Form 3160-5
(June 2015)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

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

Carlsbad Field Office
OCD Hobbs

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.

SUBMIT IN TRIPLICATE - Other instructions on page 2

HOBBS OCD
FEB 07 2019
RECEIVED

1. Type of Well ☒ Oil Well ☐ Gas Well ☐ Other	5. Lease Serial No. NMNM94186 6. If Indian, Allottee or Tribe Name 7. If Unit or CA/Agreement, Name and/or No. 8. Well Name and No. THISTLE UNIT 7H
2. Name of Operator DEVON ENERGY PRODUCTION COMPAN	Contact: REBECCA DEAL E-Mail: Rebecca.Deal@dvn.com 9. API Well No. 30-025-43432
3a. Address 333 WEST SHERIDAN AVE OKLAHOMA CITY, OK 73102	3b. Phone No. (include area code) Ph: 405-228-8429 10. Field and Pool or Exploratory Area TRIPLE X; BONE SPRING
4. Location of Well *(Footage, Sec., T., R., M., or Survey Description)* Sec 33 T23S R33E Mer NMP SESE 124FSL 883FEL	11. County or Parish, State LEA 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	☐ Hydraulic Fracturing	☐ Reclamation	☐ Well Integrity
☐ Final Abandonment Notice	☐ Casing Repair	☐ New Construction	☐ Recomplete	☒ Other Change to Original APD
	☐ 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 recomplete 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 recompletion 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.

Devon Energy Production Co. requests the following changes to the Thistle Unit 7H APD:

? BHL change from 2630 FSL & 1340 FEL, 28-23S-33E to 20 FNL & 380 FEL, 21-23S-33E, extending lateral to 3mi.

? MD/TVD change from 17,728/10,065' to 25,151'/9600'

Please see attached C-102, drilling plan, directional & AC plan and plot.

SEE ATTACHED FOR
CONDITIONS OF APPROVAL

14. I hereby certify that the foregoing is true and correct.

Electronic Submission #450698 verified by the BLM Well Information System
For DEVON ENERGY PRODUCTION COMPAN, sent to the Hobbs
Committed to AFMSS for processing by MUSTAFA HAQUE on 01/16/2019 ()

Name *(Printed/Typed)* REBECCA DEAL — Title REGULATORY COMPLIANCE PROFESSI

Signature (Electronic Submission) — Date 01/15/2019

THIS SPACE FOR FEDERAL OR STATE OFFICE USE

Approved By Mustafa Haque — Title Petroleum Engineer, Carlsbad Field Office — Date 01-17-201

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)

**** OPERATOR-SUBMITTED ** OPERATOR-SUBMITTED ** OPERATOR-SUBMITTED ****

KG

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

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

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

☐ AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

[1] API Number	[2] Pool Code	[3] Pool Name
30-025-43432	59900	Triple X; Bone Spring

[4] Property Code	[5] Property Name	[6] Well Number
	THISTLE UNIT	7H

[7] OGRID No.	[8] Operator Name	[9] Elevation
6137	DEVON ENERGY PRODUCTION COMPANY, L.P.	3650.5

[10] Surface Location

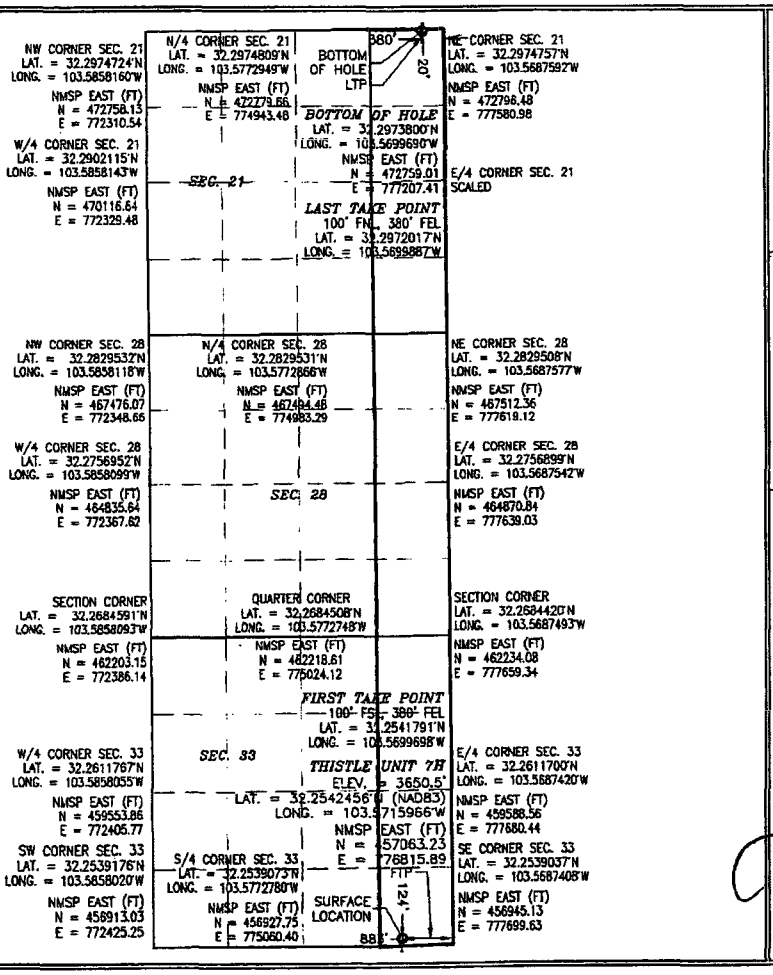
UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
P	33	23 S	33 E		124	SOUTH	883	EAST	LEA

[11] Bottom Hole Location If Different From Surface

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
A	21	23 S	33 E		20	NORTH	380	EAST	LEA

[12] Dedicated Acres	[13] Joint or Infill	[14] Consolidation Code	[15] Order No.
480			

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.

Rebecca Deal 1/10/2019
Signature Date

Rebecca Deal, Regulatory Analyst
Printed Name

rebecca.deal@dvn.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.

JANUARY 3, 2018
Date of Survey

FILIMON F. JARAMILLO
NEW MEXICO
12797
REGISTERED PROFESSIONAL SURVEYOR

Signature and Seal of Professional Surveyor

Certificate Number FILIMON F. JARAMILLO, PLS 12797

SURVEY NO. 4721B

Intent [x] As Drilled [ ]

API #
30-025-43432

Operator Name:	Property Name:	Well Number
DEVON ENERGY PRODUCTION COMPANY, L.P.	THISTLE UNIT	7H

Kick Off Point (KOP)

UL	Section	Township	Range	Lot	Feet	From N/S	Feet	From E/W	County
	33	23S	33E		50	FSL	380	FEL	LEA

Latitude	Longitude	NAD
32.254040	-103.56997	83

First Take Point (FTP)

UL	Section	Township	Range	Lot	Feet	From N/S	Feet	From E/W	County
P	33	23S	33E		100	SOUTH	380	EAST	LEA

Latitude	Longitude	NAD
32.2541791	103.5699698	83

Last Take Point (LTP)

UL	Section	Township	Range	Lot	Feet	From N/S	Feet	From E/W	County
A	21	23S	33E		100	NORTH	380	EAST	LEA

Latitude	Longitude	NAD
32.2972017	103.5699887	83

Is this well the defining well for the Horizontal Spacing Unit? [ ]

Is this well an infill well? [ ]

