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(June 2015) FEB 2 5 Amil

FEB 2 5 2020

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

DEPARTMENT OF THE INTERPOLATES ALease Serial No. NMNM096848

MANUEL CONTRACTOR IN THE WAY			1414114101090046	
APPLICATION FOR PERMIT TO	DRILL OR REE	NTER	6. If Indian, Allotee o	r Tribe Name
15 Town - C 17 11	REENTER Other		7. If Unit or CA Agree	
Ic. Type of Completion: Hydraulic Fracturing	Single Zone Mu	ultiple Zone	8. Lease Name and W ADMIRAL FEDERAL 501H	1 Buch
2. Name of Operator COG OPERATING LLC			9/API.Well No. /	211102
3a. Address 600 West Illinois Ave Midland TX 79701	3b. Phone No. (inc. (432)683-7443	lude area code)	10. Field and Pool, or	
4. Location of Well (Report location clearly and in accordance	with any State requir	ements.*)	12 T 1 T 1	Blk. and Survey or Area
At surface SWSW / 220 FSL / 880 FWL / LAT 32.094 At proposed prod. zone NWNW / 50 FNL / 330 FWL / L	146 / LONG -103.99	95024	SEC 28 / T25S / R29	DE / NMP
	**	VG -103.996956		····
14. Distance in miles and direction from nearest town or post of 10 miles		The state of the s	12. County or Parish EDDY	NM
15. Distance from proposed* location to nearest property or lease line, ft. (Also to nearest drig, unit line, if any)	16. No of acres in 1600	lease 17. S 640	pacing. Unit dedicated to this	s well
18. Distance from proposed location* to nearest well, drilling, completed, applied for, on this lease, ft.	19. Proposed Dept 8633 feet / 18939	nesses in a self	LM/BIA Bond No. in file NMB000215	
21. Elevations (Show whether DF, KDB, RT, GL, etc.) 2983 feet	22/Approximate d 01/01/2020		23. Estimated duration 30 days	
	24. Attachment	7		
The following, completed in accordance with the requirements of (as applicable)	of Oilshore Oil and Ga	is Order No. 1, and t	he Hydraulic Fracturing rule	e per 43 CFR 3162.3-3
Well plat certified by a registered surveyor. A Drilling Plan.	````€`⊋` Ite	and to cover the opera m 20 above)	ntions unless covered by an e	xisting bond on file (see
3. A Surface Use Plan (if the location is on National Forest Syste SUPO must be filed with the appropriate Forest Service Office	e). 6. Su	perator certification. ch other site specific i _M.	nformation and/or plans as m	ay be requested by the
25. Signature (Electronic Submission)	Name (Printe Stan Wagne	<i>ed/Typed)</i> r / Ph: (432)253-96		ate 0/04/2019
Title Regulatory Advisor				
Approved by (Signature) (Electronic Submission)	Name (Printe Cody Layton	ed/Typed) / Ph: (575)234-59	ľ	ate
Title () Assistant Field Manager Lands & Minerals	Office CARLSBAD		· · · · · · · · · · · · · · · · · · ·	
Application approval does not warrant or certify that the application to conduct operations thereon. Conditions of approval, if any are attached.	nt holds legal or equit	able title to those rig	hts in the subject lease whic	h would entitle the
Title 18 U.S.C. Section 1001 and Title 43 U.S.C. Section 1212, r of the United States any false, fictitious or fraudulent statements	nake it a crime for an or representations as	person knowingly to any matter within	and willfully to make to any its jurisdiction.	department or agency

(Continued on page 2)

Approval Date: 02/24/2020

*(Instructions on page 2)

RNP 2-25-2020

Additional Operator Remarks

Location of Well

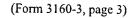
1. SHL: SWSW / 220 FSL / 880 FWL / TWSP: 25S / RANGE: 29E / SECTION: 28 / LAT: 32.094146 / LONG: -103.995024 (TVD: 0 feet, MD: 0 feet)
PPP: SWSW / 100 FSL / 330 FWL / TWSP: 25S / RANGE: 29E / SECTION: 28 / LAT: 32.093814 / LONG: -103.996796 (TVD: 8487 feet, MD: 8582 feet)
BHL: NWNW / 50 FNL / 330 FWL / TWSP: 25S / RANGE: 29E / SECTION: 21 / LAT: 32.122585 / LONG: -103.996956 (TVD: 8633 feet; MD: 18939 feet)

BLM Point of Contact

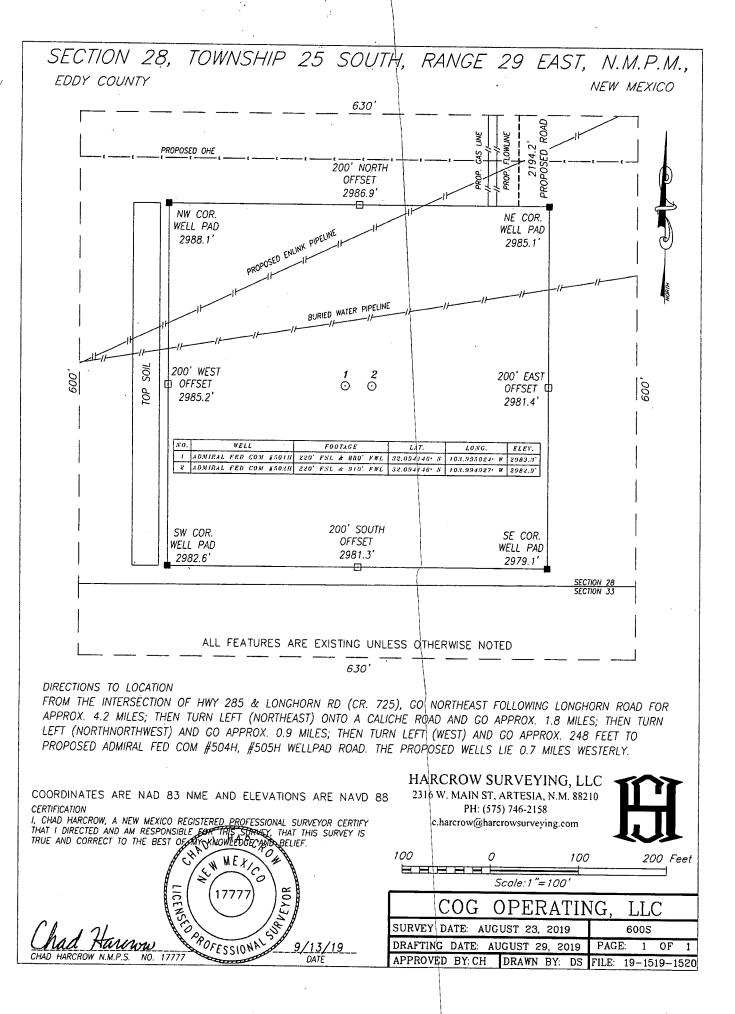
Name: Deborah Ham

Title: Legal Landlaw Examiner

Phone: 5752345965 Email: dham@blm.gov



Approval Date: 02/24/2020



ADMIRAL FEDERAL COM #501H 1 MILE DATA (19-1519)

		MIRAL FEDERAL CO					
FID WELL_NAME	OPERATOR .	API SI	CTION TOWNS	IP RANGE	FTG_NS_NS_CE	FTG_EW_EW_C	D LATITUDE LONGITUDE COMPLESTAT
0 FEDERAL 27 001	BENNETT J	3001503719	27 25.05	29E	660 S	660 W	32.095346 -103.978554 Plugged
1 SUPERIOR ST 001	D 8 SCULLY	3001503721	32 25.05	29E	1980 S	1980 E	32.084361 -104.004324 Plugged
2 FEDERAL 001	BELL PETROLEUM CO	3001520987.	29 25.0S	29E	660 N	1880 W	32.106441 -104.009063 Plugged
3 NORTHERN NATURAL GAS 001	DINERO OPERATING CO	3001523882	32 25.0\$	29€	660 N	1980 E	32.091742 -104.00429 Plugged
4 CORRAL FED UT 001	EOG Y RESOURCES, INC.	3001527522	33 25.05	29€	1980 S	660 E	32.084367 -103.982859 Plugged
5 CHIMAYO 16 STATE 001	DEVON ENERGY PRODUCTION COMPANY, LP	3001531781	16 25.05	29E	660 N	1980 W	32.13551 -103.991645 Active
6 CHIMAYO 16 STATE 002	DEVON ENERGY PRODUCTION COMPANY, LP	3001531782	16 25.0S	29E	1980 N	660 W	32.131873 -103.995917
7 SAVE D A 21 FED 001	COG OPERATING LLC	3001534840	21 25.0S	29E	660 N	660 W	32.1206 -103.995943 Active
8 PICKETT DRAW 16 STATE 001H	VANGUARD OPERATING, LLC	3001535443	16 25.0S	29€	2600 N	530 E	32.130196 -103.982504 Active
9 PICKETT DRAW 16 STATE 002H	VANGUARD OPERATING, LLC	3001535681	16 25.05	29E	2600 N	1530 E	32.130203 -103.98575 Active
10 WHITE FEDERAL COM 001H	COG OPERATING LLC .	3001536185	21 25.05	29E	480 N	380 €	32.121373 -103.981978 New (Not drilled or compl)
11 SHOCKER 32 STATE COM 003H	XTO ENERGY, INC	3001536220	32 25.05	29E	330 N	330 E	32.092173 -103.998986 New (Not drilled or compl)
12 SHOCKER 32 STATE 004G	EOG Y RESOURCES, INC.	3001536224	32 25.05	29E	1981 N	1981 E	32.087655 -104.004304 New (Not drilled or compl)
13 SHOCKER 29 FEDERAL 002H	EOG RESOURCES INC	3001536622	29 25.05	29E	660 S	330 €	32.094895 -103.998994 New (Not drilled or compl)
14 COOPER 29 FEDERAL 001H	COG PRODUCTION, LLC	3001536932	29 25.05	29E	2230 S	560 W	32.099372 -104.013164 New (Not drilled or compl)
15 WEST BRUSHY FEDERAL 33 001	XTO ENERGY, INC	3001536971	33 25.05	29E	580 S	1580 W	32.080258 -103.992687 New (Not drilled or compl)
16 SHOCKER 32 STATE 005i	EOG Y RESOURCES, INC.	3001536997	32 25.05	29E	1981 S	331 E	32.0841 -103.99892 New (Not drilled or compl)
17 COOTER 16 STATE 001H	DEVON ENERGY PRODUCTION COMPANY, LP	3001537625	16 25.05	29E	330 5	1580 W	32.12338 -103.992988 New (Not drilled or compl)
18 COOTER 16 STATE 002H	DEVON ENERGY PRODUCTION COMPANY, LP	3001537626	16 25.05	29E	480 S	330 W	32.123712 -103.997047 New (Not drilled or compl)
19 COOTER 16 STATE 003H	DEVON ENERGY PRODUCTION COMPANY, LP	3001537627	16 25.05	29E	330 N	1190 W	32.136462 -103.994232 New (Not drilled or compl)
20 COOTER 16 STATE 004H	DEVON ENERGY PRODUCTION COMPANY, LP	3001537628	16 25.05	29E	330 S	2310 W	32.123428 -103.990619 New (Not drilled or compl)
21 SHOWSTOPPER 17 FEDERAL COM 011	COG OPERATING LLC	3001537711	17 25.05	29E	330 S	2310 W	
22 SHOWSTOPPER 17 FEDERAL COM 012H	COG OPERATING LLC	3001537712	17 25.05	29E	660 S	560 W	32.123379 -104.007554 New (Not drilled or compl)
23 SHOWSTOPPER 17 FEDERAL COM 009H	XTO ENERGY, INC	3001537836	17 25.05	29E	150 S	150 E	32.124408 -104.013235 New (Not drilled or compl)
24 SHOWSTOPPER 17 FEDERAL COM 010H	COG OPERATING LLC	3001537837	17 25.0S	29E	180 S	2460 E	32.122773 -103.998602 New (Not drilled or compl)
25 COOTER 16 STATE COM 005H	DEVON ENERGY PRODUCTION COMPANY, LP	3001537875	16 25.05	29E	330 S	2310 E	32.122936 -104.006101 New (Not drilled or compl)
26 COOTER 16 STATE COM 006H	DEVON ENERGY PRODUCTION COMPANY, LP	3001537875	16 25.0S	29E	330 S		32.123475 -103.98824 New (Not drilled or compl)
27 COOTER 16 STATE COM 007H	DEVON ENERGY PRODUCTION COMPANY, LP	3001537870	16 25.0S	29E 29E	330 S	1650 E	32.123518 -103.986098 New (Not drilled or compl)
28 COOTER 16 STATE COM 008H	DEVON ENERGY PRODUCTION COMPANY, LP	3001537878	16 25.05	29E	330 S	770 E 420 E	32.123575 -103.983242 New (Not drilled or compl)
29 CHIMAYO 16 STATE 003	DEVON ENERGY PRODUCTION COMPANY, LP	3001537878	16 25.05	29£			32.123597 -103.982105 New (Not drilled or compl)
30 SHOCKER SWD 001	EOG RESOURCES INC	3001539470	32,25.05	- 29E -	1610 N 1040 N	1455 W	32.132942 103,99338 New (Not drilled or compl)
31 COTTONTAIL 16 STATE COM 001H	DEVON ENERGY PRODUCTION COMPANY TP	3001542321				990 E	32.090191 -104.00111 New (Not drilled or compl)
32_ADMIRAL-FEDERAL-COM-002H	COG OPERATING LLC	3001542321	16 25.05	29€	150 S	1950 E	32.123003 -103.987072 New (Not drilled or compl)
33 COTTONTAIL 16 STATE COM 002H	DEVON ENERGY PRODUCTION COMPANY, LP		28 25.05	29E	190 S	1980 E	32.093925 -103.987182 New (Not drilled or compl)
34 COTTONTAIL 16 STATE COM 003H	DEVON ENERGY PRODUCTION COMPANY, EP	3001543302	16 25.05	29E	675 S	660 E	32.12453 -103.982884 New (Not drilled or compl)
35 COTTONTAIL 16 STATE COM 004H	DEVON ENERGY PRODUCTION COMPANY, LP	3001543303	16 25.05	29E	220 5	630 W	32.123017 -103.996071 New (Not drilled or compl)
36 SHOWSTOPPER 17 FEDERAL COM 024H	COG OPERATING LLC	3001543304	16 25.05	29E	220 S	680 W	32.12302 -103.995908 New (Not drilled or compl)
37 CORRAL CANYON 16 STATE SWD 001	XTO ENERGY, INC	3001543727	17 25.0S	29€	310 S	750 W	32.123432 -104.012618 New (Not drilled or compl)
38 LONE WATIE 32 STATE 168H	•	3001544387	16 25.05	29E	990 N	1280 W	32.134647 -103.993944 New (Not drilled or compl)
SO COME WATER DE STATE TOUT	XTO ENERGY, INC	3001545772	32 25.0S	29E	336 N	695 E	32.092125 -104.00017

