

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**

1a. Type of work: <input checked="" type="checkbox"/> DRILL <input type="checkbox"/> REENTER		5. Lease Serial No. NMNM018038
1b. Type of Well: <input type="checkbox"/> Oil Well <input checked="" type="checkbox"/> Gas Well <input type="checkbox"/> Other		6. If Indian, Allottee or Tribe Name
1c. Type of Completion: <input type="checkbox"/> Hydraulic Fracturing <input checked="" type="checkbox"/> Single Zone <input type="checkbox"/> Multiple Zone		7. If Unit or CA Agreement, Name and No.  8. Lease Name and Well No. GOONCH FED COM 04 211H
2. Name of Operator NOVO OIL AND GAS NORTHERN DELAWARE LLC		9. API Well No. 30 015 47054
3a. Address 1001 West Wilshire Boulevard Suite 206, Oklahoma City, OK	3b. Phone No. (include area code) (405) 404-0414	10. Field and Pool, or Exploratory CORRAL DRAW BONE SPRING/null
4. Location of Well (Report location clearly and in accordance with any State requirements. *) At surface SWSW / 1120 FSL / 980 FWL / LAT 32.3302165 / LONG -104.0977864 At proposed prod. zone LOT 4 / 130 FNL / 726 FWL / LAT 32.3415681 / LONG -104.0981324		11. Sec., T. R. M. or Blk. and Survey or Area SEC 4/T23S/R28E/NMP
14. Distance in miles and direction from nearest town or post office* 3 miles		12. County or Parish EDDY
15. Distance from proposed* location to nearest property or lease line, ft. (Also to nearest drig. unit line, if any) 1120 feet		13. State NM
16. No of acres in lease 280.21		17. Spacing Unit dedicated to this well 320.0
18. Distance from proposed location* to nearest well, drilling, completed, applied for, on this lease, ft. 20 feet		20. BLM/BIA Bond No. in file FED: NMB001536
21. Elevations (Show whether DF, KDB, RT, GL, etc.) 3014 feet		22. Approximate date work will start* 11/01/2019
		23. Estimated duration 90 days

24. Attachments

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

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

25. Signature (Electronic Submission)	Name (Printed/Typed) Brian Wood / Ph: (505) 466-8120	Date 08/02/2019
Title President		
Approved by (Signature) (Electronic Submission)	Name (Printed/Typed) Cody Layton / Ph: (575) 234-5959	Date 04/15/2020
Title Assistant Field Manager Lands & Minerals	Office Carlsbad Field Office	

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.



(Continued on page 2)

\*(Instructions on page 2)



Intent  YES As Drilled

API #

Operator Name: <b>NOVO OIL &amp; GAS NORTHERN DELAWARE, LLC</b>	Property Name: <b>GOONCH FED COM 04</b>	Well Number <b>211H</b>
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Kick Off Point (KOP)

UL M	Section	Township	Range	Lot	Feet	From N/S	Feet	From E/W	County
	<b>4</b>	<b>23S</b>	<b>28E</b>		<b>1120</b>	<b>SOUTH</b>	<b>980</b>	<b>WEST</b>	<b>EDDY</b>
Latitude <b>32.3302165</b>					Longitude <b>104.0977864</b>				NAD <b>83</b>

First Take Point (FTP)

UL M	Section	Township	Range	Lot	Feet	From N/S	Feet	From E/W	County
	<b>4</b>	<b>23S</b>	<b>28E</b>		<b>330</b>	<b>SOUTH</b>	<b>726</b>	<b>WEST</b>	<b>EDDY</b>
Latitude <b>32.3280457</b>					Longitude <b>104.0987005</b>				NAD <b>83</b>

Last Take Point (LTP)

UL	Section	Township	Range	Lot	Feet	From N/S	Feet	From E/W	County
	<b>4</b>	<b>23S</b>	<b>28E</b>	<b>4</b>	<b>330</b>	<b>NORTH</b>	<b>726</b>	<b>WEST</b>	<b>EDDY</b>
Latitude <b>32.3410185</b>					Longitude <b>104.0981555</b>				NAD <b>83</b>

Is this well the defining well for the Horizontal Spacing Unit?  NO

Is this well an infill well?  YES

If infill is yes please provide API if available, Operator Name and well number for Defining well for Horizontal Spacing Unit.

API #

Operator Name: <b>NOVO OIL &amp; GAS NORTHERN DELAWARE, LLC</b>	Property Name: <b>GOONCH FED COM 04</b>	Well Number <b>231H</b>
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## PECOS DISTRICT DRILLING CONDITIONS OF APPROVAL

<b>OPERATOR'S NAME:</b>	<b>NOVO OIL AND GAS</b>
<b>WELL NAME &amp; NO.:</b>	<b>GOONCH FED COM 04 211H</b>
<b>SURFACE HOLE FOOTAGE:</b>	<b>1120'/S &amp; 980'/W</b>
<b>BOTTOM HOLE FOOTAGE:</b>	<b>130'/N &amp; 726'/W</b>
<b>LOCATION:</b>	<b>Section 4, T.23 S., R.28 E., NMPM</b>
<b>COUNTY:</b>	<b>EDDY County, New Mexico</b>

COA

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

### A. HYDROGEN SULFIDE

A Hydrogen Sulfide (H2S) Drilling Plan shall be activated 500 feet prior to drilling into the **North East Loving** formation. 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

1. The **13-3/8** inch surface casing shall be set at approximately **594** feet (a minimum of **70 feet (Eddy County)** into the Rustler Anhydrite and above the salt) and cemented to the surface.
  - 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 **8 hours** 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 minimum required fill of cement behind the **9-5/8** inch intermediate casing is:

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. **Excess cement calculates to 18%, additional cement might be required. Wait on cement (WOC) time for a primary cement job is to include the lead cement slurry due to cave/karst or potash.**
- ❖ In Medium Cave/Karst Areas if cement does not circulate to surface on the first two casing strings, the cement on the 3rd casing string must come to surface.
3. The minimum required fill of cement behind the **5-1/2** inch production casing is:
- Cement should tie-back at least **200 feet** into previous casing string. Operator shall provide method of verification. **Excess cement calculates to 19%, additional cement might be required.**

## 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 **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 Santa Fe Office, 301 Dinosaur Trail Santa Fe, New Mexico 87508, 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.  
**JJP04102020**

## 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 2<sup>nd</sup> Rig. Rig to be moved in within 90 days of notification that Spudder Rig has left the location.
    - BOP/BOPE test to be conducted per Onshore Oil and Gas Order No. 2 as soon as 2nd Rig is rigged up on well.
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 integrity test can be done (prior to the cement setting up) immediately after bumping the plug.
3. Wait on cement (WOC) for Water Basin: After cementing but before commencing any tests, the casing string shall stand cemented under pressure until both of the following conditions have been met: 1) cement reaches a minimum compressive strength of 500 psi at the shoe, 2) until cement has been in place at least 8 hours. WOC time will be recorded in the driller's log. See individual casing strings for details regarding lead cement slurry requirements. The casing integrity test can be done (prior to the cement setting up) immediately after bumping the plug.
4. Provide compressive strengths including hours to reach required 500 pounds compressive strength prior to cementing each casing string. Have well specific cement details onsite prior to pumping the cement for each casing string.
5. No pea gravel permitted for remedial or fall back remedial without prior authorization from the BLM engineer.
6. On that portion of any well approved for a 5M BOPE system or greater, a pressure integrity test of each casing shoe shall be performed. Formation at the shoe shall be tested to a minimum of the mud weight equivalent anticipated to control the formation pressure to the next casing depth or at total depth of the well. This test shall be performed before drilling more than 20 feet of new hole.
7. If hardband drill pipe is rotated inside casing, returns will be monitored for metal. If metal is found in samples, drill pipe will be pulled and rubber protectors which have a larger diameter than the tool joints of the drill pipe will be installed prior to continuing drilling operations.
8. Whenever a casing string is cemented in the R-111-P potash area, the NMOCD requirements shall be followed.

## B. PRESSURE CONTROL

1. All blowout preventer (BOP) and related equipment (BOPE) shall comply with well control requirements as described in Onshore Oil and Gas Order No. 2 and API RP 53 Sec. 17.
2. If a variance is approved for a flexible hose to be installed from the BOP to the choke manifold, the following requirements apply: The flex line must meet the requirements of API 16C. Check condition of flexible line from BOP to choke manifold, replace if exterior is damaged or if line fails test. Line to be as straight as possible with no hard bends and is to be anchored according to Manufacturer's requirements. The flexible hose can be exchanged with a hose of equal size and equal or greater pressure rating. Anchor requirements, specification sheet and hydrostatic pressure test certification matching the hose in service, to be onsite for review. These documents shall be posted in the company man's trailer and on the rig floor.
3. 5M or higher system requires an HCR valve, remote kill line and annular to match. The remote kill line is to be installed prior to testing the system and tested to stack pressure.
4. If the operator has proposed a multi-bowl wellhead assembly in the APD. The following requirements must be met:
  - a. Wellhead shall be installed by manufacturer's representatives, submit documentation with subsequent sundry.
  - b. If the welding is performed by a third party, the manufacturer's representative shall monitor the temperature to verify that it does not exceed the maximum temperature of the seal.
  - c. Manufacturer representative shall install the test plug for the initial BOP test.
  - d. 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.

