONTERA FEDERAL 023H	COG OPERATING LLC	3002543924	10	25.0S	35E	190 S		1650 W		32.138149	-103.358492	New (Not drilled or compl)
13	WHITE FALCON 16 FEDERAL COM 011H	COG OPERATING LLC	3002543930	16	25.0S	35E	226 N		1980 E		32.13701	-103.370273	New (Not drilled or compl)
14	WHITE FALCON 16 FEDERAL COM 021H	COG OPERATING LLC	3002543931	16	25.0S	35E	226 N		2020 W		32.13699	-103.374378	New (Not drilled or compl)
15	WHITE FALCON 16 FEDERAL COM 022H	COG OPERATING LLC	3002543932	16	25.0S	35E	226 N		1940 E		32.13701	-103.370143	New (Not drilled or compl)
16	MAN HANDS 24S35E3427 217H	TAP ROCK OPERATING, LLC	3002544655	34	24.0S	35E	2580 N		2025 W		32.174073	-103.357292	New (Not drilled or compl)
17	COSMO K 24S35E3328 213H	TAP ROCK OPERATING, LLC	3002544656	33	24.0S	35E	2306 N		1952 E		32.174902	-103.370206	New (Not drilled or compl)

## COG Operating, LLC - Fez Federal Com 607H

### 1. Geologic Formations

TVD of target	12,281'	Pilot hole depth	NA
MD at TD:	22,524'	Deepest expected fresh water:	207'

Formation	Depth (TVD) from KB	Water/Mineral Bearing/ Target Zone?	Hazards*
Quaternary Fill	Surface	Water	
Rustler	775	Water	
Top of Salt	1121	Salt	
Base of Salt	4919	Salt	
Lamar	5292	Salt Water	
Bell Canyon	5349	Salt Water	
Cherry Canyon	6260	Oil/Gas	
Brushy Canyon	7769	Oil/Gas	
Bone Spring Lime	8987	Oil/Gas	
U. Avalon Shale	9241	Oil/Gas	
L. Avalon Shale	9687	Oil/Gas	
1st Bone Spring Sand	10322	Oil/Gas	
2nd Bone Spring Sand	10842	Oil/Gas	
3rd Bone Spring Sand	11925	Target Oil/Gas	
Wolfcamp	12310	Not Penetrated	

### 2. Casing Program

Hole Size	Casing Interval		Csg. Size	Weight (lbs)	Grade	Conn.	SF Collapse	SF Burst	SF Tension
	From	To							
17.5"	0	1100	13.375"	54.5	J55	STC	2.30	6.87	8.57
14.75"	0	11475	9.625"	47	HCL80	BTC	1.62	1.09	2.08
8.75"	0	22,524	5.5"	23	P110	BTC	1.82	2.15	2.56
BLM Minimum Safety Factor							1.125	1	1.6 Dry 1.8 Wet

Intermediate casing will be kept at least 1/3 full while running casing to mitigate collapse. Intermediate burst based on 0.7 frac gradient at the shoe with Gas Gradient 0.1 psi/ft to surface.

All casing strings will be tested in accordance with Onshore Oil and Gas Order #2 III.B.1.h

**COG Operating, LLC - Fez Federal Com 607H**

	Y or N
Is casing new? If used, attach certification as required in Onshore Order #1	Y
Does casing meet API specifications? If no, attach casing specification sheet.	Y
Is premium or uncommon casing planned? If yes attach casing specification sheet.	N
Does the above casing design meet or exceed BLM's minimum standards? If not provide justification (loading assumptions, casing design criteria).	Y
Will the intermediate pipe be kept at a minimum 1/3 fluid filled to avoid approaching the collapse pressure rating of the casing?	Y
Is well located within Capitan Reef?	N
If yes, does production casing cement tie back a minimum of 50' above the Reef?	
Is well within the designated 4 string boundary?	
Is well located in SOPA but not in R-111-P?	N
If yes, are the first 2 strings cemented to surface and 3 <sup>rd</sup> string cement tied back 500' into previous casing?	
Is well located in R-111-P and SOPA?	N
If yes, are the first three strings cemented to surface?	
Is 2 <sup>nd</sup> string set 100' to 600' below the base of salt?	
Is well located in high Cave/Karst?	N
If yes, are there two strings cemented to surface?	
(For 2 string wells) If yes, is there a contingency casing if lost circulation occurs?	
Is well located in critical Cave/Karst?	N
If yes, are there three strings cemented to surface?	

## COG Operating, LLC - Fez Federal Com 607H

### 3. Cementing Program

Casing	# Sks	Wt. lb/ gal	Yld ft3/ sack	H <sub>2</sub> O gal/sk	500# Comp. Strength (hours)	Slurry Description
Surf.	470	13.5	1.75	9	12	Lead: Class C + 4% Gel
	250	14.8	1.34	6.34	8	Tail: Class C + 2% CaCl <sub>2</sub>
Inter. Stage1	920	11	2.8	19	48	Lead: NeoCem
	300	16.4	1.1	5	8	Tail: Class H
DV Tool @ 5275'						
Inter. Stage2	730	11	2.8	19	48	Lead: NeoCem
	100	14.8	1.35	6.34	8	Tail: Class C + 2% Cacl
5.5 Prod	400	12.7	2	10.6	16	Lead: 35:65:6 H Blend
	3040	14.4	1.24	5.7	19	Tail: 50:50:2 Class H Blend

Volumes Subject to Observed Hole Conditions and/or Fluid Caliper Results

Lab reports with the 500 psi compressive strength time for the cement will be onsite for review.

Casing String	TOC	% Excess
Surface	0'	50%
1 <sup>st</sup> Intermediate	0'	50%
Production	10,475'	35%



## COG Operating, LLC - Fez Federal Com 607H

## 4. Pressure Control Equipment

Y	A variance is requested for the use of a diverter on the surface casing. See attached for schematic.
---	---

BOP installed and tested before drilling which hole?	Size?	Min. Required WP	Type	x	Tested to:
12-1/4"	13-5/8"	5M	Annular	x	2500 psi
			Blind Ram	x	5M
			Pipe Ram	x	
			Double Ram		
			Other*		
8-3/4"	13-5/8"	10M	5M Annular	x	2500 psi
			Blind Ram	x	10M
			Pipe Ram	x	
			Double Ram		
			Other*		

BOP/BOPE will be tested by an independent service company to 250 psi low and the high pressure indicated above per Onshore Order 2 requirements. The System may be upgraded to a higher pressure but still tested to the working pressure listed in the table above. If the system is upgraded all the components installed will be functional and tested.

Pipe rams will be operationally checked each 24 hour period. Blind rams will be operationally checked on each trip out of the hole. These checks will be noted on the daily tour sheets. Other accessories to the BOP equipment will include a Kelly cock and floor safety valve (inside BOP) and choke lines and choke manifold. See attached schematics.

Y	Formation integrity test will be performed per Onshore Order #2. On Exploratory wells or on that portion of any well approved for a 5M BOPE system or greater, a pressure integrity test of each casing shoe shall be performed. Will be tested in accordance with Onshore Oil and Gas Order #2 III.B.1.i.
Y	A variance is requested for the use of a flexible choke line from the BOP to Choke Manifold. See attached for specs and hydrostatic test chart.
N	Are anchors required by manufacturer?
N	A multibowl wellhead is being used. The BOP will be tested per Onshore Order #2 after installation on the surface casing which will cover testing requirements for a maximum of 30 days. If any seal subject to test pressure is broken the system must be tested.

## COG Operating, LLC - Fez Federal Com 607H

### 5. Mud Program

Depth		Type	Weight (ppg)	Viscosity	Water Loss
From	To				
0	Surf. Shoe	FW Gel	8.4 - 8.6	28-29	N/C
Surf csg	Int shoe	Diesel Brine Emul	8.6 - 8.9	30-40	N/C
Int shoe	Lateral TD	OBM	10.5 - 12.5	30-40	20

Sufficient mud materials to maintain mud properties and meet minimum lost circulation and weight increase requirements will be kept on location at all times.

What will be used to monitor the loss or gain of fluid?	PVT/Pason/Visual Monitoring
---	-----------------------------

### 6. Logging and Testing Procedures

#### Logging, Coring and Testing.

Y	Will run GR/CNL from TD to surface (horizontal well – vertical portion of hole). Stated logs run will be in the Completion Report and submitted to the BLM.
N	Are Logs are planned based on well control or offset log information.
N	Drill stem test? If yes, explain.
N	Coring? If yes, explain.

Additional logs planned		Interval
N	Resistivity	Pilot Hole TD to ICP
N	Density	Pilot Hole TD to ICP
Y	CBL	Production casing (If cement not circulated to surface)
Y	Mud log	Intermediate shoe to TD
N	PEX	

## COG Operating, LLC - Fez Federal Com 607H

### 7. Drilling Conditions

Condition	Specify what type and where?
BH Pressure at deepest TVD	7985 psi at 12281' TVD
Abnormal Temperature	NO 180 Deg. F.

No abnormal pressure or temperature conditions are anticipated. Sufficient mud materials to maintain mud properties and weight increase requirements will be kept on location at all times.

Sufficient supplies of Paper/LCM for periodic sweeps to control seepage and losses will be maintained on location.

Hydrogen Sulfide (H<sub>2</sub>S) monitors will be installed prior to drilling out the surface shoe. If H<sub>2</sub>S is detected in concentrations greater than 100 ppm, the operator will comply with the provisions of Onshore Oil and Gas Order #6. If Hydrogen Sulfide is encountered, measured values and formations will be provided to the BLM.

N H<sub>2</sub>S is present

Y H<sub>2</sub>S Plan attached

### 8. Other Facets of Operation

Y	Is it a walking operation?
N	Is casing pre-set?

x	H <sub>2</sub> S Plan.
x	BOP & Choke Schematics.
x	Directional Plan
x	5M Annular Variance



## **COG Operating LLC**

**Lea County, NM (NAD27 NME)**

**Fez Federal Com**

**607H**

**OH**

**Plan: Plan 1 03-15-19**

## **Standard Planning Report**

**15 March, 2019**



**Database:** USA Compass  
**Company:** COG Operating LLC  
**Project:** Lea County, NM (NAD27 NME)  
**Site:** Fez Federal Com  
**Well:** 607H  
**Wellbore:** OH  
**Design:** Plan 1 03-15-19

**Local Co-ordinate Reference:** Well 607H  
**TVD Reference:** RKB @ 3272.40usft (Scandril Quest)  
**MD Reference:** RKB @ 3272.40usft (Scandril Quest)  
**North Reference:** Grid  
**Survey Calculation Method:** Minimum Curvature

<b>Project</b>	Lea County, NM (NAD27 NME)		
<b>Map System:</b>	US State Plane 1927 (Exact solution)	<b>System Datum:</b>	Mean Sea Level
<b>Geo Datum:</b>	NAD 1927 (NADCON CONUS)		
<b>Map Zone:</b>	New Mexico East 3001		

Site		Fez Federal Com				
Site Position:		Northing:	415,342.20 usft	Latitude:	32° 8' 17.81002 N	
From:	Map	Easting:	795,972.50 usft	Longitude:	103° 22' 37.73484 W	
Position Uncertainty:		0.00 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.51 °

<b>Well</b>	607H					
<b>Well Position</b>	<b>+N/-S</b>	66.90 usft	<b>Northing:</b>	415,409.10 usft	<b>Latitude:</b>	32° 8' 18.30414 N
	<b>+E/-W</b>	1,904.50 usft	<b>Easting:</b>	797,877.00 usft	<b>Longitude:</b>	103° 22' 15.58055 W
<b>Position Uncertainty</b>	0.00 usft		<b>Wellhead Elevation:</b>		<b>Ground Level:</b>	3,242.40 usft

<b>Wellbore</b>	OH				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	MVHD	4/30/2019	6.63	59.78	47,774.30429281

<b>Design</b>	Plan 1 03-15-19			
<b>Audit Notes:</b>				
<b>Version:</b>	<b>Phase:</b>	PLAN	<b>Tie On Depth:</b>	0.00
<b>Vertical Section:</b>	<b>Depth From (TVD) (usft)</b>	<b>+N/-S (usft)</b>	<b>+E/-W (usft)</b>	<b>Direction (°)</b>
	0.00	0.00	0.00	0.15

Plan Sections										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100usft)	Bulld 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	
1,500.00	0.00	0.00	1,500.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,749.91	5.00	157.82	1,749.60	-10.09	4.11	2.00	2.00	0.00	157.82	
4,907.73	5.00	157.82	4,895.40	-264.86	107.97	0.00	0.00	0.00	0.00	
5,157.64	0.00	0.00	5,145.00	-274.95	112.08	2.00	-2.00	0.00	180.00	
11,716.64	0.00	0.00	11,704.00	-274.95	112.08	0.00	0.00	0.00	0.00	
12,626.67	91.00	359.53	12,276.87	308.02	107.29	10.00	10.00	-0.05	359.53	
15,819.05	91.00	359.53	12,221.00	3,499.80	81.07	0.00	0.00	0.00	0.00	3500' VS - Fez Fed
15,902.93	89.33	359.53	12,220.76	3,583.68	80.38	2.00	-2.00	0.00	180.00	
19,319.50	89.33	359.53	12,261.00	6,999.89	52.32	0.00	0.00	0.00	0.00	7000'VS - Fez Fed
19,335.40	89.64	359.53	12,261.14	7,015.79	52.19	2.00	2.00	0.00	0.00	
22,523.88	89.64	359.53	12,281.00	10,204.10	26.00	0.00	0.00	0.00	0.00	BHL - Fez Federal

**Database:** USA Compass  
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**MD Reference:** RKB @ 3272.40usft (Scandril Quest)  
**North Reference:** Grid  
**Survey Calculation Method:** Minimum Curvature

**Planned Survey**

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Bulld 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
774.00	0.00	0.00	774.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>Rustler</b>									
1,121.00	0.00	0.00	1,121.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>TOS</b>									
1,500.00	0.00	0.00	1,500.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>KOP, Begin 2.00°/100' Build</b>									
1,600.00	2.00	157.82	1,599.98	-1.62	0.66	-1.61	2.00	2.00	0.00
1,700.00	4.00	157.82	1,699.84	-6.46	2.63	-6.46	2.00	2.00	0.00
1,749.91	5.00	157.82	1,749.60	-10.09	4.11	-10.08	2.00	2.00	0.00
<b>Hold 5.00° Inc at 157.82° Azm</b>									
1,800.00	5.00	157.82	1,799.49	-14.13	5.76	-14.11	0.00	0.00	0.00
1,900.00	5.00	157.82	1,899.11	-22.20	9.05	-22.17	0.00	0.00	0.00
2,000.00	5.00	157.82	1,998.73	-30.26	12.34	-30.23	0.00	0.00	0.00
2,100.00	5.00	157.82	2,098.35	-38.33	15.63	-38.29	0.00	0.00	0.00
2,200.00	5.00	157.82	2,197.97	-46.40	18.91	-46.35	0.00	0.00	0.00
2,300.00	5.00	157.82	2,297.59	-54.47	22.20	-54.41	0.00	0.00	0.00
2,400.00	5.00	157.82	2,397.21	-62.54	25.49	-62.47	0.00	0.00	0.00
2,500.00	5.00	157.82	2,496.83	-70.60	28.78	-70.53	0.00	0.00	0.00
2,600.00	5.00	157.82	2,596.45	-78.67	32.07	-78.59	0.00	0.00	0.00
2,700.00	5.00	157.82	2,696.07	-86.74	35.36	-86.65	0.00	0.00	0.00
2,800.00	5.00	157.82	2,795.69	-94.81	38.65	-94.71	0.00	0.00	0.00
2,900.00	5.00	157.82	2,895.31	-102.88	41.94	-102.77	0.00	0.00	0.00
3,000.00	5.00	157.82	2,994.93	-110.94	45.23	-110.83	0.00	0.00	0.00
3,100.00	5.00	157.82	3,094.55	-119.01	48.51	-118.89	0.00	0.00	0.00
3,200.00	5.00	157.82	3,194.17	-127.08	51.80	-126.95	0.00	0.00	0.00
3,300.00	5.00	157.82	3,293.79	-135.15	55.09	-135.01	0.00	0.00	0.00
3,400.00	5.00	157.82	3,393.41	-143.22	58.38	-143.07	0.00	0.00	0.00
3,500.00	5.00	157.82	3,493.03	-151.28	61.67	-151.13	0.00	0.00	0.00
3,600.00	5.00	157.82	3,592.65	-159.35	64.96	-159.19	0.00	0.00	0.00
3,700.00	5.00	157.82	3,692.27	-167.42	68.25	-167.25	0.00	0.00	0.00
3,800.00	5.00	157.82	3,791.89	-175.49	71.54	-175.31	0.00	0.00	0.00
3,900.00	5.00	157.82	3,891.51	-183.56	74.83	-183.36	0.00	0.00	0.00
4,000.00	5.00	157.82	3,991.13	-191.62	78.11	-191.42	0.00	0.00	0.00
4,100.00	5.00	157.82	4,090.75	-199.69	81.40	-199.48	0.00	0.00	0.00
4,200.00	5.00	157.82	4,190.37	-207.76	84.69	-207.54	0.00	0.00	0.00
4,300.00	5.00	157.82	4,289.99	-215.83	87.98	-215.60	0.00	0.00	0.00
4,400.00	5.00	157.82	4,389.61	-223.90	91.27	-223.66	0.00	0.00	0.00
4,500.00	5.00	157.82	4,489.23	-231.96	94.56	-231.72	0.00	0.00	0.00
4,600.00	5.00	157.82	4,588.85	-240.03	97.85	-239.78	0.00	0.00	0.00
4,700.00	5.00	157.82	4,688.47	-248.10	101.14	-247.84	0.00	0.00	0.00
4,800.00	5.00	157.82	4,788.08	-256.17	104.42	-255.90	0.00	0.00	0.00
4,900.00	5.00	157.82	4,887.70	-264.24	107.71	-263.96	0.00	0.00	0.00
4,907.73	5.00	157.82	4,895.40	-264.86	107.97	-264.58	0.00	0.00	0.00
<b>Begin 2.00°/100' Drop</b>									
4,935.07	4.45	157.82	4,922.65	-266.94	108.82	-266.67	2.00	-2.00	0.00
<b>BOS (Fletcher)</b>									
5,000.00	3.15	157.82	4,987.44	-270.93	110.44	-270.65	2.00	-2.00	0.00
5,100.00	1.15	157.82	5,087.36	-274.41	111.86	-274.12	2.00	-2.00	0.00
5,157.64	0.00	0.00	5,145.00	-274.95	112.08	-274.66	2.00	-2.00	0.00
<b>Begin Vertical Hold</b>									
5,309.44	0.00	0.00	5,296.79	-274.95	112.08	-274.66	0.00	0.00	0.00
<b>LMAR (Top Delaware)</b>									