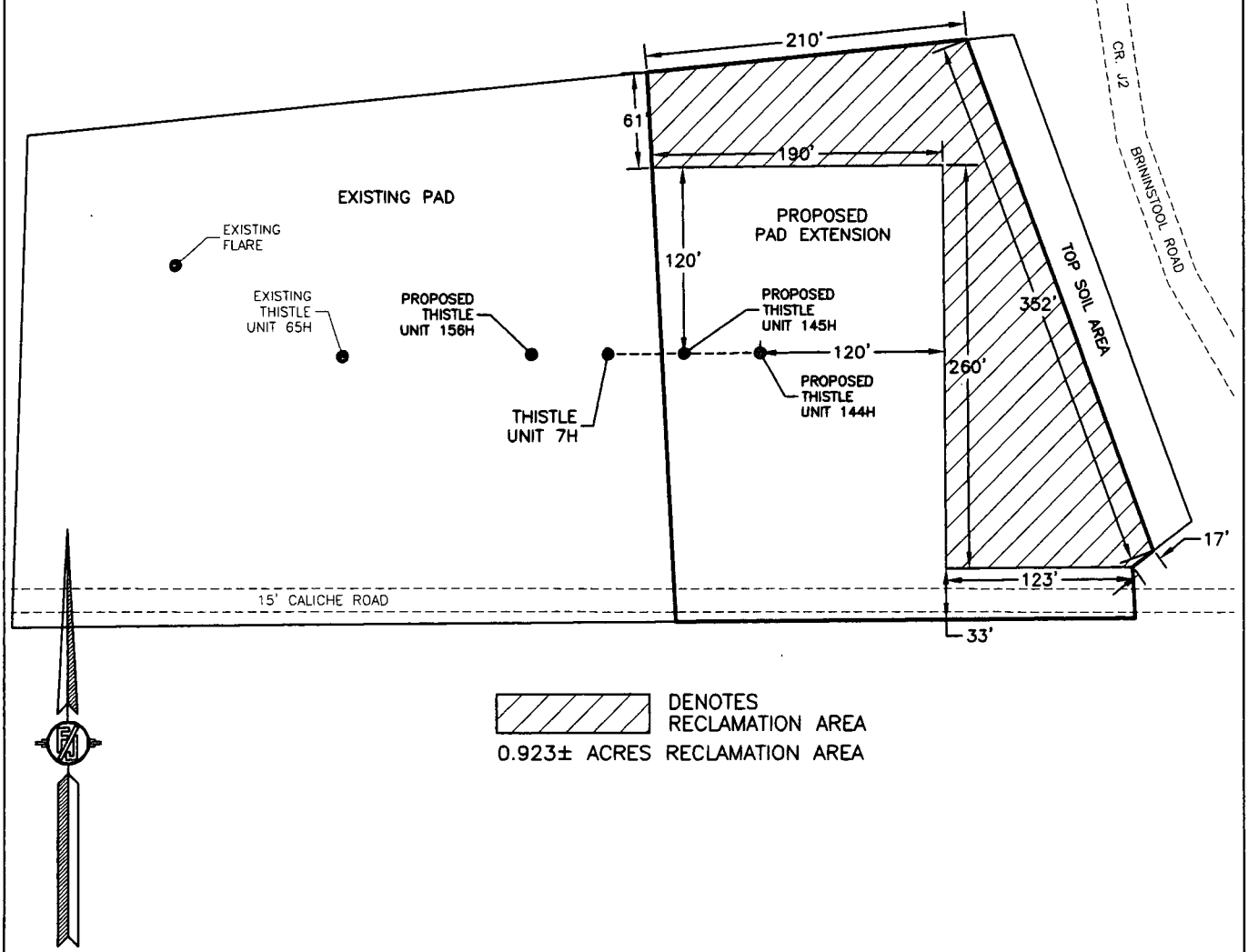
If infill is yes please provide API if available, Operator Name and well number for Defining well for Horizontal Spacing Unit.

API #

Operator Name:	Property Name:	Well Number

KZ 06/29/2018

PROPOSED INTERIM SITE RECLAMATION
FOR THISTLE UNIT 7H
SECTION 33, TOWNSHIP 23 SOUTH, RANGE 33 EAST, N.M.P.M.
LEA COUNTY, STATE OF NEW MEXICO



DENOTES RECLAMATION AREA

0.923± ACRES RECLAMATION AREA

010 50 100 200

SCALE 1" = 100'

DEVON ENERGY PRODUCTION COMPANY, L.P.

THISTLE UNIT 7H

LOCATED 124 FT. FROM THE SOUTH LINE AND 883 FT. FROM THE EAST LINE OF SECTION 33, TOWNSHIP 23 SOUTH, RANGE 33 EAST, N.M.P.M. LEA COUNTY, STATE OF NEW MEXICO

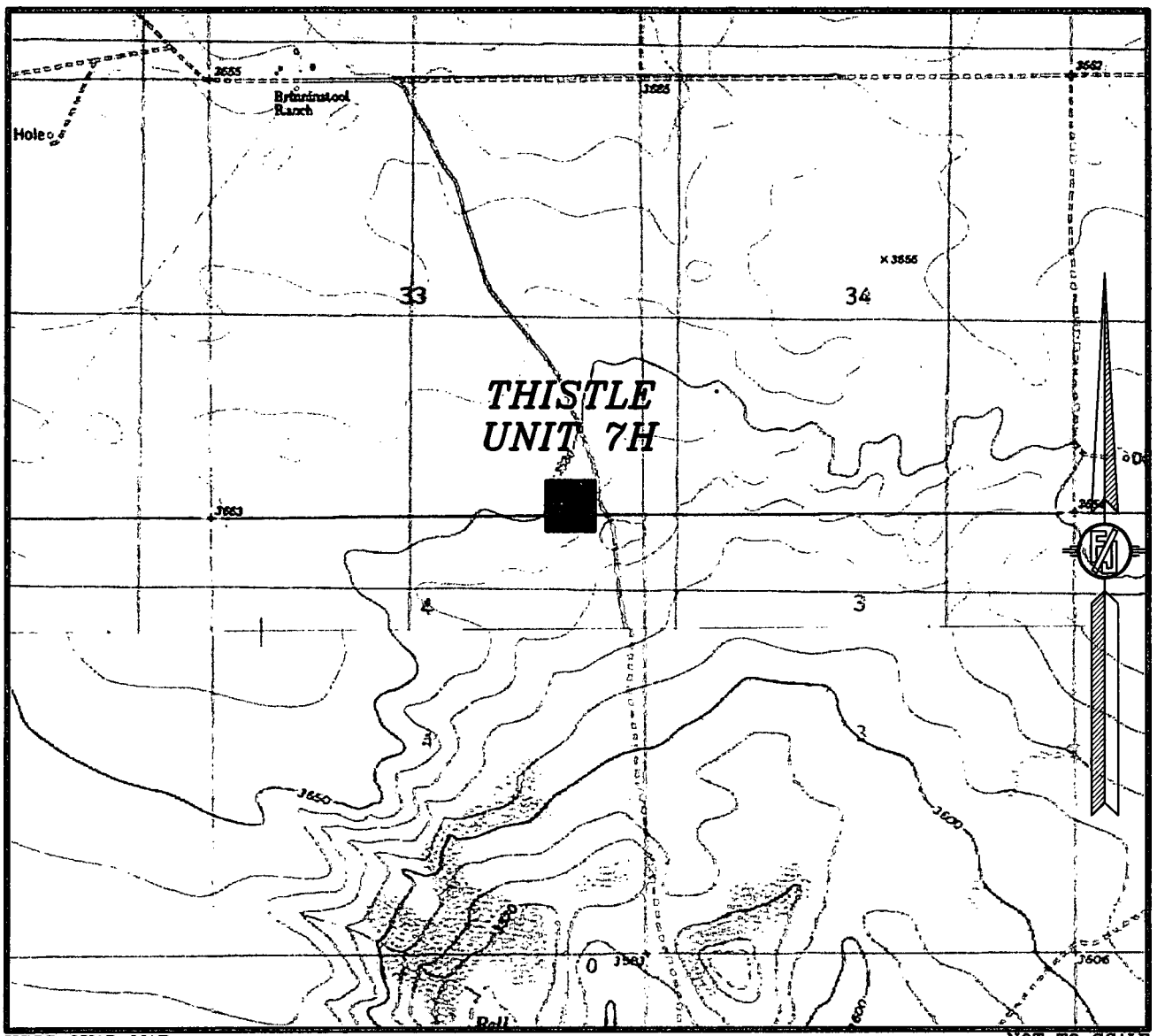
JANUARY 3, 2019

SURVEY NO. 4721B

MADRON SURVEYING, INC. 301 SOUTH CANAL (575) 234-3341 *CARLSBAD, NEW MEXICO*

SECTION 33, TOWNSHIP 23 SOUTH, RANGE 33 EAST, N.M.P.M.
LEA COUNTY, STATE OF NEW MEXICO

LOCATION VERIFICATION MAP



USGS QUAD MAP:
TIP TOP WELLS

NOT TO SCALE

DEVON ENERGY PRODUCTION COMPANY, L.P.

THISTLE UNIT 7H

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AND 883 FT. FROM THE EAST LINE OF
SECTION 33, TOWNSHIP 23 SOUTH,
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JANUARY 3, 2019