Inte	nt X	As Dr	illed											
API 30-	# -015-													
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CC	G Opei	rating LL	С			Ad	miral	Fode	aralı	Com				
										COIII				501H
Kick	Off Point	(KOP)												
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<u> </u>							-						83	
First	Take Poir	nt (FTP)												
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Last 1	Take Poin	t (LTP)												
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<u>32.</u>	122446) ————————————————————————————————————			-103	.996	955					NAC	83	
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API#	15-					•.								
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COG	Operat	ing LLC												
		g LLO				Aum ——	iral F	edera	al Co	om ———				503H
														KZ 06/29/2018

1. Geologic Formations

TVD of target	8,636' EOL	Pilot hole depth	NA
MD at TD:	18,940'	Deepest expected fresh water:	45'

Formation	Depth (TVD) from KB	Water/Mineral Bearing/ Target Zone?	Hazards*
Quaternary Fill	Surface	Water	The second of th
Rustler	560	Water	
Top of Salt	732	Salt	
Base of Salt	2732	Salt	
Lamar	2913	Salt Water	
Bell Canyon	2957	Salt Water	
Cherry Canyon	3803	Oil/Gas	
Brushy Canyon	5083	Oil/Gas	
Bone Spring Lime	6677	Oil/Gas	
U. Avalon Shale	6991	Oil/Gas	
L. Avalon Shale	7285	Oil/Gas	
1st Bone Spring Sand	7591	Oil/Gas	
2nd Bone Spring Sand	8257	Oil/Gas	
3rd Bone Spring Sand	9518	Not Penetrated	
Wolfcamp	X	Not Penetrated	

2. Casing Program

	From	rsing orval To	Csg. Size	Weight (lbs)	Grade	Conn.	SF Collapse	SF Burst	SF Tension
17.5"	0	585	13.375"	54.5	J55	STC	4.22	2.19	16.12
12.25"	0	2940	9.625"	40	J55	LT¢	1.66	1.19	4.42
8.75"	0	18,940	5.5"	17	P110	LTC	1.79	3.21	3.03
	BLM Minimum Safety Facto						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

Does casing meet API specifications? If no, attach casing specification sheet. Is premium or uncommon casing planned? If yes attach casing specification sheet. Does the above casing design meet or exceed BLM's minimum standards? If not provide justification (loading assumptions, casing design criteria). Will the intermediate pipe be kept at a minimum 1/3 fluid filled to avoid approaching the collapse pressure rating of the casing? Is well located within Capitan Reef? If yes, does production casing cement tie back a minimum of 50' above the Reef? Is well within the designated 4 string boundary? If yes, are the first 2 strings cemented to surface and 3 rd string cement tied back 500' into previous casing? If yes, are the first 12 at 11-P and SOPA? If yes, are the first three strings cemented to surface? Is 2 rd string set 100' to 600' below the base of salt? Note that the provide is previous as in the provide is previous as in the provide in		
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In the collapse pressure rating of the casing? See well located within Capitan Reef? If yes, are the first 2 strings cemented to surface? If yes, are the first three strings cemented to surface? If yes, are the first three strings cemented to surface? If yes, are the first three strings cemented to surface? If yes, are there two strings cemented to surface? If yes, are there two strings cemented to surface? If yes, are there two strings cemented to surface? If yes, are there two strings cemented to surface? If yes, are there two strings cemented to surface? If yes, are there two strings cemented to surface? If yes, are there two strings cemented to surface? If yes, are there two strings cemented to surface? If yes, are there two strings cemented to surface? If yes, are there two strings cemented to surface? If yes, are there two strings cemented to surface? If yes, are there two strings cemented to surface? If yes, are there two strings cemented to surface? If yes, are there two strings cemented to surface? If yes, are there two strings cemented to surface? If yes, are there two strings cemented to surface? If yes, are there two strings cemented to surface? If yes, are there two strings cemented to surface?	is casing new; it used, attach certification as required in Ohshore Order #1	Y
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If yes, are the first 2 strings cemented to surface and 3 rd string cement tied back 500' into previous casing? s well located in R-111-P and SOPA? If yes, are the first three strings cemented to surface? Is 2 nd string set 100' to 600' below the base of salt? s well located in high Cave/Karst? If yes, are there two strings cemented to surface? (For 2 string wells) If yes, is there a contingency casing if loct circulation according.	Is well located in SOPA but not in R-111-P?	
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s well located in R-111-P and SOPA? If yes, are the first three strings cemented to surface? Is 2 nd string set 100' to 600' below the base of salt? s well located in high Cave/Karst? If yes, are there two strings cemented to surface? (For 2 string wells) If yes, is there a contingency casing if loct circulation according.	500' into previous casing?	
If yes, are the first three strings cemented to surface? Is 2 nd string set 100' to 600' below the base of salt? S well located in high Cave/Karst? If yes, are there two strings cemented to surface? (For 2 string wells) If yes, is there a contingency casing if loct circulation accounts.	The first of the second of	
If yes, are the first three strings cemented to surface? Is 2 nd string set 100' to 600' below the base of salt? s well located in high Cave/Karst? If yes, are there two strings cemented to surface? (For 2 string wells) If yes, is there a contingency casing if loct circulation accounts.	Is well located in R-111-P and SOPA2	
Is 2 nd string set 100' to 600' below the base of salt? s well located in high Cave/Karst? If yes, are there two strings cemented to surface? (For 2 string wells) If yes, is there a contingency casing if lost circulation account.		N
s well located in high Cave/Karst? If yes, are there two strings cemented to surface? (For 2 string wells) If yes, is there a contingency casing if lost circulation account.	Is 2 nd string and 100% to 000%.	
s well located in high Cave/Karst? If yes, are there two strings cemented to surface? (For 2 string wells) If yes, is there a contingency casing if lost circulation account.	is 2 String set 100 to 600 below the base of salt?	
If yes, are there two strings cemented to surface? (For 2 string wells) If yes, is there a contingency casing if lost circulation account.		ત્રાંભારા તે મુખ્યા છે. તારા હતા. અને જિલ્લો માન ને કાંગ્રેક કરો છે. પત્રો ભાગમાં ભાગમાં ભાગમાં છે. તે કે પ્રિયોગ મોહ માને માને માને મોર્ટ પ્રોમે
(For 2 string wells) If yes, is there a contingency casing if lost circulation accounts		N
(For 2 string wells) If yes, is there a contingency casing if lost circulation occurs?	if yes, are there two strings cemented to surface?	
	(For 2 string wells) If yes, is there a contingency casing if lost circulation occurs?	
스트 교통 프로마스 : 11 11 11 11 11 11 11 11 11 11 11 11 1		
s well located in Childar Cave/Karst?	is well located in Childai Cave/Karst?	
If yes, are there three strings cemented to surface?	If yes, are there three strings cemented to surface?	14

3. Cementing Program

Casing	# Sks	Wt. lb/ gal	Yld ft3/	H₂0 gal/sk		Slurry Description
Surf.	160	13.5	1.75	9		Lead: Class C + 4% Gel + 1% CaCl2
	250	14.8	1.34	6.34	8	Tail: Class C + 2% CaCl2
Inter.	500	12.7	2.0	9.6	16	Lead: 35:65:6 C Blend
	250	14.8	1.34	6.34		Tail: Class C + 2% CaCl
5.5 Prod	800	11.9	2.5	19		Lead: 50:50:10 H Blend
0.0 . 100	2750	14.4	1.24	5.7		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 st Intermediate	0'	50%
Production	2,440'	25% OH in Lateral (KOP to EOL) – 40% OH in Vertical

4. Pressure Control Equipment

N 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		Туре		X	Tested to:
				Anr	nular	×	2000 psi
				Blind	Ram		
12-1/4"	13-5/8"	2М		Pipe Ram			2M
				Double Ram			
			Ot	her*			
	13-5/8"			Annular		x	50% testing pressure
8-3/4"		3M	L	Blind	Ram	Х	
				Pipe Ram Double Ram		Х	3M
			Ot	ner*]

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.