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**Design:** Plan 1 03-15-19

**Local Co-ordinate Reference:** Well 607H  
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**MD Reference:** RKB @ 3272.40usft (Scandril Quest)  
**North Reference:** Grid  
**Survey Calculation Method:** Minimum Curvature

**Planned Survey**

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
5,365.44	0.00	0.00	5,352.79	-274.95	112.08	-274.66	0.00	0.00	0.00
<b>BLCN</b>									
6,277.44	0.00	0.00	6,264.79	-274.95	112.08	-274.66	0.00	0.00	0.00
<b>CYCN</b>									
7,785.44	0.00	0.00	7,772.79	-274.95	112.08	-274.66	0.00	0.00	0.00
<b>BYCN</b>									
9,004.44	0.00	0.00	8,991.79	-274.95	112.08	-274.66	0.00	0.00	0.00
<b>Bone Springs</b>									
9,258.44	0.00	0.00	9,245.79	-274.95	112.08	-274.66	0.00	0.00	0.00
<b>U Avalon Shale</b>									
9,704.44	0.00	0.00	9,691.79	-274.95	112.08	-274.66	0.00	0.00	0.00
<b>L Avalon Shale</b>									
10,339.44	0.00	0.00	10,326.79	-274.95	112.08	-274.66	0.00	0.00	0.00
<b>FBSG_sand</b>									
10,859.44	0.00	0.00	10,846.79	-274.95	112.08	-274.66	0.00	0.00	0.00
<b>SBSG_sand</b>									
11,359.44	0.00	0.00	11,346.79	-274.95	112.08	-274.66	0.00	0.00	0.00
<b>SBSG_sand base</b>									
11,716.64	0.00	0.00	11,704.00	-274.95	112.08	-274.66	0.00	0.00	0.00
<b>KOP2, Begin 10.00°/100' Build</b>									
11,800.00	8.34	359.53	11,787.06	-268.89	112.03	-268.61	10.00	10.00	0.00
11,900.00	18.34	359.53	11,884.24	-245.86	111.84	-245.57	10.00	10.00	0.00
11,947.86	23.12	359.53	11,928.99	-228.93	111.70	-228.64	10.00	10.00	0.00
<b>TBSG_sand</b>									
12,000.00	28.34	359.53	11,975.95	-206.30	111.52	-206.01	10.00	10.00	0.00
12,100.00	38.34	359.53	12,059.39	-151.42	111.07	-151.13	10.00	10.00	0.00
12,200.00	48.34	359.53	12,132.03	-82.88	110.50	-82.60	10.00	10.00	0.00
12,300.00	58.34	359.53	12,191.67	-2.77	109.84	-2.49	10.00	10.00	0.00
12,400.00	68.34	359.53	12,236.49	86.48	109.11	86.76	10.00	10.00	0.00
12,500.00	78.34	359.53	12,265.13	182.16	108.33	182.43	10.00	10.00	0.00
12,600.00	88.34	359.53	12,276.72	281.35	107.51	281.63	10.00	10.00	0.00
12,626.67	91.00	359.53	12,276.87	308.02	107.29	308.29	10.00	10.00	0.00
<b>LP, Hold 91.00° Inc at 359.53° Azm</b>									
12,700.00	91.00	359.53	12,275.59	381.34	106.69	381.61	0.00	0.00	0.00
12,800.00	91.00	359.53	12,273.84	481.32	105.87	481.58	0.00	0.00	0.00
12,900.00	91.00	359.53	12,272.09	581.30	105.05	581.56	0.00	0.00	0.00
13,000.00	91.00	359.53	12,270.34	681.28	104.22	681.54	0.00	0.00	0.00
13,100.00	91.00	359.53	12,268.59	781.26	103.40	781.52	0.00	0.00	0.00
13,200.00	91.00	359.53	12,266.84	881.24	102.58	881.50	0.00	0.00	0.00
13,300.00	91.00	359.53	12,265.09	981.22	101.76	981.48	0.00	0.00	0.00
13,400.00	91.00	359.53	12,263.34	1,081.20	100.94	1,081.46	0.00	0.00	0.00
13,500.00	91.00	359.53	12,261.59	1,181.19	100.12	1,181.44	0.00	0.00	0.00
13,600.00	91.00	359.53	12,259.84	1,281.17	99.30	1,281.42	0.00	0.00	0.00
13,700.00	91.00	359.53	12,258.09	1,381.15	98.48	1,381.39	0.00	0.00	0.00
13,800.00	91.00	359.53	12,256.34	1,481.13	97.65	1,481.37	0.00	0.00	0.00
13,900.00	91.00	359.53	12,254.59	1,581.11	96.83	1,581.35	0.00	0.00	0.00
14,000.00	91.00	359.53	12,252.84	1,681.09	96.01	1,681.33	0.00	0.00	0.00
14,100.00	91.00	359.53	12,251.09	1,781.07	95.19	1,781.31	0.00	0.00	0.00
14,200.00	91.00	359.53	12,249.34	1,881.05	94.37	1,881.29	0.00	0.00	0.00
14,300.00	91.00	359.53	12,247.59	1,981.04	93.55	1,981.27	0.00	0.00	0.00
14,400.00	91.00	359.53	12,245.84	2,081.02	92.73	2,081.25	0.00	0.00	0.00
14,500.00	91.00	359.53	12,244.09	2,181.00	91.90	2,181.23	0.00	0.00	0.00



## Planning Report



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Design: Plan 1 03-15-19

Local Co-ordinate Reference: Well 607H  
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North Reference: Grid  
Survey Calculation Method: Minimum Curvature

## Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
14,600.00	91.00	359.53	12,242.33	2,280.98	91.08	2,281.20	0.00	0.00	0.00
14,700.00	91.00	359.53	12,240.58	2,380.96	90.26	2,381.18	0.00	0.00	0.00
14,800.00	91.00	359.53	12,238.83	2,480.94	89.44	2,481.16	0.00	0.00	0.00
14,900.00	91.00	359.53	12,237.08	2,580.92	88.62	2,581.14	0.00	0.00	0.00
15,000.00	91.00	359.53	12,235.33	2,680.91	87.80	2,681.12	0.00	0.00	0.00
15,100.00	91.00	359.53	12,233.58	2,780.89	86.98	2,781.10	0.00	0.00	0.00
15,200.00	91.00	359.53	12,231.83	2,880.87	86.16	2,881.08	0.00	0.00	0.00
15,300.00	91.00	359.53	12,230.08	2,980.85	85.33	2,981.06	0.00	0.00	0.00
15,400.00	91.00	359.53	12,228.33	3,080.83	84.51	3,081.04	0.00	0.00	0.00
15,500.00	91.00	359.53	12,226.58	3,180.81	83.69	3,181.01	0.00	0.00	0.00
15,600.00	91.00	359.53	12,224.83	3,280.79	82.87	3,280.99	0.00	0.00	0.00
15,700.00	91.00	359.53	12,223.08	3,380.77	82.05	3,380.97	0.00	0.00	0.00
15,800.00	91.00	359.53	12,221.33	3,480.76	81.23	3,480.95	0.00	0.00	0.00
15,819.05	91.00	359.53	12,221.00	3,499.80	81.07	3,500.00	0.00	0.00	0.00
Begin 2.00°/100' Drop									
15,900.00	89.38	359.53	12,220.73	3,580.75	80.41	3,580.94	2.00	-2.00	0.00
15,902.93	89.33	359.53	12,220.76	3,583.68	80.38	3,583.87	2.00	-2.00	0.00
Hold 89.33° Inc									
16,000.00	89.33	359.53	12,221.90	3,680.74	79.58	3,680.93	0.00	0.00	0.00
16,100.00	89.33	359.53	12,223.08	3,780.73	78.76	3,780.91	0.00	0.00	0.00
16,200.00	89.33	359.53	12,224.26	3,880.72	77.94	3,880.90	0.00	0.00	0.00
16,300.00	89.33	359.53	12,225.44	3,980.71	77.12	3,980.89	0.00	0.00	0.00
16,400.00	89.33	359.53	12,226.61	4,080.69	76.30	4,080.88	0.00	0.00	0.00
16,500.00	89.33	359.53	12,227.79	4,180.68	75.48	4,180.86	0.00	0.00	0.00
16,600.00	89.33	359.53	12,228.97	4,280.67	74.66	4,280.85	0.00	0.00	0.00
16,700.00	89.33	359.53	12,230.15	4,380.66	73.84	4,380.84	0.00	0.00	0.00
16,800.00	89.33	359.53	12,231.33	4,480.65	73.01	4,480.83	0.00	0.00	0.00
16,815.78	89.33	359.53	12,231.51	4,496.43	72.88	4,496.60	0.00	0.00	0.00
WFMP									
16,900.00	89.33	359.53	12,232.50	4,580.64	72.19	4,580.81	0.00	0.00	0.00
17,000.00	89.33	359.53	12,233.68	4,680.63	71.37	4,680.80	0.00	0.00	0.00
17,100.00	89.33	359.53	12,234.86	4,780.62	70.55	4,780.79	0.00	0.00	0.00
17,200.00	89.33	359.53	12,236.04	4,880.61	69.73	4,880.77	0.00	0.00	0.00
17,300.00	89.33	359.53	12,237.21	4,980.60	68.91	4,980.76	0.00	0.00	0.00
17,400.00	89.33	359.53	12,238.39	5,080.59	68.09	5,080.75	0.00	0.00	0.00
17,500.00	89.33	359.53	12,239.57	5,180.58	67.26	5,180.74	0.00	0.00	0.00
17,600.00	89.33	359.53	12,240.75	5,280.57	66.44	5,280.72	0.00	0.00	0.00
17,700.00	89.33	359.53	12,241.93	5,380.56	65.62	5,380.71	0.00	0.00	0.00
17,800.00	89.33	359.53	12,243.10	5,480.55	64.80	5,480.70	0.00	0.00	0.00
17,900.00	89.33	359.53	12,244.28	5,580.54	63.98	5,580.69	0.00	0.00	0.00
18,000.00	89.33	359.53	12,245.46	5,680.53	63.16	5,680.67	0.00	0.00	0.00
18,100.00	89.33	359.53	12,246.64	5,780.52	62.34	5,780.66	0.00	0.00	0.00
18,200.00	89.33	359.53	12,247.81	5,880.51	61.52	5,880.65	0.00	0.00	0.00
18,300.00	89.33	359.53	12,248.99	5,980.50	60.69	5,980.63	0.00	0.00	0.00
18,400.00	89.33	359.53	12,250.17	6,080.49	59.87	6,080.62	0.00	0.00	0.00
18,500.00	89.33	359.53	12,251.35	6,180.48	59.05	6,180.61	0.00	0.00	0.00
18,600.00	89.33	359.53	12,252.53	6,280.47	58.23	6,280.60	0.00	0.00	0.00
18,700.00	89.33	359.53	12,253.70	6,380.46	57.41	6,380.58	0.00	0.00	0.00
18,800.00	89.33	359.53	12,254.88	6,480.45	56.59	6,480.57	0.00	0.00	0.00
18,900.00	89.33	359.53	12,256.06	6,580.44	55.77	6,580.56	0.00	0.00	0.00
19,000.00	89.33	359.53	12,257.24	6,680.43	54.94	6,680.55	0.00	0.00	0.00
19,100.00	89.33	359.53	12,258.42	6,780.42	54.12	6,780.53	0.00	0.00	0.00
19,107.89	89.33	359.53	12,258.51	6,788.30	54.06	6,788.42	0.00	0.00	0.00
WFMP Lith									



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Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
19,200.00	89.33	359.53	12,259.59	6,880.41	53.30	6,880.52	0.00	0.00	0.00
19,300.00	89.33	359.53	12,260.77	6,980.40	52.48	6,980.51	0.00	0.00	0.00
19,319.50	89.33	359.53	12,261.00	6,999.89	52.32	7,000.00	0.00	0.00	0.00
<b>Begin 2.00°/100' Build</b>									
19,335.40	89.64	359.53	12,261.14	7,015.79	52.19	7,015.90	2.00	2.00	0.00
<b>Hold 89.64° Inc</b>									
19,400.00	89.64	359.53	12,261.55	7,080.39	51.66	7,080.50	0.00	0.00	0.00
19,500.00	89.64	359.53	12,262.17	7,180.38	50.84	7,180.49	0.00	0.00	0.00
19,600.00	89.64	359.53	12,262.79	7,280.38	50.02	7,280.48	0.00	0.00	0.00
19,700.00	89.64	359.53	12,263.41	7,380.37	49.19	7,380.47	0.00	0.00	0.00
19,800.00	89.64	359.53	12,264.04	7,480.37	48.37	7,480.47	0.00	0.00	0.00
19,900.00	89.64	359.53	12,264.66	7,580.36	47.55	7,580.46	0.00	0.00	0.00
20,000.00	89.64	359.53	12,265.28	7,680.36	46.73	7,680.45	0.00	0.00	0.00
20,100.00	89.64	359.53	12,265.91	7,780.35	45.91	7,780.44	0.00	0.00	0.00
20,200.00	89.64	359.53	12,266.53	7,880.35	45.09	7,880.44	0.00	0.00	0.00
20,300.00	89.64	359.53	12,267.15	7,980.34	44.27	7,980.43	0.00	0.00	0.00
20,400.00	89.64	359.53	12,267.77	8,080.34	43.45	8,080.42	0.00	0.00	0.00
20,500.00	89.64	359.53	12,268.40	8,180.33	42.62	8,180.41	0.00	0.00	0.00
20,600.00	89.64	359.53	12,269.02	8,280.33	41.80	8,280.41	0.00	0.00	0.00
20,700.00	89.64	359.53	12,269.64	8,380.32	40.98	8,380.40	0.00	0.00	0.00
20,800.00	89.64	359.53	12,270.26	8,480.31	40.16	8,480.39	0.00	0.00	0.00
20,900.00	89.64	359.53	12,270.89	8,580.31	39.34	8,580.38	0.00	0.00	0.00
21,000.00	89.64	359.53	12,271.51	8,680.30	38.52	8,680.37	0.00	0.00	0.00
21,100.00	89.64	359.53	12,272.13	8,780.30	37.70	8,780.37	0.00	0.00	0.00
21,200.00	89.64	359.53	12,272.76	8,880.29	36.87	8,880.36	0.00	0.00	0.00
21,300.00	89.64	359.53	12,273.38	8,980.29	36.05	8,980.35	0.00	0.00	0.00
21,400.00	89.64	359.53	12,274.00	9,080.28	35.23	9,080.34	0.00	0.00	0.00
21,500.00	89.64	359.53	12,274.62	9,180.28	34.41	9,180.34	0.00	0.00	0.00
21,600.00	89.64	359.53	12,275.25	9,280.27	33.59	9,280.33	0.00	0.00	0.00
21,700.00	89.64	359.53	12,275.87	9,380.27	32.77	9,380.32	0.00	0.00	0.00
21,800.00	89.64	359.53	12,276.49	9,480.26	31.95	9,480.31	0.00	0.00	0.00
21,900.00	89.64	359.53	12,277.11	9,580.26	31.12	9,580.30	0.00	0.00	0.00
22,000.00	89.64	359.53	12,277.74	9,680.25	30.30	9,680.30	0.00	0.00	0.00
22,100.00	89.64	359.53	12,278.36	9,780.25	29.48	9,780.29	0.00	0.00	0.00
22,200.00	89.64	359.53	12,278.98	9,880.24	28.66	9,880.28	0.00	0.00	0.00
22,300.00	89.64	359.53	12,279.61	9,980.24	27.84	9,980.27	0.00	0.00	0.00
22,400.00	89.64	359.53	12,280.23	10,080.23	27.02	10,080.27	0.00	0.00	0.00
22,500.00	89.64	359.53	12,280.85	10,180.22	26.20	10,180.26	0.00	0.00	0.00
22,523.88	89.64	359.53	12,281.00	10,204.10	26.00	10,204.13	0.00	0.00	0.00
<b>TD at 22523.88</b>									

**Database:** USA Compass  
**Company:** COG Operating LLC  
**Project:** Lea County, NM (NAD27 NME)  
**Site:** Fez Federal Com  
**Well:** 607H  
**Wellbore:** OH  
**Design:** Plan 1 03-15-19

**Local Co-ordinate Reference:** Well 607H  
**TVD Reference:** RKB @ 3272.40usft (Scandrill Quest)  
**MD Reference:** RKB @ 3272.40usft (Scandrill Quest)  
**North Reference:** Grid  
**Survey Calculation Method:** Minimum Curvature

