Form 3160-3
(June 2015)

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

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

APPLICATION FOR PERMIT TO DRILL OR REENTER

5. Lease Serial No.
NMNM129263

6. If Indian, Allotee or Tribe Name

1a. Type of work: ☑ DRILL ☐ REENTER

1b. Type of Well: ☑ Oil Well ☐ Gas Well ☐ Other

1c. Type of Completion: ☐ Hydraulic Fracturing ☑ Single Zone ☐ Multiple Zone

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

8. Lease Name and Well No.
HORSESHOE FED COM
702H 327861

2. Name of Operator
ASCENT ENERGY LLC 325830

9. API Well No.
30-025-47059

3a. Address	3b. Phone No. *(include area code)*	10. Field and Pool, or Exploratory 98033
1621 18th Street, Suite 200 Denver CO 80202	(720)710-8999	WC-025 G-10 S2133280;WOLFCAMP

4. Location of Well *(Report location clearly and in accordance with any State requirements.*)*
At surface NENE / 300 FNL / 645 FEL / LAT 32.470829 / LONG -103.605255
At proposed prod. zone NENE / 100 FNL / 330 FEL / LAT 32.485881 / LONG -103.604244

11. Sec., T. R. M. or Blk. and Survey or Area
SEC 19 / T21S / R33E / NMP

14. Distance in miles and direction from nearest town or post office*	12. County or Parish	13. State
59.3 miles	LEA	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 lease	17. Spacing Unit dedicated to this well
100 feet	160	160

18. Distance from proposed location* to nearest well, drilling, completed, applied for, on this lease, ft.	19. Proposed Depth	20. BLM/BIA Bond No. in file
30 feet	11900 feet / 17431 feet	FED: NMB001471

21. Elevations (Show whether DF, KDB, RT, GL, etc.)	22. Approximate date work will start*	23. Estimated duration
3793 feet	12/01/2019	30 days

24. Attachments

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

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

25. Signature	Name *(Printed/Typed)*	Date
(Electronic Submission)	Sarah Ferreyros / Ph: (720)499-1454	12/06/2018

Title
Sr. Regulatory Analyst

Approved by *(Signature)*	Name *(Printed/Typed)*	Date
(Electronic Submission)	Cody Layton / Ph: (575)234-5959	03/30/2020

Title	Office
Assistant Field Manager Lands & Minerals	CARLSBAD

Application approval does not warrant or certify that the applicant holds legal or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations thereon.
Conditions of approval, if any, are attached.

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

GCP Rec 03/31/2020

KZ
04/06/2020

SL

APPROVED WITH CONDITIONS

Approval Date: 03/30/2020

(Continued on page 2)

*(Instructions on page 2)

PECOS DISTRICT
DRILLING CONDITIONS OF APPROVAL

OPERATOR'S NAME:	ASCENT ENERGY LLC
LEASE NO.:	NMNM129263
LOCATION:	SECTION 19, T21S, R33E, NMPM
COUNTY:	LEA

WELL NAME & NO.:	701H – HORSESHOE FED COM
SURFACE HOLE FOOTAGE:	300'/N & 1965'/E
BOTTOM HOLE FOOTAGE	100'/N & 1650'/E

WELL NAME & NO.:	702H – HORSESHOE FED COM
SURFACE HOLE FOOTAGE:	300'/N & 645'/E
BOTTOM HOLE FOOTAGE	100'/N & 330'/E

COA

H2S	○ Yes	◉ No	
Potash	○ None	○ Secretary	◉ R-111-P
Cave/Karst Potential	◉ Low	○ Medium	○ High
Cave/Karst Potential	○ Critical		
Variance	○ None	◉ Flex Hose	○ Other
Wellhead	○ Conventional	◉ Multibowl	○ Both
Other	☑ 4 String Area	☑ Capitan Reef	☐ WIPP
Other	☐ Fluid Filled	☐ Cement Squeeze	☐ Pilot Hole
Special Requirements	☐ Water Disposal	☑ COM	☐ Unit

A. HYDROGEN SULFIDE

A Hydrogen Sulfide (H2S) Drilling Plan shall be activated 500 feet prior to drilling into an **unknown formation in the Hat Mesa Pool**. As a result, the Hydrogen Sulfide area must meet Onshore Order 6 requirements, which includes equipment and personnel/public protection items. If Hydrogen Sulfide is encountered, please provide measured values and formations to the BLM.

B. CASING

Casing Design:

1. The **16** inch surface casing shall be set at approximately **1635** feet (a minimum of 25 feet (Lea County) into the Rustler Anhydrite and above the salt) and cemented to the surface.

Approval Date: 03/30/2020

a. If cement does not circulate to the 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 six hours after pumping cement and ideally between 8-10 hours after completing the cement job.
b. Wait on cement (WOC) time for a primary cement job will be a minimum of **24 hours in the Potash Area** or 500 pounds compressive strength, whichever is greater. (This is to include the lead cement)
c. Wait on cement (WOC) time for a remedial job will be a minimum of 4 hours after bringing cement to surface or 500 pounds compressive strength, whichever is greater.
d. If cement falls back, remedial cementing will be done prior to drilling out that string.

2. The **13-3/8** inch intermediate casing shall be set at approximately **3600** feet**.**The minimum required fill of cement behind the **13-3/8** inch intermediate casing is:

Option 1 (Single Stage):

- Cement to surface. If cement does not circulate see B.1.a, c-d above. **Wait on cement (WOC) time for a primary cement job is to include the lead cement slurry due to cave/karst or potash.**

Option 2:

Operator has proposed a DV tool, the depth may be adjusted as long as the cement is changed proportionally. The DV tool may be cancelled if cement circulates to surface on the first stage.

a. First stage to DV tool: Cement to circulate. If cement does not circulate off the DV tool, contact the appropriate BLM office before proceeding with second stage cement job.

b. Second stage above DV tool:

- Cement to surface. If cement does not circulate, contact the appropriate BLM office.
  Wait on cement (WOC) time for a primary cement job is to include the lead cement slurry due to cave/karst or potash.

❖ In R111 Potash 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.

- ❖ In Capitan Reef 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.

- ❖ **Special Capitan Reef requirements.** If lost circulation (50% or greater) occurs below the Base of the Salt, the operator shall do the following:

  - Switch to fresh water mud to protect the Capitan Reef and use fresh water mud until setting the intermediate casing. The appropriate BLM office is to be notified for a PET to witness the switch to fresh water.

  - Daily drilling reports from the Base of the Salt to the setting of the intermediate casing are to be submitted to the BLM CFO engineering staff via e-mail by 0800 hours each morning. Any lost circulation encountered is to be recorded on these drilling reports. The daily drilling report should show mud volume per shift/tour. Failure to submit these reports will result in an Incidence of Non-Compliance being issued for failure to comply with the Conditions of Approval. If not already planned, the operator shall run a caliper survey for the intermediate well bore and submit to the appropriate BLM office.

3. The minimum required fill of cement behind the **10-3/4** inch 2nd intermediate casing is:

   Option 1 (Single Stage):

   - Cement to surface. If cement does not circulate see B.1.a, c-d above. **Wait on cement (WOC) time for a primary cement job is to include the lead cement slurry due to cave/karst or potash.**

   Option 2:

   Operator has proposed a DV tool, the depth may be adjusted as long as the cement is changed proportionally. The DV tool may be cancelled if cement circulates to surface on the first stage.

   c. First stage to DV tool: Cement to circulate. If cement does not circulate off the DV tool, contact the appropriate BLM office before proceeding with second stage cement job.

   d. Second stage above DV tool:

   - Cement to surface. If cement does not circulate see B.1.a, c-d above. **Wait on cement (WOC) time for a primary cement job is to include the lead cement slurry due to cave/karst or potash.**

4. The minimum required fill of cement behind the **7-5/8** inch 3rd intermediate casing is:

Option 1 (Single Stage):

- Cement should tie-back at least **50 feet** on top of Capitan Reef top. If cement does not circulate see B.1.a, c-d above.
  Wait on cement (WOC) time for a primary cement job is to include the lead cement slurry due to cave/karst or potash.

Option 2:

Operator has proposed a DV tool, the depth may be adjusted as long as the cement is changed proportionally. The DV tool may be cancelled if cement circulates to surface on the first stage.

a. First stage to DV tool: Cement to circulate. If cement does not circulate off the DV tool, contact the appropriate BLM office before proceeding with second stage cement job.

b. Second stage above DV tool:

- Cement should tie-back at least **50 feet** on top of Capitan Reef top. If cement does not circulate see B.1.a, c-d above.
  Wait on cement (WOC) time for a primary cement job is to include the lead cement slurry due to cave/karst or potash.

5. The minimum required fill of cement behind the **5-1/2** inch production casing is:

- Cement should tie-back **500 feet** into the previous casing. Operator shall provide method of verification.

C. PRESSURE CONTROL

1. Variance approved to use flex line from BOP to choke manifold. Manufacturer's specification to be readily available. No external damage to flex line. Flex line to be installed as straight as possible (no hard bends).'

2. Operator has proposed a multi-bowl wellhead assembly. This assembly will only be tested when installed on the surface casing. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the surface casing shoe shall be **10,000 (10M)** psi. **Variance is approved to use a 5000 (5M) Annular which shall be tested to 5000 (5M) psi.**

   a. Wellhead shall be installed by manufacturer's representatives, submit documentation with subsequent sundry.
   b. If the welding is performed by a third party, the manufacturer's representative shall monitor the temperature to verify that it does not exceed the maximum temperature of the seal.

c. Manufacturer representative shall install the test plug for the initial BOP test.
d. If the cement does not circulate and one inch operations would have been possible with a standard wellhead, the well head shall be cut off, cementing operations performed and another wellhead installed.
e. Whenever any seal subject to test pressure is broken, all the tests in OOGO2.III.A.2.i must be followed.

D. SPECIAL REQUIREMENT (S)

Communitization Agreement

- The operator will submit a Communitization Agreement to the Carlsbad Field Office, 620 E Greene St. Carlsbad, New Mexico 88220, at least 90 days before the anticipated date of first production from a well subject to a spacing order issued by the New Mexico Oil Conservation Division. The Communitization Agreement will include the signatures of all working interest owners in all Federal and Indian leases subject to the Communitization Agreement (i.e., operating rights owners and lessees of record), or certification that the operator has obtained the written signatures of all such owners and will make those signatures available to the BLM immediately upon request.
- If the operator does not comply with this condition of approval, the BLM may take enforcement actions that include, but are not limited to, those specified in 43 CFR 3163.1.
- In addition, the well sign shall include the surface and bottom hole lease numbers. When the Communitization Agreement number is known, it shall also be on the sign.

GENERAL REQUIREMENTS

The BLM is to be notified in advance for a representative to witness:

a. Spudding well (minimum of 24 hours)
b. Setting and/or Cementing of all casing strings (minimum of 4 hours)
c. BOPE tests (minimum of 4 hours)

☒ Eddy County
Call the Carlsbad Field Office, 620 East Greene St., Carlsbad, NM 88220, (575) 361-2822

☒ Lea County
Call the Hobbs Field Station, 414 West Taylor, Hobbs NM 88240, (575) 393-3612

1. Unless the production casing has been run and cemented or the well has been properly plugged, the drilling rig shall not be removed from over the hole without prior approval.

   a. In the event the operator has proposed to drill multiple wells utilizing a skid/walking rig. Operator shall secure the wellbore on the current well, after installing and testing the wellhead, by installing a blind flange of like pressure rating to the wellhead and a pressure gauge that can be monitored while drilling is performed on the other well(s).
   b. When the operator proposes to set surface casing with Spudder Rig
      - Notify the BLM when moving in and removing the Spudder Rig.
      - Notify the BLM when moving in the 2nd Rig. Rig to be moved in within 90 days of notification that Spudder Rig has left the location.
      - BOP/BOPE test to be conducted per Onshore Oil and Gas Order No. 2 as soon as 2nd Rig is rigged up on well.

2. 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.

3. 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 submitted to the BLM office as well as all other logs run on the borehole 30 days from completion. If available, a digital copy of the logs is to be submitted in addition to the paper copies. The Rustler top and top and bottom of Salt are to be recorded on the Completion Report.

A. CASING

1. Changes to the approved APD casing program need prior approval if the items substituted are of lesser grade or different casing size or are Non-API. The Operator can exchange the components of the proposal with that of superior strength (i.e. changing from J-55 to N-80, or from 36# to 40#). Changes to the approved cement program need prior approval if the altered cement plan has less volume or strength or if the changes are substantial (i.e. Multistage tool, ECP, etc.). The initial wellhead installed on the well will remain on the well with spools used as needed.

2. Wait on cement (WOC) for Potash Areas: After cementing but before commencing any tests, the casing string shall stand cemented under pressure until both of the following conditions have been met: 1) cement reaches a minimum compressive strength of 500 psi for all cement blends, 2) until cement has been in place at least 24 hours. WOC time will be recorded in the driller's log. The casing 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 that portion of any well approved for a 5M BOPE system or greater, a pressure integrity test of each casing shoe shall be performed. Formation at the shoe shall be tested to a minimum of the mud weight equivalent anticipated to control the formation pressure to the next casing depth or at total depth of the well. This test shall be performed before drilling more than 20 feet of new hole.

7. If hardband drill pipe is rotated inside casing, returns will be monitored for metal. If metal is found in samples, drill pipe will be pulled and rubber protectors which have a larger diameter than the tool joints of the drill pipe will be installed prior to continuing drilling operations.
8. Whenever a casing string is cemented in the R-111-P potash area, the NMOCD requirements shall be followed.

B. PRESSURE CONTROL

1. All blowout preventer (BOP) and related equipment (BOPE) shall comply with well control requirements as described in Onshore Oil and Gas Order No. 2 and API RP 53 Sec. 17.

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

3. 5M or higher system requires an HCR valve, remote kill line and annular to match. The remote kill line is to be installed prior to testing the system and tested to stack pressure.

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

    a. Wellhead shall be installed by manufacturer's representatives, submit documentation with subsequent sundry.
    b. If the welding is performed by a third party, the manufacturer's representative shall monitor the temperature to verify that it does not exceed the maximum temperature of the seal.
    c. Manufacturer representative shall install the test plug for the initial BOP test.
    d. Whenever any seal subject to test pressure is broken, all the tests in OOGO2.III.A.2.i must be followed.
    e. 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.

5. The appropriate BLM office shall be notified a minimum of 4 hours in advance for a representative to witness the tests.

    a. In a water basin, for all casing strings utilizing slips, these are to be set as soon as the crew and rig are ready and any fallback cement remediation has been done. The casing cut-off and BOP installation can be initiated four hours after installing the slips, which will be approximately six hours after bumping the plug. For those casing strings not using slips, the minimum wait time before cut-off is eight hours after bumping the plug. BOP/BOPE testing can begin after cut-off or once cement reaches 500 psi compressive strength (including

lead when specified), whichever is greater. However, if the float does not hold, cut-off cannot be initiated until cement reaches 500 psi compressive strength (including lead when specified).

b. In potash areas, for all casing strings utilizing slips, these are to be set as soon as the crew and rig are ready and any fallback cement remediation has been done. For all casing strings, casing cut-off and BOP installation can be initiated at twelve hours after bumping the plug. However, **no tests** shall commence until the cement has had a minimum of 24 hours setup time, except the casing pressure test can be initiated immediately after bumping the plug (only applies to single stage cement jobs).

c. The tests shall be done by an independent service company utilizing a test plug not a cup or J-packer. The operator also has the option of utilizing an independent tester to test without a plug (i.e. against the casing) pursuant to Onshore Order 2 with the pressure not to exceed 70% of the burst rating for the casing. Any test against the casing must meet the WOC time for water basin (8 hours) or potash (24 hours) or 500 pounds compressive strength, whichever is greater, prior to initiating the test (see casing segment as lead cement may be critical item).

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

f. All tests are required to be recorded on a calibrated test chart. A copy of the BOP/BOPE test chart and a copy of independent service company test will be submitted to the appropriate BLM office.

g. 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 if test is done with a test plug and 30 minutes without a test plug. This test shall be performed prior to the test at full stack pressure.

h. BOP/BOPE must be tested by an independent service company within 500 feet of the top of the Wolfcamp formation if the time between the setting of the intermediate casing and reaching this depth exceeds 20 days. This test does not exclude the test prior to drilling out the casing shoe as per Onshore Order No. 2.

C. DRILLING MUD

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

All waste (i.e. drilling fluids, trash, salts, chemicals, sewage, gray water, etc.) created as a result of drilling operations and completion operations shall be safely contained and disposed of properly at a waste disposal facility. No waste material or fluid shall be disposed of on the well location or surrounding area.

