

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

OCD Artesia

FORM APPROVED
OMB No. 1004-0137
Expires: July 31, 2010

SUNDRY NOTICES AND REPORTS ON WELLS
Do not use this form for proposals to drill or to re-enter an abandoned well. Use Form 3160-3 (APD) for such proposals.

5. Lease Serial No.
NM NM 120349

6. If Indian, Allottee or Tribe Name
N/A

SUBMIT IN TRIPLICATE – Other instructions on page 2.

1. Type of Well

☒ Oil Well ☐ Gas Well ☐ Other

2. Name of Operator
MURCHISON OIL & GAS, INC.

3a. Address
1100 MIRA VISTA BLVD.
PLANO, TX 75093-4698

3b. Phone No. (include area code)
972-931-0700

7. If Unit of CA/Agreement, Name and/or No.
N/A

8. Well Name and No.
FROSTY FEDERAL COM #1

9. API Well No.
30-015-37003

10. Field and Pool or Exploratory Area
EMPIRE; WOLFCAMP, NORTHWEST

4. Location of Well (Footage, Sec., T., R., M., or Survey Description)
SHL: 2285' FNL & 330' FWL, SEC. 26, T16S, R27E, UNIT H
BHL: 2135' FNL & 330' FWL, SEC. 26, T16S, R27E, UNIT E

11. Country or Parish, State
EDDY COUNTY, NM

12. CHECK THE APPROPRIATE BOX(ES) TO INDICATE NATURE OF NOTICE, REPORT OR OTHER DATA

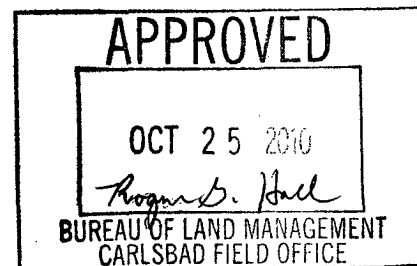
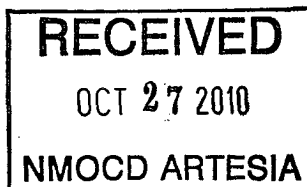
TYPE OF SUBMISSION	TYPE OF ACTION			
☒ Notice of Intent	☐ Acidize	☐ Deepen	☐ Production (Start/Resume)	☐ Water Shut-Off
☐ Subsequent Report	☐ Alter Casing	☐ Fracture Treat	☐ Reclamation	☐ Well Integrity
☐ Final Abandonment Notice	☐ Casing Repair	☐ New Construction	☐ Recomplete	☐ Other _____
	☒ Change Plans	☐ Plug and Abandon	☐ Temporarily Abandon	
	☐ Convert to Injection	☐ Plug Back	☐ Water Disposal	

13. Describe Proposed or Completed Operation: Clearly state all pertinent details, including estimated starting date of any proposed work and approximate duration thereof. If the proposal is to deepen directionally or recompleat horizontally, give subsurface locations and measured and true vertical depths of all pertinent markers and zones. Attach the Bond under which the work will be performed or provide the Bond No. on file with BLM/BIA. Required subsequent reports must be filed within 30 days following completion of the involved operations. If the operation results in a multiple completion or recompleat in a new interval, a Form 3160-4 must be filed once testing has been completed. Final Abandonment Notices must be filed only after all requirements, including reclamation, have been completed and the operator has determined that the site is ready for final inspection.)

Murchison Oil & Gas, Inc. respectfully requests to change the projected Bottom Hole Location (BHL) from the previously approved 2,285' FNL & 330' FWL, Sec. 26-T16S-R27E, Unit E to 2135' FNL & 330' FWL, Sec. 26-T16S-R27E, Unit E. A revised directional well plan is included. Additionally, we propose to change to previously approved casing and cementing program as described on the attached.

**SUBJECT TO LIKE
APPROVAL BY STATE**

Possible down-hole commingle
behind pipe (Abo)



**SEE ATTACHED FOR
CONDITIONS OF APPROVAL**

14. I hereby certify that the foregoing is true and correct. Name (Printed/Typed)

A. Arnold Nall

Title Vice President Operations

Signature

Date 09/14/2010

THIS SPACE FOR FEDERAL OR STATE OFFICE USE

Approved by

Title

Date

Conditions of approval, if any, are attached. Approval of this notice 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.

Office

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.

(Instructions on page 2)

Murchison Oil & Gas, Inc.
 Frosty Federal Com #1
 SHL: 2285' FNL & 330' FEL, Unit H
 BHL: 2135' FNL & 330' FWL, Unit E
 Section 26-T16S-R27E, Eddy Co., NM
 API # 30-015-37003

REVISED CASING AND CEMENTING PROGRAM

Hole Size	Casing Size	Wt./Ft.	Grade	Thread	Interval	Length	Condition
12-1/4"	9-5/8"	36.0#	J-55	ST&C	0'-1,100'	1,100'	New
8-3/4"	7"	26.0#	HC P-110	LT&C	0'-5,620'	5,620'	New
6-1/8"	4-1/2"	11.6#	HC P-110	BT&C	5,520'-10,746'	5,155'	New

MINIMUM CASING DESIGN FACTORS:

Burst = 1.0; Tensile Strength = 1.8; Collapse = 1.125
 An 8-3/4" vertical pilot hole is planned to be drilled to 6,550' ± MD/TVD. Upon running CNL/LDT/CAL/GR/MSFL/HALS/GR open hole logs, we plan to run a combination 2-7/8" fiberglass tubing x 7" intermediate casing with bottom of the 7" steel casing to be landed at ≤5,620'± to isolate with cement and plugback the vertical hole for drilling the horizontal.

See - CEMENTING PROGRAM:
 COA

9.625" Intermediate Casing - Cementing Program

Cement lead with 375 sacks of Extenda Cem™ System + additives with yield = 1.75 cu.ft./sack; followed by 220 sacks HalCem™ System + additives with yield = 1.35 cu.ft./sack tail slurry; sufficient volume of cement will be pumped to ensure cement is circulated to surface.

7" Production Casing and Fiberglass Tubing - Cementing Program

Cement lead with 960 sacks of EconoCem™ System + additives with yield = 1.83 cu.ft./sack, tail with 680 sacks HalCem™ System + additives with yield = 1.00 cu.ft./sack; sufficient volume of cement will be pumped to ensure cement is circulated to surface. Will cement below 7" casing via 2-7/8" fiberglass tubing stinger to adequately plug back vertical pilot hole after logging and prior to drilling curve/horizontal section of well.