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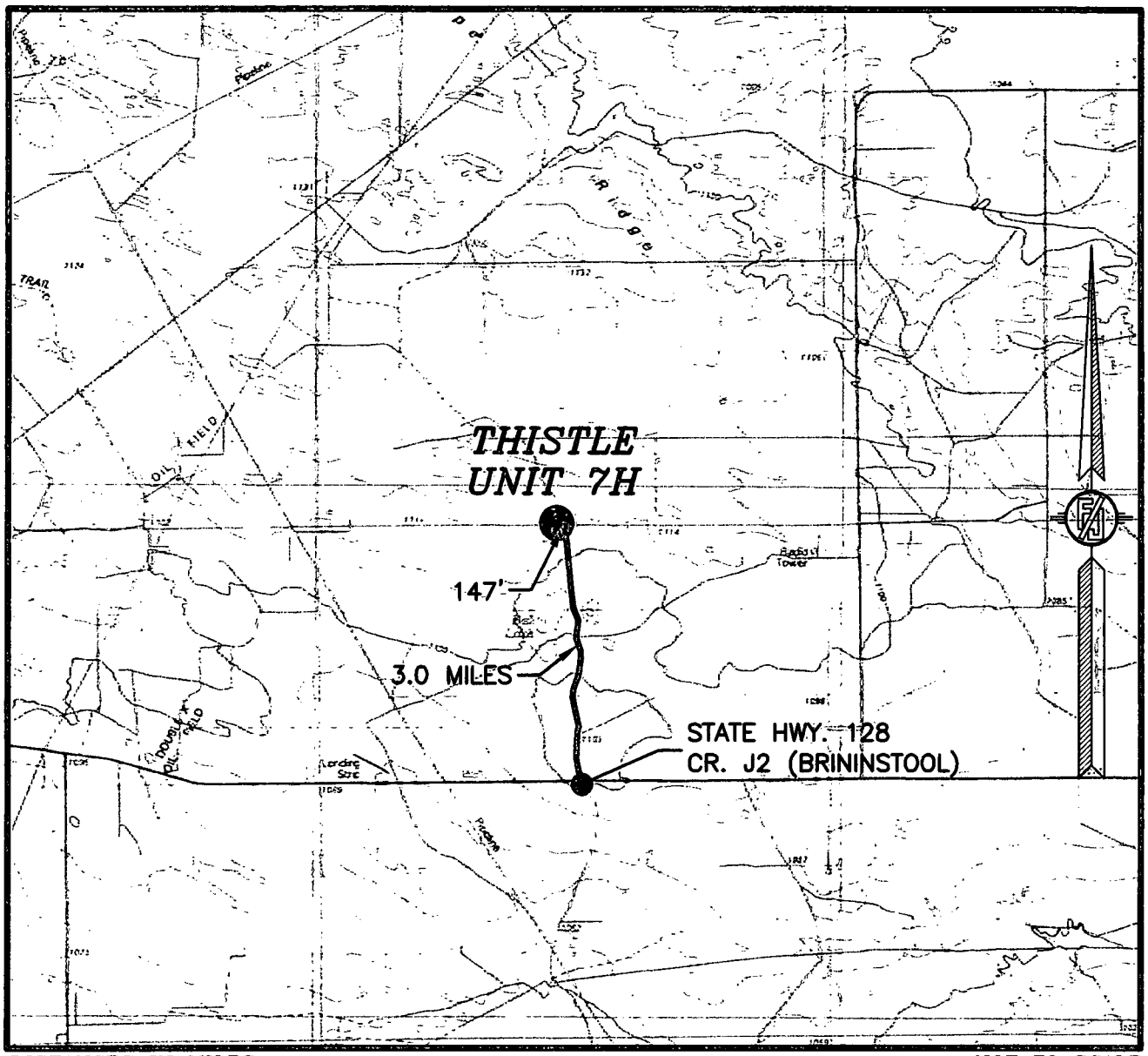
SECTION 33, TOWNSHIP 23 SOUTH, RANGE 33 EAST, N.M.P.M.
LEA COUNTY, STATE OF NEW MEXICO

VICINITY MAP



DISTANCES IN MILES *NOT TO SCALE*

DIRECTIONS TO LOCATION
FROM STATE HWY. 128 AND CR. J2 (BRININSTOOL) GO NORTH ON J2 3.0 MILES, TURN LEFT ON CALICHE ROAD AND GO WEST 147' TO THE SOUTHEAST PAD CORNER FOR THIS LOCATION.

DEVON ENERGY PRODUCTION COMPANY, L.P.
THISTLE UNIT 7H
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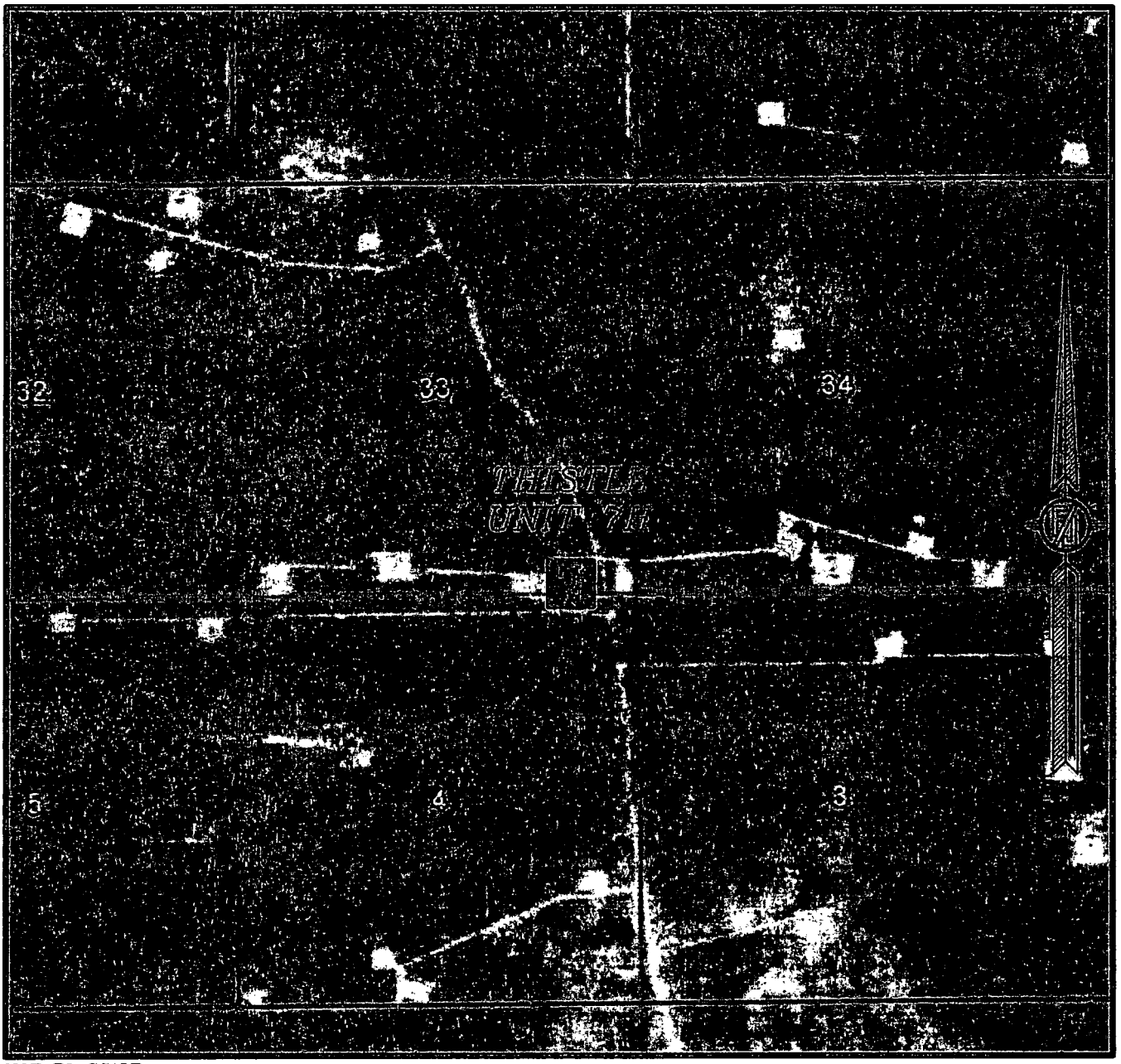
SECTION 33, TOWNSHIP 23 SOUTH, RANGE 33 EAST, N.M.P.M.
LEA COUNTY, STATE OF NEW MEXICO

AERIAL PHOTO



NOT TO SCALE
AERIAL PHOTO:
GOOGLE EARTH
FEB. 2014

DEVON ENERGY PRODUCTION COMPANY, L.P.

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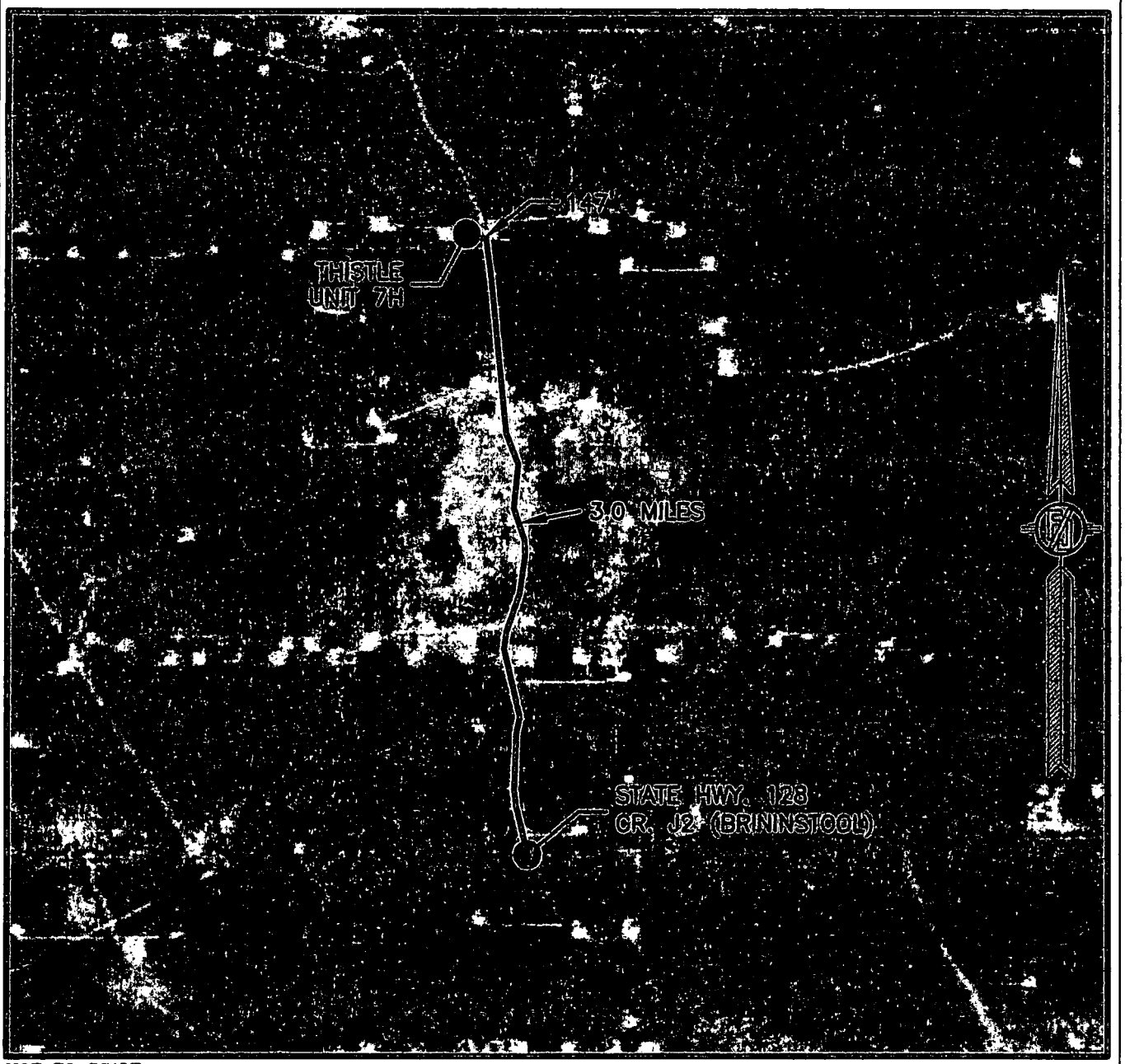
JANUARY 3, 2019