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: 7/12/2019

Original Operator & OGRID No.: Novo Oil & Gas Northern Delaware, LLC (372920)  
 Amended - Reason for Amendment: added more wells to pad

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

*Note: A C-129 must be submitted and approved prior to exceeding 60 days allowed by Rule 19.15.18.12.A*

**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	API	SHL (ULSTR)	SHL Footages	Expected MCF/D	Flared or Vented	Comments
Goonch Fed Com 04 131H	30-015-	M-4-23S-29E	1140 FSL & 980 FWL	200	30 days	Time depends on well clean up
Goonch Fed Com 04 132H	30-015-	M-4-23S-29E	1140 FSL & 1180 FWL	200	30 days	Time depends on well clean up
Goonch Fed Com 04 211H	30-015-	M-4-23S-29E	1120 FSL & 980 FWL	4000	30 days	Time depends on well clean up
Goonch Fed Com 04 212H	30-015-	M-4-23S-29E	1120 FSL & 1180 FWL	4000	30 days	Time depends on well clean up
Goonch Fed Com 04 221H	30-015-	M-4-23S-29E	1100 FSL & 980 FWL	4000	30 days	Time depends on well clean up
Goonch Fed Com 04 222H	30-015-	M-4-23S-29E	1100 FSL & 1180 FWL	4000	30 days	Time depends on well clean up
Goonch Fed Com 04 231H	30-015-	M-4-23S-29E	1080 FSL & 980 FWL	4000	30 days	Time depends on well clean up
Goonch Fed Com 04 232H	30-015-	M-4-23S-29E	1080 FSL & 1180 FWL	4000	30 days	Time depends on well clean up

**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 not yet dedicated. However, negotiations are underway. One possible connection is an existing Enterprise line that is 200 yards west. Novo Oil & Gas Northern Delaware, LLC will provide (periodically) to its Gas Transporter a drilling, completion and estimated first production date for wells that are scheduled to be drilled in the foreseeable future. In addition, Novo Oil & Gas Northern Delaware, LLC and its Gas Transporter have periodic conference calls to discuss changes to drilling and completion schedules. Gas from these wells will be processed at an as yet undetermined Gas Transporter Processing Plant located in Eddy 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 its Gas Transporter system at that time. Based on current information, it is Novo Oil & Gas Northern Delaware, LLC's belief an existing or new 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

**APD ID:** 10400045302

**Submission Date:** 08/02/2019

Highlighted data reflects the most recent changes

**Operator Name:** NOVO OIL AND GAS NORTHERN DELAWARE LLC

**Well Name:** GOONCH FED COM 04

**Well Number:** 211H

[Show Final Text](#)

**Well Type:** CONVENTIONAL GAS WELL

**Well Work Type:** Drill

## Section 1 - Geologic Formations

Formation ID	Formation Name	Elevation	True Vertical Depth	Measured Depth	Lithologies	Mineral Resources	Producing Formation
507936	QUATERNARY	3014	0	0	OTHER : None	USEABLE WATER	N
507937	RUSTLER	2914	100	100	ANHYDRITE	NONE	N
544618	CASTILE	2044	970	970	GYPSUM	NONE	N
507938	LAMAR	541	2473	2476	LIMESTONE	NONE	N
507939	BELL CANYON	475	2539	2543	SANDSTONE	NATURAL GAS, OIL	N
507940	CHERRY CANYON	-600	3614	3641	SANDSTONE	NATURAL GAS, OIL	N
507941	BRUSHY CANYON	-1613	4627	4677	SANDSTONE	NATURAL GAS, OIL	N
507942	BONE SPRING	-3056	6070	6152	LIMESTONE	NATURAL GAS, OIL	N
544631	AVALON SAND	-3564	6578	6671	OTHER : Shale	OIL	N
507944	BONE SPRING 1ST	-4023	7037	7140	SANDSTONE	OIL	N
507945	BONE SPRING 2ND	-4236	7250	7357	OTHER : Carbonate	NATURAL GAS, OIL	N
507946	BONE SPRING 2ND	-4771	7785	7893	SANDSTONE	NATURAL GAS, OIL	N
507947	BONE SPRING 3RD	-5068	8082	8190	OTHER : Carbonate	NATURAL GAS, OIL	N
507948	BONE SPRING 3RD	-6002	9016	9124	SANDSTONE	NATURAL GAS, OIL	N
507949	WOLFCAMP	-6326	9340	9486	OTHER : XY Carbonate	NATURAL GAS, OIL	Y

## Section 2 - Blowout Prevention

**Operator Name:** NOVO OIL AND GAS NORTHERN DELAWARE LLC

**Well Name:** GOONCH FED COM 04

**Well Number:** 211H

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

**Rating Depth:** 13000

**Equipment:** A 13.625 5,000-psi BOP system will be installed on a multi-bowl (speed head) wellhead with a 13.625 flanged casing spool. Top flange of casing spool will be set in a cellar below ground level. BOP system will consist of a single pipe ram on the bottom, mud cross, double pipe ram with blind rams on bottom and pipe rams on top, and annular preventer. Blowout preventer will be installed on top of the 13.375 surface casing and will remain installed to TD of the well. Wellhead, blowout preventer, and choke manifold diagram are included.

**Requesting Variance?** YES

**Variance request:** Variance is requested to use a co-flex hose between the BOP system and choke manifold. A typical co-flex pressure test certificate is attached. An equipment specific co-flex pressure test certificate will be on site when testing the BOP.

**Testing Procedure:** BOP system will be isolated with a test plug and tested by an independent tester to 250-psi low and 5000-psi high for 10 minutes. All casing strings will be tested in accordance with Onshore Order 2 III.B.1.h.

**Choke Diagram Attachment:**

Goonch\_04\_211H\_Choke\_Revised\_20191008093841.pdf

**BOP Diagram Attachment:**

Goonch\_04\_211H\_BOP\_20191017125202.pdf

### Section 3 - Casing

Casing ID	String Type	Hole Size	Csg Size	Condition	Standard	Tapered String	Top Set MD	Bottom Set MD	Top Set TVD	Bottom Set TVD	Top Set MSL	Bottom Set MSL	Calculated casing length MD	Grade	Weight	Joint Type	Collapse SF	Burst SF	Joint SF Type	Joint SF	Body SF Type	Body SF
1	SURFACE	17.5	13.375	NEW	API	N	0	594	0	594	3014	2420	594	J-55	54.5	BUTT	1.125	1.125	DRY	1.6	DRY	1.6
2	INTERMEDIATE	12.25	9.625	NEW	API	N	0	8900	0	8792	3014	-5778	8900	HCL-80	43.5	BUTT	1.125	1.125	DRY	1.6	DRY	1.6
3	PRODUCTION	8.5	5.5	NEW	API	N	0	14544	0	9479	3014	-6465	14544	P-110	20	OTHER - TMK DQX	1.125	1.125	DRY	1.6	DRY	1.6

### Casing Attachments

**Operator Name:** NOVO OIL AND GAS NORTHERN DELAWARE LLC

**Well Name:** GOONCH FED COM 04

**Well Number:** 211H

### Casing Attachments

---

**Casing ID:** 1            **String Type:** SURFACE

**Inspection Document:**

**Spec Document:**

**Tapered String Spec:**

**Casing Design Assumptions and Worksheet(s):**

Goonch\_04\_211H\_Casing\_Design\_Assumptions\_20190802144343.pdf

---

**Casing ID:** 2            **String Type:** INTERMEDIATE

**Inspection Document:**

**Spec Document:**

**Tapered String Spec:**

**Casing Design Assumptions and Worksheet(s):**

Goonch\_04\_211H\_Casing\_Design\_Assumptions\_20190802150659.pdf

---

**Casing ID:** 3            **String Type:** PRODUCTION

**Inspection Document:**

**Spec Document:**

**Tapered String Spec:**

**Casing Design Assumptions and Worksheet(s):**

Goonch\_04\_211H\_Casing\_Design\_Assumptions\_20190802144550.pdf

5.50in\_TMK\_UP\_DQX\_20190923124158.pdf

---

## Section 4 - Cement

**Operator Name:** NOVO OIL AND GAS NORTHERN DELAWARE LLC

**Well Name:** GOONCH FED COM 04

**Well Number:** 211H

String Type	Lead/Tail	Stage Tool Depth	Top MD	Bottom MD	Quantity(sx)	Yield	Density	Cu Ft	Excess%	Cement type	Additives
SURFACE	Lead		0	0	0	0	0	0	0	None	None
SURFACE	Tail		0	594	509	13.8	1.62	824	100	Class C	gel + accelerator + LCM
PRODUCTION	Lead		0	0	0	0	0	0	0	None	None
PRODUCTION	Tail		8400	1454 4	894	13	1.89	1689		Class H	fluid loss + retarder + LCM
INTERMEDIATE	Lead	4000	0	4000	690	2.27	11.9	1573	20	Class C or H	fluid loss + retarder + LCM
INTERMEDIATE	Tail		0	4000	200	14.8	1.34	268	20	Class C or H	fluid loss + retarder + LCM
INTERMEDIATE	Lead	4000	4000	8900	542	2.27	11.9	1235	20	Class C or H	fluid loss + retarder + LCM
INTERMEDIATE	Tail		4000	8900	200	14.8	1.34	268	20	Class C or H	fluid loss + retarder + LCM

### 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 (barite, bentonite, LCM) to control weight and fluid loss will be on site at all times. Mud program may change due to hole conditions.

**Describe the mud monitoring system utilized:** An electronic PVT mud system will monitor flow rate, pump pressure, stroke rate, and volume.

### 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
0	594	OTHER : Fresh water spud	8.3	8.3							

**Operator Name:** NOVO OIL AND GAS NORTHERN DELAWARE LLC

**Well Name:** GOONCH FED COM 04

**Well Number:** 211H

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
594	8900	OTHER : Brine diesel emulsion	8.8	9.2							
8900	14544	OIL-BASED MUD	8.8	12.5							

### Section 6 - Test, Logging, Coring

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

A 2-person mud logging program will be used from 3000 to TD.

GR log will be acquired by MWD tools from the intermediate casing to TD.

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

GAMMA RAY LOG,

**Coring operation description for the well:**

No core or drill stem test is planned.

### Section 7 - Pressure

**Anticipated Bottom Hole Pressure:** 5071

**Anticipated Surface Pressure:** 2985

**Anticipated Bottom Hole Temperature(F):** 165

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

**Describe:**

**Contingency Plans geohazards description:**

**Contingency Plans geohazards attachment:**

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

**Hydrogen sulfide drilling operations plan:**

Goonch\_04\_211H\_H2S\_Plan\_20190802145551.pdf

**Operator Name:** NOVO OIL AND GAS NORTHERN DELAWARE LLC

**Well Name:** GOONCH FED COM 04

**Well Number:** 211H

## Section 8 - Other Information

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

Goonch\_04\_211H\_Horizontal\_Drill\_Plan\_20190802145616.pdf

**Other proposed operations facets description:**

**Other proposed operations facets attachment:**

Goonch\_04\_211H\_Speedhead\_Specs\_20190802145652.pdf

Goonch\_04\_211H\_Anti\_Collision\_Report\_20190802145707.pdf

Goonch\_04\_211H\_Alternative\_Casing\_Spec\_Request\_20190923124434.pdf

CoFlex\_Certs\_20191008093911.pdf

**Other Variance attachment:**

Goonch\_04\_211H\_Alternative\_Casing\_Spec\_Request\_20191017125238.pdf

Goonch\_04\_211H\_Casing\_Variance\_Request\_20191017125251.pdf

Novo Oil & Gas Northern Delaware, LLC  
 Goonch Fed Com 04 211H  
 SHL 1120' FSL & 980' FWL 4-23S-28E  
 BHL 130' FNL & 726' FWL 4-23S-28e  
 Eddy County, NM

DRILL PLAN PAGE 1

fee/fee/Fed

Drilling Program

1. ESTIMATED TOPS

Formation Name	TVD KB	MD	Bearing
Quaternary	0'	0'	water
Rustler anhydrite (surface csg @ 594' MD)	100'	100'	N/A
Castile gypsum	970'	970'	N/A
Lamar limestone	2473'	2476'	N/A
Bell Canyon sandstone	2539'	2543'	hydrocarbons
Cherry Canyon sandstone	3614'	3641'	hydrocarbons
Brushy Canyon sandstone	4627'	4677'	hydrocarbons
Bone Spring limestone	6070'	6152'	hydrocarbons
Avalon shale	6578'	6671'	hydrocarbons
1 <sup>st</sup> Bone Spring sandstone	7037'	7140'	hydrocarbons
2 <sup>nd</sup> Bone Spring carbonate	7250'	7357'	hydrocarbons
2nd Bone Spring sandstone	7785'	7893'	hydrocarbons
3d Bone Spring carbonate (inter. csg @ 8900' MD)	8082'	8190'	hydrocarbons
(KOP	9001'	9108'	hydrocarbons)
3 <sup>rd</sup> Bone Spring sandstone	9016'	9124'	hydrocarbons
Wolfcamp XY carbonate (pro. csg @ 14544' MD)	9340'	9486'	hydrocarbons
TD	9479'	14544'	hydrocarbons

2. NOTABLE ZONES

Wolfcamp XY carbonate is the goal. All perforations will be  $\geq 330'$  from the dedication perimeter. Closest water well (C 00800) is 0.90 mile southeast. Water bearing strata were found from 50' to 155' in the 200' deep well.