4.5" Production Liner - Cementing Program

Plan to utilize 4-1/2" 11.6# HCP-110 BTC Peak completion liner system from RSB packer @ 5,520' to TD of 10,746' MD. No cement required.

PRESSURE CONTROL EQUIPMENT:

1100' – 10746' 11" 3000# ram type preventers with one set blind rams and one set pipe rams and a 3000# annular type preventer. A choke manifold and 120 gallon accumulator with floor and remote operating stations and auxiliary power system. Rotating head below 5500'.

A Kelly cock will be installed and maintained in operable condition and a drill string safety valve in the open position will be available on the rig floor.

Murchison Oil & Gas, Inc.
Frosty Federal Com #1
SHL: 2285' FNL & 330' FEL, Unit H
BHL: 2135' FNL & 330' FWL, Unit E
Section 26-T16S-R27E, Eddy Co., NM
API # 30-015-37003

After setting the '9 5/8" casing, the blowout preventers and related control equipment shall be pressure tested to 3000 psi and 1500 psi respectively. Any equipment failing to test satisfactorily shall be repaired or replaced. Results of the BOP test will be recorded in the Driller's Log.

The BOP's will be maintained ready for use until drilling operations are completed. Pipe and blind rams shall be activated each trip. Annular preventer shall be functionally operated at least weekly.

BOP drills will be conducted as necessary to assure that equipment is operational and each crew is properly trained to carry out emergency duties.

Accumulator shall maintain a pressure capacity reserve at all times to provide for the close-open-close sequence of the blind and pipe rams of the hydraulic preventers.

MUD PROGRAM

- | | |
|---------------|---|
| 0' - 1100' | Fresh water / native mud. Wt. 8.4 to 8.6 ppg, vis 28-34 sec, Lime for pH control. Paper for seepage. Lost circulation may be encountered. |
| 1100' - 6350' | Cut brine. Wt. 8.4 - 8.8 ppg, vis 28-29 sec, No control water loss, lime for pH control. |
| 6350' -10746' | Mud up with XCD Polymer mud system. Wt. 9.0 - 9.5 ppg, Vis 32-40 sec, WL 8-10 cc. |

Sufficient mud materials will be kept on location at all times in order to combat lost circulation, or unexpected kicks. In order to run open-hole logs and casing, the viscosity and water loss may have to be adjusted to meet these needs.

Mud system monitoring equipment with derrick floor indicators and visual / audio alarms shall be installed and operative prior to drilling into the Wolfcamp formation. This equipment will remain in use until the production casing is run and cemented. Monitoring equipment shall consist of the following:

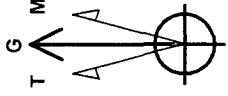
- A recording pit level indicator.
- A pit volume totalizer.
- A flowline sensor.

TESTING, LOGGING AND CORING PROGRAM

- | | |
|----|---|
| A. | Testing program: None planned. |
| B. | Mud logging program. Two man unit from 1,100' to TD. |
| C. | Electric logging program: CNL/LDT/CAL/GR, MSFL/HALS/GR. |
| D. | Coring program: None planned. |

See
COA

Murchison Oil & Gas



Project: Eddy County (NAD27)
 Site: Frosty Fed Com #1
 Well: Frosty #1
 Wellbore: OH
 Plan: Plan #2 (Frosty #1/OH)

PATHFINDER®

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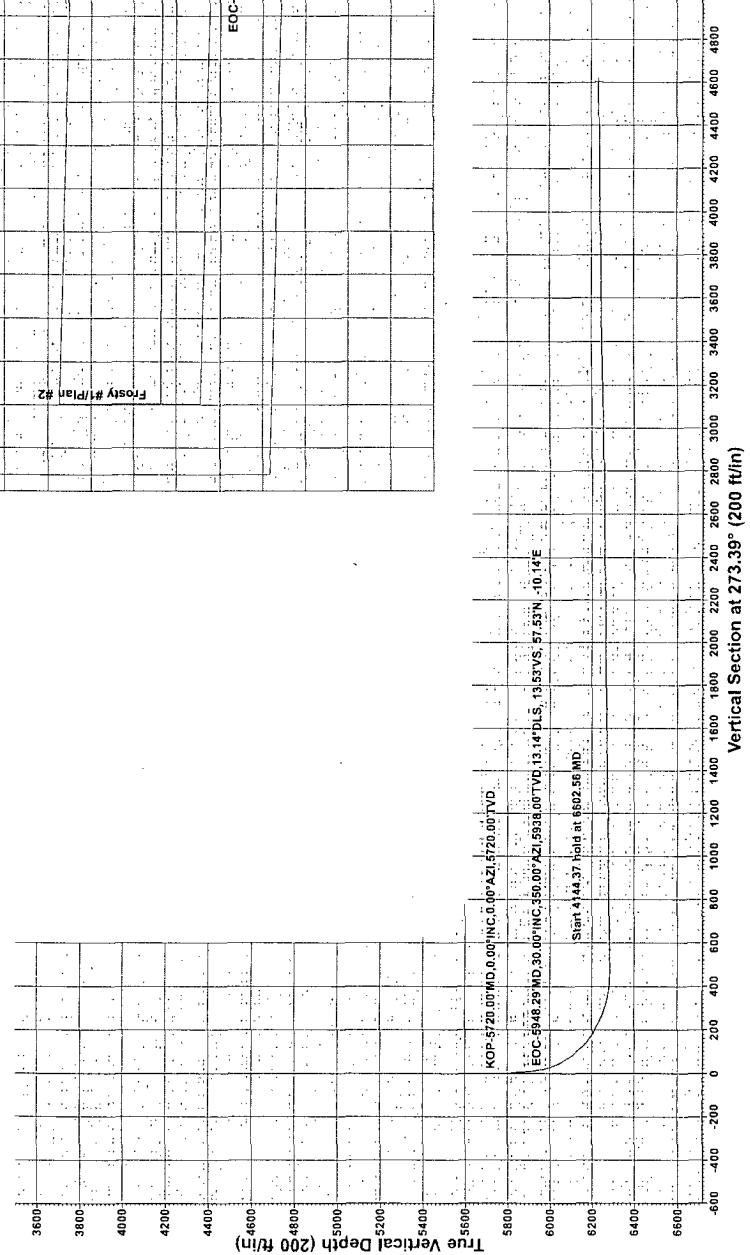
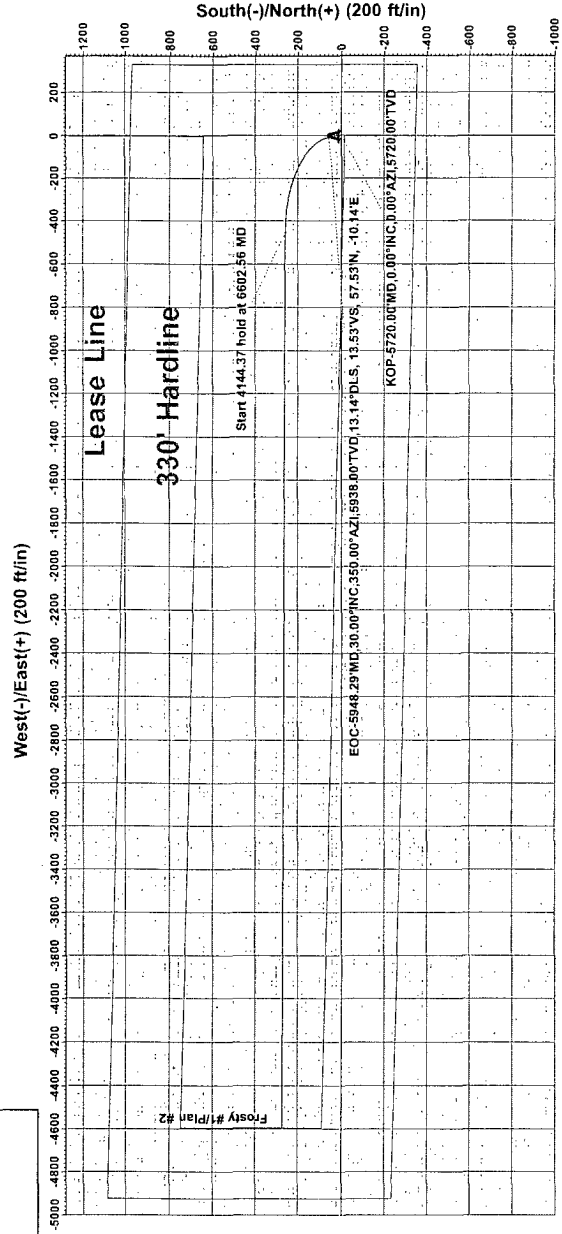
Magnetic Field
 Strength: 49095.5snT
 Dip Angle: 60.74°
 Date: 03/30/2010
 Model: IGRF200510