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

NMK11252019

AFMSS

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

Operator Certification Data Report

03/30/2020

Operator Certification

I hereby certify that I, or someone under my direct supervision, have inspected the drill site and access route proposed herein; that I am familiar with the conditions which currently exist; that I have full knowledge of state and Federal laws applicable to this operation; that the statements made in this APD package are, to the best of my knowledge, true and correct; and that the work associated with the operations proposed herein will be performed in conformity with this APD package and the terms and conditions under which it is approved. I also certify that I, or the company I represent, am responsible for the operations conducted under this application. These statements are subject to the provisions of 18 U.S.C. 1001 for the filing of false statements.

NAME: Brian Wood **Signed on:** 12/06/2018

Title: President

Street Address: 37 Verano Looop

City: Santa Fe **State:** NM **Zip:** 87508

Phone: (505)466-8120

Email address: afmss@permitswest.com

Field Representative

Representative Name:

Street Address:

City: **State:** **Zip:**

Phone:

Email address:

APD ID: 10400037000 **Submission Date:** 12/06/2018

Operator Name: ASCENT ENERGY LLC

Well Name: HORSESHOE FED COM **Well Number:** 702H

Well Type: OIL WELL **Well Work Type:** Drill

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Section 1 - General

APD ID: 10400037000 **Tie to previous NOS?** N **Submission Date:** 12/06/2018

BLM Office: CARLSBAD **User:** Brian Wood **Title:** President

Federal/Indian APD: FED **Is the first lease penetrated for production Federal or Indian?** FED

Lease number: NMNM129263 **Lease Acres:** 160

Surface access agreement in place? **Allotted?** **Reservation:**

Agreement in place? NO **Federal or Indian agreement:**

Agreement number:

Agreement name:

Keep application confidential? YES

Permitting Agent? NO **APD Operator:** ASCENT ENERGY LLC

Operator letter of designation:

Operator Info

Operator Organization Name: ASCENT ENERGY LLC

Operator Address: 1621 18th Street, Suite 200 **Zip:** 80202

Operator PO Box:

Operator City: Denver **State:** CO

Operator Phone: (720)710-8999

Operator Internet Address:

Section 2 - Well Information

Well in Master Development Plan? NO **Master Development Plan name:**

Well in Master SUPO? NO **Master SUPO name:**

Well in Master Drilling Plan? NO **Master Drilling Plan name:**

Well Name: HORSESHOE FED COM **Well Number:** 702H **Well API Number:**

Field/Pool or Exploratory? Field and Pool **Field Name:** WC-025 G-10 S2133280;WOLFCAMP **Pool Name:**

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

Operator Name: ASCENT ENERGY LLC

Well Name: HORSESHOE FED COM **Well Number:** 702H

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

Is the proposed well in a Helium production area? N **Use Existing Well Pad?** NO **New surface disturbance?**

Type of Well Pad: MULTIPLE WELL **Multiple Well Pad Name:** HORSESHOE EAST **Number:** 602H

Well Class: HORIZONTAL **Number of Legs:** 1

Well Work Type: Drill

Well Type: OIL WELL

Describe Well Type:

Well sub-Type: INFILL

Describe sub-type:

Distance to town: 59.3 Miles **Distance to nearest well:** 30 FT **Distance to lease line:** 100 FT

Reservoir well spacing assigned acres Measurement: 160 Acres

Well plat: HS_702H_C102_GCP_20191024095120.pdf

Well work start Date: 12/01/2019 **Duration:** 30 DAYS

Section 3 - Well Location Table

Survey Type: RECTANGULAR

Describe Survey Type:

Datum: NAD83 **Vertical Datum:** NAVD88

Survey number: 23782 **Reference Datum:**

Wellbore	NS-Foot	NS Indicator	EW-Foot	EW Indicator	Twsp	Range	Section	Aliquot/Lot/Tract	Latitude	Longitude	County	State	Meridian	Lease Type	Lease Number	Elevation	MD	TVD	Will this well produce from this lease?
SHL Leg #1	300	FNL	645	FEL	21S	33E	19	Aliquot NENE	32.470829	-103.605255	LEA	NEW MEXICO	NEW MEXICO	S	STATE	3793	0	0	
KOP Leg #1	100	FSL	330	FEL	21S	33E	18	Aliquot SESE	32.471927	-103.604236	LEA	NEW MEXICO	NEW MEXICO	S	STATE	-7534	11341	11327	
PPP Leg #1-1	100	FSL	330	FEL	21S	33E	18	Aliquot SESE	32.471927	-103.604236	LEA	NEW MEXICO	NEW MEXICO	S	STATE	-7534	11341	11327	

Operator Name: ASCENT ENERGY LLC

Well Name: HORSESHOE FED COM **Well Number:** 702H

Wellbore	NS-Foot	NS Indicator	EW-Foot	EW Indicator	Twsp	Range	Section	Aliquot/Lot/Tract	Latitude	Longitude	County	State	Meridian	Lease Type	Lease Number	Elevation	MD	TVD	Will this well produce from this lease?
EXIT Leg #1	100	FNL	330	FEL	21S	33E	18	Aliquot NENE	32.485881	-103.604244	LEA	NEW MEXICO	NEW MEXICO	F	NMNM 129263	-8107	17431	11900	
BHL Leg #1	100	FNL	330	FEL	21S	33E	18	Aliquot NENE	32.485881	-103.604244	LEA	NEW MEXICO	NEW MEXICO	F	NMNM 129263	-8107	17431	11900	

APD ID: 10400037000 **Submission Date:** 12/06/2018

Operator Name: ASCENT ENERGY LLC

Well Name: HORSESHOE FED COM **Well Number:** 702H

Well Type: OIL WELL **Well Work Type:** Drill

Highlighted data reflects the most recent changes

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Section 1 - Geologic Formations

Formation ID	Formation Name	Elevation	True Vertical Depth	Measured Depth	Lithologies	Mineral Resources	Producing Formation
567636	QUATERNARY	3792	0	0		NONE	N
355258	RUSTLER	-1606	1606	1606	SANDSTONE	NONE	N
567637	SALADO	-1961	1961	1961	ANHYDRITE, SALT	OTHER : Salt	N
567638	BASE OF SALT	-3384	3384	3384	SALT	OTHER : Salt	N
567639	TANSILL	-3530	3530	3531	DOLOMITE	NONE	N
567640	YATES	-3704	3704	3705	SANDSTONE	NONE	N
355259	CAPITAN REEF	-4029	4029	4031	LIMESTONE, OTHER	NONE, USEABLE WATER	N
567641	DELAWARE SAND	-5249	5249	5254		NONE	N
355260	BELL CANYON	-5254	5254	5459	SANDSTONE	NATURAL GAS, OIL	N
355255	CHERRY CANYON	-5760	5760	5766	SANDSTONE	NATURAL GAS, OIL	N
355261	BRUSHY CANYON	-7129	7129	7138	SANDSTONE	NATURAL GAS, OIL	N
355262	BONE SPRING	-8876	8876	8890	LIMESTONE, OTHER	NATURAL GAS, OIL	N
355256	AVALON SAND	-9060	9060	9074	SHALE	CO2, NATURAL GAS, OIL	N
355263	BONE SPRING 1ST	-10015	10015	10029	SANDSTONE	NATURAL GAS, OIL	N
355257	BONE SPRING 2ND	-10251	10251	10265	OTHER, SHALE : Carbonate	NATURAL GAS, OIL	N
567642	BONE SPRING	-10563	10563	10577	SANDSTONE	NATURAL GAS, OIL	N
355264	BONE SPRING 3RD	-11116	11116	11130	LIMESTONE, SANDSTONE	NATURAL GAS, OIL	N
567643	BONE SPRING 3RD	-11593	11593	11618	SANDSTONE	NATURAL GAS, OIL	N

Operator Name: ASCENT ENERGY LLC

Well Name: HORSESHOE FED COM **Well Number:** 702H

Formation ID	Formation Name	Elevation	True Vertical Depth	Measured Depth	Lithologies	Mineral Resources	Producing Formation
355937	WOLFCAMP	-11838	11838	11975	OTHER, SHALE : A	NATURAL GAS, OIL	Y

Section 2 - Blowout Prevention

Pressure Rating (PSI): 10M **Rating Depth:** 15000

Equipment: A 10,000 psi BOP stack consisting of 3 rams with 2 pipe rams, 1 blind ram, and 1 annular preventer will be used below surface casing to TD. See attachments for BOP and choke manifold diagrams. Also present will be an accumulator that meets the requirements of Onshore Order #2 for the pressure rating of the BOP stack. A rotating head will also be installed as needed. BOP will be inspected and operated as recommended in Onshore Order #2. A top drive check valve and sub equipped with a full opening valve sized to fit the drill pipe and collars will be available on the rig floor in the open position. The wellhead will be a multi-bowl speed head.

Requesting Variance? YES

Variance request: Ascent requests a variance to run a multi-bowl speed head for setting the Intermediate 1, Intermediate 2, and Production Strings. Ascent requests a variance to drill this well using a co-flex line between the BOP and choke manifold (instead of the 4" OD steel line). Certification for proposed co-flex hose is attached. The hose is not required by the manufacturer to be anchored. In the event the specific hose is not available, one of equal or higher rating will be used. Ascent requests a variance to have the option of batch drilling this well with other wells on the same pad. In the event that this well is batch drilled, after drilling surface, 1st intermediate, and 2nd intermediate hole sections and cementing 2nd intermediate casing, a 10M dry hole cap with bleed off valve will be installed. The rig will then walk to another well on the pad. When the rig returns to this well and BOPs are installed, the operator will perform a full BOP test. 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. A hydraulically operated choke will be installed prior to drilling out of the intermediate casing shoe.

Testing Procedure: After surface casing is set and the BOP is nipped up, the BOP pressure tests will be made with a third party tester to 250 psi low, 5000 psi high, and the annular preventer will be tested to 2,500 psi. The BOP will be tested in this manner after nipple-up if any break of the stack occurs as wells as every 30 days.

Choke Diagram Attachment:

HS_702H_BOP_Choke_20191021162914.pdf

BOP Diagram Attachment:

HS_702H_BOP_Choke_20191021162921.pdf

Section 3 - Casing

Casing ID	String Type	Hole Size	Csg Size	Condition	Standard	Tapered String	Top Set MD	Bottom Set MD	Top Set TVD	Bottom Set TVD	Top Set MSL	Bottom Set MSL	Calculated casing length MD	Grade	Weight	Joint Type	Collapse SF	Burst SF	Joint SF Type	Joint SF	Body SF Type	Body SF
1	CONDUCTOR	30	20.0	NEW	API	N	0	80	0	80	3792	3673	80	OTHER	52.78	OTHER - Weld						

Operator Name: ASCENT ENERGY LLC

Well Name: HORSESHOE FED COM **Well Number:** 702H

Casing ID	String Type	Hole Size	Csg Size	Condition	Standard	Tapered String	Top Set MD	Bottom Set MD	Top Set TVD	Bottom Set TVD	Top Set MSL	Bottom Set MSL	Calculated casing length MD	Grade	Weight	Joint Type	Collapse SF	Burst SF	Joint SF Type	Joint SF	Body SF Type	Body SF
2	SURFACE	20	16.0	NEW	API	N	0	1635	0	1635	3792	1993	1635	J-55	75.5	OTHER - BTC	1.23	2.7	DRY	9.69	DRY	9.5
3	INTERMEDIATE	14.75	13.375	NEW	API	N	0	3600	0	3600	3792	193	3600	L-80	68	OTHER - TMK UP	1.2	2.36	DRY	2.45	DRY	3.95
4	INTERMEDIATE	12.25	10.75	NEW	API	N	0	5255	0	5250	3792	-1407	5255	J-55	51	OTHER - TMK UP	1.15	1.29	DRY	1.22	DRY	1.9
5	INTERMEDIATE	9.875	7.625	NEW	API	N	0	11623	0	11600	3792	-7789	11623	HCP-110	29.7	OTHER - EZGO FJ3	1.3	1.32	DRY	2	DRY	3.1
6	PRODUCTION	6.75	5.5	NEW	API	N	0	17431	0	11900	3792	-8107	17431	HCP-110	20	OTHER - EZGO FJ3	2.1	1.2	DRY	1.3	DRY	2.28

Casing Attachments

Casing ID: 1 **String Type:** CONDUCTOR

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

Casing ID: 2 **String Type:** SURFACE

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

Horseshoe_Casing_Design_Assumptions_20191021163358.pdf

Operator Name: ASCENT ENERGY LLC

Well Name: HORSESHOE FED COM **Well Number:** 702H

Casing Attachments

Casing ID: 3 **String Type:** INTERMEDIATE

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

Horseshoe_Casing_Design_Assumptions_20191021163408.pdf

13.375_TMK_UP_Casing_Spec_20191021163528.pdf

Casing ID: 4 **String Type:** INTERMEDIATE

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

10.75_TMK_UP_Casing_Spec_20191021163509.pdf

Horseshoe_Casing_Design_Assumptions_20191021163517.pdf

Casing ID: 5 **String Type:** INTERMEDIATE

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

7.625_EZGO_Casing_Spec_20191021163720.pdf

Horseshoe_Casing_Design_Assumptions_20191021163728.pdf

Operator Name: ASCENT ENERGY LLC

Well Name: HORSESHOE FED COM **Well Number:** 702H

Casing Attachments

Casing ID: 6 **String Type:** PRODUCTION

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

5.5in_EZGO_Casing_Spec_20191021163929.pdf

Horseshoe_Casing_Design_Assumptions_20191021163935.pdf

Section 4 - Cement

String Type	Lead/Tail	Stage Tool Depth	Top MD	Bottom MD	Quantity(sx)	Yield	Density	Cu Ft	Excess%	Cement type	Additives
CONDUCTOR	Lead		0	80	174	1.49	12.9	259		Grout	Bentonite 4% BWOC, Cellophane #/sx, CaCl2 2% BWOC.
SURFACE	Lead		0	1130	885	1.73	13.5	1772	100	Class C HALCEM System	4% Bentonite
SURFACE	Tail		1130	1625	550	1.33	14.8	793	100	4% Bentonite	None
INTERMEDIATE	Lead		0	2600	695	1.73	12.7	1096	100	Class C HALCEM System	4% Bentonite
INTERMEDIATE	Tail		2600	3600	485	1.33	14.8	421	100	Class C HALCEM System	None
INTERMEDIATE	Lead		0	3950	220	2.04	12.7	1114	50	Class C EconoCem HLC + 5% Salt	+ 3% Microbond + 3 lbm/sk Kol-Seal + 0.3% HR-800
INTERMEDIATE	Tail		3950	5250	155	1.37	14.8	368	50	Class C HALCEM System	3% Microbond
PRODUCTION	Lead		0	9400	625	2.89	11	980	25	Class H NeoCem PL	3% Microbond
PRODUCTION	Tail		9400	17431	1725	1.47	13.2	837	25	Class H NeoCem PT	3% Microbond

Operator Name: ASCENT ENERGY LLC

Well Name: HORSESHOE FED COM **Well Number:** 702H

String Type	Lead/Tail	Stage Tool Depth	Top MD	Bottom MD	Quantity(sx)	Yield	Density	Cu Ft	Excess%	Cement type	Additives
INTERMEDIATE	Lead		0	10280	625	3.43	10.5	1542	50	Class H NeoCem IL2 Bridgemaker II LCM	None
INTERMEDIATE	Tail		10280	11623	475	1.21	15.6	201	50	Class H HalCem System Bridgemaker II LCM	None

Section 5 - Circulating Medium

Mud System Type: Closed

Will an air or gas system be Used? NO

Description of the equipment for the circulating system in accordance with Onshore Order #2:

Diagram of the equipment for the circulating system in accordance with Onshore Order #2:

Describe what will be on location to control well or mitigate other conditions: All necessary mud products (e. g., barite, cedar bark) for weight addition and fluid loss control will always be on site. Mud program is subject to change due to hole conditions. A closed loop system will be used.
Describe the mud monitoring system utilized: Electronic Pason mud monitor system complying with Onshore Order 1 will be used.