Novo Oil & Gas Northern Delaware, LLC  
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Eddy County, NM

DRILL PLAN PAGE 2

fee/fee/Fed

### 3. PRESSURE CONTROL

A 13.625" 5,000-psi BOP system will be installed on a multi-bowl (speed head) wellhead with a 13.625" flanged casing spool. Top flange of casing spool will be set in a cellar below ground level. BOP system will consist of a single pipe ram on the bottom, mud cross, double pipe ram with blind rams on bottom and pipe rams on top, and annular preventer. Blowout preventer will be installed on top of the 13.375" surface casing and will remain installed to TD of the well. Wellhead, blowout preventer, and choke manifold diagram are included.

BOP system will be isolated with a test plug and tested by an independent tester to 250-psi low and 5000-psi high for 10 minutes. Variance is requested to use a co-flex hose between the BOP system and choke manifold. A typical co-flex pressure test certificate is attached. An equipment specific co-flex pressure test certificate will be on site when testing the BOP.

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

### 4. CASING & CEMENT

Variance is requested for an option to use a surface rig to drill the surface hole, set the surface casing, and cement the surface casing. If the schedule between rigs would preclude presetting the surface casing, then the primary rig will MIRU and drill all of the well.

All casing will be API and new. See attached casing assumption worksheet.

Novo Oil & Gas Northern Delaware, LLC  
 Goonch Fed Com 04 211H  
 SHL 1120' FSL & 980' FWL 4-23S-28E  
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 Eddy County, NM

DRILL PLAN PAGE 3

fee/fee/Fed

Hole O. D.	Set MD	Set TVD	Casing OD	Weight (lb/ft)	Grade	Joint	Collapse	Burst	Tension
17.5"	0' - 594'	0' - 594'	13.375" surface	54.5	J-55	BTC	1.125	1.125	1.60
12.25"	0' - 8900'	0' - 8792'	9.625" intermed.	43.5	HCL-80	BTC	1.125	1.125	1.60
8.5"	0' - 14544'	0' - 9479'	5.5" product.	20	P-110	*TMK DQX, GBCD, CDC, or DWC/C	1.125	1.125	1.60

\*Depends on coupling availability.

Alternate Production Casing:

Hole O. D.	Set MD	Set TVD	Casing OD	Weight (lb/ft)	Grade	Joint	Collapse	Burst	Tension
8.5"	0' - 14544'	0' - 9479'	5.5" product.	20	P-110 ICY	TXP- BTC	1.125	1.125	1.60
8.5"	0' - 14544'	0' - 9479'	5.5" product.	20	P-110 EC	DWC- C-IS+ BK-HT	1.125	1.125	1.60
8.5"	0' - 14544'	0' - 9479'	5.5" product.	20	P-110 CYHP	TMK BPN	1.125	1.125	1.60
8.5"	0' - 14544'	0' - 9479'	5.5" product.	23	P-110	TMK DQX	1.125	1.125	1.60
8.5"	0' - 14544'	0' - 9479'	5.5" product.	23	P-110 ICY	TXP- BTC	1.125	1.125	1.60

Alternate weights and grades could be substituted to meet maximum stimulation pressures.

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 Eddy County, NM

DRILL PLAN PAGE 4

fee/fee/Fed

Name	Type	Sacks	Yield	Cu. Ft.	Weight	Blend
Surface	Tail	509	1.62	824	13.8	Class C + gel + accelerator + LCM
TOC = GL		100% Excess			Centralizers on every jt to GL	
Intermediate Stage * 1	Lead	690	2.28	1573	11.9	Class C or H + fluid loss + retarder + LCM
	Tail	200	1.34	268	14.8	Class C or H + fluid loss + retarder + LCM
Intermediate Stage * 2	Lead	542	2.28	1235	11.9	Class C or H + fluid loss + retarder + LCM
	Tail	200	1.34	268	14.8	Class C or H + fluid loss + retarder + LCM
TOC = GL		20% Excess			Centralizers on bottom 3 jts and then 1 centralizer every 4th jt to GL	
Production	Tail	894	1.89	1689	13.0	Class H + fluid loss + retarder + LCM
TOC = 8400'		20% Excess			None planned	

\*Stage tool set at  $\approx$ 4000'.

## 5. MUD PROGRAM

An electronic PVT mud system will monitor flow rate, pump pressure, stroke rate, and volume. All necessary mud products (barite, bentonite, LCM) to control weight and fluid loss will be on site at all times. Mud program may change due to hole conditions. A closed loop system will be used.

Type	Interval (MD)	lb/gal	Viscosity	Fluid Loss
fresh water spud	0' - 594'	8.3	30 - 60	NC
brine diesel emulsion	594' - 8900'	8.8 - 9.2	35 - 45	NC
OBM	8900' - 14544'	8.8 - 12.5	35 - 65	4 - 6

Novo Oil & Gas Northern Delaware, LLC  
Goonch Fed Com 04 211H  
SHL 1120' FSL & 980' FWL 4-23S-28E  
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Eddy County, NM

DRILL PLAN PAGE 5

fee/fee/Fed

#### 6. CORES, TESTS, & LOGS

No core or drill stem test is planned.

A 2-person mud logging program will be used from  $\approx 3000'$  to TD.

GR log will be acquired by MWD tools from the intermediate casing to TD.

#### 7. DOWN HOLE CONDITIONS

No abnormal pressure or temperature is expected. Maximum expected bottom hole pressure is  $\approx 5071$  psi. Expected bottom hole temperature is  $\approx 165^\circ$  F.

An H2S plan is attached.

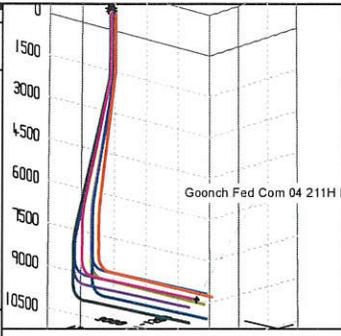
#### 8. OTHER INFORMATION

Anticipated spud date is upon approval. It is expected it will take  $\approx 3$  months to drill and complete the well.

Novo owns fee leases in the S2 Section 4. Novo has NMOCD approval to be the operator in the W2 Section 4 via NMOCD Case 20184 and R-20578.

### PROJECT DETAILS: Eddy County, NM

Geodetic System: US State Plane 1983  
 Datum: North American Datum 1983  
 Ellipsoid: GRS 1980  
 Zone: New Mexico Eastern Zone  
 North Reference: Grid  
 System Datum: Mean Sea Level  
 To convert a True Direction to a Grid Direction, Subtract 0.13°  
 To convert a Magnetic Direction to a True Direction, Add 6.99° East  
 To convert a Magnetic Direction to a Grid Direction, Add 6.87°



Azimuths to Grid North  
 True North: -0.13°  
 Magnetic North: 6.87°

Magnetic Field  
 Strength: 47745.7nT  
 Dip Angle: 60.05°  
 Date: 06/06/2019  
 Model: IGRF2015