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N-S	+E-W	DLeg	TFace	VSec	Target
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	5720.00	0.00	0.00	5720.00	0.00	0.00	0.00	0.00	0.00	0.00
3	5948.29	30.00	350.00	5938.00	57.53	-10.14	13.14	350.00	13.53	0.00
4	6602.35	90.70	270.19	6284.00	258.41	-450.54	13.08	-80.81	465.03	0.00
5	6692.69	90.69	270.19	6282.90	258.71	-540.87	0.01	173.39	555.23	0.00
6	10746.94	90.69	270.19	6233.75	272.20	-4594.80	0.00	0.00	4602.86	PBHL(Frosty #1)

WELL DETAILS: Frosty #1

Ground Elevation::	3503.00
RKB Elevation: Well1 @ 3526.00ft (23' KB Depth Correction)	
Rig Name: 23' KB Depth Correction	
+N-S	0.00
+E-W	0.00
Northing	689077.200
Eastings	528173.900
Latitude	32° 53' 39.550 N
Longitude	104° 14' 29.566 W
Spot	



PROJECT DETAILS: Eddy County (NAD27)
 Geodetic System: US State Plane 1927 (Exact solution)
 Datum: NAD 1927 (NADCON CONUS)
 Ellipsoid: Clarke 1866
 Zone: New Mexico East 3001
 System Datum: Mean Sea Level
 Local North: Grid

Murchison Oil & Gas

Eddy County (NAD27)

Frosty Fed Com #1

Frosty #1

OH

Plan: Plan #2

Pathfinder X & Y Planning Report

03 September, 2010

PATHFINDER®

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Pathfinder

Pathfinder X & Y Planning Report



Company:	Murchison Oil & Gas	Local Co-ordinate Reference:	Well Frosty #1
Project:	Eddy County (NAD27)	TVD Reference:	Well1 @ 3526.00ft (23' KB Depth Correction)
Site:	Frosty Fed Com #1	MD Reference:	Well1 @ 3526.00ft (23' KB Depth Correction)
Well:	Frosty #1	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	Plan #2	Database:	Midland Database

Project	Eddy County (NAD27)	System Datum:	Mean Sea Level
Map System:	US State Plane 1927 (Exact solution)		
Geo Datum:	NAD 1927 (NADCON CONUS)		
Map Zone:	New Mexico East 3001		

Site	Frosty Fed Com #1		
Site Position:			
From:	Map	689,077.200 ft	Latitude: 32° 53' 39.550 N
Position Uncertainty:	0.00 ft	528,173.900 ft	Longitude: 104° 14' 29.566 W
			Grid Convergence: 0.05 °

Well	Frosty #1		
Well Position			
+N/-S	0.00 ft	689,077.200 ft	Latitude: 32° 53' 39.550 N
+E/-W	0.00 ft	528,173.900 ft	Longitude: 104° 14' 29.566 W
Position Uncertainty	0.00 ft		Ground Level: 3,503.00 ft

Wellbore	OH		
Magnetics			
Model Name	IGRF200510	Dip Angle (°)	60.74
Sample Date	03/30/2010	Field Strength (nT)	49,095
		Declination (°)	8.08

Design	Plan #2		
Audit Notes:			
Version:			
Phase:	PLAN	Tie On Depth:	0.00
Vertical Section:			
Depth From (TVD)	0.00	+N/-S (ft)	0.00
From (ft)		+E/-W (ft)	0.00
To (ft)		Direction (°)	273.39

Survey Tool Program	Date	09/03/2010	
From (ft)			
To (ft)			
Survey (Wellbore)			
Tool Name	MWD	Description	MWD - Standard
0.00	10,746.58	Plan #2 (OH)	

Pathfinder

Pathfinder X & Y Planning Report



A Schlumberger Company

Company: Murchison Oil & Gas
 Project: Eddy County (NAD27)
 Site: Frosty Fed Com #1
 Well: Frosty #1
 Wellbore: OH
 Design: Plan #2

Local Co-ordinate Reference: Well Frosty #1
 TVD Reference: Well1 @ 3526.00ft (23' KB Depth Correction)
 MD Reference: Well1 @ 3526.00ft (23' KB Depth Correction)
 North Reference: Grid
 Survey Calculation Method: Minimum Curvature
 Database: Midland Database