Circulating Medium Table

Top Depth	Bottom Depth	Mud Type	Min Weight (lbs/gal)	Max Weight (lbs/gal)	Density (lbs/cu ft)	Gel Strength (lbs/100 sqft)	PH	Viscosity (CP)	Salinity (ppm)	Filtration (cc)	Additional Characteristics
3600	5255	OTHER : Fresh water	8.4	9.6							
0	1635	OTHER : Fresh water	8.4	9.6							
1635	3600	OTHER : Brine water	10	10							
11623	17431	OIL-BASED MUD	10.1	10.1							
5255	11623	OTHER : Cut Brine/Gel	8.5	9.3							

Operator Name: ASCENT ENERGY LLC

Well Name: HORSESHOE FED COM **Well Number:** 702H

Section 6 - Test, Logging, Coring

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

Electric Logging Program: No open-hole logs are planned at this time for the pilot hole. GR will be collected while drilling through the MWD tools from 9.625" casing shoe to TD. A 2-person mud logging program will be used from 9.625" casing shoe to TD.

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

GR

Coring operation description for the well:

- No DSTs or cores are planned at this time.

Section 7 - Pressure

Anticipated Bottom Hole Pressure: 6900 **Anticipated Surface Pressure:** 4282

Anticipated Bottom Hole Temperature(F): 170

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

Describe:

Contingency Plans geoharzards description:

Contingency Plans geohazards attachment:

Hydrogen Sulfide drilling operations plan required? YES

Hydrogen sulfide drilling operations plan:

Horseshoe_Fed_Com_702H_H2S_Plan_20181206170645.pdf

Section 8 - Other Information

Proposed horizontal/directional/multi-lateral plan submission:

HORSESHOE_FED_COM_702H_Plan_20181206170711.pdf

Other proposed operations facets description:

We are planning to use a spudder rig to preset surface casing. Gas Capture Plan attached.

Other proposed operations facets attachment:

Horseshoe_Fed_Com_702H_Gas_Capture_Plan_20181206170732.pdf
HS_702H_Drill_Plan_20191021165732.pdf
HS_702H_Well_Control_Plan_20191021165741.pdf
HS_702H_CoFlex_Certs_20191021165847.pdf
HS_702H_Speedhead_Specs_20191021165855.pdf

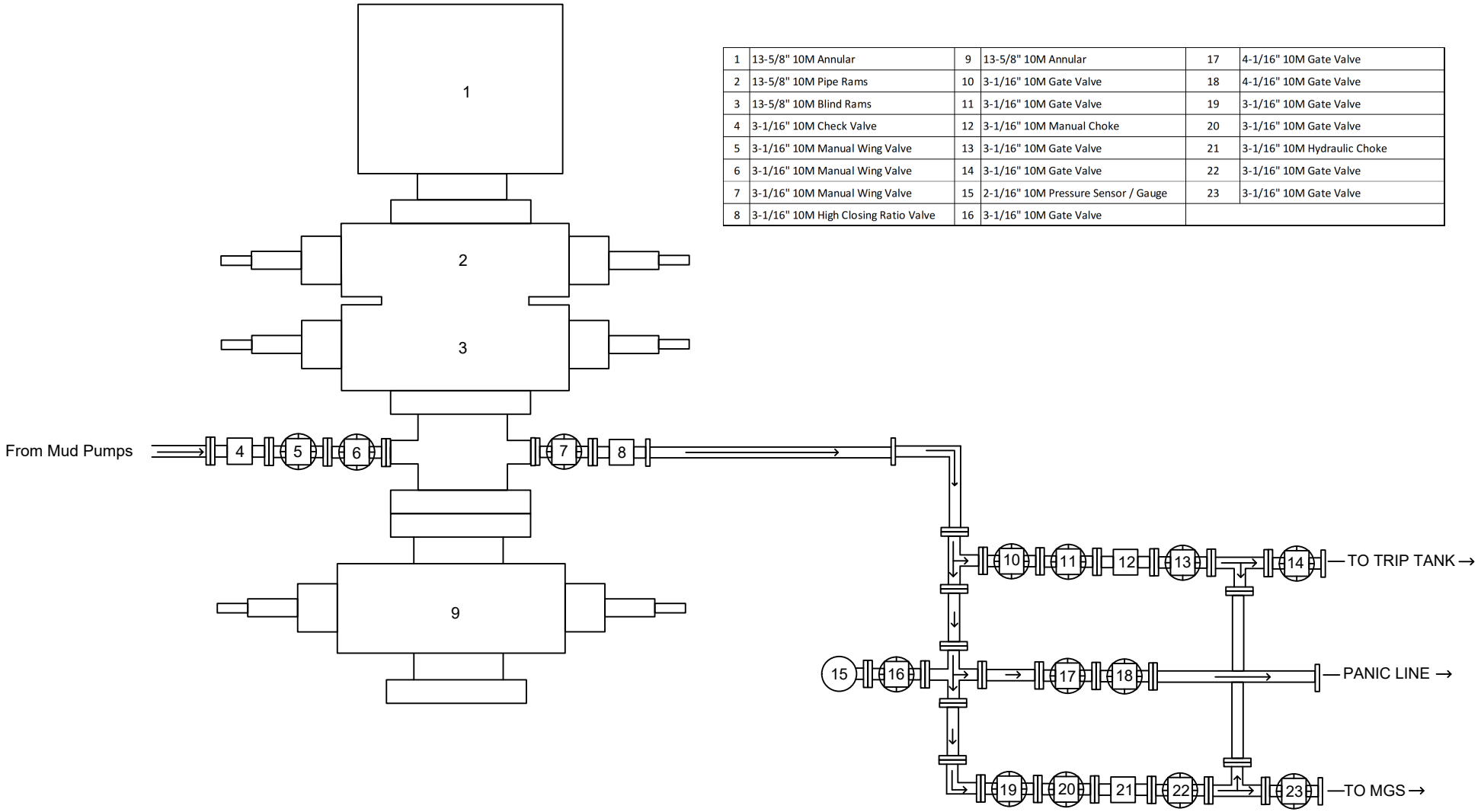
Other Variance attachment:

HS_702H_Casing_Cementing_Variance_20191021165710.pdf
HS_702H_Surface_Rig_Variance_20191021165721.pdf

ASCENT ENERGY - NABORS X04

BOPE & CHOKE MANIFOLD DIAGRAM

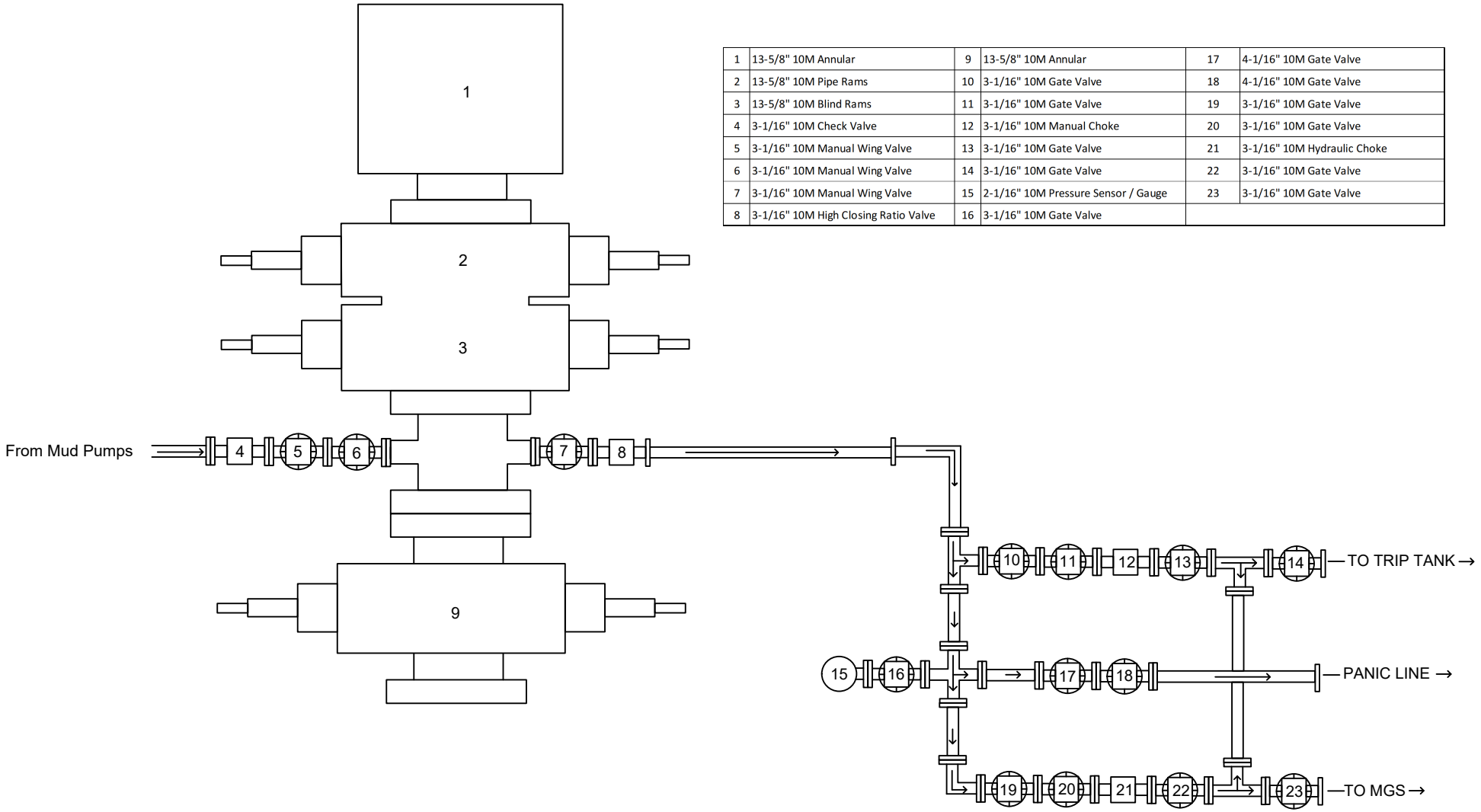
1	13-5/8" 10M Annular	9	13-5/8" 10M Annular	17	4-1/16" 10M Gate Valve
2	13-5/8" 10M Pipe Rams	10	3-1/16" 10M Gate Valve	18	4-1/16" 10M Gate Valve
3	13-5/8" 10M Blind Rams	11	3-1/16" 10M Gate Valve	19	3-1/16" 10M Gate Valve
4	3-1/16" 10M Check Valve	12	3-1/16" 10M Manual Choke	20	3-1/16" 10M Gate Valve
5	3-1/16" 10M Manual Wing Valve	13	3-1/16" 10M Gate Valve	21	3-1/16" 10M Hydraulic Choke
6	3-1/16" 10M Manual Wing Valve	14	3-1/16" 10M Gate Valve	22	3-1/16" 10M Gate Valve
7	3-1/16" 10M Manual Wing Valve	15	2-1/16" 10M Pressure Sensor / Gauge	23	3-1/16" 10M Gate Valve
8	3-1/16" 10M High Closing Ratio Valve	16	3-1/16" 10M Gate Valve		



ASCENT ENERGY - NABORS X04

BOPE & CHOKE MANIFOLD DIAGRAM

1	13-5/8" 10M Annular	9	13-5/8" 10M Annular	17	4-1/16" 10M Gate Valve
2	13-5/8" 10M Pipe Rams	10	3-1/16" 10M Gate Valve	18	4-1/16" 10M Gate Valve
3	13-5/8" 10M Blind Rams	11	3-1/16" 10M Gate Valve	19	3-1/16" 10M Gate Valve
4	3-1/16" 10M Check Valve	12	3-1/16" 10M Manual Choke	20	3-1/16" 10M Gate Valve
5	3-1/16" 10M Manual Wing Valve	13	3-1/16" 10M Gate Valve	21	3-1/16" 10M Hydraulic Choke
6	3-1/16" 10M Manual Wing Valve	14	3-1/16" 10M Gate Valve	22	3-1/16" 10M Gate Valve
7	3-1/16" 10M Manual Wing Valve	15	2-1/16" 10M Pressure Sensor / Gauge	23	3-1/16" 10M Gate Valve
8	3-1/16" 10M High Closing Ratio Valve	16	3-1/16" 10M Gate Valve		



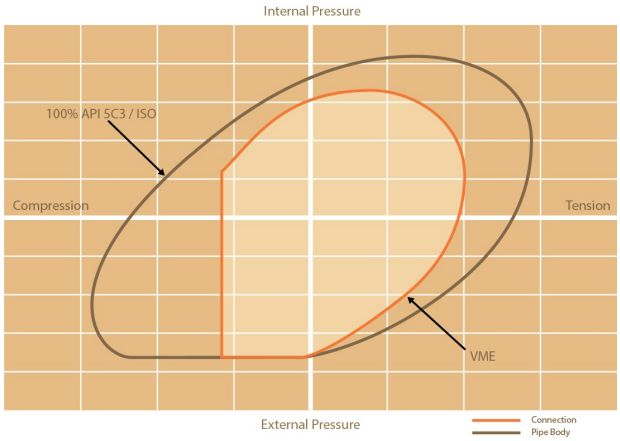
TECHNICAL DATA SHEET TMK UP TMK UP™ FJ 10.75 X 51 J55

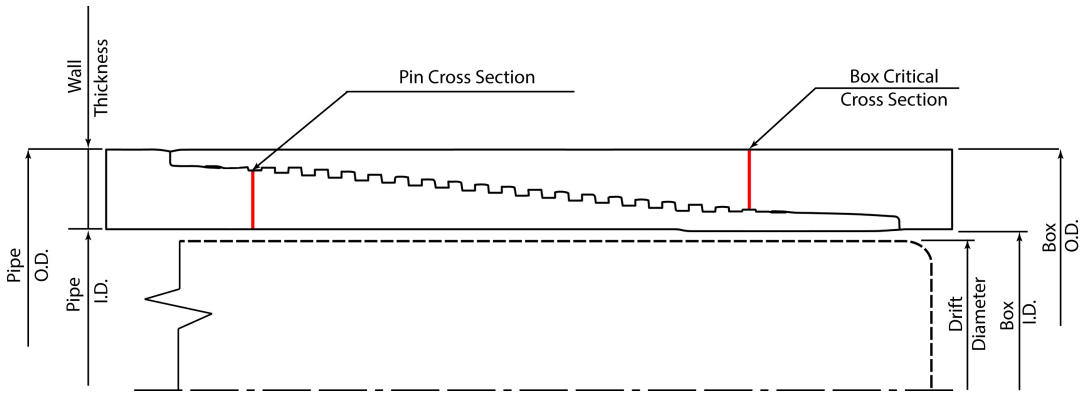
TUBULAR PARAMETERS	
Nominal OD, (inch)	10.750
Wall Thickness, (inch)	0.450
Pipe Grade	J55
Drift	Standard

CONNECTION PARAMETERS	
Connection OD (inch)	10.750
Connection ID, (inch)	9.862
Make-Up Loss, (inch)	5.027
Connection Critical Area, (sq inch)	9.309
Yield Strength in Tension, (klbs)	512
Yeld Strength in Compression, (klbs)	512
Tension Efficiency	64%
Compression Efficiency	64%
Min. Internal Yield Pressure, (psi)	4 030
Collapse Pressure, (psi)	2 710
Uniaxial Bending (deg/100ft)	15.0

MAKE-UP TORQUES	
Minimum Make-Up Torque, (ft-lb)	16 500
Optimum Make-Up Torque, (ft-lb)	18 300
Maximum Make-Up Torque, (ft-lb)	20 100
Operating Torque, (ft-lb)	16 500
Yield Torque, (ft-lb)	30 400

PIPE BODY PROPERTIES	
PE Weight, (lbs/ft)	49.55
Nominal Weight, (lbs/ft)	51.00
Nominal ID, (inch)	9.850
Drift Diameter, (inch)	9.694
Nominal Pipe Body Area, (sq inch)	14.561
Yield Strength in Tension, (klbs)	801
Min. Internal Yield Pressure, (psi)	4 030
Collapse Pressure, (psi)	2 710
Minimum Yield Strength, (psi)	55 000
Minimum Tensile Strength, (psi)	75 000





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Casing Design Assumptions

- Gas Gradient 0.11 – For all strings
- Frac Gradient 0.7 – For all strings
- 1.5°/ 100ft temperature gradient
- Collapse designed with fully evacuated pipe in mind
- Gas kicks assumed at each shoe
- Strings landed at neutral weight
- Cementing loads based on slurries listed in cement table
- Production string burst designed with frac treating pressures in mind of 8500 psi

EZGO™ Connection Data Sheet

Your Requirements

Pipe Size (OD): **5.50 in** Weight: **20 lb/ft** Grade: **P110 HC** Connection: **EZGO™ FJ3**