**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
3500' VS - Fez Federal - plan hits target center - Point	0.00	0.00	12,221.00	3,499.80	81.07	418,908.90	797,958.07	32° 8' 52.92788 N 03° 22' 14.27391 W	
7000' VS - Fez Federal - plan hits target center - Point	0.00	0.00	12,261.00	6,999.89	52.32	422,408.99	797,929.32	32° 9' 27.56414 N 03° 22' 14.24426 W	
LTP - Fez Federal Co - plan misses target center by 0.01usft at 22473.87usft MD (12280.69 TVD, 10154.10 N, 26.41 E) - Point	0.00	0.00	12,280.69	10,154.10	26.40	425,563.20	797,903.40	32° 9' 58.77760 N 03° 22' 14.21757 W	
BHL - Fez Federal Co - plan hits target center - Point	0.00	0.00	12,281.00	10,204.10	26.00	425,613.20	797,903.00	32° 9' 59.27239 N 03° 22' 14.21702 W	
FTP - Fez Federal Co - plan misses target center by 208.61usft at 12200.00usft MD (12132.03 TVD, -82.88 N, 110.50 E) - Point	0.00	0.00	12,281.00	-228.90	111.70	415,180.20	797,988.70	32° 8' 16.02927 N 03° 22' 14.30538 W	

**Formations**

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
774.00	774.00	Rustler		-1.00	0.15
1,121.00	1,121.00	TOS		-1.00	0.15
4,935.07	4,922.65	BOS (Fletcher)		-1.00	0.15
5,309.44	5,296.79	LMAR (Top Delaware)		-1.00	0.15
5,365.44	5,352.79	BLCN		-1.00	0.15
6,277.44	6,264.79	CYCN		-1.00	0.15
7,785.44	7,772.79	BYCN		-1.00	0.15
9,004.44	8,991.79	Bone Springs		-1.00	0.15
9,258.44	9,245.79	U Avalon Shale		-1.00	0.15
9,704.44	9,691.79	L Avalon Shale		-1.00	0.15
10,339.44	10,326.79	FBSG_sand		-1.00	0.15
10,859.44	10,846.79	SBSG_sand		-1.00	0.15
11,359.44	11,346.79	SBSG_sand base		-1.00	0.15
11,947.86	11,928.99	TBSG_sand		-1.00	0.15
16,815.78	12,231.51	WFMP		-1.00	0.15
19,107.89	12,258.51	WFMP Lith		-1.00	0.15



## Planning Report



**Database:** USA Compass  
**Company:** COG Operating LLC  
**Project:** Lea County, NM (NAD27 NME)  
**Site:** Fez Federal Com  
**Well:** 607H  
**Wellbore:** OH  
**Design:** Plan 1 03-15-19

**Local Co-ordinate Reference:** Well 607H  
**TVD Reference:** RKB @ 3272.40usft (Scandril Quest)  
**MD Reference:** RKB @ 3272.40usft (Scandril Quest)  
**North Reference:** Grid  
**Survey Calculation Method:** Minimum Curvature

### Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
1,500.00	1,500.00	0.00	0.00	KOP, Begin 2.00°/100' Build
1,749.91	1,749.60	-10.09	4.11	Hold 5.00° Inc at 157.82° Azm
4,907.73	4,895.40	-264.86	107.97	Begin 2.00°/100' Drop
5,157.64	5,145.00	-274.95	112.08	Begin Vertical Hold
11,716.64	11,704.00	-274.95	112.08	KOP2, Begin 10.00°/100' Build
12,626.67	12,276.87	308.02	107.29	LP, Hold 91.00° Inc at 359.53° Azm
15,819.05	12,221.00	3,499.80	81.07	Begin 2.00°/100' Drop
15,902.93	12,220.76	3,583.68	80.38	Hold 89.33° Inc
19,319.50	12,261.00	6,999.89	52.32	Begin 2.00°/100' Build
19,335.40	12,261.14	7,015.79	52.19	Hold 89.64° Inc
22,523.88	12,281.00	10,204.10	26.00	TD at 22523.88

RKB @ 3272.40usf (Scandril Quest)  
3242.40

**CONCHO**

Project: Lea County, NM (NAD27 NME)  
Site: Fez Federal Com  
Well: 607H  
Wellbore: OH  
Design: Plan 1 03-15-19  
Rig: Scandril Quest

**PHOENIX**  
TECHNOLOGY SERVICES



Azimuths to Grid North  
True North: 4.51°  
Magnetic North: 6.11°  
Magnetic Field  
Strength: 47774.3anT  
Dip Angle: 59.78°  
Date: 4/30/2019  
Model: MVHD

WELL DETAILS

3242.40  
+N-S 0.00 +E-W 0.00 Northing 415408.10 Easting 797877.00 Latitude 32° 8' 18.30414 N Longitude 103° 22' 15.58054 W

DESIGN TARGET DETAILS

Name	TVD	+N-S	+E-W	Northing	Easting	Latitude	Longitude
3500' VS - Fez Federal Com 607H	12221.00	3499.80	81.07	418908.90	797958.07	32° 8' 52.92788 N	103° 22' 14.27391 W
7000' VS - Fez Federal Com 607H	12261.00	6999.89	52.32	422408.99	797929.32	32° 9' 27.56414 N	103° 22' 14.24425 W
LTP - Fez Federal Com 607H	12280.69	10154.10	26.40	425563.20	797903.40	32° 9' 58.77760 N	103° 22' 14.21757 W
BHL - Fez Federal Com 607H	12281.00	10204.10	26.00	425613.20	797903.00	32° 9' 59.27239 N	103° 22' 14.21702 W
FTP - Fez Federal Com 607H	12281.00	-228.90	111.70	415180.20	797988.70	32° 8' 16.02927 N	103° 22' 14.30538 W

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N-S	+E-W	Deg	TFace	VFace	Target	Annotation
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	1500.00	0.00	0.00	1500.00	0.00	0.00	0.00	0.00	0.00	0.00	KOP, Begin 2.00°/100' Build
3	1749.91	5.00	157.82	1749.60	-10.09	4.11	2.00	157.82	-10.08		Hold 5.00° Inc at 157.82° Azm
4	4907.73	5.00	157.82	4895.40	-264.86	107.97	0.00	0.00	-264.58		Begin 2.00°/100' Drop
5	5157.84	0.00	0.00	5145.00	-274.95	112.08	2.00	180.00	-274.68		Begin Vertical Hold
6	11719.84	0.00	0.00	11704.00	-274.95	112.08	0.00	0.00	-274.68		KOP2, Begin 10.00°/100' Build
7	12626.87	91.00	359.53	12276.87	308.02	107.29	10.00	359.53	308.29		LP, Hold 91.00° Inc at 359.53° Azm
8	15819.05	91.00	359.53	12221.00	3499.80	80.38	2.00	180.00	3583.87		Begin 2.00°/100' Drop
9	15902.93	89.33	359.53	12220.78	3583.68						Hold 89.33° Inc
10	19319.50	89.33	359.53	12261.00	6999.89	52.32	0.00	0.00	7000.00		Begin 2.00°/100' Build
11	19335.40	89.64	359.53	12261.14	7015.79	52.19	2.00	0.00	7015.90		Hold 89.64° Inc
12	22523.88	89.64	359.53	12261.00	10204.10	26.00	0.00	0.00	10204.13		BHL - Fez Federal Com 607H

FORMATION TOP DETAILS

TVDPath	MDPath	Formation	DipAngle	DipDir
774.00	774.00	Rustler	-1.00	0.15
1121.00	1121.00	TOS	-1.00	0.15
4922.65	4935.07	BOS (Fletcher)	-1.00	0.15
5296.79	5309.44	LMAR (Top Deleware)	-1.00	0.15
5352.79	5365.44	BLCN	-1.00	0.15
6284.79	6277.44	CYCN	-1.00	0.15
7772.79	7785.44	BYCN	-1.00	0.15
8991.79	9004.44	Bone Springs	-1.00	0.15
9245.79	9258.44	U Avalon Shale	-1.00	0.15
9691.79	9704.44	L Avalon Shale	-1.00	0.15
10326.79	10339.44	FBSG_sand	-1.00	0.15
10848.79	10859.44	SBSG_sand	-1.00	0.15
11348.79	11359.44	SBSG_sand base	-1.00	0.15
11829.99	11947.88	WFMP_sand	-1.00	0.15
12231.51	12615.78	WFMP	-1.00	0.15
12258.51	19107.89	WFMP Lth	-1.00	0.15

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 607H, Grid North

Latitude: 32° 8' 18.30414 N  
Longitude: 103° 22' 15.58054 W

Grid East: 797877.00

Grid North: 415408.10

Scale Factor: 1.000

Geomagnetic Model: MVHD

Sample Date: 30-Apr-19

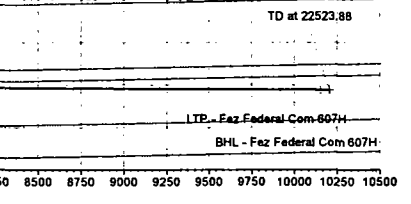
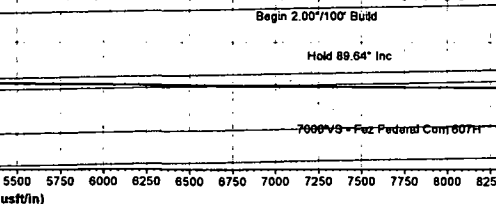
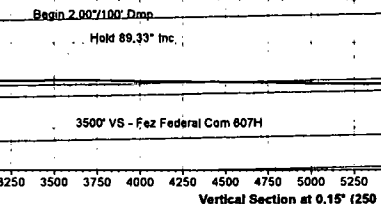
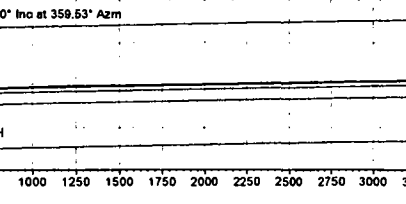
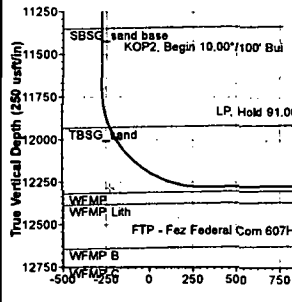
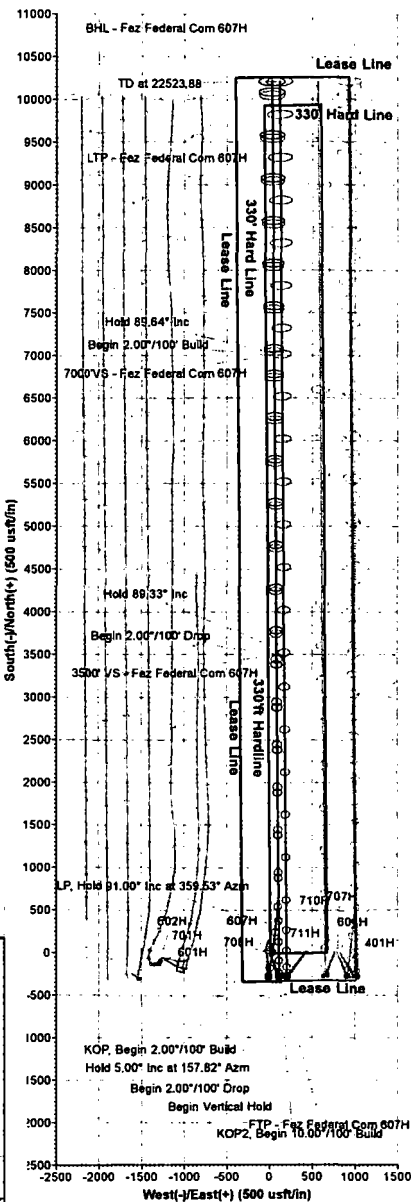
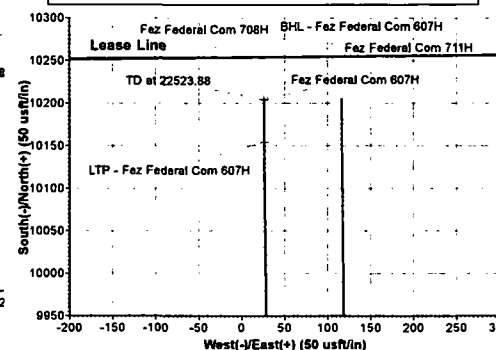
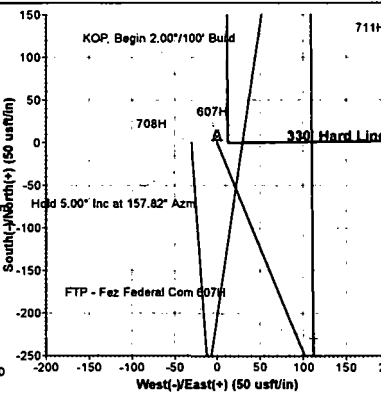
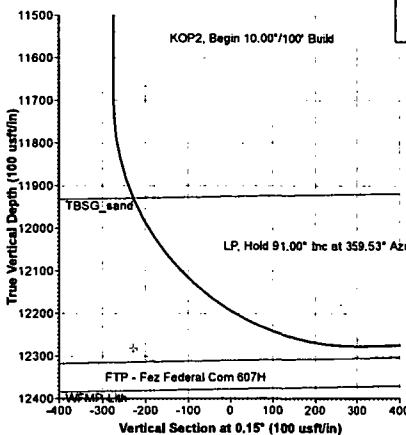
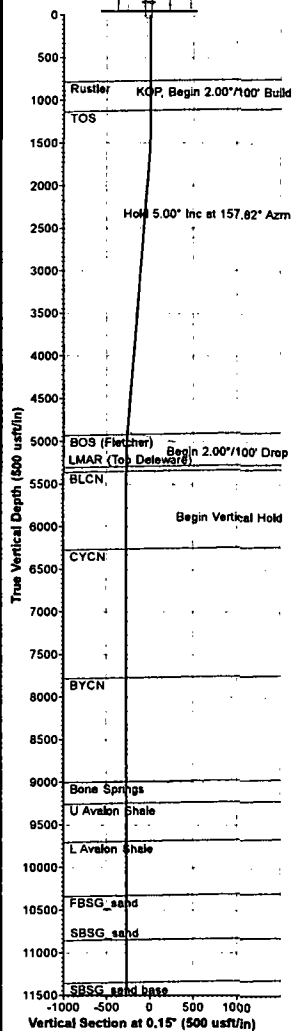
Magnetic Declination: 6.63°

Dip Angle from Horizontal: 59.78°

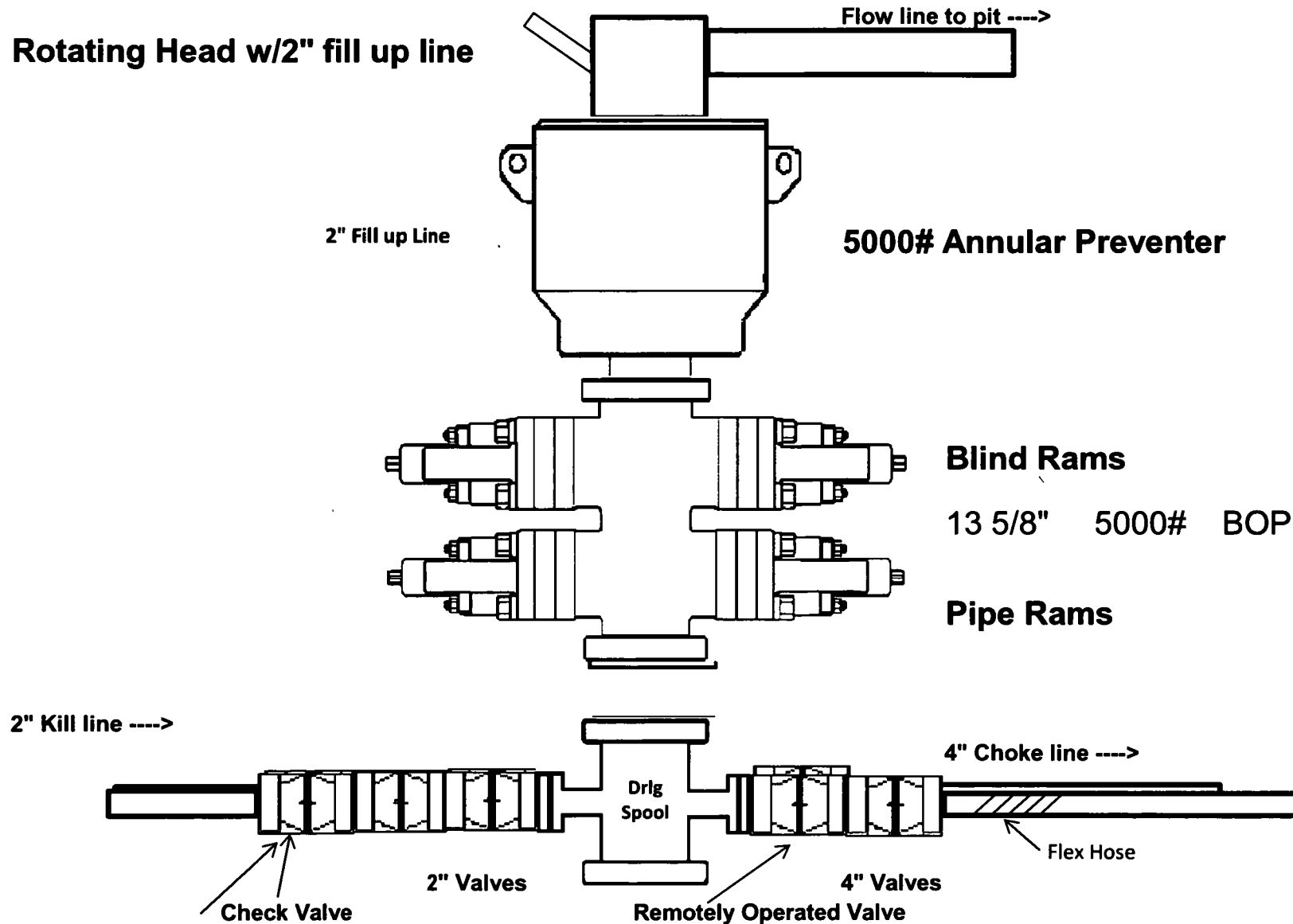
Magnetic Field Strength: 47774.30429281nT

