

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 type="checkbox"/> DRILL <input type="checkbox"/> REENTER		5. Lease Serial No.
1b. Type of Well: <input type="checkbox"/> Oil Well <input type="checkbox"/> Gas Well <input type="checkbox"/> Other		6. If Indian, Allottee or Tribe Name
1c. Type of Completion: <input type="checkbox"/> Hydraulic Fracturing <input type="checkbox"/> Single Zone <input type="checkbox"/> Multiple Zone		7. If Unit or CA Agreement, Name and No.
2. Name of Operator		8. Lease Name and Well No.
3a. Address	3b. Phone No. (include area code)	9. API Well No. 30-015-49845
4. Location of Well (Report location clearly and in accordance with any State requirements. *) At surface At proposed prod. zone		10. Field and Pool, or Exploratory
14. Distance in miles and direction from nearest town or post office*		11. Sec., T. R. M. or Blk. and Survey or Area
		12. County or Parish
		13. State
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
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
21. Elevations (Show whether DF, KDB, RT, GL, etc.)	22. Approximate date work will start*	23. Estimated duration
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)

- | | |
|---|---|
| <ul style="list-style-type: none"> 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). | <ul style="list-style-type: none"> 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
Title		
Approved by (Signature)	Name (Printed/Typed)	Date
Title		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)

Additional Operator Remarks

Other description

Horizontal Gas Well

Location of Well

1. SHL: LOT L3 / 320 FSL / 1681 FWL / TWSP: 26S / RANGE: 30E / SECTION: 33 / LAT: 32.00101 / LONG: -103.889365 (TVD: 0 feet, MD: 0 feet)
PPP: LOT L4 / 66 FSL / 852 FWL / TWSP: 26S / RANGE: 30E / SECTION: 33 / LAT: 32.0004 / LONG: -103.89206 (TVD: 10384 feet, MD: 10445 feet)
PPP: LOT M / 826 FSL / 850 FWL / TWSP: 26S / RANGE: 30E / SECTION: 28 / LAT: 32.00241 / LONG: -103.89205 (TVD: 10811 feet, MD: 11400 feet)
PPP: LOT E / 2640 FSL / 850 FWL / TWSP: 26S / RANGE: 30E / SECTION: 28 / LAT: 32.01336 / LONG: -103.89209 (TVD: 10811 feet, MD: 15300 feet)
PPP: LOT M / 0 FSL / 850 FWL / TWSP: 26S / RANGE: 30E / SECTION: 21 / LAT: 32.02066 / LONG: -103.89212 (TVD: 10811 feet, MD: 18000 feet)
BHL: LOT D / 230 FNL / 850 FWL / TWSP: 26S / RANGE: 30E / SECTION: 21 / LAT: 32.03463 / LONG: -103.89218 (TVD: 10811 feet, MD: 23125 feet)

BLM Point of Contact

Name: Priscilla Perez

Title: Legal Instruments Examiner

Phone: 5752345934

Email: pperez@blm.gov

CONFIDENTIAL

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 30-015-49845		² Pool Code 98220	³ Pool Name PURPLE SAGE WOLFCAMP GAS POOL
⁴ Property Code 333164	⁵ Property Name CLAWHAMMER 33-28-21 FEDERAL COM		⁶ Well Number 421H
⁷ OGRID No. 246289	⁸ Operator Name WPX ENERGY PERMIAN, LLC		⁹ Elevation 2,952'

¹⁰ Surface Location

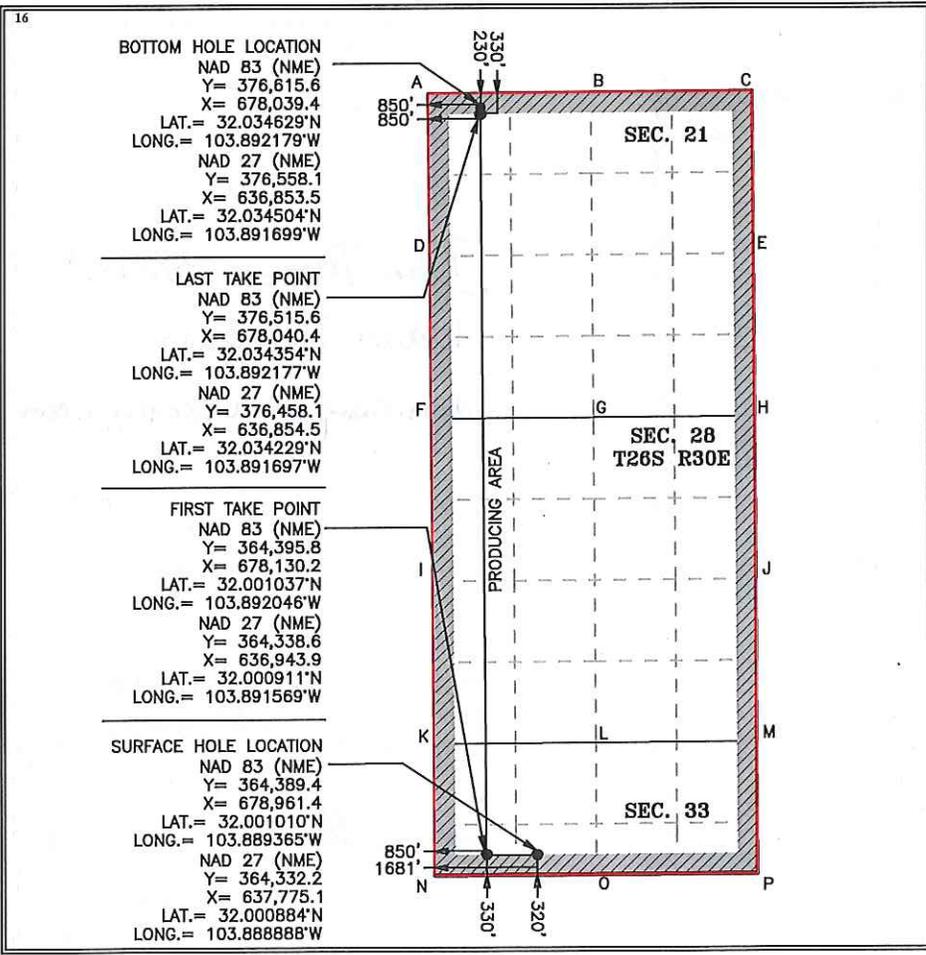
UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
L3	33	26 S	30 E		320	SOUTH	1681	WEST	EDDY

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
D	21	26 S	30 E		230	NORTH	850	WEST	EDDY

¹² Dedicated Acres 1539.08 AC	¹³ Joint or Infill	¹⁴ Consolidation Code	¹⁵ Order No.
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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.



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.

Dana Thompson 3/27/19
Signature Date

Dana Thompson
Printed Name

dana.thompson@wpxenergy.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.

03-22-2019
Date of Survey

Signature and Seal of Professional Surveyor:

MARK DILLON HARP 23786
Certificate Number RR/TM 2018102264

State of New Mexico
 Energy, Minerals and Natural Resources Department

Submit Electronically
 Via E-permitting

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

NATURAL GAS MANAGEMENT PLAN

This Natural Gas Management Plan must be submitted with each Application for Permit to Drill (APD) for a new or recompleted well.

Section 1 – Plan Description Effective May 25, 2021

I. Operator: WPX Energy Permian, LLC **OGRID:** 246289 **Date:** 06 / 10 / 2022

II. Type: Original Amendment due to 19.15.27.9.D(6)(a) NMAC 19.15.27.9.D(6)(b) NMAC Other.

If Other, please describe: _____

III. Well(s): Provide the following information for each new or recompleted well or set of wells proposed to be drilled or proposed to be recompleted from a single well pad or connected to a central delivery point.

Well Name	API	ULSTR	Footages	Anticipated Oil BBL/D	Anticipated Gas MCF/D	Anticipated Produced Water BBL/D
See attachment						

IV. Central Delivery Point Name: See attachment [See 19.15.27.9(D)(1) NMAC]

V. Anticipated Schedule: Provide the following information for each new or recompleted well or set of wells proposed to be drilled or proposed to be recompleted from a single well pad or connected to a central delivery point.

Well Name	API	Spud Date	TD Reached Date	Completion Commencement Date	Initial Flow Back Date	First Production Date
See attachment						

VI. Separation Equipment: Attach a complete description of how Operator will size separation equipment to optimize gas capture.

VII. Operational Practices: Attach a complete description of the actions Operator will take to comply with the requirements of Subsection A through F of 19.15.27.8 NMAC.

VIII. Best Management Practices: Attach a complete description of Operator’s best management practices to minimize venting during active and planned maintenance.

Section 2 – Enhanced Plan
EFFECTIVE APRIL 1, 2022

Beginning April 1, 2022, an operator that is not in compliance with its statewide natural gas capture requirement for the applicable reporting area must complete this section.

Operator certifies that it is not required to complete this section because Operator is in compliance with its statewide natural gas capture requirement for the applicable reporting area.

IX. Anticipated Natural Gas Production:

Well	API	Anticipated Average Natural Gas Rate MCF/D	Anticipated Volume of Natural Gas for the First Year MCF

X. Natural Gas Gathering System (NGGS):

Operator	System	ULSTR of Tie-in	Anticipated Gathering Start Date	Available Maximum Daily Capacity of System Segment Tie-in

XI. Map. Attach an accurate and legible map depicting the location of the well(s), the anticipated pipeline route(s) connecting the production operations to the existing or planned interconnect of the natural gas gathering system(s), and the maximum daily capacity of the segment or portion of the natural gas gathering system(s) to which the well(s) will be connected.

XII. Line Capacity. The natural gas gathering system will will not have capacity to gather 100% of the anticipated natural gas production volume from the well prior to the date of first production.

XIII. Line Pressure. Operator does does not anticipate that its existing well(s) connected to the same segment, or portion, of the natural gas gathering system(s) described above will continue to meet anticipated increases in line pressure caused by the new well(s).

Attach Operator’s plan to manage production in response to the increased line pressure.

XIV. Confidentiality: Operator asserts confidentiality pursuant to Section 71-2-8 NMSA 1978 for the information provided in Section 2 as provided in Paragraph (2) of Subsection D of 19.15.27.9 NMAC, and attaches a full description of the specific information for which confidentiality is asserted and the basis for such assertion.

NATURAL GAS MANAGEMENT PLAN
Section 1 - Plan Description

III. Well(s): Provide the following information for each new or recompleted well or set of wells proposed to be drilled or proposed to be recompleted from a single well pad or connected to a central delivery point.

Well Name	Central Delivery Point Name:	API	ULSTR	SHL FOOTAGES		Anticipated Oil BBL/D	Anticipated Gas MCF/D	Anticipated Produced Water BBL/D
CLAWHAMMER 33-28-21 FED COM 416H	CLAWHAMMER 33-28-21 FEDERAL COM EAST PRODUCTION PAD(5.62AC)		33-265-30E	316 FSL 1121 FEL		PURPLE SAGE WOLFCAMP	(+/-) 8464 mcf/d(+/-) 1840 bopd(+/-) 10120 bwpd	
CLAWHAMMER 33-28-21 FED COM 422H	CLAWHAMMER 33-28-21 FEDERAL COM WEST PRODUCTION PAD(5.63AC)		33-265-30E	370 FSL 1681 FWL		PURPLE SAGE WOLFCAMP	(+/-) 8464 mcf/d(+/-) 1840 bopd(+/-) 10120 bwpd	
CLAWHAMMER 33-28-21 FED COM 414H	CLAWHAMMER 33-28-21 FEDERAL COM EAST PRODUCTION PAD(5.62AC)		33-265-30E	243 FSL 1520 FEL		PURPLE SAGE WOLFCAMP	(+/-) 8464 mcf/d(+/-) 1840 bopd(+/-) 10120 bwpd	
CLAWHAMMER 33-28-21 FED COM 426H	CLAWHAMMER 33-28-21 FEDERAL COM EAST PRODUCTION PAD(5.62AC)		33-265-30E	291 FSL 1121 FEL		PURPLE SAGE WOLFCAMP	(+/-) 8464 mcf/d(+/-) 1840 bopd(+/-) 10120 bwpd	
CLAWHAMMER 33-28-21 FED COM 423H	CLAWHAMMER 33-28-21 FEDERAL COM WEST PRODUCTION PAD(5.63AC)		33-265-30E	342 FSL 2354 FWL		PURPLE SAGE WOLFCAMP	(+/-) 8464 mcf/d(+/-) 1840 bopd(+/-) 10120 bwpd	
CLAWHAMMER 33-28-21 FED COM 415H	CLAWHAMMER 33-28-21 FEDERAL COM EAST PRODUCTION PAD(5.62AC)		33-265-30E	293 FSL 1521 FEL		PURPLE SAGE WOLFCAMP	(+/-) 8464 mcf/d(+/-) 1840 bopd(+/-) 10120 bwpd	
CLAWHAMMER 33-28-21 FED COM 412H	CLAWHAMMER 33-28-21 FEDERAL COM WEST PRODUCTION PAD(5.63AC)		33-265-30E	345 FSL 1681 FWL		PURPLE SAGE WOLFCAMP	(+/-) 8464 mcf/d(+/-) 1840 bopd(+/-) 10120 bwpd	
CLAWHAMMER 33-28-21 FED COM 413H	CLAWHAMMER 33-28-21 FEDERAL COM WEST PRODUCTION PAD(5.63AC)		33-265-30E	367 FSL 2354 FWL		PURPLE SAGE WOLFCAMP	(+/-) 8464 mcf/d(+/-) 1840 bopd(+/-) 10120 bwpd	
CLAWHAMMER 33-28-21 FED COM 424H	CLAWHAMMER 33-28-21 FEDERAL COM EAST PRODUCTION PAD(5.62AC)		33-265-30E	318 FSL 1521 FEL		PURPLE SAGE WOLFCAMP	(+/-) 8464 mcf/d(+/-) 1840 bopd(+/-) 10120 bwpd	
CLAWHAMMER 33-28-21 FED COM 421H	CLAWHAMMER 33-28-21 FEDERAL COM WEST PRODUCTION PAD(5.63AC)		33-265-30E	320 FSL 1681 FWL		PURPLE SAGE WOLFCAMP	(+/-) 8464 mcf/d(+/-) 1840 bopd(+/-) 10120 bwpd	
CLAWHAMMER 33-28-21 FED COM 425H	CLAWHAMMER 33-28-21 FEDERAL COM EAST PRODUCTION PAD(5.62AC)		33-265-30E	341 FSL 1120 FEL		PURPLE SAGE WOLFCAMP	(+/-) 8464 mcf/d(+/-) 1840 bopd(+/-) 10120 bwpd	

V. Anticipated Schedule: Provide the following information for each new or recompleted well or set of wells proposed to be drilled or proposed to be recompleted from a single well pad or connected to a central delivery point.

Well Name	API	Spud Date	TD Reached Date	Completion Commencement Date	Initial Flow back Date	First Production Date
CLAWHAMMER 33-28-21 FED COM 416H		9/1/2023	10/1/2023	1/29/2024	1/29/2024	1/29/2024
CLAWHAMMER 33-28-21 FED COM 422H		9/1/2023	10/1/2023	1/29/2024	1/29/2024	1/29/2024
CLAWHAMMER 33-28-21 FED COM 414H		9/1/2023	10/1/2023	1/29/2024	1/29/2024	1/29/2024
CLAWHAMMER 33-28-21 FED COM 426H		9/1/2023	10/1/2023	1/29/2024	1/29/2024	1/29/2024
CLAWHAMMER 33-28-21 FED COM 423H		9/1/2023	10/1/2023	1/29/2024	1/29/2024	1/29/2024
CLAWHAMMER 33-28-21 FED COM 415H		9/1/2023	10/1/2023	1/29/2024	1/29/2024	1/29/2024
CLAWHAMMER 33-28-21 FED COM 412H		9/1/2023	10/1/2023	1/29/2024	1/29/2024	1/29/2024
CLAWHAMMER 33-28-21 FED COM 413H		9/1/2023	10/1/2023	1/29/2024	1/29/2024	1/29/2024
CLAWHAMMER 33-28-21 FED COM 424H		9/1/2023	10/1/2023	1/29/2024	1/29/2024	1/29/2024
CLAWHAMMER 33-28-21 FED COM 421H		9/1/2023	10/1/2023	1/29/2024	1/29/2024	1/29/2024
CLAWHAMMER 33-28-21 FED COM 425H		9/1/2023	10/1/2023	1/29/2024	1/29/2024	1/29/2024

Dates above are subject to change

Section 3 - Certifications

Effective May 25, 2021

Operator certifies that, after reasonable inquiry and based on the available information at the time of submittal:

Operator will be able to connect the well(s) to a natural gas gathering system in the general area with sufficient capacity to transport one hundred percent of the anticipated volume of natural gas produced from the well(s) commencing on the date of first production, taking into account the current and anticipated volumes of produced natural gas from other wells connected to the pipeline gathering system; or

D Operator will not be able to connect to a natural gas gathering system in the general area with sufficient capacity to transport one hundred percent of the anticipated volume of natural gas produced from the well(s) commencing on the date of first production, taking into account the current and anticipated volumes of produced natural gas from other wells connected to the pipeline gathering system.

If Operator checks this box, Operator will select one of the following:

Well Shut-In. Operator will shut-in and not produce the well until it submits the certification required by Paragraph (4) of Subsection D of 19.15.27.9 NMAC; or

Venting and Flaring Plan. Operator has attached a venting and flaring plan that evaluates and selects one or more of the potential alternative beneficial uses for the natural gas until a natural gas gathering system is available, including:

- (a) power generation on lease;
- (b) power generation for grid;
- (c) compression on lease;
- (d) liquids removal on lease;
- (e) reinjection for underground storage;
- (f) reinjection for temporary storage;
- (g) reinjection for enhanced oil recovery;
- (h) fuel cell production; and
- (i) other alternative beneficial uses approved by the division.