### WELL DETAILS: Goonch Fed Com 04 211H

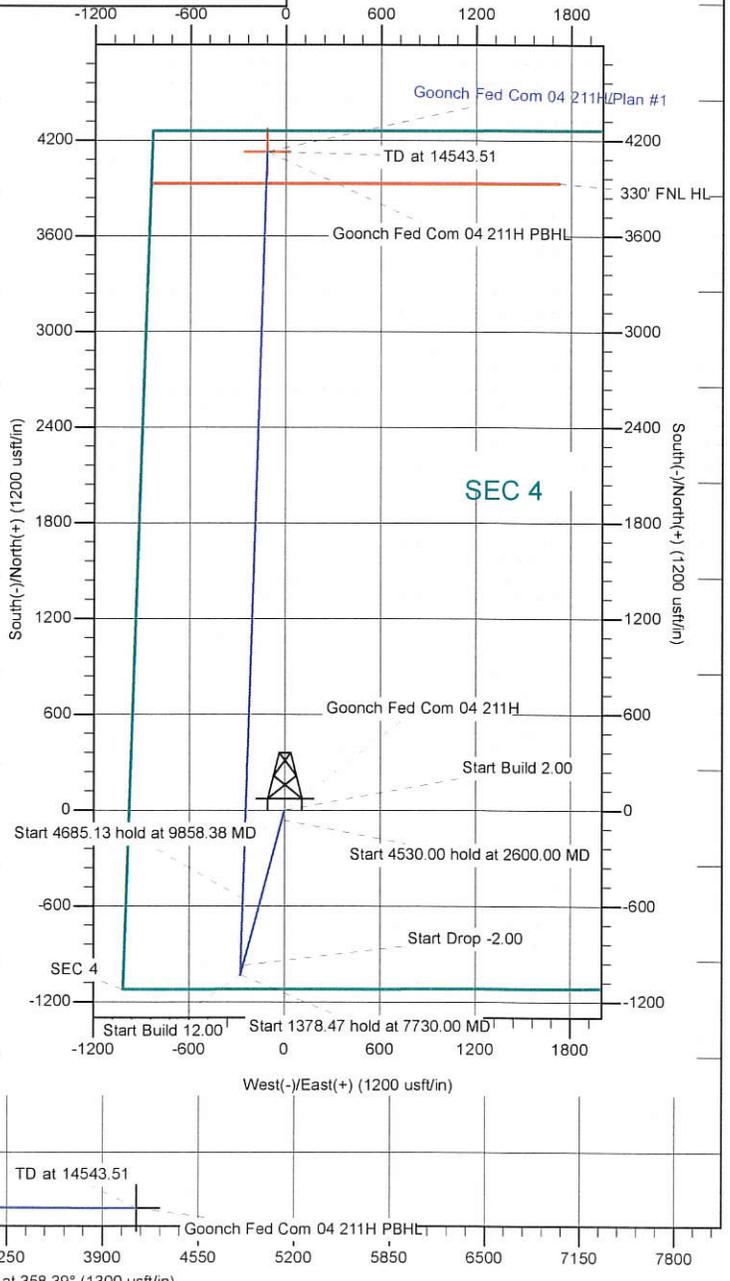
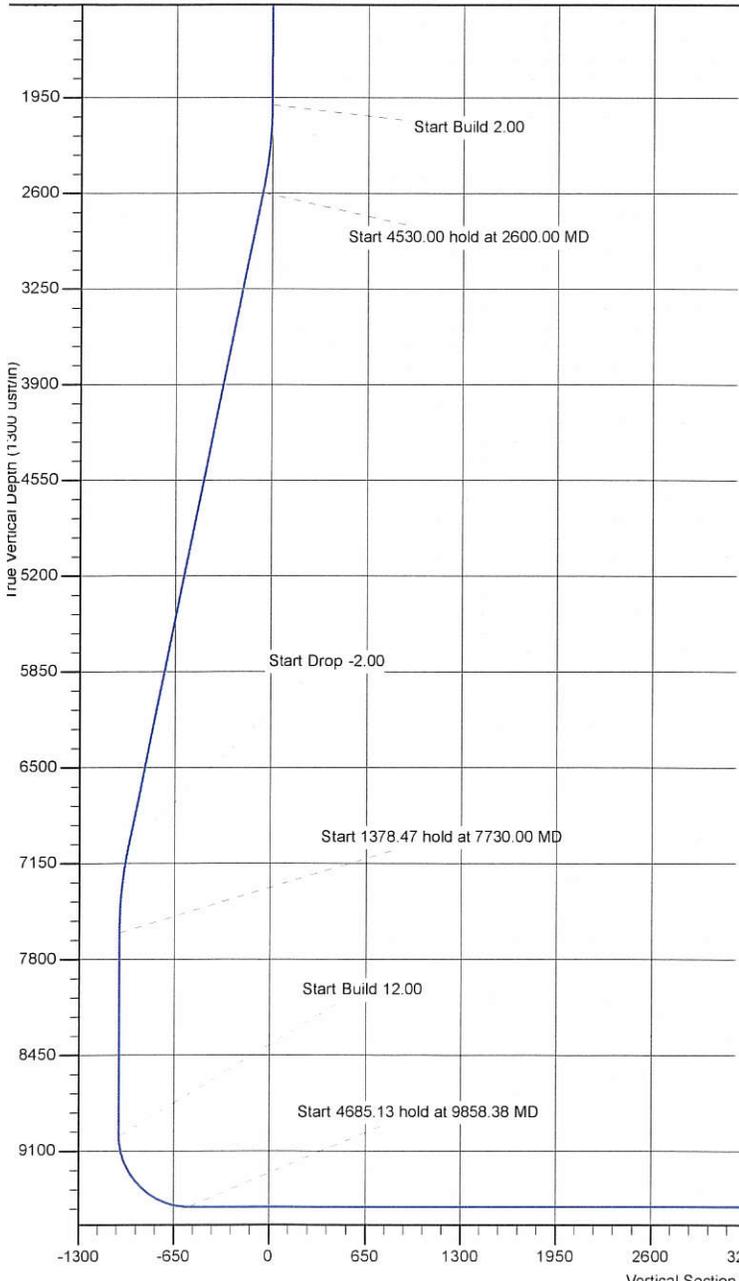
		GL 3014.3' + 25' KB @ 3039.30usft				
+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	
0.00	0.00	483944.88	614091.43	32° 19' 48.780 N	104° 5' 52.031 W	

### SECTION DETAILS

MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	Annotation
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	2000.00	0.00	0.00	2000.00	0.00	0.00	0.00	0.00	Start Build 2.00
3	2600.00	12.00	195.00	2595.62	-60.47	-16.20	2.00	195.00	Start 4530.00 hold at 2600.00 MD
4	7130.00	12.00	195.00	7026.63	-970.22	-259.97	0.00	0.00	Start Drop -2.00
5	7730.00	0.00	0.00	7622.25	-1030.69	-276.17	2.00	180.00	Start 1378.47 hold at 7730.00 MD
6	9108.46	0.00	0.00	9000.72	-1030.69	-276.17	0.00	0.00	Start Build 12.00
7	9858.38	89.99	1.78	9478.18	-553.54	-261.36	12.00	1.78	Start 4685.13 hold at 9858.38 MD
8	14543.51	89.99	1.78	9479.00	4129.34	-115.95	0.00	0.00	TD at 14543.51

Start Build 2.00  
 Start 4530.00 hold at 2600.00 MD  
 Start Drop -2.00  
 Start 1378.47 hold at 7730.00 MD  
 Start Build 12.00  
 Start 4685.13 hold at 9858.38 MD  
 TD at 14543.51  
 Goonch Fed Com 04 211H PBHL

-)/East(+) (1200 usft/in)



# Hawkeye Directional Planning Report



<b>Database:</b> HED_Compass_DSN	<b>Local Co-ordinate Reference:</b> Well Goonch Fed Com 04 211H
<b>Company:</b> Novo Oil & Gas, LLC	<b>TVD Reference:</b> GL 3014.3' + 25' KB @ 3039.30usft
<b>Project:</b> Eddy County, NM	<b>MD Reference:</b> GL 3014.3' + 25' KB @ 3039.30usft
<b>Site:</b> SEC 4 - T23S - R28E	<b>North Reference:</b> Grid
<b>Well:</b> Goonch Fed Com 04 211H	<b>Survey Calculation Method:</b> Minimum Curvature
<b>Wellbore:</b> OH	
<b>Design:</b> Plan #1	

<b>Project</b> Eddy County, NM
<b>Map System:</b> US State Plane 1983 <b>System Datum:</b> Mean Sea Level
<b>Geo Datum:</b> North American Datum 1983
<b>Map Zone:</b> New Mexico Eastern Zone

<b>Site</b> SEC 4 - T23S - R28E
<b>Site Position:</b> <b>Northing:</b> 483,964.87 usft <b>Latitude:</b> 32° 19' 48.977 N
<b>From:</b> Map <b>Easting:</b> 614,092.09 usft <b>Longitude:</b> 104° 5' 52.023 W
<b>Position Uncertainty:</b> 0.00 usft <b>Slot Radius:</b> 13.200 in <b>Grid Convergence:</b> 0.13 °

<b>Well</b> Goonch Fed Com 04 211H
<b>Well Position</b> <b>+N/-S</b> -19.99 usft <b>Northing:</b> 483,944.88 usft <b>Latitude:</b> 32° 19' 48.780 N
<b>+E/-W</b> -0.66 usft <b>Easting:</b> 614,091.43 usft <b>Longitude:</b> 104° 5' 52.031 W
<b>Position Uncertainty</b> 0.00 usft <b>Wellhead Elevation:</b> <b>Ground Level:</b> 3,014.30 usft

<b>Wellbore</b> OH
--------------------

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	06/06/19	6.99	60.05	47,745.68547213

<b>Design</b> Plan #1								
<b>Audit Notes:</b>								
<b>Version:</b> <b>Phase:</b> PLAN <b>Tie On Depth:</b> 0.00								
<b>Vertical Section:</b>								
<table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 30%;">Depth From (TVD) (usft)</th> <th style="width: 15%;">+N/-S (usft)</th> <th style="width: 15%;">+E/-W (usft)</th> <th style="width: 40%;">Direction (°)</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">0.00</td> <td style="text-align: center;">0.00</td> <td style="text-align: center;">0.00</td> <td style="text-align: center;">358.39</td> </tr> </tbody> </table>	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)	0.00	0.00	0.00	358.39
Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)					
0.00	0.00	0.00	358.39					

<b>Plan Survey Tool Program</b> <b>Date</b> 06/09/19										
<table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 10%;">Depth From (usft)</th> <th style="width: 10%;">Depth To (usft)</th> <th style="width: 20%;">Survey (Wellbore)</th> <th style="width: 20%;">Tool Name</th> <th style="width: 40%;">Remarks</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">1</td> <td style="text-align: center;">0.00</td> <td style="text-align: center;">14,543.51</td> <td style="text-align: center;">Plan #1 (OH)</td> <td style="text-align: center;">MWD OWSG MWD - Standard</td> </tr> </tbody> </table>	Depth From (usft)	Depth To (usft)	Survey (Wellbore)	Tool Name	Remarks	1	0.00	14,543.51	Plan #1 (OH)	MWD OWSG MWD - Standard
Depth From (usft)	Depth To (usft)	Survey (Wellbore)	Tool Name	Remarks						
1	0.00	14,543.51	Plan #1 (OH)	MWD OWSG MWD - Standard						

<b>Plan Sections</b>										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	TFO (°)	Target
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2,000.00	0.00	0.00	2,000.00	0.00	0.00	0.00	0.00	0.00	0.00	
2,600.00	12.00	195.00	2,595.62	-60.47	-16.20	2.00	2.00	0.00	195.00	
7,130.00	12.00	195.00	7,026.63	-970.22	-259.97	0.00	0.00	0.00	0.00	
7,730.00	0.00	0.00	7,622.25	-1,030.69	-276.17	2.00	-2.00	0.00	180.00	
9,108.46	0.00	0.00	9,000.72	-1,030.69	-276.17	0.00	0.00	0.00	0.00	
9,858.38	89.99	1.78	9,478.18	-553.54	-261.36	12.00	12.00	0.00	1.78	
14,543.51	89.99	1.78	9,479.00	4,129.34	-115.95	0.00	0.00	0.00	0.00	Goonch Fed Com 04

# Hawkeye Directional Planning Report



<b>Database:</b>	HED_Compass_DSN	<b>Local Co-ordinate Reference:</b>	Well Goonch Fed Com 04 211H
<b>Company:</b>	Novo Oil & Gas, LLC	<b>TVD Reference:</b>	GL 3014.3' + 25' KB @ 3039.30usft
<b>Project:</b>	Eddy County, NM	<b>MD Reference:</b>	GL 3014.3' + 25' KB @ 3039.30usft
<b>Site:</b>	SEC 4 - T23S - R28E	<b>North Reference:</b>	Grid
<b>Well:</b>	Goonch Fed Com 04 211H	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	OH		
<b>Design:</b>	Plan #1		

## Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	0.00
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00
400.00	0.00	0.00	400.00	0.00	0.00	0.00	0.00	0.00	0.00
500.00	0.00	0.00	500.00	0.00	0.00	0.00	0.00	0.00	0.00
600.00	0.00	0.00	600.00	0.00	0.00	0.00	0.00	0.00	0.00
700.00	0.00	0.00	700.00	0.00	0.00	0.00	0.00	0.00	0.00
800.00	0.00	0.00	800.00	0.00	0.00	0.00	0.00	0.00	0.00
900.00	0.00	0.00	900.00	0.00	0.00	0.00	0.00	0.00	0.00
1,000.00	0.00	0.00	1,000.00	0.00	0.00	0.00	0.00	0.00	0.00
1,100.00	0.00	0.00	1,100.00	0.00	0.00	0.00	0.00	0.00	0.00
1,200.00	0.00	0.00	1,200.00	0.00	0.00	0.00	0.00	0.00	0.00
1,300.00	0.00	0.00	1,300.00	0.00	0.00	0.00	0.00	0.00	0.00
1,400.00	0.00	0.00	1,400.00	0.00	0.00	0.00	0.00	0.00	0.00
1,500.00	0.00	0.00	1,500.00	0.00	0.00	0.00	0.00	0.00	0.00
1,600.00	0.00	0.00	1,600.00	0.00	0.00	0.00	0.00	0.00	0.00
1,700.00	0.00	0.00	1,700.00	0.00	0.00	0.00	0.00	0.00	0.00
1,800.00	0.00	0.00	1,800.00	0.00	0.00	0.00	0.00	0.00	0.00
1,900.00	0.00	0.00	1,900.00	0.00	0.00	0.00	0.00	0.00	0.00
2,000.00	0.00	0.00	2,000.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>Start Build 2.00</b>									
2,100.00	2.00	195.00	2,099.98	-1.69	-0.45	-1.67	2.00	2.00	0.00
2,200.00	4.00	195.00	2,199.84	-6.74	-1.81	-6.69	2.00	2.00	0.00
2,300.00	6.00	195.00	2,299.45	-15.16	-4.06	-15.04	2.00	2.00	0.00
2,400.00	8.00	195.00	2,398.70	-26.93	-7.22	-26.72	2.00	2.00	0.00
2,500.00	10.00	195.00	2,497.47	-42.04	-11.26	-41.71	2.00	2.00	0.00
2,600.00	12.00	195.00	2,595.62	-60.47	-16.20	-59.99	2.00	2.00	0.00
<b>Start 4530.00 hold at 2600.00 MD</b>									
2,700.00	12.00	195.00	2,693.44	-80.55	-21.58	-79.91	0.00	0.00	0.00
2,800.00	12.00	195.00	2,791.25	-100.63	-26.97	-99.84	0.00	0.00	0.00
2,900.00	12.00	195.00	2,889.07	-120.72	-32.35	-119.76	0.00	0.00	0.00
3,000.00	12.00	195.00	2,986.88	-140.80	-37.73	-139.69	0.00	0.00	0.00
3,100.00	12.00	195.00	3,084.70	-160.88	-43.11	-159.61	0.00	0.00	0.00
3,200.00	12.00	195.00	3,182.51	-180.97	-48.49	-179.53	0.00	0.00	0.00
3,300.00	12.00	195.00	3,280.33	-201.05	-53.87	-199.46	0.00	0.00	0.00
3,400.00	12.00	195.00	3,378.14	-221.13	-59.25	-219.38	0.00	0.00	0.00
3,500.00	12.00	195.00	3,475.96	-241.21	-64.63	-239.30	0.00	0.00	0.00
3,600.00	12.00	195.00	3,573.77	-261.30	-70.01	-259.23	0.00	0.00	0.00
3,700.00	12.00	195.00	3,671.59	-281.38	-75.40	-279.15	0.00	0.00	0.00
3,800.00	12.00	195.00	3,769.40	-301.46	-80.78	-299.08	0.00	0.00	0.00
3,900.00	12.00	195.00	3,867.22	-321.54	-86.16	-319.00	0.00	0.00	0.00
4,000.00	12.00	195.00	3,965.03	-341.63	-91.54	-338.92	0.00	0.00	0.00
4,100.00	12.00	195.00	4,062.84	-361.71	-96.92	-358.85	0.00	0.00	0.00
4,200.00	12.00	195.00	4,160.66	-381.79	-102.30	-378.77	0.00	0.00	0.00
4,300.00	12.00	195.00	4,258.47	-401.88	-107.68	-398.70	0.00	0.00	0.00
4,400.00	12.00	195.00	4,356.29	-421.96	-113.06	-418.62	0.00	0.00	0.00
4,500.00	12.00	195.00	4,454.10	-442.04	-118.44	-438.54	0.00	0.00	0.00
4,600.00	12.00	195.00	4,551.92	-462.12	-123.83	-458.47	0.00	0.00	0.00
4,700.00	12.00	195.00	4,649.73	-482.21	-129.21	-478.39	0.00	0.00	0.00
4,800.00	12.00	195.00	4,747.55	-502.29	-134.59	-498.31	0.00	0.00	0.00
4,900.00	12.00	195.00	4,845.36	-522.37	-139.97	-518.24	0.00	0.00	0.00
5,000.00	12.00	195.00	4,943.18	-542.45	-145.35	-538.16	0.00	0.00	0.00

# Hawkeye Directional Planning Report



<b>Database:</b>	HED_Compass_DSN	<b>Local Co-ordinate Reference:</b>	Well Goonch Fed Com 04 211H
<b>Company:</b>	Novo Oil & Gas, LLC	<b>TVD Reference:</b>	GL 3014.3' + 25' KB @ 3039.30usft
<b>Project:</b>	Eddy County, NM	<b>MD Reference:</b>	GL 3014.3' + 25' KB @ 3039.30usft
<b>Site:</b>	SEC 4 - T23S - R28E	<b>North Reference:</b>	Grid
<b>Well:</b>	Goonch Fed Com 04 211H	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	OH		
<b>Design:</b>	Plan #1		

Planned Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	
5,100.00	12.00	195.00	5,040.99	-562.54	-150.73	-558.09	0.00	0.00	0.00	
5,200.00	12.00	195.00	5,138.81	-582.62	-156.11	-578.01	0.00	0.00	0.00	
5,300.00	12.00	195.00	5,236.62	-602.70	-161.49	-597.93	0.00	0.00	0.00	
5,400.00	12.00	195.00	5,334.44	-622.79	-166.87	-617.86	0.00	0.00	0.00	
5,500.00	12.00	195.00	5,432.25	-642.87	-172.26	-637.78	0.00	0.00	0.00	
5,600.00	12.00	195.00	5,530.07	-662.95	-177.64	-657.70	0.00	0.00	0.00	
5,700.00	12.00	195.00	5,627.88	-683.03	-183.02	-677.63	0.00	0.00	0.00	
5,800.00	12.00	195.00	5,725.70	-703.12	-188.40	-697.55	0.00	0.00	0.00	
5,900.00	12.00	195.00	5,823.51	-723.20	-193.78	-717.48	0.00	0.00	0.00	
6,000.00	12.00	195.00	5,921.33	-743.28	-199.16	-737.40	0.00	0.00	0.00	
6,100.00	12.00	195.00	6,019.14	-763.36	-204.54	-757.32	0.00	0.00	0.00	
6,200.00	12.00	195.00	6,116.95	-783.45	-209.92	-777.25	0.00	0.00	0.00	
6,300.00	12.00	195.00	6,214.77	-803.53	-215.31	-797.17	0.00	0.00	0.00	
6,400.00	12.00	195.00	6,312.58	-823.61	-220.69	-817.09	0.00	0.00	0.00	
6,500.00	12.00	195.00	6,410.40	-843.70	-226.07	-837.02	0.00	0.00	0.00	
6,600.00	12.00	195.00	6,508.21	-863.78	-231.45	-856.94	0.00	0.00	0.00	
6,700.00	12.00	195.00	6,606.03	-883.86	-236.83	-876.87	0.00	0.00	0.00	
6,800.00	12.00	195.00	6,703.84	-903.94	-242.21	-896.79	0.00	0.00	0.00	
6,900.00	12.00	195.00	6,801.66	-924.03	-247.59	-916.71	0.00	0.00	0.00	
7,000.00	12.00	195.00	6,899.47	-944.11	-252.97	-936.64	0.00	0.00	0.00	
7,100.00	12.00	195.00	6,997.29	-964.19	-258.35	-956.56	0.00	0.00	0.00	
7,130.00	12.00	195.00	7,026.63	-970.22	-259.97	-962.54	0.00	0.00	0.00	
<b>Start Drop -2.00</b>										
7,200.00	10.60	195.00	7,095.27	-983.47	-263.52	-975.68	2.00	-2.00	0.00	
7,300.00	8.60	195.00	7,193.87	-999.57	-267.83	-991.66	2.00	-2.00	0.00	
7,400.00	6.60	195.00	7,292.98	-1,012.35	-271.26	-1,004.33	2.00	-2.00	0.00	
7,500.00	4.60	195.00	7,392.50	-1,021.77	-273.78	-1,013.69	2.00	-2.00	0.00	
7,600.00	2.60	195.00	7,492.30	-1,027.84	-275.41	-1,019.70	2.00	-2.00	0.00	
7,700.00	0.60	195.00	7,592.26	-1,030.53	-276.13	-1,022.38	2.00	-2.00	0.00	
7,730.00	0.00	0.00	7,622.25	-1,030.69	-276.17	-1,022.53	2.00	-2.00	0.00	
<b>Start 1378.47 hold at 7730.00 MD</b>										
7,800.00	0.00	0.00	7,692.26	-1,030.69	-276.17	-1,022.53	0.00	0.00	0.00	
7,900.00	0.00	0.00	7,792.26	-1,030.69	-276.17	-1,022.53	0.00	0.00	0.00	
8,000.00	0.00	0.00	7,892.26	-1,030.69	-276.17	-1,022.53	0.00	0.00	0.00	
8,100.00	0.00	0.00	7,992.26	-1,030.69	-276.17	-1,022.53	0.00	0.00	0.00	
8,200.00	0.00	0.00	8,092.26	-1,030.69	-276.17	-1,022.53	0.00	0.00	0.00	
8,300.00	0.00	0.00	8,192.26	-1,030.69	-276.17	-1,022.53	0.00	0.00	0.00	
8,400.00	0.00	0.00	8,292.26	-1,030.69	-276.17	-1,022.53	0.00	0.00	0.00	
8,500.00	0.00	0.00	8,392.26	-1,030.69	-276.17	-1,022.53	0.00	0.00	0.00	
8,600.00	0.00	0.00	8,492.26	-1,030.69	-276.17	-1,022.53	0.00	0.00	0.00	
8,700.00	0.00	0.00	8,592.26	-1,030.69	-276.17	-1,022.53	0.00	0.00	0.00	
8,800.00	0.00	0.00	8,692.26	-1,030.69	-276.17	-1,022.53	0.00	0.00	0.00	
8,900.00	0.00	0.00	8,792.26	-1,030.69	-276.17	-1,022.53	0.00	0.00	0.00	
9,000.00	0.00	0.00	8,892.26	-1,030.69	-276.17	-1,022.53	0.00	0.00	0.00	
9,108.46	0.00	0.00	9,000.72	-1,030.69	-276.17	-1,022.53	0.00	0.00	0.00	
<b>Start Build 12.00</b>										
9,125.00	1.98	1.78	9,017.25	-1,030.40	-276.16	-1,022.24	12.00	12.00	0.00	
9,150.00	4.98	1.78	9,042.20	-1,028.88	-276.12	-1,020.73	12.00	12.00	0.00	
9,175.00	7.98	1.78	9,067.04	-1,026.06	-276.03	-1,017.91	12.00	12.00	0.00	
9,200.00	10.98	1.78	9,091.70	-1,021.94	-275.90	-1,013.80	12.00	12.00	0.00	
9,225.00	13.98	1.78	9,116.10	-1,016.54	-275.73	-1,008.40	12.00	12.00	0.00	
9,250.00	16.98	1.78	9,140.19	-1,009.87	-275.53	-1,001.74	12.00	12.00	0.00	
9,275.00	19.98	1.78	9,163.90	-1,001.95	-275.28	-993.83	12.00	12.00	0.00	