	Formation integrity test will be performed per Onshore Order #2.
Х	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.
Υ	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.

5. Mud Program

The state of the state of the	Depth		Weight	St. Santage	43.
From	Tó,	Type	(ppg)	Viscosity	Water Loss
0	Surf. Shoe	FW Gel	8.6 - 8.8	28-34	NC
Surf csg	9-5/8" Int shoe	Saturated Brine	10 - 10.1	28-34	N/C
9-5/8" Int shoe	Lateral TD	Cut Brine	8.6 - 9.3	28-34	N/C

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?	D) (T/D) A (; 114
Prince this be deed to indinition the loss of gain of huld?	PVT/Pason/Visual Monitoring
	The death violati 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.
Υ	No Logs are planned based on well control or offset log information.
N	Drill stem test? If yes, explain.
N	Coring? If yes, explain.

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

7. Drilling Conditions

Condition	Spec	ify what type and where?
BH Pressure at deepest TVD		4180 psi at 8636' TVD
Abnormal Temperature		NO 145 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 (H2S) monitors will be installed prior to drilling out the surface shoe. If H2S 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	H2S is present	
Y	H2S Plan attached	

8. Other Facets of Operation

N	ls it a walking oper	ation?
Υ	ls casing pre-set?	

х	H2S Plan.
Х	BOP & Choke Schematics.
×	Directional Plan



COG Operating LLC

Eddy County, NM (NAD27 NME) Admiral Fed Com 501H

ОН

Plan: Plan 1 10-02-19

Standard Planning Report

02 October, 2019







Database: **USA Compass** Local Co-ordinate Reference: Well 501H Company: COG Operating LLC TVD Reference: RKB @ 3007.30usft (Ensign 155) Project: Eddy County, NM (NAD27 NME) MD Reference: RKB @ 3007.30usft (Ensign 155) Site: Admiral Fed Com North Reference Grid Well: 501H Survey Calculation Method: Minimum Curvature Wellbore: OH . Plan 1 10-02-19 Design: Project Eddy County, NM (NAD27 NME) Map System: US State Plane 1927 (Exact solution) System Datum: Mean Sea Level Geo Datum: NAD 1927 (NADCON CONUS) Map Zone: New Mexico East 3001 Admiral Fed Com Site Position: Northing: 398,093.60 usft Latitude: 32° 5' 38.479918 N From: Easting: 604,917.40 usft Longitude: 103° 59' 40.340397 W Position Uncertainty: 0.00 usft Slot Radius: 13-3/16 " **Grid Convergence:** 0.18° Well Well Position +N/-S 0.00 usft Northing: 398.093.60 usft Latitude: 32° 5' 38.479918 N +E/-W 0.00 usft Easting: 604,917,40 usft Longitude: 103° 59' 40.340397 W Position Uncertainty 1.00 usft Wellhead Elevation: Ground Level: 2.983.30 usft Wellbore Magnetics Model Name Sample Date Declination Dip Angle Field Strength (nT) MVHD 10/31/2019 47,796.51753698 Plan 1 10-02-19 **Audit Notes:** Version: Phase: Tie On Depth: 0.00 Vertical Section: Depth From (TVD) +N/-S Direction (usft) (usft) (usft) (°) · 0.00 0.00 356.51 Plan Survey Tool Program Date 10/2/2019 Depth From Depth To (usft) (usft) Survey (Wellbore) Tool Name 0.00 18,939.50 Plan 1 10-02-19 (OH) MWD+HRGM OWSG MWD + HRGM Plan Sections Measured Vertical Dogleg Build Turn Depth Inclination Azimuth Depth +N/-S +E/-W Rate." Rate Rate (usft) (°). (usft) (usft) (°/100usft) (usft) /100usft) (°/100usft) · (°) : Target 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 3,000.00 0.00 0.00 3,000.00 0.00 0.00 0.00 0.00 0.00 0.00 3,399.78 8.00 252.76 3,398.49 -8.25 -26.60 2.00 2.00 0.00 252.76

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0.00 BHL - Admiral Fed Cc





Database: Company: Project:

USA Compass COG Operating LLC

Site: Well: Wellbore:

Design:

Eddy County, NM (NAD27 NME)
Ädmiral Fed Com
501H
OH

Plan 1 10-02-19

Local Co-ordinate Reference: Well 501H
TVD Reference: RKB @ 3007.30usft (E

MD Reference: North Reference:

Survey Calculation Method:

RKB @ 3007.30usft (Ensign 155) RKB @ 3007.30usft (Ensign 155)

Grid Minimum Curvature

lanned	f Survey							1. Tark 1. 4		
* *	Measured			Vertical			i de la fille de l			
	Depth (usft)	Inclination (°)	Azimuth (°)	Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
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	LMAR (Top D					0.00	0.00	0.00	0.00	0.00
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a *	BLCN	0.00	0,00 	2,957.30	0.00	0.00	0.00	0.00	0.00	0.00
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	3,100.00	2.00	252.76	3,099.98	-0.52	-1.67	-0.41	2.00	2.00	0.00
	3,200.00	4.00	252.76	3,199.84	-2.07	-6.67	-1.66	2.00	2.00 2.00	0.00 0.00
	3,300.00	6.00	252.76	3,299.45	-4.65	-14.99	-3.73	2.00	2.00	0.00
	3,399.78	8.00	252.76	3,398,48	-8.25	-26.60	-6.62	2.00	2.00	0.00
	Hold 8.00° In	c at 252.76° Azm	14 T. W.				1 3	3 1.4 15	2.00	0.00
•	3,400.00	8.00	252.76	3,398.70	-8.26	-26.63	-6.63	0.04	0.04	0.00
	3,500.00	8.00	252.76	3,497.73	-12.38	-39.91	-9.93	0.00	0.00	0.00
	3,600.00	8.00	252.76	3,596.76	-16.50	-53.20	-13.24	0.00	0.00	0.00
	3,700.00	8.00	252.76	3,695.79	-20.63	-66.48	-16.54	0.00	0.00	0.00
	3,800.00	8,00	252.76	3,794.81	-24.75	-79.77	-19.85	0.00	0.00	0.00
	3,808.57	8.00	252.76	3,803.30	-25.10	-80.91	-20.13	0.00	0.00	0.00
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						-119.62	-29.77	0.00	0.00	0.00
	4,200.00 4,300.00	8.00 8.00	252.76	4,190.92	-41.23	-132.91	-33.07	0.00	0.00	0.00
	4,400.00	8.00	252.76 252.76	4,289.95 4,388.98	-45.35	-146.19	-36.38	0.00	0.00	0.00
	4,500.00	8.00	252.76	4,488.01	-49.48 -53.60	-159.48 -172.77	-39.68 -42.99	0.00	0.00	0.00
	4,600.00	8.00	252.76	4,587.04	-57,72	-186.05	-46.29	0.00 0.00	0.00 0.00	0.00 0.00
	4,700.00	8.00	252.76	4,686.06	-61.84		1			
	4,800.00	8.00	252.76	4,785.09	-65.96	-199.34 -212.62	-49.60 -52.91	0.00 0.00	0.00	0.00
	4,900.00	8.00	252.76	4,884.12	-70.08	-225.91	-56.21	0.00	0.00 0.00	0.00 0.00
	5,000.00	8.00	252.76	4,983.15	-74.21	-239.19	-59.52	0.00	0.00	0.00
	5,100.00	8.00	252.76	5,082.18	-78.33	-252.48	-62.82	0.00	0.00	0.00
	5,101.14	8.00	252.76	5,083.30	-78.37	-252.63	-62.86	0.00	0.00	0.00
	BYCN		en e						7.	5.00
	5,200.00	8.00	252.76	5,181.20	-82.45	-265.76	-66.13	0.00	0.00	0.00
	5,300.00	8.00	252.76	5,280.23	-86.57	-279.05	-69.43	0.00	0.00	0.00
	5,400.00 5,500.00	8.00	252.76	5,379.26	-90.69	-292.33	-72.74	0.00	0.00	0.00
		8.00	252.76	5,478.29	-94.81	-305.62	-76.05	0.00	0.00	0.00
	5,600.00	8.00	252.76	5,577.31	-98.94	-318.90	-79.35	0.00	0.00	0.00
	5,700.00	8.00	252.76	5,676.34	-103.06	-332.19	-82.66	0.00	0.00	0.00
	5,800.00 5,900.00	8.00	252.76	5,775.37	-107.18	-345.47	-85.96	0.00	0.00	0.00
	6,000.00	8.00 8.00	252.76 252.76	5,874.40 5,973.43	-111.30 -115.42	-358.76	-89.27	0.00	0.00	0.00
				5,973.43	-115.42	-372.04	-92.57	0.00	0.00	0.00
	6,100.00	8.00	252.76	6,072.45	-119.54	-385.33	-95.88	0.00	0.00	0.00
	6,200.00 6,300.00	8.00 8.00	252.76 252.76	6,171.48	-123.66	-398.61	-99.19	0.00	0.00	0.00
	6,400.00	8.00 8.00	252.76 252.76	6,270.51 6,369.54	-127.79 -131.91	-411.90 -425.18	102.49 105.80	0.00	0.00	0.00





Database: Company: USA Compass

Project:

COG Operating LLC

Site: Well:

Eddy County, NM (NAD27 NME) Admiral Fed Com 501H

Wellbore: ОН Design: Plan 1 10-02-19

a interest to Local Co-ordinate Reference:

TVD Reference MD Reference:

North Reference Survey Calculation Method: Well 501H

RKB @ 3007.30usft (Ensign 155) RKB @ 3007.30usft (Ensign 155)