Section 4 - Notices

1. If, at any time after Operator submits this Natural Gas Management Plan and before the well is spud:

(a) Operator becomes aware that the natural gas gathering system it planned to connect the well(s) to has become unavailable or will not have capacity to transport one hundred percent of the production from the well(s), no later than 20 days after becoming aware of such information, Operator shall submit for OCD's approval a new or revised venting and flaring plan containing the information specified in Paragraph (5) of Subsection D of 19.15.27.9 NMAC; or

(b) Operator becomes aware that it has, cumulatively for the year, become out of compliance with its baseline natural gas capture rate or natural gas capture requirement, no later than 20 days after becoming aware of such information, Operator shall submit for OCD's approval a new or revised Natural Gas Management Plan for each well it plans to spud during the next 90 days containing the information specified in Paragraph (2) of Subsection D of 19.15.27.9 NMAC, and shall file an update for each Natural Gas Management Plan until Operator is back in compliance with its baseline natural gas capture rate or natural gas capture requirement.

2. OCD may deny or conditionally approve an APD if Operator does not make a certification, fails to submit an adequate venting and flaring plan which includes alternative beneficial uses for the anticipated volume of natural gas produced, or if OCD determines that Operator will not have adequate natural gas takeaway capacity at the time a well will be spud.

I certify that, after reasonable inquiry, the statements in and attached to this Natural Gas Management Plan are true and correct to the best of my knowledge and acknowledge that a false statement may be subject to civil and criminal penalties under the Oil and Gas Act.

Signature: 
Printed Name: Jeff Walla
Title: Surface Land and Regulatory Manager
E-mail Address:
Date:
Phone:
OIL CONSERVATION DIVISION (Only applicable when submitted as a standalone form)
Approved By:
Title:
Approval Date:
Conditions of Approval:



VI. Separation Equipment

WPX Energy Permian, LLC (WPX) utilizes a "stage separation" process in which oil and gas separation is carried out through a series of separators operating at successively reduced pressures. Hydrocarbon liquids are produced into a high-pressure inlet separator, then carried through one or more lower pressure separation vessels before entering the storage tanks. The purpose of this separation process is to attain maximum recovery of liquid hydrocarbons from the fluids and allow maximum capture of produced gas into the sales pipeline. WPX utilizes a series of Low-Pressure Compression units to capture gas off the staged separation and send it to the sales pipeline. This process minimizes the amount of flash gas that enters the end-stage storage tanks that is subsequently vented or flared.



VII. Operational Practices

WPX Energy Permian, LLC will employ best management practices and control technologies to maximize the recovery and minimize waste of natural gas through venting and flaring.

- During drilling operations, WPX will utilize flares and/or combustors to capture and control natural gas, where technically feasible. If flaring is deemed technically in-feasible, WPX will employ best management practices to minimize or reduce venting to the extent possible.
- During completions operations, WPX will utilize Green Completion methods to capture gas produced during well completions that is otherwise vented or flared. If capture is technically in-feasible, flares and/or combustors will be used to capture and control flow back fluids entering into frac tanks during initial flowback. Upon indication of first measurable hydrocarbon volumes, WPX will turn operations to onsite separation vessels and flow to the gathering pipeline.
- During production operations, WPX will take every practical effort to minimize waste of natural gas through venting and flaring by:
 - Designing and constructing facilities in a manner consistent to achieve maximum capture and control of hydrocarbon liquids & produced gas
 - Utilizing a closed-loop capture system to collect and route produced gas to sales line via low pressure compression, or to a flare/combustor
 - Flaring in lieu of venting, where technically feasible
 - Utilizing auto-ignitors or continuous pilots, with thermocouples connected to Scada, to quickly detect and resolve issues related to malfunctioning flares/combustors
 - Employ the use of automatic tank gauging to minimize storage tank venting during loading events
 - Installing air-driven or electric-driven pneumatics & combustion engines, where technically feasible to minimize venting to the atmosphere
 - Confirm equipment is properly maintained and repaired through a preventative maintenance and repair program to ensure equipment meets all manufacturer specifications
 - Conduct and document AVO inspections on the frequency set forth in Part 27 to detect and repair any onsite leaks as quickly and efficiently as is feasible



VIII. Best Management Practices during Maintenance

WPX Energy Permian, LLC will utilize best management practices to minimize venting during active and planned maintenance activities. WPX is operating under guidance that production facilities permitted under NOI permits have no provisions to allow high pressure flaring and high pressure flaring is only allowed in disruption scenarios so long as the duration is less than eight hours. When technically feasible, flaring during maintenance activities will be utilized in lieu of venting to the atmosphere. WPX will work with third-party operators during scheduled maintenance of downstream pipeline or processing plants to address those events ahead of time to minimize venting. Actions considered include identifying alternative capture approaches or planning to temporarily reduce production or shut in the well to address these circumstances.



Drilling Plan

Well Clawhammer 33-28-21 Federal Com 421H
Location **Surface:** 320 FSL 1681 FWL, Sec 33 T26S R30E S33
Bottom Hole: 230 FNL 850 FWL Sec 21 T26S R30E S21
County/State Eddy, NM

The elevation of the unprepared ground is 2,952 feet above sea level.

The geologic name of the surface formation is Quaternary - Alluvium

A rotary rig will be utilized to drill the well to 23125' MD, then will be cased and cemented. This equipment will then be rigged down and the well will be completed with a workover rig.

Proposed depth is 23,125 feet MD.

1) Estimated Tops:

Formation Name	MD	TVD	Bearing	BHP (psi)	MASP (psi)
Quaternary - Alluvium	GL	GL	Water		
Bell Canyon Sand (Base Salt)	3,315	3,303	Oil/Gas		
Cherry Canyon Sand	4,445	4,422	Oil/Gas		
Brushy Canyon Sand	5,412	5,379	Oil/Gas		
1st Bone Spring Sand	8,185	8,126	Oil/Gas		
2nd Bone Spring Sand	8,812	8,752	Oil/Gas		
3rd Bone Spring Sand	10,089	10,029	Oil/Gas		
KOP	10,298	10,238			
Wolfcamp	10,445	10,384	Oil/Gas		
Landing Point (Wolfcamp)	11,198	10,811	Target Frm		
TD	23,125	10,811	Oil/Gas	7,027	4,649

2) Notable Formations:

Any usable fresh water zones encountered will be adequately protected and reported. All usable water zones, potential hydrocarbon zones, and valuable mineral zones will be isolated.

Useable water will be protected by surface casing set and cemented to surface.

3) Pressure Control Equipment:

The blowout preventer equipment (BOPE) will consist of 3 rams (10,000 psi WP) with 2 pipe rams (one of which may be variable), 1 blind ram and 1 annular preventer (5,000 psi WP) will be installed. The BOPE will be used below surface casing to TD. See attachments for BOP and choke manifold diagrams. A rotating head will be installed as needed. Units will be hydraulically operated.

An accumulator that meets the requirements of Onshore Order 2 for the pressure rating of the BOP stack will be present.

BOPE will be inspected and operated as recommended in Onshore Order 2. A third party company will test the BOPE. After surface casing is set and the BOPE is nipped up, pressure tests will be conducted to 250 psi low and 5000 psi high (50% of WP) with the annular tested to 250 psi low and 2500 psi high (50% of WP).

A 20" x 13-3/8" x 9-5/8" x 7" 10M multi-bowl wellhead w/ 9-5/8" and 7" mandrel hangers will be install after setting surface casing and utilized until total depth is reached. The 9-5/8" and 7" casings will be set using a mandrel in the casing head and the stack will not be retested at these casing points.

The following BOPE will be installed, tested and operational:

- Drilling spool or blowout preventer with two (2) side outlets;
 - Choke line side shall be 3" minimum diameter;
 - Two (2) adjustable chokes with one (1) remotely controlled from the rig floor and pressure gauge.
 - Kill side shall be at least 2" diameter;
 - Two (2) manual valves and one (1) check valve.

Auxiliary equipment is as follows:

- Upper kelly cock valve with a handle available;
- Lower kelly cock valve with a handle available;
- A float valve will be used in the drill string, either in a float sub or in the mud motor;
- Safety valves and subs with a full opening sized to fit all drill strings and collars will be available on the rig floor in ..

WPX Energy Permian, LLC requests a variance to drill this well using a co-flex line between the BOP and the choke manifold. Certification for proposed co-flex hose is attached. The hose is 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.

4) Casing Program:

Section	Hole Size	Top (MD)	Bottom (MD)	Bottom (TVD)	Casing OD	Weight (ppf)	Grade	Threads
Surf	17-1/2"	0	1,123	1,123	13-3/8"	54.5	J-55	BT&C
Int_1	12-1/4"	0	3,315	3,303	9-5/8"	40.0	J-55	BT&C
Int_2	8-3/4"	0	11,198	10,811	7"	29.0	VAXP P-110	BT&C
Prod	6-1/8"	10,298	23,125	10,811	4-1/2"	13.5	HCP-110	CDC-HTC

Safety Factors	
Collapse	1.125
Burst	1.000
Tension	1.600

Design Factors			
Section	Collapse	Burst	Tension
Surf	2.29	11.05	8.40
Int_1	1.77	5.44	3.92
Int_2	2.37	5.82	3.25
Prod	2.24	5.22	2.56

Centralizers will be run as follows:

- One (1) centralizer on each of the bottom three jts of casing beginning with the shoe jt;
- One (1) centralizer every third jt from above bottom three jts to planned top of cement (TOC).

5) Cement Program:

Section	Hole Size	Casing OD	Cap _{Ann} (cuft/ft)
Surf	17.50	13.375	0.6946

Type	Cmt Btm	Cmt Top	Cubic Feet	Yield	Excess	Sacks	Weight	Blend & Additives
Lead	870	0	604	2.38	50%	381	12	Class C + 0.50 BWOB Accelerator + 2.00 BWOB Sodium Metasilicate
Tail	1123	870	132	1.32	50%	200	14.8	Class C

Section	Hole Size	Casing OD	Cap _{Ann} (cuft/ft)	Prev Csg ID	Cap _{Csg-Csg} (cuft/ft)
Int_1	12.25	9.625	0.3132	12.615	0.3627

Type	Cmt Btm	Cmt Top	Cubic Feet	Yield	Excess	Sacks	Weight	Blend & Additives
Lead	1123	0	407	1.98	0%	494	12.5	Class C/Poz 35/65 + 3.00 BWOB Salt + 6.00 BWOB Bentonite
	2641	1123	475		20%			
Tail	3315	2641	211	1.32	20%	200	14.8	Class C + 0.15 BWOB Retarder

Section	Hole Size	Casing OD	Cap _{Ann} (cuft/ft)	Prev Csg ID	Cap _{Csg-Csg} (cuft/ft)
Int_2	8.75	7.00	0.1503	8.835	0.1585

Type	Cmt Btm	Cmt Top	Cubic Feet	Yield	Excess	Sacks	Weight	Blend & Additives
Lead	3315	2815	79	3.01	0%	445	11	Class C + 50% Poz + 2.75 lb/sk LCM + 0.10 BWOB Sodium Metasilicate + 0.25 BWOB Retarder + 10.0 BWOB Bentonite
	10298	3315	1050		20%			
Tail	11198	10298	135	1.26	20%	129	14.2	Class H + 50% Poz + 0.15 BWOB Sodium Metasilicate + 0.15 BWOB Retarder + 0.30 BWOB Dispersant + 0.40 BWOB Fluid Loss + 2.0 BWOB Bentonite



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

Drilling Plan Data Report

06/21/2021

APD ID: 10400040497

Submission Date: 04/10/2019

Highlighted data
reflects the most
recent changes

Operator Name: WPX ENERGY PERMIAN LLC

Well Name: CLAWHAMMER 33-28-21 FED COM

Well Number: 421H

[Show Final Text](#)

Well Type: OTHER

Well Work Type: Drill

Section 1 - Geologic Formations

Formation ID	Formation Name	Elevation	True Vertical Depth	Measured Depth	Lithologies	Mineral Resources	Producing Formation
431160	UNKNOWN	2952	0	0	ALLUVIUM, OTHER : Quaternary	USEABLE WATER	N
431161	BELL CANYON	-351	3303	3315	SANDSTONE, SHALE	NATURAL GAS, OIL	N
431162	CHERRY CANYON	-1470	4422	4445	SANDSTONE, SHALE	NATURAL GAS, OIL	N
431163	BRUSHY CANYON	-2427	5379	5412	SANDSTONE, SHALE	NATURAL GAS, OIL	N
431165	BONE SPRING 1ST	-5174	8126	8185	LIMESTONE, SANDSTONE, SHALE	NATURAL GAS, OIL	N
431166	BONE SPRING 2ND	-5800	8752	8812	LIMESTONE, SANDSTONE, SHALE	NATURAL GAS, OIL	N
431167	BONE SPRING 3RD	-7077	10029	10089	LIMESTONE, SANDSTONE, SHALE	NATURAL GAS, OIL	N
431168	WOLFCAMP	-7432	10384	10445	LIMESTONE, SANDSTONE, SHALE	NATURAL GAS, OIL	Y

Section 2 - Blowout Prevention

Pressure Rating (PSI): 5M

Rating Depth: 22942

Equipment: "The blowout preventer equipment (BOPE) will consist of 3 rams (10,000 psi WP) with 2 pipe rams (one of which may be variable), 1 blind ram and 1 annular preventer (5,000 psi WP) will be installed. The BOPE will be used below surface casing to TD. See attachments for BOP and choke manifold diagrams. A rotating head will be installed as needed. Units will be hydraulically operated. An accumulator that meets the requirements of Onshore Order 2 for the pressure rating of the BOP stack will be present. BOPE will be inspected and operated as recommended in Onshore Order 2. A third party company will test the BOPE. After surface casing is set and the BOPE is nipped up, pressure tests will be conducted to 250 psi low and 5000 psi high (50% of WP) with the annular tested to 250 psi low and 2500 psi high (50% of WP). A 20" x 13-3/8" x 9-5/8" x 7" 10M multi-bowl wellhead w/ 9-5/8" and 7" mandrel hangers will be install after setting surface casing and utilized until total depth is reached. The 9-5/8" and 7" casings will be set using a mandrel in the casing head and the stack will not be retested at these casing points. The following BOPE will be installed, tested and operational: • Drilling spool or blowout preventer with two (2) side outlets; Choke line side shall be 3" minimum diameter; Two (2) adjustable chokes with one (1) remotely controlled from the rig floor and pressure gauge. Kill side shall be at least 2" diameter; Two (2) manual valves and one (1) check valve. Auxiliary equipment is as follows: • Upper kelly cock valve with a handle available; • Lower kelly cock valve with a handle available; • A float valve will be used in the drill string, either in a float sub or in the mud motor; • Safety valves and subs with a full opening sized to fit all drill strings and collars will be available on the rig floor in the open position.

Requesting Variance? YES

Variance request: WPX Energy Permian, LLC requests a variance to drill this well using a co-flex line between the BOP and

Section	Hole Size	Casing OD	Cap _{Ann} (cuft/ft)	Prev Csg ID	Cap _{Csg-Csg} (cuft/ft)			
Prod	6.125	4.50	0.0942	6.184	0.0981			
Type	Cmt Btm	Cmt Top	Cubic Feet	Yield	Excess	Sacks	Weight	Blend & Additives
Tail	11198	10298	88	1.25	0%	1149	14.2	Class H + 50% Poz + 0.15 BWOB Sodium Metasilicate + 0.15 BWOB Retarder + 0.30 BWOB Fluid Loss + 2.0 BWOB Bentonite
	23125	11198	1123		20%			

6) Drilling Fluids Program:

An electronic mud monitoring system satisfying the requirements of Onshore Order 1 will be used. All necessary mud products for weight addition and fluid loss control will be on location at all times. Mud program is subject to change due to hole conditions.

Section	Hole Size	TMD	Mud Wt.	Vis	PV	YP	Fluid Loss	Type
Surf	17-1/2"	1,123	8.5 to 8.9	32 to 36	1 - 6	1 - 6	NC	Fresh Wtr
Int_1	12-1/4"	3,315	9.8 to 10.0	28 to 30	1 - 3	1 - 3	NC	Brine
Int_2	8-3/4"	11,198	8.9 to 9.4	28 to 36	1 - 3	1 - 3	NC	Cut Brine
Prod	6-1/8"	23,125	11.5 to 12.5	50 to 55	20-22	8 - 10	8 - 10	OBM

Mud checks will be performed every 24 hours.

The following mud system monitoring equipment will be in place during drilling:

- Visual pit markers
- Pit volume totalizer (PVT)
- Stroke counter
- Gas detection
- Mud-gas separator (gas buster)
- Flow sensor

A closed-loop system will be in place during all phases of drilling. Cuttings disposal will be at an off-site disposal facility.

7) Formation Evaluation Program:

No core or drill stem test is planned.

A 2-person mud-logging program will be used from Int_1 9-5/8" casing point to TD.

No electronic logs are planned.

8) Abnormal Conditions:

No abnormal pressure or temperature is expected.

Maximum expected bottom hole pressure is 7027 psi at 10811' TVD. Expected bottom hole temperature is <200°F.

In accordance with Onshore Order 6, WPX Energy Permian, LLC does not anticipate that there will be enough H2S to meet the BLM's minimum requirements for the submission of an "H2S Drilling Operation Plan" or "Public Protection Plan" for the drilling and completion of this well. However, since WPX Energy Permian, LLC has an H2S safety package on all wells, an "H2S Drilling Operations Plan" is attached.

Adequate flare lines will be installed off the mud/gas separator where gas may be flared safely.

All personnel will be familiar with all aspects of safe operation of equipment being used.

9) Other Information

The anticipated spud date is upon approval. Expected duration is 30 days to drill the well.



Commitment Runs Deep



Design Plan
Operation and Maintenance Plan
Closure Plan

SENM - Closed Loop Systems
June 2010

I. Design Plan

Devon uses MI SWACO closed loop system (CLS). The MI SWACO CLS is designed to maintain drill solids at or below 5%. The equipment is arranged to progressively remove solids from the largest to the smallest size. Drilling fluids can thus be reused and savings is realized on mud and disposal costs. Dewatering may be required with the centrifuges to insure removal of ultra fine solids.