# Hawkeye Directional Planning Report



<b>Database:</b>	HED_Compass_DSN	<b>Local Co-ordinate Reference:</b>	Well Goonch Fed Com 04 211H
<b>Company:</b>	Novo Oil & Gas, LLC	<b>TVD Reference:</b>	GL 3014.3' + 25' KB @ 3039.30usft
<b>Project:</b>	Eddy County, NM	<b>MD Reference:</b>	GL 3014.3' + 25' KB @ 3039.30usft
<b>Site:</b>	SEC 4 - T23S - R28E	<b>North Reference:</b>	Grid
<b>Well:</b>	Goonch Fed Com 04 211H	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	OH		
<b>Design:</b>	Plan #1		

Planned Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	
9,300.00	22.98	1.78	9,187.16	-992.80	-275.00	-984.69	12.00	12.00	0.00	
9,325.00	25.98	1.78	9,209.91	-982.44	-274.67	-974.35	12.00	12.00	0.00	
9,350.00	28.98	1.78	9,232.08	-970.91	-274.32	-962.83	12.00	12.00	0.00	
9,375.00	31.98	1.78	9,253.63	-958.24	-273.92	-950.17	12.00	12.00	0.00	
9,400.00	34.98	1.78	9,274.47	-944.45	-273.49	-936.40	12.00	12.00	0.00	
9,425.00	37.98	1.78	9,294.57	-929.60	-273.03	-921.57	12.00	12.00	0.00	
9,450.00	40.98	1.78	9,313.87	-913.71	-272.54	-905.70	12.00	12.00	0.00	
9,475.00	43.98	1.78	9,332.30	-896.84	-272.02	-888.85	12.00	12.00	0.00	
9,500.00	46.98	1.78	9,349.83	-879.02	-271.46	-871.05	12.00	12.00	0.00	
9,525.00	49.98	1.78	9,366.39	-860.31	-270.88	-852.37	12.00	12.00	0.00	
9,550.00	52.98	1.78	9,381.96	-840.76	-270.27	-832.84	12.00	12.00	0.00	
9,575.00	55.98	1.78	9,396.48	-820.43	-269.64	-812.53	12.00	12.00	0.00	
9,600.00	58.98	1.78	9,409.92	-799.36	-268.99	-791.49	12.00	12.00	0.00	
9,625.00	61.98	1.78	9,422.23	-777.61	-268.31	-769.78	12.00	12.00	0.00	
9,650.00	64.98	1.78	9,433.39	-755.26	-267.62	-747.45	12.00	12.00	0.00	
9,675.00	67.98	1.78	9,443.37	-732.35	-266.91	-724.57	12.00	12.00	0.00	
9,700.00	70.98	1.78	9,452.13	-708.95	-266.18	-701.20	12.00	12.00	0.00	
9,725.00	73.98	1.78	9,459.65	-685.12	-265.44	-677.40	12.00	12.00	0.00	
9,750.00	76.98	1.78	9,465.92	-660.93	-264.69	-653.24	12.00	12.00	0.00	
9,775.00	79.98	1.78	9,470.91	-636.45	-263.93	-628.79	12.00	12.00	0.00	
9,800.00	82.98	1.78	9,474.61	-611.74	-263.16	-604.11	12.00	12.00	0.00	
9,825.00	85.98	1.78	9,477.01	-586.87	-262.39	-579.27	12.00	12.00	0.00	
9,850.00	88.98	1.78	9,478.11	-561.91	-261.62	-554.35	12.00	12.00	0.00	
9,858.38	89.99	1.78	9,478.18	-553.54	-261.36	-545.98	12.00	12.00	0.00	
<b>Start 4685.13 hold at 9858.38 MD</b>										
9,900.00	89.99	1.78	9,478.19	-511.93	-260.06	-504.43	0.00	0.00	0.00	
10,000.00	89.99	1.78	9,478.21	-411.98	-256.96	-404.61	0.00	0.00	0.00	
10,100.00	89.99	1.78	9,478.22	-312.03	-253.86	-304.78	0.00	0.00	0.00	
10,200.00	89.99	1.78	9,478.24	-212.08	-250.75	-204.96	0.00	0.00	0.00	
10,300.00	89.99	1.78	9,478.26	-112.13	-247.65	-105.13	0.00	0.00	0.00	
10,400.00	89.99	1.78	9,478.28	-12.18	-244.55	-5.31	0.00	0.00	0.00	
10,500.00	89.99	1.78	9,478.29	87.78	-241.44	94.52	0.00	0.00	0.00	
10,600.00	89.99	1.78	9,478.31	187.73	-238.34	194.34	0.00	0.00	0.00	
10,700.00	89.99	1.78	9,478.33	287.68	-235.24	294.17	0.00	0.00	0.00	
10,800.00	89.99	1.78	9,478.35	387.63	-232.13	394.00	0.00	0.00	0.00	
10,900.00	89.99	1.78	9,478.36	487.58	-229.03	493.82	0.00	0.00	0.00	
11,000.00	89.99	1.78	9,478.38	587.54	-225.92	593.65	0.00	0.00	0.00	
11,100.00	89.99	1.78	9,478.40	687.49	-222.82	693.47	0.00	0.00	0.00	
11,200.00	89.99	1.78	9,478.42	787.44	-219.72	793.30	0.00	0.00	0.00	
11,300.00	89.99	1.78	9,478.43	887.39	-216.61	893.12	0.00	0.00	0.00	
11,400.00	89.99	1.78	9,478.45	987.34	-213.51	992.95	0.00	0.00	0.00	
11,500.00	89.99	1.78	9,478.47	1,087.30	-210.41	1,092.77	0.00	0.00	0.00	
11,600.00	89.99	1.78	9,478.49	1,187.25	-207.30	1,192.60	0.00	0.00	0.00	
11,700.00	89.99	1.78	9,478.50	1,287.20	-204.20	1,292.42	0.00	0.00	0.00	
11,800.00	89.99	1.78	9,478.52	1,387.15	-201.10	1,392.25	0.00	0.00	0.00	
11,900.00	89.99	1.78	9,478.54	1,487.10	-197.99	1,492.07	0.00	0.00	0.00	
12,000.00	89.99	1.78	9,478.56	1,587.05	-194.89	1,591.90	0.00	0.00	0.00	
12,100.00	89.99	1.78	9,478.57	1,687.01	-191.79	1,691.72	0.00	0.00	0.00	
12,200.00	89.99	1.78	9,478.59	1,786.96	-188.68	1,791.55	0.00	0.00	0.00	
12,300.00	89.99	1.78	9,478.61	1,886.91	-185.58	1,891.38	0.00	0.00	0.00	
12,400.00	89.99	1.78	9,478.63	1,986.86	-182.48	1,991.20	0.00	0.00	0.00	
12,500.00	89.99	1.78	9,478.64	2,086.81	-179.37	2,091.03	0.00	0.00	0.00	
12,600.00	89.99	1.78	9,478.66	2,186.77	-176.27	2,190.85	0.00	0.00	0.00	
12,700.00	89.99	1.78	9,478.68	2,286.72	-173.16	2,290.68	0.00	0.00	0.00	

# Hawkeye Directional Planning Report



<b>Database:</b>	HED_Compass_DSN	<b>Local Co-ordinate Reference:</b>	Well Goonch Fed Com 04 211H
<b>Company:</b>	Novo Oil & Gas, LLC	<b>TVD Reference:</b>	GL 3014.3' + 25' KB @ 3039.30usft
<b>Project:</b>	Eddy County, NM	<b>MD Reference:</b>	GL 3014.3' + 25' KB @ 3039.30usft
<b>Site:</b>	SEC 4 - T23S - R28E	<b>North Reference:</b>	Grid
<b>Well:</b>	Goonch Fed Com 04 211H	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	OH		
<b>Design:</b>	Plan #1		

Planned Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	
12,800.00	89.99	1.78	9,478.70	2,386.67	-170.06	2,390.50	0.00	0.00	0.00	
12,900.00	89.99	1.78	9,478.71	2,486.62	-166.96	2,490.33	0.00	0.00	0.00	
13,000.00	89.99	1.78	9,478.73	2,586.57	-163.85	2,590.15	0.00	0.00	0.00	
13,100.00	89.99	1.78	9,478.75	2,686.52	-160.75	2,689.98	0.00	0.00	0.00	
13,200.00	89.99	1.78	9,478.77	2,786.48	-157.65	2,789.80	0.00	0.00	0.00	
13,300.00	89.99	1.78	9,478.78	2,886.43	-154.54	2,889.63	0.00	0.00	0.00	
13,400.00	89.99	1.78	9,478.80	2,986.38	-151.44	2,989.45	0.00	0.00	0.00	
13,500.00	89.99	1.78	9,478.82	3,086.33	-148.34	3,089.28	0.00	0.00	0.00	
13,600.00	89.99	1.78	9,478.84	3,186.28	-145.23	3,189.10	0.00	0.00	0.00	
13,700.00	89.99	1.78	9,478.85	3,286.24	-142.13	3,288.93	0.00	0.00	0.00	
13,800.00	89.99	1.78	9,478.87	3,386.19	-139.03	3,388.76	0.00	0.00	0.00	
13,900.00	89.99	1.78	9,478.89	3,486.14	-135.92	3,488.58	0.00	0.00	0.00	
14,000.00	89.99	1.78	9,478.91	3,586.09	-132.82	3,588.41	0.00	0.00	0.00	
14,100.00	89.99	1.78	9,478.92	3,686.04	-129.71	3,688.23	0.00	0.00	0.00	
14,200.00	89.99	1.78	9,478.94	3,785.99	-126.61	3,788.06	0.00	0.00	0.00	
14,300.00	89.99	1.78	9,478.96	3,885.95	-123.51	3,887.88	0.00	0.00	0.00	
14,400.00	89.99	1.78	9,478.98	3,985.90	-120.40	3,987.71	0.00	0.00	0.00	
14,500.00	89.99	1.78	9,478.99	4,085.85	-117.30	4,087.53	0.00	0.00	0.00	
14,543.51	89.99	1.78	9,479.00	4,129.34	-115.95	4,130.97	0.00	0.00	0.00	
<b>TD at 14543.51</b>										