SURVEY NO. 4721B

MADRON SURVEYING, INC. 301 SOUTH CANAL (575) 234-3341 CARLSBAD, NEW MEXICO

SECTION 33, TOWNSHIP 23 SOUTH, RANGE 33 EAST, N.M.P.M.
LEA COUNTY, STATE OF NEW MEXICO

AERIAL ACCESS ROUTE MAP



NOT TO SCALE
AERIAL PHOTO:
GOOGLE EARTH
FEB. 2014

DEVON ENERGY PRODUCTION COMPANY, L.P.

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LEA COUNTY, STATE OF NEW MEXICO

JANUARY 3, 2019

SURVEY NO. 4721B

MADRON SURVEYING, INC. 301 SOUTH CANAL (575) 234-3341 CARLSBAD, NEW MEXICO

Devon Energy – Thistle Unit 7H

1. Geologic Formations

TVD of target	9600	Pilot hole depth	N/A
MD at TD:	25151	Deepest expected fresh water:	

Basin

Formation	Depth (TVD) from KB	Water/Mineral Bearing/ Target Zone?	Hazards*
Rustler	1225		
Salado	1735		
B/Salt	5150		
Delaware	5240		
Bone Spring	9150		
2BSSS	10920		

*H2S, water flows, loss of circulation, abnormal pressures, etc.

2. Casing Program -PSEF COA

Hole Size	Casing Interval		Csg. Size	Weight (PPF)	Grade	Conn.
	From	To				
17.5"	0	~~1250~~ 1380'	13.375"	48	H-40	STC
12.25"	0	~~5340~~ 5150'	9.625"	40	J-55	BTC
8.75"	0	TD	5.5"	17	P-110	BTC
BLM Minimum Safety Factor				Collapse: 1.125	Burst: 1.00	Tension: 1.6 Dry 1.8 Wet

- All casing strings will be tested in accordance with Onshore Oil and Gas Order #2 III.B.1.h Must have table for contingency casing
- Rustler top will be validated via drilling parameters (i.e. reduction in ROP) and surface casing setting depth revised accordingly if needed.
- Variance is requested for collapse rating on intermediate casing. Operator will keep pipe full while running casing. No losses are expected in subsequent hole section.
- Int casing shoe will be selected based on drilling data, gamma, and flows experienced while drilling. Setting depth with be revised accordingly if needed.
- A variance is requested to wave the centralizer requirement for the intermediate and production casing strings if drilling conditions dictate

	Y or N
Is casing new? If used, attach certification as required in Onshore Order #1	Y
Does casing meet API specifications? If no, attach casing specification sheet.	Y
Is premium or uncommon casing planned? If yes attach casing specification sheet.	N
Does the above casing design meet or exceed BLM's minimum standards? If not provide justification (loading assumptions, casing design criteria).	Y
Will the intermediate pipe be kept at a minimum 1/3 fluid filled to avoid approaching the collapse pressure rating of the casing?	Y
Is well located within Capitan Reef?	N
If yes, does production casing cement tie back a minimum of 50' above the Reef?	
Is well within the designated 4 string boundary.	
Is well located in SOPA but not in R-111-P?	N
If yes, are the first 2 strings cemented to surface and 3rd string cement tied back 500' into previous casing?	
Is well located in R-111-P and SOPA?	N
If yes, are the first three strings cemented to surface?	
Is 2nd string set 100' to 600' below the base of salt?	
Is well located in high Cave/Karst?	N
If yes, are there two strings cemented to surface?	
(For 2 string wells) If yes, is there a contingency casing if lost circulation occurs?	
Is well located in critical Cave/Karst?	N
If yes, are there three strings cemented to surface?	

3. Cementing Program (3-String Primary Design)

Casing	# Sks	TOC	Wt. (lb/gal)	H_20 (gal/sk)	Yld (ft3/sack)	Slurry Description
Surface	1305	Surf	13.2	6.33	1.33	Lead: Class C Cement + additives
Int	818	Surf	9	20.6	1.94	Lead: Class C Cement + additives
	196	500' above shoe	13.2	6.42	1.33	Tail: Class H / C + additives
Production	329	500' tieback	9	20.6	1.94	Lead: Class H / C + additives
	2794	KOP	13.2	5.31	1.6	Tail: Class H / C + additives

If a DV tool is ran the depth(s) will be adjusted based on hole conditions and cement volumes will be adjusted proportionally. Slurry weights will be adjusted based on estimated fracture gradient of the formation. DV tool will be set a minimum of 50 feet below previous casing and a minimum of 200 feet above current shoe. If cement is not returned to surface during the primary cement job on the surface casing string, a planned top job will be conducted immediately after completion of the primary job.

Casing String	% Excess
Surface	100%
Intermediate	50%
Production	10%

4. Pressure Control Equipment

BOP installed and tested before drilling which hole?	Size?	Min. Required WP	Type	✓	Tested to:
Int 1	13-5/8"	3M	Annular	X	50% of rated working pressure
			Blind Ram		3M
			Pipe Ram		
			Double Ram	X	
			Other*		
Production	13-5/8"	5M	Annular	X	50% of rated working pressure
			Blind Ram		5M
			Pipe Ram		
			Double Ram	X	
			Other *		
			Annular		
			Blind Ram		
			Pipe Ram		
			Double Ram		
			Other *		

5. Mud Program

Interval	Type	Weight (ppg)	Vis	Water Loss
Surface	FW	8.5 – 9.0	28-34	N/C
Intermediate	Brine	10 – 10.5	28-34	N/C
Production	WBM	8.5 – 9.0	28-34	N/C

Sufficient mud materials to maintain mud properties and meet minimum lost circulation and weight increase requirements will be kept on location at all times.

What will be used to monitor the loss or gain of fluid?	PVT/Pason/Visual Monitoring

6. Logging and Testing Procedures

Logging, Coring and Testing.	
X	Will run GR/CNL from TD to surface (horizontal well – vertical portion of hole). Stated logs run will be in the Completion Report and submitted to the BLM.
	No Logs are planned based on well control or offset log information.
	Drill stem test? If yes, explain
	Coring? If yes, explain

Additional logs planned		Interval
	Resistivity	
	Density	
X	CBL	Production casing
X	Mud log	KOP to TD

7. Drilling Conditions

Condition	Specify what type and where?
BH Pressure at deepest TVD	4493 psi
Abnormal Temperature	No

Mitigation measure for abnormal conditions. Describe. Lost circulation material/sweeps/mud scavengers.

Hydrogen Sulfide (H2S) monitors will be installed prior to drilling out the surface shoe. If H2S is detected in concentrations greater than 100 ppm, the operator will comply with the provisions of Onshore Oil and Gas Order #6. If Hydrogen Sulfide is encountered, measured values and formations will be provided to the BLM.	
N	H2S is present
Y	H2S Plan attached

8. Other facets of operation

Is this a walking operation? Potentially

1. If operator elects, drilling rig will batch drill the surface holes and run/cement surface casing; walking the rig to next wells on the pad.
2. The drilling rig will then batch drill the intermediate sections and run/cement intermediate casing; the wellbore will be isolated with a blind flange and pressure gauge installed for monitoring the well before walking to the next well.
3. The drilling rig will then batch drill the production hole sections on the wells with OBM, run/cement production casing, and install TA caps or tubing heads for completions.

NOTE: During batch operations the drilling rig will be moved from well to well however, it will not be removed from the pad until all wells have production casing run/cemented.