Grid

Minimum Curvature

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Planne	d Survey		الهائم الراز الله الاحتجاز الهامات القامدات				- F.34 1.48	1 1 2 2 2 2 2 2 2 2 2 2		The state of the s	
	4			fill transfer							P 5 P 1
	Measured			Vertical			Vertical	Dogleg	Build	Turn	
	Depth	Inclination	Azimuth	Depth	+N/-S	+E/-W	Section	Rate	Rate	Rate	1.
	(usft)	(°)	(°)	(usft)	(usft)	(usft)	(usft).	(°/100usft)	(°/100usft)	(°/100usft)	
	6,500.00	8.00	252.76	6,468.57	-136.03	-438.47	-109:10	0.00	0.00	0.00	-
1	6,600.00	8.00	252.76	6,567.59	-140.15	-451.75	-112.41	0.00	0.00	0.00	
	6,700.00 6,707.75	8.00 8.00	252.76	6,666.62	-144.27	-465.04	-115,71	0.00	0.00	0.00	
	B Avalon Sh	Committee of the committee of	252.76	6,674.30	-144.59	-466.07	-115.97	0.00	0.00	0.00	
' '	6,710.78	8.00	252.76	6.677.20	444.75	i arian in	5 <u>K</u>				
,	Bone Sprg (ي ودوسود د د د د د د د	252.76	6,677.30	-144.72	-466.47	-116.07	0.00	0.00	0.00	
1 ***	6,800.00	8.00	252.76	676565	440.00				*		
				6,765.65	-148.39	-478.32	-119.02	0.00	0.00	0.00	
-	6,900.00	8.00	252.76	6,864.68	-152.52	-491.61	-122.33	0.00	0.00	0.00	
	7,000.00 7,027.87	8.00 8.00	252.76	6,963.70	-156.64	-504.90	-125.63	0.00	0.00	0.00	
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,	7,100.00	8.00	252.76	7.062.72	400.70	5.5.4		and the said of the	The second of th		
	7,124.01	8.00	252.76	7,062.73 7,086.51	-160.76 -161.75	-518.18 -521.37	-128.94 -129.73	0.00	0.00	0.00	
17.	Begin 2.00°/			7,000.01	-101.73	-321.37	-129.73	0.00	0.00	0.00	
-	Commercial	more and and	2 10 10 10		ar mark					· 20 ·	
	7,200.00 7,300.00	6.48 4.48	252.76	7,161.89	-164.58	-530.51	-132.01	2.00	-2.00	0.00	
	7,323.94	4.00	252.76 252.76	7,261.43 7,285.30	-167.41	-539.63	-134.27	2.00	-2.00	0.00	l
	L Avaion Sh		232.10	7,205.30	-167.94	-541.31	-134.69	2.00	-2.00	0.00	
	7,400.00	2.48	252.76	7,361.24	-169.21	545.40		AN A Been			
İ	7,500.00	0.48	252.76	7,461.20	-169.97	-545.42 -547.88	-135.71 -136.33	2.00	-2.00	0.00	
	7,523.80	0.00						2.00	-2.00	0.00	
,	Begin Vertic		0.00	7,485.00	-170.00	-547.97	-136.35	2.00	-2.00	0.00	
	7,630.10	0.00	0.00	7,591.30	-170.00	547.07	100.05		ಿನ್ ಚಿತ್ರವೃತ್ತಿಗ		10
	FBSG			,,551.55	-170.00	-547.97	-136.35	0.00	0.00	0.00	ļ
	8,098.84	0.00	0.00	8,060.04	-170.00	-547.97	-136.35	0.00	0,00	2000	-
1 2	KOP2, Begin	10.00°/100' Build			17 J. P. S. S.	φ	130.33	0.00	0.00	0.00	
	8,100.00	0.12	359.55	8,061.20	-170.00	-547.97	-136.35	10.02	10.02	0.00	
	8,200.00	10.12	359.55	8,160.68	-161.09	-548.04	-127.45	10.00	10.00	0.00	
	8,300.00	20.12	359.55	8,257.10	-135.05	-548.24	-101.45	10,00	10.00		
İ	8,300.22	20.12	359.55	8,257.30	-134.97	-548.24	-101.37	0.00	0.00	0.00 0.00	İ
	SBSG		1 to 1 to 1	,		ুণ্ডার জ	n vi Cita			5.00 V 4.00 C	
	8,400.00	30.12	359.55	8,347.53	-92.66	-548.58	-59.11	10.02	10.02	0.00	
	8,500.00	40.12	359.55	8,429.22	-35.21	-549.03	-1.74	10.00	10.00	0.00	į
	8,600.00	50.12	359.55	8,499.70	35.55	-549,58	68.92	10.00	10.00	0.00	1
	8,700.00	60.12	359,55	8,556.82	117.48	-550.22	150.73	10.00	10.00	0.00	
	8,800.00	70.12	359.55	8,598.84	208.08	-550.93	241.21	10.00	10.00	0.00	
	8,900.00 8,998.84	80,12 90.00	359.55	8,624.49	304.60	-551.69	337.59	10.00	10.00	0.00	
	4 1 5 5 5 5	0° Inc at 359,55°	359.55	8,633.00	402.94	-552.46	435.81	10.00	10.00	0.00	
	9,000.00	90.00	359.55	8,633.00	404.10	-552.47	436.96	0.00	0.00	0.00	
	9,100.00	90.00	359.55	8,633.00	504.10	-553.26	536.82				-
	9,200.00	90.00	359.55	8,633.00	604.10	-554.04	636.68	0.00 0.00	0.00 0.00	0.00	1
	9,300.00	90.00	359.55	8,633.00	704.09	-554.82	736.54	0.00	0.00	0,00 0,00	
	9,400.00	90.00	359.55	8,633.00	804.09	-555.61	836.40	0.00	0.00	0.00	
	9,500.00	90.00	359.55	8,633.00	904.09	-556.39	936.26	0.00	0.00	0.00	
	9,600.00	90.00	359.55	8,633.00	1,004.08	-557.18	1 036.12	0.00	0.00	0.00	ł
	9,700.00	90.00	359.55	8,633.00	1,104.08	-557.96	1,135.98	0.00	0.00	0.00	
	9,800.00	90.00	359.55	8,633.00	1,204,08	-558.74	1,235.84	0.00	0.00	0.00	1
	9,900.00	90.00	359.55	8,633.00	1,304.07	-559,53	1,335.70	0.00	0.00	0.00	
	10,000.00	90.00	359.55	8,633.00	1,404.07	-560,31	1,435.56	0.00	0.00	0.00	
	10,100.00	90.00	. 359.55	8,633.00	1,504.07	-561.10	1,535.42	0.00	. 0.00	0.00	





Database: Company: Project:

Site:

Well:

USA Compass

COG Operating LLC Eddy County, NM (NAD27 NME)

Admiral Fed Com.

501H ОН

Wellbore: Design: Plan 1 10-02-19 Local Co-ordinate Reference:

Local Co-ordinate Received
TVD Reference:
MD Reference:
North Reference:
Survey Calculation Method:

Well 501H

RKB @ 3007.30usft (Ensign 155) RKB @ 3007.30usft (Ensign 155) Grid

Minimum Curvature

Non-ad Comme							·		ئد سنديد دعاميه
Planned Survey						5. 化施克特斯内线 6. 医克萨克氏征	The second of th		
Monoured									
Measured Depth			Vertical			Vertical	Dogleg	Build	Turn
(usft) (Inclination	Azimuth	Depth	+N/-S	+E/-W	Section	Rate	Rate	Rate
(usn),	(°)	(*)	(usft)	(usft)	(usft)	(usft)	(°/100usft)	(°/100usft)	(°/100usft)
10,200.00	90.00	359.55	8,633.00	1,604.07	-561.88	1,635.28	0.00	0.00	0.00
10,300.00	90.00	359.55	8,633.00	1,704.06	-562,66	1,735.14	0.00	0.00	0.00 0.00
10,400.00	90.00	359.55	8,633.00	1,804.06	-563 45	1,835.00	0.00	0.00	0.00
10,500.00	90.00	359.55	8,633.00	1,904.06	-564.23	1,934.85	0.00	0.00	0.00
10,600.00	90.00	359.55	8,633.00	2,004.05	-565.02				
10,700.00	90.00	359.55	8,633.00	2,104.05	-565.B0		0.00	0.00	0.00
10,800.00	90.00	359.55	8,633.00	2,204.05	-566.58	2,134.57	0.00	0.00	0.00
10,900.00	90.00	359.55	8,633.00	2,304.04	-567.37	2,234.43 2,334.29	0.00	0.00	0.00
11,000.00	90.00	359.55	8,633.00	2,404.04	-568.15	2,334.29	0.00	0.00	0.00
11,100.00	90.00				1:		0,00	0.00	0.00
11,200.00	90.00	359.55	8,633.00	2,504.04	-568.94	2,534.01	0.00	0.00	0.00
11,300.00	90.00	359.55 359.55	8,633.00	2,604.04	-569.72	2,633.87	0.00	0.00	0.00
11,400.00	90.00	359.55 359.55	8,633.00	2,704.03	-570.50	2,733.73	0.00	0.00	0.00
11,500.00	90.00	359.55	8,633.00	2,804.03	-571.29	2,833.59	0.00	0.00	0.00
		•	8,633.00	2,904.03	-572.07	2,933.45	0.00	0.00	0.00
11,600.00	90.00	359.55	8,633.00	3,004.02	-572.86	3,033.31	0.00	0.00	0.00
11,700.00	90.00	359.55	8,633.00	3,104.02	-573.64	3,133.17	0.00	0.00	0.00
11,800.00	90.00	359.55	8,633.00	3,204.02	-574.42	3,233.03	0.00	0.00	0.00
11,900.00	90.00	359.55	8,633.00	3,304.01	-575.21	3,332.89	0.00	0.00	0.00
12,000,00	90.00	359.55	8,633.00	3,404.01	-575.99	3,432.75	0.00	0.00	0.00
12,100.00	90.00	359.55	8,633.00	3,504.01	-576.78	3,532.61			
12,200.00	90.00	359.55	8,633.00	3,604.00	-577.56	3,532.61	0.00	0.00	0.00
12,300.00	90.00	359.55	8,633,00	3,704.00	-578.34	3,732.32	0.00	0.00	0.00
12,400.00	90.00	359.55	8,633.00	3,804.00	-579.13	3,832.18	0.00	0.00	0.00
12,500.00	90.00	359.55	8,633.00	3,904.00	-579.91	3,932.16	0.00 0.00	0.00	0.00
12,600.00	00.00						0.00	0.00	0.00
12,700.00	90.00 90.00	359.55	8,633.00	4,003.99	-580.70	4,031.90	0.00	0.00	0.00
12,800.00	90.00	359.55	8,633.00	4,103.99	-581.48	4,131.76	0.00	0.00	0.00
12,900.00	90.00	359.55 359.55	8,633.00	4,203.99	-582.26	4,231.62	0.00	0.00	0.00
13.000.00	90.00		8,633.00	4,303.98	-583.05	4,331.48	0.00	0.00	0.00
		359.55	8,633.00	4,403.98	-583,83	4,431.34	0.00	0.00	0.00
13,100.00	90.00	359.55	8,633.00	4,503.98	-584,62	4,531.20	0.00	0.00	0.00
13,200.00	90.00	359.55	8,633.00	4,603.97	-585.40	4.631.06	0.00	0.00	0.00
13,300.00	90.00	359.55	8,633.00	4,703.97	-586.18	4,730.92	0.00	0.00	0.00
13,400.00	90.00	359.55	8,633.00	4,803.97	-586.97	4,830.78	0.00	0.00	0.00
13,500.00	90.00	359.55	8,633.00	4,903.96	-587.75	4,930.64	0.00	0.00	0.00
13,600.00	90.00	359,55	8,633.00	5,003.96	-588.54	5,030.50	0.00	0.00	
13,700.00	90.00	359.55	8,633.00	5,103.96	-589.32	5,130.36	0.00	0.00 0.00	0.00
13,800.00	90.00	359.55	8,633.00	5,203.96	-590.10	5,230.22	0.00	0.00	0.00 0.00
13,900.00	90:00	359.55	8,633.00	5,303.95	-590.89	5,330.07	0.00	0.00	0.00
14,000.00	90.00	359.55	8,633.00	5,403.95	-591.67	5,429.93	0.00	0.00	0.00
14,100.00	90.00	359.55	8,633.00	5,503,95	-592.46	\ \			
14,200.00	90.00	359.55	8,633.00	5,603.94	-592.46 -593.24	5,529.79	0.00	0.00	0.00
14,300.00	90.00	359.55	8,633.00	5,703.94	-594.02	5,629.65 5,729.51	0.00	0.00	0,00
14,400.00	90.00	359.55	8,633.00	5,803.94	-594.81	5,829.37	0.00 0.00	0.00	0.00
14,500.00	90.00	359.55	8,633.00	5,903.93	-595.59	5,929.23	0.00	0.00	0.00
14,600,00	00.00					1		0.00	0.00
14,700.00	90.00 90.00	359,55	8,633.00	6,003.93	-596.38	6,029.09	0.00	0.00	0.00
14,800.00	90.00	359,55	8,633.00	6,103.93	-597,16	6,128.95	0.00	0.00	0.00
14,900.00	90.00	359.55	8,633.00	6,203.92	-597.94	6,228.81	0.00	0.00	0.00
15,000.00	90.00	359.55	8,633.00	6,303.92	-598.73	6,328.67	0.00	0.00	0.00
		359.55	8,633.00	6,403.92	-599.51	6,428.53	0.00	0.00	0.00
J 15,100.00	90.00	359.55	8,633.00	6,503.92	-600.30	6,528.39	0.00	0.00	
15,200.00	90.00	359.55	8,633.00	6,603.91	-601.08	6,628.25	0.00	0.00	0.00
15,300.00	90.00	359.55	8,633.00	6,703.91	-601.87	6,728.11	0.00	0.00	0.00 0.00
15,400.00	90.00	359.55	8,633.00	6,803.91	-602.65	6,827.97	0.00	0.00	0.00
15,500.00	90.00	359.55	8,633.00	6,903.90	-603.43	6 927.83	0.00	0.00	0.00