Design Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
Goonch Fed Com 04 211 - hit/miss target - Shape - Point	0.00	0.00	9,479.00	4,129.34	-115.95	488,074.22	613,975.48	32° 20' 29.645 N	104° 5' 53.277 W

Plan Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment	
		+N/-S (usft)	+E/-W (usft)		
2,000.00	2,000.00	0.00	0.00	Start Build 2.00	
2,600.00	2,595.62	-60.47	-16.20	Start 4530.00 hold at 2600.00 MD	
7,130.00	7,026.63	-970.22	-259.97	Start Drop -2.00	
7,730.00	7,622.25	-1,030.69	-276.17	Start 1378.47 hold at 7730.00 MD	
9,108.46	9,000.72	-1,030.69	-276.17	Start Build 12.00	
9,858.38	9,478.18	-553.54	-261.36	Start 4685.13 hold at 9858.38 MD	
14,543.51	9,479.00	4,129.34	-115.95	TD at 14543.51	



## H<sub>2</sub>S Drilling Operations Plan

- a. All personnel will be trained in H<sub>2</sub>S working conditions as required by Onshore Order 6 before drilling out of the surface casing.
- b. Two briefing areas will be established. Each will be at least 150' from the wellhead, perpendicular from one another, and easily entered and exited. See H<sub>2</sub>S page 5 for more details.
- c. H<sub>2</sub>S Safety Equipment/Systems:
  - i. Well Control Equipment
    - Flare line will be  $\geq 150'$  from the wellhead and ignited by a pilot light.
    - Beware of SO<sub>2</sub> created by flaring.
    - Choke manifold will include a remotely operated choke.
    - Mud gas separator
  - ii. Protective Equipment for Essential Personnel
    - Every person on site will be required to wear a personal H<sub>2</sub>S and SO<sub>2</sub> monitor at all times while on site. Monitors will not be worn on hard hats. Monitors will be worn on the front of the chest.
    - One self-contained breathing apparatus (SCBA) 30-minute rescue pack will be at each briefing area. Two 30-minute SCBA packs will be stored in the safety trailer.
    - Four work/escape packs will be on the rig floor. Each pack will have a long enough hose to allow unimpaired work activity.
    - Four emergency escape packs will be in the doghouse for emergency evacuation.
    - Hand signals will be used when wearing protective breathing apparatus.
    - Stokes litter or stretcher
    - Two full OSHA compliant body harnesses
    - A 100-foot long x 5/8" OSHA compliant rope
    - One 20-pound ABC fire extinguisher

- iii. H<sub>2</sub>S Detection & Monitoring Equipment
  - Every person on site will be required to wear a personal H<sub>2</sub>S and SO<sub>2</sub> monitor at all times while on site. Monitors will not be worn on hard hats. Monitors will be worn on the front of the chest.
  - A stationary detector with three sensors will be in the doghouse.
  - Sensors will be installed on the rig floor, bell nipple, and at the end of the flow line or where drilling fluids are discharged.
  - Visual alarm will be triggered at 10 ppm.
  - Audible alarm will be triggered at 10 ppm.
  - Calibration will occur at least every 30 days. Gas sample tubes will be kept in the safety trailer.
  
- iv. Visual Warning System
  - Color-coded H<sub>2</sub>S condition sign will be set at the entrance to the pad.
  - Color-coded condition flag will be installed to indicate current H<sub>2</sub>S conditions.
  - Two wind socks will be installed that will be visible from all sides.
  
- v. Mud Program
  - A water based mud with a pH of  $\geq 10$  will be maintained to control corrosion, H<sub>2</sub>S gas returns to the surface, and minimize sulfide stress cracking and embrittlement.
  - Drilling mud containing H<sub>2</sub>S gas will be degassed at an optimum location for the rig configuration.
  - This gas will be piped into the flare system.
  - Enough mud additives will be on location to scavenge and/or neutralize H<sub>2</sub>S where formation pressures are unknown.
  
- vi. Metallurgy
  - All equipment that has the potential to be exposed to H<sub>2</sub>S will be suitable for H<sub>2</sub>S service.
  - Equipment that will meet these metallurgical standards include the drill string, casing, wellhead, BOP assembly, casing head and spool, rotating head, kill lines, choke, choke manifold and lines, valves, mud-gas separators, DST tools, test units, tubing, flanges, and other related equipment (elastomer packings and seals).
  
- vii. Communication from well site
  - Cell phones and/or two-way radios will be used to communicate from the well site.

d. A remote-controlled choke, mud-gas separator, and a rotating head will be installed before drilling or testing any formation expected to contain H<sub>2</sub>S.

Company Personnel to be Notified

Kurt Shipley, Vice-President - Operations                      Office: (405) 609-1596

Local & County Agencies

Loving Fire Department    911 or (575) 745-3600

Eddy County Sheriff (Carlsbad)                                      911 (575) 887-7551

Eddy County Emergency Management (Carlsbad)              (575) 887-9511

Carlsbad Medical Center Hospital                                  (575) 887-4100

Eddy County South Road Department (Carlsbad)              (575) 885-4835

State Agencies

NM State Police (Carlsbad)    (575) 885-3138

NM Oil Conservation (Artesia)                                      (575) 748-1283

NM Oil Conservation (Santa Fe)                                    (505) 476-3440

NM Dept. of Transportation (Roswell)                              (575) 637-7201

Federal Agencies

BLM Carlsbad Field Office    (575) 234-5972

National Response Center    (800) 424-8802

US EPA Region 6 (Dallas)    (800) 887-6063

(214) 665-6444

Residents within 3/4 mile

none

Air Evacuation

Med Flight Air Ambulance (Albuquerque) (800) 842-4431

Lifeguard (Albuquerque) (888) 866-7256

Veterinarians

Desert Willow Veterinary Services (Carlsbad) (575) 885-3399

Animal Care Center (Carlsbad) (575) 885-5352

PLAN VIEW

highest ground to Northwest

flare >150' from well head flare line straight

secondary briefing area >150' from well head & exit

- A - GOONCH FED COM 04 131H
- B - GOONCH FED COM 04 211H
- C - GOONCH FED COM 04 221H
- D - GOONCH FED COM 04 231H
- E - GOONCH FED COM 04 132H
- F - GOONCH FED COM 04 212H
- G - GOONCH FED COM 04 222H
- H - GOONCH FED COM 04 232H

LIMITS OF EARTHWORK 3:1 SLOPE

laydown (V-door) to North

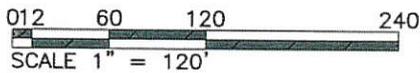
windsocks on rig floor & at mud tanks

PRIMARY safety briefing area >150' from well head & exit route

LIMITS OF EARTHWORK 3:1 SLOPE (TYP.)

prevailing wind from South

NOVO OIL & GAS NORTHERN DELAWARE, LLC  
 GRADING PLAN AND CROSS SECTIONS  
 FOR GOONCH FED COM 04 232H  
 SECTION 4, TOWNSHIP 23 SOUTH,  
 RANGE 28 EAST, N.M.P.M.  
 EDDY COUNTY, STATE OF NEW MEXICO



warning sign & windsock

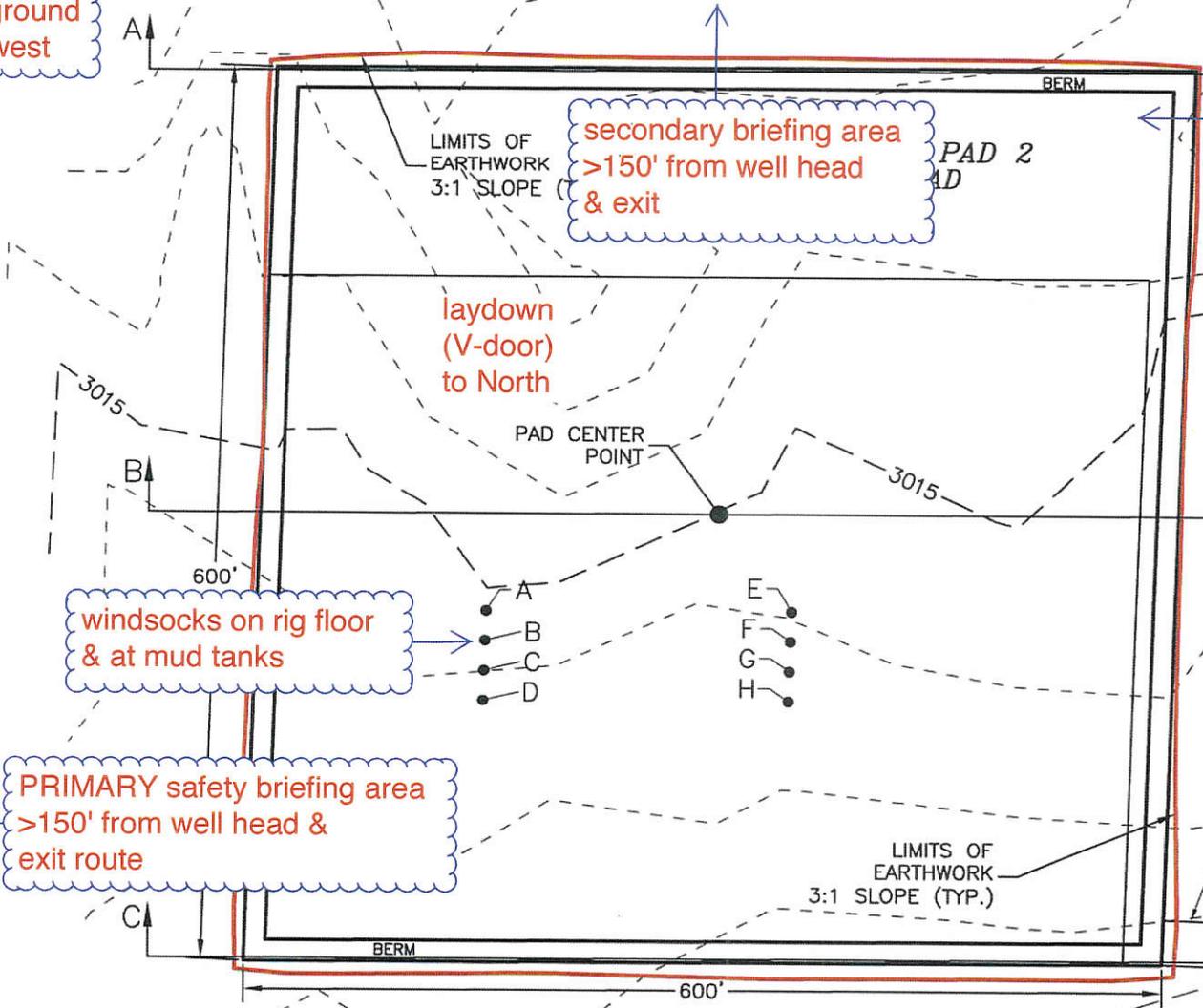
FILL	NET
11692 CU. YD	3331 CU. YD (FILL)