To convert a Magnetic Direction to a Grid Direction, Add 6.11°  
To convert a Magnetic Direction to a True Direction, Add 6.63° East  
To convert a True Direction to a Grid Direction, Subtract 0.51°

- 701H, OH / 64018, Surveys (McVay 8) V0
- 606H, OH, Plan 1 03-15-19 V0
- 708H, OH, Plan 1 03-15-19 V0
- 702H, OH / 64150, Plan 5 03-10-19 V0
- 709H, OH, Plan 1 V0
- 602H, OH / 63923, Surveys (McVay 8) V0
- 601H, OH / 64017, Surveys (McVay 8) V0
- 603H, OH / 64148, Plan 2 01-28-19 V0
- 703H, OH / 64151, Plan 2 02-19-19 V0
- 707H, OH, Plan 1 03-15-19 V0
- 710H, OH, Plan 1 03-15-19 V0
- 711H, OH, Plan 1 03-15-19 V0
- 704H, OH / 64148, Plan 7 03-11-19 V0
- 401H, OH, Plan 1 01-25-19 V0
- Plan 1 03-15-19

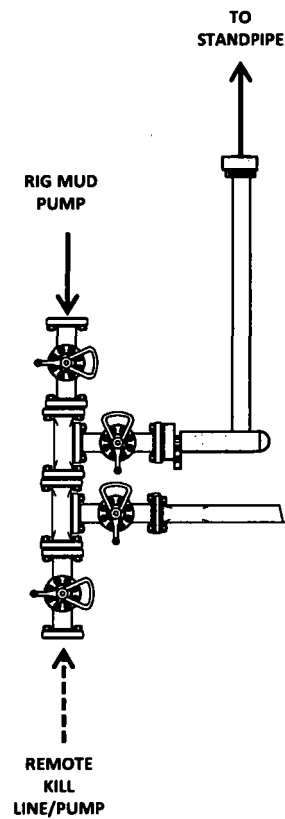


# 5,000 psi BOP Schematic

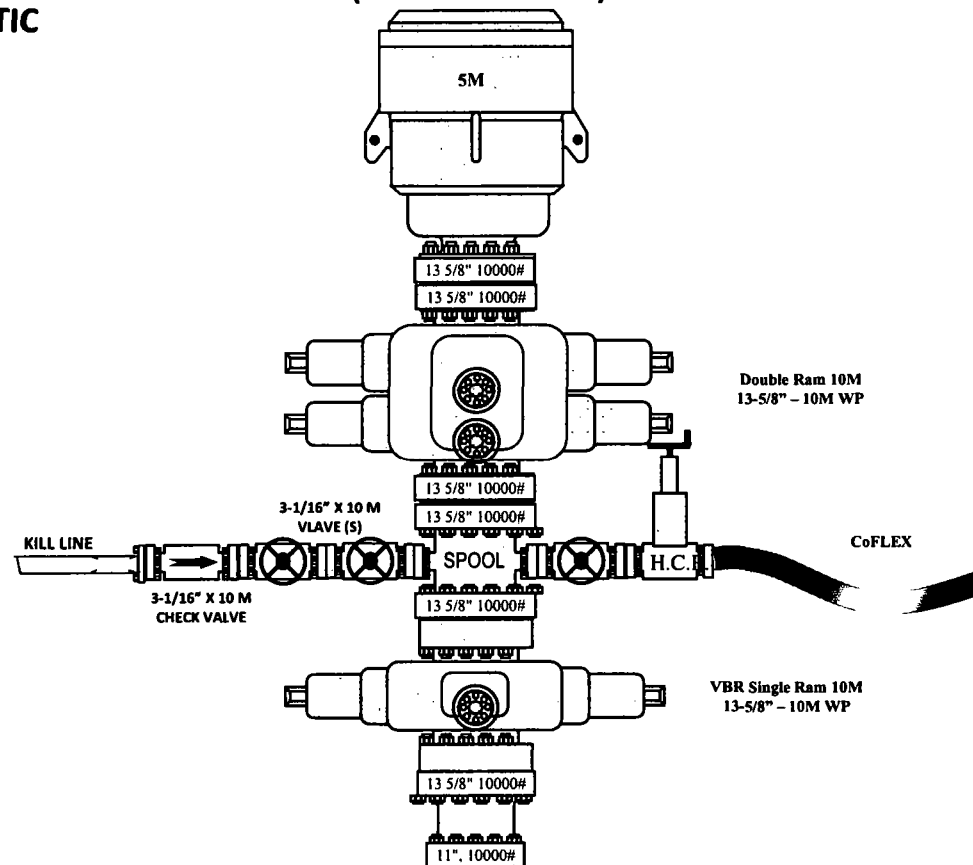


## 10M BOP Stack

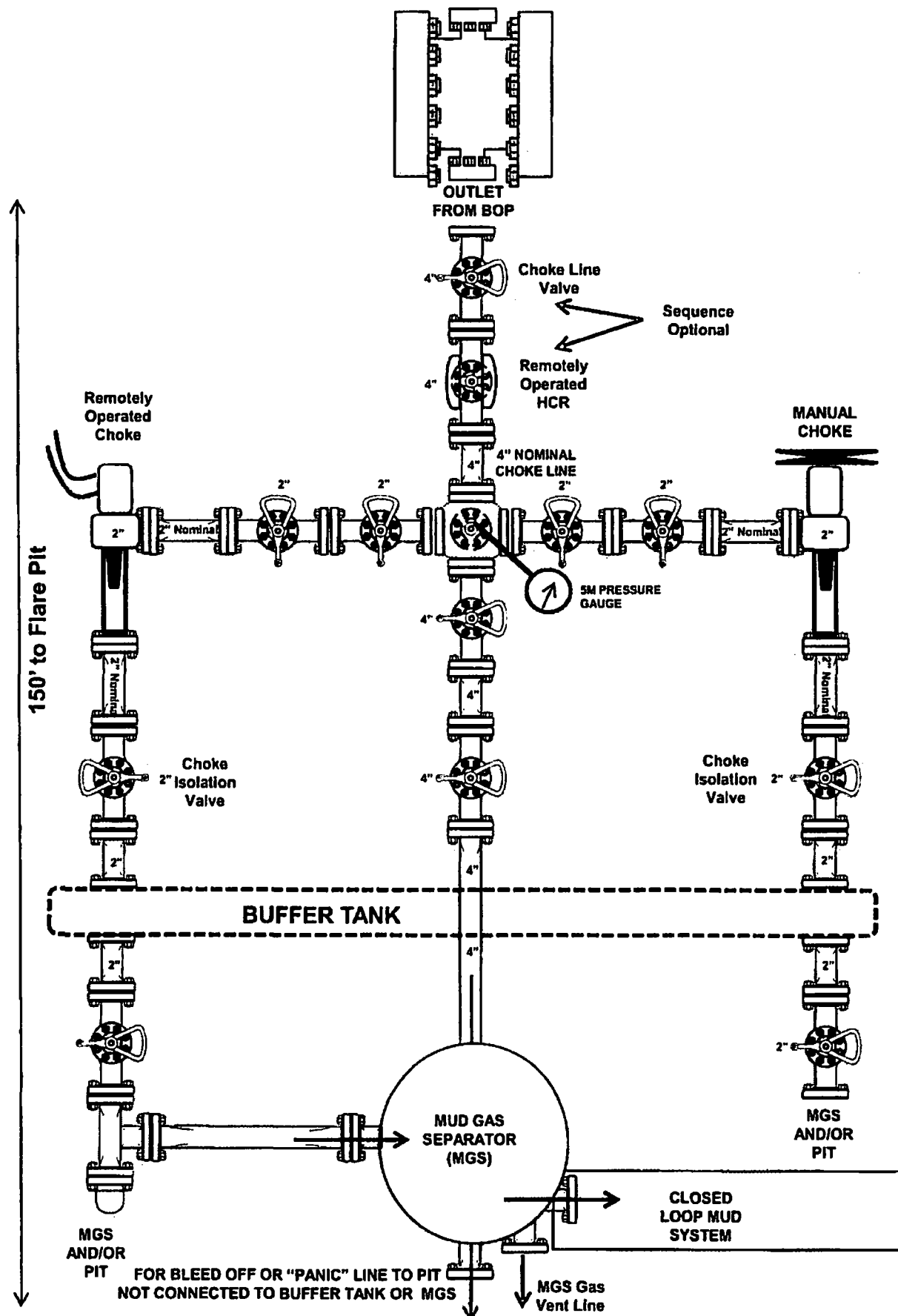
### 10M REMOTE KILL SCHEMATIC



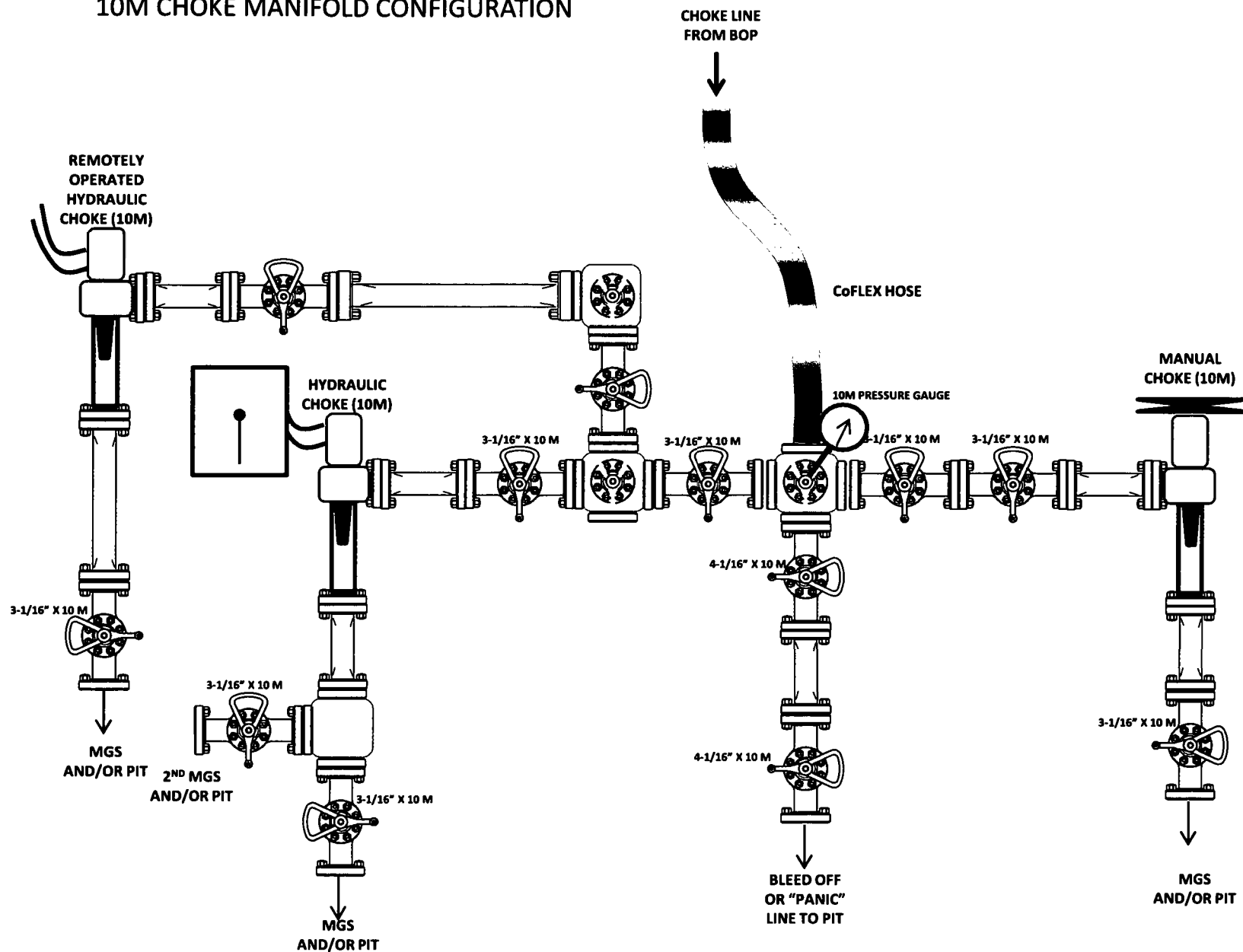
## 10M BOP Stack (5M Annular)



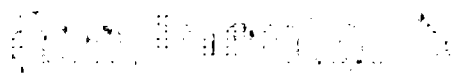
## 5M Choke Manifold Equipment (WITH MGS + CLOSED LOOP)



# 10M CHOKE MANIFOLD CONFIGURATION







ContiTech

QUALITY CONTROL	No.: QC-DB- 351 / 2016
	Page : 1 / 88
Hose No.: 72879	Revision : 0
	Date: 05. September 2016.
	Prepared by : <i>Robert K. Zolt</i>
	Appr. by: <i>[Signature]</i>

# CHOKER AND KILL HOSE

id.: 3" 69 MPa x 13,72 m (45 ft)

## DATA BOOK

Purchaser: SCANDRILL

Purchaser Order No.: 143799

ContiTech Rubber Order No.: 543951

ContiTech Oil & Marine Corp. Order No.:  
4500795683 COM880841

**NOT DESIGNED FOR WELL TESTING**

CONTITECH RUBBER  
Industrial Kft.

No: QC-DB- 351 / 2016  
Page: 5 / 88

ContiTech

QUALITY CONTROL INSPECTION AND TEST CERTIFICATE				CERT. N°: 1050	
PURCHASER: ContiTech Oil & Marine Corp.				P.O. N°: 4500795683	
CONTITECH RUBBER order N°: 543951		HOSE TYPE: 3" ID Choke and Kill Hose			
HOSE SERIAL N°: 72879		NOMINAL / ACTUAL LENGTH: 13,72 m / 13,80 m			
W.P. 69,0 MPa 10000 psi		T.P. 103,5 MPa 15000 psi		Duration: 60 min.	
Pressure test with water at ambient temperature					
See attachment ( 1 page )					
COUPLINGS Type		Serial N°		Quality	
3" coupling with		2587		AISI 4130	
3 1/16" 10K API Swivel Flange end				AISI 4130	
Hub				AISI 4130	
3" coupling with		2584		AISI 4130	
3 1/16" 10K API b.w. Flange end				AISI 4130	
Not Designed For Well Testing					
API Spec 16 C 2 <sup>nd</sup> Edition- FSL2					
Temperature rate: "B"					
All metal parts are flawless					
WE CERTIFY THAT THE ABOVE HOSE HAS BEEN MANUFACTURED IN ACCORDANCE WITH THE TERMS OF THE ORDER INSPECTED AND PRESSURE TESTED AS ABOVE WITH SATISFACTORY RESULT.					
STATEMENT OF CONFORMITY: We hereby certify that the above items/equipment supplied by us are in conformity with the terms, conditions and specifications of the above Purchaser Order and that these items/equipment were fabricated inspected and tested in accordance with the referenced standards, codes and specifications and meet the relevant acceptance criteria and design requirements.					
COUNTRY OF ORIGIN HUNGARY/EU					
Date:		Inspector		Quality Control	
30. August 2016.				ContiTech Rubber Industrial Kft. Quality Control Dept. <i>Robert Mikolich</i> <i>Yves Cigars</i>	

ATTACHMENT OF QUALITY CONTROL  
INSPECTION AND TEST CERTIFICATE  
No: 1050

CONTITECH RUBBER  
Industrial Kft.

No: QC-DB- 351 / 2016  
Page: 6 / 88

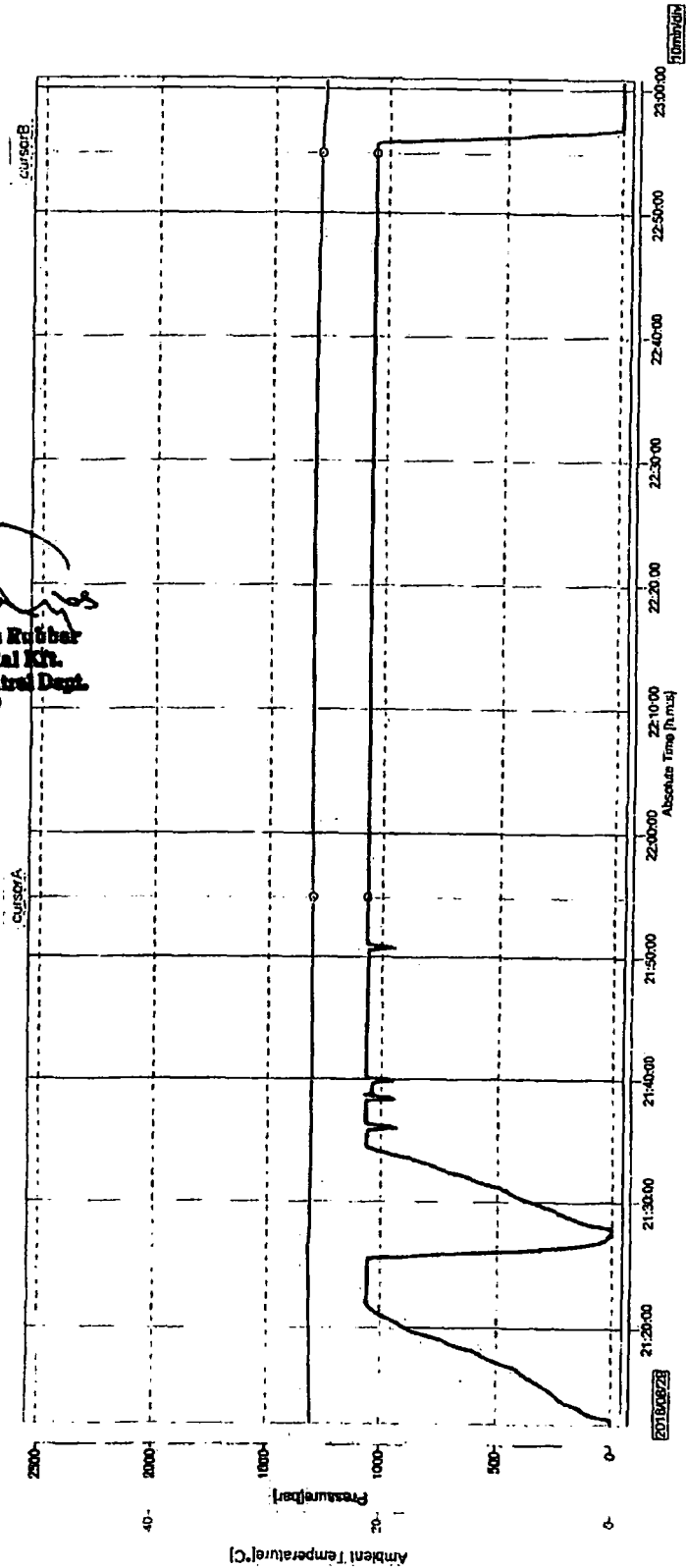
1/1

File Name : 014986\_72879.GEV....014986\_72879.GEV  
File Message : 72879  
Device Type : GK10  
Serial No. : SSP606399  
Data Count : 1302  
Print Group : Press-Temp  
Print Range : 2016/08/29 21:12:25.000 - 2016/08/29 23:00:50.000  
Comment : 142056635

Sampling Int. : 5.000 sec  
Start Time : 2016/08/29 21:12:25.000  
Stop Time : 2016/08/29 23:00:50.000

Data No.	Cursor A	Cursor B	Difference
720	509	1229	720
Absolute Time	2016/08/29 21:34:50.000	2016/08/29 22:54:50.000	01:00:00.000
Tag Comment	Value A	Value B	Value B-A
Pressure[bar]	1068.16	1054.43	-13.73
Ambient Temperature[°C]	28.17	25.88	-2.29

ContiTech Rubber  
Industrial Kft.  
Quality Control Dept.