Planned Survey

MD (ft)	Inc (°)	Azi (°)	TVD (ft)	TVDSS (ft)	N/S (ft)	E/W (ft)	V. Sec (ft)	DLeg (°/100ft)	Northing (ft)	Easting (ft)
0.00	0.00	0.00	0.00	-3.526.00	0.00	0.00	0.00	0.00	689,077.20	528,173.90
100.00	0.00	0.00	100.00	-3.426.00	0.00	0.00	0.00	0.00	689,077.20	528,173.90
200.00	0.00	0.00	200.00	-3.326.00	0.00	0.00	0.00	0.00	689,077.20	528,173.90
300.00	0.00	0.00	300.00	-3.226.00	0.00	0.00	0.00	0.00	689,077.20	528,173.90
400.00	0.00	0.00	400.00	-3.126.00	0.00	0.00	0.00	0.00	689,077.20	528,173.90
500.00	0.00	0.00	500.00	-3.026.00	0.00	0.00	0.00	0.00	689,077.20	528,173.90
600.00	0.00	0.00	600.00	-2.926.00	0.00	0.00	0.00	0.00	689,077.20	528,173.90
700.00	0.00	0.00	700.00	-2.826.00	0.00	0.00	0.00	0.00	689,077.20	528,173.90
800.00	0.00	0.00	800.00	-2.726.00	0.00	0.00	0.00	0.00	689,077.20	528,173.90
900.00	0.00	0.00	900.00	-2.626.00	0.00	0.00	0.00	0.00	689,077.20	528,173.90
1,000.00	0.00	0.00	1,000.00	-2.526.00	0.00	0.00	0.00	0.00	689,077.20	528,173.90
1,100.00	0.00	0.00	1,100.00	-2.426.00	0.00	0.00	0.00	0.00	689,077.20	528,173.90
1,200.00	0.00	0.00	1,200.00	-2.326.00	0.00	0.00	0.00	0.00	689,077.20	528,173.90
1,300.00	0.00	0.00	1,300.00	-2.226.00	0.00	0.00	0.00	0.00	689,077.20	528,173.90
1,400.00	0.00	0.00	1,400.00	-2.126.00	0.00	0.00	0.00	0.00	689,077.20	528,173.90
1,500.00	0.00	0.00	1,500.00	-2.026.00	0.00	0.00	0.00	0.00	689,077.20	528,173.90
1,600.00	0.00	0.00	1,600.00	-1.926.00	0.00	0.00	0.00	0.00	689,077.20	528,173.90
1,700.00	0.00	0.00	1,700.00	-1.826.00	0.00	0.00	0.00	0.00	689,077.20	528,173.90
1,800.00	0.00	0.00	1,800.00	-1.726.00	0.00	0.00	0.00	0.00	689,077.20	528,173.90
1,900.00	0.00	0.00	1,900.00	-1.626.00	0.00	0.00	0.00	0.00	689,077.20	528,173.90
2,000.00	0.00	0.00	2,000.00	-1.526.00	0.00	0.00	0.00	0.00	689,077.20	528,173.90
2,100.00	0.00	0.00	2,100.00	-1.426.00	0.00	0.00	0.00	0.00	689,077.20	528,173.90
2,200.00	0.00	0.00	2,200.00	-1.326.00	0.00	0.00	0.00	0.00	689,077.20	528,173.90
2,300.00	0.00	0.00	2,300.00	-1.226.00	0.00	0.00	0.00	0.00	689,077.20	528,173.90
2,400.00	0.00	0.00	2,400.00	-1.126.00	0.00	0.00	0.00	0.00	689,077.20	528,173.90
2,500.00	0.00	0.00	2,500.00	-1.026.00	0.00	0.00	0.00	0.00	689,077.20	528,173.90
2,600.00	0.00	0.00	2,600.00	-926.00	0.00	0.00	0.00	0.00	689,077.20	528,173.90

Pathfinder

Pathfinder X & Y Planning Report



A Schlumberger Company

Company: Murchison Oil & Gas
Project: Eddy County (NAD27)
Site: Frosty Fed Com #1
Well: Frosty #1
Wellbore: OH
Design: Plan #2

Local Co-ordinate Reference:
TVD Reference: Well1 @ 3526.00ft (23' KB Depth Correction)
MD Reference: Well1 @ 3526.00ft (23' KB Depth Correction)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: Midland Database

Well Frosty #1

Well1 @ 3526.00ft (23' KB Depth Correction)
 Well1 @ 3526.00ft (23' KB Depth Correction)

Grid

Minimum Curvature

Midland Database

Planned Survey

MD (ft)	Inc (°)	Azi (°)	TVD (ft)	TVDSS (ft)	N/S (ft)	E/W (ft)	V. Sec (ft)	DLeg (°/100ft)	Northing (ft)	Easting (ft)
2,700.00	0.00	0.00	2,700.00	-826.00	0.00	0.00	0.00	0.00	689,077.20	528,173.90
2,800.00	0.00	0.00	2,800.00	-726.00	0.00	0.00	0.00	0.00	689,077.20	528,173.90
2,900.00	0.00	0.00	2,900.00	-626.00	0.00	0.00	0.00	0.00	689,077.20	528,173.90
3,000.00	0.00	0.00	3,000.00	-526.00	0.00	0.00	0.00	0.00	689,077.20	528,173.90
3,100.00	0.00	0.00	3,100.00	-426.00	0.00	0.00	0.00	0.00	689,077.20	528,173.90
3,200.00	0.00	0.00	3,200.00	-326.00	0.00	0.00	0.00	0.00	689,077.20	528,173.90
3,300.00	0.00	0.00	3,300.00	-226.00	0.00	0.00	0.00	0.00	689,077.20	528,173.90
3,400.00	0.00	0.00	3,400.00	-126.00	0.00	0.00	0.00	0.00	689,077.20	528,173.90
3,500.00	0.00	0.00	3,500.00	-26.00	0.00	0.00	0.00	0.00	689,077.20	528,173.90
3,600.00	0.00	0.00	3,600.00	74.00	0.00	0.00	0.00	0.00	689,077.20	528,173.90
3,700.00	0.00	0.00	3,700.00	174.00	0.00	0.00	0.00	0.00	689,077.20	528,173.90
3,800.00	0.00	0.00	3,800.00	274.00	0.00	0.00	0.00	0.00	689,077.20	528,173.90
3,900.00	0.00	0.00	3,900.00	374.00	0.00	0.00	0.00	0.00	689,077.20	528,173.90
4,000.00	0.00	0.00	4,000.00	474.00	0.00	0.00	0.00	0.00	689,077.20	528,173.90
4,100.00	0.00	0.00	4,100.00	574.00	0.00	0.00	0.00	0.00	689,077.20	528,173.90
4,200.00	0.00	0.00	4,200.00	674.00	0.00	0.00	0.00	0.00	689,077.20	528,173.90
4,300.00	0.00	0.00	4,300.00	774.00	0.00	0.00	0.00	0.00	689,077.20	528,173.90
4,400.00	0.00	0.00	4,400.00	874.00	0.00	0.00	0.00	0.00	689,077.20	528,173.90
4,500.00	0.00	0.00	4,500.00	974.00	0.00	0.00	0.00	0.00	689,077.20	528,173.90
4,600.00	0.00	0.00	4,600.00	1,074.00	0.00	0.00	0.00	0.00	689,077.20	528,173.90
4,700.00	0.00	0.00	4,700.00	1,174.00	0.00	0.00	0.00	0.00	689,077.20	528,173.90
4,800.00	0.00	0.00	4,800.00	1,274.00	0.00	0.00	0.00	0.00	689,077.20	528,173.90
4,900.00	0.00	0.00	4,900.00	1,374.00	0.00	0.00	0.00	0.00	689,077.20	528,173.90
5,000.00	0.00	0.00	5,000.00	1,474.00	0.00	0.00	0.00	0.00	689,077.20	528,173.90
5,100.00	0.00	0.00	5,100.00	1,574.00	0.00	0.00	0.00	0.00	689,077.20	528,173.90
5,200.00	0.00	0.00	5,200.00	1,674.00	0.00	0.00	0.00	0.00	689,077.20	528,173.90
5,300.00	0.00	0.00	5,300.00	1,774.00	0.00	0.00	0.00	0.00	689,077.20	528,173.90