Database: Company: USA Compass

COG Operating LLC . Project:

Site: Well: Wellbore:

Design:

Eddy County, NM (NAD27 NME) Admiral Fed Com Admiral Feu 501H

Plan 1 10-02-19

North Reference: Grid Survey Calculation Method: Minimum Curvature

Local Co-ordinate Reference: Well 501H
TVD Reference RKB @ 3007,30usft (Ensign 155) Local Co-ordinate Reference: Well 501H

TVD Reference: RKB @ 3007.30usft (Ensign 155)

MD Reference: RKB @ 3007.30usft (Ensign 155)

North Reference: Grid

Survey Calculation Method:

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	- 1.				.~,

Measured Depth (usft)	Inclination	Áżimuth	Vertical Depth	+N/-S	+E/-W	Vertical Section	Dogleg Rate	Build Rate	Turn Rate
	(°)	(°)	(usft)	(usft)	(usft)	(usft)	(°/100usft)	(°/100usft)	(°/100usft)
15,600.00	90.00	359.55	8,633.00	7,003.90	-604.22	7,027.68	0.00	0.00	0.00
15,700.00	90.00	359.55	8,633.00	7,103.90	-605.po	7,127.54	0.00	0.00	0.00
15,800.00	90.00	359.55	8,633.00	7,203.89	-605.79	7,227.40	0.00	0.00	0.00
15,900.00	90.00	359.55	8,633.00	7,303.89	-606,57	7,327.26	0.00	0.00	0.00
16,000.00	90.00	359,55	8,633.00	7,403.89	-607.35	7,427.12	0.00	0.00	0.00
16,100.00	90.00	359.55	8,633.00	7,503.88	-608.14	7,526.98	0.00	0.00	0.00
16,200.00	90,00	359.55	8,633.00	7,603.88	-608.92	7,626.84	0.00	0.00	0.00
16,300.00	90.00	359.55	8,633.00	7,703.88	-609.71	7,726,70	0.00	0.00	0.00
16,400.00	90.00	359.55	8,633.00	7,803.88	-610,49	7,826,56	0.00	0.00	0.00
16,500.00	90.00	359.55	8,633.00	7,903.87	-611.27	7,926.42	0.00	0.00	0.00
16,600.00	90.00	359.55	8,633.00	8,003.87	-612.06	8,026,28	0.00	0.00	0.00
16,700.00	90.00	359.55	8,633.00	8,103.87	-612.84	8,126.14	0.00	0.00	
16,800.00	90.00	359.55	8,633,00	8,203,86	-613.63	8,226.00	0.00	0.00	0.00
16,900.00	90.00	359.55	8,633.00	8,303.86	-614.41	8,325.86	0.00	0.00	0.00
17,000.00	90.00	359.55	8,633.00	8,403.86	-615.19	8,425,72	0.00	0.00	0.00 0.00
17,100.00	90.00	359.55	8,633,00	8,503.85	-615.98	8,525,58			
17,200.00	90.00	359.55	8,633.00	8,603.85	-616.76	8,625,44	0.00	0.00	0.00
17,300.00	90,00	359.55	8,633,00	8.703.85	-617.55		0.00	0.00	0.00
17,400.00	90.00	359.55	8,633,00	8,803,84	-618.33	8,725.30	0.00	0.00	0.00
17,500,00	90,00	359.55	8,633.00	8,903.84	1	8,825.15	0.00	0.00	0.00
			·		-619.11	8,925.01	0.00	0.00	0.00
17,600.00	90.00	359.55	8,633.00	9,003.84	-619.90	9,024.87	0.00	0.00	0.00
17,700.00	90.00	359.55	8,633.00	9,103.84	-620.68	9,124,73	0.00	0.00	0.00
17,800.00	90.00	359.55	8,633.00	9,203.83	-621.47	9,224.59	0.00	0.00	0.00
17,900.00	90.00	359.55	8,633.00	9,303.83	-622.25	9,324.45	0.00	0.00	0.00
18,000.00	90.00	359.55	8,633.00	9,403.83	-623.03	9,424.31	0.00	0.00	0.00
18,100.00	90.00	359,55	8,633.00	9,503.82	-623.82	9,524.17	0.00	0.00	0.00
18,200.00	90.00	359.55	8,633.00	9,603.82	-624.60	9,624.03	0.00	0.00	0.00
18,300.00	90.00	359.55	8,633.00	9,703.82	-625.39	9,723.89	0.00	0.00	0.00
18,400.00	90.00	359,55	8,633.00	9,803.81	-626.17	9,823.75	0.00	0.00	0.00
18,500.00	90.00	359.55	8,633.00	9,903.81	-626.95	9,923.61	0.00	0,00	0.00
18,600.00	90.00	359.55	8,633.00	10,003,81	-627.74	10,023.47	0.00	0.00	0.00
18,700.00	90.00	359.55	8,633.00	10,103,80	-628.52	10,123.33	0.00	0.00	
18,800.00	90.00	359.55	8,633.00	10,203.80	-629.31	10,123.33	0.00	0.00	0.00 0.00
18,900.00	90.00	359.55	8,633.00	10,303.80	-630.09	10,323.05	0.00	0.00	0.00
18,939.50	90.00	359.55	8,633.00	10,343.30	-630.40	10,362.49	0.00	0.00	0.00

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ı		c,	,,,	••		21	9	c	w

Target Name - hit/miss target Di - Shape	•	p Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)		Latitude L	on gitude
LTP - Admiral Fed Com - plan misses target cen - Point	0.00 ter by 0.01usft	0.00 at 18889	8,633.00 9.50usft MD	10,293.30 (8633.00 TVD,	-630.00 10293.30 N	408,386.9 I, -630.01 E)	604,287.40	32°	7' 20.366012 N 103° 59	9' 47.290070 W
BHL - Admiral Fed Com - plan hits target center - Point	0.00	0.00	8,633.00	10,343.30	-630.40	408,436.9	604,287.00	32°	7' 20.860843 N 103° 59	' 47.292904 W
FTP - Admiral Fed Com - plan misses target cen	0.00 ter by 204 70us	0.00	8,633.00	-122.50	-548.50	397,971.1	0 604,368.90	32°	5' 37.284616 N 103° 59	' 46.721035 W

- Point





Database: Company: Project:

USA Compass

COG Operating LLC

Eddy County, NM (NAD27 NME)

Site: Well: Admiral Fed Com 501H

Wellbore: Design:

ОН Plan 1 10-02-19 Local Co-ordinate Reference: TVD Reference: MD Reference:

MD Reference:

North Reference: Survey Calculation Method:

Well 501H

RKB @ 3007.30usft (Ensign 155) ,

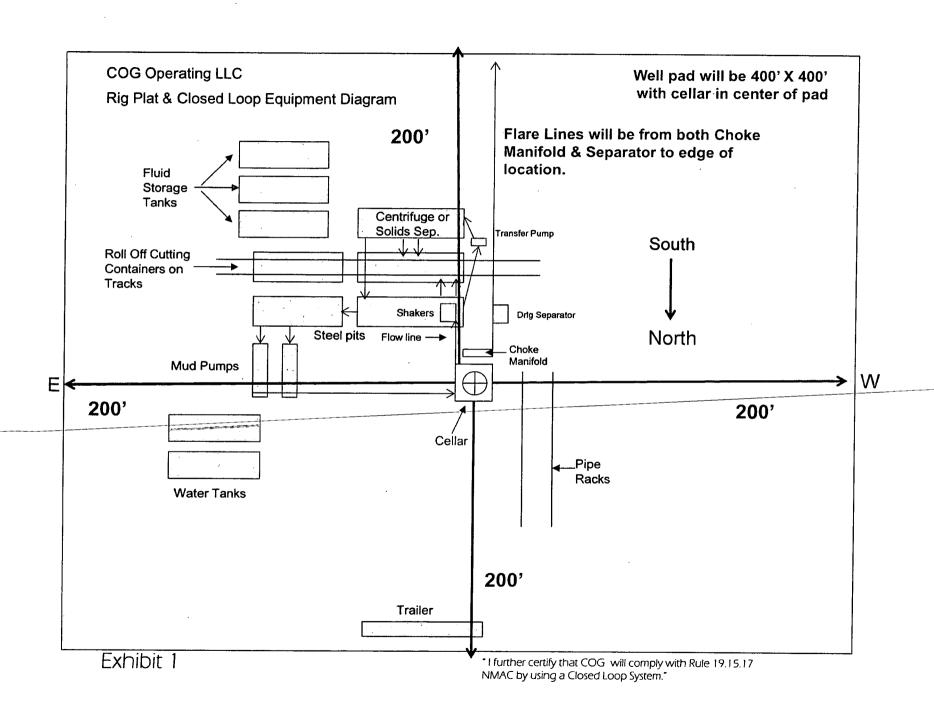
RKB @ 3007.30usft (Ensign 155)