CONTITECH RUBBER  
Industrial Kft.

No: QC-DB- 351 / 2016

Page: 7 / 88

ContiTech

## Hose Data Sheet

CRI Order No.	543951
Customer	ContiTech Oil & Marine Corp.
Customer Order No	4500795683 COM880841
Item No.	1
Hose Type	Flexible Hose
<b>Standard</b>	<b>API SPEC 16C 2ND EDITION FSL2</b>
Inside dia in inches	3
Length	45 ft
Type of coupling one end	FLANGE 3.1/16" 10K API SPEC 6A TYPE 6BX, BUTT WELDED, BX154ST.ST. LINED R.GR. SOUR
Type of coupling other end	FLANGE 3.1/16" 10K API SPEC 17D SV SWIVEL FLANGE, BX154 ST.ST. LINED R.GR. SOUR
H2S service NACE MR0175	Yes
Working Pressure	10 000 psi
Design Pressure	10 000 psi
Test Pressure	15 000 psi
Safety Factor	2,25
Marking	CONTINENTAL CONTITECH
Cover	NOT FIRE RESISTANT
Outside protection	St. steel outer wrap
Internal stripwound tube	No
Lining	OIL + GAS RESISTANT SOUR
Safety clamp	Yes
Lifting collar	Yes
Element C	Yes
Safety chain	Yes
Safety wire rope	No
Max. design temperature [°C]	100
Min. design temperature [°C]	-20
Min. Bend Radius operating [m]	0,90
Min. Bend Radius storage [m]	0,90
Electrical continuity	The Hose is electrically continuous
Type of packing	WOODEN CRATE ISPM-15

*S. L. L. L.*  
ContiTech Rubber  
Industrial Kft.  
QC 2



ContiTech Fluid Technology

<b>ContiTech Oil &amp; Marine Corp, # 11535 Brittmore Park Dr., Houston, TX 77041-6916 USA</b>		<b>Delivery Note</b>	
ScanDrill Inc. 9395 HWY 2767 TYLER TX 75708		Document No.	<b>83352143</b>
		Document Date	<b>10/05/2016</b>
		Customer Number	15483
Transport-Details - Shipping		Customer VAT No.	
		Supplier Number	
		N° EORI:	FR41027953300021
		Purchase Order No.	143799
		Purchase Order Date	07/01/2016
Conditions Shipping Conditions 0 days Inco Terms EXW Houston, TX Ex Works		Sales Order Number	880841
		Sales Order Date	07/05/2016
		Unloading Point	
		<b>Page 1 of 3</b>	
		<b>Weights (Gross / Net)</b>	
		Total Weight	2,323 LB
		Net Weight	1,643 LB
 <i>Buyer: Joe Ward</i> <i>E-mail: jward@scandrift.com</i> <i>Tel: 903.597.5368</i>  <i>Payment Terms:</i> <i>50% Due at order Placement</i> <i>50% Due Prior to Dispatch</i>  <i>Rev 01 - 092116 - Sales Tax added to the order.</i>			
<b>Item</b>	<b>Material/Description</b>	<b>Quantity</b>	<b>Weight</b>
10	HCK3FA45IPSIVS 3" x 45ft, Choke and Kill Hose, WP 10K End A: 3.1/16" 10K Flange, API Spec. 6A Type 6BX, Butt Welded, BX154 Stainless Steel 316 Lined Ring Groove - Sour End B: 3.1/16" 10K Flange, API Spec 17D SV Swivel Flange, BX154 Stainless Steel 316 Lined Ring Groove - Sour Standard: API SPEC 16C 2ND EDITION FSL2 - Monogrammed Working Pressure: 10000 psi Test Pressure: 15000 psi Fire Rated: No Armoured: Yes - Stainless Steel 316L Intertock Design Temperature: -20 to 100°C High Temperature Exposure / Survival @ 177 Deg C (Internal in a kick situation) As Per API 16C B.12.5!	1 PC	1,643 LB

ContiTech Oil & Marine Corp.  
11535 Brittmore Park Drive  
Houston, TX 77041  
USA

Phone: (832)-327-0141  
Fax: (832)-327-0148  
www.contitech-oil-gas.com  
sales@fluid.contitech.us

Managing Director  
(President)  
Zuzana Czovek

Bank: JPMorgan Chase,  
707 Travis St, 9 Floor N, Houston, TX 77002  
Account: 08100044552  
ABA/Routing: 021000021, ACH: 111000614





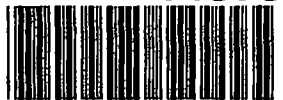
ContiTech Fluid Technology

<b>Conditions</b> Shipping Conditions 0 days Inco Terms EXW Houston, TX Ex Works		<b>Delivery Note</b> Document No. 83352143 Document Date 10/05/2016 Page 2 of 3	
<b>Brand Name:</b> Continental ContiTech  <b>serial no:</b> 72879  <b>Supplied with:</b> 2 x Safety Clamps 2 x Lifting Collars Double Eyed 2 x Safety Chains c/w Shackles Each End x 8ft  <b>Packing to ISPM-15 Heat Treated</b> <b>Packing type:</b> Wooden Crate, <b>Gross weight:</b> 1056 kg / 2323 lbs <b>Dimensions:</b> 2870 x 640 x 2800 mm (L x W x H) 113 x 25.2 x 110.2 inch <b>To be handled/shipped in a vertical position</b>  <b>HTS#</b> 4009.42.0050 <b>ECCN:</b> EAR99 <b>COO:</b> Hungary  20 00TAX-SALES 1 PC 0 LB SALES TAX %8.25 Buyer: Joe Ward E-mail: jward@scandrill.com Tel: 903.597.5388  <b>Payment Terms:</b> 50% Due at order Placement. 50% Due Prior to Dispatch  Rev 01 - 092116 - Sales Tax added to the order.  Order/Item 880841/20 07/05/2016 Customer's PO no./item 143799			
<b>Inner packages</b>			



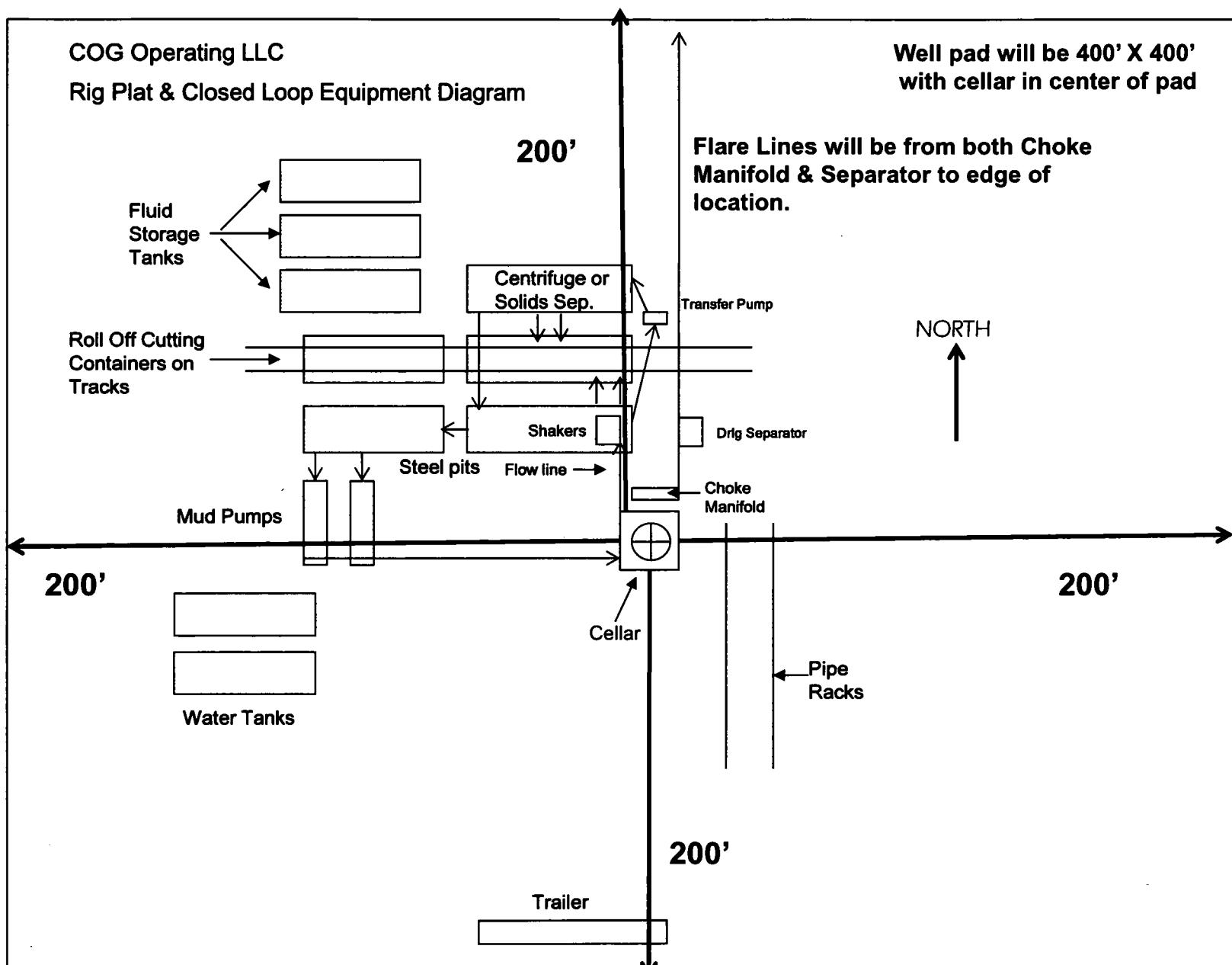
ContiTech Fluid Technology

<b>Conditions</b> Shipping Conditions      0 days Inco Terms                EXW Houston, TX Ex Works		<b>Delivery Note</b> Document No.            83352143 Document Date        10/05/2016 Page 3 of 3	
<b>Quantity</b>	<b>Packaging</b> 1      113 X 25.2 X 110.2 INCH -Wooden crate <b>Package number</b> 118448718	<b>Material</b> HCK3FA45IPSIVS	<b>Charge</b> 1

(1) Ship-to party <b>ScanDrill Inc. 9395 HWY 2767 TYLER TX 75708</b>		(2) Unloading point - storage location - usage	
(3) Delivery note no. <b>83352143</b> 		(4) Vendor address (short name, plant, ZIP, city) <b>ContiTech Oil &amp; Marine Corp. 11535 Brittmoore Park Drive Houston TX 77041-6916</b>	
(8) Supplier ref. no.			
(9) Quantity	(5) Net weight <b>1,643 LB</b>	(6) Gross weight <b>2,323 LB</b>	(7) Number of packages <b>1</b>
(12) Contitech Sales order no. <b>SN: 72879</b>		(10) Description of delivery, service	
		(13) Packing date <b>10/07/16</b>	
(14) Engineering change status			
(15) Package no. <b>118448718</b> 		(16) Customer PO no. <b>143799</b> 	

Material label VDA 4802 Vers. 4



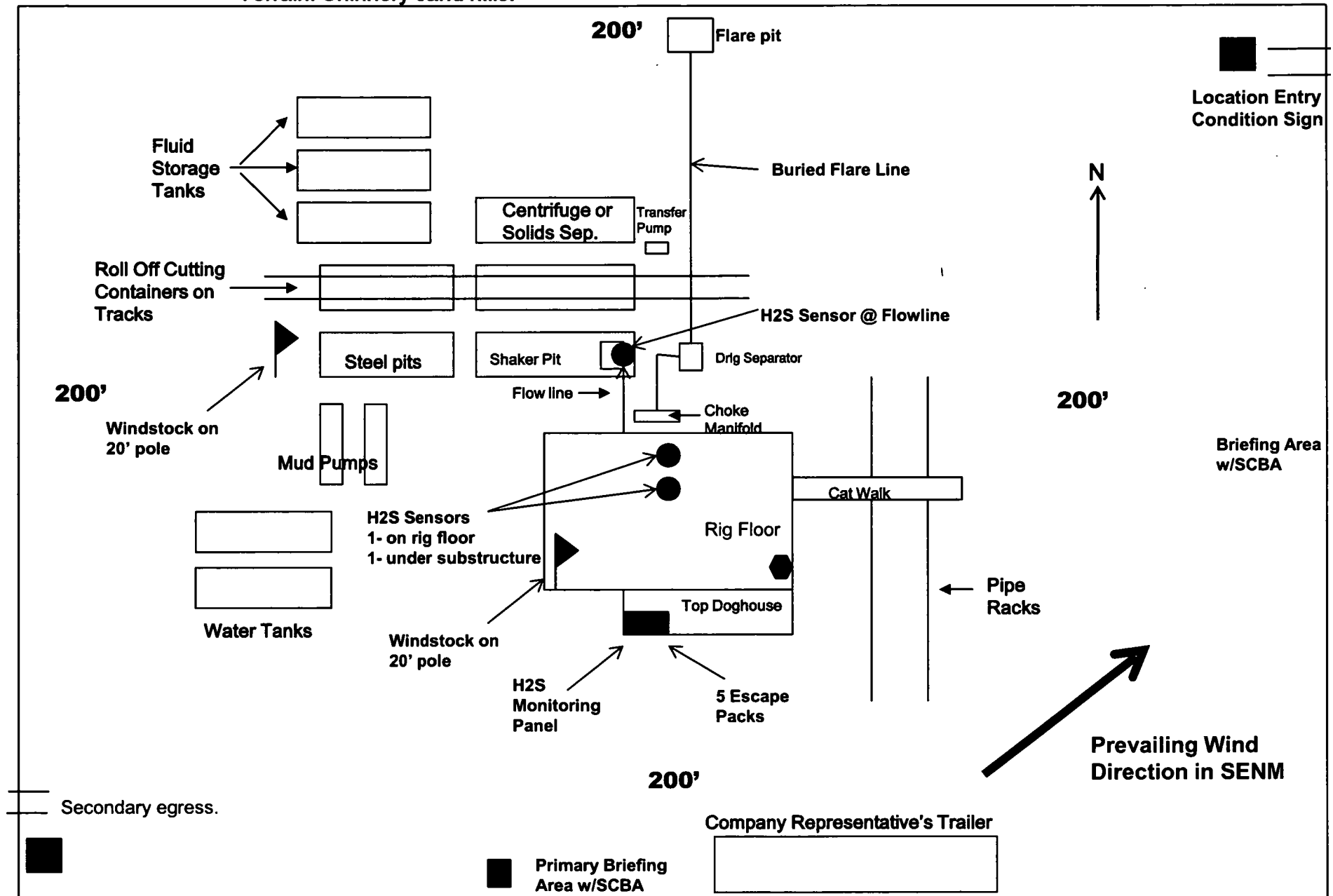


**Exhibit 1**

"I further certify that COG will comply with Rule 19.15.17 NMAC by using a Closed Loop System."