Will be pre-setting casing? Potentially

1. Spudder rig will move in and drill surface hole.
    a. Rig will utilize fresh water based mud to drill surface hole to TD. Solids control will be handled entirely on a closed loop basis.
2. After drilling the surface hole section, the spudder rig will run casing and cement following all of the applicable rules and regulations (OnShore Order 2, all COAs and NMOCD regulations).
3. The wellhead will be installed and tested once the surface casing is cut off and the WOC time has been reached.
4. A blind flange with the same pressure rating as the wellhead will be installed to seal the wellbore. Pressure will be monitored with a pressure gauge installed on the wellhead.
5. Spudder rig operations is expected to take 4-5 days per well on a multi well pad.
6. The NMOCD will be contacted and notified 24 hours prior to commencing spudder rig operations.
7. Drilling operations will be performed with the drilling rig. At that time an approved BOP stack will be nippled up and tested on the wellhead before drilling operations commences on each well.
    a. The NMOCD will be contacted / notified 24 hours before the drilling rig moves back on to the pad with the pre-set surface casing.

Attachments

_x_ Directional Plan

___ Other, describe

Devon Energy

WELL DETAILS: Thistle Unit 7H

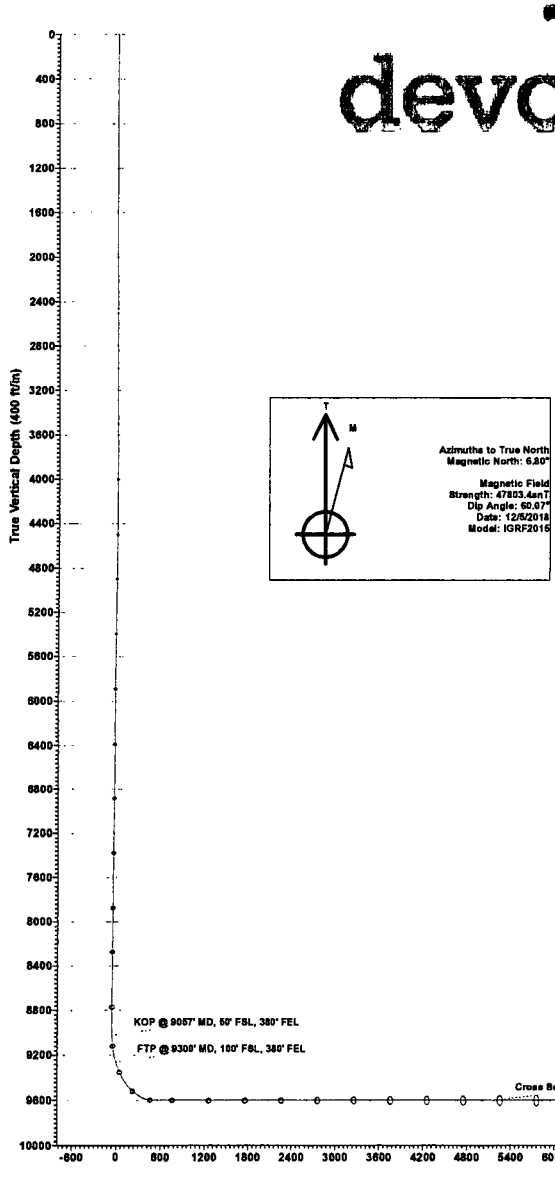
RKB @ 3675.50ft
3653.90

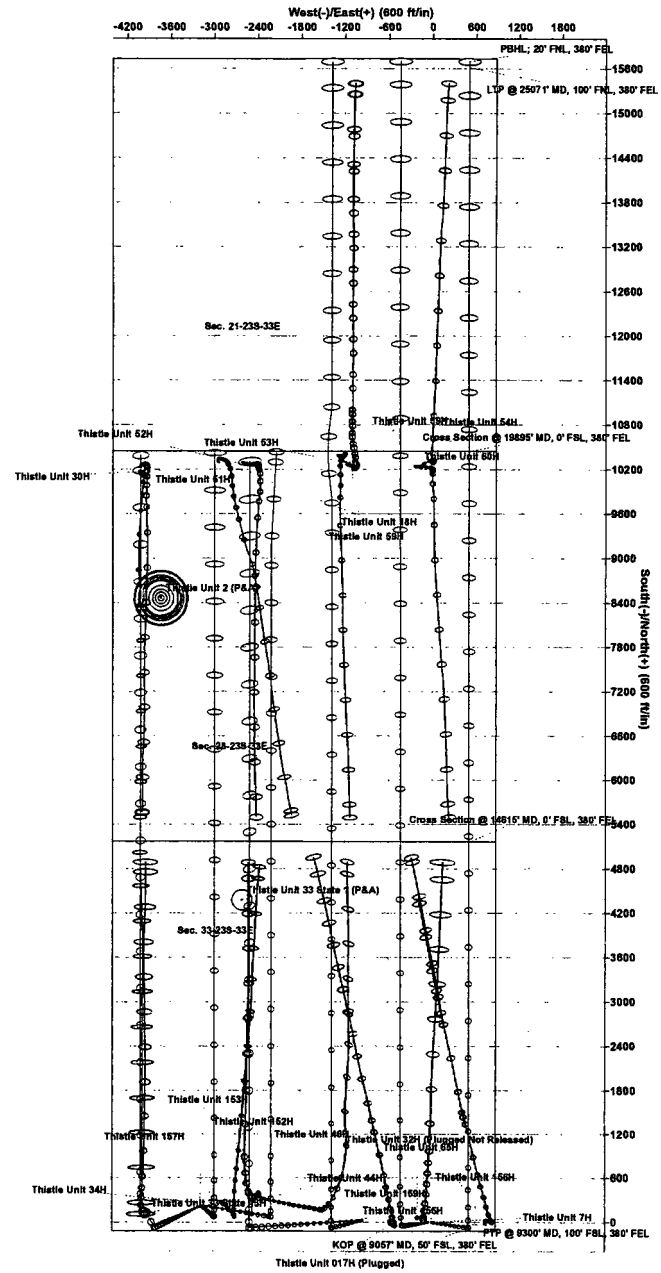
Northing	Easting	Latitude	Longitude
457063.31	776815.89	32.254246	-103.571597

SECTION DETAILS Permit Plan 1

	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	VSect	Annotation
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	4000.00	0.00	0.00	4000.00	0.00	0.00	0.00	0.00	
	4556.80	6.96	98.48	4555.43	-4.98	33.41	1.25	-3.91	
	8242.67	6.96	98.48	8214.14	-70.85	475.16	0.00	-55.59	
5	8706.67	0.00	0.00	8677.00	-75.00	503.00	1.50	-58.85	
6	9056.71	0.00	0.00	9027.04	-75.00	503.00	0.00	-58.85	KOP @ 9057' MD, 50' FSL, 380' FEL
7	9956.71	90.00	0.00	9600.00	497.96	503.00	10.00	513.82	
8	25151.33	90.00	0.00	9600.00	15692.58	503.00	0.00	15700.64	PBHL; 20' FNL, 380' FEL

devon





WCDSC Permian NM

Lea County (NAD83 New Mexico East)
Sec 33-T23S-R33E
Thistle Unit 7H

Wellbore #1

Plan: Permit Plan 1

Standard Planning Report - Geographic

09 January, 2019

Database:	EDM r5000.141_Prod US	**Local Co-ordinate Reference:**	Well Thistle Unit 7H
Company:	WCDSC Permian NM	**TVD Reference:**	RKB @ 3675.50ft
Project:	Lea County (NAD83 New Mexico East)	**MD Reference:**	RKB @ 3675.50ft
Site:	Sec 33-T23S-R33E	**North Reference:**	True
Well:	Thistle Unit 7H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Permit Plan 1		

Project	Lea County (NAD83 New Mexico East)		
Map System:	US State Plane 1983	**System Datum:**	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	New Mexico Eastern Zone		

Site	Sec 33-T23S-R33E				
Site Position:		**Northing:**	462,265.86 usft	**Latitude:**	32.268581
From:	Lat/Long	**Easting:**	775,000.24 usft	**Longitude:**	-103.577351
Position Uncertainty:	0.00 ft	**Slot Radius:**	13-3/16 "	**Grid Convergence:**	0.40 °

Well	Thistle Unit 7H					
Well Position	**+N/-S**	0.00 ft	**Northing:**	457,063.31 usft	**Latitude:**	32.254246
	+E/-W	0.00 ft	**Easting:**	776,815.89 usft	**Longitude:**	-103.571597
Position Uncertainty		0.50 ft	**Wellhead Elevation:**		**Ground Level:**	3,653.90 ft

Wellbore	Wellbore #1				
Magnetics	**Model Name**	**Sample Date**	**Declination (°)**	**Dip Angle (°)**	**Field Strength (nT)**
	IGRF2015	12/5/2018	6.80	60.07	47,803.35931101

Design	Permit Plan 1				
Audit Notes:					
Version:		**Phase:**	PROTOTYPE	**Tie On Depth:**	0.00
Vertical Section:	**Depth From (TVD) (ft)**	**+N/-S (ft)**	**+E/-W (ft)**	**Direction (°)**	
	0.00	0.00	0.00	1.84	