Material	
Grade	P-110 HC
Minimum Yield Strength	125,000 psi
Minimum Ultimate Strength	135,000 psi

Pipe Dimensions	
Nominal OD	5.5 in
Nominal ID	4.778 in
Nominal Wall Thickness	0.361 in
Nominal Weight	20.00 lbs/ft
Plain End Weight	19.83 lbs/ft
Nominal Pipe Body Area	5.828 sq in

Pipe Body Performance	
Minimum Pipe Body Yield Strength	729,000 lbs
Minimum Collapse Pressure	12,090 psi
Minimum Internal Yield Pressure	14,360 psi
Hydrostatic Test Pressure	13,100 psi

Torque Values	
Minimum Final Torque	2,400 ft-lbs
Maximum Final Torque	3,700 ft-lbs

EZGO™ Connection Dimensions	
Connection OD	5.50 in
Connection ID	4.708 in
Connection Drift Diameter	4.653 in
Make-Up Loss	4.64 in
Joint Efficiency	59 %

EZGO™ Connection Performance	
Joint Strength	430,000 lbs
Compression Rating	258,000 lbs
Collapse Pressure Rating	12,090 psi
Internal Pressure Resistance	14,360 psi
Maximum Uniaxial Bend Rating	36°/100 ft

Casing Design Assumptions

- Gas Gradient 0.11 – For all strings
- Frac Gradient 0.7 – For all strings
- 1.5°/ 100ft temperature gradient
- Collapse designed with fully evacuated pipe in mind
- Gas kicks assumed at each shoe
- Strings landed at neutral weight
- Cementing loads based on slurries listed in cement table
- Production string burst designed with frac treating pressures in mind of 8500 psi

Casing Design Assumptions

- Gas Gradient 0.11 – For all strings
- Frac Gradient 0.7 – For all strings
- 1.5°/ 100ft temperature gradient
- Collapse designed with fully evacuated pipe in mind
- Gas kicks assumed at each shoe
- Strings landed at neutral weight
- Cementing loads based on slurries listed in cement table
- Production string burst designed with frac treating pressures in mind of 8500 psi

Casing Design Assumptions

- Gas Gradient 0.11 – For all strings
- Frac Gradient 0.7 – For all strings
- 1.5°/ 100ft temperature gradient
- Collapse designed with fully evacuated pipe in mind
- Gas kicks assumed at each shoe
- Strings landed at neutral weight
- Cementing loads based on slurries listed in cement table
- Production string burst designed with frac treating pressures in mind of 8500 psi

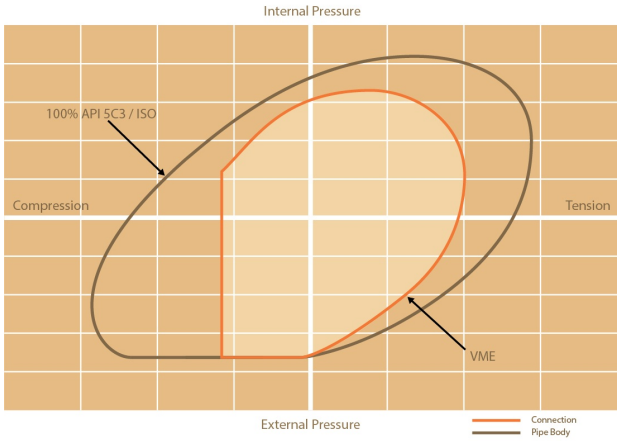
TECHNICAL DATA SHEET TMK UP TMK UP™ FJ 13.375 X 68 L80 HC

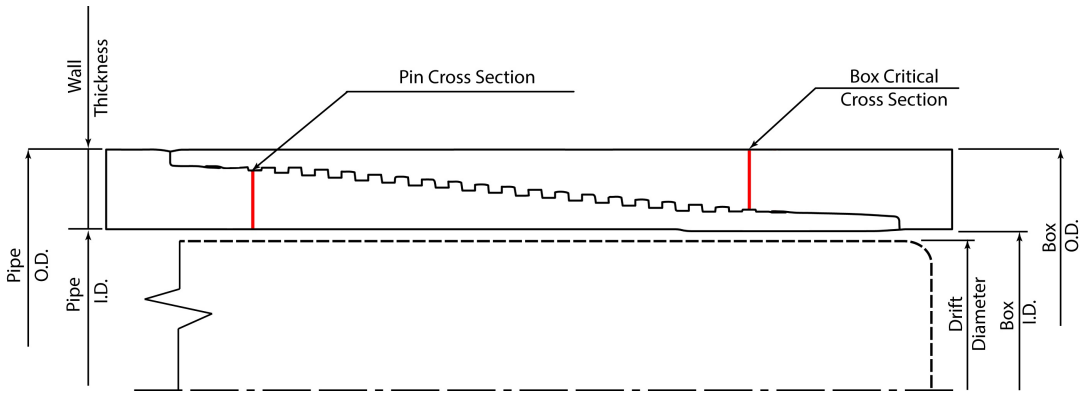
TUBULAR PARAMETERS	
Nominal OD, (inch)	13.375
Wall Thickness, (inch)	0.480
Pipe Grade	L80 HC
Drift	Standard

CONNECTION PARAMETERS	
Connection OD (inch)	13.375
Connection ID, (inch)	12.437
Make-Up Loss, (inch)	4.628
Connection Critical Area, (sq inch)	12.105
Yield Strength in Tension, (klbs)	968
Yeld Strength in Compression, (klbs)	948
Tension Efficiency	62%
Compression Efficiency	61%
Min. Internal Yield Pressure, (psi)	5 020
Collapse Pressure, (psi)	2 600
Uniaxial Bending (deg/100ft)	17.1

MAKE-UP TORQUES	
Minimum Make-Up Torque, (ft-lb)	32 300
Optimum Make-Up Torque, (ft-lb)	35 900
Maximum Make-Up Torque, (ft-lb)	39 500
Operating Torque, (ft-lb)	32 300
Yield Torque, (ft-lb)	71 800

PIPE BODY PROPERTIES	
PE Weight, (lbs/ft)	66.17
Nominal Weight, (lbs/ft)	68.00
Nominal ID, (inch)	12.415
Drift Diameter, (inch)	12.259
Nominal Pipe Body Area, (sq inch)	19.445
Yield Strength in Tension, (klbs)	1 556
Min. Internal Yield Pressure, (psi)	5 020
Collapse Pressure, (psi)	2 600
Minimum Yield Strength, (psi)	80 000
Minimum Tensile Strength, (psi)	95 000





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EZGO™ Connection Data Sheet

Your Requirements

Pipe Size (OD): **7.625 in** | Weight: **29.7 lb/ft** | Grade: **P-110 HC** | Connection: **EZGO™ FJ3**

Material	
Grade	P110 HC
Minimum Yield Strength	125,000 psi
Minimum Ultimate Strength	135,000 psi

Pipe Dimensions	
Nominal OD	7.625 in
Nominal ID	6.875 in
Nominal Wall Thickness	0.375 in
Nominal Weight	29.7 lbs/ft
Plain End Weight	29.06 lbs/ft
Nominal Pipe Body Area	8.541 sq in

Pipe Body Performance	
Minimum Pipe Body Yield Strength	1,069,000 lbs
Minimum Collapse Pressure	7,360 psi
Minimum Internal Yield Pressure	10,760 psi
Hydrostatic Test Pressure	9,800 psi

Torque Values	
Minimum Final Torque	4,600 ft-lbs
Maximum Final Torque	6,000 ft-lbs

EZGO™ Connection Dimensions	
Connection OD	7.625 in
Connection ID	6.782 in
Connection Drift Diameter	6.750 in
Make-Up Loss	4.39 in
Joint Efficiency	65.0 %

EZGO™ Connection Performance	
Joint Strength	694,000 lbs
Compression Rating	416,000 lbs
Collapse Pressure Rating	7,360 psi
Internal Pressure Resistance	10,760 psi
Maximum Uniaxial Bend Rating	29.3°/100 ft
String Length (1.4 Design Factor)	17,060 ft

Casing Design Assumptions

- Gas Gradient 0.11 – For all strings
- Frac Gradient 0.7 – For all strings
- 1.5°/ 100ft temperature gradient
- Collapse designed with fully evacuated pipe in mind
- Gas kicks assumed at each shoe
- Strings landed at neutral weight
- Cementing loads based on slurries listed in cement table
- Production string burst designed with frac treating pressures in mind of 8500 psi

HYDROGEN SULFIDE CONTINGENCY PLAN

Horseshoe Fed Com 602H and 702H

Section 19

T 21S R 33E

Lea County, NM

Initial Date: 11/01/18

Revision Date:

Table of Contents

INTRODUCTION

This plan specifies precautionary measures, safety equipment, emergency procedures, responsibilities, duties, and the compliance status pertaining to the production operations of Hydrogen Sulfide producing wells on:

Centennial Resource Development, Inc.

This plan will be in full effect prior to and continuing with all drilling operations for all wells producing potential Hydrogen Sulfide on the

Horseshoe Fed Com 602H and 702H

This plan was developed in response to the potential hazards involved when producing formations that may contain Hydrogen Sulfide (H_2S) It has been written in compliance with current New Mexico Oil Conservation Division Rule 118 and Bureau of Land Management 43 CFR 3160 Onshore Order No. 6.

All personnel shall receive proper H2S training in accordance with Onshore Order III.C.3.a

This plan shall require the full cooperation and efforts of all individuals participating in the production of potential H_2S wells.

Each individual is required to know their assigned responsibilities and duties in regard to normal production operations and emergency procedures.

Each person should thoroughly understand and be able to use all safety related equipment on the production facility.

Each person should become familiar with the location of all safety equipment and become involved in ensuring that all equipment is properly stored, easily accessible, and routinely maintained.

An ongoing training program will remain in effect with regular training, equipment inspections, and annual certifications for all personnel.

Centennial Resource Development, Inc. shall make every reasonable effort to provide all possible safeguards to protect all personnel, both on this location and in the immediate vicinity, from the harmful effects of H_2S exposure, if a release to the atmosphere should occur.

DIRECTIONS TO LOCATION

Horseshoe Fed Com 602H and 702H

Section 19

T 21S R 33E

Lea County, NM

PROCEED IN A NORTHERLY DIRECTION FROM JAL, NEW MEXICO ALONG NM-18 APPROXIMATELY 22.8 MILES TO THE JUNCTION OF THIS ROAD AND NM-176 TO THE WEST; TURN LEFT AND PROCEED IN A WESTERLY, THEN NORTHWESTERLY, THEN WESTERLY DIRECTION APPROXIMATELY 31.1 MILES TO THE JUNCTION OF THIS ROAD AND AN EXISTING ROAD TO THE SOUTH; TURN LEFT AND PROCEED IN A SOUTHERLY, THEN SOUTHWESTERLY, THEN SOUTHEASTERLY, THEN NORTHEASTERLY, THEN SOUTHEASTERLY, THEN SOUTHERLY DIRECTION APPROXIMATELY 4.6 MILES TO THE JUNCTION OF THIS ROAD AND THE PROPOSED ACCESS FOR THE HORSESHOE FED COM 602H & 702H TO THE EAST; FOLLOW ROAD FLAGS IN AN EASTERLY DIRECTION APPROXIMATELY 3,984' TO THE PROPOSED ACCESS ROAD TO THE SOUTH; FOLLOW ROAD FLAGS IN A SOUTHERLY DIRECTION APPROXIMATELY 150' TO THE PROPOSED LOCATION.

TOTAL DISTANCE FROM JAL, NEW MEXICO TO THE PROPOSED WELL LOCATION IS APPROXIMATELY 59.3 MILES.

SAFE BRIEFING AREAS

Two areas will be designated as “SAFE BRIEFING AREAS”.

The Primary Safe Briefing Area

If the Primary Safe Briefing Area cannot be used due to wind conditions; the designated secondary safe briefing area will be used.

These two areas are so designated for accessibility reasons related to self-contained safe breathing air device locations, evacuation muster point utility, and for ease of overall communication, organizational support, as well as the all-important prevailing wind directions. Drawings of the facility denoting these locations are included on Page 15.

If H_2S is detected in concentrations equal to or in excess of 15 PPM, all personnel not assigned emergency duties are to assemble in the appropriate “SAFE BRIEFING AREA” for instructions.

Wind Direction Indicators: A windsock, shall be positioned, allowing the wind direction to be observed from anywhere on the charted facility location.

Warning-DANGER SIGNS for Approaching Traffic: All signs shall also be illuminated under conditions of poor visibility.

DANGER
POISONOUS GAS
HYDROGEN SULFIDE
DO NOT APPROACH IF AMBER LIGHTS ARE FLASHING

An amber strobe light system will be activated for H_2S concentrations of 10 PPM or greater and an audible alarm will sound when H_2S exceeds 15 ppm, and. This condition will exist until the all clear is given.

DRILL SITE LOCATION:

1. The drilling rig should be situated on location such that the prevailing winds blow across the rig toward the reserve pit or at right angles to a line from the rig to the reserve pit.
2. The entrance to the location should be designated so that it can be barricaded if Hydrogen Sulfide emergency conditions arise. An auxiliary exit (or entrance) should be available in case of a catastrophe; a shift in wind direction would not preclude escape from the location. Appropriate warning signs and flags should be placed at all location entrances.
3. Once H2S safety procedures are established on location, no beards or facial hair, which will interfere with face seal or mask, will be allowed on location.
4. A minimum of two BRIEFING AREAS will be established, no less than 250 feet from the wellhead and in such location that at least one area will be up-wind from the well at all times. Upon recognition of an emergency situation, all personnel should assemble at the designated briefing areas for instructions.
5. A safety equipment trailer will be station at one of the briefing areas.
6. Windsocks will be installed and wind streamers (6 to 8 feet above ground level) placed at the location entrance. Windsocks shall be illuminated for nighttime operations. Personnel should develop wind direction consciousness.
7. The mud-logging trailer will be located so as to minimize the danger from the gas that breaks out of the drilling fluid.
8. Shale shaker mud tanks will be located so as to minimize the danger from gas that breaks out of the drilling fluid.
9. Electric power plant(s) will be located as far from the well bore as practical so that it may be used under conditions where it otherwise would have to be shut down.
10. When approaching depth where Hydrogen Sulfide may be encountered, appropriate warning signs will be posted on all access roads to the location and at the foot of all stairways to the derrick floor.
11. Appropriate smoking areas will be designated, and smoking will be prohibited elsewhere.

The table below lists various poisonous gases and the concentrations at which they become dangerous.

TOXICITY OF VARIOUS GASES

TOXICITY OF GASES (Taken from API RP-49 September 1974 – Re-issued August 1978)					
Common Name	**Chemical Formula**	**Gravity (Air = 1)**	**Threshold 1 Limit**	**Hazardous 2 Limit**	**Lethal 3 Limit**
Hydrogen Sulfide	H_2S	1.18	10 ppm	250 ppm/1hr	600 ppm
Sulfur Dioxide	SO_2	2.21	20 ppm	---	1000 ppm
Carbon Monoxide	CO	0.97	50 ppm	400 ppm/1hr	1000 ppm
Carbon Dioxide	CO_2	1.52	5000 ppm	5%	10%
Methane	CH_4	0.55	90000 ppm	Combustible Above 5% in Air	

1. Threshold concentration at which it is believed that all workers may repeatedly be exposed day after day, without adverse effect	2. Hazardous concentration that may cause death	3. Lethal concentration that will cause death with short-term exposure

Properties of Gases

The produced gas will probably be a mixture of Carbon Dioxide, Hydrogen Sulfide, and Methane.

Carbon Dioxide

Carbon Dioxide (CO_2) is usually considered inert and is commonly used to extinguish fires.

It is heavier than air (1.52 times) and it will concentrate in low areas of still air.

Humans cannot breathe air containing more than 10% CO_2 without losing consciousness. Air containing 5% CO_2 will cause disorientation in a few minutes.

Continued exposures to CO_2 after being affected will cause convulsions, coma, and respiratory failure.

The threshold limit of CO_2 is 5000 ppm.

Short-term exposure to 50,000 PPM (5%) is reasonable. This gas is colorless and odorless and can be tolerated in relatively high concentrations.

Hydrogen Sulfide

Hydrogen Sulfide (H_2S) itself is a colorless, transparent gas and is flammable. It is heavier than air and, hence, may accumulate in low places.

Although the slightest presence of H_2S in the air is normally detectable by its characteristic "rotten egg" odor, it is dangerous to rely on the odor as a means of detecting excessive concentrations because the sense of smell is rapidly lost, allowing lethal concentrations to be accumulated without warning. The following table indicates the poisonous nature of Hydrogen Sulfide.