The drilling location is constructed to allow storm water to flow to a central sump normally the cellar. This insures no contamination leaves the drilling pad in the event of a spill. Storm water is reused in the mud system or stored in a reserve fluid tank farm until it can be reused. All lubricants, oils, or chemicals are removed immediately from the ground to prevent the contamination of storm water. An oil trap is normally installed on the sump if an oil spill occurs during a storm.

A tank farm is utilized to store drilling fluids including fresh water and brine fluids. The tank farm is constructed on a 20 ml plastic lined, bermed pad to prevent the contamination of the drilling site during a spill. Fluids from other sites may be stored in these tanks for processing by the solids control equipment and reused in the mud system. At the end of the well the fluids are transported from the tank farm to an adjoining well or to the next well for the rig.

Prior to installing a closed-loop system on site, the topsoil, if present, will be stripped and stockpiled for use as the final cover or fill at the time of closure.

Signs will be posted on the fence surrounding the closed-loop system unless the closed-loop system is located on a site where there is an existing well, that is operated by Devon.

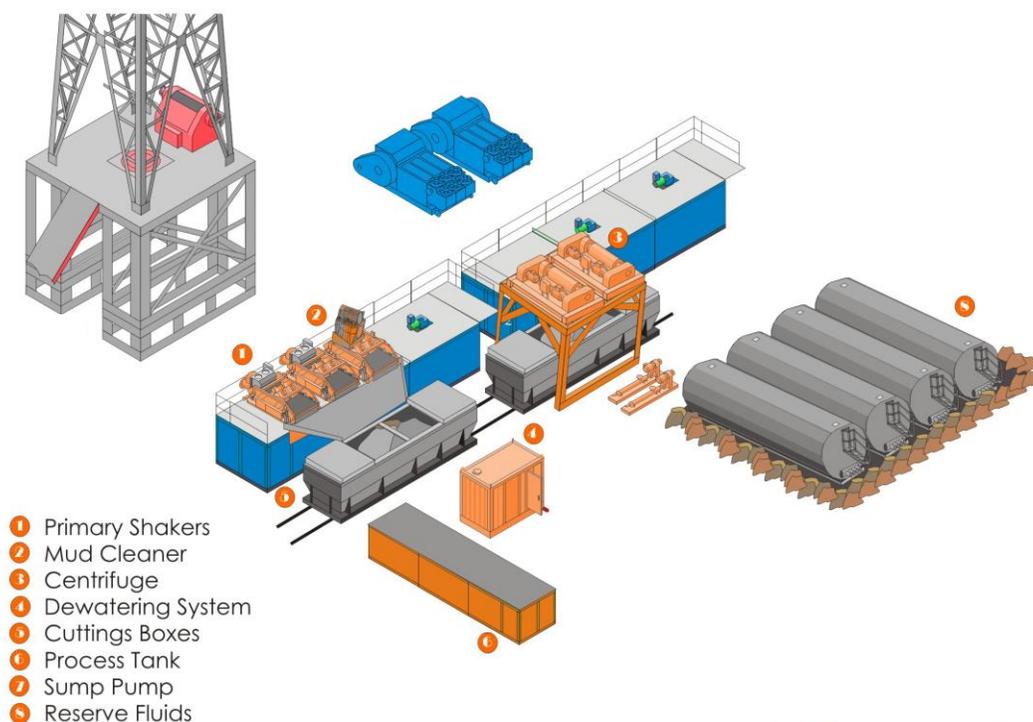
II. Operations and Maintenance Plan

Primary Shakers: The primary shakers make the first removal of drill solids from the drilling mud as it leaves the well bore. The shakers are sized to handle maximum drilling rate at optimal screen size. The shakers normally remove solids down to 74 microns.

Mud Cleaner: The Mud Cleaner cleans the fluid after it leaves the shakers. A set of hydrocyclones are sized to handle 1.25 to 1.5 times the maximum circulating rate. This ensures all the fluid is being processed to an average cut point of 25 microns. The wet discharged is dewatered on a shaker equipped with ultra fine mesh screens and generally cut at 40 microns.



Closed Loop Schematic



Mi SWACO

Centrifuges: The centrifuges can be one or two in number depending on the well geometry or depth of well. The centrifuges are sized to maintain low gravity solids at 5% or below. They may or may not need a dewatering system to enhance the removal rates. The centrifuges can make a cut point of 8-10 microns depending on bowl speed, feed rate, solids loading and other factors.

The centrifuge system is designed to work on the active system and be flexible to process incoming fluids from other locations. This set-up is also dependant on well factors.

Dewatering System: The dewatering system is a chemical mixing and dosing system designed to enhance the solids removal of the centrifuge. Not commonly used in shallow wells. It may contain pH adjustment, coagulant mixing and dosing, and polymer mixing and dosing. Chemical flocculation binds ultra fine solids into a mass that is within the centrifuge operating design. The

dewatering system improves the centrifuge cut point to infinity or allows for the return of clear water or brine fluid. This ability allows for the ultimate control of low gravity solids.

Cuttings Boxes: Cuttings boxes are utilized to capture drill solids that are discarded from the solids control equipment. These boxes are set upon a rail system that allows for the removal and replacement of a full box of cuttings with an empty one. They are equipped with a cover that insures no product is spilled into the environment during the transportation phase.

Process Tank: (Optional) The process tank allows for the holding and process of fluids that are being transferred into the mud system. Additionally, during times of lost circulation the process tank may hold active fluids that are removed for additional treatment. It can further be used as a mixing tank during well control conditions.

Sump and Sump Pump: The sump is used to collect storm water and the pump is used to transfer this fluid to the active system or to the tank for to hold in reserve. It can also be used to collect fluids that may escape during spills. The location contains drainage ditches that allow the location fluids to drain to the sump.

Reserve Fluids (Tank Farm): A series of frac tanks are used to replace the reserve pit. These are steel tanks that are equipped with a manifold system and a transfer pump. These tanks can contain any number of fluids used during the drilling process. These can include fresh water, cut brine, and saturated salt fluid. The fluid can be from the active well or reclaimed fluid from other locations. A 20 ml liner and berm system is employed to ensure the fluids do not migrate to the environment during a spill.

If a leak develops, the appropriate division district office will be notified within 48 hours of the discovery and the leak will be addressed. Spill prevention is accomplished by maintaining pump packing, hoses, and pipe fittings to insure no leaks are occurring. During an upset condition the source of the spill is isolated and repaired as soon as it is discovered. Free liquid is removed by a diaphragm pump and returned to the mud system. Loose topsoil may be used to stabilize the spill and the contaminated soil is excavated and placed in the cuttings boxes. After the well is finished and the rig has moved, the entire location is scrapped and testing will be performed to determine if a release has occurred.

All trash is kept in a wire mesh enclosure and removed to an approved landfill when full. All spent motor oils are kept in separate containers and they are removed and sent to an approved recycling center. Any spilled lubricants, pipe

dope, or regulated chemicals are removed from soil and sent to landfills approved for these products.

These operations are monitored by Mi Swaco service technicians. Daily logs are maintained to ensure optimal equipment operation and maintenance. Screen and chemical use is logged to maintain inventory control. Fluid properties are monitored and recorded and drilling mud volumes are accounted for in the mud storage farm. This data is kept for end of well review to insure performance goals are met. Lessons learned are logged and used to help with continuous improvement.

A MI SWACO field supervisor manages from 3-5 wells. They are responsible for training personnel, supervising installations, and inspecting sites for compliance of MI SWACO safety and operational policy.

III. Closure Plan

A maximum 340' X 340' caliche pad is built per well. All of the trucks and steel tanks fit on this pad. All fluid cuttings go to the steel tanks to be hauled by various trucking companies to an agency approved disposal.



Company: WPX Energy
 Well: Clawhammer 33-28-21 Federal Com 421H
 County: Eddy County, New Mexico (NAD 83)
 Rig: H&P 314
 Wellbore: Wellbore #1
 Design: Design #1
 Created By: BSW
 Date: 14:49, February 15 2019

Geodetic System: US State Plane 1983
 Datum: North American Datum 1983
 Ellipsoid: GRS 1980
 Zone: New Mexico Eastern Zone
 System Datum: Mean Sea Level

To convert a Magnetic Direction to a Grid Direction, Add 6.761°
 To convert a Magnetic Direction to a True Direction, Add 6.996° East
 To convert a True Direction to a Grid Direction, Subtract 0.235°



Azimuths to Grid North
 True North: -0.24°
 Magnetic North: 6.76°

Magnetic Field
 Strength: 47636.8nT
 Dip Angle: 59.72°
 Date: 2/12/2019
 Model: BGGM2018

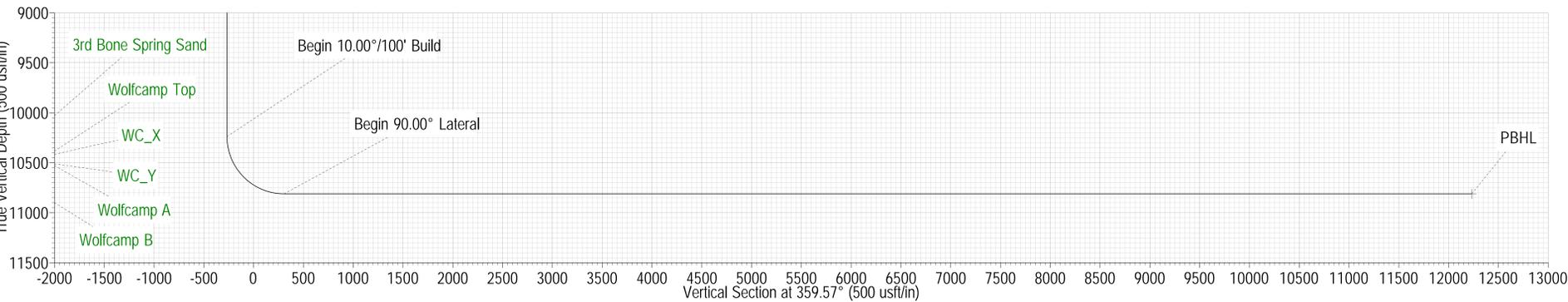
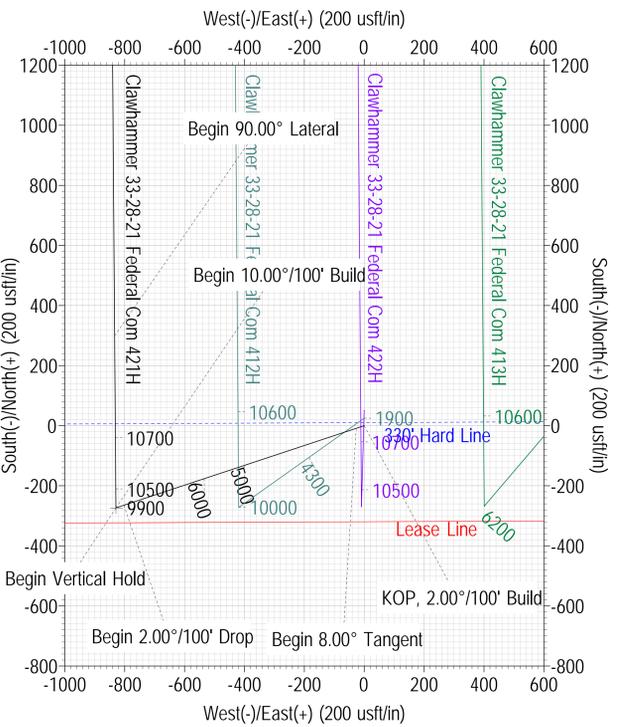
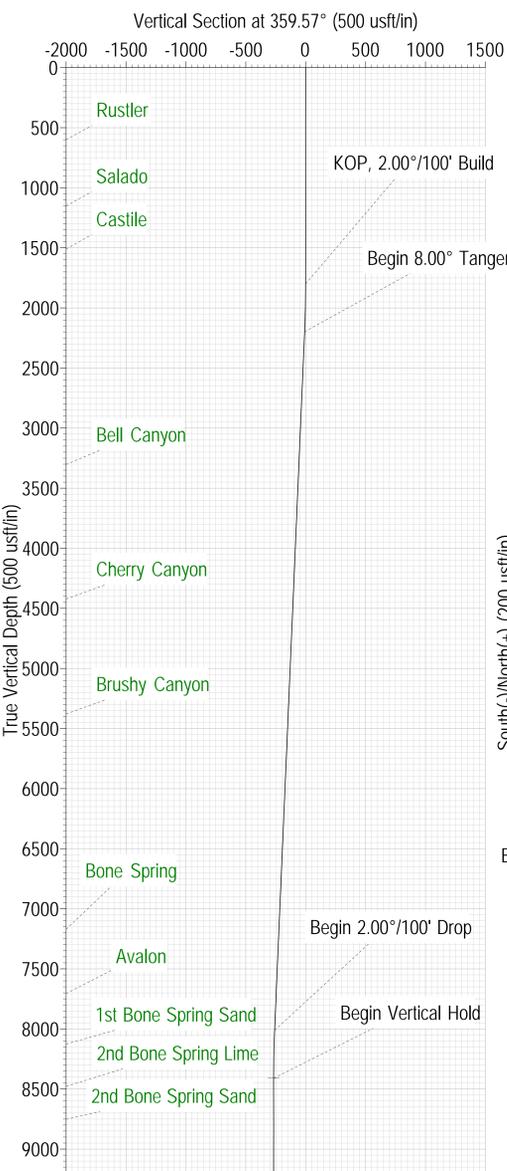
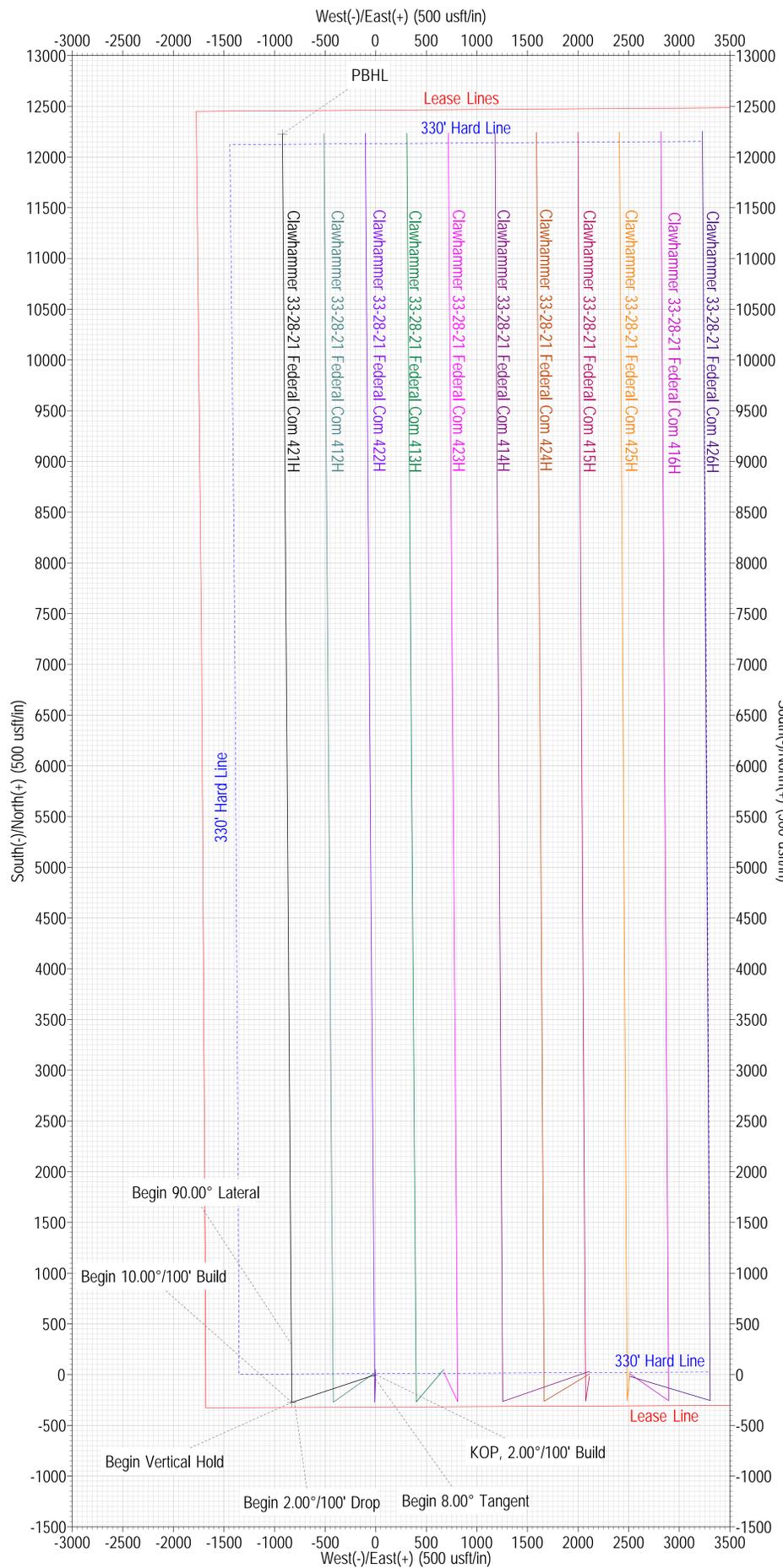
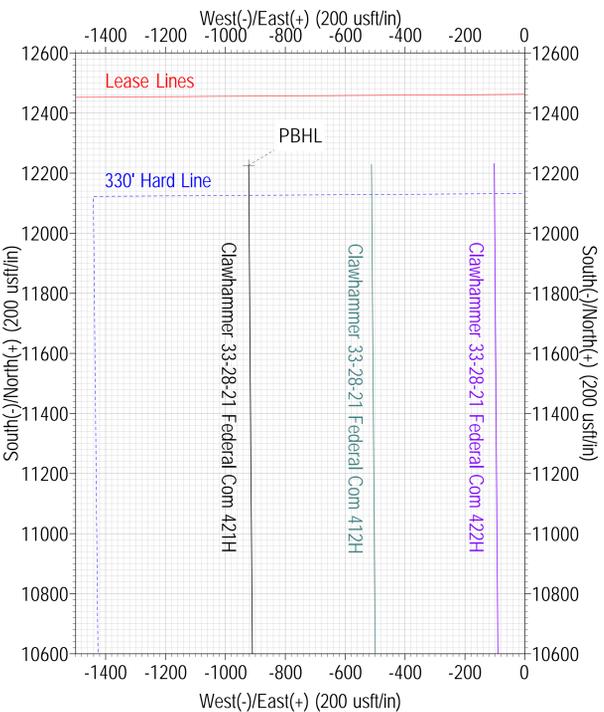
SURVEY PROGRAM