ARK QUANTITIES ARE ESTIMATED

APRIL 3, 2019

MADRON SURVEYING, INC. CARLSBAD, NEW MEXICO

SHEET 1-2  
 SURVEY NO. 7134

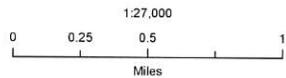


# Novo Oil and Gas Northern Delaware, LLC

Goonch Fed Com 04 Pad G  
H<sub>2</sub>S Contingency Plan:  
Radius Map

Section 4, Township 23S, Range 28E  
Eddy County, New Mexico

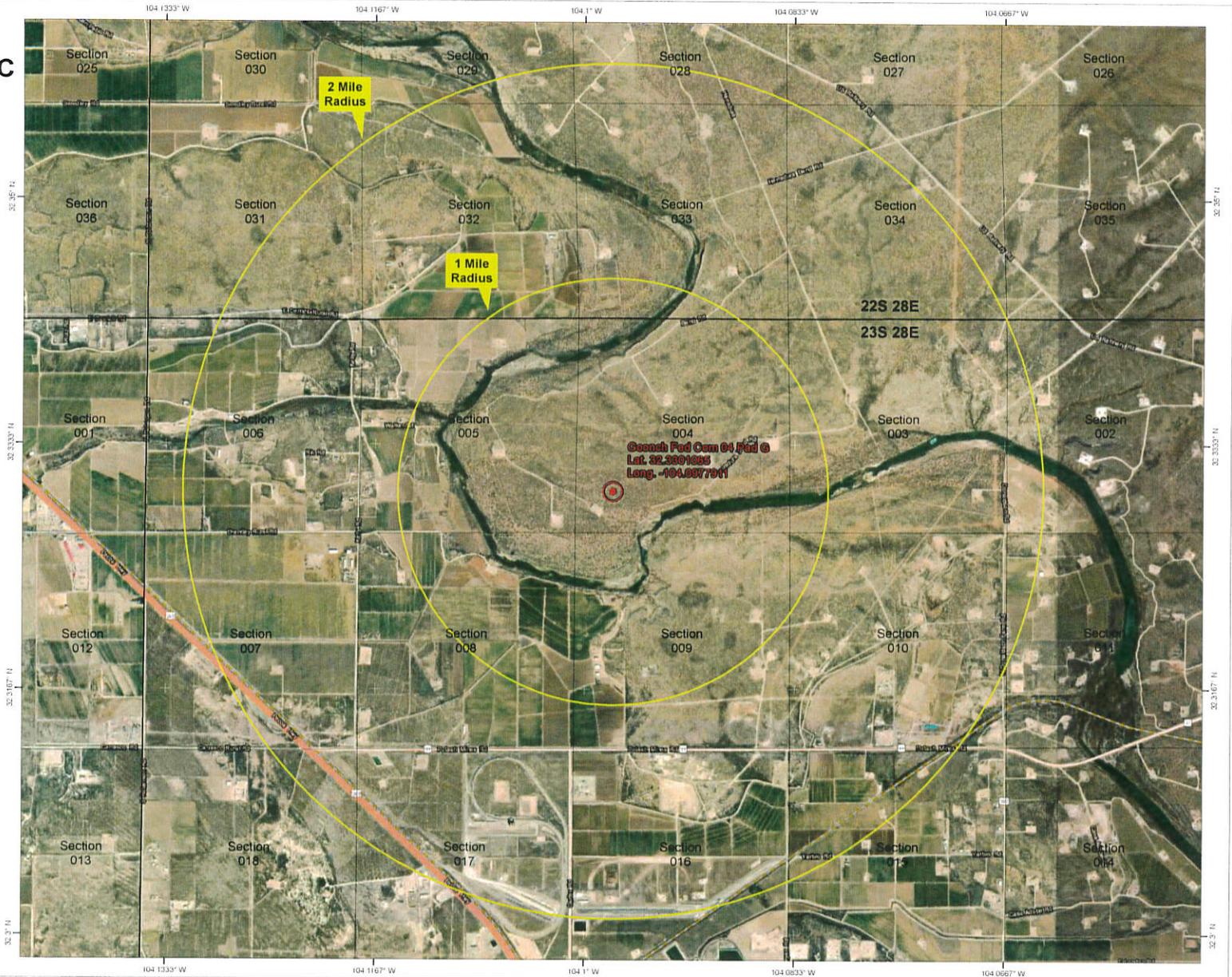
 Surface Hole Location

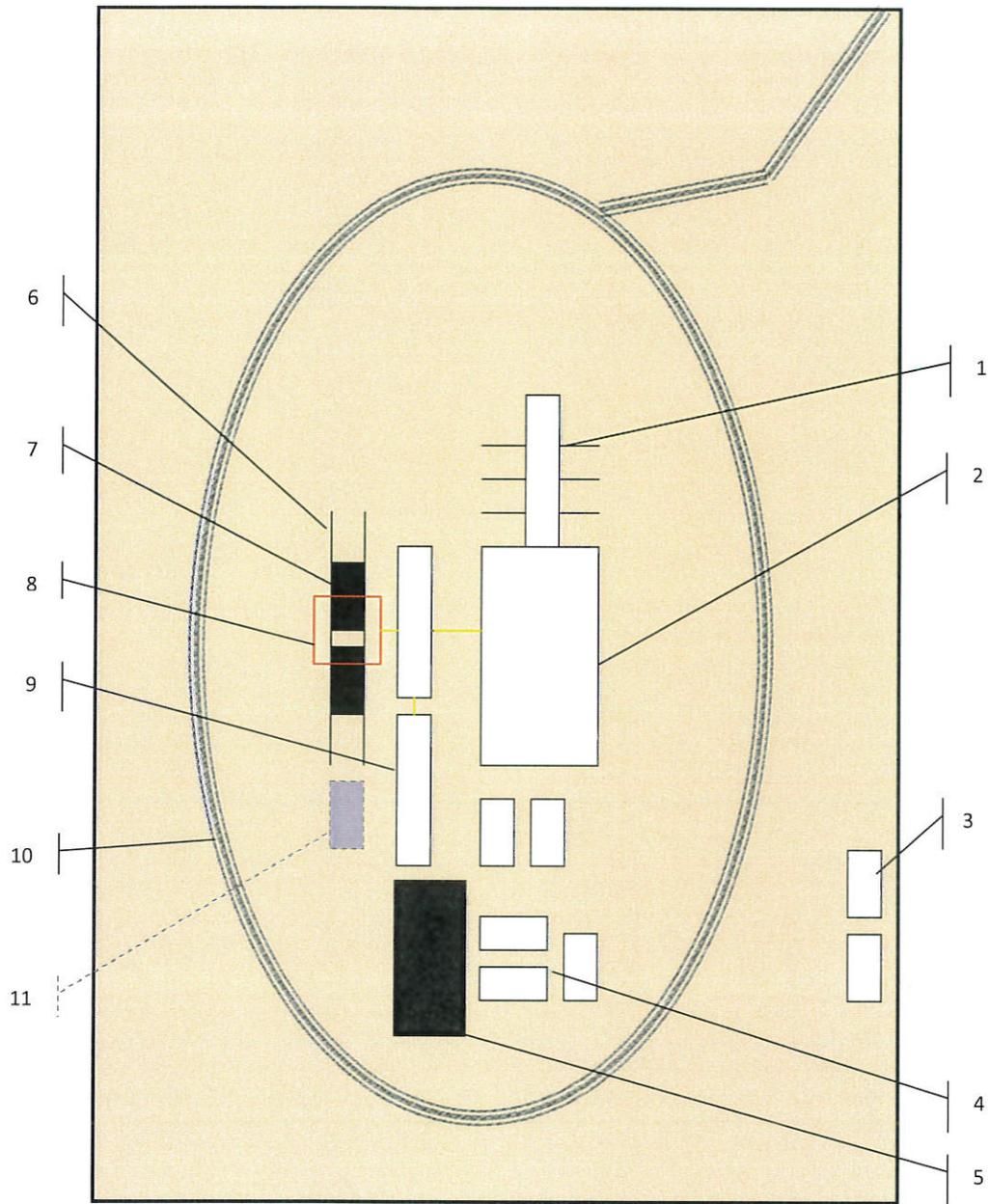


NAD 1983 New Mexico State Plane East  
FIPS 3001 Feet



Prepared by Permits West, Inc., May 28, 2019  
for Novo Oil and Gas Northern Delaware, LLC





**Schematic Closed Loop Drilling Rig\***

1. Pipe Rack
2. Drill Rig
3. House Trailers/ Offices
4. Generator/Fuel/Storage
5. Overflow-Frac Tank
6. Skids
7. Roll Offs
8. Hopper or Centrifuge
9. Mud Tanks
10. Loop Drive
11. Generator (only for use with centrifuge)

\*Not drawn to scale: Closed loop system requires at least 30 feet beyond mud tanks. Ideally 60 feet would be available

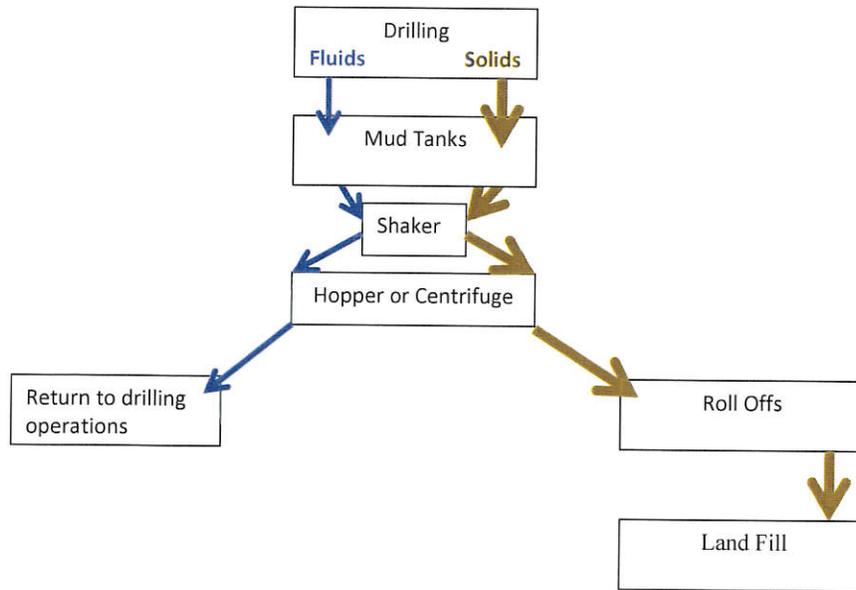


Above: Centrifugal Closed Loop System



Closed Loop Drilling System: Mud tanks to right (1)  
 Hopper in air to settle out solids (2)  
 Water return pipe (3)  
 Shaker between hopper and mud tanks (4)  
 Roll offs on skids (5)

**Flow Chart for Drilling Fluids and Solids**



Photos Courtesy of Gandy Corporation Oil Field Service