HYDROGEN SULFIDE TOXICITY			
Concentration			Effects
$\%H_2S$	PPM	GR/100 SCF 1	
0.001	10	0.65	Safe for 8 hours without respirator. Obvious and unpleasant odor.
0.002	20	1.30	Burning in eyes and irritation of respiratory tract after on hour.
0.01	100	6.48	Kills smell in 3 to 15 minutes; may sting eyes and throat.
0.02	200	12.96	Kills smell shortly; stings eyes and throat.
0.05	500	32.96	Dizziness; breathing ceases in a few minutes; need prompt artificial respiration.
0.07	700	45.92	Unconscious quickly; death will result if not rescued promptly
0.10	1000	64.80	DEATH!
Note: 1 grain per 100 cubic feet			

Sulfur Dioxide

Sulfur Dioxide is a colorless, transparent gas and is non-flammable.

Sulfur Dioxide (SO_2) is produced during the burning of H_2S. Although SO_2 is heavier than air, it will be picked up by a breeze and carried downwind at elevated temperatures. Since Sulfur Dioxide is extremely irritating to the eyes and mucous membranes of the upper respiratory tract, it has exceptionally good warning powers in this respect. The following table indicates the toxic nature of the gas.

SULFUR DIOXIDE TOXICITY		
Concentration		Effects
$\%SO_2$	PPM	
0.0005	3 to 5	Pungent odor-normally a person can detect SO_2 in this range.
0.0012	12	Throat irritation, coughing, and constriction of the chest tearing and smarting of eyes.
0.15	150	So irritating that it can only be endured for a few minutes.
0.05	500	Causes a sense of suffocation, even with first breath.

H_2S REQUIRED EQUIPMENT LIST

RESPIRATORY SAFETY SYSTEMS
- Working cascade system available on rig floor and pit system & 750' of air line hose
- Four (4) breathing air manifolds
- Four (4) 30-minute rescue packs
- Five (5) work/Escape units
- Five (5) escape units
- One (1) filler hose for the work/escape/rescue units

DETECTION AND ALARM SYSTEM
- 4 channel H2S monitor
- 4 wireless H2S monitors
- H2S alarm system (Audible/Red strobe)
- Personal gas monitor for each person on location
- Gas sample tubes

WELL CONTROL EQUIPMENT
- Flare line with remote ignitor and backup flare gun, placed 150' from wellhead
- Choke manifold with remotely operated choke
- Mud gas separator

VISUAL WARNING SYSTEMS
- One color code condition sign will be placed at each entrance reflecting possible conditions at the site
- A colored condition flag will be on display, reflecting current condition at the site at the time
- At least 4 wind socks placed on location, visible at all angles and locations

MUD PROGRAM
- Mud will contain sufficient weight and additives to control and minimize H2S

METALLURGY
- All drill strings, casing, tubing, wellhead, BOP, spools, kill lines, choke manifold and lines, and valves shall be suitable for anticipated H2S volume and pressure

COMMUNICATION
- Cell phones, intercoms, and satellite phones will be available on location

ADDITIONAL SAFETY RELATED ITEMS
- Stretcher
- 2 OSHA full body harness
- 20# class ABC fire extinguisher

DETERMINATION OF RADIUS OF EXPOSURE

Potentially hazardous volume means a volume of gas of such H2S concentration and flow rate that it may result in radius of exposure-calculated ambient concentrations of 100 ppm H2S at any occupied residence, school, church, park, school bus stop, place of business or other area where the public could reasonably be expected to frequent, or 500 ppm H2S at any Federal, State, County or municipal road or highway.

Currently there are no residence located within the ROE

Radius of exposure means the calculation resulting from using the Pasquill -Gifford derived equation, or by such other method(s) that may be approved by the authorized officer.
Advanced Fire and Safety has provided the Pasquill-Gifford formula in excel format for simple calculations.

NEW MEXICO OIL & GAS CONSERVATION DIVISION 118

Horseshoe Fed Com 602H

H2S Concentration- 10 PPM (Block 13)

Maximum Escape Volume- 3000 MCF/Day (Block 13)

100 PPM Radius of Exposure (Block 15)- 11
(Formula= 1.589 x (B5/1000000) x (B6 x 1000) x .6258

500 PPM Radius of Exposure (Block 16)- 5
Formula= .4546 x (B5/1000000) x (B6 x 1000) x .6258

Horseshoe Fed Com 702H

H2S Concentration- 2 PPM (Block 13)

Maximum Escape Volume- 3000 MCF/Day (Block 13)

100 PPM Radius of Exposure (Block 15)- 4
(Formula= 1.589 x (B5/1000000) x (B6 x 1000) x .6258

500 PPM Radius of Exposure (Block 16)- 2
Formula= .4546 x (B5/1000000) x (B6 x 1000) x .6258

EMERGENCY CONTACT LIST

911 is available in the area			
NAME	**POSITION**	**COMPANY**	**NUMBER**
Centennial Contacts			
Jeremy Ray	Drilling Engineer	CDEV	303-263-7872
Ricky Mills/John Helm	Superintendent	CDEV	432-305-1068
Mike Ponder/Wayne Miller	Field Superintendent	CDEV	432-287-3003
Brett Thompson	Drilling Manager	CDEV	720-656-7027
Reggie Phillips	HSE Manager	CDEV	432-638-3380
H&P 650 Drilling Office	Drilling Supervisor	CDEV	432-538-3343
Local Emergency Response			
Fire Department			575-395-2511
Jal Community Hospital			505-395-2511
State Police			505-827-9000
Lea County Sheriff			575-396-3611
Safety Contractor			
Advanced Safety	Office	Advanced Safety	833-296-3913
Joe Gadway	Permian Supervisor	Advanced Safety	318-446-3716
Clint Hudson	Operations Manager	Advanced Safety	337-552-8330
Well Control Company			
Wild Well Control			866-404-9564
Contractors			
Tommy E Lee	Pump Trucks		432-813-7140
Paul Smith	Drilling Fluids	Momentum	307-258-6254
Compass Coordinators	Cement	Compass	432-561-5970

CENTENNIAL
RESOURCE DEVELOPMENT, INC

New Mexico

LEA
HORSESHOE
HORSESHOE FED COM 702H

HORSESHOE FED COM 702H

Plan: PWP0

Survey Report - Geographic

06 November, 2018

Company:	New Mexico	**Local Co-ordinate Reference:**	Well HORSESHOE FED COM 702H
Project:	LEA	**TVD Reference:**	RKB=3792.9+25 @ 3817.9usft
Site:	HORSESHOE	**MD Reference:**	RKB=3792.9+25 @ 3817.9usft
Well:	HORSESHOE FED COM 702H	**North Reference:**	True
Wellbore:	HORSESHOE FED COM 702H	**Survey Calculation Method:**	Minimum Curvature
Design:	PWP0	**Database:**	Centennial EDM SQL Server

Wellbore HORSESHOE FED COM 702H

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF200510	12/31/2009	7.78	60.47	48,935.40608103

Design PWP0

Audit Notes:

Version: **Phase:** PROTOTYPE **Tie On Depth:** 0.0

Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.0	0.0	0.0	3.26

Survey Tool Program **Date** 11/6/2018

From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
0.0	17,431.5	PWP0 (HORSESHOE FED COM 702H)	MWD+IFR1+MS	OWSG MWD + IFR1 + Multi-Station Correction

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
0.0	0.00	0.00	0.0	0.0	0.0	11,789,615.78	2,070,432.21	32° 28' 14.985 N	103° 36' 18.918 W
100.0	0.00	0.00	100.0	0.0	0.0	11,789,615.78	2,070,432.21	32° 28' 14.985 N	103° 36' 18.918 W
200.0	0.00	0.00	200.0	0.0	0.0	11,789,615.78	2,070,432.21	32° 28' 14.985 N	103° 36' 18.918 W
300.0	0.00	0.00	300.0	0.0	0.0	11,789,615.78	2,070,432.21	32° 28' 14.985 N	103° 36' 18.918 W
400.0	0.00	0.00	400.0	0.0	0.0	11,789,615.78	2,070,432.21	32° 28' 14.985 N	103° 36' 18.918 W
500.0	0.00	0.00	500.0	0.0	0.0	11,789,615.78	2,070,432.21	32° 28' 14.985 N	103° 36' 18.918 W
600.0	0.00	0.00	600.0	0.0	0.0	11,789,615.78	2,070,432.21	32° 28' 14.985 N	103° 36' 18.918 W
700.0	0.00	0.00	700.0	0.0	0.0	11,789,615.78	2,070,432.21	32° 28' 14.985 N	103° 36' 18.918 W
800.0	0.00	0.00	800.0	0.0	0.0	11,789,615.78	2,070,432.21	32° 28' 14.985 N	103° 36' 18.918 W
900.0	0.00	0.00	900.0	0.0	0.0	11,789,615.78	2,070,432.21	32° 28' 14.985 N	103° 36' 18.918 W
1,000.0	0.00	0.00	1,000.0	0.0	0.0	11,789,615.78	2,070,432.21	32° 28' 14.985 N	103° 36' 18.918 W
1,100.0	0.00	0.00	1,100.0	0.0	0.0	11,789,615.78	2,070,432.21	32° 28' 14.985 N	103° 36' 18.918 W
1,200.0	0.00	0.00	1,200.0	0.0	0.0	11,789,615.78	2,070,432.21	32° 28' 14.985 N	103° 36' 18.918 W
1,300.0	0.00	0.00	1,300.0	0.0	0.0	11,789,615.78	2,070,432.21	32° 28' 14.985 N	103° 36' 18.918 W
1,400.0	0.00	0.00	1,400.0	0.0	0.0	11,789,615.78	2,070,432.21	32° 28' 14.985 N	103° 36' 18.918 W
1,500.0	0.00	0.00	1,500.0	0.0	0.0	11,789,615.78	2,070,432.21	32° 28' 14.985 N	103° 36' 18.918 W
1,600.0	0.00	0.00	1,600.0	0.0	0.0	11,789,615.78	2,070,432.21	32° 28' 14.985 N	103° 36' 18.918 W
1,700.0	0.00	0.00	1,700.0	0.0	0.0	11,789,615.78	2,070,432.21	32° 28' 14.985 N	103° 36' 18.918 W
1,800.0	0.00	0.00	1,800.0	0.0	0.0	11,789,615.78	2,070,432.21	32° 28' 14.985 N	103° 36' 18.918 W
1,900.0	0.00	0.00	1,900.0	0.0	0.0	11,789,615.78	2,070,432.21	32° 28' 14.985 N	103° 36' 18.918 W
2,000.0	0.00	0.00	2,000.0	0.0	0.0	11,789,615.78	2,070,432.21	32° 28' 14.985 N	103° 36' 18.918 W
2,100.0	0.00	0.00	2,100.0	0.0	0.0	11,789,615.78	2,070,432.21	32° 28' 14.985 N	103° 36' 18.918 W
2,200.0	0.00	0.00	2,200.0	0.0	0.0	11,789,615.78	2,070,432.21	32° 28' 14.985 N	103° 36' 18.918 W
2,300.0	0.00	0.00	2,300.0	0.0	0.0	11,789,615.78	2,070,432.21	32° 28' 14.985 N	103° 36' 18.918 W
2,400.0	0.00	0.00	2,400.0	0.0	0.0	11,789,615.78	2,070,432.21	32° 28' 14.985 N	103° 36' 18.918 W
2,500.0	0.00	0.00	2,500.0	0.0	0.0	11,789,615.78	2,070,432.21	32° 28' 14.985 N	103° 36' 18.918 W
2,600.0	0.00	0.00	2,600.0	0.0	0.0	11,789,615.78	2,070,432.21	32° 28' 14.985 N	103° 36' 18.918 W
2,700.0	0.00	0.00	2,700.0	0.0	0.0	11,789,615.78	2,070,432.21	32° 28' 14.985 N	103° 36' 18.918 W
2,800.0	0.00	0.00	2,800.0	0.0	0.0	11,789,615.78	2,070,432.21	32° 28' 14.985 N	103° 36' 18.918 W
2,900.0	0.00	0.00	2,900.0	0.0	0.0	11,789,615.78	2,070,432.21	32° 28' 14.985 N	103° 36' 18.918 W
3,000.0	0.00	0.00	3,000.0	0.0	0.0	11,789,615.78	2,070,432.21	32° 28' 14.985 N	103° 36' 18.918 W
3,100.0	1.00	134.40	3,100.0	-0.6	0.6	11,789,615.18	2,070,432.84	32° 28' 14.979 N	103° 36' 18.910 W

Company:	New Mexico	**Local Co-ordinate Reference:**	Well HORSESHOE FED COM 702H
Project:	LEA	**TVD Reference:**	RKB=3792.9+25 @ 3817.9usft
Site:	HORSESHOE	**MD Reference:**	RKB=3792.9+25 @ 3817.9usft
Well:	HORSESHOE FED COM 702H	**North Reference:**	True
Wellbore:	HORSESHOE FED COM 702H	**Survey Calculation Method:**	Minimum Curvature
Design:	PWP0	**Database:**	Centennial EDM SQL Server