Depth From	Depth To	Survey/Plan	Tool	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	Vsect	Annotation
0.00	23125.01	Design #1 (Wellbore #1)	MWD	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.00	
FORMATION TOP DETAILS													
TVDPPath	MDPath	Formation	DipAngle										
600.05	600.05	Rustler	0.000 359.57	1800.00	0.00	0.00	1800.00	0.00	0.00	0.00	0.000	0.00	KOP, 2.00°/100' Build
1152.05	1152.05	Salado	0.000 359.57	2200.23	8.00	251.74	2198.93	-8.75	-26.51	2.00	251.737	-8.55	Begin 8.00° Tangent
1510.05	1510.05	Castile	0.000 359.57	8069.56	8.00	251.74	8011.07	-264.87	-802.65	0.00	0.000	-258.84	Begin 2.00°/100' Drop
3303.05	3315.21	Bell Canyon	0.000 359.57	8469.79	0.00	0.00	8410.00	-273.62	-829.16	2.00	180.000	-267.39	Begin Vertical Hold
4422.05	4445.22	Cherry Canyon	0.000 359.57	10297.83	0.00	0.00	10238.04	-273.62	-829.16	0.00	0.000	-267.39	Begin 10.00°/100' Build
5379.05	5411.64	Brushy Canyon	0.000 359.57	11197.83	90.00	359.57	10811.00	299.32	-833.42	10.00	359.574	305.57	Begin 90.00° Lateral
7171.05	7221.27	Bone Spring	0.000 359.57	23125.01	90.00	359.57	10811.00	12226.17	-922.03	0.00	0.000	12232.75	PBHL
7706.05	7761.53	Avalon	0.000 359.57										
8126.05	8185.37	1st Bone Spring Sand	0.000 359.57										
8478.05	8537.84	2nd Bone Spring Lime	0.000 359.57										
8752.05	8811.84	2nd Bone Spring Sand	0.000 359.57										
9227.05	9286.84	3rd Bone Spring Lime	0.000 359.57										
10029.05	10088.84	3rd Bone Spring Sand	0.000 359.57										
10384.05	10445.46	Wolfcamp Top	0.000 359.57										
10416.05	10478.83	WC_X	0.000 359.57										
10511.05	10582.39	WC_Y	0.000 359.57										
10529.05	10603.07	Wolfcamp A	0.000 359.57										

Wellbore #1

WELL DETAILS: Clawhammer 33-28-21 Federal Com 421H

+N/-S	+E/-W	GL @ 2952.05 Northing	WELL @ 2979.05usft (H&P 314) Easting	Latitude	Longitude
0.00	0.00	364389.43	678961.43	32° 0' 3.635 N	103° 53' 21.715 W



Any decisions made or wells drilled utilizing this or any other information supplied by MS Directional are at the sole risk and responsibility of the customer. MS Directional is not responsible for the accuracy of this schematic or the information contained herein. The customer should only rely on this document after independently verifying all paths, targets, coordinates, lease and hard lines represented.



WPX Energy

**Eddy County, New Mexico (NAD 83)
Clawhammer 33-28-21 Federal Com
Clawhammer 33-28-21 Federal Com 421H**

Wellbore #1

Plan: Design #1

Standard Planning Report

15 February, 2019





MS Directional
Planning Report



Database:	EDM 5000.14 Conroe Db	Local Co-ordinate Reference:	Well Clawhammer 33-28-21 Federal Com 421H
Company:	WPX Energy	TVD Reference:	WELL @ 2979.05usft (H&P 314)
Project:	Eddy County, New Mexico (NAD 83)	MD Reference:	WELL @ 2979.05usft (H&P 314)
Site:	Clawhammer 33-28-21 Federal Com	North Reference:	Grid
Well:	Clawhammer 33-28-21 Federal Com 421H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1		

Project	Eddy County, New Mexico (NAD 83)		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	New Mexico Eastern Zone		

Site	Clawhammer 33-28-21 Federal Com				
Site Position:		Northing:	364,439.44 usft	Latitude:	32° 0' 4.130 N
From:	Map	Easting:	678,961.36 usft	Longitude:	103° 53' 21.713 W
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "		

Well	Clawhammer 33-28-21 Federal Com 421H					
Well Position	+N/-S	0.00 usft	Northing:	364,389.43 usft	Latitude:	32° 0' 3.635 N
	+E/-W	0.00 usft	Easting:	678,961.43 usft	Longitude:	103° 53' 21.715 W
Position Uncertainty	0.00 usft		Wellhead Elevation:	usft	Ground Level:	2,952.05 usft
Grid Convergence:	0.235 °					

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	BGGM2018	2/12/2019	6.996	59.716	47,636.82

Design	Design #1			
Audit Notes:				
Version:	Phase:	PLAN	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.00	0.00	0.00	359.57

Plan Survey Tool Program	Date	2/15/2019		
Depth From (usft)	Depth To (usft)	Survey (Wellbore)	Tool Name	Remarks
1	0.00	23,125.01	Design #1 (Wellbore #1)	MWD OWSG MWD - Standard



Database:	EDM 5000.14 Conroe Db	Local Co-ordinate Reference:	Well Clawhammer 33-28-21 Federal Com 421H
Company:	WPX Energy	TVD Reference:	WELL @ 2979.05usft (H&P 314)
Project:	Eddy County, New Mexico (NAD 83)	MD Reference:	WELL @ 2979.05usft (H&P 314)
Site:	Clawhammer 33-28-21 Federal Com	North Reference:	Grid
Well:	Clawhammer 33-28-21 Federal Com 421H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1		

Plan Sections

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000	
1,800.00	0.00	0.00	1,800.00	0.00	0.00	0.00	0.00	0.00	0.000	
2,200.23	8.00	251.74	2,198.93	-8.75	-26.51	2.00	2.00	0.00	251.737	
8,069.56	8.00	251.74	8,011.07	-264.87	-802.65	0.00	0.00	0.00	0.000	
8,469.79	0.00	0.00	8,410.00	-273.62	-829.16	2.00	-2.00	0.00	180.000	VP - Clawhammer 3
10,297.83	0.00	0.00	10,238.04	-273.62	-829.16	0.00	0.00	0.00	0.000	
11,197.83	90.00	359.57	10,811.00	299.32	-833.42	10.00	10.00	0.00	359.574	
23,125.01	90.00	359.57	10,811.00	12,226.17	-922.03	0.00	0.00	0.00	0.000	PBHL - Clawhammer



MS Directional
Planning Report



Database:	EDM 5000.14 Conroe Db	Local Co-ordinate Reference:	Well Clawhammer 33-28-21 Federal Com 421H
Company:	WPX Energy	TVD Reference:	WELL @ 2979.05usft (H&P 314)
Project:	Eddy County, New Mexico (NAD 83)	MD Reference:	WELL @ 2979.05usft (H&P 314)
Site:	Clawhammer 33-28-21 Federal Com	North Reference:	Grid
Well:	Clawhammer 33-28-21 Federal Com 421H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1		

Planned Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
0.00	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	0.00
200.00	0.00	0.00	200.00	0.00	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	0.00
400.00	0.00	0.00	400.00	0.00	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	0.00
600.00	0.00	0.00	600.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
600.05	0.00	0.00	600.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rustler										
700.00	0.00	0.00	700.00	0.00	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	0.00
900.00	0.00	0.00	900.00	0.00	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	0.00
1,100.00	0.00	0.00	1,100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1,152.05	0.00	0.00	1,152.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Salado										
1,200.00	0.00	0.00	1,200.00	0.00	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	0.00
1,400.00	0.00	0.00	1,400.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1,500.00	0.00	0.00	1,500.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1,510.05	0.00	0.00	1,510.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Castile										
1,600.00	0.00	0.00	1,600.00	0.00	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	0.00
1,800.00	0.00	0.00	1,800.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
KOP, 2.00°/100' Build										
1,900.00	2.00	251.74	1,899.98	-0.55	-1.66	-0.53	2.00	2.00	0.00	0.00
2,000.00	4.00	251.74	1,999.84	-2.19	-6.63	-2.14	2.00	2.00	0.00	0.00
2,100.00	6.00	251.74	2,099.45	-4.92	-14.90	-4.81	2.00	2.00	0.00	0.00
2,200.00	8.00	251.74	2,198.70	-8.74	-26.48	-8.54	2.00	2.00	0.00	0.00
2,200.23	8.00	251.74	2,198.93	-8.75	-26.51	-8.55	2.00	2.00	0.00	0.00
Begin 8.00° Tangent										
2,300.00	8.00	251.74	2,297.73	-13.10	-39.70	-12.80	0.00	0.00	0.00	0.00
2,400.00	8.00	251.74	2,396.75	-17.46	-52.92	-17.07	0.00	0.00	0.00	0.00
2,500.00	8.00	251.74	2,495.78	-21.83	-66.15	-21.33	0.00	0.00	0.00	0.00
2,600.00	8.00	251.74	2,594.80	-26.19	-79.37	-25.60	0.00	0.00	0.00	0.00
2,700.00	8.00	251.74	2,693.83	-30.56	-92.59	-29.86	0.00	0.00	0.00	0.00
2,800.00	8.00	251.74	2,792.86	-34.92	-105.82	-34.12	0.00	0.00	0.00	0.00
2,900.00	8.00	251.74	2,891.88	-39.28	-119.04	-38.39	0.00	0.00	0.00	0.00
3,000.00	8.00	251.74	2,990.91	-43.65	-132.27	-42.65	0.00	0.00	0.00	0.00
3,100.00	8.00	251.74	3,089.93	-48.01	-145.49	-46.92	0.00	0.00	0.00	0.00
3,200.00	8.00	251.74	3,188.96	-52.37	-158.71	-51.18	0.00	0.00	0.00	0.00
3,300.00	8.00	251.74	3,287.98	-56.74	-171.94	-55.45	0.00	0.00	0.00	0.00
3,315.21	8.00	251.74	3,303.05	-57.40	-173.95	-56.10	0.00	0.00	0.00	0.00
Bell Canyon										
3,400.00	8.00	251.74	3,387.01	-61.10	-185.16	-59.71	0.00	0.00	0.00	0.00
3,500.00	8.00	251.74	3,486.04	-65.47	-198.38	-63.98	0.00	0.00	0.00	0.00
3,600.00	8.00	251.74	3,585.06	-69.83	-211.61	-68.24	0.00	0.00	0.00	0.00
3,700.00	8.00	251.74	3,684.09	-74.19	-224.83	-72.50	0.00	0.00	0.00	0.00
3,800.00	8.00	251.74	3,783.11	-78.56	-238.06	-76.77	0.00	0.00	0.00	0.00
3,900.00	8.00	251.74	3,882.14	-82.92	-251.28	-81.03	0.00	0.00	0.00	0.00
4,000.00	8.00	251.74	3,981.16	-87.29	-264.50	-85.30	0.00	0.00	0.00	0.00



MS Directional
Planning Report



Database:	EDM 5000.14 Conroe Db	Local Co-ordinate Reference:	Well Clawhammer 33-28-21 Federal Com 421H
Company:	WPX Energy	TVD Reference:	WELL @ 2979.05usft (H&P 314)
Project:	Eddy County, New Mexico (NAD 83)	MD Reference:	WELL @ 2979.05usft (H&P 314)
Site:	Clawhammer 33-28-21 Federal Com	North Reference:	Grid
Well:	Clawhammer 33-28-21 Federal Com 421H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1		

Planned Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
4,100.00	8.00	251.74	4,080.19	-91.65	-277.73	-89.56	0.00	0.00	0.00	
4,200.00	8.00	251.74	4,179.22	-96.01	-290.95	-93.83	0.00	0.00	0.00	
4,300.00	8.00	251.74	4,278.24	-100.38	-304.18	-98.09	0.00	0.00	0.00	
4,400.00	8.00	251.74	4,377.27	-104.74	-317.40	-102.36	0.00	0.00	0.00	
4,445.22	8.00	251.74	4,422.05	-106.71	-323.38	-104.28	0.00	0.00	0.00	
Cherry Canyon										
4,500.00	8.00	251.74	4,476.29	-109.10	-330.62	-106.62	0.00	0.00	0.00	
4,600.00	8.00	251.74	4,575.32	-113.47	-343.85	-110.88	0.00	0.00	0.00	
4,700.00	8.00	251.74	4,674.34	-117.83	-357.07	-115.15	0.00	0.00	0.00	
4,800.00	8.00	251.74	4,773.37	-122.20	-370.29	-119.41	0.00	0.00	0.00	
4,900.00	8.00	251.74	4,872.40	-126.56	-383.52	-123.68	0.00	0.00	0.00	
5,000.00	8.00	251.74	4,971.42	-130.92	-396.74	-127.94	0.00	0.00	0.00	
5,100.00	8.00	251.74	5,070.45	-135.29	-409.97	-132.21	0.00	0.00	0.00	
5,200.00	8.00	251.74	5,169.47	-139.65	-423.19	-136.47	0.00	0.00	0.00	
5,300.00	8.00	251.74	5,268.50	-144.01	-436.41	-140.74	0.00	0.00	0.00	
5,400.00	8.00	251.74	5,367.52	-148.38	-449.64	-145.00	0.00	0.00	0.00	
5,411.64	8.00	251.74	5,379.05	-148.89	-451.18	-145.50	0.00	0.00	0.00	
Brushy Canyon										
5,500.00	8.00	251.74	5,466.55	-152.74	-462.86	-149.26	0.00	0.00	0.00	
5,600.00	8.00	251.74	5,565.58	-157.11	-476.08	-153.53	0.00	0.00	0.00	
5,700.00	8.00	251.74	5,664.60	-161.47	-489.31	-157.79	0.00	0.00	0.00	
5,800.00	8.00	251.74	5,763.63	-165.83	-502.53	-162.06	0.00	0.00	0.00	
5,900.00	8.00	251.74	5,862.65	-170.20	-515.76	-166.32	0.00	0.00	0.00	
6,000.00	8.00	251.74	5,961.68	-174.56	-528.98	-170.59	0.00	0.00	0.00	
6,100.00	8.00	251.74	6,060.70	-178.93	-542.20	-174.85	0.00	0.00	0.00	
6,200.00	8.00	251.74	6,159.73	-183.29	-555.43	-179.12	0.00	0.00	0.00	
6,300.00	8.00	251.74	6,258.76	-187.65	-568.65	-183.38	0.00	0.00	0.00	
6,400.00	8.00	251.74	6,357.78	-192.02	-581.88	-187.64	0.00	0.00	0.00	
6,500.00	8.00	251.74	6,456.81	-196.38	-595.10	-191.91	0.00	0.00	0.00	
6,600.00	8.00	251.74	6,555.83	-200.74	-608.32	-196.17	0.00	0.00	0.00	
6,700.00	8.00	251.74	6,654.86	-205.11	-621.55	-200.44	0.00	0.00	0.00	
6,800.00	8.00	251.74	6,753.88	-209.47	-634.77	-204.70	0.00	0.00	0.00	
6,900.00	8.00	251.74	6,852.91	-213.84	-647.99	-208.97	0.00	0.00	0.00	
7,000.00	8.00	251.74	6,951.94	-218.20	-661.22	-213.23	0.00	0.00	0.00	
7,100.00	8.00	251.74	7,050.96	-222.56	-674.44	-217.50	0.00	0.00	0.00	
7,200.00	8.00	251.74	7,149.99	-226.93	-687.67	-221.76	0.00	0.00	0.00	
7,221.27	8.00	251.74	7,171.05	-227.86	-690.48	-222.67	0.00	0.00	0.00	
Bone Spring										
7,300.00	8.00	251.74	7,249.01	-231.29	-700.89	-226.02	0.00	0.00	0.00	
7,400.00	8.00	251.74	7,348.04	-235.65	-714.11	-230.29	0.00	0.00	0.00	
7,500.00	8.00	251.74	7,447.06	-240.02	-727.34	-234.55	0.00	0.00	0.00	
7,600.00	8.00	251.74	7,546.09	-244.38	-740.56	-238.82	0.00	0.00	0.00	
7,700.00	8.00	251.74	7,645.11	-248.75	-753.78	-243.08	0.00	0.00	0.00	
7,761.53	8.00	251.74	7,706.05	-251.43	-761.92	-245.71	0.00	0.00	0.00	
Avalon										
7,800.00	8.00	251.74	7,744.14	-253.11	-767.01	-247.35	0.00	0.00	0.00	
7,900.00	8.00	251.74	7,843.17	-257.47	-780.23	-251.61	0.00	0.00	0.00	
8,000.00	8.00	251.74	7,942.19	-261.84	-793.46	-255.88	0.00	0.00	0.00	
8,069.56	8.00	251.74	8,011.07	-264.87	-802.65	-258.84	0.00	0.00	0.00	
Begin 2.00°/100' Drop										
8,100.00	7.40	251.74	8,041.24	-266.15	-806.53	-260.09	2.00	-2.00	0.00	
8,185.37	5.69	251.74	8,126.05	-269.20	-815.76	-263.07	2.00	-2.00	0.00	