Plan Survey Tool Program **Date** 1/9/2019

	Depth From (ft)	Depth To (ft)	Survey (Wellbore)	Tool Name	Remarks
1	0.00	25,151.33	Permit Plan 1 (Wellbore #1)	MWD+IFR1 OWSG MWD + IFR1	

Plan Sections

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	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	0.00	
4,000.00	0.00	0.00	4,000.00	0.00	0.00	0.00	0.00	0.00	0.00	
4,556.80	6.96	98.48	4,555.43	-4.98	33.41	1.25	1.25	0.00	98.48	
8,242.67	6.96	98.48	8,214.14	-70.85	475.16	0.00	0.00	0.00	0.00	
8,706.67	0.00	0.00	8,677.00	-75.00	503.00	1.50	-1.50	0.00	180.00	
9,056.71	0.00	0.00	9,027.04	-75.00	503.00	0.00	0.00	0.00	0.00	
9,956.71	90.00	0.00	9,600.00	497.96	503.00	10.00	10.00	0.00	0.00	
25,151.33	90.00	0.00	9,600.00	15,692.58	503.00	0.00	0.00	0.00	0.00	

Database:	EDM r5000.141_Prod US	**Local Co-ordinate Reference:**	Well Thistle Unit 7H
Company:	WCDSC Permian NM	**TVD Reference:**	RKB @ 3675.50ft
Project:	Lea County (NAD83 New Mexico East)	**MD Reference:**	RKB @ 3675.50ft
Site:	Sec 33-T23S-R33E	**North Reference:**	True
Well:	Thistle Unit 7H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Permit Plan 1		

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
0.00	0.00	0.00	0.00	0.00	0.00	457,063.31	776,815.89	32.254246	-103.571597
100.00	0.00	0.00	100.00	0.00	0.00	457,063.31	776,815.89	32.254246	-103.571597
200.00	0.00	0.00	200.00	0.00	0.00	457,063.31	776,815.89	32.254246	-103.571597
300.00	0.00	0.00	300.00	0.00	0.00	457,063.31	776,815.89	32.254246	-103.571597
400.00	0.00	0.00	400.00	0.00	0.00	457,063.31	776,815.89	32.254246	-103.571597
500.00	0.00	0.00	500.00	0.00	0.00	457,063.31	776,815.89	32.254246	-103.571597
600.00	0.00	0.00	600.00	0.00	0.00	457,063.31	776,815.89	32.254246	-103.571597
700.00	0.00	0.00	700.00	0.00	0.00	457,063.31	776,815.89	32.254246	-103.571597
800.00	0.00	0.00	800.00	0.00	0.00	457,063.31	776,815.89	32.254246	-103.571597
900.00	0.00	0.00	900.00	0.00	0.00	457,063.31	776,815.89	32.254246	-103.571597
1,000.00	0.00	0.00	1,000.00	0.00	0.00	457,063.31	776,815.89	32.254246	-103.571597
1,100.00	0.00	0.00	1,100.00	0.00	0.00	457,063.31	776,815.89	32.254246	-103.571597
1,200.00	0.00	0.00	1,200.00	0.00	0.00	457,063.31	776,815.89	32.254246	-103.571597
1,300.00	0.00	0.00	1,300.00	0.00	0.00	457,063.31	776,815.89	32.254246	-103.571597
1,400.00	0.00	0.00	1,400.00	0.00	0.00	457,063.31	776,815.89	32.254246	-103.571597
1,500.00	0.00	0.00	1,500.00	0.00	0.00	457,063.31	776,815.89	32.254246	-103.571597
1,600.00	0.00	0.00	1,600.00	0.00	0.00	457,063.31	776,815.89	32.254246	-103.571597
1,700.00	0.00	0.00	1,700.00	0.00	0.00	457,063.31	776,815.89	32.254246	-103.571597
1,800.00	0.00	0.00	1,800.00	0.00	0.00	457,063.31	776,815.89	32.254246	-103.571597
1,900.00	0.00	0.00	1,900.00	0.00	0.00	457,063.31	776,815.89	32.254246	-103.571597
2,000.00	0.00	0.00	2,000.00	0.00	0.00	457,063.31	776,815.89	32.254246	-103.571597
2,100.00	0.00	0.00	2,100.00	0.00	0.00	457,063.31	776,815.89	32.254246	-103.571597
2,200.00	0.00	0.00	2,200.00	0.00	0.00	457,063.31	776,815.89	32.254246	-103.571597
2,300.00	0.00	0.00	2,300.00	0.00	0.00	457,063.31	776,815.89	32.254246	-103.571597
2,400.00	0.00	0.00	2,400.00	0.00	0.00	457,063.31	776,815.89	32.254246	-103.571597
2,500.00	0.00	0.00	2,500.00	0.00	0.00	457,063.31	776,815.89	32.254246	-103.571597
2,600.00	0.00	0.00	2,600.00	0.00	0.00	457,063.31	776,815.89	32.254246	-103.571597
2,700.00	0.00	0.00	2,700.00	0.00	0.00	457,063.31	776,815.89	32.254246	-103.571597
2,800.00	0.00	0.00	2,800.00	0.00	0.00	457,063.31	776,815.89	32.254246	-103.571597
2,900.00	0.00	0.00	2,900.00	0.00	0.00	457,063.31	776,815.89	32.254246	-103.571597
3,000.00	0.00	0.00	3,000.00	0.00	0.00	457,063.31	776,815.89	32.254246	-103.571597
3,100.00	0.00	0.00	3,100.00	0.00	0.00	457,063.31	776,815.89	32.254246	-103.571597
3,200.00	0.00	0.00	3,200.00	0.00	0.00	457,063.31	776,815.89	32.254246	-103.571597
3,300.00	0.00	0.00	3,300.00	0.00	0.00	457,063.31	776,815.89	32.254246	-103.571597
3,400.00	0.00	0.00	3,400.00	0.00	0.00	457,063.31	776,815.89	32.254246	-103.571597
3,500.00	0.00	0.00	3,500.00	0.00	0.00	457,063.31	776,815.89	32.254246	-103.571597
3,600.00	0.00	0.00	3,600.00	0.00	0.00	457,063.31	776,815.89	32.254246	-103.571597
3,700.00	0.00	0.00	3,700.00	0.00	0.00	457,063.31	776,815.89	32.254246	-103.571597
3,800.00	0.00	0.00	3,800.00	0.00	0.00	457,063.31	776,815.89	32.254246	-103.571597
3,900.00	0.00	0.00	3,900.00	0.00	0.00	457,063.31	776,815.89	32.254246	-103.571597
4,000.00	0.00	0.00	4,000.00	0.00	0.00	457,063.31	776,815.89	32.254246	-103.571597
4,100.00	1.25	98.48	4,099.99	-0.16	1.08	457,063.16	776,816.97	32.254245	-103.571593
4,200.00	2.50	98.48	4,199.94	-0.64	4.31	457,062.70	776,820.21	32.254244	-103.571583
4,300.00	3.75	98.48	4,299.79	-1.45	9.71	457,061.93	776,825.60	32.254242	-103.571565
4,400.00	5.00	98.48	4,399.49	-2.57	17.25	457,060.86	776,833.16	32.254239	-103.571541
4,500.00	6.25	98.48	4,499.01	-4.02	26.95	457,059.48	776,842.86	32.254235	-103.571510
4,556.80	6.96	98.48	4,555.43	-4.98	33.41	457,058.57	776,849.33	32.254232	-103.571489
4,600.00	6.96	98.48	4,598.31	-5.75	38.59	457,057.83	776,854.51	32.254230	-103.571472
4,700.00	6.96	98.48	4,697.58	-7.54	50.57	457,056.13	776,866.51	32.254225	-103.571433
4,800.00	6.96	98.48	4,796.84	-9.33	62.56	457,054.43	776,878.51	32.254220	-103.571395
4,900.00	6.96	98.48	4,896.10	-11.11	74.54	457,052.73	776,890.50	32.254215	-103.571356
5,000.00	6.96	98.48	4,995.37	-12.90	86.53	457,051.02	776,902.50	32.254210	-103.571317
5,100.00	6.96	98.48	5,094.63	-14.69	98.51	457,049.32	776,914.50	32.254206	-103.571278
5,200.00	6.96	98.48	5,193.89	-16.48	110.50	457,047.62	776,926.50	32.254201	-103.571239
5,300.00	6.96	98.48	5,293.16	-18.26	122.48	457,045.92	776,938.49	32.254196	-103.571201

Database:	EDM r5000.141_Prod US	**Local Co-ordinate Reference:**	Well Thistle Unit 7H
Company:	WCDSC Permian NM	**TVD Reference:**	RKB @ 3675.50ft
Project:	Lea County (NAD83 New Mexico East)	**MD Reference:**	RKB @ 3675.50ft
Site:	Sec 33-T23S-R33E	**North Reference:**	True
Well:	Thistle Unit 7H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Permit Plan 1		