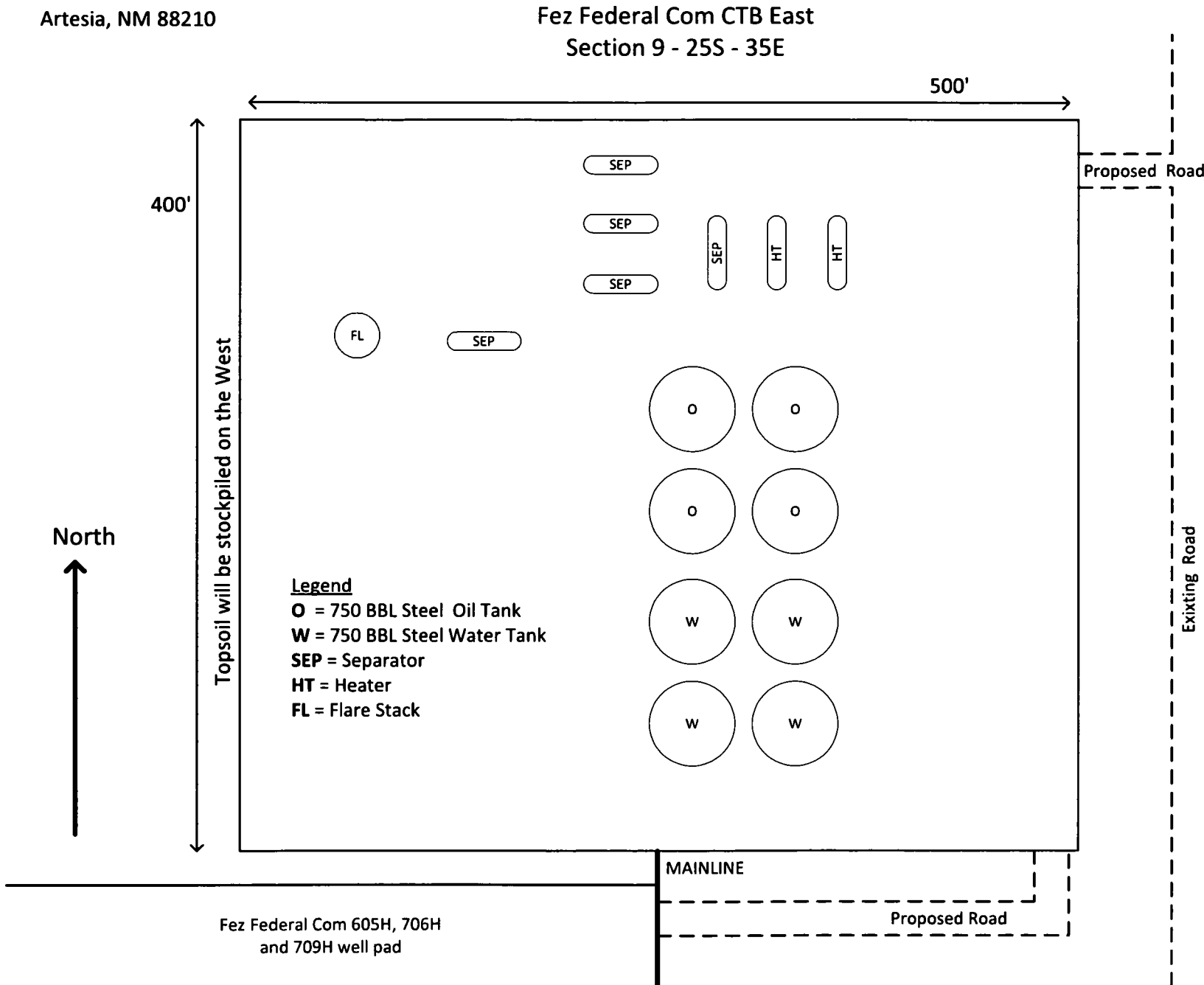
COG Operating LLC  
H<sub>2</sub>S Equipment Schematic  
Terrain: Shinnery sand hills.

Well pad will be 400' x 400'  
with cellar in center of pad



**Well Site Layout**  
**Production Facility Layout**  
Fez Federal Com CTB East  
Section 9 - 25S - 35E

# Exhibit 3



**COG OPERATING LLC**  
**HYDROGEN SULFIDE DRILLING OPERATIONS PLAN**

**1. HYDROGEN SULFIDE TRAINING**

All personnel, whether regularly assigned, contracted, or employed on an unscheduled basis, will receive training from a qualified instructor in the following areas prior to commencing drilling operations on this well:

- a. The hazards and characteristics of hydrogen sulfide (H<sub>2</sub>S).
- b. The proper use and maintenance of personal protective equipment and life support systems.
- c. The proper use of H<sub>2</sub>S detectors, alarms, warning systems, briefing areas, evacuation procedures, and prevailing winds.
- d. The proper techniques for first aid and rescue procedures.

In addition, supervisory personnel will be trained in the following areas:

- a. The effects of H<sub>2</sub>S on metal components. If high tensile tubulars are to be used, personnel will be trained in their special maintenance requirements.
- b. Corrective action and shut-in procedures when drilling or reworking a well and blowout prevention and well control procedures.
- c. The contents and requirements of the H<sub>2</sub>S Drilling Operations Plan and the Public Protection Plan.

There will be an initial training session just prior to encountering a known or probable H<sub>2</sub>S zone (within 3 days or 500 feet) and weekly H<sub>2</sub>S and well control drills for all personnel in each crew. The initial training session shall include a review of the site specific H<sub>2</sub>S Drilling Operations Plan and the Public Protection Plan. This plan shall be available at the well site. All personnel will be required to carry documentation that they have received the proper training.

**2. H<sub>2</sub>S SAFETY EQUIPMENT AND SYSTEMS**

Note: All H<sub>2</sub>S safety equipment and systems will be installed, tested, and operational when drilling reaches a depth of 500 feet above, or three days prior to penetrating the first zone containing or reasonably expected to contain H<sub>2</sub>S. If H<sub>2</sub>S greater than 100 ppm is encountered in the gas stream we will shut in and install H<sub>2</sub>S equipment.

- a. Well Control Equipment:
  - Flare line.
  - Choke manifold with remotely operated choke.
  - Blind rams and pipe rams to accommodate all pipe sizes with properly sized closing unit.
  - Auxiliary equipment to include: annular preventer, mud-gas separator, rotating head.

- b. Protective equipment for essential personnel:  
Mark II Surviveair 30-minute units located in the dog house and at briefing areas.
- c. H2S detection and monitoring equipment:  
2 - portable H2S monitor positioned on location for best coverage and response. These units have warning lights and audible sirens when H2S levels of 20 ppm are reached.
- d. Visual warning systems:  
Caution/Danger signs shall be posted on roads providing direct access to location. Signs will be painted a high visibility yellow with black lettering of sufficient size to be readable at a reasonable distance from the immediate location. Bilingual signs will be used, when appropriate. See example attached.
- e. Mud Program:  
The mud program has been designed to minimize the volume of H2S circulated to the surface.
- f. Metallurgy:  
All drill strings, casings, tubing, wellhead, blowout preventers, drilling spool, kill lines, choke manifold and lines, and valves shall be suitable for H2S service.
- g. Communication:  
Company vehicles equipped with cellular telephone.

COG OPERATING LLC has conducted a review to determine if an H2S contingency plan is required for the above referenced well. We were able to conclude that any potential hazardous volume would be minimal. H2S concentrations of wells in this area from surface to TD are low enough; therefore, we do not believe that an H2S contingency plan is necessary.

# **W A R N I N G**

**YOU ARE ENTERING AN H<sub>2</sub>S AREA  
AUTHORIZED PERSONNEL ONLY**

- 1. BEARDS OR CONTACT LENSES NOT ALLOWED***
- 2. HARD HATS REQUIRED***
- 3. SMOKING IN DESIGNATED AREAS ONLY***
- 4. BE WIND CONSCIOUS AT ALL TIMES***
- 5. CK WITH COG OPERATING LLC FOREMAN AT MAIN OFFICE***

**COG OPERATING LLC**

**1-575-748-6940**

## **EMERGENCY CALL LIST**

	<b><u>OFFICE</u></b>	<b><u>MOBILE</u></b>
COG OPERATING LLC OFFICE	575-748-6940	
SETH WILD	432-683-7443	432-528-3633
WALTER ROYE	575-748-6940	432-934-1886

## **EMERGENCY RESPONSE NUMBERS**

	<b><u>OFFICE</u></b>
STATE POLICE	575-748-9718
EDDY COUNTY SHERIFF	575-746-2701
EMERGENCY MEDICAL SERVICES (AMBULANCE)	911 or 575-746-2701
EDDY COUNTY EMERGENCY MANAGEMENT (HARRY BURGESS)	575-887-9511
STATE EMERGENCY RESPONSE CENTER (SERC)	575-476-9620
CARLSBAD POLICE DEPARTMENT	575-885-2111
CARLSBAD FIRE DEPARTMENT	575-885-3125
NEW MEXICO OIL CONSERVATION DIVISION	575-748-1283
INDIAN FIRE & SAFETY	800-530-8693
HALLIBURTON SERVICES	800-844-8451

**PECOS DISTRICT  
DRILLING OPERATIONS  
CONDITIONS OF APPROVAL**

<b>OPERATOR'S NAME:</b>	<b>COG Operating LLC</b>
<b>LEASE NO.:</b>	<b>NMNM125658</b>
<b>WELL NAME &amp; NO.:</b>	<b>Fez Federal Com 607H</b>
<b>SURFACE HOLE FOOTAGE:</b>	<b>330' FSL &amp; 2330' FEL</b>
<b>BOTTOM HOLE FOOTAGE:</b>	<b>50' FNL &amp; 2220' FEL</b>
<b>LOCATION:</b>	<b>Section 9, T 25S, R 35E, NMPM</b>
<b>COUNTY:</b>	<b>Lea County, New Mexico</b>

H2S	<input type="radio"/> Yes	<input checked="" type="radio"/> No	
Potash	<input checked="" type="radio"/> None	<input type="radio"/> Secretary	<input type="radio"/> R-111-P
Cave/Karst Potential	<input checked="" type="radio"/> Low	<input type="radio"/> Medium	<input type="radio"/> High
Variance	<input type="radio"/> None	<input type="radio"/> Flex Hose	<input checked="" type="radio"/> Other
Wellhead	<input checked="" type="radio"/> Conventional	<input type="radio"/> Multibowl	<input type="radio"/> Both
Other	<input type="checkbox"/> 4 String Area	<input type="checkbox"/> Capitan Reef	<input type="checkbox"/> WIPP
Other	<input type="checkbox"/> Fluid Filled	<input type="checkbox"/> Cement Squeeze	<input type="checkbox"/> Pilot Hole
Special Requirements	<input type="checkbox"/> Water Disposal	<input checked="" type="checkbox"/> COM	<input type="checkbox"/> Unit

**A. HYDROGEN SULFIDE**

1. Hydrogen Sulfide (H2S) monitors shall be installed prior to drilling out the surface shoe. If H2S is detected in concentrations greater than 100 ppm, the Hydrogen Sulfide area shall meet Onshore Order 6 requirements, which includes equipment and personnel/public protection items. If Hydrogen Sulfide is encountered, provide measured values and formations to the BLM.

**B. CASING**

1. The 13-3/8" surface casing shall be set at approximately 1000' (a minimum of 25' into the Rustler Anhydrite and above the salt) and cemented to surface.
  - a. If cement does not circulate to surface, the appropriate BLM office shall be notified and a temperature survey utilizing an electronic type temperature survey with surface log readout will be used or a cement bond log shall be run to verify the top of the cement. Temperature survey will be run a minimum of 6 hours after pumping cement, ideally between 8-10 hours after completing the cement job.
  - b. WOC time for a primary cement job will be a minimum of 8 hours or 500 psi compressive strength, whichever is greater. This is to include the lead cement.
  - c. If cement falls back, remedial cementing will be done prior to drilling out that string.
  - d. WOC time for a remedial job will be a minimum of 4 hours after bringing cement to surface or 500 psi compressive strength, whichever is greater.



2. The 9-5/8" intermediate casing shall be cemented to surface.
  - a. If cement does not circulate to surface, see B.1.a, c & d.
  - b. Operator has proposed a DV tool, the depth may be adjusted as long as the cement is changed proportionally. The DV tool may be cancelled if cement circulates to surface on the first stage.
    - i. First stage to DV tool: Cement to circulate. If cement does not circulate off the DV tool, contact the appropriate BLM office before proceeding with the second stage.
    - ii. Second stage via DV tool: Cement to surface. If cement does not circulate, contact the appropriate BLM office.
3. The 5-1/2" production casing shall be cemented with at least 200' tie-back into the previous casing. Operator shall provide method of verification.

#### **C. PRESSURE CONTROL**

1. Variance approved to use flex line from BOP to choke manifold. Manufacturer's specification to be readily available. No external damage to flex line. Flex line to be installed as straight as possible (no hard bends).
2. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the surface casing shoe shall be **5000 (5M) psi**.
3. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the intermediate casing shoe shall be **10,000 (10M) psi**. **Variance approved to use a 5M annular. The annular must be tested to full working pressure (5000 psi).**

#### **D. SPECIAL REQUIREMENTS**

1. The operator will submit a Communitization Agreement to the Carlsbad Field Office, 620 E Greene St. Carlsbad, New Mexico 88220, at least 90 days before the anticipated date of first production from a well subject to a spacing order issued by the New Mexico Oil Conservation Division. The Communitization Agreement will include the signatures of all working interest owners in all Federal and Indian leases subject to the Communitization Agreement (i.e., operating rights owners and lessees of record), or certification that the operator has obtained the written signatures of all such owners and will make those signatures available to the BLM immediately upon request.
2. The well sign on location shall include the surface and bottom hole lease numbers. When the Communitization Agreement number is known, it shall also be on the sign.

**DR 7/14/2019**

## **GENERAL REQUIREMENTS**

1. The BLM is to be notified in advance for a representative to witness:
  - a. Spudding well (minimum of 24 hours)
  - b. Setting and/or Cementing of all casing strings (minimum of 4 hours)
  - c. BOPE tests (minimum of 4 hours)
    - ☒ Chaves and Roosevelt Counties  
Call the Roswell Field Office, 2909 West Second St., Roswell NM 88201.  
During office hours call (575) 627-0272.  
After office hours call (575)
    - ☒ Eddy County  
Call the Carlsbad Field Office, 620 East Greene St., Carlsbad, NM 88220,  
(575) 361-2822
    - ☒ Lea County  
Call the Hobbs Field Station, 414 West Taylor, Hobbs NM 88240, (575)  
393-3612
2. Unless the production casing has been run and cemented or the well has been properly plugged, the drilling rig shall not be removed from over the hole without prior approval.
  - a. In the event the operator has proposed to drill multiple wells utilizing a skid/walking rig. Operator shall secure the wellbore on the current well, after installing and testing the wellhead, by installing a blind flange of like pressure rating to the wellhead and a pressure gauge that can be monitored while drilling is performed on the other well(s).
  - b. When the operator proposes to set surface casing with Spudder Rig
    - Notify the BLM when moving in and removing the Spudder Rig.
    - Notify the BLM when moving in the 2<sup>nd</sup> Rig. Rig to be moved in within 90 days of notification that Spudder Rig has left the location.
    - BOP/BOPE test to be conducted per Onshore Oil and Gas Order No. 2 as soon as 2nd Rig is rigged up on well.
3. Floor controls are required for 3M or Greater systems. These controls will be on the rig floor, unobstructed, readily accessible to the driller and will be operational at all times during drilling and/or completion activities. Rig floor is defined as the area immediately around the rotary table; the area immediately above the substructure on which the draw works are located, this does not include the dog house or stairway area.
4. The record of the drilling rate along with the GR/N well log (one log per well pad is acceptable) run from TD to surface (horizontal well – vertical portion of hole) shall be submitted to the BLM office as well as all other logs run on the borehole 30 days from completion. If available, a digital copy of the logs is to be submitted in addition to the paper copies. The Rustler top and top and bottom of Salt are to be recorded on the Completion Report.

## **A. CASING**

1. Changes to the approved APD casing program need prior approval if the items substituted are of lesser grade or different casing size or are Non-API. The Operator can exchange the components of the proposal with that of superior strength (i.e. changing from J-55 to N-80, or from 36# to 40#). Changes to the approved cement program need prior approval if the altered cement plan has less volume or strength or if the changes are substantial (i.e. Multistage tool, ECP, etc.). The initial wellhead installed on the well will remain on the well with spools used as needed.
2. Wait on cement (WOC) for Potash Areas: After cementing but before commencing any tests, the casing string shall stand cemented under pressure until both of the following conditions have been met: 1) cement reaches a minimum compressive strength of 500 psi for all cement blends, 2) until cement has been in place at least 24 hours. WOC time will be recorded in the driller's log. The casing integrity test can be done (prior to the cement setting up) immediately after bumping the plug.
3. Wait on cement (WOC) for Water Basin: After cementing but before commencing any tests, the casing string shall stand cemented under pressure until both of the following conditions have been met: 1) cement reaches a minimum compressive strength of 500 psi at the shoe, 2) until cement has been in place at least 8 hours. WOC time will be recorded in the driller's log. See individual casing strings for details regarding lead cement slurry requirements. The casing integrity test can be done (prior to the cement setting up) immediately after bumping the plug.
4. Provide compressive strengths including hours to reach required 500 pounds compressive strength prior to cementing each casing string. Have well specific cement details onsite prior to pumping the cement for each casing string.
5. No pea gravel permitted for remedial or fall back remedial without prior authorization from the BLM engineer.
6. On that portion of any well approved for a 5M BOPE system or greater, a pressure integrity test of each casing shoe shall be performed. Formation at the shoe shall be tested to a minimum of the mud weight equivalent anticipated to control the formation pressure to the next casing depth or at total depth of the well. This test shall be performed before drilling more than 20 feet of new hole.
7. If hardband drill pipe is rotated inside casing, returns will be monitored for metal. If metal is found in samples, drill pipe will be pulled and rubber protectors which have a larger diameter than the tool joints of the drill pipe will be installed prior to continuing drilling operations.
8. Whenever a casing string is cemented in the R-111-P potash area, the NMOCD requirements shall be followed.

## **B. PRESSURE CONTROL**

1. 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.
2. If a variance is approved for a flexible hose to be installed from the BOP to the choke manifold, the following requirements apply: The flex line must meet the requirements

of API 16C. Check condition of flexible line from BOP to choke manifold, replace if exterior is damaged or if line fails test. Line to be as straight as possible with no hard bends and is to be anchored according to Manufacturer's requirements. The flexible hose can be exchanged with a hose of equal size and equal or greater pressure rating. Anchor requirements, specification sheet and hydrostatic pressure test certification matching the hose in service, to be onsite for review. These documents shall be posted in the company man's trailer and on the rig floor.