MS Directional
Planning Report



Database:	EDM 5000.14 Conroe Db	Local Co-ordinate Reference:	Well Clawhammer 33-28-21 Federal Com 421H
Company:	WPX Energy	TVD Reference:	WELL @ 2979.05usft (H&P 314)
Project:	Eddy County, New Mexico (NAD 83)	MD Reference:	WELL @ 2979.05usft (H&P 314)
Site:	Clawhammer 33-28-21 Federal Com	North Reference:	Grid
Well:	Clawhammer 33-28-21 Federal Com 421H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1		

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
1st Bone Spring Sand									
8,200.00	5.40	251.74	8,140.61	-269.64	-817.11	-263.50	2.00	-2.00	0.00
8,300.00	3.40	251.74	8,240.31	-272.04	-824.38	-265.85	2.00	-2.00	0.00
8,400.00	1.40	251.74	8,340.22	-273.35	-828.35	-267.13	2.00	-2.00	0.00
8,469.79	0.00	0.00	8,410.00	-273.62	-829.16	-267.39	2.00	-2.00	0.00
Begin Vertical Hold									
8,500.00	0.00	0.00	8,440.21	-273.62	-829.16	-267.39	0.00	0.00	0.00
8,537.84	0.00	0.00	8,478.05	-273.62	-829.16	-267.39	0.00	0.00	0.00
2nd Bone Spring Lime									
8,600.00	0.00	0.00	8,540.21	-273.62	-829.16	-267.39	0.00	0.00	0.00
8,700.00	0.00	0.00	8,640.21	-273.62	-829.16	-267.39	0.00	0.00	0.00
8,800.00	0.00	0.00	8,740.21	-273.62	-829.16	-267.39	0.00	0.00	0.00
8,811.84	0.00	0.00	8,752.05	-273.62	-829.16	-267.39	0.00	0.00	0.00
2nd Bone Spring Sand									
8,900.00	0.00	0.00	8,840.21	-273.62	-829.16	-267.39	0.00	0.00	0.00
9,000.00	0.00	0.00	8,940.21	-273.62	-829.16	-267.39	0.00	0.00	0.00
9,100.00	0.00	0.00	9,040.21	-273.62	-829.16	-267.39	0.00	0.00	0.00
9,200.00	0.00	0.00	9,140.21	-273.62	-829.16	-267.39	0.00	0.00	0.00
9,286.84	0.00	0.00	9,227.05	-273.62	-829.16	-267.39	0.00	0.00	0.00
3rd Bone Spring Lime									
9,300.00	0.00	0.00	9,240.21	-273.62	-829.16	-267.39	0.00	0.00	0.00
9,400.00	0.00	0.00	9,340.21	-273.62	-829.16	-267.39	0.00	0.00	0.00
9,500.00	0.00	0.00	9,440.21	-273.62	-829.16	-267.39	0.00	0.00	0.00
9,600.00	0.00	0.00	9,540.21	-273.62	-829.16	-267.39	0.00	0.00	0.00
9,700.00	0.00	0.00	9,640.21	-273.62	-829.16	-267.39	0.00	0.00	0.00
9,800.00	0.00	0.00	9,740.21	-273.62	-829.16	-267.39	0.00	0.00	0.00
9,900.00	0.00	0.00	9,840.21	-273.62	-829.16	-267.39	0.00	0.00	0.00
10,000.00	0.00	0.00	9,940.21	-273.62	-829.16	-267.39	0.00	0.00	0.00
10,088.84	0.00	0.00	10,029.05	-273.62	-829.16	-267.39	0.00	0.00	0.00
3rd Bone Spring Sand									
10,100.00	0.00	0.00	10,040.21	-273.62	-829.16	-267.39	0.00	0.00	0.00
10,200.00	0.00	0.00	10,140.21	-273.62	-829.16	-267.39	0.00	0.00	0.00
10,297.83	0.00	0.00	10,238.04	-273.62	-829.16	-267.39	0.00	0.00	0.00
Begin 10.00°/100' Build									
10,300.00	0.22	359.57	10,240.21	-273.62	-829.16	-267.39	10.00	10.00	0.00
10,400.00	10.22	359.57	10,339.67	-264.53	-829.23	-258.30	10.00	10.00	0.00
10,445.47	14.76	359.57	10,384.05	-254.70	-829.30	-248.47	10.00	10.00	0.00
Wolfcamp Top									
10,478.83	18.10	359.57	10,416.05	-245.27	-829.37	-239.04	10.00	10.00	0.00
WC_X									
10,500.00	20.22	359.57	10,436.04	-238.32	-829.42	-232.09	10.00	10.00	0.00
10,582.39	28.46	359.57	10,511.05	-204.40	-829.67	-198.17	10.00	10.00	0.00
WC_Y									
10,600.00	30.22	359.57	10,526.40	-195.77	-829.74	-189.54	10.00	10.00	0.00
10,603.07	30.52	359.57	10,529.05	-194.22	-829.75	-187.99	10.00	10.00	0.00
Wolfcamp A									
10,700.00	40.22	359.57	10,607.99	-138.18	-830.17	-131.94	10.00	10.00	0.00
10,800.00	50.22	359.57	10,678.35	-67.29	-830.69	-61.06	10.00	10.00	0.00
10,900.00	60.22	359.57	10,735.32	14.73	-831.30	20.97	10.00	10.00	0.00
11,000.00	70.22	359.57	10,777.19	105.41	-831.98	111.65	10.00	10.00	0.00
11,100.00	80.22	359.57	10,802.67	201.97	-832.69	208.21	10.00	10.00	0.00
11,197.83	90.00	359.57	10,811.00	299.32	-833.42	305.57	10.00	10.00	0.00



MS Directional
Planning Report



Database:	EDM 5000.14 Conroe Db	Local Co-ordinate Reference:	Well Clawhammer 33-28-21 Federal Com 421H
Company:	WPX Energy	TVD Reference:	WELL @ 2979.05usft (H&P 314)
Project:	Eddy County, New Mexico (NAD 83)	MD Reference:	WELL @ 2979.05usft (H&P 314)
Site:	Clawhammer 33-28-21 Federal Com	North Reference:	Grid
Well:	Clawhammer 33-28-21 Federal Com 421H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1		

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
Begin 90.00° Lateral									
11,200.00	90.00	359.57	10,811.00	301.49	-833.43	307.74	0.00	0.00	0.00
11,300.00	90.00	359.57	10,811.00	401.49	-834.18	407.74	0.00	0.00	0.00
11,400.00	90.00	359.57	10,811.00	501.49	-834.92	507.74	0.00	0.00	0.00
11,500.00	90.00	359.57	10,811.00	601.48	-835.66	607.74	0.00	0.00	0.00
11,600.00	90.00	359.57	10,811.00	701.48	-836.40	707.74	0.00	0.00	0.00
11,700.00	90.00	359.57	10,811.00	801.48	-837.15	807.74	0.00	0.00	0.00
11,800.00	90.00	359.57	10,811.00	901.48	-837.89	907.74	0.00	0.00	0.00
11,900.00	90.00	359.57	10,811.00	1,001.47	-838.63	1,007.74	0.00	0.00	0.00
12,000.00	90.00	359.57	10,811.00	1,101.47	-839.38	1,107.74	0.00	0.00	0.00
12,100.00	90.00	359.57	10,811.00	1,201.47	-840.12	1,207.74	0.00	0.00	0.00
12,200.00	90.00	359.57	10,811.00	1,301.47	-840.86	1,307.74	0.00	0.00	0.00
12,300.00	90.00	359.57	10,811.00	1,401.46	-841.61	1,407.74	0.00	0.00	0.00
12,400.00	90.00	359.57	10,811.00	1,501.46	-842.35	1,507.74	0.00	0.00	0.00
12,500.00	90.00	359.57	10,811.00	1,601.46	-843.09	1,607.74	0.00	0.00	0.00
12,600.00	90.00	359.57	10,811.00	1,701.45	-843.83	1,707.74	0.00	0.00	0.00
12,700.00	90.00	359.57	10,811.00	1,801.45	-844.58	1,807.74	0.00	0.00	0.00
12,800.00	90.00	359.57	10,811.00	1,901.45	-845.32	1,907.74	0.00	0.00	0.00
12,900.00	90.00	359.57	10,811.00	2,001.45	-846.06	2,007.74	0.00	0.00	0.00
13,000.00	90.00	359.57	10,811.00	2,101.44	-846.81	2,107.74	0.00	0.00	0.00
13,100.00	90.00	359.57	10,811.00	2,201.44	-847.55	2,207.74	0.00	0.00	0.00
13,200.00	90.00	359.57	10,811.00	2,301.44	-848.29	2,307.74	0.00	0.00	0.00
13,300.00	90.00	359.57	10,811.00	2,401.44	-849.03	2,407.74	0.00	0.00	0.00
13,400.00	90.00	359.57	10,811.00	2,501.43	-849.78	2,507.74	0.00	0.00	0.00
13,500.00	90.00	359.57	10,811.00	2,601.43	-850.52	2,607.74	0.00	0.00	0.00
13,600.00	90.00	359.57	10,811.00	2,701.43	-851.26	2,707.74	0.00	0.00	0.00
13,700.00	90.00	359.57	10,811.00	2,801.42	-852.01	2,807.74	0.00	0.00	0.00
13,800.00	90.00	359.57	10,811.00	2,901.42	-852.75	2,907.74	0.00	0.00	0.00
13,900.00	90.00	359.57	10,811.00	3,001.42	-853.49	3,007.74	0.00	0.00	0.00
14,000.00	90.00	359.57	10,811.00	3,101.42	-854.24	3,107.74	0.00	0.00	0.00
14,100.00	90.00	359.57	10,811.00	3,201.41	-854.98	3,207.74	0.00	0.00	0.00
14,200.00	90.00	359.57	10,811.00	3,301.41	-855.72	3,307.74	0.00	0.00	0.00
14,300.00	90.00	359.57	10,811.00	3,401.41	-856.46	3,407.74	0.00	0.00	0.00
14,400.00	90.00	359.57	10,811.00	3,501.40	-857.21	3,507.74	0.00	0.00	0.00
14,500.00	90.00	359.57	10,811.00	3,601.40	-857.95	3,607.74	0.00	0.00	0.00
14,600.00	90.00	359.57	10,811.00	3,701.40	-858.69	3,707.74	0.00	0.00	0.00
14,700.00	90.00	359.57	10,811.00	3,801.40	-859.44	3,807.74	0.00	0.00	0.00
14,800.00	90.00	359.57	10,811.00	3,901.39	-860.18	3,907.74	0.00	0.00	0.00
14,900.00	90.00	359.57	10,811.00	4,001.39	-860.92	4,007.74	0.00	0.00	0.00
15,000.00	90.00	359.57	10,811.00	4,101.39	-861.67	4,107.74	0.00	0.00	0.00
15,100.00	90.00	359.57	10,811.00	4,201.39	-862.41	4,207.74	0.00	0.00	0.00
15,200.00	90.00	359.57	10,811.00	4,301.38	-863.15	4,307.74	0.00	0.00	0.00
15,300.00	90.00	359.57	10,811.00	4,401.38	-863.89	4,407.74	0.00	0.00	0.00
15,400.00	90.00	359.57	10,811.00	4,501.38	-864.64	4,507.74	0.00	0.00	0.00
15,500.00	90.00	359.57	10,811.00	4,601.37	-865.38	4,607.74	0.00	0.00	0.00
15,600.00	90.00	359.57	10,811.00	4,701.37	-866.12	4,707.74	0.00	0.00	0.00
15,700.00	90.00	359.57	10,811.00	4,801.37	-866.87	4,807.74	0.00	0.00	0.00
15,800.00	90.00	359.57	10,811.00	4,901.37	-867.61	4,907.74	0.00	0.00	0.00
15,900.00	90.00	359.57	10,811.00	5,001.36	-868.35	5,007.74	0.00	0.00	0.00
16,000.00	90.00	359.57	10,811.00	5,101.36	-869.09	5,107.74	0.00	0.00	0.00
16,100.00	90.00	359.57	10,811.00	5,201.36	-869.84	5,207.74	0.00	0.00	0.00
16,200.00	90.00	359.57	10,811.00	5,301.36	-870.58	5,307.74	0.00	0.00	0.00



MS Directional
Planning Report



Database:	EDM 5000.14 Conroe Db	Local Co-ordinate Reference:	Well Clawhammer 33-28-21 Federal Com 421H
Company:	WPX Energy	TVD Reference:	WELL @ 2979.05usft (H&P 314)
Project:	Eddy County, New Mexico (NAD 83)	MD Reference:	WELL @ 2979.05usft (H&P 314)
Site:	Clawhammer 33-28-21 Federal Com	North Reference:	Grid
Well:	Clawhammer 33-28-21 Federal Com 421H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1		

Planned Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
16,300.00	90.00	359.57	10,811.00	5,401.35	-871.32	5,407.74	0.00	0.00	0.00	
16,400.00	90.00	359.57	10,811.00	5,501.35	-872.07	5,507.74	0.00	0.00	0.00	
16,500.00	90.00	359.57	10,811.00	5,601.35	-872.81	5,607.74	0.00	0.00	0.00	
16,600.00	90.00	359.57	10,811.00	5,701.34	-873.55	5,707.74	0.00	0.00	0.00	
16,700.00	90.00	359.57	10,811.00	5,801.34	-874.30	5,807.74	0.00	0.00	0.00	
16,800.00	90.00	359.57	10,811.00	5,901.34	-875.04	5,907.74	0.00	0.00	0.00	
16,900.00	90.00	359.57	10,811.00	6,001.34	-875.78	6,007.74	0.00	0.00	0.00	
17,000.00	90.00	359.57	10,811.00	6,101.33	-876.52	6,107.74	0.00	0.00	0.00	
17,100.00	90.00	359.57	10,811.00	6,201.33	-877.27	6,207.74	0.00	0.00	0.00	
17,200.00	90.00	359.57	10,811.00	6,301.33	-878.01	6,307.74	0.00	0.00	0.00	
17,300.00	90.00	359.57	10,811.00	6,401.33	-878.75	6,407.74	0.00	0.00	0.00	
17,400.00	90.00	359.57	10,811.00	6,501.32	-879.50	6,507.74	0.00	0.00	0.00	
17,500.00	90.00	359.57	10,811.00	6,601.32	-880.24	6,607.74	0.00	0.00	0.00	
17,600.00	90.00	359.57	10,811.00	6,701.32	-880.98	6,707.74	0.00	0.00	0.00	
17,700.00	90.00	359.57	10,811.00	6,801.31	-881.72	6,807.74	0.00	0.00	0.00	
17,800.00	90.00	359.57	10,811.00	6,901.31	-882.47	6,907.74	0.00	0.00	0.00	
17,900.00	90.00	359.57	10,811.00	7,001.31	-883.21	7,007.74	0.00	0.00	0.00	
18,000.00	90.00	359.57	10,811.00	7,101.31	-883.95	7,107.74	0.00	0.00	0.00	
18,100.00	90.00	359.57	10,811.00	7,201.30	-884.70	7,207.74	0.00	0.00	0.00	
18,200.00	90.00	359.57	10,811.00	7,301.30	-885.44	7,307.74	0.00	0.00	0.00	
18,300.00	90.00	359.57	10,811.00	7,401.30	-886.18	7,407.74	0.00	0.00	0.00	
18,400.00	90.00	359.57	10,811.00	7,501.29	-886.93	7,507.74	0.00	0.00	0.00	
18,500.00	90.00	359.57	10,811.00	7,601.29	-887.67	7,607.74	0.00	0.00	0.00	
18,600.00	90.00	359.57	10,811.00	7,701.29	-888.41	7,707.74	0.00	0.00	0.00	
18,700.00	90.00	359.57	10,811.00	7,801.29	-889.15	7,807.74	0.00	0.00	0.00	
18,800.00	90.00	359.57	10,811.00	7,901.28	-889.90	7,907.74	0.00	0.00	0.00	
18,900.00	90.00	359.57	10,811.00	8,001.28	-890.64	8,007.74	0.00	0.00	0.00	
19,000.00	90.00	359.57	10,811.00	8,101.28	-891.38	8,107.74	0.00	0.00	0.00	
19,100.00	90.00	359.57	10,811.00	8,201.28	-892.13	8,207.74	0.00	0.00	0.00	
19,200.00	90.00	359.57	10,811.00	8,301.27	-892.87	8,307.74	0.00	0.00	0.00	
19,300.00	90.00	359.57	10,811.00	8,401.27	-893.61	8,407.74	0.00	0.00	0.00	
19,400.00	90.00	359.57	10,811.00	8,501.27	-894.36	8,507.74	0.00	0.00	0.00	
19,500.00	90.00	359.57	10,811.00	8,601.26	-895.10	8,607.74	0.00	0.00	0.00	
19,600.00	90.00	359.57	10,811.00	8,701.26	-895.84	8,707.74	0.00	0.00	0.00	
19,700.00	90.00	359.57	10,811.00	8,801.26	-896.58	8,807.74	0.00	0.00	0.00	
19,800.00	90.00	359.57	10,811.00	8,901.26	-897.33	8,907.74	0.00	0.00	0.00	
19,900.00	90.00	359.57	10,811.00	9,001.25	-898.07	9,007.74	0.00	0.00	0.00	
20,000.00	90.00	359.57	10,811.00	9,101.25	-898.81	9,107.74	0.00	0.00	0.00	
20,100.00	90.00	359.57	10,811.00	9,201.25	-899.56	9,207.74	0.00	0.00	0.00	
20,200.00	90.00	359.57	10,811.00	9,301.25	-900.30	9,307.74	0.00	0.00	0.00	
20,300.00	90.00	359.57	10,811.00	9,401.24	-901.04	9,407.74	0.00	0.00	0.00	
20,400.00	90.00	359.57	10,811.00	9,501.24	-901.78	9,507.74	0.00	0.00	0.00	
20,500.00	90.00	359.57	10,811.00	9,601.24	-902.53	9,607.74	0.00	0.00	0.00	
20,600.00	90.00	359.57	10,811.00	9,701.23	-903.27	9,707.74	0.00	0.00	0.00	
20,700.00	90.00	359.57	10,811.00	9,801.23	-904.01	9,807.74	0.00	0.00	0.00	
20,800.00	90.00	359.57	10,811.00	9,901.23	-904.76	9,907.74	0.00	0.00	0.00	
20,900.00	90.00	359.57	10,811.00	10,001.23	-905.50	10,007.74	0.00	0.00	0.00	
21,000.00	90.00	359.57	10,811.00	10,101.22	-906.24	10,107.74	0.00	0.00	0.00	
21,100.00	90.00	359.57	10,811.00	10,201.22	-906.99	10,207.74	0.00	0.00	0.00	
21,200.00	90.00	359.57	10,811.00	10,301.22	-907.73	10,307.74	0.00	0.00	0.00	
21,300.00	90.00	359.57	10,811.00	10,401.21	-908.47	10,407.74	0.00	0.00	0.00	
21,400.00	90.00	359.57	10,811.00	10,501.21	-909.21	10,507.74	0.00	0.00	0.00	
21,500.00	90.00	359.57	10,811.00	10,601.21	-909.96	10,607.74	0.00	0.00	0.00	