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
3,200.0	2.00	134.40	3,200.0	-2.4	2.5	11,789,613.37	2,070,434.73	32° 28' 14.961 N	103° 36' 18.889 W
3,300.0	3.00	134.40	3,299.9	-5.5	5.6	11,789,610.36	2,070,437.89	32° 28' 14.931 N	103° 36' 18.852 W
3,400.0	4.00	134.40	3,399.7	-9.8	10.0	11,789,606.15	2,070,442.30	32° 28' 14.889 N	103° 36' 18.801 W
3,500.0	4.00	134.40	3,499.4	-14.6	15.0	11,789,601.33	2,070,447.35	32° 28' 14.840 N	103° 36' 18.743 W
3,600.0	4.00	134.40	3,599.2	-19.5	19.9	11,789,596.52	2,070,452.40	32° 28' 14.792 N	103° 36' 18.685 W
3,700.0	4.00	134.40	3,698.9	-24.4	24.9	11,789,591.70	2,070,457.45	32° 28' 14.744 N	103° 36' 18.627 W
3,800.0	4.00	134.40	3,798.7	-29.3	29.9	11,789,586.89	2,070,462.49	32° 28' 14.695 N	103° 36' 18.568 W
3,900.0	4.00	134.40	3,898.5	-34.2	34.9	11,789,582.07	2,070,467.54	32° 28' 14.647 N	103° 36' 18.510 W
4,000.0	4.00	134.40	3,998.2	-39.0	39.9	11,789,577.26	2,070,472.59	32° 28' 14.599 N	103° 36' 18.452 W
4,100.0	4.00	134.40	4,098.0	-43.9	44.9	11,789,572.44	2,070,477.64	32° 28' 14.550 N	103° 36' 18.394 W
4,200.0	4.00	134.40	4,197.7	-48.8	49.8	11,789,567.63	2,070,482.68	32° 28' 14.502 N	103° 36' 18.336 W
4,300.0	4.00	134.40	4,297.5	-53.7	54.8	11,789,562.81	2,070,487.73	32° 28' 14.454 N	103° 36' 18.278 W
4,400.0	4.00	134.40	4,397.2	-58.6	59.8	11,789,558.00	2,070,492.78	32° 28' 14.406 N	103° 36' 18.219 W
4,500.0	4.00	134.40	4,497.0	-63.5	64.8	11,789,553.18	2,070,497.83	32° 28' 14.357 N	103° 36' 18.161 W
4,600.0	4.00	134.40	4,596.8	-68.3	69.8	11,789,548.37	2,070,502.87	32° 28' 14.309 N	103° 36' 18.103 W
4,700.0	4.00	134.40	4,696.5	-73.2	74.8	11,789,543.55	2,070,507.92	32° 28' 14.261 N	103° 36' 18.045 W
4,800.0	4.00	134.40	4,796.3	-78.1	79.7	11,789,538.74	2,070,512.97	32° 28' 14.212 N	103° 36' 17.987 W
4,900.0	4.00	134.40	4,896.0	-83.0	84.7	11,789,533.92	2,070,518.01	32° 28' 14.164 N	103° 36' 17.928 W
5,000.0	4.00	134.40	4,995.8	-87.9	89.7	11,789,529.11	2,070,523.06	32° 28' 14.116 N	103° 36' 17.870 W
5,100.0	4.00	134.40	5,095.5	-92.7	94.7	11,789,524.29	2,070,528.11	32° 28' 14.067 N	103° 36' 17.812 W
5,200.0	4.00	134.40	5,195.3	-97.6	99.7	11,789,519.48	2,070,533.16	32° 28' 14.019 N	103° 36' 17.754 W
5,300.0	4.00	134.40	5,295.0	-102.5	104.7	11,789,514.66	2,070,538.20	32° 28' 13.971 N	103° 36' 17.696 W
5,400.0	4.00	134.40	5,394.8	-107.4	109.7	11,789,509.85	2,070,543.25	32° 28' 13.923 N	103° 36' 17.638 W
5,500.0	4.00	134.40	5,494.6	-112.3	114.6	11,789,505.03	2,070,548.30	32° 28' 13.874 N	103° 36' 17.579 W
5,600.0	4.00	134.40	5,594.3	-117.1	119.6	11,789,500.22	2,070,553.35	32° 28' 13.826 N	103° 36' 17.521 W
5,700.0	4.00	134.40	5,694.1	-122.0	124.6	11,789,495.40	2,070,558.39	32° 28' 13.778 N	103° 36' 17.463 W
5,800.0	4.00	134.40	5,793.8	-126.9	129.6	11,789,490.59	2,070,563.44	32° 28' 13.729 N	103° 36' 17.405 W
5,900.0	4.00	134.40	5,893.6	-131.8	134.6	11,789,485.77	2,070,568.49	32° 28' 13.681 N	103° 36' 17.347 W
6,000.0	4.00	134.40	5,993.3	-136.7	139.6	11,789,480.96	2,070,573.53	32° 28' 13.633 N	103° 36' 17.288 W
6,100.0	4.00	134.40	6,093.1	-141.5	144.5	11,789,476.14	2,070,578.58	32° 28' 13.584 N	103° 36' 17.230 W
6,200.0	4.00	134.40	6,192.9	-146.4	149.5	11,789,471.33	2,070,583.63	32° 28' 13.536 N	103° 36' 17.172 W
6,300.0	4.00	134.40	6,292.6	-151.3	154.5	11,789,466.51	2,070,588.68	32° 28' 13.488 N	103° 36' 17.114 W
6,400.0	4.00	134.40	6,392.4	-156.2	159.5	11,789,461.70	2,070,593.72	32° 28' 13.440 N	103° 36' 17.056 W
6,500.0	4.00	134.40	6,492.1	-161.1	164.5	11,789,456.88	2,070,598.77	32° 28' 13.391 N	103° 36' 16.997 W
6,600.0	4.00	134.40	6,591.9	-165.9	169.5	11,789,452.07	2,070,603.82	32° 28' 13.343 N	103° 36' 16.939 W
6,700.0	4.00	134.40	6,691.6	-170.8	174.4	11,789,447.25	2,070,608.87	32° 28' 13.295 N	103° 36' 16.881 W
6,800.0	4.00	134.40	6,791.4	-175.7	179.4	11,789,442.44	2,070,613.91	32° 28' 13.246 N	103° 36' 16.823 W
6,900.0	4.00	134.40	6,891.1	-180.6	184.4	11,789,437.62	2,070,618.96	32° 28' 13.198 N	103° 36' 16.765 W
7,000.0	4.00	134.40	6,990.9	-185.5	189.4	11,789,432.81	2,070,624.01	32° 28' 13.150 N	103° 36' 16.707 W
7,100.0	4.00	134.40	7,090.7	-190.3	194.4	11,789,427.99	2,070,629.05	32° 28' 13.101 N	103° 36' 16.648 W
7,200.0	4.00	134.40	7,190.4	-195.2	199.4	11,789,423.18	2,070,634.10	32° 28' 13.053 N	103° 36' 16.590 W
7,300.0	4.00	134.40	7,290.2	-200.1	204.3	11,789,418.36	2,070,639.15	32° 28' 13.005 N	103° 36' 16.532 W
7,400.0	4.00	134.40	7,389.9	-205.0	209.3	11,789,413.55	2,070,644.20	32° 28' 12.957 N	103° 36' 16.474 W
7,500.0	4.00	134.40	7,489.7	-209.9	214.3	11,789,408.73	2,070,649.24	32° 28' 12.908 N	103° 36' 16.416 W
7,600.0	4.00	134.40	7,589.4	-214.8	219.3	11,789,403.92	2,070,654.29	32° 28' 12.860 N	103° 36' 16.357 W
7,700.0	4.00	134.40	7,689.2	-219.6	224.3	11,789,399.10	2,070,659.34	32° 28' 12.812 N	103° 36' 16.299 W
7,800.0	4.00	134.40	7,789.0	-224.5	229.3	11,789,394.29	2,070,664.39	32° 28' 12.763 N	103° 36' 16.241 W
7,900.0	4.00	134.40	7,888.7	-229.4	234.2	11,789,389.47	2,070,669.43	32° 28' 12.715 N	103° 36' 16.183 W
8,000.0	4.00	134.40	7,988.5	-234.3	239.2	11,789,384.66	2,070,674.48	32° 28' 12.667 N	103° 36' 16.125 W
8,100.0	4.00	134.40	8,088.2	-239.2	244.2	11,789,379.84	2,070,679.53	32° 28' 12.618 N	103° 36' 16.067 W
8,200.0	4.00	134.40	8,188.0	-244.0	249.2	11,789,375.03	2,070,684.57	32° 28' 12.570 N	103° 36' 16.008 W
8,300.0	4.00	134.40	8,287.7	-248.9	254.2	11,789,370.21	2,070,689.62	32° 28' 12.522 N	103° 36' 15.950 W
8,400.0	4.00	134.40	8,387.5	-253.8	259.2	11,789,365.40	2,070,694.67	32° 28' 12.473 N	103° 36' 15.892 W
8,500.0	4.00	134.40	8,487.3	-258.7	264.2	11,789,360.58	2,070,699.72	32° 28' 12.425 N	103° 36' 15.834 W
8,600.0	4.00	134.40	8,587.0	-263.6	269.1	11,789,355.77	2,070,704.76	32° 28' 12.377 N	103° 36' 15.776 W

Company:	New Mexico	**Local Co-ordinate Reference:**	Well HORSESHOE FED COM 702H
Project:	LEA	**TVD Reference:**	RKB=3792.9+25 @ 3817.9usft
Site:	HORSESHOE	**MD Reference:**	RKB=3792.9+25 @ 3817.9usft
Well:	HORSESHOE FED COM 702H	**North Reference:**	True
Wellbore:	HORSESHOE FED COM 702H	**Survey Calculation Method:**	Minimum Curvature
Design:	PWP0	**Database:**	Centennial EDM SQL Server

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
8,700.0	4.00	134.40	8,686.8	-268.4	274.1	11,789,350.95	2,070,709.81	32° 28' 12.329 N	103° 36' 15.717 W
8,800.0	4.00	134.40	8,786.5	-273.3	279.1	11,789,346.14	2,070,714.86	32° 28' 12.280 N	103° 36' 15.659 W
8,900.0	4.00	134.40	8,886.3	-278.2	284.1	11,789,341.32	2,070,719.91	32° 28' 12.232 N	103° 36' 15.601 W
9,000.0	3.00	134.40	8,986.1	-282.5	288.4	11,789,337.11	2,070,724.32	32° 28' 12.190 N	103° 36' 15.550 W
9,100.0	2.00	134.40	9,086.0	-285.5	291.6	11,789,334.10	2,070,727.48	32° 28' 12.160 N	103° 36' 15.514 W
9,200.0	1.00	134.40	9,186.0	-287.4	293.4	11,789,332.29	2,070,729.37	32° 28' 12.141 N	103° 36' 15.492 W
9,300.0	0.00	0.00	9,286.0	-288.0	294.1	11,789,331.69	2,070,730.00	32° 28' 12.135 N	103° 36' 15.485 W
9,400.0	0.00	0.00	9,386.0	-288.0	294.1	11,789,331.69	2,070,730.00	32° 28' 12.135 N	103° 36' 15.485 W
9,500.0	0.00	0.00	9,486.0	-288.0	294.1	11,789,331.69	2,070,730.00	32° 28' 12.135 N	103° 36' 15.485 W
9,600.0	0.00	0.00	9,586.0	-288.0	294.1	11,789,331.69	2,070,730.00	32° 28' 12.135 N	103° 36' 15.485 W
9,700.0	0.00	0.00	9,686.0	-288.0	294.1	11,789,331.69	2,070,730.00	32° 28' 12.135 N	103° 36' 15.485 W
9,800.0	0.00	0.00	9,786.0	-288.0	294.1	11,789,331.69	2,070,730.00	32° 28' 12.135 N	103° 36' 15.485 W
9,900.0	0.00	0.00	9,886.0	-288.0	294.1	11,789,331.69	2,070,730.00	32° 28' 12.135 N	103° 36' 15.485 W
10,000.0	0.00	0.00	9,986.0	-288.0	294.1	11,789,331.69	2,070,730.00	32° 28' 12.135 N	103° 36' 15.485 W
10,100.0	0.00	0.00	10,086.0	-288.0	294.1	11,789,331.69	2,070,730.00	32° 28' 12.135 N	103° 36' 15.485 W
10,200.0	0.00	0.00	10,186.0	-288.0	294.1	11,789,331.69	2,070,730.00	32° 28' 12.135 N	103° 36' 15.485 W
10,300.0	0.00	0.00	10,286.0	-288.0	294.1	11,789,331.69	2,070,730.00	32° 28' 12.135 N	103° 36' 15.485 W
10,400.0	0.00	0.00	10,386.0	-288.0	294.1	11,789,331.69	2,070,730.00	32° 28' 12.135 N	103° 36' 15.485 W
10,500.0	0.00	0.00	10,486.0	-288.0	294.1	11,789,331.69	2,070,730.00	32° 28' 12.135 N	103° 36' 15.485 W
10,600.0	0.00	0.00	10,586.0	-288.0	294.1	11,789,331.69	2,070,730.00	32° 28' 12.135 N	103° 36' 15.485 W
10,700.0	0.00	0.00	10,686.0	-288.0	294.1	11,789,331.69	2,070,730.00	32° 28' 12.135 N	103° 36' 15.485 W
10,800.0	0.00	0.00	10,786.0	-288.0	294.1	11,789,331.69	2,070,730.00	32° 28' 12.135 N	103° 36' 15.485 W
10,900.0	0.00	0.00	10,886.0	-288.0	294.1	11,789,331.69	2,070,730.00	32° 28' 12.135 N	103° 36' 15.485 W
11,000.0	0.00	0.00	10,986.0	-288.0	294.1	11,789,331.69	2,070,730.00	32° 28' 12.135 N	103° 36' 15.485 W
11,100.0	0.00	0.00	11,086.0	-288.0	294.1	11,789,331.69	2,070,730.00	32° 28' 12.135 N	103° 36' 15.485 W
11,200.0	0.00	0.00	11,186.0	-288.0	294.1	11,789,331.69	2,070,730.00	32° 28' 12.135 N	103° 36' 15.485 W
11,300.0	0.00	0.00	11,286.0	-288.0	294.1	11,789,331.69	2,070,730.00	32° 28' 12.135 N	103° 36' 15.485 W
11,341.0	0.00	0.00	11,327.0	-288.0	294.1	11,789,331.69	2,070,730.00	32° 28' 12.135 N	103° 36' 15.485 W
11,400.0	5.90	0.17	11,385.8	-284.9	294.1	11,789,334.72	2,070,729.97	32° 28' 12.165 N	103° 36' 15.485 W
11,500.0	15.90	0.17	11,483.9	-266.0	294.1	11,789,353.60	2,070,729.78	32° 28' 12.352 N	103° 36' 15.484 W
11,600.0	25.90	0.17	11,577.2	-230.4	294.2	11,789,389.23	2,070,729.42	32° 28' 12.705 N	103° 36' 15.483 W
11,700.0	35.89	0.17	11,662.9	-179.1	294.4	11,789,440.50	2,070,728.90	32° 28' 13.212 N	103° 36' 15.481 W
11,800.0	45.89	0.17	11,738.4	-113.8	294.6	11,789,505.88	2,070,728.24	32° 28' 13.859 N	103° 36' 15.479 W
11,900.0	55.89	0.17	11,801.4	-36.3	294.8	11,789,583.38	2,070,727.46	32° 28' 14.626 N	103° 36' 15.476 W
12,000.0	65.89	0.17	11,850.0	51.0	295.1	11,789,670.63	2,070,726.58	32° 28' 15.490 N	103° 36' 15.473 W
12,100.0	75.89	0.17	11,882.7	145.4	295.3	11,789,765.00	2,070,725.63	32° 28' 16.424 N	103° 36' 15.470 W
12,200.0	85.89	0.17	11,898.5	244.0	295.6	11,789,863.60	2,070,724.63	32° 28' 17.400 N	103° 36' 15.466 W
12,241.1	90.00	0.17	11,900.0	285.1	295.8	11,789,904.71	2,070,724.21	32° 28' 17.807 N	103° 36' 15.465 W
12,300.0	90.00	0.17	11,900.0	343.9	295.9	11,789,963.56	2,070,723.62	32° 28' 18.389 N	103° 36' 15.463 W
12,320.1	90.00	0.17	11,900.0	364.0	296.0	11,789,983.64	2,070,723.42	32° 28' 18.588 N	103° 36' 15.462 W
12,400.0	90.00	0.17	11,900.0	443.9	296.2	11,790,063.56	2,070,722.61	32° 28' 19.379 N	103° 36' 15.459 W
12,500.0	90.00	0.17	11,900.0	543.9	296.5	11,790,163.55	2,070,721.60	32° 28' 20.368 N	103° 36' 15.456 W
12,600.0	90.00	0.17	11,900.0	643.9	296.8	11,790,263.55	2,070,720.59	32° 28' 21.358 N	103° 36' 15.452 W
12,700.0	90.00	0.17	11,900.0	743.9	297.1	11,790,363.54	2,070,719.58	32° 28' 22.348 N	103° 36' 15.449 W
12,800.0	90.00	0.17	11,900.0	843.9	297.4	11,790,463.54	2,070,718.57	32° 28' 23.337 N	103° 36' 15.445 W
12,900.0	90.00	0.17	11,900.0	943.9	297.7	11,790,563.53	2,070,717.56	32° 28' 24.327 N	103° 36' 15.442 W
13,000.0	90.00	0.17	11,900.0	1,043.9	298.0	11,790,663.53	2,070,716.55	32° 28' 25.317 N	103° 36' 15.438 W
13,100.0	90.00	0.17	11,900.0	1,143.9	298.3	11,790,763.52	2,070,715.54	32° 28' 26.306 N	103° 36' 15.435 W
13,200.0	90.00	0.17	11,900.0	1,243.9	298.6	11,790,863.52	2,070,714.53	32° 28' 27.296 N	103° 36' 15.431 W
13,300.0	90.00	0.17	11,900.0	1,343.9	298.9	11,790,963.51	2,070,713.52	32° 28' 28.286 N	103° 36' 15.428 W
13,400.0	90.00	0.17	11,900.0	1,443.9	299.2	11,791,063.51	2,070,712.51	32° 28' 29.275 N	103° 36' 15.424 W
13,500.0	90.00	0.17	11,900.0	1,543.9	299.5	11,791,163.50	2,070,711.50	32° 28' 30.265 N	103° 36' 15.421 W
13,600.0	90.00	0.17	11,900.0	1,643.9	299.8	11,791,263.50	2,070,710.49	32° 28' 31.255 N	103° 36' 15.418 W
13,700.0	90.00	0.17	11,900.0	1,743.9	300.1	11,791,363.49	2,070,709.48	32° 28' 32.244 N	103° 36' 15.414 W
13,800.0	90.00	0.17	11,900.0	1,843.9	300.4	11,791,463.49	2,070,708.47	32° 28' 33.234 N	103° 36' 15.411 W

Company:	New Mexico	**Local Co-ordinate Reference:**	Well HORSESHOE FED COM 702H
Project:	LEA	**TVD Reference:**	RKB=3792.9+25 @ 3817.9usft
Site:	HORSESHOE	**MD Reference:**	RKB=3792.9+25 @ 3817.9usft
Well:	HORSESHOE FED COM 702H	**North Reference:**	True
Wellbore:	HORSESHOE FED COM 702H	**Survey Calculation Method:**	Minimum Curvature
Design:	PWP0	**Database:**	Centennial EDM SQL Server