Grid

Minimum Curvature

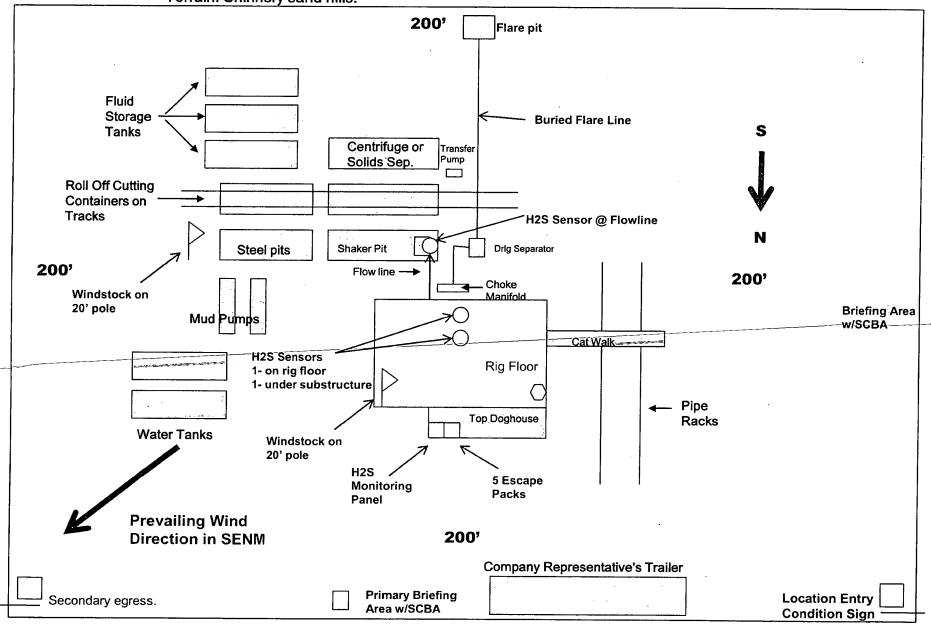
Formations				
Measured Depth (usft)	Vertical Depth (úsft)	Name	Dip Dip Direction Lithology (°) (°)	
560.3	560.30	Rustler	0.00 356.51	
732.3	0 732,30	TOS	0.00 356.51	
2,732.3	0 2,732.30	BOS (Fletcher)	0.00 356.51	
2,913.3	0 2,913.30	LMAR (Top Delaware)	0.00 356,51	
2,957.3	0 2,957.30	BLCN	0.00 356.51	
3,808.5	7 3,803,30	CYCN	0.00 356,51	
5,101.1	4 5,083.30	BYCN	0.00 356.51	
6,707.7	5 6,674.30	B Avaion Sh	0.00 356.51	
6,710.7	8 6,677,30	Bone Sprg (BSGL)	0.00 356.51	
7,027.8		U Avalon Sh	0.00 356.51	
7,323.9	4 7,285.30	L Avalon Sh	0.00 356.51	
7,630.1	0 7,591.30	FBSG	0.00 356.51	
8,300.2	2 8,257.30	SBSG	0.00 356.51	

(usft) (usft)	(usft)			
3,000.00 3,000.00 3,399.78 3,398.48 7,124.01 7,086.51 7,523.80 7,485.00 8,098.84 8,060.04 8,998.84 8,633.00 18,939.50 8,633.00	0.00 -8.25 -161.75 -170.00 -170.00 402.94 10,343.30	0.00 -26.60 -521.37 -547.97 -547.97 -552.46 -630.40	Hold 8.00° Inc at 252.76° Azm Begin 2.00°/100' Drop Begin Vertical Hold KOP2, Begin 10.00°/100' Build LP, Hold 90.00° Inc at 359.55° Azm	



COG Operating LLC H₂S Equipment Schematic Terrain: Shinnery sand hills.

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



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 (H₂S).
- b. The proper use and maintenance of personal protective equipment and life support systems.
- c. The proper use of H₂S 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 H2S 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.
- The contents and requirements of the H₂S Drilling Operations Plan and the Public Protection Plan.

There will be an initial training session just prior to encountering a known or probable H2S zone (within 3 days or 500 feet) and weekly H2S and well control drills for all personnel in each crew. The initial training session shall include a review of the site specific H2S 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. <u>H₂S SAFETY EQUIPMENT AND SYSTEMS</u>

Note: All H₂S 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 H₂S. If H₂S greater than 100 ppm is encountered in the gas stream we will shut in and install H₂S 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.

WARNING

YOU ARE ENTERING AN H₂S 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

OFFICE

MOBILE

COG OPERATING LLC OFFICE

575-748-6940

SETH WILD

432-683-7443

432-528-3633

JOHN COFFMAN

432-685-4310

432-631-9762

EMERGENCY RESPONSE NUMBERS

	<u>OFFICE</u>
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

Surface Use Plan COG Operating LLC Admiral Federal Com 501H SHL: 220' FSL & 880' FWL

Section 28, T25S, R29E BHL: 50' FNL & 330' FWL

Section 21, T25S, R29E Eddy County, New Mexico ULM

UL D

Surface Use & Operating Plan

Admiral Federal Com #501H

- Surface Owner: Bureau of Land Management
- New Road: 2194.2' well pad to road tie-in east of CTB.
- Flow Line: Buried onsite
- Tank Battery Facilities: 780' FSL & 2640' FEL, Sec. 28-T25S-R29E
- Well Pad: Multiple. Admiral Federal Com 501H and 502H share a well pad.

Well Site Information

- V Door: East
- Topsoil: West
- Interim Reclamation: West

Attachments

- C102
- Closed Loop System
- Layout
- Brine H20
- Fresh H2O
- Existing Roads
- 1Mile Map and Data
- Maps and Plats
- Well Site Layout

Surface Use Plan COG Operating LLC

Admiral Federal Com 501H

SHL: 220' FSL & 880' FWL Section 28, T25S, R29E

ULM

BHL: 50' FNL & 330' FWL

UL D

Section 21, T25S, R29E Eddy County, New Mexico

Reclamation

Notes

<u>Onsite</u>: On-site was done by Gerald Herrera (COG), Zane Kirsch (BLM), and Matias Telles (BLM) on August 21, 2019.

Surface Use Plan

Surface Use Plan COG Operating LLC Admiral Federal Com 501H

SHL: 220' FSL & 880' FWL

UL M

Section 28, T25S, R29E BHL: 50' FNL & 330' FWL

UL D

Section 21, T25S, R29E Eddy County, New Mexico

SURFACE USE AND OPERATING PLAN

1. Existing & Proposed Access Roads

- A. The well site survey and elevation plat for the proposed well is attached with this application. It was staked by Harcrow Surveying, Artesia, NM.
- B. All roads to the location are shown on the maps and road plats. The existing lease roads are illustrated and are adequate for travel during drilling and production operations. Upgrading existing roads prior to drilling the well will be done where necessary. The road route to the well site is depicted in well layout map. The road shown in the well layout will be used to access the well.
- C. Directions to location: See 600 x 600 plat.

FROM THE INTERSECTION OF HIGHWAY 285 AND LONGHORN RD. (CR-725), GO NORTHEAST ON CR-725 FOR APPROX. 4.2 M LES; THEN TURN LEFT (NORTHEAST) AND GO APPROX. 1.8 MILES; THEN TURN LEFT (NORTHNORTHWEST) AND GO APPROX. 0.9 MILES, THEN TURN LEFT (WEST) AND GO APPROX. 248 FEET TO THE PROPOSED ADMIRAL FED COM 504H/505H WELL PAD ROAD. PROPOSED WELLS LIE APPROX. 0.7 MILES WESTERLY.

D. Based on current road maintenance performed on other roads serving existing wells, we anticipate maintaining the lease roads leading to the proposed well pad at least once a year on dry conditions and twice a year in wetter conditions.

2. Proposed Access Road:

The Location Verification Map shows that 2194.2 ft. of new road to the tie-in east of the CTB will be required for this location. The required roads will be constructed as follows:

The maximum width of the running surface will be 14'. The road will be crowned, ditched and constructed of 6" rolled and compacted caliche. Ditches will be at 3:1 slope and 4 feet wide. Water will be diverted where necessary to avoid ponding, prevent be consistent with local drainage patterns.

- A. The average grade will be less than 1%.
- B. No turnouts are planned.
- C. No cattleguard, culvert, gates, or fence cuts are necessary.

Surface Use Plan COG Operating LLC Admiral Federal Com 501H SHL: 220' FSL & 880' FWL

UL M

BHL: 50' FNL & 330' FWL Section 21, T25S, R29E

Section 28, T25S, R29E

ULD

Eddy County, New Mexico

D. Surfacing material will consist of native caliche. Caliche will be obtained from the actual well site if available. If not available onsite, caliche will be obtained from a Federal Caliche Pit located in Section 23, T25S, R29E.

3. Location of Existing Well:

The One-Mile Radius Map shows existing wells within a one-mile radius of the proposed wellbore.

4. Location of Existing and/or Proposed Facilities:

A Central Tank Battery will be constructed 7\\$0' FSL & 2640' FEL of Section 28, T25S, R29E. Topsoil will be on the eastside of the CTB pad.

Production from 5 producing Admiral Federal Com wells will be routed to the CTB.

Planned Pipeline Installation across adjoining pads:

1 buried 4-inch FP 601HT production flowline 1409.3' from the wellhead to CTB

1 buried 4-inch FP line for gas-lift supply 1429.2' from CTB to well site servicing

1 buried 6-inch Poly water transfer line 623.5' from CTB to existing Admiral Fed Com 2H battery as shown on layout plat.

Above pipeline routes shown on attached facility layout plat.

- The tank battery and facilities including all flow lines and piping will be installed 2) according to API specifications.
- 3) Any additional caliche will be obtained from the actual well site. If caliche does not exist or is not plentiful from the well site, caliche will be obtained from the Federal Caliche Pit located in Section 23, T25S, R29E. Any additional construction materials will be purchased from contractors.
- It will be necessary to run electric power if this well is productive. Power will be provided by Xcel Energy and they will submit a separate plan and ROW for service to the well location.
- 5) If the well is productive, rehabilitation plans will include the following:

Surface Use Plan

COG Operating LLC

Admiral Federal Com 501H

SHL: 220' FSL & 880' FWL UL M

Section 28, T25S, R29E

BHL: 50' FNL & 330' FWL UL D

Section 21, T25S, R29E

Eddy County, New Mexico

6) The original topsoil from the well site will be returned to the location, and the site will be re-contoured as close as possible to the original site.