Database:	EDM 5000.14 Conroe Db	Local Co-ordinate Reference:	Well Clawhammer 33-28-21 Federal Com 421H
Company:	WPX Energy	TVD Reference:	WELL @ 2979.05usft (H&P 314)
Project:	Eddy County, New Mexico (NAD 83)	MD Reference:	WELL @ 2979.05usft (H&P 314)
Site:	Clawhammer 33-28-21 Federal Com	North Reference:	Grid
Well:	Clawhammer 33-28-21 Federal Com 421H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
21,600.00	90.00	359.57	10,811.00	10,701.21	-910.70	10,707.74	0.00	0.00	0.00
21,700.00	90.00	359.57	10,811.00	10,801.20	-911.44	10,807.74	0.00	0.00	0.00
21,800.00	90.00	359.57	10,811.00	10,901.20	-912.19	10,907.74	0.00	0.00	0.00
21,900.00	90.00	359.57	10,811.00	11,001.20	-912.93	11,007.74	0.00	0.00	0.00
22,000.00	90.00	359.57	10,811.00	11,101.20	-913.67	11,107.74	0.00	0.00	0.00
22,100.00	90.00	359.57	10,811.00	11,201.19	-914.41	11,207.74	0.00	0.00	0.00
22,200.00	90.00	359.57	10,811.00	11,301.19	-915.16	11,307.74	0.00	0.00	0.00
22,300.00	90.00	359.57	10,811.00	11,401.19	-915.90	11,407.74	0.00	0.00	0.00
22,400.00	90.00	359.57	10,811.00	11,501.18	-916.64	11,507.74	0.00	0.00	0.00
22,500.00	90.00	359.57	10,811.00	11,601.18	-917.39	11,607.74	0.00	0.00	0.00
22,600.00	90.00	359.57	10,811.00	11,701.18	-918.13	11,707.74	0.00	0.00	0.00
22,700.00	90.00	359.57	10,811.00	11,801.18	-918.87	11,807.74	0.00	0.00	0.00
22,800.00	90.00	359.57	10,811.00	11,901.17	-919.62	11,907.74	0.00	0.00	0.00
22,900.00	90.00	359.57	10,811.00	12,001.17	-920.36	12,007.74	0.00	0.00	0.00
23,000.00	90.00	359.57	10,811.00	12,101.17	-921.10	12,107.74	0.00	0.00	0.00
23,100.00	90.00	359.57	10,811.00	12,201.17	-921.84	12,207.74	0.00	0.00	0.00
23,125.01	90.00	359.57	10,811.00	12,226.17	-922.03	12,232.75	0.00	0.00	0.00
PBHL									

Design Targets

Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
VP - Clawhammer 33- - plan hits target center - Point	0.00	0.00	8,410.00	-273.62	-829.16	364,115.81	678,132.27	32° 0' 0.961 N	103° 53' 31.357 W
PBHL - Clawhammer - plan hits target center - Point	0.00	0.00	10,811.00	12,226.17	-922.03	376,615.60	678,039.40	32° 2' 4.664 N	103° 53' 31.843 W



Database:	EDM 5000.14 Conroe Db	Local Co-ordinate Reference:	Well Clawhammer 33-28-21 Federal Com 421H
Company:	WPX Energy	TVD Reference:	WELL @ 2979.05usft (H&P 314)
Project:	Eddy County, New Mexico (NAD 83)	MD Reference:	WELL @ 2979.05usft (H&P 314)
Site:	Clawhammer 33-28-21 Federal Com	North Reference:	Grid
Well:	Clawhammer 33-28-21 Federal Com 421H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1		

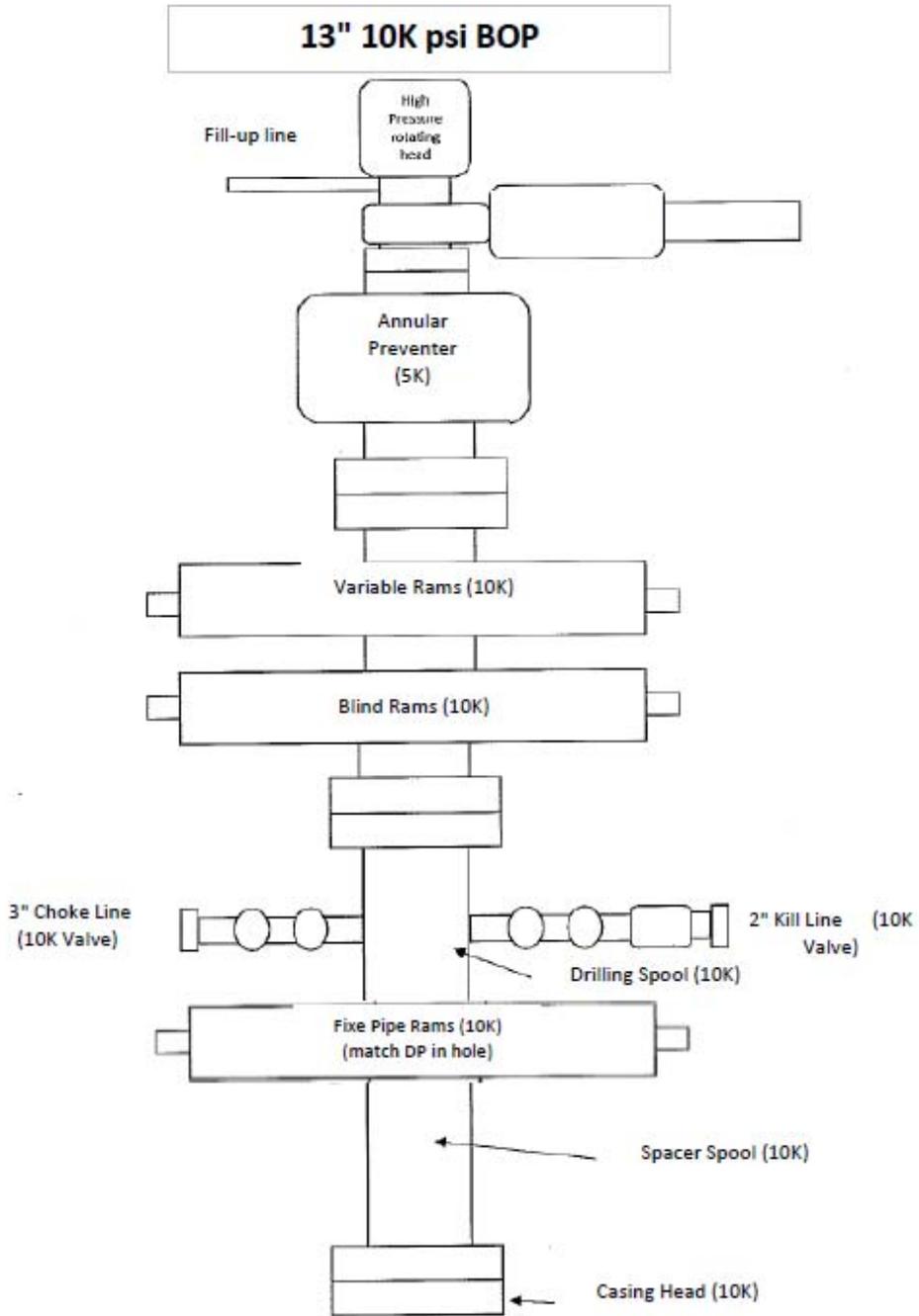
Formations

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
600.05	600.05	Rustler		0.000	359.57
1,152.05	1,152.05	Salado		0.000	359.57
1,510.05	1,510.05	Castile		0.000	359.57
3,315.21	3,303.05	Bell Canyon		0.000	359.57
4,445.22	4,422.05	Cherry Canyon		0.000	359.57
5,411.64	5,379.05	Brushy Canyon		0.000	359.57
7,221.27	7,171.05	Bone Spring		0.000	359.57
7,761.53	7,706.05	Avalon		0.000	359.57
8,185.37	8,126.05	1st Bone Spring Sand		0.000	359.57
8,537.84	8,478.05	2nd Bone Spring Lime		0.000	359.57
8,811.84	8,752.05	2nd Bone Spring Sand		0.000	359.57
9,286.84	9,227.05	3rd Bone Spring Lime		0.000	359.57
10,088.84	10,029.05	3rd Bone Spring Sand		0.000	359.57
10,445.47	10,384.05	Wolfcamp Top		0.000	359.57
10,478.83	10,416.05	WC_X		0.000	359.57
10,582.39	10,511.05	WC_Y		0.000	359.57
10,603.07	10,529.05	Wolfcamp A		0.000	359.57

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
1,800.00	1,800.00	0.00	0.00	KOP, 2.00°/100' Build
2,200.23	2,198.93	-8.75	-26.51	Begin 8.00° Tangent
8,069.56	8,011.07	-264.87	-802.65	Begin 2.00°/100' Drop
8,469.79	8,410.00	-273.62	-829.16	Begin Vertical Hold
10,297.83	10,238.04	-273.62	-829.16	Begin 10.00°/100' Build
11,197.83	10,811.00	299.32	-833.42	Begin 90.00° Lateral
23,125.01	10,811.00	12,226.17	-922.03	PBHL

Exhibit #1:



CONTITECH RUBBER Industrial Kft.	No: QC-DB- 257 / 2018
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ContiTech

QUALITY CONTROL INSPECTION AND TEST CERTIFICATE		CERT. N°: 735	
PURCHASER: Contitech Oil & Marine Corp.		P.O. N°: 4501120613	
CONTITECH RUBBER order N°: 1064135	HOSE TYPE: 3" ID	Choke & Kill Hose	
HOSE SERIAL N°: 74907	NOMINAL / ACTUAL LENGTH: 10,67 m / 10,69 m		
W.P. 69,0 MPa 10000 psi	T.P. 103,5 MPa 15000 psi	Duration: 60 min.	
Pressure test with water at ambient temperature See attachment (1. page)			
COUPLINGS Type	Serial N°	Quality	Heat N°
3" coupling with 4 1/16" 10K API Swivel Flange end Hub	9719	AISI 4130	B42639
		AISI 4130	038272
		AISI 4130	52799
3" coupling with 4 1/16" 10K API b.w. Flange end	4155	AISI 4130	B42639
		AISI 4130	038721
Not Designed For Well Testing		API Spec 16 C 2nd Edition – FSL2	
		Temperature rate: "B"	
All metal parts are flawless			
WE CERTIFY THAT THE ABOVE HOSE HAS BEEN MANUFACTURED IN ACCORDANCE WITH THE TERMS OF THE ORDER INSPECTED AND PRESSURE TESTED AS ABOVE WITH SATISFACTORY RESULT.			
STATEMENT OF CONFORMITY: We hereby certify that the above items/equipment supplied by us are in conformity with the terms, conditions and specifications of the above Purchaser Order and that these items/equipment were fabricated inspected and tested in accordance with the referenced standards, codes and specifications and meet the relevant acceptance criteria and design requirements.			
Date: 05. July 2018.	Inspector	Quality Control Contitech Rubber Industrial Kft. Quality Control Dept.	

INSPECTION AND TEST CERTIFICATE
 No: 730, 734, 735

CONTITECH RUBBER Industrial Kft.	No: QC-DB- 257 / 2018
	Page: 24 / 117

1/1

5.000 sec
 : 20180704 20:08:40.000
 : 20180704 21:58:15.000

Sampling Int.
 Start Time
 Stop Time

File Name : 02542_74902,906,907.GEV,....,025252_74902,906,907.GEV
 File Message : 74902,74906,74907
 Device Type : GX10
 Serial No. : SJP08038H
 Data Count : 1316
 Print Group : Press-Temp
 Print Range : 20180704 20:08:40.000 - 20180704 21:58:15.000
 Comment : 1108078E

	Cursor A	Cursor B	Difference
Date No.	559	1279	720
Absolute Time	20180704 20:58:15.000 Value A	20180704 21:58:15.000 Value B	01:00:00.000 Value B-A
Tag Comment	1088.16	1050.96	-37.20
Ambient Temperature [C]	24.68	24.70	0.02

Handwritten Signature
**Contitech Rubber
 Industrial Kft.
 Quality Control Dept.**



PECOS DISTRICT DRILLING CONDITIONS OF APPROVAL

OPERATOR'S NAME:	WPX Energy Permian LLC
LEASE NO.:	NMNM035607
WELL NAME & NO.:	Clawhammer 33-28-21 Federal Com 421H
SURFACE HOLE FOOTAGE:	320'/S & 1681'/W
BOTTOM HOLE FOOTAGE:	230'/N & 850'/W
LOCATION:	Section 33, T.26 S., R.30 E., NMPM
COUNTY:	Eddy County, New Mexico

COA

H2S	<input type="radio"/> Yes	<input checked="" type="radio"/> No	
Potash	<input checked="" type="radio"/> None	<input type="radio"/> Secretary	<input type="radio"/> R-111-P
Cave/Karst Potential	<input type="radio"/> Low	<input type="radio"/> Medium	<input checked="" 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

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

B. CASING

1. The **13-3/8 inch** surface casing shall be set at approximately **360 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 1 casing and shall be set at approximately **3,260 feet** is:

(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.

There is an excess of 20% for the Intermediate 1 casing. Additional cement may be needed.

- ❖ In High 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 **7 inch** intermediate 2 casing and shall be set at approximately **11,198 feet** is:

(Single Stage):

- Cement should tie-back at least **200 feet** into previous casing string. Operator shall provide method of verification.

There is an excess of 23% for the Intermediate 2 casing. Additional cement may be needed.

4. The minimum required fill of cement behind the **4-1/2 inch** production liner is:
 - Cement should tie-back **100 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. 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**.
3. 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 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.

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 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.

YJ (03/26/2020)



H&P 314

Clawhammer 33-28-21 Fed Com 422H

Clawhammer 33-28-21 Fed Com 412H

Clawhammer 33-28-21 Fed Com 421H

1. H2S Safety Training

When working in an area where Hydrogen Sulfide (H₂S) might be encountered, definite training requirements must be carried out. The Company Supervisor will ensure that all personnel, at the well site, have had adequate training in the following:

- Hazards and characteristics of Hydrogen Sulfide (H₂S).
- Physicals effects of Hydrogen Sulfide on the human body.
- Toxicity of Hydrogen Sulfide and Sulfur Dioxide.
- H₂S detection, Emergency alarm and sensor location.
- Emergency rescue.
- Resuscitators.
- First aid and artificial resuscitation.
- The effects of Hydrogen Sulfide on metals.
- Location safety.

Service company personnel and visiting personnel must be notified if the zone contains H₂S, and each service company must provide adequate training and equipment for their employees before they arrive at the well site.

2. H2S detection and Alarm Systems

- Four channel H₂S monitor with alarms.
- Three (3) sensors located as follows: #1 – Rig Floor, #2 – Shale Shaker, #3 – Cellar.
- Gastec or Draeger pump with tubes.
- Sensor test gas.

3. Windsocks and / Wind Streamers

- A minimum of two 10" windsocks located at strategic locations so that they may be seen from any point on location.
- Wind streamers (if preferred) should be placed at various locations on the well site to ensure wind consciousness at all times. (Corners of location).

4. Condition Flags and Signs

The Well Condition Sign w/flags should be placed a minimum of 150' before you enter the location. It should have three (3) color coded flags (green, yellow and red) that will be used to denote the following location conditions:

- GREEN – Normal Operating Conditions
- YELLOW – Potential Danger
- RED – Danger, H₂S Gas Present

5. Well Control Equipment

- See APD

6. Communications

- Proper communication equipment such as cell phones or 2-way radios should be available at the rig.
- Radio communication shall be available for communication between the company man’s trailer, rig floor and the tool pusher’s trailer.
- Communication equipment shall be available on the vehicles.

7. Drilling Stem Testing

Not Applicable

8. Drilling Fluids

The primary control to avoid H₂S problems in a drilling operation is to keep it retained in the formation. A slight over balance in drilling fluid density is required. It must be enough to overcome any swabbing effects on connections and trips. Ample pit volume will be provided to contain an adequate supply of drilling mud.

- Drilling Fluid Monitoring – On Any Hazardous H₂S gas well, the earlier the warning of danger the better chance to control operations. Mud Company will be in daily contact with a RKI Representative. The Mud Engineer will take samples of the mud, analyze these samples, and make necessary recommendations to prevent H₂S gas from the formation, the pH will be increased as necessary for corrosion control.
- pH Control – For normal drilling, pH of 10.5 – 11.5. Would be sufficient for corrosion protection. If there is an influx of H₂S gas from the formation, the pH will be increased as necessary for corrosion control.
- H₂S Scavengers – If necessary H₂S scavengers will be added to the drilling mud.
- Garret Gas Train or Hach Tester for inspection of Hydrogen Sulfide in the drilling mud system.