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
5,400.00	6.96	98.48	5,392.42	-20.05	134.47	457,044.22	776,950.49	32.254191	-103.571162
5,500.00	6.96	98.48	5,491.68	-21.84	146.45	457,042.51	776,962.49	32.254186	-103.571123
5,600.00	6.96	98.48	5,590.94	-23.62	158.44	457,040.81	776,974.49	32.254181	-103.571084
5,700.00	6.96	98.48	5,690.21	-25.41	170.42	457,039.11	776,986.48	32.254176	-103.571046
5,800.00	6.96	98.48	5,789.47	-27.20	182.41	457,037.41	776,998.48	32.254171	-103.571007
5,900.00	6.96	98.48	5,888.73	-28.98	194.39	457,035.71	777,010.48	32.254166	-103.570968
6,000.00	6.96	98.48	5,988.00	-30.77	206.38	457,034.00	777,022.48	32.254161	-103.570929
6,100.00	6.96	98.48	6,087.26	-32.56	218.36	457,032.30	777,034.47	32.254156	-103.570891
6,200.00	6.96	98.48	6,186.52	-34.35	230.35	457,030.60	777,046.47	32.254152	-103.570852
6,300.00	6.96	98.48	6,285.79	-36.13	242.33	457,028.90	777,058.47	32.254147	-103.570813
6,400.00	6.96	98.48	6,385.05	-37.92	254.32	457,027.20	777,070.47	32.254142	-103.570774
6,500.00	6.96	98.48	6,484.31	-39.71	266.30	457,025.49	777,082.46	32.254137	-103.570735
6,600.00	6.96	98.48	6,583.58	-41.49	278.29	457,023.79	777,094.46	32.254132	-103.570697
6,700.00	6.96	98.48	6,682.84	-43.28	290.27	457,022.09	777,106.46	32.254127	-103.570658
6,800.00	6.96	98.48	6,782.10	-45.07	302.26	457,020.39	777,118.45	32.254122	-103.570619
6,900.00	6.96	98.48	6,881.37	-46.86	314.24	457,018.69	777,130.45	32.254117	-103.570580
7,000.00	6.96	98.48	6,980.63	-48.64	326.23	457,016.98	777,142.45	32.254112	-103.570542
7,100.00	6.96	98.48	7,079.89	-50.43	338.21	457,015.28	777,154.45	32.254107	-103.570503
7,200.00	6.96	98.48	7,179.15	-52.22	350.20	457,013.58	777,166.44	32.254102	-103.570464
7,300.00	6.96	98.48	7,278.42	-54.00	362.18	457,011.88	777,178.44	32.254097	-103.570425
7,400.00	6.96	98.48	7,377.68	-55.79	374.17	457,010.18	777,190.44	32.254093	-103.570387
7,500.00	6.96	98.48	7,476.94	-57.58	386.15	457,008.47	777,202.44	32.254088	-103.570348
7,600.00	6.96	98.48	7,576.21	-59.36	398.14	457,006.77	777,214.43	32.254083	-103.570309
7,700.00	6.96	98.48	7,675.47	-61.15	410.12	457,005.07	777,226.43	32.254078	-103.570270
7,800.00	6.96	98.48	7,774.73	-62.94	422.11	457,003.37	777,238.43	32.254073	-103.570232
7,900.00	6.96	98.48	7,874.00	-64.73	434.09	457,001.67	777,250.43	32.254068	-103.570193
8,000.00	6.96	98.48	7,973.26	-66.51	446.08	456,999.96	777,262.42	32.254063	-103.570154
8,100.00	6.96	98.48	8,072.52	-68.30	458.06	456,998.26	777,274.42	32.254058	-103.570115
8,200.00	6.96	98.48	8,171.79	-70.09	470.05	456,996.56	777,286.42	32.254053	-103.570076
8,242.67	6.96	98.48	8,214.14	-70.85	475.16	456,995.83	777,291.54	32.254051	-103.570060
8,300.00	6.10	98.48	8,271.10	-71.81	481.61	456,994.92	777,297.99	32.254049	-103.570039
8,400.00	4.60	98.48	8,370.66	-73.19	490.83	456,993.61	777,307.22	32.254045	-103.570009
8,500.00	3.10	98.48	8,470.43	-74.18	497.47	456,992.67	777,313.87	32.254042	-103.569988
8,600.00	1.60	98.48	8,570.34	-74.78	501.53	456,992.09	777,317.93	32.254040	-103.569975
8,700.00	0.10	98.48	8,670.33	-75.00	502.99	456,991.88	777,319.40	32.254040	-103.569970
8,706.67	0.00	0.00	8,677.00	-75.00	503.00	456,991.88	777,319.41	32.254040	-103.569970
8,800.00	0.00	0.00	8,770.33	-75.00	503.00	456,991.88	777,319.41	32.254040	-103.569970
8,900.00	0.00	0.00	8,870.33	-75.00	503.00	456,991.88	777,319.41	32.254040	-103.569970
9,000.00	0.00	0.00	8,970.33	-75.00	503.00	456,991.88	777,319.41	32.254040	-103.569970
9,056.71	0.00	0.00	9,027.04	-75.00	503.00	456,991.88	777,319.41	32.254040	-103.569970
KOP @ 9057' MD, 50' FSL, 380' FEL									
9,100.00	4.33	0.00	9,070.29	-73.37	503.00	456,993.52	777,319.39	32.254044	-103.569970
9,200.00	14.33	0.00	9,168.84	-57.18	503.00	457,009.71	777,319.28	32.254089	-103.569970
9,300.00	24.33	0.00	9,263.09	-24.12	503.00	457,042.76	777,319.04	32.254180	-103.569970
9,300.29	24.36	0.00	9,263.35	-24.00	503.00	457,042.88	777,319.04	32.254180	-103.569970
FTP @ 9300' MD, 100' FSL, 380' FEL									
9,400.00	34.33	0.00	9,350.16	24.80	503.00	457,091.68	777,318.70	32.254314	-103.569970
9,500.00	44.33	0.00	9,427.41	88.10	503.00	457,154.98	777,318.25	32.254488	-103.569970
9,600.00	54.33	0.00	9,492.50	163.85	503.00	457,230.72	777,317.71	32.254696	-103.569970
9,700.00	64.33	0.00	9,543.45	249.75	503.00	457,316.62	777,317.10	32.254932	-103.569970
9,800.00	74.33	0.00	9,578.70	343.19	503.00	457,410.06	777,316.44	32.255189	-103.569970
9,900.00	84.33	0.00	9,597.19	441.34	503.00	457,508.21	777,315.74	32.255459	-103.569970
9,956.71	90.00	0.00	9,600.00	497.96	503.00	457,564.82	777,315.34	32.255615	-103.569970
10,000.00	90.00	0.00	9,600.00	541.25	503.00	457,608.11	777,315.03	32.255734	-103.569970

Database:	EDM r5000.141_Prod US	**Local Co-ordinate Reference:**	Well Thistle Unit 7H
Company:	WCDSC Permian NM	**TVD Reference:**	RKB @ 3675.50ft
Project:	Lea County (NAD83 New Mexico East)	**MD Reference:**	RKB @ 3675.50ft
Site:	Sec 33-T23S-R33E	**North Reference:**	True
Well:	Thistle Unit 7H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Permit Plan 1		