5. Location and Type of Water Supply:

The well will be drilled with combination brine and fresh water mud system as outlined in the drilling program. Fresh water will be obtained from the Mescal Frac Pond located in Section 22, T25S, R29E. Brine water will be obtained from the Malaga I Brine Station in Sec 2, T21S, R25E, or if necessary other commercial water stations in the area and hauled to location by transport truck over the existing and proposed access roads shown in road maps. If a commercial fresh water source is nearby, fast line may be laid along existing road ROW's and fresh water pumped to the well. No water well will be drilled on the location.

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

Obtaining caliche: One primary way of obtaining caliche to build locations and roads will be by "turning over" the location. This means, caliche will be obtained from the actual well site. Amount will vary for each pad. The procedure below has been approved by BLM personnel:

- A. The top 6 inches of topsoil is pushed off and stockpiled along the side of the location.
- B. An approximate 160' X 160' area is used within the proposed well site to remove caliche.
- C. Subsoil is removed and stockpiled within the surveyed well pad.
- D. When caliche is found, material will be stock piled within the pad site to build the location and road.
- E. Then subsoil is pushed back in the hole and caliche is spread accordingly across entire location and road.
- F. Once well is drilled, the stock piled top soil will be used for interim reclamation and spread along areas where caliche is picked up and the location size is reduced.
- G. Neither caliche, nor subsoil will be stock piled outside of the well pad. Topsoil will be stockpiled along the edge of the pad as depicted in the Well Site Layout or survey plat.
- H. Methods of Handling Water Disposal:

Surface Use Plan
COG Operating LLC
Admiral Federal Com 501H
SHL: 220' FSL & 880' FWL UL M
Section 28, T25S, R29E
BHL: 50' FNL & 330' FWL UL D
Section 21, T25S, R29E
Eddy County, New Mexico

- The well will be drilled utilizing a closed loop mud system. Drill cuttings will be held in roll-off style mud boxes and taken to R360's disposal site.
- Drilling fluids will be contained in steel mud pits.
- Water produced from the well during completion will be held temporarily in steel tanks and then taken to an NMOCD approved commercial disposal facility.
- Garbage and trash produced during drilling or completion operations will be collected in a trash bin and hauled to an approved landfill. No toxic waste or hazardous chemicals will be produced by this operation.
- Human waste and grey water will need to be properly contained and disposed of.
 Proper disposal and elimination of waste and grey water may include but are not
 limited to portable septic systems and/or portable waste gathering systems (i.e.
 portable toilets).
- After the rig is moved out and the well is either completed or abandoned, all waste materials will be cleaned up within 30 days. In the event of a dry hole only a dry hole marker will remain.

7. Ancillary Facilities:

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

8. Well Site Layout:

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

9. Plans for Restoration of the Surface:

A. Interim Reclamation will take place after the well has been completed. The pad will be downsized by reclaiming the areas not needed for production operations. The portions of

Surface Use Plan

Page 6

Surface Use Plan COG Operating LLC Admiral Federal Com 501H SHL: 220' FSL & 880' FWL Section 28, T25S, R29E BHL: 50' FNL & 330' FWL

ULM

ULD

330' FWL R29F

Section 21, T25S, R29E Eddy County, New Mexico

the pad that are not needed for production operations will be re-contoured to its original state as much as possible. The caliche that is removed will be reused to either build another pad site or for road repairs within the lease. The stockpiled topsoil will then be spread out reclaimed area and reseeded with a BLM approved seed mixture. In the event that the well must be worked over or maintained, it may be necessary to drive, park, and/or operate machinery on reclaimed land. This area will be repaired or reclaimed after work is complete.

10. Sedimentation and Erosion Control

Straw Waddles will be used as necessary at the well site to reduce sediment impacts to fragile/sensitive soils.

B. Final Reclamation: Upon plugging and abandoning the well all caliche for well pad and lease road will be removed and surface will be recountoured to reflect its surroundings as much as possible. Caliche will be recycled for road repair or reused for another well pad within the lease. If any topsoil remains, it will be spread out and the area will be reseeded with a BLM approved mixture and re-vegetated as per BLM orders. When required by BLM, the well pad site will be restored to match pre-construction grades.

11. Surface Ownership:

- A. The surface is owned by The United States Government, Bureau of Land Management. The surface is multiple uses with the primary uses of the region for grazing of livestock and the production of oil and gas. The surface owner was notified before staking this well.
- B. The proposed road routes and surface location will be restored as directed by the BLM.

12. Other Information:

- A. The area around the well site is grassland and the topsoil is sandy. The vegetation is moderately sparse with native prairie grasses, some mesquite and shinnery oak. No wildlife was observed but it is likely that mule deer, rabbits, coyotes and rodents traverse the area.
- B. There is no permanent or live water in the immediate area.
- C. There are no dwellings within 2 miles of this location.

Surface Use Plan
COG Operating LLC
Admiral Federal Com 501H

SHL: 220' FSL & 880' FWL Section 28, T25S, R29E

Section 28, T25S, R29E BHL: 50' FNL & 330' FWL

UL D

UL M

Section 21, T25S, R29E Eddy County, New Mexico

D. If needed, a Cultural Resources Examination is being prepared by Boone Arch Services of NM, LLC., 2030 North Canal, Carlsbad, New Mexico, 88220, phone number 575-885-1352 and the results will be forwarded to your office in the near future. Otherwise, COG will be participating in the Permian Basin MOA Program.

13. Bond Coverage:

Bond Coverage is Statewide Bond NMB000215

14. Lessee's and Operator's Representative:

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

Seth Wild Drilling Superintendent COG Operating LLC One Concho Center 600 W Illinois Ave Midland, TX 79701

(432) 221-0414 (office) (432) 525-3633(cell) Ray Peterson
Drilling Manager
COG Operating LLC
One Concho Center
600 W Illinois Ave
Midland, TX 79701

Phone (432) 685-4304 (office) (432) 818-2254 (business)

PECOS DISTRICT DRILLING OPERATIONS CONDITIONS OF APPROVAL

OPERATOR'S NAME: COG Operating LLC

LEASE NO.: NMNM096848

WELL NAME & NO.: | Admiral Federal Com 502H SURFACE HOLE FOOTAGE: | 220' FSL & 910' FWL

SURFACE HOLE FOOTAGE: | 220' FSL & 910' FWL BOTTOM HOLE FOOTAGE | 50' FNL & 1485' FWL

LOCATION: Section 28, T 25S, R 29E, NMPM COUNTY: Eddy County, New Mexico

H2S	© Yes	€ No	
Potash	• None	Secretary	○ R-111-P
Cave/Karst Potential	C Low	6 Medium	C High
Variance	○ None	© Flex Hose	○ Other
Wellhead	Conventional	Multibowl	⊂ Both
Other	☐4 String Area	Capitan Reef	□ WIPP
Other	Fluid Filled	Cement Squeeze	F Pilot Hole
Special Requirements	☐ Water Disposal	₩ COM	T 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 595' (a minimum of 75' 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.
 - b. WOC time for a primary cement job will be a minimum of <u>8 hours</u> or <u>500 psi</u> 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 the shoe.
 - 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 set in the Lamar Limestone and cemented to surface.
 - a. If cement does not circulate to surface, see B.1.a, c & d.
- 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.
 - a. If cement does not circulate to surface, see B.1.a, c & d.
 - b. In Medium Cave/Karst Areas, if cement does not circulate to surface on the first two casing strings, the cement on the 3rd casing string must come to surface.

C. PRESSURE CONTROL

- 1. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the surface casing shoe shall be 2000 (2M) psi.
- 2. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the intermediate casing shoe shall be 3000 (3M) psi.

D. SPECIAL REQUIREMENTS

- 1. 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.
 - a. 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 1/23/2020

GENERAL REQUIREMENTS

- 1. The BLM is to be notified in advance for a representative to witness:
 - a. Spudding the well (minimum of 24 hours)
 - b. Setting and/or Cementing of all casing strings (minimum of 4 hours)
 - c. BOP/BOPE tests (minimum of 4 hours)
 - Eddy County: Call the Carlsbad Field Office, (575) 361-2822
 - Lea County: Call the Hobbs Field Station, (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:
 - i. Notify the BLM when moving in and removing the Spudder Rig.
 - ii. Notify the BLM when moving in the 2nd Rig. Rig to be moved in within 90 days of notification that Spudder Rig has left the location.
 - iii. 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 run from TD to surface (horizontal well vertical portion of hole) shall be available upon request. 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

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Approval Date: 02/24/2020

- 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 intergrity 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 intergrity 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 the portion of 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. If the operator has proposed a multi-bowl wellhead assembly in the APD. The following requirements must be met:

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Approval Date: 02/24/2020

- 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 Onshore Order 2 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 BOP/BOPE 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 which 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 made available upon request.
 - 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. 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.
 - f. BOP/BOPE must be tested 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.

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PECOS DISTRICT SURFACE USE CONDITIONS OF APPROVAL

OPERATOR'S NAME:	COG Operating LLC	
	Lease Number NMNM096848	
l	Section 28, T. 25 S., R. 29 E	
COUNTY: 1	Eddy	
Wells: Well Pad 1 Admiral Federal Com 501H Surface Hole Location: 220' FSL & 880' FWL, Section 28, T. 25 S., R. 29 E. Bottom Hole Location: 50' FNL & 330' FWL, Section 21, T. 25 S, R 29 E.		
Admiral Federal Com 502H Surface Hole Location: 220' FSL Bottom Hole Location: 50' FNL	. & 910' FWL, Section 28, T. 25 S., R. 29 E. & 1485' FWL, Section 21, T. 25 S, R 29 E.	
Well Pad 2 Admiral Federal Com 503H Surface Hole Location: 220' FSL Bottom Hole Location: 50' FNL	. & 2630' FWL, Section 28, T. 25 S., R. 29 E. & 2630' FEL, Section 21, T. 25 S, R 29 E.	
Well Pad 3 Admiral Federal Com 504H Surface Hole Location: 300' FSL Bottom Hole Location: 50' FNL	. & 1040' FEL, Section 28, T. 25 S., R. 29 E. & 1485' FEL, Section 21, T. 25 S, R 29 E.	
Admiral Federal Com 505H Surface Hole Location: 300' FSL Bottom Hole Location: 50' FNL	. & 1010' FEL, Section 28, T. 25 S., R. 29 E. & 330' FEL, Section 21, T. 25 S, R 29 E.	
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 Noxious Weeds Special Requirements Hydrology Cave/Karst Construction Notification Topsoil	Historical Sites	
Closed Loop System		

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Federal Mineral Material Pits
Well Pads
Roads
Road Section Diagram
Production (Post Drilling)
Well Structures & Facilities
Pipelines
Electric Lines
Interim Reclamation
Final Ahandonment & 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 resource (historic or prehistoric site or object) discovered by the holder, or any person working on the holder's behalf, on public or Federal land shall be immediately reported to the Authorized Officer. The 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 the proper mitigation measures will be made by the Authorized Officer after consulting with the holder.

OR

If the entire project is covered under the Permian Basin Programmatic Agreement (cultural resources only):

The proponent has contributed funds commensurate to the undertaking into an account for offsite mitigation. Participation in the PA serves as mitigation for the effects of this project on cultural resources. If any human skeletal remains, funerary objects, sacred objects, or objects of cultural patrimony are discovered at any time during construction, all construction activities shall halt and the BLM will be notified as soon as possible within 24 hours. Work shall not resume until a Notice to Proceed is issued by the BLM. See information below discussing NAGPRA.