Pathfinder

Pathfinder X & Y Planning Report



A Schlumberger Company

Company:	Murchison Oil & Gas	Local Co-ordinate Reference:	Well Frosty #1
Project:	Eddy County (NAD27)	TVD Reference:	Well1 @ 3526.00ft (23' KB Depth Correction)
Site:	Frosty Fed Com #1	MD Reference:	Well1 @ 3526.00ft (23' KB Depth Correction)
Well:	Frosty #1	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	Plan #2	Database:	Midland Database

Planned Survey

MD (ft)	Inc (°)	Azi (°)	TVD (ft)	TVDSS (ft)	N/S (ft)	EW (ft)	V. Sec (ft)	D Leg (°/100ft)	Northing (ft)	Easting (ft)
5,400.00	0.00	0.00	5,400.00	1,874.00	0.00	0.00	0.00	0.00	689,077.20	528,173.90
5,500.00	0.00	0.00	5,500.00	1,974.00	0.00	0.00	0.00	0.00	689,077.20	528,173.90
5,600.00	0.00	0.00	5,600.00	2,074.00	0.00	0.00	0.00	0.00	689,077.20	528,173.90
5,700.00	0.00	0.00	5,700.00	2,174.00	0.00	0.00	0.00	0.00	689,077.20	528,173.90
5,720.00	0.00	0.00	5,720.00	2,194.00	0.00	0.00	0.00	0.00	689,077.20	528,173.90
KOP-5720.00°MD,0.00°INC,0.00°AZI,5720.00°TVD										
5,725.00	0.66	350.00	5,725.00	2,199.00	0.03	0.00	0.01	13.14	689,077.23	528,173.90
5,750.00	3.94	350.00	5,749.98	2,223.98	1.02	-0.18	0.24	13.14	689,078.22	528,173.72
5,775.00	7.23	350.00	5,774.85	2,248.85	3.41	-0.60	0.80	13.14	689,080.61	528,173.30
5,800.00	10.51	350.00	5,799.55	2,273.55	7.21	-1.27	1.69	13.14	689,084.41	528,172.63
5,825.00	13.80	350.00	5,823.99	2,297.99	12.39	-2.18	2.91	13.14	689,089.59	528,171.72
5,850.00	17.08	350.00	5,848.08	2,322.08	18.95	-3.34	4.46	13.14	689,096.15	528,170.56
5,875.00	20.37	350.00	5,871.76	2,345.76	26.85	-4.73	6.31	13.14	689,104.05	528,169.17
5,900.00	23.65	350.00	5,894.93	2,368.93	36.07	-6.36	8.48	13.14	689,113.27	528,167.54
5,925.00	26.94	350.00	5,917.53	2,391.53	46.59	-8.22	10.96	13.14	689,123.79	528,165.68
5,948.29	30.00	350.00	5,938.00	2,412.00	57.53	-10.14	13.53	13.14	689,134.73	528,163.76
EOC-5948.29°MD,30.00°INC,350.00°AZI,5938.00°TVD,13.14°DLS, 13.53°VS, 57.53°N, -10.14°E										
5,950.00	30.04	349.56	5,939.48	2,413.48	58.37	-10.30	13.73	13.08	689,135.57	528,163.60
5,975.00	30.73	343.24	5,961.05	2,435.05	70.64	-13.27	17.43	13.08	689,147.84	528,160.63
6,000.00	31.72	337.23	5,982.44	2,456.44	82.82	-17.66	22.53	13.08	689,160.02	528,156.24
6,025.00	32.98	331.58	6,003.56	2,477.56	94.87	-23.44	29.01	13.08	689,172.07	528,150.46
6,050.00	34.47	326.34	6,024.36	2,498.36	106.75	-30.60	36.86	13.08	689,183.95	528,143.30
6,075.00	36.17	321.51	6,044.76	2,518.76	118.41	-39.12	46.05	13.08	689,195.61	528,134.78
6,100.00	38.05	317.07	6,064.70	2,538.70	129.83	-48.96	56.55	13.08	689,207.03	528,124.94
6,125.00	40.08	313.00	6,084.11	2,558.11	140.96	-60.10	68.33	13.08	689,218.16	528,113.80
6,150.00	42.24	309.27	6,102.94	2,576.94	151.77	-72.49	81.34	13.08	689,228.97	528,101.41
6,175.00	44.51	305.85	6,121.11	2,595.11	162.23	-86.10	95.54	13.08	689,239.43	528,087.80

Pathfinder

Pathfinder X & Y Planning Report



A Schlumberger Company

Company: Murchison Oil & Gas
Project: Eddy County (NAD27)
Site: Frosty Fed Com #1
Well: Frosty #1
Wellbore: OH
Design: Plan #2