3. 5M or higher system requires an HCR valve, remote kill line and annular to match. The remote kill line is to be installed prior to testing the system and tested to stack pressure.
4. If the operator has proposed a multi-bowl wellhead assembly in the APD. The following requirements must be met:
  - a. Wellhead shall be installed by manufacturer's representatives, submit documentation with subsequent sundry.
  - b. If the welding is performed by a third party, the manufacturer's representative shall monitor the temperature to verify that it does not exceed the maximum temperature of the seal.
  - c. Manufacturer representative shall install the test plug for the initial BOP test.
  - d. If the cement does not circulate and one inch operations would have been possible with a standard wellhead, the well head shall be cut off, cementing operations performed and another wellhead installed.
  - e. Whenever any seal subject to test pressure is broken, all the tests in OOGO2.III.A.2.i must be followed.
5. The appropriate BLM office shall be notified a minimum of 4 hours in advance for a representative to witness the tests.
  - a. In a water basin, for all casing strings utilizing slips, these are to be set as soon as the crew and rig are ready and any fallback cement remediation has been done. The casing cut-off and BOP installation can be initiated four hours after installing the slips, which will be approximately six hours after bumping the plug. For those casing strings not using slips, the minimum wait time before cut-off is eight hours after bumping the plug. BOP/BOPE testing can begin after cut-off or once cement reaches 500 psi compressive strength (including lead when specified), whichever is greater. However, if the float does not hold, cut-off cannot be initiated until cement reaches 500 psi compressive strength (including lead when specified).
  - b. In potash areas, for all casing strings utilizing slips, these are to be set as soon as the crew and rig are ready and any fallback cement remediation has been done. For all casing strings, casing cut-off and BOP installation can be initiated at twelve hours after bumping the plug. However, **no tests** shall commence until the cement has had a minimum of 24 hours setup time, except the casing pressure test can be initiated immediately after bumping the plug (only applies to single stage cement jobs).
  - c. The tests shall be done by an independent service company utilizing a test plug.

The results of the test shall be reported to the appropriate BLM office.

- d. The test shall be run on a 5000 psi chart for a 2-3M BOP/BOP, on a 10000 psi chart for a 5M BOP/BOPE and on a 15000 psi chart for a 10M BOP/BOPE. If a linear chart is used, it shall be a one hour chart. A circular chart shall have a maximum 2 hour clock. If a twelve hour or twenty-four hour chart is used, tester shall make a notation that it is run with a two hour clock.
- e. All tests are required to be recorded on a calibrated test chart. A copy of the BOP/BOPE test chart and a copy of independent service company test will be submitted to the appropriate BLM office.
- f. The BOP/BOPE test shall include a low pressure test from 250 to 300 psi. The test will be held for a minimum of 10 minutes. This test shall be performed prior to the test at full stack pressure.
- g. BOP/BOPE must be tested by an independent service company within 500 feet of the top of the Wolfcamp formation if the time between the setting of the intermediate casing and reaching this depth exceeds 20 days. This test does not exclude the test prior to drilling out the casing shoe as per Onshore Order No. 2.

#### **C. DRILLING MUD**

1. Mud system monitoring equipment, with derrick floor indicators and visual and audio alarms, shall be operating before drilling into the Wolfcamp formation, and shall be used until production casing is run and cemented.

#### **D. WASTE MATERIAL AND FLUIDS**

1. 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.
2. Porto-johns and trash containers will be on-location during fracturing operations or any other crew-intensive operations.

**PECOS DISTRICT  
SURFACE USE  
CONDITIONS OF APPROVAL**

OPERATOR'S NAME:	COG Operating LLC
WELL NAME & NO.:	FEZ Federal Com 607H
SURFACE HOLE FOOTAGE:	330'/N & 2330'/E
BOTTOM HOLE FOOTAGE	50'/S & 2220'/E
LOCATION:	Section 9, T.25 S., R.35 E., NMPM
COUNTY:	Lea County, New Mexico

**TABLE OF CONTENTS**

Standard Conditions of Approval (COA) apply to this APD. If any deviations to these standards exist or special COAs are required, the section with the deviation or requirement will be checked below.

- ☐ **General Provisions**
- ☐ **Permit Expiration**
- ☐ **Archaeology, Paleontology, and Historical Sites**
- ☐ **Noxious Weeds**
- ☒ **Special Requirements**
  - Lesser Prairie-Chicken Timing Stipulations
  - Ground-level Abandoned Well Marker
  - Hydrology
- ☐ **Construction**
  - Notification
  - Topsoil
  - Closed Loop System
  - Federal Mineral Material Pits
  - Well Pads
  - Roads
- ☐ **Road Section Diagram**
- ☒ **Production (Post Drilling)**
  - Well Structures & Facilities
  - Pipelines
- ☐ **Interim Reclamation**
- ☐ **Final Abandonment & Reclamation**

## **I. GENERAL PROVISIONS**

The approval of the Application For Permit To Drill (APD) is in compliance with all applicable laws and regulations: 43 Code of Federal Regulations 3160, the lease terms, Onshore Oil and Gas Orders, Notices To Lessees, New Mexico Oil Conservation Division (NMOCD) Rules, National Historical Preservation Act As Amended, and instructions and orders of the Authorized Officer. Any request for a variance shall be submitted to the Authorized Officer on Form 3160-5, Sundry Notices and Report on Wells.

## **II. PERMIT EXPIRATION**

If the permit terminates prior to drilling and drilling cannot be commenced within 60 days after expiration, an operator is required to submit Form 3160-5, Sundry Notices and Reports on Wells, requesting surface reclamation requirements for any surface disturbance. However, if the operator will be able to initiate drilling within 60 days after the expiration of the permit, the operator must have set the conductor pipe in order to allow for an extension of 60 days beyond the expiration date of the APD. (Filing of a Sundry Notice is required for this 60 day extension.)

## **III. ARCHAEOLOGICAL, PALEONTOLOGY & HISTORICAL SITES**

Any cultural and/or paleontological resource discovered by the operator or by any person working on the operator's behalf shall immediately report such findings to the Authorized Officer. The operator is fully accountable for the actions of their contractors and subcontractors. The operator shall suspend all operations in the immediate area of such discovery until written authorization to proceed is issued by the Authorized Officer. An evaluation of the discovery shall be made by the Authorized Officer to determine the appropriate actions that shall be required to prevent the loss of significant cultural or scientific values of the discovery. The operator shall be held responsible for the cost of the proper mitigation measures that the Authorized Officer assesses after consultation with the operator on the evaluation and decisions of the discovery. Any unauthorized collection or disturbance of cultural or paleontological resources may result in a shutdown order by the Authorized Officer.

## **IV. NOXIOUS WEEDS**

The operator shall be held responsible if noxious weeds become established within the areas of operations. Weed control shall be required on the disturbed land where noxious weeds exist, which includes the roads, pads, associated pipeline corridor, and adjacent land affected by the establishment of weeds due to this action. The operator shall consult with the Authorized Officer for acceptable weed control methods, which include following EPA and BLM requirements and policies.

## **V. SPECIAL REQUIREMENT(S)**

### **Timing Limitation Stipulation / Condition of Approval for lesser prairie-chicken:**

Oil and gas activities including 3-D geophysical exploration, and drilling will not be allowed in lesser prairie-chicken habitat during the period from March 1st through June 15th annually. During that period, other activities that produce noise or involve human activity, such as the maintenance of oil and gas facilities, pipeline, road, and well pad construction, will be allowed except between 3:00 am and 9:00 am. The 3:00 am to 9:00 am restriction will not apply to normal, around-the-clock operations, such as venting, flaring, or pumping, which do not require a human presence during this period. Additionally, no new drilling will be allowed within up to 200 meters of leks known at the time of permitting. Normal vehicle use on existing roads will not be restricted. Exhaust noise from pump jack engines must be muffled or otherwise controlled so as not to exceed 75 db measured at 30 feet from the source of the noise.

**Ground-level Abandoned Well Marker to avoid raptor perching:** Upon the plugging and subsequent abandonment of the well, the well marker will be installed at ground level on a plate containing the pertinent information for the plugged well. For more installation details, contact the Carlsbad Field Office at 575-234-5972.

### **Timing Limitation Exceptions:**

The Carlsbad Field Office will publish an annual map of where the LPC timing and noise stipulations and conditions of approval (Limitations) will apply for the identified year (between March 1 and June 15) based on the latest survey information. The LPC Timing Area map will identify areas which are Habitat Areas (HA), Isolated Population Area (IPA), and Primary Population Area (PPA). The LPC Timing Area map will also have an area in red crosshatch. The red crosshatch area is the only area where an operator is required to submit a request for exception to the LPC Limitations. If an operator is operating outside the red crosshatch area, the LPC Limitations do not apply for that year and an exception to LPC Limitations is not required.

### **Hydrology**

The entire well pad(s) will be bermed to prevent oil, salt, and other chemical contaminants from leaving the well pad. The compacted berm shall be constructed at a minimum of 12 inches with impermeable mineral material (e.g. caliche). Topsoil shall not be used to construct the berm. No water flow from the uphill side(s) of the pad shall be allowed to enter the well pad. The integrity of the berm shall be maintained around the surfaced pad throughout the life of the well and around the downsized pad after interim reclamation has been completed. Any water erosion that may occur due to the construction of the well pad during the life of the well will be quickly corrected and proper measures will be taken to prevent future erosion. Stockpiling of topsoil is required. The top soil shall be stockpiled in an appropriate location to prevent loss of soil due to water or wind erosion and not used for berming or erosion control. If fluid collects



within the bermed area, the fluid must be vacuumed into a safe container and disposed of properly at a state approved facility.

Tank battery locations will be lined and bermed. A 20 mil permanent liner will be installed with a 4 oz. felt backing to prevent tears or punctures. Tank battery berms must be large enough to contain 1 ½ times the content of the largest tank or 24 hour production, whichever is greater. Automatic shut off, check valves, or similar systems will be installed for tanks to minimize the effects of catastrophic line failures used in production or drilling.

When crossing ephemeral drainages the pipeline(s) will be buried to a minimum depth of 48 inches from the top of pipe to ground level. Erosion control methods such as gabions and/or rock aprons should be placed on both up and downstream sides of the pipeline crossing. In addition, curled (weed free) wood/straw fiber wattles/logs and/or silt fences should be placed on the downstream side for sediment control during construction and maintained until soils and vegetation have stabilized. Water bars should be placed within the ROW to divert and dissipate surface runoff. A pipeline access road is not permitted to cross these ephemeral drainages. Traffic should be diverted to a preexisting route. Additional seeding may be required in floodplains and drainages to restore energy dissipating vegetation.

A leak detection plan will be submitted to the BLM Carlsbad Field Office for approval prior to pipeline installation. The method could incorporate gauges to detect pressure drops, situating valves and lines so they can be visually inspected periodically or installing electronic sensors to alarm when a leak is present. The leak detection plan will incorporate an automatic shut off system that will be installed for proposed pipelines to minimize the effects of an undesirable event.

Any water erosion that may occur due to the construction of overhead electric line and during the life of the power line will be quickly corrected and proper measures will be taken to prevent future erosion. A power pole should not be placed in drainages, playas, wetlands, riparian areas, or floodplains and must span across the features at a distance away that would not promote further erosion.

### **Range**

The proponent would not damage the allotment fence during construction of the pads or roads. If fence is damaged the blm must be contacted immediately and all work must cease till the fence has been repaired back to its original condition or better.

## **VI. CONSTRUCTION**

### **A. NOTIFICATION**

The BLM shall administer compliance and monitor construction of the access road and well pad. Notify the Carlsbad Field Office at (575) 234-5909 at least 3 working days prior to commencing construction of the access road and/or well pad.

When construction operations are being conducted on this well, the operator shall have the approved APD and Conditions of Approval (COA) on the well site and they shall be made available upon request by the Authorized Officer.

### **B. TOPSOIL**

The operator shall strip the top portion of the soil (root zone) from the entire well pad area and stockpile the topsoil along the edge of the well pad as depicted in the APD. The root zone is typically six (6) inches in depth. All the stockpiled topsoil will be redistributed over the interim reclamation areas. Topsoil shall not be used for berming the pad or facilities. For final reclamation, the topsoil shall be spread over the entire pad area for seeding preparation.

Other subsoil (below six inches) stockpiles must be completely segregated from the topsoil stockpile. Large rocks or subsoil clods (not evident in the surrounding terrain) must be buried within the approved area for interim and final reclamation.

### **C. CLOSED LOOP SYSTEM**

Tanks are required for drilling operations: No Pits.

The operator shall properly dispose of drilling contents at an authorized disposal site.

### **D. FEDERAL MINERAL MATERIALS PIT**

Payment shall be made to the BLM prior to removal of any federal mineral materials. Call the Carlsbad Field Office at (575) 234-5972.

### **E. WELL PAD SURFACING**

Surfacing of the well pad is not required.

If the operator elects to surface the well pad, the surfacing material may be required to be removed at the time of reclamation. The well pad shall be constructed in a manner which creates the smallest possible surface disturbance, consistent with safety and operational needs.

### **F. EXCLOSURE FENCING (CELLARS & PITS)**

**Exclosure Fencing**

The operator will install and maintain exclosure fencing for all open well cellars to prevent access to public, livestock, and large forms of wildlife before and after drilling operations until the pit is free of fluids and the operator initiates backfilling. (For examples of exclosure fencing design, refer to BLM's Oil and Gas Gold Book, Exclosure Fence Illustrations, Figure 1, Page 18.)

**G. ON LEASE ACCESS ROADS****Road Width**

The access road shall have a driving surface that creates the smallest possible surface disturbance and does not exceed fourteen (14) feet in width. The maximum width of surface disturbance, when constructing the access road, shall not exceed twenty-five (25) feet.

**Surfacing**

Surfacing material is not required on the new access road driving surface. If the operator elects to surface the new access road or pad, the surfacing material may be required to be removed at the time of reclamation.

Where possible, no improvements should be made on the unsurfaced access road other than to remove vegetation as necessary, road irregularities, safety issues, or to fill low areas that may sustain standing water.

The Authorized Officer reserves the right to require surfacing of any portion of the access road at any time deemed necessary. Surfacing may be required in the event the road deteriorates, erodes, road traffic increases, or it is determined to be beneficial for future field development. The surfacing depth and type of material will be determined at the time of notification.

**Crowning**

Crowning shall be done on the access road driving surface. The road crown shall have a grade of approximately 2% (i.e., a 1" crown on a 14' wide road). The road shall conform to Figure 1; cross section and plans for typical road construction.

**Ditching**

Ditching shall be required on both sides of the road.

**Turnouts**

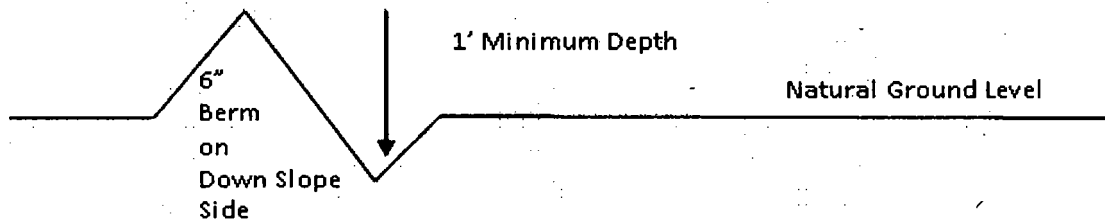
Vehicle turnouts shall be constructed on the road. Turnouts shall be intervisible with interval spacing distance less than 1000 feet. Turnouts shall conform to Figure 1; cross section and plans for typical road construction.

**Drainage**

Drainage control systems shall be constructed on the entire length of road (e.g. ditches, sidehill out sloping and insloping, lead-off ditches, culvert installation, and low water crossings).

A typical lead-off ditch has a minimum depth of 1 foot below and a berm of 6 inches above natural ground level. The berm shall be on the down-slope side of the lead-off ditch.

#### **Cross Section of a Typical Lead-off Ditch**



All lead-off ditches shall be graded to drain water with a 1 percent minimum to 3 percent maximum ditch slope. The spacing interval are variable for lead-off ditches and shall be determined according to the formula for spacing intervals of lead-off ditches, but may be amended depending upon existing soil types and centerline road slope (in %);

#### **Formula for Spacing Interval of Lead-off Ditches**

Example - On a 4% road slope that is 400 feet long, the water flow shall drain water into a lead-off ditch. Spacing interval shall be determined by the following formula:

$$400 \text{ foot road with } 4\% \text{ road slope: } \frac{400'}{4\%} + 100' = 200' \text{ lead-off ditch interval}$$

#### **Cattle guards**

An appropriately sized cattle guard sufficient to carry out the project shall be installed and maintained at fence/road crossings. Any existing cattle guards on the access road route shall be repaired or replaced if they are damaged or have deteriorated beyond practical use. The operator shall be responsible for the condition of the existing cattle guards that are in place and are utilized during lease operations.

#### **Fence Requirement**

Where entry is granted across a fence line, the fence shall be braced and tied off on both sides of the passageway prior to cutting. The operator shall notify the private surface landowner or the grazing allotment holder prior to crossing any fences.

#### **Public Access**

Public access on this road shall not be restricted by the operator without specific written approval granted by the Authorized Officer.