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If the proposed project is split between a Class III inventory and a Permian Basin Programmatic Agreement contribution, the portion of the project covered under Class III inventory should default to the first paragraph stipulations.

The holder is hereby obligated to comply with procedures established in the Native American Graves Protection and Repatriation Act (NAGPRA) to protect such cultural items as human remains, associated funerary objects, sacred objects, and objects of cultural patrimony discovered inadvertently during the course of project implementation. In the event that any of the cultural items listed above are discovered during the course of project work, the proponent shall immediately halt the disturbance and contact the BLM within 24 hours for instructions. The proponent or initiator of any project shall be held responsible for protecting, evaluating, reporting, excavating, treating, and disposing of these cultural items according to the procedures established by the BLM in consultation with Indian Tribes."

Any paleontological resource (historic or prehistoric site or object) discovered by the holder, or any person working on the holder's behalf, on public or Federal land shall be immediately reported to the Authorized Officer. The 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 the proper mitigation measures will be made by the Authorized Officer after consulting with the holder.

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.

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V. SPECIAL REQUIREMENT(S)

Watershed:

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 topsoil 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.

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.

This authorization is subject to your Certificate of Participation and/or Certificate of Inclusion under the New Mexico Candidate Conservation Agreement. Because it involves surface disturbing activities covered under your Certificate, your Habitat Conservation Fund Account with the Center of Excellence for Hazardous Materials Management (CEHMM) will be debited according to Exhibit B Part 2 of the Certificate of Participation.

Cave/Karst Surface Mitigation

The following stipulations will be applied to minimize impacts during construction, drilling and production:

Construction:

General Construction:

- No blasting
- The BLM, Carlsbad Field Office, will be informed immediately if any subsurface drainage channels, cave passages, or voids are penetrated during construction, and no additional construction shall occur until clearance has been issued by the Authorized Officer.
- All linear surface disturbance activities will avoid sinkholes and other karst features to lessen the possibility of encountering near surface voids during construction, minimize changes to runoff, and prevent untimely leaks and spills from entering the karst drainage system.

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• All spills or leaks will be reported to the BLM immediately for their immediate and proper treatment.

Pad Construction:

- The pad will be constructed and leveled by adding the necessary fill and caliche

 no blasting.
- The entire perimeter of the well pad 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 high with impermeable mineral material (e.g., caliche).
- No water flow from the uphill side(s) of the pad shall be allowed to enter the well pad.
- The topsoil stockpile shall be located outside the bermed well pad.
- Topsoil, either from the well pad or surrounding area, shall not be used to construct the berm.
- No storm drains, tubing or openings shall be placed in the berm.
- 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.
- 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 access road entering the well pad shall be constructed so that the integrity of the berm height surrounding the well pad is not compromised (i.e. an access road crossing the berm cannot be lower than the berm height).
- Following a rain event, all fluids will vacuumed off of the pad and hauled offsite and disposed at a proper disposal facility.

Tank Battery Construction:

- The pad will be constructed and leveled by adding the necessary fill and caliche

 no blasting.
- All tank battery locations and facilities will be lined and bermed.
- The liner should be at least 20 mil in thickness and installed with a 4 oz. felt backing, or equivalent, to prevent tears or punctures.
- Tank battery berms must be large enough to contain 1 ½ times the content of the largest tank.

Road Construction:

- Turnout ditches and drainage leadoffs will not be constructed in such a manner as to alter the natural flow of water into or out of cave or karst features.
- Special restoration stipulations or realignment may be required if subsurface features are discovered during construction.

Buried Pipeline/Cable Construction:

• Rerouting of the buried line(s) may be required if a subsurface void is encountered during construction to minimize the potential subsidence/collapse

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of the feature(s) as well as the possibility of leaks/spills entering the karst drainage system.

Powerline Construction:

- Smaller powerlines will be routed around sinkholes and other karst features to avoid or lessen the possibility of encountering near surface voids and to minimize changes to runoff or possible leaks and spills from entering karst systems.
- Larger powerlines will adjust their pole spacing to avoid cave and karst features.
- Special restoration stipulations or realignment may be required if subsurface voids are encountered.

Surface Flowlines Installation:

• Flowlines will be routed around sinkholes and other karst features to minimize the possibility of leaks/spills from entering the karst drainage system.

Leak Detection System:

- A method of detecting leaks is required. The method could incorporate gauges to measure loss, situating values and lines so they can be visually inspected, or installing electronic sensors to alarm when a leak is present.
- A leak detection plan will be submitted to BLM that incorporates an automatic shut off system (see below) to minimize the effects of an undesirable event that could negatively sensitive cave/karst resources.
- Well heads, pipelines (surface and buried), storage tanks, and all supporting equipment should be monitored regularly after installation to promptly identify and fix leaks.

Automatic Shut-off Systems:

• Automatic shut off, check values, or similar systems will be installed for pipelines and tanks to minimize the effects of catastrophic line failures used in production or drilling.

Cave/Karst Subsurface Mitigation

The following stipulations will be applied to protect cave/karst and groundwater concerns:

Closed Loop System:

- A closed loop system using steel tanks will be utilized during drilling no pits
- All fluids and cuttings will be hauled off-site and disposed of properly at an authorized site

Rotary Drilling with Fresh Water:

 Fresh water will be used as a circulating medium in zones where caves or karst features are expected. SEE ALSO: Drilling COAs for this well.

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Directional Drilling:

• The kick off point for directional drilling will occur at least 100 feet below the bottom of the cave occurrence zone. SEE ALSO: Drilling COAs for this well.

Lost Circulation:

• ALL lost circulation zones between surface and the base of the cave occurrence zone will be logged and reported in the drilling report.

• If a void of four feet or more and circulation losses greater than 70 percent occur simultaneously while drilling in any cave-bearing zone, regardless of the type of drilling machinery used, the BLM will be notified immediately by the operator. The BLM will assess the situation and work with the operator on corrective actions to resolve the problem.

Abandonment Cementing:

 Additional plugging conditions of approval may be required upon well abandonment in high and medium karst potential occurrence zones.

• The BLM will assess the situation and work with the operator to ensure proper plugging of the wellbore.

Pressure Testing:

• The operator will perform annual pressure monitoring on all casing annuli and reported in a sundry notice.

• If the test results indicated a casing failure has occurred, remedial action will be undertaken to correct the problem to the BLM's approval.

VRM IV:

• Above-ground structures including meter housing that are not subject to safety requirements are painted a flat non-reflective paint color, <u>Shale Green</u> from the BLM Standard Environmental Color Chart (CC-001: June 2013).

VI. CONSTRUCTION

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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)

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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.

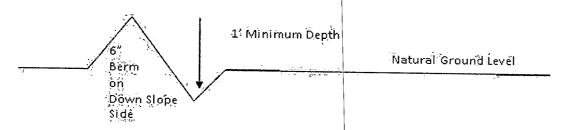
Drainage

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Drainage control systems shall be constructed on the entire length of road (e.g. ditches, sidehill outsloping 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 foot road with 4% road slope:
$$\frac{400'}{4\%} + 100' = 200'$$
 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.

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Construction Steps

- 1. Salvage topsoil
- 3. Redistribute topsoil
- 2. Construct road
 - 4. Revegetate slopes

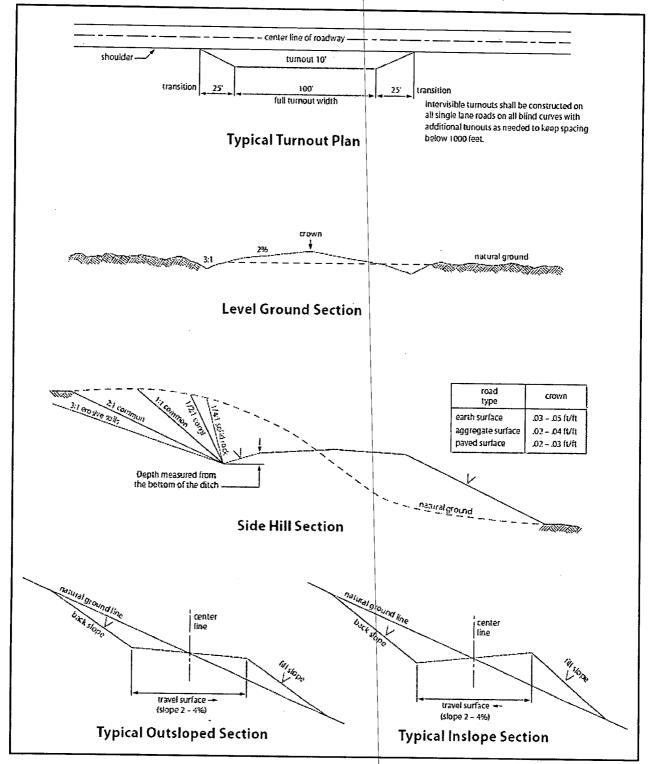


Figure 1. Cross-sections and plans for typical road sections representative of BLM resource or FS local and higher-class roads.

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.

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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

- The BLM, Carlsbad Field Office, will be informed immediately if any subsurface drainage channels, passages, or voids are intersected by trenching, and no pipe will be laid in the trench at that point until clearance has been issued by the Authorized Officer.
- If a void is encountered alignments may be rerouted to avoid the karst feature and lessen; the potential of subsidence or collapse of karst features, buildup of toxic or combustible gas, or other possible impacts to buried pipeline.
- Special restoration stipulations or realignment may be required at such intersections, if any.
- 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 values 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.
- Regular monitoring is required to quickly identify leaks for their immediate and proper treatment.
- All spills or leaks will be reported to the BLM immediately for their immediate and proper treatment.

C. ELECTRIC LINES

- Smaller powerlines will be routed around sinkholes and other karst features to avoid or lessen the possibility of encountering near surface voids and to minimize changes to runoff or possible leaks and spills from entering karst systems. Larger powerlines will adjust their pole spacing to avoid cave and karst features.
- The BLM, Carlsbad Field Office, will be informed immediately if any subsurface drainage channels, cave passages, or voids are penetrated during construction.
- No further construction will be done until clearance has been issued by the Authorized Officer.
- Special restoration stipulations or realignment may be required.

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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.

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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 1 for Loamy 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 shall be tested and the viability testing of seed will 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 shall be planted using a drill equipped with a depth regulator to ensure proper depth regulator to ensure proper depth of planting where drilling is possible. The seed mixture shall be evenly and uniformly planted over the disturbed area (small/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 shall be broadcast and the area shall be raked or chained to cover the seed. When broadcasting the seed, the pounds per acre shall be doubled. The 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:

Species

DI : I	lb/acre
Plains lovegrass (Eragrostis intermedia)	0.5
Sand dropseed (Sporobolus cryptandrus)	1.0
Sideoats grama (Bouteloua curtipendula)	5.0
Plains bristlegrass (Setaria macrostachya)	2.0

^{*}Pounds of pure live seed:

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

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