Local Co-ordinate Reference: Well Frosty #1
TVD Reference: Well1 @ 3526.00ft (23' KB Depth Correction)
MD Reference: Well1 @ 3526.00ft (23' KB Depth Correction)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: Midland Database

Planned Survey

MD (ft)	Inc (°)	Azi (°)	TVD (ft)	TVDSS (ft)	N/S (ft)	E/W (ft)	V. Sec (ft)	D/Leg (°/100ft)	Northing (ft)	Easting (ft)
6,200.00	46.88	302.70	6,138.57	2,612.57	172.29	-100.89	110.90	13.08	689,249.49	528,073.01
6,225.00	49.32	299.78	6,155.27	2,629.27	181.93	-116.80	127.35	13.08	689,259.13	528,057.10
6,250.00	51.84	297.07	6,171.15	2,645.15	191.11	-133.78	144.85	13.08	689,268.31	528,040.12
6,275.00	54.41	294.55	6,186.15	2,660.15	199.81	-151.78	163.33	13.08	689,277.01	528,022.12
6,300.00	57.03	292.19	6,200.23	2,674.23	208.00	-170.74	182.74	13.08	689,285.20	528,003.16
6,325.00	59.69	289.96	6,213.34	2,687.34	215.65	-190.60	203.02	13.08	689,292.85	527,983.30
6,350.00	62.39	287.85	6,225.45	2,699.45	222.73	-211.30	224.10	13.08	689,299.93	527,962.60
6,375.00	65.12	285.84	6,236.50	2,710.50	229.22	-232.75	245.90	13.08	689,306.42	527,941.15
6,400.00	67.88	283.93	6,246.47	2,720.47	235.11	-254.91	268.37	13.08	689,312.31	527,918.99
6,425.00	70.66	282.08	6,255.32	2,729.32	240.36	-277.69	291.42	13.08	689,317.56	527,896.21
6,450.00	73.45	280.30	6,263.02	2,737.02	244.97	-301.02	314.98	13.08	689,322.17	527,872.88
6,475.00	76.26	278.56	6,269.55	2,743.55	248.92	-324.82	338.97	13.08	689,326.12	527,849.08
6,500.00	79.08	276.87	6,274.89	2,748.89	252.20	-349.02	363.32	13.08	689,329.40	527,824.88
6,525.00	81.91	275.21	6,279.02	2,753.02	254.80	-373.54	387.95	13.08	689,332.00	527,800.36
6,550.00	84.75	273.58	6,281.92	2,755.92	256.70	-398.29	412.77	13.08	689,333.90	527,775.61
6,575.00	87.59	271.96	6,283.59	2,757.59	257.90	-423.20	437.71	13.08	689,335.10	527,750.70
6,602.35	90.70	270.19	6,284.00	2,758.00	258.41	-450.54	465.03	13.08	689,335.61	527,723.36
6,602.56	90.70	270.19	6,284.00	2,758.00	258.41	-450.75	465.25	0.00	689,335.61	527,723.15
Start 4144.37 hold at 6602.56 MD										
6,692.69	90.69	270.19	6,282.90	2,756.90	258.71	-540.87	555.23	0.01	689,335.91	527,633.03
6,700.00	90.69	270.19	6,282.81	2,756.81	258.74	-548.18	562.52	0.00	689,335.94	527,625.72
6,800.00	90.69	270.19	6,281.60	2,755.60	259.07	-648.17	662.36	0.00	689,336.27	527,525.73
6,900.00	90.69	270.19	6,280.39	2,754.39	259.40	-748.17	762.20	0.00	689,336.60	527,425.73
7,000.00	90.69	270.19	6,279.17	2,753.17	259.73	-848.16	862.03	0.00	689,336.93	527,325.74
7,100.00	90.69	270.19	6,277.96	2,751.96	260.07	-948.15	961.87	0.00	689,337.27	527,225.75
7,200.00	90.69	270.19	6,276.75	2,750.75	260.40	-1,048.14	1,061.71	0.00	689,337.60	527,125.76
7,300.00	90.69	270.19	6,275.54	2,749.54	260.73	-1,148.13	1,161.54	0.00	689,337.93	527,025.77

Pathfinder

Pathfinder X & Y Planning Report



A Schlumberger Company

Company: Murchison Oil & Gas
Project: Eddy County (NAD27)
Site: Frosty Fed Com #1
Well: Frosty #1
Wellbore: OH
Design: Plan #2

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

Well Frosty #1
Well1 @ 3526.00ft (23' KB Depth Correction)
Well1 @ 3526.00ft (23' KB Depth Correction)
Grid
Minimum Curvature
Midland Database

