District I
1625 N. French Dr., Hobbs, NM 88240
District II
811 S. First St., Artesia, NM 88210
District III
1000 Rio Brazos Road, Aztec, NM 87410
District IV
1220 S. St. Francis Dr., Santa Fe, NM 87505

State of New Mexico
Energy, Minerals and Natural Resources Department

Oil Conservation Division
1220 South St. Francis Dr.
Santa Fe, NM 87505

Submit Original to Appropriate District Office

GAS CAPTURE PLAN

Date: **11/5/2018**

☒ Original
☐ Amended - Reason for Amendment:

Operator & OGRID No.: **COG Operating LLC, OGRID 229137**

This Gas Capture Plan outlines actions to be taken by the Operator to reduce well/production facility flaring/venting for new completion (new drill, recomplete to new zone, re-frac) activity.

Note: Form C-129 must be submitted and approved prior to exceeding 60 days allowed by Rule (Subsection A of 19.15.18.12 NMAC).

Well(s)/Production Facility – Name of facility

The well(s) that will be located at the production facility are shown in the table below.

Well Name	API	Well Location (ULSTR)	Footages	Expected MCF/D	Flared or Vented	Comments
Howitzer Federal Com 602H	**30-015-**	**A-12-24S-28E**	**1014' FNL & 620' FEL**	**2,823 MCF**		**Subject to Crestwood AMI.**

Gathering System and Pipeline Notification

Well(s) will be connected to a production facility after flowback operations are complete, if gas transporter system is in place. The gas produced from production facility is dedicated to **Crestwood Midstream.** and will be connected to **Willow Lake low**/high pressure gathering system located in **Reeve,** County, Texas. It will require **0' to an undetermined amount of feet** of pipeline to connect the facility to **low**/high pressure gathering system. **COG Operating LLC** provides (periodically) to **Crestwood Midstream.** a drilling, completion and estimated first production date for wells that are scheduled to be drilled in the foreseeable future. In addition, **COG Operating LLC** and **Crestwood Midstream.** have periodic conference calls to discuss changes to drilling and completion schedules. Gas from these wells will be processed at **Orla** Processing Plant located in **Sec 19-Blk 56, T2 Reeves,** County, Texas. The actual flow of the gas will be based on compression operating parameters and gathering system pressures.

Flowback Strategy

After the fracture treatment/completion operations, well(s) will be produced to temporary production tanks and gas will be flared or vented. During flowback, the fluids and sand content will be monitored. When the produced fluids contain minimal sand, the wells will be turned to production facilities. Gas sales should start as soon as the wells start flowing through the production facilities, unless there are operational issues on Gas Transporter system at that time. Based on current information, it is Operator's belief the system can take this gas upon completion of the well(s).

Safety requirements during cleanout operations from the use of underbalanced air cleanout systems may necessitate that sand and non-pipeline quality gas be vented and/or flared rather than sold on a temporary basis.

Alternatives to Reduce Flaring

Below are alternatives considered from a conceptual standpoint to reduce the amount of gas flared.

- Power Generation – On lease
  - Only a portion of gas is consumed operating the generator, remainder of gas will be flared
- Compressed Natural Gas – On lease
  - Gas flared would be minimal, but might be uneconomical to operate when gas volume declines
- NGL Removal – On lease
  - Plants are expensive, residue gas is still flared, and uneconomical to operate when gas volume declines

COG Operating, LLC - Howitzer Federal Com 602H

1. Geologic Formations

TVD of target	9,894'	Pilot hole depth	NA
MD at TD:	20,088'	Deepest expected fresh water:	47'

Formation	Depth (TVD) from KB	Water/Mineral Bearing/ Target Zone?	Hazards*
Quaternary Fill	Surface	Water	
Rustler	N/A	Water	
Top of Salt	81	Salt	
Base of Salt	2541	Salt	
Lamar	2750	Salt Water	
Bell Canyon	2803	Salt Water	
Cherry Canyon	3664	Oil/Gas	
Brushy Canyon	4885	Oil/Gas	
Bone Spring Lime	6419	Oil/Gas	
U. Avalon Shale	6718	Oil/Gas	
L. Avalon Shale	7041	Oil/Gas	
1st Bone Spring Sand	7417	Oil/Gas	
2nd Bone Spring Sand	8217	Oil/Gas	
3rd Bone Spring Sand	9306	Oil/Gas	
Wolfcamp	9639	Target Oil/Gas	

2. Casing Program

Hole Size	Casing From	Casing To	Csg. Size	Weight (lbs)	Grade	Conn.	SF Collapse	SF Burst	SF Tension
17.5"	0	2700	13.375"	61	J55	STC	1.28	2.94	3.61
12.25"	0	9160	9.625"	40	HCL80	BTC	1.30	1.14	2.58
8.5	0	20,088	5.5"	23	P110	BTC	2.26	2.67	3.18
			BLM Minimum Safety Factor				1.125	1	1.6 Dry 1.8 Wet

Intermediate casing will be kept at least 1/3 full while running casing.to mitigate collapse. Intermediate burst based on 0.7 frac gradient at the shoe with Gas Gradient 0.1 psi/ft to surface.
All casing strings will be tested in accordance with Onshore Oil and Gas Order #2 III.B.1.h