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
13,900.0	90.00	0.17	11,900.0	1,943.9	300.7	11,791,563.48	2,070,707.45	32° 28' 34.224 N	103° 36' 15.407 W
14,000.0	90.00	0.17	11,900.0	2,043.9	301.0	11,791,663.48	2,070,706.44	32° 28' 35.213 N	103° 36' 15.404 W
14,100.0	90.00	0.17	11,900.0	2,143.9	301.3	11,791,763.47	2,070,705.43	32° 28' 36.203 N	103° 36' 15.400 W
14,200.0	90.00	0.17	11,900.0	2,243.9	301.6	11,791,863.47	2,070,704.42	32° 28' 37.193 N	103° 36' 15.397 W
14,300.0	90.00	0.17	11,900.0	2,343.9	301.9	11,791,963.46	2,070,703.41	32° 28' 38.182 N	103° 36' 15.393 W
14,400.0	90.00	0.17	11,900.0	2,443.9	302.2	11,792,063.46	2,070,702.40	32° 28' 39.172 N	103° 36' 15.390 W
14,500.0	90.00	0.17	11,900.0	2,543.9	302.5	11,792,163.45	2,070,701.39	32° 28' 40.162 N	103° 36' 15.386 W
14,600.0	90.00	0.17	11,900.0	2,643.9	302.8	11,792,263.45	2,070,700.38	32° 28' 41.151 N	103° 36' 15.383 W
14,700.0	90.00	0.17	11,900.0	2,743.9	303.1	11,792,363.44	2,070,699.37	32° 28' 42.141 N	103° 36' 15.379 W
14,800.0	90.00	0.17	11,900.0	2,843.9	303.4	11,792,463.44	2,070,698.36	32° 28' 43.131 N	103° 36' 15.376 W
14,900.0	90.00	0.17	11,900.0	2,943.9	303.7	11,792,563.43	2,070,697.35	32° 28' 44.120 N	103° 36' 15.372 W
15,000.0	90.00	0.17	11,900.0	3,043.9	303.9	11,792,663.42	2,070,696.34	32° 28' 45.110 N	103° 36' 15.369 W
15,100.0	90.00	0.17	11,900.0	3,143.9	304.2	11,792,763.42	2,070,695.33	32° 28' 46.099 N	103° 36' 15.365 W
15,200.0	90.00	0.17	11,900.0	3,243.9	304.5	11,792,863.41	2,070,694.32	32° 28' 47.089 N	103° 36' 15.362 W
15,300.0	90.00	0.17	11,900.0	3,343.9	304.8	11,792,963.41	2,070,693.31	32° 28' 48.079 N	103° 36' 15.358 W
15,400.0	90.00	0.17	11,900.0	3,443.9	305.1	11,793,063.40	2,070,692.30	32° 28' 49.068 N	103° 36' 15.355 W
15,500.0	90.00	0.17	11,900.0	3,543.9	305.4	11,793,163.40	2,070,691.29	32° 28' 50.058 N	103° 36' 15.351 W
15,600.0	90.00	0.17	11,900.0	3,643.9	305.7	11,793,263.39	2,070,690.28	32° 28' 51.048 N	103° 36' 15.348 W
15,700.0	90.00	0.17	11,900.0	3,743.9	306.0	11,793,363.39	2,070,689.27	32° 28' 52.037 N	103° 36' 15.344 W
15,800.0	90.00	0.17	11,900.0	3,843.9	306.3	11,793,463.38	2,070,688.26	32° 28' 53.027 N	103° 36' 15.341 W
15,900.0	90.00	0.17	11,900.0	3,943.9	306.6	11,793,563.38	2,070,687.25	32° 28' 54.017 N	103° 36' 15.338 W
16,000.0	90.00	0.17	11,900.0	4,043.9	306.9	11,793,663.37	2,070,686.23	32° 28' 55.006 N	103° 36' 15.334 W
16,100.0	90.00	0.17	11,900.0	4,143.9	307.2	11,793,763.37	2,070,685.22	32° 28' 55.996 N	103° 36' 15.331 W
16,200.0	90.00	0.17	11,900.0	4,243.9	307.5	11,793,863.36	2,070,684.21	32° 28' 56.986 N	103° 36' 15.327 W
16,300.0	90.00	0.17	11,900.0	4,343.9	307.8	11,793,963.36	2,070,683.20	32° 28' 57.975 N	103° 36' 15.324 W
16,400.0	90.00	0.17	11,900.0	4,443.9	308.1	11,794,063.35	2,070,682.19	32° 28' 58.965 N	103° 36' 15.320 W
16,500.0	90.00	0.17	11,900.0	4,543.9	308.4	11,794,163.35	2,070,681.18	32° 28' 59.955 N	103° 36' 15.317 W
16,600.0	90.00	0.17	11,900.0	4,643.9	308.7	11,794,263.34	2,070,680.17	32° 29' 0.944 N	103° 36' 15.313 W
16,700.0	90.00	0.17	11,900.0	4,743.9	309.0	11,794,363.34	2,070,679.16	32° 29' 1.934 N	103° 36' 15.310 W
16,800.0	90.00	0.17	11,900.0	4,843.9	309.3	11,794,463.33	2,070,678.15	32° 29' 2.924 N	103° 36' 15.306 W
16,900.0	90.00	0.17	11,900.0	4,943.9	309.6	11,794,563.33	2,070,677.14	32° 29' 3.913 N	103° 36' 15.303 W
17,000.0	90.00	0.17	11,900.0	5,043.9	309.9	11,794,663.32	2,070,676.13	32° 29' 4.903 N	103° 36' 15.299 W
17,100.0	90.00	0.17	11,900.0	5,143.9	310.2	11,794,763.32	2,070,675.12	32° 29' 5.893 N	103° 36' 15.296 W
17,200.0	90.00	0.17	11,900.0	5,243.9	310.5	11,794,863.31	2,070,674.11	32° 29' 6.882 N	103° 36' 15.292 W
17,300.0	90.00	0.17	11,900.0	5,343.9	310.8	11,794,963.31	2,070,673.10	32° 29' 7.872 N	103° 36' 15.289 W
17,400.0	90.00	0.17	11,900.0	5,443.9	311.1	11,795,063.30	2,070,672.09	32° 29' 8.862 N	103° 36' 15.285 W
17,431.5	90.00	0.17	11,900.0	5,475.4	311.6	11,795,094.79	2,070,672.19	32° 29' 9.173 N	103° 36' 15.279 W

Design Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
LTP/BHL - HORSESHOI - plan hits target center - Point	0.00	0.00	11,900.0	5,475.4	311.6	11,795,094.79	2,070,672.19	32° 29' 9.173 N	103° 36' 15.279 W
Interp @ 11900.0 (HORS - plan misses target center by 2.0usft at 12243.2usft MD (11900.0 TVD, 287.1 N, 295.8 E) - Point	0.00	0.00	11,900.0	287.1	297.8	11,789,906.79	2,070,726.19	32° 28' 17.827 N	103° 36' 15.441 W
FTP - HORSESHOE FE - plan misses target center by 18.0usft at 12355.6usft MD (11900.0 TVD, 399.5 N, 296.1 E) - Circle (radius 50.0)	0.00	0.00	11,900.0	399.5	314.1	11,790,019.33	2,070,741.10	32° 28' 18.939 N	103° 36' 15.250 W

Company:	New Mexico	**Local Co-ordinate Reference:**	Well HORSESHOE FED COM 702H
Project:	LEA	**TVD Reference:**	RKB=3792.9+25 @ 3817.9usft
Site:	HORSESHOE	**MD Reference:**	RKB=3792.9+25 @ 3817.9usft
Well:	HORSESHOE FED COM 702H	**North Reference:**	True
Wellbore:	HORSESHOE FED COM 702H	**Survey Calculation Method:**	Minimum Curvature
Design:	PWP0	**Database:**	Centennial EDM SQL Server

Checked By: _____ Approved By: _____ Date: _____

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: 12/05/2018

☒ Original Operator & OGRID No.: Centennial Resource Production, LLC 372165
☐ Amended - Reason for Amendment: _____

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
Horseshoe Fed Com 602H	Pending	A-19-21S-33E	300 FNL & 675 FEL	2500MCF/D	Neither	New Well
Horseshoe Fed Com 702H	Pending	A-19-21S-33E	300 FNL & 645 FEL	2500MCF/D	Neither	New Well

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 Lucid Energy Group low/high pressure gathering system located in Lea County, New Mexico. It will require 0' of pipeline to connect the facility to low/high pressure gathering system. Centennial Resource Production, LLC provides (periodically) to Lucid Energy Group a drilling, completion and estimated first production date for wells that are scheduled to be drilled in the foreseeable future. In addition, Centennial Resource Production, LLC and Lucid Energy Group have periodic conference calls to discuss changes to drilling and completion schedules. Gas from these wells will be processed at Red Hills Plant located in Sec. 13, Twn. 24S, Rng. 33E, Lea County, New Mexico. 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 Lucid Energy Group system at that time. Based on current information, it is Centennial Resource Production, LLC'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

Ascent Energy Drilling Operations Plan
SHL 300' FNL & 645' FEL, Sec. 19
BHL 100' FNL & 330 FEL, Sec. 18
T. 21S., R. 33E Lea County, NM

Elevation above Sea Level: 3792'

DRILLING PROGRAM

Proposed Drilling Depth:
16116' MD / 10936' TVD

Type of well:
Horizontal well, no pilot hole

Permitted Well Type:
Oil

Geologic Name of Surface Formation:
Quaternary Deposits

KOP Lat/Long (NAD83):
32.470038 N / -103.604301 W

TD Lat/Long (NAD83):
32. N / -103. W

1. Estimated Tops

Formation	TVD	MD	Lithologies	Bearing
Quaternary Deposits	0	0	Surface	None
Rustler Anhydrite	1606	1606		Salt
Salado	1961	1961	Salt	Salt
Base Salt	3384	3384		Salt
Tansill	3530	3531	Dolomite	None
Yates	3704	3705	Sandstone	
Capitan Reef	4029	4031	Limestone	
Delaware Sands	5249	5254	Sandstone	
Bell Canyon	5454	5459	Sandstone	Hydrocarbons
Cherry Canyon	5760	5766	Sandstone	Hydrocarbons
Brushy Canyon	7129	7138	Sandstone	Hydrocarbons
Bone Spring Lime	8876	8890	Limestone	Hydrocarbons
Avalon	9060	9074	Shale/Limestone	Hydrocarbons
1st Bone Spring Sand	10015	10029	Sandstone	Hydrocarbons
2nd Bone Spring Carbonate	10251	10265	Limestone	Hydrocarbons
2nd Bone Spring Sand	10563	10577	Sandstone	Hydrocarbons
3rd Bone Spring	11116	11130	Limestone	Hydrocarbons

Carbonate				
3rd Bone Spring Sand	11593	11618	Sandstone	Hydrocarbons
Wolfcamp A	11838	11975	Shale	Hydrocarbons
KOP	11326	11341		
TD	11900	17431		

2. Notable Zones

Wolfcamp is the target formation.

3. Pressure Control

Pressure Control Equipment (See Schematics):
A 10,000 psi BOP stack consisting of 3 rams with 2 pipe rams, 1 blind ram, and 1 annular preventer will be used below surface casing to TD. See attachments for BOP and choke manifold diagrams. Also present will be an accumulator that meets the requirements of Onshore Order #2 for the pressure rating of the BOP stack. A rotating head will also be installed as needed. BOP will be inspected and operated as recommended in Onshore Order #2. A top drive check valve and sub equipped with a full opening valve sized to fit the drill pipe and collars will be available on the rig floor in the open position. The wellhead will be a multi-bowl speed head.

BOP Test Procedure:
After surface casing is set and the BOP is nippled up, the BOP pressure tests will be made with a third party tester to 250 psi low, 5000 psi high, and the annular preventer will be tested to 2,500 psi. The BOP will be tested in this manner after nipple-up if any break of the stack occurs as wells as every 30 days.

Variance Request**:**

Ascent requests a variance to run a multi-bowl speed head for setting the Intermediate 1, Intermediate 2, and Production Strings. Ascent requests a variance to drill this well using a co-flex line between the BOP and choke manifold (instead of the 4" OD steel line). Certification for proposed co-flex hose is attached. The hose is not required by the manufacturer to be anchored. In the event the specific hose is not available, one of equal or higher rating will be used. Ascent requests a variance to have the option of batch drilling this well with other wells on the same pad. In the event that this well is batch drilled, after drilling surface, 1st intermediate, and 2nd intermediate hole sections and cementing 2nd intermediate casing, a 10M dry hole cap with bleed off valve will be installed. The rig will then walk to another well on the pad. When the rig returns to this well and BOPs are installed, the operator will perform a full BOP test. 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. A hydraulically operated choke will be installed prior to drilling out of the intermediate casing shoe.

Ascent Energy Drilling Operations Plan
SHL 300' FNL & 645' FEL, Sec. 19
BHL 100' FNL & 330 FEL, Sec. 18
T. 21S., R. 33E Lea County, NM

4. Casing & Cement

All Casing will be new.

Section	Hole Size	Interval TVD	Interval MD	Casing OD	Weight	Grade	Conn	Standard	SF Collapse	SF Burst	SF Tension	MW
Cond	30"	0-80'	0-80'	20"	52.78#	5L B	Weld	API				8.5ppg
Surface	20"	0-1635'	0-1635'	16"	75.5#	J-55	BTC	API	1.23	2.7	9.5 Body / 9.69 Conn	9.6ppg
Int	14.75"	0-3600'	0-3600'	13.375"	68#	L-80	TMK UP	Non-API	1.2	2.36	3.95 Body/ 2.45 Conn	10ppg
2nd Int	12.25"	0-5250'	0-5255'	10.75"	51#	J-55	TMK UP	Non-API	1.15	1.29	1.9 Body/ 1.22 Conn	8.6ppg
3rd Int	8.75"	0-11,600'	0-11,623'	7.625"	29.7#	HCP-110	EZGO FJ3	Non-API	1.3	1.32	3.1 Body/ 2.0 Conn	9.3ppg
Prod	6.75"	0-11,900	0-17,431'	5.5"	20#	HCP-110	EZGO FJ3	Non-API	2.1	1.2	2.28 Body/ 1.3 Conn	9.3ppg

Ascent requests a variance to wave the centralizer requirement for the run 7-5/8" EZGO FJ3 casing inside 8.75" hole. An expansion additive will be used in the cement slurry for the entire length of the 8.75" hole to maximize cement bond and zone isolation.

Variance is also requested to wave any centralizer requirements for the 5-1/2" EZGO JF3 casing the 6-3/4" hole size. An expansion additive will be used in the cement slurry for the entire length of the 6.75" hole to maximize cement bond and zone isolation.

Section	Type	Top	Excess	Sacks	Cu Ft.	Wt. ppg	Yld Ft^3/sk	Mix Water Gal/sk	Slurry Description
Surface	Lead	0'	100%	885	1772	13.5	1.728	9.21	Class C HALCEM System+ 4% Bentonite
	Tail	1130'	100%	550	793	14.8	1.332	6.42	Class C HALCEM System
Int	Lead	0'	100%	695	1096	12.7	1.728	10.67	Class C HALCEM System+ 4% Bentonite
	Tail	2600'	100%	485	421	14.8	1.332	6.42	Class C HALCEM System
2nd Int	Lead	0'	50%	220	1114	12.7	2.039	10.67	Class C EconoCem HLC + 5% Salt + 3% Microbond + 3 lbm/sk Kol-Seal + 0.3% HR-800
	Tail	3950'	50%	155	368	14.8	1.368	6.42	Class C HALCEM System + 3% Microbond
3rd Int	Lead	0'	50%	625	1542	10.5	3.429	21.75	Class H NeoCem IL2 Bridgemaker II LCM
	Tail	10,280'	50%	475	201	15.6	1.207	5.3	Class H HalCem System Bridgemaker II LCM
Production	Lead	0'	25%	625	980	11	2.887	17.38	Class H NeoCem PL + 3% Microbond
	Tail	9400'	25%	1725	837	13.2	1.472	7.47	Class H NeoCem PT + 3% Microbond

Ascent Energy Drilling Operations Plan
SHL 300' FNL & 645' FEL, Sec. 19
BHL 100' FNL & 330 FEL, Sec. 18
T. 21S., R. 33E Lea County, NM

5. Mud Program

Section	Interval		Type	Weight	Viscosity	Water Loss
Surface	0'	1,635'	Fresh Water	8.4-9.6	34-38	N/C
Intermediate	1,635'	3,600'	Brine Water	10	28-34	N/C
2nd Intermediate	3,600'	5,255'	Fresh Water	8.4-8.6	28-34	N/C
3rd Intermediate	5,255'	11,623'	Cut Brine/Gel	8.5-9.3	28-34	N/C
Production	11,623'	17,431'	OBM	10.1	20-30	N/C

Electronic Pason mud monitor system complying with Onshore Order 1 will be used. All necessary mud products (e. g., barite, cedar bark) for weight addition and fluid loss control will always be on site. Mud program is subject to change due to hole conditions. A closed loop system will be used.