Planned Survey

MD (ft)	Inc (°)	Azi (°)	TVD (ft)	TVDSS (ft)	N/S (ft)	E/W (ft)	V. Sec (ft)	D Leg (°/100ft)	Northing (ft)	Easting (ft)
7,400.00	90.69	270.19	6,274.33	2,748.33	261.07	-1,248.13	1,261.38	0.00	689,338.27	526,925.77
7,500.00	90.69	270.19	6,273.11	2,747.11	261.40	-1,348.12	1,361.22	0.00	689,338.60	526,825.78
7,600.00	90.69	270.19	6,271.90	2,745.90	261.73	-1,448.11	1,461.05	0.00	689,338.93	526,725.79
7,700.00	90.69	270.19	6,270.69	2,744.69	262.06	-1,548.10	1,560.89	0.00	689,339.26	526,625.80
7,800.00	90.69	270.19	6,269.48	2,743.48	262.40	-1,648.09	1,660.73	0.00	689,339.60	526,525.81
7,900.00	90.69	270.19	6,268.26	2,742.26	262.73	-1,748.09	1,760.56	0.00	689,339.93	526,425.81
8,000.00	90.69	270.19	6,267.05	2,741.05	263.06	-1,848.08	1,860.40	0.00	689,340.26	526,325.82
8,100.00	90.69	270.19	6,265.84	2,739.84	263.39	-1,948.07	1,960.24	0.00	689,340.59	526,225.83
8,200.00	90.69	270.19	6,264.63	2,738.63	263.73	-2,048.06	2,060.07	0.00	689,340.93	526,125.84
8,300.00	90.69	270.19	6,263.41	2,737.41	264.06	-2,148.05	2,159.91	0.00	689,341.26	526,025.85
8,400.00	90.69	270.19	6,262.20	2,736.20	264.39	-2,248.05	2,259.75	0.00	689,341.59	525,925.85
8,500.00	90.69	270.19	6,260.99	2,734.99	264.73	-2,348.04	2,359.58	0.00	689,341.93	525,825.86
8,600.00	90.69	270.19	6,259.78	2,733.78	265.06	-2,448.03	2,459.42	0.00	689,342.26	525,725.87
8,700.00	90.69	270.19	6,258.57	2,732.57	265.39	-2,548.02	2,559.26	0.00	689,342.59	525,625.88
8,800.00	90.69	270.19	6,257.35	2,731.35	265.72	-2,648.02	2,659.09	0.00	689,342.92	525,525.88
8,900.00	90.69	270.19	6,256.14	2,730.14	266.06	-2,748.01	2,758.93	0.00	689,343.26	525,425.89
9,000.00	90.69	270.19	6,254.93	2,728.93	266.39	-2,848.00	2,858.77	0.00	689,343.59	525,325.90
9,100.00	90.69	270.19	6,253.72	2,727.72	266.72	-2,947.99	2,958.61	0.00	689,343.92	525,225.91
9,200.00	90.69	270.19	6,252.50	2,726.50	267.05	-3,047.98	3,058.44	0.00	689,344.25	525,125.92
9,300.00	90.69	270.19	6,251.29	2,725.29	267.39	-3,147.98	3,158.28	0.00	689,344.59	525,025.92
9,400.00	90.69	270.19	6,250.08	2,724.08	267.72	-3,247.97	3,258.12	0.00	689,344.92	524,925.93
9,500.00	90.69	270.19	6,248.87	2,722.87	268.05	-3,347.96	3,357.95	0.00	689,345.25	524,825.94
9,600.00	90.69	270.19	6,247.65	2,721.65	268.38	-3,447.95	3,457.79	0.00	689,345.58	524,725.95
9,700.00	90.69	270.19	6,246.44	2,720.44	268.72	-3,547.94	3,557.63	0.00	689,345.92	524,625.96
9,800.00	90.69	270.19	6,245.23	2,719.23	269.05	-3,647.94	3,657.46	0.00	689,346.25	524,525.96
9,900.00	90.69	270.19	6,244.02	2,718.02	269.38	-3,747.93	3,757.30	0.00	689,346.58	524,425.97
10,000.00	90.69	270.19	6,242.81	2,716.81	269.72	-3,847.92	3,857.14	0.00	689,346.92	524,325.98

Pathfinder

Pathfinder X & Y Planning Report

Company:	Murchison Oil & Gas	Local Co-ordinate Reference:	Well Frosty #1
Project:	Eddy County (NAD27)	TVD Reference:	Well1 @ 3526.00ft (23' KB Depth Correction)
Site:	Frosty Fed Com #1	MD Reference:	Well1 @ 3526.00ft (23' KB Depth Correction)
Well:	Frosty #1	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	Plan #2		Midland Database

Planned Survey										
MD (ft)	Inc (°)	Azi (°)	TVD (ft)	TVDSS (ft)	N/S (ft)	E/W (ft)	V. Sec (ft)	D/Leg (°/100ft)	Northing (ft)	Easting (ft)
10,100.00	90.69	270.19	6,241.59	2,715.59	270.05	-3,947.91	3,956.97	0.00	689,347.25	524,225.99
10,200.00	90.69	270.19	6,240.38	2,714.38	270.38	-4,047.90	4,056.81	0.00	689,347.58	524,126.00
10,300.00	90.69	270.19	6,239.17	2,713.17	270.71	-4,147.90	4,156.65	0.00	689,347.91	524,026.00
10,400.00	90.69	270.19	6,237.96	2,711.96	271.05	-4,247.89	4,256.48	0.00	689,348.25	523,926.01
10,500.00	90.69	270.19	6,236.74	2,710.74	271.38	-4,347.88	4,356.32	0.00	689,348.58	523,826.02
10,600.00	90.69	270.19	6,235.53	2,709.53	271.71	-4,447.87	4,456.16	0.00	689,348.91	523,726.03
10,700.00	90.69	270.19	6,234.32	2,708.32	272.04	-4,547.87	4,555.99	0.00	689,349.24	523,626.03
10,746.94	90.69	270.19	6,233.75	2,707.75	272.20	-4,594.80	4,602.86	0.00	689,349.40	523,579.10
TD at 10746.94 - PBHL(Frosty #1)										

Targets					
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)
PBHL(Frosty #1)	0.00	0.00	6,233.75	272.20	-4,594.80
- plan hits target center					
- Point					

Plan Annotations				
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates +N/-S (ft)	+E/-W (ft)	Comment
5,720.00	5,720.00	0.00	0.00	KOP-5720.00MD,0.00°INC,0.00°AZI,5720.00TVD
5,948.29	5,938.00	57.53	-10.14	EOC-5948.29MD,30.00°INC,350.00°AZI,5938.00TVD,13.14°DLS,13.1
-6,602.56	6,284.00	258.41	-450.75	Start 4144.37 hold at 6602.56 MD
10,746.94	6,233.75	272.20	-4,594.80	TD at 10746.94

Checked By: _____ Approved By: _____ Date: _____

9 5/8 surface csg in a 12 1/4 inch hole.				Design Factors			SURFACE	
Segment	#/ft	Grade	Coupling	Joint	Collapse	Burst	Length	Weight
"A"	36.00	J 55	ST&C	9.95	4.11	1.18	1,100	39,600
"B"							0	0
w/8.4#/g mud, 30min Sfc Csg Test psig: 1,500				Tail Cmt	does not	circ to sfc.	Totals:	1,100 39,600
Comparison of Proposed to Minimum Required Cement Volumes								
Hole	Annular	Proposed	CuFt Cmt	Min	Excess	Drilling	Calc	Req'd
Size	Volume	Sx Cmt	Proposed	Cu Ft	% Cmt	Mud Wt	MASP	BOPE
12 1/4	0.3132	595	953	409	133	8.60	1553	2M
								Min Dist
								Hole-Cplg
								0.81

7	casing inside the		9 5/8	casing.	-	<u>Design Factors</u>		<u>INTERMEDIATE</u>	
Segment	#/ft	Grade	Coupling	Joint	Collapse	Burst	Length	Weight	
"A"	26.00	HCP 110	LT&C	4.74	3.04	3.32	5,620	146,120	
"B"							0	0	
"C"							0	0	
"D"							0	0	
w/8.4#/g mud, 30min Sfc Csg Test psig: 1,500							Totals:	5,620	146,120
<u>The cement volume(s) proposed may achieve a top</u>					<u>0</u>	<u>feet from surface.</u>			
Hole	Annular	Proposed	CuFt Cmt	Min	Excess	Drilling	Calc	Req'd	Min Dist
Size	Volume	Sx Cmt	Proposed	Cu Ft	% Cmt	Mud Wt	MASP	BOPE	Hole-Cplg
8 3/4	0.1503	1640	2437	872	179	8.80	1719	2M	0.55
Pilot Hole to +/- 6550 ft. To be plugged back using fiberglass tubing. High cave/karst; may require DV tool.									