### Construction Steps

1. Salvage topsoil
2. Construct road

3. Redistribute topsoil
4. Revegetate slopes

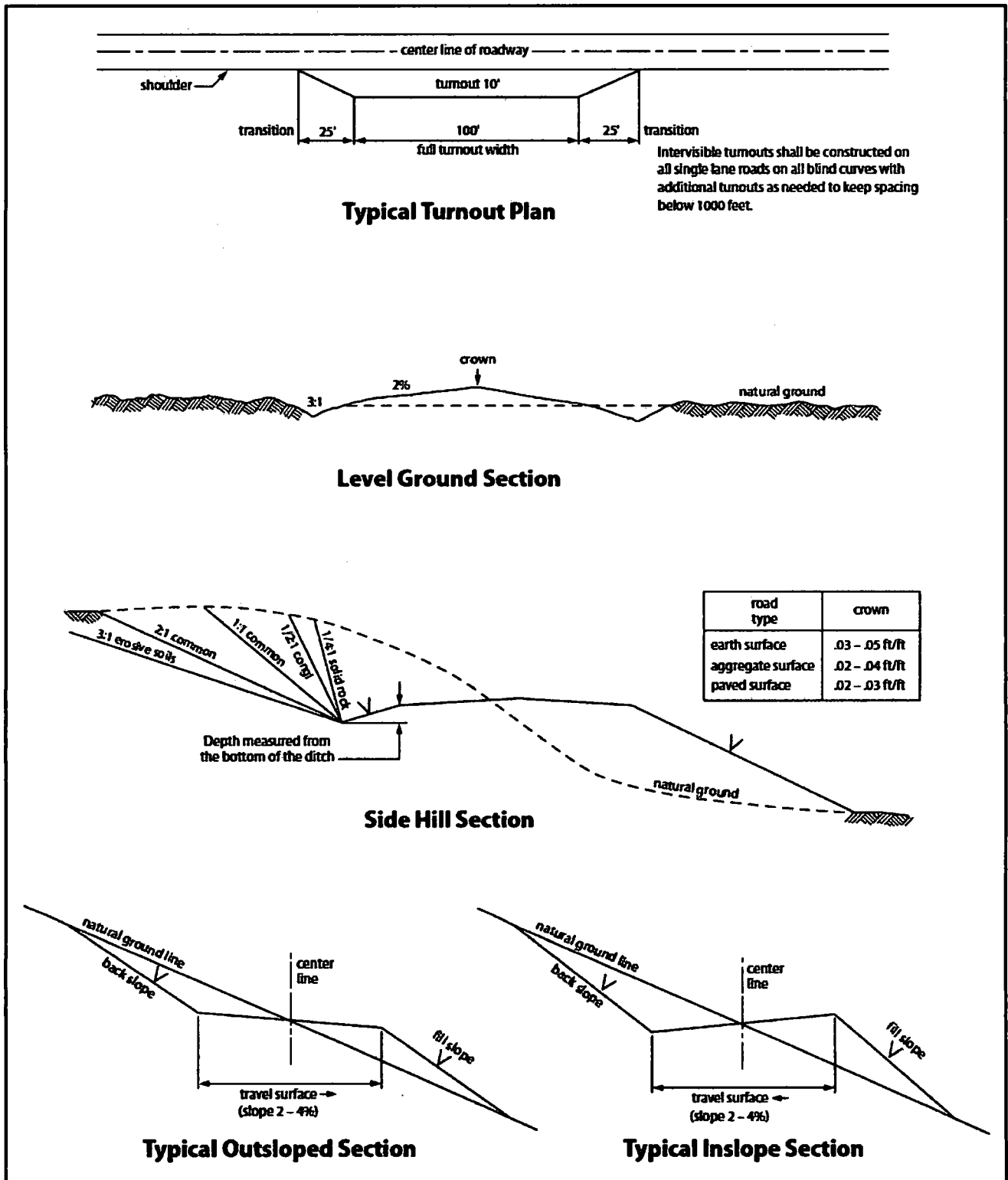


Figure 1. Cross-sections and plans for typical road sections representative of BLM resource or FS local and higher-class roads.

## **VII. PRODUCTION (POST DRILLING)**

### **A. WELL STRUCTURES & FACILITIES**

#### **Placement of Production Facilities**

Production facilities should be placed on the well pad to allow for maximum interim recontouring and revegetation of the well location.

#### **Exclosure Netting (Open-top Tanks)**

Immediately following active drilling or completion operations, the operator will take actions necessary to prevent wildlife and livestock access, including avian wildlife, to all open-topped tanks that contain or have the potential to contain salinity sufficient to cause harm to wildlife or livestock, hydrocarbons, or Resource Conservation and Recovery Act of 1976-exempt hazardous substances. At a minimum, the operator will net, screen, or cover open-topped tanks to exclude wildlife and livestock and prevent mortality. If the operator uses netting, the operator will cover and secure the open portion of the tank to prevent wildlife entry. The operator will net, screen, or cover the tanks until the operator removes the tanks from the location or the tanks no longer contain substances that could be harmful to wildlife or livestock. Use a maximum netting mesh size of 1 ½ inches. The netting must not be in contact with fluids and must not have holes or gaps.

#### **Chemical and Fuel Secondary Containment and Exclosure Screening**

The operator will prevent all hazardous, poisonous, flammable, and toxic substances from coming into contact with soil and water. At a minimum, the operator will install and maintain an impervious secondary containment system for any tank or barrel containing hazardous, poisonous, flammable, or toxic substances sufficient to contain the contents of the tank or barrel and any drips, leaks, and anticipated precipitation. The operator will dispose of fluids within the containment system that do not meet applicable state or U. S. Environmental Protection Agency livestock water standards in accordance with state law; the operator must not drain the fluids to the soil or ground. The operator will design, construct, and maintain all secondary containment systems to prevent wildlife and livestock exposure to harmful substances. At a minimum, the operator will install effective wildlife and livestock exclosure systems such as fencing, netting, expanded metal mesh, lids, and grate covers. Use a maximum netting mesh size of 1 ½ inches.

#### **Open-Vent Exhaust Stack Exclosures**

The operator will construct, modify, equip, and maintain all open-vent exhaust stacks on production equipment to prevent birds and bats from entering, and to discourage perching, roosting, and nesting. (*Recommended exclosure structures on open-vent exhaust stacks are in the shape of a cone.*) Production equipment includes, but may not be limited to, tanks, heater-treaters, separators, dehydrators, flare stacks, in-line units, and compressor mufflers.

#### **Containment Structures**

Proposed production facilities such as storage tanks and other vessels will have a secondary containment structure that is constructed to hold the capacity of 1.5 times the largest tank, plus freeboard to account for precipitation, unless more stringent protective requirements are deemed necessary.

#### **Painting Requirement**

All above-ground structures including meter housing that are not subject to safety requirements shall be painted a flat non-reflective paint color, **Shale Green** from the BLM Standard Environmental Color Chart (CC-001: June 2008).

### **B. PIPELINES**

#### **BURIED PIPELINE STIPULATIONS**

A copy of the application (Grant, APD, or Sundry Notice) and attachments, including conditions of approval, survey plat and/or map, will be on location during construction. BLM personnel may request to you a copy of your permit during construction to ensure compliance with all stipulations.

Holder agrees to comply with the following stipulations to the satisfaction of the Authorized Officer:

1. The Holder shall indemnify the United States against any liability for damage to life or property arising from the occupancy or use of public lands under this grant.
2. The Holder shall comply with all applicable Federal laws and regulations existing or hereafter enacted or promulgated. In any event, the holder shall comply with the Toxic Substances Control Act of 1976 as amended, 15 USC 2601 et seq. (1982) with regards to any toxic substances that are used, generated by or stored on the right-of-way or on facilities authorized under this right-of-way grant. (See 40 CFR Part 702-799 and especially, provisions on polychlorinated biphenyls, 40 CFR 761.1-761.193.) Additionally, any release of toxic substances (leaks, spills, etc.) in excess of the reportable quantity established by 40 CFR Part 117 shall be reported as required by the Comprehensive Environmental Response, Compensation, and Liability Act, section 102b. A copy of any report required or requested by any Federal agency or State government as a result of a reportable release or spill of any toxic substances shall be furnished to the authorized officer concurrent with the filing of the reports to the involved Federal agency or State government.
3. The holder agrees to indemnify the United States against any liability arising from the release of any hazardous substance or hazardous waste (as these terms are defined in the Comprehensive Environmental Response, Compensation and Liability Act of 1980, 42 U.S.C. 9601, et seq. or the Resource Conservation and Recovery Act, 42 U.S.C. 6901, et seq.) on the Right-of-Way (unless the release or threatened release is wholly unrelated to

the Right-of-Way holder's activity on the Right-of-Way), or resulting from the activity of the Right-of-Way holder on the Right-of-Way. This agreement applies without regard to whether a release is caused by the holder, its agent, or unrelated third parties.

4. If, during any phase of the construction, operation, maintenance, or termination of the pipeline, any oil or other pollutant should be discharged from the pipeline system, impacting Federal lands, the control and total removal, disposal, and cleaning up of such oil or other pollutant, wherever found, shall be the responsibility of holder, regardless of fault. Upon failure of holder to control, dispose of, or clean up such discharge on or affecting Federal lands, or to repair all damages resulting therefrom, on the Federal lands, the Authorized Officer may take such measures as he deems necessary to control and clean up the discharge and restore the area, including where appropriate, the aquatic environment and fish and wildlife habitats, at the full expense of the holder. Such action by the Authorized Officer shall not relieve holder of any responsibility as provided herein.

5. All construction and maintenance activity will be confined to the authorized right-of-way.

6. The pipeline will be buried with a minimum cover of 36 inches between the top of the pipe and ground level.

7. The maximum allowable disturbance for construction in this right-of-way will be 30 feet:

- Blading of vegetation within the right-of-way will be allowed: maximum width of blading operations will not exceed 20 feet. The trench is included in this area. (*Blading is defined as the complete removal of brush and ground vegetation.*)
- Clearing of brush species within the right-of-way will be allowed: maximum width of clearing operations will not exceed 30 feet. The trench and bladed area are included in this area. (*Clearing is defined as the removal of brush while leaving ground vegetation (grasses, weeds, etc.) intact. Clearing is best accomplished by holding the blade 4 to 6 inches above the ground surface.*)
- The remaining area of the right-of-way (if any) shall only be disturbed by compressing the vegetation. (*Compressing can be caused by vehicle tires, placement of equipment, etc.*)

8. The holder shall stockpile an adequate amount of topsoil where blading is allowed. The topsoil to be stripped is approximately 6 inches in depth. The topsoil will be



segregated from other spoil piles from trench construction. The topsoil will be evenly distributed over the bladed area for the preparation of seeding.

9. The holder shall minimize disturbance to existing fences and other improvements on public lands. The holder is required to promptly repair improvements to at least their former state. Functional use of these improvements will be maintained at all times. The holder will contact the owner of any improvements prior to disturbing them. When necessary to pass through a fence line, the fence shall be braced on both sides of the passageway prior to cutting of the fence. No permanent gates will be allowed unless approved by the Authorized Officer.

10. Vegetation, soil, and rocks left as a result of construction or maintenance activity will be randomly scattered on this right-of-way and will not be left in rows, piles, or berms, unless otherwise approved by the Authorized Officer. The entire right-of-way shall be recontoured to match the surrounding landscape. The backfilled soil shall be compacted and a 6 inch berm will be left over the ditch line to allow for settling back to grade.

11. In those areas where erosion control structures are required to stabilize soil conditions, the holder will install such structures as are suitable for the specific soil conditions being encountered and which are in accordance with sound resource management practices.

12. The holder will reseed all disturbed areas. Seeding will be done according to the attached seeding requirements, using the following seed mix.

<input type="checkbox"/> seed mixture 1	<input type="checkbox"/> seed mixture 3
<input type="checkbox"/> seed mixture 2	<input type="checkbox"/> seed mixture 4
<input checked="" type="checkbox"/> seed mixture 2/LPC	<input type="checkbox"/> Aplomado Falcon Mixture

13. All above-ground structures not subject to safety requirements shall be painted by the holder to blend with the natural color of the landscape. The paint used shall be color which simulates "Standard Environmental Colors" – **Shale Green**, Munsell Soil Color No. 5Y 4/2.

14. The pipeline will be identified by signs at the point of origin and completion of the right-of-way and at all road crossings. At a minimum, signs will state the holder's name, BLM serial number, and the product being transported. All signs and information thereon will be posted in a permanent, conspicuous manner, and will be maintained in a legible condition for the life of the pipeline.

15. The holder shall not use the pipeline route as a road for purposes other than routine maintenance as determined necessary by the Authorized Officer in consultation with the holder before maintenance begins. The holder will take whatever steps are necessary to ensure that the pipeline route is not used as a roadway. As determined necessary during the life of the pipeline, the Authorized Officer may ask the holder to construct temporary deterrence structures.

16. Any cultural and/or paleontological resources (historic or prehistoric site or object) discovered by the holder, or any person working on his behalf, on public or Federal land shall be immediately reported to the Authorized Officer. Holder shall suspend all operations in the immediate area of such discovery until written authorization to proceed is issued by the Authorized Officer. An evaluation of the discovery will be made by the Authorized Officer to determine appropriate actions to prevent the loss of significant cultural or scientific values. The holder will be responsible for the cost of evaluation and any decision as to proper mitigation measures will be made by the Authorized Officer after consulting with the holder.

17. The operator shall be held responsible if noxious weeds become established within the areas of operations. Weed control shall be required on the disturbed land where noxious weeds exist, which includes associated roads, pipeline corridor and adjacent land affected by the establishment of weeds due to this action. The operator shall consult with the Authorized Officer for acceptable weed control methods, which include following EPA and BLM requirements and policies.

18. Escape Ramps - The operator will construct and maintain pipeline/utility trenches [that are not otherwise fenced, screened, or netted] to prevent livestock, wildlife, and humans from becoming entrapped. At a minimum, the operator will construct and maintain escape ramps, ladders, or other methods of avian and terrestrial wildlife escape in the trenches according to the following criteria:

- a. Any trench left open for eight (8) hours or less is not required to have escape ramps; however, before the trench is backfilled, the contractor/operator shall inspect the trench for wildlife, remove all trapped wildlife, and release them at least 100 yards from the trench.
- b. For trenches left open for eight (8) hours or more, earthen escape ramps (built at no more than a 30 degree slope and spaced no more than 500 feet apart) shall be placed in the trench.

19. Special Stipulations:

**Lesser Prairie-Chicken**

Oil and gas activities will not be allowed in lesser prairie-chicken habitat during the period from March 1st through June 15th annually. During that period, other activities that produce noise or involve human activity, such as the maintenance of oil and gas facilities, geophysical exploration other than 3-D operations, and pipeline, road, and well pad construction, will be allowed except between 3:00 am and 9:00 am. The 3:00 am to 9:00 am restriction will not apply to normal, around-the-clock operations, such as venting, flaring, or pumping, which do not require a human presence during this period. Normal vehicle use on existing roads will not be restricted. Exhaust noise from pump jack engines must be muffled or otherwise controlled so as not to exceed 75 db measured at 30 ft. from the source of the noise.

## **VIII. INTERIM RECLAMATION**

During the life of the development, all disturbed areas not needed for active support of production operations should undergo interim reclamation in order to minimize the environmental impacts of development on other resources and uses.

Within six (6) months of well completion, operators should work with BLM surface management specialists (Jim Amos: 575-234-5909) to devise the best strategies to reduce the size of the location. Interim reclamation should allow for remedial well operations, as well as safe and efficient removal of oil and gas.

During reclamation, the removal of caliche is important to increasing the success of revegetating the site. Removed caliche that is free of contaminants may be used for road repairs, fire walls or for building other roads and locations. In order to operate the well or complete workover operations, it may be necessary to drive, park and operate on restored interim vegetation within the previously disturbed area. Disturbing revegetated areas for production or workover operations will be allowed. If there is significant disturbance and loss of vegetation, the area will need to be revegetated. Communicate with the appropriate BLM office for any exceptions/exemptions if needed.

All disturbed areas after they have been satisfactorily prepared need to be reseeded with the seed mixture provided below.

Upon completion of interim reclamation, the operator shall submit a Sundry Notices and Reports on Wells, Subsequent Report of Reclamation (Form 3160-5).

## **IX. FINAL ABANDONMENT & RECLAMATION**

At final abandonment, well locations, production facilities, and access roads must undergo "final" reclamation so that the character and productivity of the land are restored.

Earthwork for final reclamation must be completed within six (6) months of well plugging. All pads, pits, facility locations and roads must be reclaimed to a satisfactory

revegetated, safe, and stable condition, unless an agreement is made with the landowner or BLM to keep the road and/or pad intact.

After all disturbed areas have been satisfactorily prepared, these areas need to be revegetated with the seed mixture provided below. Seeding should be accomplished by drilling on the contour whenever practical or by other approved methods. Seeding may need to be repeated until revegetation is successful, as determined by the BLM.

Operators shall contact a BLM surface protection specialist prior to surface abandonment operations for site specific objectives (Jim Amos: 575-234-5909).

Ground-level Abandoned Well Marker to avoid raptor perching: Upon the plugging and subsequent abandonment of the well, the well marker will be installed at ground level on a plate containing the pertinent information for the plugged well.

## Seed Mixture for LPC Sand/Shinnery Sites

Holder shall seed all disturbed areas with the seed mixture listed below. The seed mixture shall be planted in the amounts specified in pounds of pure live seed (PLS)\* per acre. There shall be no primary or secondary noxious weeds in the seed mixture. Seed will be tested and the viability testing of seed shall be done in accordance with State law(s) and within nine (9) months prior to purchase. Commercial seed shall be either certified or registered seed. The seed container shall be tagged in accordance with State law(s) and available for inspection by the Authorized Officer.

Seed will be planted using a drill equipped with a depth regulator to ensure proper depth of planting where drilling is possible. The seed mixture will be evenly and uniformly planted over the disturbed area (smaller/heavier seeds have a tendency to drop the bottom of the drill and are planted first). Holder shall take appropriate measures to ensure this does not occur. Where drilling is not possible, seed will be broadcast and the area shall be raked or chained to cover the seed. When broadcasting the seed, the pounds per acre are to be doubled. Seeding shall be repeated until a satisfactory stand is established as determined by the Authorized Officer. Evaluation of growth may not be made before completion of at least one full growing season after seeding.

Species to be planted in pounds of pure live seed\* per acre:

<u>Species</u>	<u>lb/acre</u>
Plains Bristlegrass	5lbs/A
Sand Bluestem	5lbs/A
Little Bluestem	3lbs/A
Big Bluestem	6lbs/A
Plains Coreopsis	2lbs/A
Sand Dropseed	1lbs/A

\*Pounds of pure live seed:

Pounds of seed x percent purity x percent germination = pounds pure live seed