6. Cores, Tests, & Logs

- Electric Logging Program: No open-hole logs are planned at this time for the pilot hole.
- GR will be collected while drilling through the MWD tools from 9.625" casing shoe to TD.
- A 2-person mud logging program will be used from 9.625" casing shoe to TD.
- No DSTs or cores are planned at this time.

7. Down Hole Conditions

No abnormal pressure or temperature is expected. Maximum expected bottom hole pressure is ≈6,900 psi. Expected bottom hole temperature is ≈170˚ F.

- Kelly cock will be kept in the drill string at all times.
- A full opening drill pipe-stabbing valve (inside BOP) with proper drill pipe connections will be on the rig floor at all times.
- H_2S monitoring and detection equipment will be utilized from surface casing point to TD.

Ascent does not anticipate that there will be enough H2S from the surface to the Bone Spring formations to meet the BLM's Onshore Order 6 requirements for the submission of an "H2S Drilling Operation Plan" or "Public Protection Plan" for drilling and completing this well. Ascent has an H2S safety package on all wells and an "H2S Drilling Operations Plan" is attached. Adequate flare lines will be installed off the mud/gas separator where gas may be safely flared. All personnel will be familiar with all aspects of safe operation of equipment being used.

8. Other Information

Road and location construction will begin after BLM approval of APD. Anticipated spud date as soon as approved. Drilling expected to take 30 days. If production casing is run an additional 60 days will be required to complete and construct surface facilities.

Ascent Energy Drilling Operations Plan
SHL 300' FNL & 645' FEL, Sec. 19
BHL 100' FNL & 330 FEL, Sec. 18
T. 21S., R. 33E Lea County, NM

Variance is requested for the option to contract a surface rig to drill surface hole, set surface casing, and cement the surface casing. If the timing between rigs is such that Ascent would not be able to preset the surface casing, then the primary rig will MIRU and drill the well in its entirety.

This is a "fee/fee/Fed" well. Surface owner is the NM State Land Office, P. O. Box 1148, Santa Fe NM 87504; 505 827-4003). First lease penetrated is NM State Land Office lease V0-8700-0001. Ascent is preparing a business lease to file with the NM State Land Office.

Blowout Prevention and Control
Well Kick: Shut-In Procedures

Primary Kick Indicators

If any primary kick indicators are observed, report them IMMEDIATEALY TO THE DRILLER and initiate the proper shut-in procedures.

1. Increase flow rate.
2. Pit volume gain.
3. Well flows with pump off.
4. Hole not taking proper amount of mud on trips.

If a kick occurs while drilling:

1. Raise the Kelly until a tool joint is above the rotary table.
2. Stop the mud pumps.
3. Open the hydraulic gate valve.
4. Close the annular preventer.
5. Close the hydraulic choke.
6. Notify the Drill Site Manager and Drilling Manager.
7. Read and record:
    a. Shut-in drill pipe pressure,
    b. Shut-in annulus pressure, and
    c. Pit gain.
8. Prepare the well-killing spreadsheet.

If a kick occurs during a trip:

1. Set the top tool joint on the slips.
2. Install and make up a full-opening, full opened safety valve in the fill pipe.
3. Close the safety valve.
4. Open the hydraulic gate valve.
5. Close the annular preventer.
6. Close the hydraulic choke.
7. Notify the Drill Site Manager and Drilling Manager.
8. Pick up the Kelly and make it up.
9. Open the safety valve.
10. Read and record:
    a. Shut-in drill pipe pressure,
    b. Shut-in casing pressure, and
    c. Pit gain.
11. Prepare the well-killing spreadsheet.

It is assumed the hydraulic choke is always open while drilling or tripping.

Note: check all lines and valves for leaks after the well has been shut-in.

Crewmember Stations for well kicks after the well has been shut-in:

Crewmember	Station
Driller	On the brake.
Derrickman	Check pumps, line up mud and mixing equipment, check mud weight in pits.
Motorman	On hydraulic closing unit.
Floorhand #1	On hydraulic choke control panel to watch and record shut-in procedures.
Floorhand #2	Check BOPs, choke manifold, etc. for leaks then go to floor with driller.
Toolpusher	Make sure all crewmembers carry out their assignments.

APD ID: 10400037000 **Submission Date:** 12/06/2018

Operator Name: ASCENT ENERGY LLC

Well Name: HORSESHOE FED COM **Well Number:** 702H

Well Type: OIL WELL **Well Work Type:** Drill

Section 1 - General

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

Section 2 - Lined Pits

Would you like to utilize Lined Pit PWD options? NO

Produced Water Disposal (PWD) Location:

PWD surface owner: **PWD disturbance (acres):**

Lined pit PWD on or off channel:

Lined pit PWD discharge volume (bbl/day):

Lined pit specifications:

Pit liner description:

Pit liner manufacturers information:

Precipitated solids disposal:

Decribe precipitated solids disposal:

Precipitated solids disposal permit:

Lined pit precipitated solids disposal schedule:

Lined pit precipitated solids disposal schedule attachment:

Lined pit reclamation description:

Lined pit reclamation attachment:

Leak detection system description:

Leak detection system attachment:

Operator Name: ASCENT ENERGY LLC

Well Name: HORSESHOE FED COM **Well Number:** 702H

Lined pit Monitor description:

Lined pit Monitor attachment:

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

Is the reclamation bond a rider under the BLM bond?

Lined pit bond number:

Lined pit bond amount:

Additional bond information attachment:

Section 3 - Unlined Pits

Would you like to utilize Unlined Pit PWD options? NO

Produced Water Disposal (PWD) Location:

PWD disturbance (acres): **PWD surface owner:**

Unlined pit PWD on or off channel:

Unlined pit PWD discharge volume (bbl/day):

Unlined pit specifications:

Precipitated solids disposal:

Decribe precipitated solids disposal:

Precipitated solids disposal permit:

Unlined pit precipitated solids disposal schedule:

Unlined pit precipitated solids disposal schedule attachment:

Unlined pit reclamation description:

Unlined pit reclamation attachment:

Unlined pit Monitor description:

Unlined pit Monitor attachment:

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

Beneficial use user confirmation:

Estimated depth of the shallowest aquifer (feet):

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

TDS lab results:

Geologic and hydrologic evidence:

State authorization:

Unlined Produced Water Pit Estimated percolation:

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

Operator Name: ASCENT ENERGY LLC

Well Name: HORSESHOE FED COM **Well Number:** 702H

Is the reclamation bond a rider under the BLM bond?

Unlined pit bond number:

Unlined pit bond amount:

Additional bond information attachment:

Section 4 - Injection

Would you like to utilize Injection PWD options? NO

Produced Water Disposal (PWD) Location:

PWD surface owner: **PWD disturbance (acres):**

Injection PWD discharge volume (bbl/day):

Injection well mineral owner:

Injection well type:

Injection well number: **Injection well name:**

Assigned injection well API number? **Injection well API number:**

Injection well new surface disturbance (acres):

Minerals protection information:

Mineral protection attachment:

Underground Injection Control (UIC) Permit?

UIC Permit attachment:

Section 5 - Surface Discharge

Would you like to utilize Surface Discharge PWD options? NO

Produced Water Disposal (PWD) Location:

PWD surface owner: **PWD disturbance (acres):**

Surface discharge PWD discharge volume (bbl/day):

Surface Discharge NPDES Permit?

Surface Discharge NPDES Permit attachment:

Surface Discharge site facilities information:

Surface discharge site facilities map:

Section 6 - Other

Would you like to utilize Other PWD options? NO

Produced Water Disposal (PWD) Location:

PWD surface owner: **PWD disturbance (acres):**

Other PWD discharge volume (bbl/day):

Operator Name: ASCENT ENERGY LLC

Well Name: HORSESHOE FED COM **Well Number:** 702H

Other PWD type description:

Other PWD type attachment:

Have other regulatory requirements been met?

Other regulatory requirements attachment:

AFMSS

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

Bond Info Data Report

03/30/2020

APD ID: 10400037000

Submission Date: 12/06/2018

Operator Name: ASCENT ENERGY LLC

Well Name: HORSESHOE FED COM

Well Number: 702H

Well Type: OIL WELL

Well Work Type: Drill

Highlighted data reflects the most recent changes

Show Final Text

Bond Information

Federal/Indian APD: FED

BLM Bond number: NMB001471

BIA Bond number:

Do you have a reclamation bond? NO

Is the reclamation bond a rider under the BLM bond?

Is the reclamation bond BLM or Forest Service?

BLM reclamation bond number:

Forest Service reclamation bond number:

Forest Service reclamation bond attachment:

Reclamation bond number:

Reclamation bond amount:

Reclamation bond rider amount:

Additional reclamation bond information attachment:

District I
1625 N. French Dr., Hobbs, NM 88240
Phone: (575) 393-6161 Fax: (575) 393-0720
District II
811 S. First St., Artesia, NM 88210
Phone: (575) 748-1283 Fax: (575) 748-9720
District III
1000 Rio Brazos Road, Aztec, NM 87410
Phone: (505) 334-6178 Fax: (505) 334-6170
District IV
1220 S. St. Francis Dr., Santa Fe, NM 87505
Phone: (505) 476-3460 Fax: (505) 476-3462

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

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

☐ AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

[1] API Number	[2] Pool Code	[3] Pool Name
30-025- 47059	98033	WC-025 G-10 S213328O; WOLFCAMP

[4] Property Code	[5] Property Name	[6] Well Number
327861	HORSESHOE FED COM	702H

[7] OGRID No.	[8] Operator Name	[9] Elevation
325830	ASCENT ENERGY	3792.9'

[10] Surface Location

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
A	19	21S	33E		300	NORTH	645	EAST	LEA

[11] Bottom Hole Location If Different From Surface

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
A	18	21S	33E		100	NORTH	330	EAST	LEA

[12] Dedicated Acres	[13] Joint or Infill	[14] Consolidation Code	[15] Order No.
160			

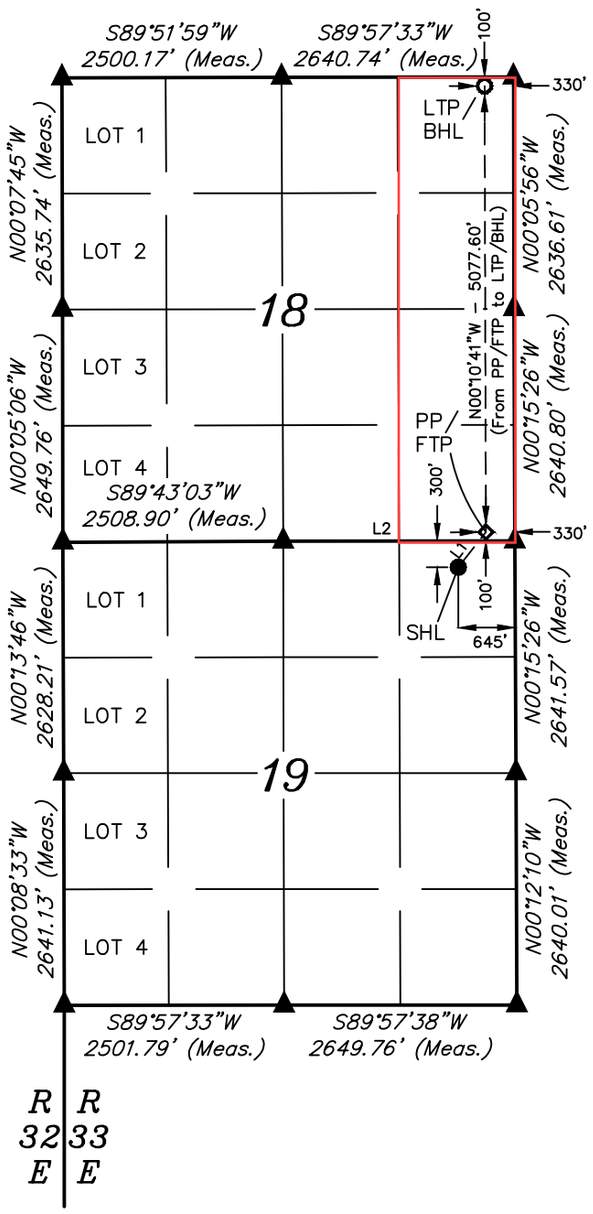
No allowable will be assigned to this completion until all interests have been consolidated or a non-standard unit has been approved by the division.

[16]

NAD 83 (SURFACE HOLE LOCATION)
LATITUDE = 32°28'14.99" (32.470829°)
LONGITUDE = 103°36'18.92" (103.605255°)
STATE PLANE NAD 83 (N.M. EAST)
Y: 535784.50' X: 765874.76'
UTM, NAD 83 (ZONE 13)
Y: 11789615.78' X: 2070432.21'

NAD 83 (PP/FTP)
LATITUDE = 32°28'18.94" (32.471927°)
LONGITUDE = 103°36'15.25" (103.604236°)
STATE PLANE NAD 83 (N.M. EAST)
Y: 536186.17' X: 766186.21'
UTM, NAD 83 (ZONE 13)
Y: 11790019.33' X: 2070741.10'

NAD 83 (LTP/BHL)
LATITUDE = 32°29'09.17" (32.485881°)
LONGITUDE = 103°36'15.28" (103.604244°)
STATE PLANE NAD 83 (N.M. EAST)
Y: 541262.75' X: 766149.03'
UTM, NAD 83 (ZONE 13)
Y: 11795094.79' X: 2070672.19'



LINE TABLE		
LINE	DIRECTION	LENGTH
L1	N38°01'53"E	508.36'
L2	S89°55'29"W	2638.56'

NOTE:
- Distances referenced on plat to section lines are perpendicular.
- Basis of Bearing is a Transverse Mercator Projection with a Central Meridian of W103°53'00"

● = SURFACE HOLE LOCATION
◇ = PP/FTP
○ = LTP/BHL
▲ = SECTION CORNER LOCATED

2000' 1000' 0' 2000'
SCALE
DRAWN BY: M.F.S. 03-05-18

REV: 3 06-13-19 J.N. (COMPANY NAME CHANGE)

[17] OPERATOR CERTIFICATION

I hereby certify that the information contained herein is true and complete to the best of my knowledge and belief, and that this organization either owns a working interest or unleased mineral interest in the land including the proposed bottom hole location or has a right to drill this well at this location pursuant to a contract with an owner of such a mineral or working interest, or to a voluntary pooling agreement or a compulsory pooling order heretofore entered by the division.

10-22-19
Signature Date

Mike Deutsch
Printed Name

mike@permitswest.com
E-mail Address

[18] SURVEYOR CERTIFICATION

I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my belief.

February 26, 2018
Date of Survey

Signature and Seal of Professional Surveyor:

PAUL BUCHELE
NEW MEXICO
23782
PROFESSIONAL SURVEYOR
06-13-19

Certificate Number:

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: 10-5-19
X Original
☐ Amended - Reason for Amendment:

Operator & OGRID No.: Ascent Energy, LLC (325830)

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	SHL (ULSTR)	SHL Footages	Expected MCF/D	Flared or Vented	Comments
Horseshoe Fed Com 502H	30-025-	A-19-21s-33e	300' FNL & 705' FEL	160	≈30 days	flare until well clean, then connect
Horseshoe Fed Com 602H	30-025-	A-19-21s-33e	300' FNL & 675' FEL	160	≈30 days	flare until well clean, then connect
Horseshoe Fed Com 702H	30-025-**30-025-47059**	A-19-21s-33e	300' FNL & 645' FEL	160	≈30 days	flare until well clean, then connect

Gathering System and Pipeline Notification

Well will be connected to a production facility after flowback operations are complete, if gas transporter system is in place. Gas produced from this production facility has not yet been dedicated. One possible outlet is a Versado Gas Processors, LLC (159160) line in K-19-21s-33e, ≈0.85 mile southwest of the Horseshoe pad. Operator will provide (periodically) to Gas Transporter a drilling, completion and estimated first production date for wells that are scheduled to be drilled in the foreseeable future. In addition, Operator and Gas Transporter will have periodic conference calls to discuss changes to drilling and completion schedules. Gas from these wells will be processed at Gas Transporter Processing Plant at an as yet undetermined location. 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 ultimately 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