4 1/2		Liner w/top @		5520		<u>Design Factors</u>		LINER	
Segment	#/ft	Grade	Coupling	Body	Collapse	Burst	Length	Weight	
"A"	11.60	HCP 110	BUTT	3.88	2.40	3.45	5,227	60,633	
"B"							0	0	
"C"							0	0	
"D"							0	0	
w/8.4#/g mud, 30min Sfc Csg Test psig: 1,500							Totals:	5,227 60,633	
A	Segment	Design	Factors	would be:	6.06	2.79	if it were a vertical wellbore.		
<u>The cement volume(s) proposed may achieve a top</u>					<u>0</u>	<u>feet from surface.</u>			
Hole	Annular	Proposed	CuFt Cmt	Min	Excess	Drilling	Calc	Req'd	Min Dist
Size	Volume	Sx Cmt	Proposed	Cu Ft	% Cmt	Mud Wt	MASP	BOPE	Hole-Cplg
6 1/8	0.0942			487	Packer	9.50			0.56
KOP - 5720' @ 13.14 degrees/100' to 90.7 degrees EOC - 6602'MD/6284'VD and lateral to 10,747'MD/6234'VD. No cement required; using Peak completion liner system (100' tie-back).									

PECOS DISTRICT CONDITIONS OF APPROVAL

OPERATOR'S NAME:	Murchison Oil & Gas, Inc.
LEASE NO.:	SHL: NMNM120349 BHL: NMNM114347
WELL NAME & NO.:	Frosty Federal Com #1
SURFACE HOLE FOOTAGE:	2285' FNL & 330' FEL
BOTTOM HOLE FOOTAGE:	2135' FNL & 330' FWL
LOCATION:	Section 26, T. 16 S., R 27 E., NMPM
COUNTY:	Eddy County, New Mexico

I. DRILLING

A. DRILLING OPERATIONS REQUIREMENTS

The BLM is to be notified a minimum of 4 hours in advance for a representative to witness:

- a. Spudding well
- b. Setting and/or Cementing of all casing strings
- c. BOPE tests

☒ **Eddy County**

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

1. **Although Hydrogen Sulfide has not been reported in this section, it is always a potential hazard. If Hydrogen Sulfide is encountered, please report measured amounts and formations to the BLM.**
2. Unless the production casing has been run and cemented or the well has been properly plugged, the drilling rig shall not be removed from over the hole without prior approval. **If the drilling rig is removed without approval – an Incident of Non-Compliance will be written and will be a “Major” violation.**
3. Floor controls are required for 3M or Greater systems. These controls will be on the rig floor, unobstructed, readily accessible to the driller and will be operational at all times during drilling and/or completion activities. Rig floor is defined as the area immediately around the rotary table; the area immediately above the substructure on which the draw works is located, this does not include the dog house or stairway area.

4. The record of the drilling rate along with the GR/N well log run from TD to surface (horizontal well – vertical portion of hole) will 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.

B. CASING

Changes to the approved APD casing and cement program require submitting a sundry and receiving approval prior to work. Failure to obtain approval prior to work will result in an Incident of Non-Compliance being issued.

Centralizers required on surface casing per Onshore Order 2.III.B.1.f.

Wait on cement (WOC) time prior to drilling out for a primary cement job will be a minimum 18 hours for a water basin, 24 hours in the potash area, or 500 pounds compressive strength, whichever is greater for all casing strings. **DURING THIS WOC TIME, NO DRILL PIPE, ETC. SHALL BE RUN IN THE HOLE.** Provide compressive strengths including hours to reach required 500 pounds compressive strength prior to cementing each casing string. See individual casing strings for details regarding lead cement slurry requirements.

No pea gravel permitted for remedial or fall back remedial without prior authorization from the BLM engineer.

Possible lost circulation in the Grayburg and San Andres formations.

HIGH CAVE/KARST – CONTINGENCY CASING WILL BE REQUIRED IF LOST CIRCULATION OCCURS WHILE DRILLING THE SURFACE HOLE. THE SURFACE HOLE WILL HAVE TO BE REAMED AND A LARGER CASING INSTALLED. IF LOST CIRCULATION OCCURS WHILE DRILLING THE 8-3/4" HOLE, THE CEMENT PROGRAM FOR THE 7" CASING WILL NEED TO BE MODIFIED AND THE BLM IS TO BE CONTACTED PRIOR TO RUNNING THE CASING. A MINIMUM OF TWO CASING STRINGS CEMENTED TO SURFACE IS REQUIRED IN HIGH CAVE/KARST AREAS. THE CEMENT MUST BE IN A SOLID SHEATH THEREFORE, ONE INCH OPERATIONS WILL NOT BE PERMITTED. A DV TOOL WILL BE REQUIRED.

1. The 9-5/8 inch surface casing shall be set at approximately 1100 feet and cemented to the surface. **Casing is to be set in a competent formation, which may be difficult in the Artesia group. Onshore Order II requires casing to be set across a competent bed.**
 - 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 a 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 is to include the lead cement slurry.**
 - 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 7 inch intermediate casing is:
☒ 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.

A two-stage job will require submitting a sundry and receiving approval prior to commencement of work.
3. The minimum required fill of cement behind the 4-1/2 inch production liner is:
☒ No cement required. Operator is using Peak Completion Liner. The tie-back of 100 feet is approved.
4. 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.

C. 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. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the surface casing shoe shall be **3000 (3M)** psi.
3. 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 or where the float does not hold, the minimum wait time before cut-off is eight hours after bumping the plug or when the cement reaches 500 psi compressive strength (including lead when specified), whichever is greater. BOP/BOPE testing can begin after the above conditions are satisfied.
 - b. 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 (18 hours) or potash (24 hours) prior to initiating the test.
 - c. The results of the test shall be reported to the appropriate BLM office.
 - d. 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.**
 - e. The BOP/BOPE test shall include a low pressure test from 250 to 300 psi. The test will be held for a minimum of 10 minutes if test is done with a test plug and 30 minutes without a test plug.
 - f. 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.

D. 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.

E. DRILL STEM TEST

If drill stem tests are performed, Onshore Order 2.III.D shall be followed.

F. 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.

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