9. Emergency Contacts

Local Contacts

Production Superintendent

Justin Warren (701) 421-7324

Production Foreman

Kipper Folmar (575) 644-2008

Gary Moreau (575) 200-4278

Curt Heckman (505) 333-1809

Omar Cordova (432)661-7201

Darrell Bays (505)486-1836

Completions Superintendent

Gary Dill (575) 200-7633

Environmental Specialist

Karolina Blaney (970) 589-0743

Jim Raley (575)689-7597

Safety Specialist

Daniel Ramirez	(575) 361-5823
Jon Thornberry (contractor)	(575) 361-6047
Randell Moreland (contractor)	(318)458-1537

Regional Contacts**Production Manager**

Bobby Goodwin	(918) 642-3688
---------------	----------------

HSE Supervisor

Josh Harvey	(918) 500-5536
-------------	----------------

Completions Engineer

Jamie Hall	(539) 573-1942
------------	----------------

Corporate Contacts**VP Asset Team**

Matt Hinson	(539) 573-0170
-------------	----------------

Drilling Manager

Bryan Knopp	(539) 573-3552
-------------	----------------

HSE Manager

Oliva McNamara	(918) 430-4870
----------------	----------------

Legal Liaison

Kevin Mathews	(918) 606-6356
---------------	----------------

RMID Liaison

Desi Miller	(918) 573-5917
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Communications Liaison

Kelly Swan	(918) 629-1037
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Emergency Response Contacts**911 or****Ambulance Service:**

Carlsbad Fire Department	(575) 885-3125
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Hospitals:

Carlsbad Medical Center (Carlsbad)	(575) 557-4100
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University Medical Center (El Paso)	(915) 577-1200
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University Medical Center (Lubbock)	(806) 775-8200
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Fire Department:

Carlsbad Fire Department	(575) 885-3125
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Pecos VFD	(432) 445-3519
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Law Enforcement:

Carlsbad Police Department	(575) 885-6547
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Pecos Police Department	(432) 445-4911
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Eddy County Sherriff's Department	(575) 887-7551
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Loving County Sherriff's Department	(432) 337-2411
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Reeves County Sherriff's Office	(432) 445-4901
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New Mexico State Police – District 3	(575) 885-3138
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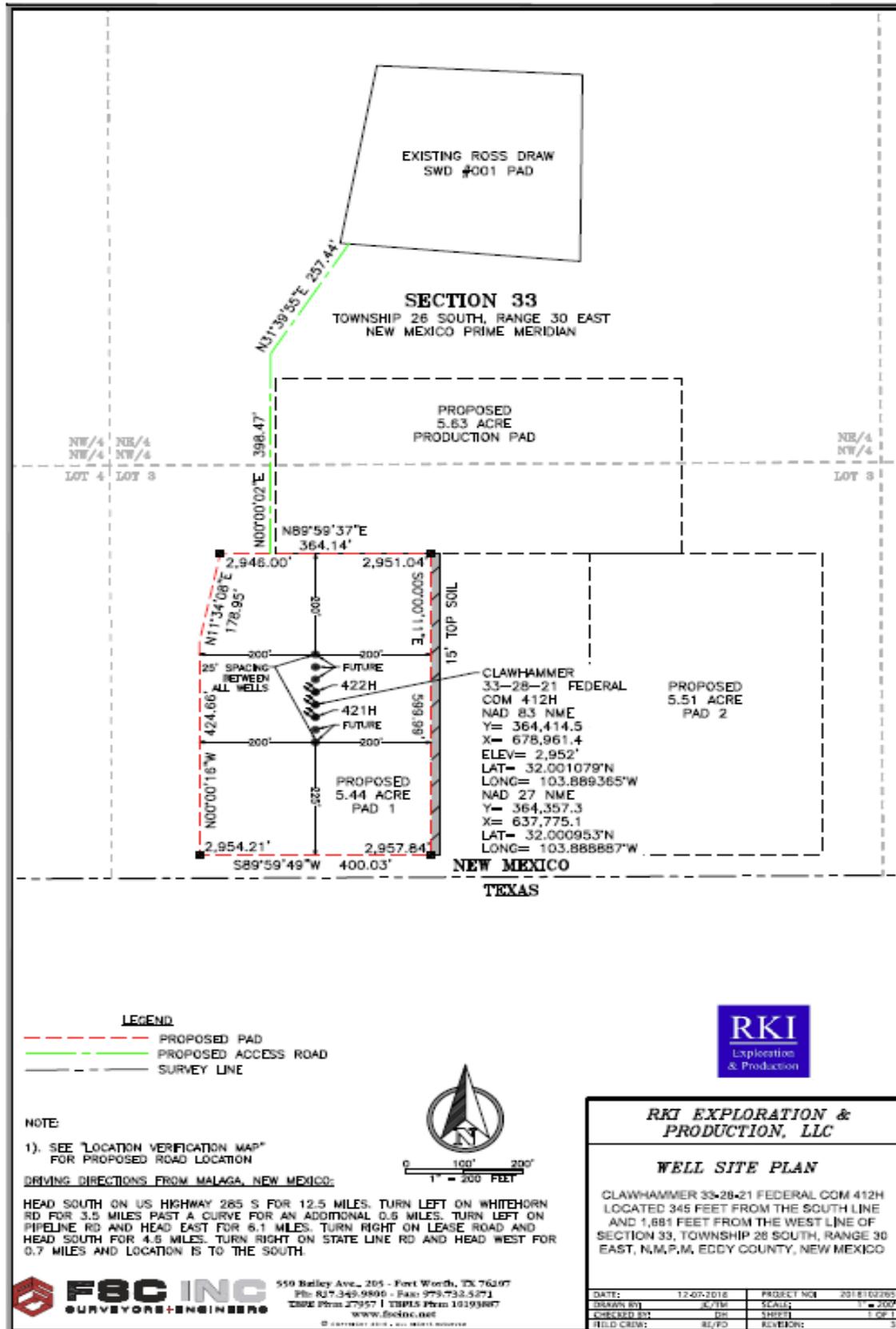
Homeland Security (Federal)	(202) 282-8000
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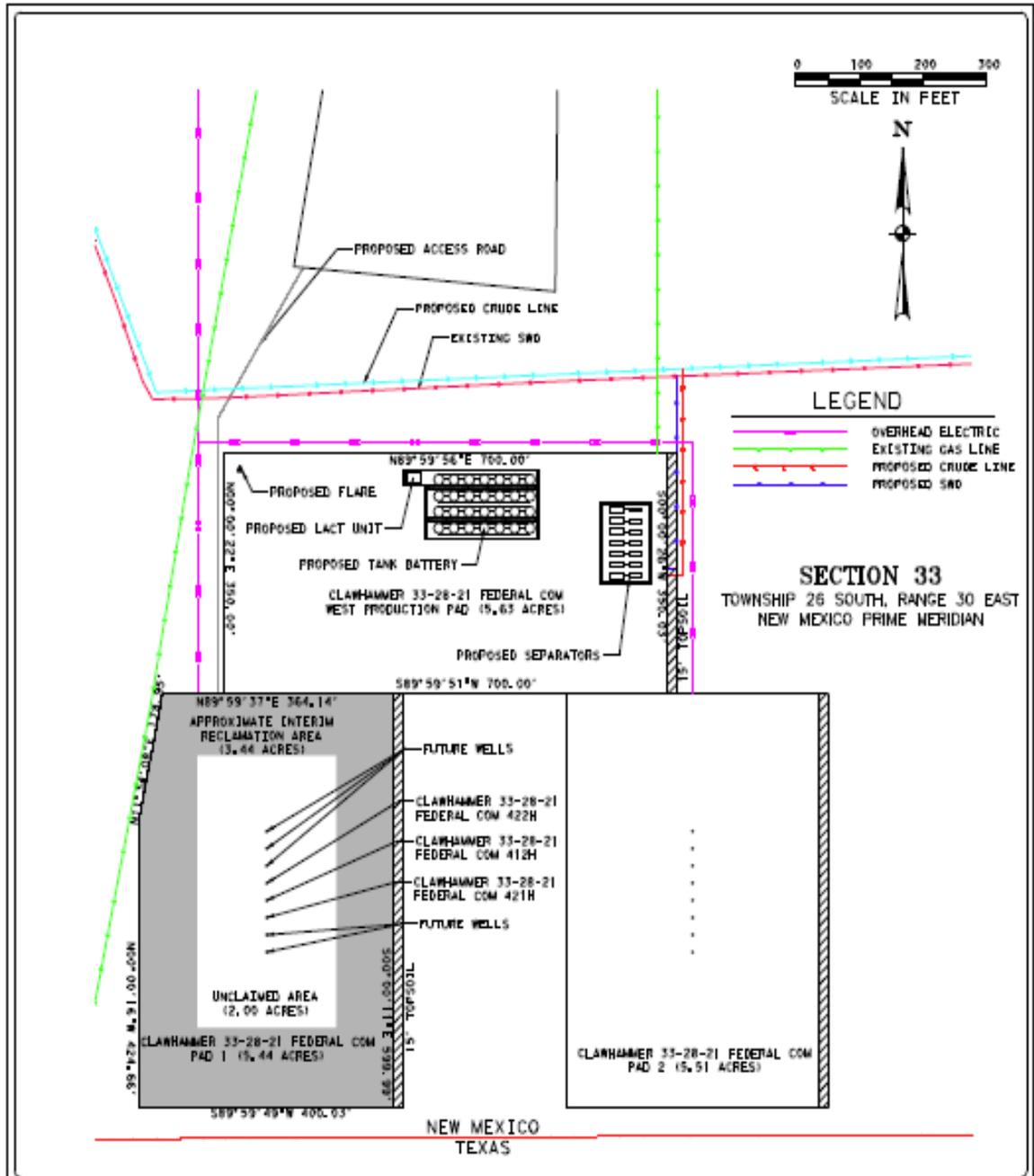
Homeland Security (New Mexico)	(505) 476-9600
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Regulatory Contacts

Local Emergency Planning Committee (LEPC)

Eddy County, Carlsbad, NM	(575) 885-3581
Lea County, Lovington, NM	(575) 396-8607
Chaves County, Roswell, NM	(575) 624-6140
Reeves County, Pecos, TX	(432) 447-3542
Loving County, Mentone, TX	(915) 377-2362
Winkler County, Kermit, TX	(432) 586-6658
Wheeler County, Wheeler, TX	(806) 826-3777
Texas Railroad Commission – District 8	(432) 684-5581
New Mexico Oil Conservation Division	(505) 476-3440
New Mexico Occupational Safety and Health Bureau (NM OSHA)	(505) 476-8700
Federal OSHA: Lubbock area office	(806) 472-7681
US BLM: Carlsbad, NM field office	(575) 234-5972
Federal Environmental Protection Agency: National Response Center (NRC)	(800) 424-8802





FSC INC
SURVEYORS • ENGINEERS

2205 WALNUT STREET / COLUMBUS, TX 76934
1.855.637.5725 / WWW.FSCINC.NET
TOWN OF PAD 1 (1987) / TOWN OF PAD 2 (1987)

RKI
Exploration & Production

RKD EXPLORATION & PRODUCTION, LLC
210 PARK AVENUE, STE 900
OKLAHOMA CITY, OK 73102

PERMITTING
PERMITTING REVIEW ONLY

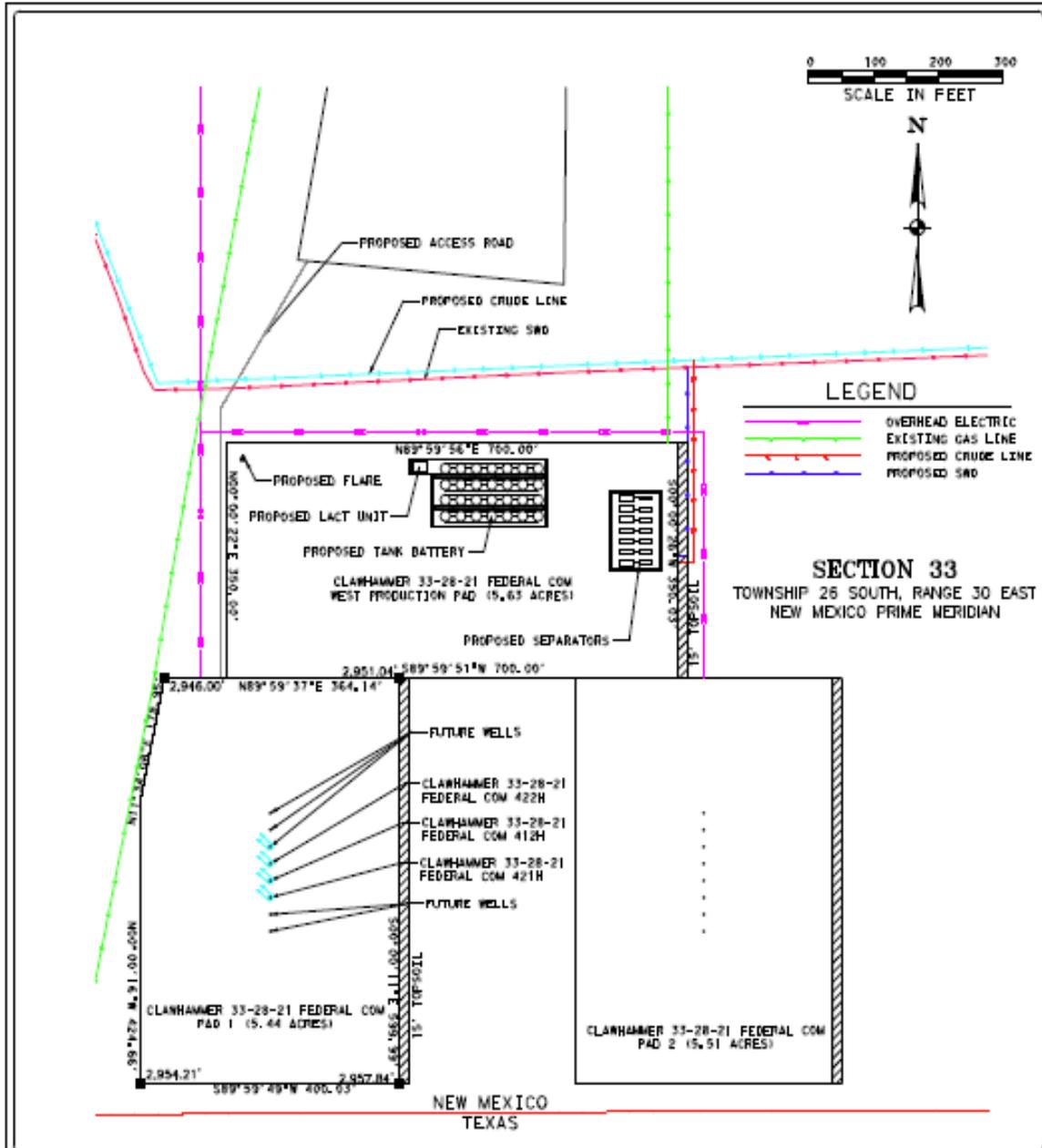
THESE DOCUMENTS ARE FOR PERMITTING REVIEW AND NOT FOR BIDDING OR CONSTRUCTION PURPOSES. THEY WERE PREPARED BY OR UNDER THE SUPERVISION OF:

KIRK E. LOWE 28827
NAME P.E. NO.
DATE 12/05/2018

CLAWHAMMER 33-28-21 FED COM
PROPOSED PAD 1
EDDY COUNTY, NEW MEXICO
BLM EXHIBIT 03
INTERIM RECLAMATION
CLAWHAMMER 422H, 412H, 421H

NO.	DATE	DESCRIPTION

Project No.	2018102007
Issue	12/05/18
Drawn By	FSC
Checked By	KL
SHEET	



FSC INC
SURVEYORS • ENGINEERS
2205 WALNUT STREET / COLUMBUS, TX 76934
1.855.637.5725 / WWW.FSCINC.NET
TSP# P254 # 17587 / TSP# S # 1302930

PERMITTING

PERMITTING REVIEW ONLY

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NRK E. LOWE 23827
NAME P.E. NO.
DATE 12/05/2018

CLAWHAMMER 33-28-21 FED COM PROPOSED PAD 1

EDDY COUNTY, NEW MEXICO

BLM EXHIBIT 01

WELL PLAT

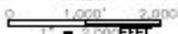
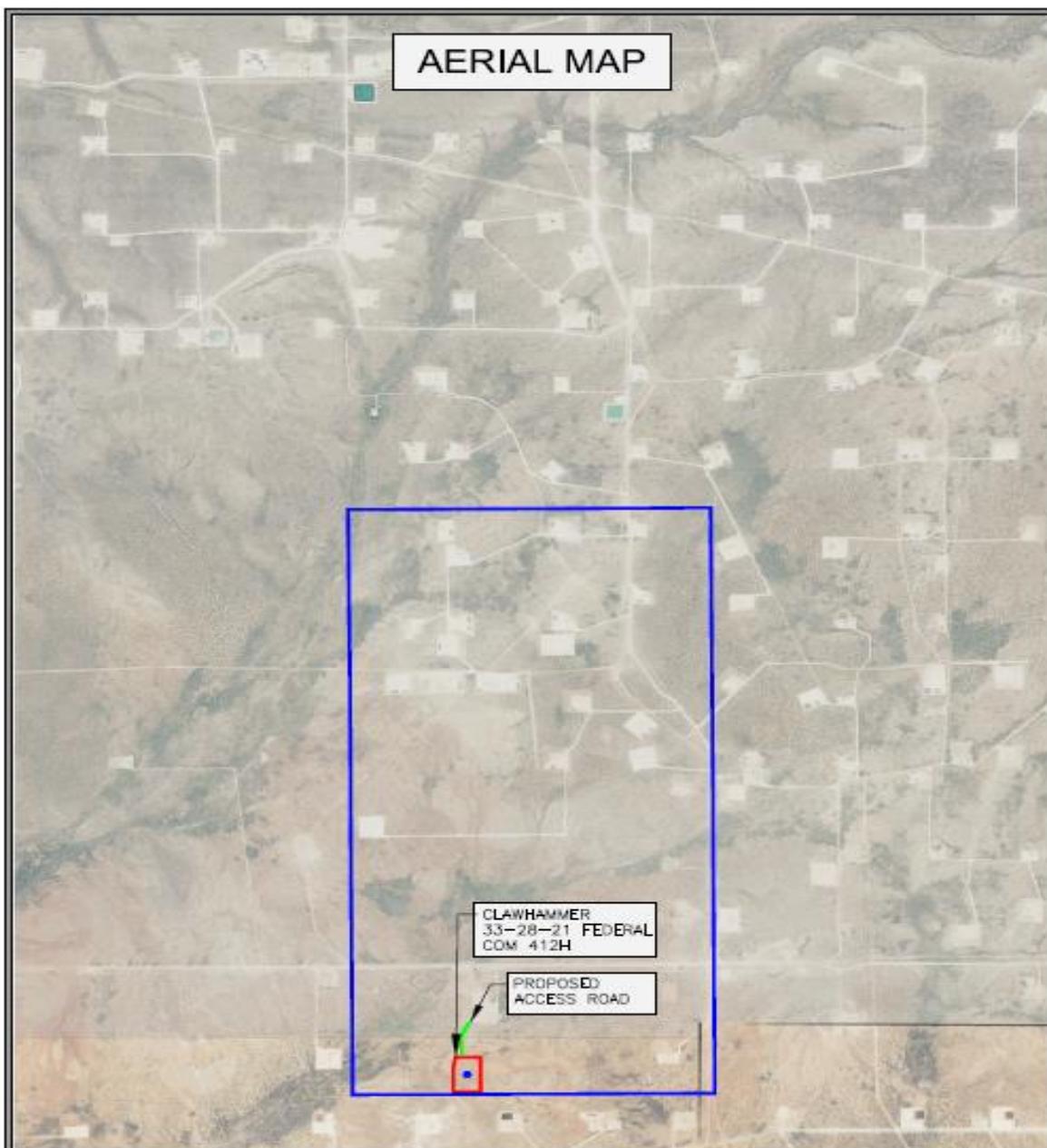
CLAWHAMMER 422H, 412H, 421H

NO.	DATE	DESCRIPTION

Project No.	2018102807
Issued	12/05/18
Drawn By	NSC
Checked By	NSC
Sheet	



RKI EXPLORATION & PRODUCTION, LLC
210 PARK AVENUE, STE 900
OKLAHOMA CITY, OK 73102



DRIVING DIRECTIONS FROM MALAGA, NEW MEXICO:

HEAD SOUTH ON US HIGHWAY 285 S FOR 12.5 MILES. TURN LEFT ON WHITEHORN RD FOR 3.5 MILES. PAST A CURVE FOR AN ADDITIONAL 0.6 MILES. TURN LEFT ON PIPELINE RD AND HEAD EAST FOR 6.1 MILES. TURN RIGHT ON LEASE ROAD AND HEAD SOUTH FOR 4.6 MILES. TURN RIGHT ON STATE LINE RD AND HEAD WEST FOR 0.7 MILES AND LOCATION IS TO THE SOUTH.

RKI EXPLORATION & PRODUCTION, LLC

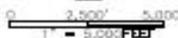
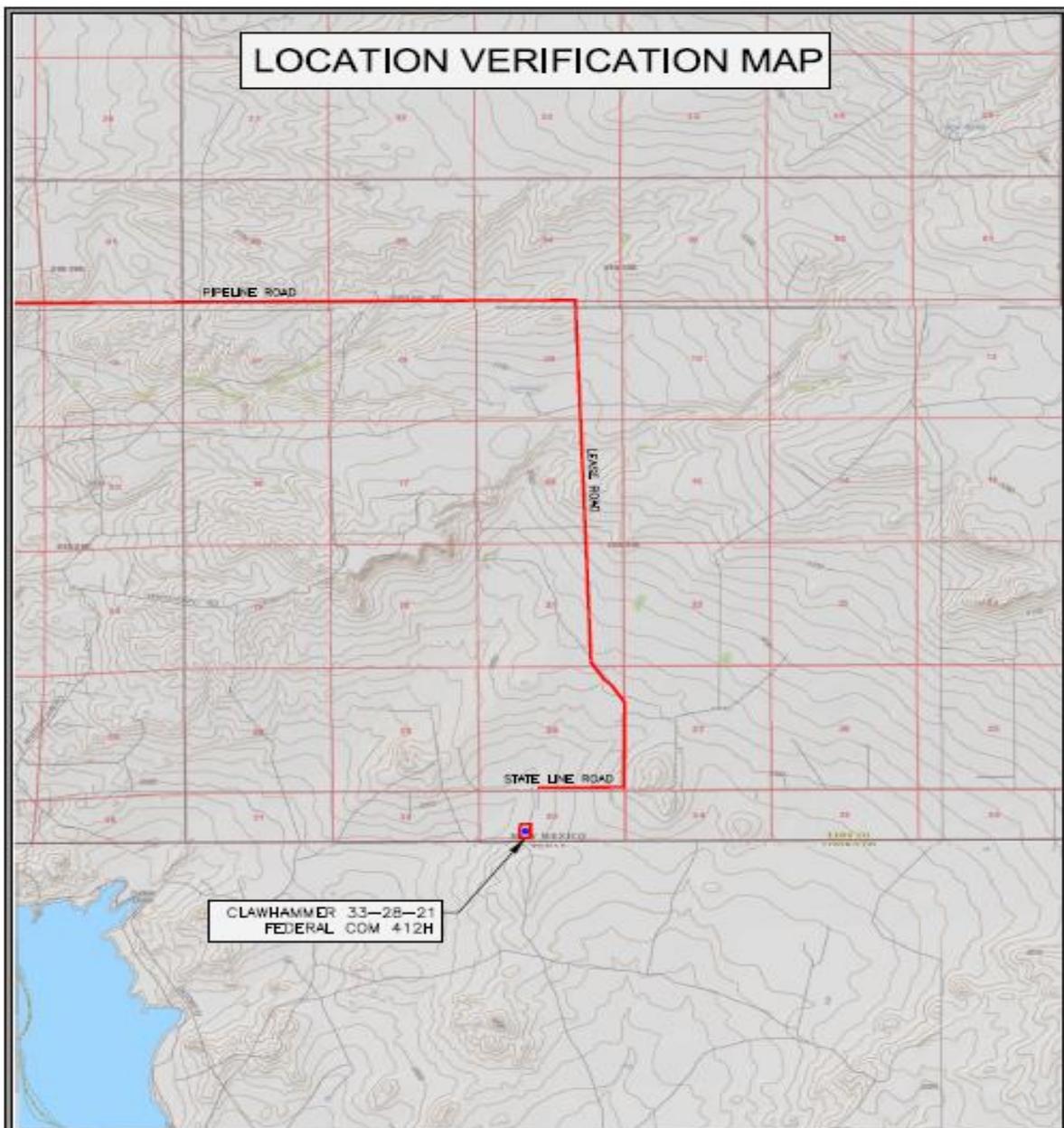
CLAWHAMMER 33-28-21 FEDERAL COM 412H
 LOCATED 345 FEET FROM THE SOUTH LINE
 AND 1,681 FEET FROM THE WEST LINE OF
 SECTION 33, TOWNSHIP 26 SOUTH, RANGE 30
 EAST, N.M.P.M. EDDY COUNTY, NEW MEXICO



550 Bailey Ave., 205 - Fort Worth, TX 76107
 Ph: 817.549.9888 - Fax: 979.752.5271
 TSPS: 47957 | TSPRS: 48495487
 www.fbcinc.net

DATE:	12-07-2018	PROJECT NO.:	2018100343
DRAWN BY:	ZJM	SCALE:	1" = 2,000'
CHECKED BY:	DM	SHEET:	1 OF 1
FIELD CREW:	BLND	REVISION:	0

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DRIVING DIRECTIONS FROM MALAGA, NEW MEXICO:

HEAD SOUTH ON US HIGHWAY 285 S FOR 12.5 MILES. TURN LEFT ON WHITEHORN RD FOR 3.5 MILES PAST A CURVE FOR AN ADDITIONAL 0.6 MILES. TURN LEFT ON PIPELINE RD AND HEAD EAST FOR 6.1 MILES. TURN RIGHT ON LEASE ROAD AND HEAD SOUTH FOR 4.6 MILES. TURN RIGHT ON STATE LINE RD AND HEAD WEST FOR 0.6 MILES AND LOCATION IS TO THE SOUTH.

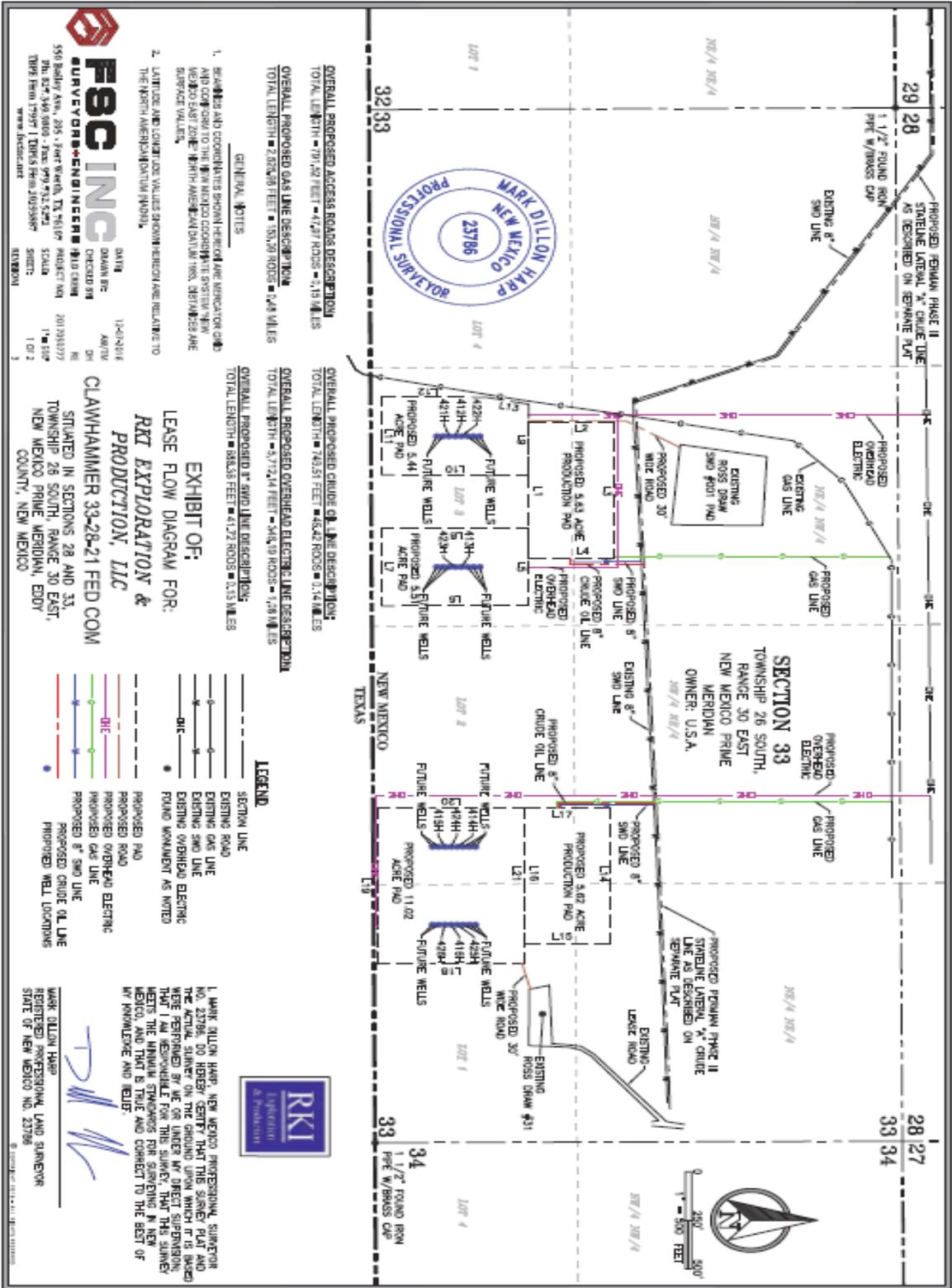
RKI EXPLORATION & PRODUCTION, LLC

CLAWHAMMER 33-28-21 FEDERAL COM 412H
LOCATED 345 FEET FROM THE SOUTH LINE
AND 1,681 FEET FROM THE WEST LINE OF
SECTION 33, TOWNSHIP 26 SOUTH, RANGE 30
EAST, N.M.P.M. EDDY COUNTY, NEW MEXICO



550 Bailey Ave., 205 - Fort Worth, TX 76107
Ph: 817.349.9800 - Fax: 979.752.6271
TXPA Firm 17957 | TXPEL Firm 18192687
www.fbcinc.net

DATE:	12-07-2018	PROJECT No:	20181022-03
DRAWN BY:	JCM	SCALE:	1" = 5,000'
CHECKED BY:	DM	SHEET:	1 OF 1
FIELD CREW:	SE/NO	REVISION:	



1. SCALERS AND CORRECTIONS SHOWN HEREON ARE NECESSARY TO BRING THE SURVEY INTO ACCORD WITH THE NEW MEXICO COORDINATE SYSTEM - NEW MEXICO EAST ZONE. WITH AN EARTHQUAKE IN 1963, SURVEYED ARE SURFACE VALUES.

2. LATITUDE AND LONGITUDE VALUES SHOWN HEREON ARE RELATIVE TO THE NORTH AMERICAN DATUM 1983.

OVERALL PROPOSED ACCESS ROADS DESCRIPTION
TOTAL LENGTH = 791.22 FEET = 4.97 ROADS = 4.15 MILES

OVERALL PROPOSED GAS LINE DESCRIPTION
TOTAL LENGTH = 2,826.85 FEET = 53.29 ROADS = 4.98 MILES

OVERALL PROPOSED OVERHEAD ELECTRIC LINE DESCRIPTION
TOTAL LENGTH = 745.57 FEET = 14.29 ROADS = 0.74 MILES

OVERALL PROPOSED 8" SAND LINE DESCRIPTION
TOTAL LENGTH = 2,724.4 FEET = 54.49 ROADS = 4.28 MILES

LEGEND

- EXISTING ROAD
- EXISTING GAS LINE
- EXISTING SAND LINE
- EXISTING OVERHEAD ELECTRIC
- PROPOSED ROAD
- PROPOSED GAS LINE
- PROPOSED SAND LINE
- PROPOSED OVERHEAD ELECTRIC
- PROPOSED CRUISE OIL LINE
- PROPOSED WELL LOCATIONS

EXHIBIT OF:
LEASE FLOW DIAGRAM FOR:
RRI EXPLORATION & PRODUCTION, LLC
CLAWHAMMER 33-26-21 FED COM

SITUATED IN SECTIONS 28 AND 33,
TOWNSHIP 26 SOUTH, RANGE 30 EAST,
NEW MEXICO PRIME MERIDIAN, EDDY
COUNTY, NEW MEXICO

MARK DILLON HARP
REGISTERED PROFESSIONAL LAND SURVEYOR
STATE OF NEW MEXICO NO. 23786



FBC INC
SURVEYORS & ENGINEERS
590 Butler Ave., 205 - East Wend, TX 76167
Ph: 817.349.9800 - Fax: 817.312.5221
THRU: 817.312.7187 | DRG'S FROM 20058887
www.fbcinc.com

DATE: 12/01/2018
DRAWN BY: AM/TV
CHECKED BY: NI
PROJECT NO: 2017010177
SCALE: 1" = 400'
SHEETS: 1 OF 2
REVISION: 3

MARK DILLON HARP
REGISTERED PROFESSIONAL SURVEYOR
STATE OF NEW MEXICO NO. 23786

MARK DILLON HARP, NEW MEXICO PROFESSIONAL SURVEYOR
FOR SECTION 33, TOWNSHIP 26 SOUTH, RANGE 30 EAST, NEW MEXICO PRIME MERIDIAN, EDDY COUNTY, NEW MEXICO, I HEREBY CERTIFY THAT THE SURVEY WAS MADE AND THE SURVEY IS ACCURATE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF.

MARK DILLON HARP
REGISTERED PROFESSIONAL LAND SURVEYOR
STATE OF NEW MEXICO NO. 23786

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 Rd., Aztec, NM 87410
 Phone:(505) 334-6178 Fax:(505) 334-6170

District IV
 1220 S. St Francis Dr., Santa Fe, NM 87505
 Phone:(505) 476-3470 Fax:(505) 476-3462

State of New Mexico
Energy, Minerals and Natural Resources
Oil Conservation Division
1220 S. St Francis Dr.
Santa Fe, NM 87505

COMMENTS

Action 133272

COMMENTS

Operator: WPX Energy Permian, LLC Devon Energy - Regulatory Oklahoma City, OK 73102	OGRID: 246289
	Action Number: 133272
	Action Type: [C-101] BLM - Federal/Indian Land Lease (Form 3160-3)

COMMENTS

Created By	Comment	Comment Date
kpickford	Defining well 30-015-49839 CLAWHAMMER 33 28 21 FEDERAL COM #414H	8/19/2022

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CONDITIONS

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CONDITIONS

Created By	Condition	Condition Date
kpickford	Notify OCD 24 hours prior to casing & cement	8/19/2022
kpickford	Will require a File As Drilled C-102 and a Directional Survey with the C-104	8/19/2022
kpickford	Once the well is spud, to prevent ground water contamination through whole or partial conduits from the surface, the operator shall drill without interruption through the fresh water zone or zones and shall immediately set in cement the water protection string	8/19/2022
kpickford	Cement is required to circulate on both surface and intermediate1 strings of casing	8/19/2022
kpickford	Oil base muds are not to be used until fresh water zones are cased and cemented providing isolation from the oil or diesel. This includes synthetic oils. Oil based mud, drilling fluids and solids must be contained in a steel closed loop system	8/19/2022