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
10,100.00	90.00	0.00	9,600.00	641.25	503.00	457,708.11	777,314.32	32.256009	-103.569970
10,200.00	90.00	0.00	9,600.00	741.25	503.00	457,808.11	777,313.61	32.256283	-103.569970
10,300.00	90.00	0.00	9,600.00	841.25	503.00	457,908.10	777,312.90	32.256558	-103.569970
10,400.00	90.00	0.00	9,600.00	941.25	503.00	458,008.10	777,312.19	32.256833	-103.569970
10,500.00	90.00	0.00	9,600.00	1,041.25	503.00	458,108.10	777,311.49	32.257108	-103.569970
10,600.00	90.00	0.00	9,600.00	1,141.25	503.00	458,208.10	777,310.78	32.257383	-103.569970
10,700.00	90.00	0.00	9,600.00	1,241.25	503.00	458,308.09	777,310.07	32.257658	-103.569970
10,800.00	90.00	0.00	9,600.00	1,341.25	503.00	458,408.09	777,309.36	32.257933	-103.569970
10,900.00	90.00	0.00	9,600.00	1,441.25	503.00	458,508.09	777,308.65	32.258207	-103.569970
11,000.00	90.00	0.00	9,600.00	1,541.25	503.00	458,608.09	777,307.94	32.258482	-103.569970
11,100.00	90.00	0.00	9,600.00	1,641.25	503.00	458,708.08	777,307.23	32.258757	-103.569970
11,200.00	90.00	0.00	9,600.00	1,741.25	503.00	458,808.08	777,306.52	32.259032	-103.569970
11,300.00	90.00	0.00	9,600.00	1,841.25	503.00	458,908.08	777,305.81	32.259307	-103.569970
11,400.00	90.00	0.00	9,600.00	1,941.25	503.00	459,008.07	777,305.10	32.259582	-103.569970
11,500.00	90.00	0.00	9,600.00	2,041.25	503.00	459,108.07	777,304.39	32.259857	-103.569970
11,600.00	90.00	0.00	9,600.00	2,141.25	503.00	459,208.07	777,303.68	32.260132	-103.569970
11,700.00	90.00	0.00	9,600.00	2,241.25	503.00	459,308.07	777,302.97	32.260406	-103.569970
11,800.00	90.00	0.00	9,600.00	2,341.25	503.00	459,408.06	777,302.26	32.260681	-103.569970
11,900.00	90.00	0.00	9,600.00	2,441.25	503.00	459,508.06	777,301.55	32.260956	-103.569970
12,000.00	90.00	0.00	9,600.00	2,541.25	503.00	459,608.06	777,300.84	32.261231	-103.569970
12,100.00	90.00	0.00	9,600.00	2,641.25	503.00	459,708.06	777,300.13	32.261506	-103.569970
12,200.00	90.00	0.00	9,600.00	2,741.25	503.00	459,808.05	777,299.42	32.261781	-103.569970
12,300.00	90.00	0.00	9,600.00	2,841.25	503.00	459,908.05	777,298.71	32.262056	-103.569970
12,400.00	90.00	0.00	9,600.00	2,941.25	503.00	460,008.05	777,298.00	32.262331	-103.569970
12,500.00	90.00	0.00	9,600.00	3,041.25	503.00	460,108.04	777,297.29	32.262605	-103.569970
12,600.00	90.00	0.00	9,600.00	3,141.25	503.00	460,208.04	777,296.58	32.262880	-103.569970
12,700.00	90.00	0.00	9,600.00	3,241.25	503.00	460,308.04	777,295.87	32.263155	-103.569970
12,800.00	90.00	0.00	9,600.00	3,341.25	503.00	460,408.04	777,295.16	32.263430	-103.569970
12,900.00	90.00	0.00	9,600.00	3,441.25	503.00	460,508.03	777,294.45	32.263705	-103.569970
13,000.00	90.00	0.00	9,600.00	3,541.25	503.00	460,608.03	777,293.75	32.263980	-103.569970
13,100.00	90.00	0.00	9,600.00	3,641.25	503.00	460,708.03	777,293.04	32.264255	-103.569970
13,200.00	90.00	0.00	9,600.00	3,741.25	503.00	460,808.03	777,292.33	32.264530	-103.569970
13,300.00	90.00	0.00	9,600.00	3,841.25	503.00	460,908.02	777,291.62	32.264804	-103.569970
13,400.00	90.00	0.00	9,600.00	3,941.25	503.00	461,008.02	777,290.91	32.265079	-103.569970
13,500.00	90.00	0.00	9,600.00	4,041.25	503.00	461,108.02	777,290.20	32.265354	-103.569970
13,600.00	90.00	0.00	9,600.00	4,141.25	503.00	461,208.01	777,289.49	32.265629	-103.569970
13,700.00	90.00	0.00	9,600.00	4,241.25	503.00	461,308.01	777,288.78	32.265904	-103.569970
13,800.00	90.00	0.00	9,600.00	4,341.25	503.00	461,408.01	777,288.07	32.266179	-103.569970
13,900.00	90.00	0.00	9,600.00	4,441.25	503.00	461,508.01	777,287.36	32.266454	-103.569970
14,000.00	90.00	0.00	9,600.00	4,541.25	503.00	461,608.00	777,286.65	32.266728	-103.569970
14,100.00	90.00	0.00	9,600.00	4,641.25	503.00	461,708.00	777,285.94	32.267003	-103.569970
14,200.00	90.00	0.00	9,600.00	4,741.25	503.00	461,808.00	777,285.23	32.267278	-103.569970
14,300.00	90.00	0.00	9,600.00	4,841.25	503.00	461,908.00	777,284.52	32.267553	-103.569970
14,400.00	90.00	0.00	9,600.00	4,941.25	503.00	462,007.99	777,283.81	32.267828	-103.569970
14,500.00	90.00	0.00	9,600.00	5,041.25	503.00	462,107.99	777,283.10	32.268103	-103.569970
14,600.00	90.00	0.00	9,600.00	5,141.25	503.00	462,207.99	777,282.39	32.268378	-103.569970
14,615.00	90.00	0.00	9,600.00	5,156.25	503.00	462,222.99	777,282.29	32.268419	-103.569970
Cross Section @ 14615' MD, 0' FSL, 380' FEL									
14,700.00	90.00	0.00	9,600.00	5,241.25	503.00	462,307.98	777,281.68	32.268653	-103.569970
14,800.00	90.00	0.00	9,600.00	5,341.25	503.00	462,407.98	777,280.97	32.268927	-103.569970
14,900.00	90.00	0.00	9,600.00	5,441.25	503.00	462,507.98	777,280.26	32.269202	-103.569970
15,000.00	90.00	0.00	9,600.00	5,541.25	503.00	462,607.98	777,279.55	32.269477	-103.569970
15,100.00	90.00	0.00	9,600.00	5,641.25	503.00	462,707.97	777,278.84	32.269752	-103.569970
15,200.00	90.00	0.00	9,600.00	5,741.25	503.00	462,807.97	777,278.13	32.270027	-103.569970

Database:	EDM r5000.141_Prod US	**Local Co-ordinate Reference:**	Well Thistle Unit 7H
Company:	WCDSC Permian NM	**TVD Reference:**	RKB @ 3675.50ft
Project:	Lea County (NAD83 New Mexico East)	**MD Reference:**	RKB @ 3675.50ft
Site:	Sec 33-T23S-R33E	**North Reference:**	True
Well:	Thistle Unit 7H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Permit Plan 1		

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
15,300.00	90.00	0.00	9,600.00	5,841.25	503.00	462,907.97	777,277.42	32.270302	-103.569970
15,400.00	90.00	0.00	9,600.00	5,941.25	503.00	463,007.97	777,276.72	32.270577	-103.569970
15,500.00	90.00	0.00	9,600.00	6,041.25	503.00	463,107.96	777,276.01	32.270852	-103.569970
15,600.00	90.00	0.00	9,600.00	6,141.25	503.00	463,207.96	777,275.30	32.271126	-103.569970
15,700.00	90.00	0.00	9,600.00	6,241.25	503.00	463,307.96	777,274.59	32.271401	-103.569970
15,800.00	90.00	0.00	9,600.00	6,341.25	503.00	463,407.96	777,273.88	32.271676	-103.569970
15,900.00	90.00	0.00	9,600.00	6,441.25	503.00	463,507.95	777,273.17	32.271951	-103.569970
16,000.00	90.00	0.00	9,600.00	6,541.25	503.00	463,607.95	777,272.46	32.272226	-103.569969
16,100.00	90.00	0.00	9,600.00	6,641.25	503.00	463,707.95	777,271.75	32.272501	-103.569969
16,200.00	90.00	0.00	9,600.00	6,741.25	503.00	463,807.94	777,271.04	32.272776	-103.569969
16,300.00	90.00	0.00	9,600.00	6,841.25	503.00	463,907.94	777,270.33	32.273051	-103.569969
16,400.00	90.00	0.00	9,600.00	6,941.25	503.00	464,007.94	777,269.62	32.273325	-103.569969
16,500.00	90.00	0.00	9,600.00	7,041.25	503.00	464,107.94	777,268.91	32.273600	-103.569969
16,600.00	90.00	0.00	9,600.00	7,141.25	503.00	464,207.93	777,268.20	32.273875	-103.569969
16,700.00	90.00	0.00	9,600.00	7,241.25	503.00	464,307.93	777,267.49	32.274150	-103.569969
16,800.00	90.00	0.00	9,600.00	7,341.25	503.00	464,407.93	777,266.78	32.274425	-103.569969
16,900.00	90.00	0.00	9,600.00	7,441.25	503.00	464,507.93	777,266.07	32.274700	-103.569969
17,000.00	90.00	0.00	9,600.00	7,541.25	503.00	464,607.92	777,265.36	32.274975	-103.569969
17,100.00	90.00	0.00	9,600.00	7,641.25	503.00	464,707.92	777,264.65	32.275249	-103.569969
17,200.00	90.00	0.00	9,600.00	7,741.25	503.00	464,807.92	777,263.94	32.275524	-103.569969
17,300.00	90.00	0.00	9,600.00	7,841.25	503.00	464,907.91	777,263.23	32.275799	-103.569969
17,400.00	90.00	0.00	9,600.00	7,941.25	503.00	465,007.91	777,262.52	32.276074	-103.569969
17,500.00	90.00	0.00	9,600.00	8,041.25	503.00	465,107.91	777,261.81	32.276349	-103.569969
17,600.00	90.00	0.00	9,600.00	8,141.25	503.00	465,207.91	777,261.10	32.276624	-103.569969
17,700.00	90.00	0.00	9,600.00	8,241.25	503.00	465,307.90	777,260.39	32.276899	-103.569969
17,800.00	90.00	0.00	9,600.00	8,341.25	503.00	465,407.90	777,259.68	32.277174	-103.569969
17,900.00	90.00	0.00	9,600.00	8,441.25	503.00	465,507.90	777,258.98	32.277448	-103.569969
18,000.00	90.00	0.00	9,600.00	8,541.25	503.00	465,607.90	777,258.27	32.277723	-103.569969
18,100.00	90.00	0.00	9,600.00	8,641.25	503.00	465,707.89	777,257.56	32.277998	-103.569969
18,200.00	90.00	0.00	9,600.00	8,741.25	503.00	465,807.89	777,256.85	32.278273	-103.569969
18,300.00	90.00	0.00	9,600.00	8,841.25	503.00	465,907.89	777,256.14	32.278548	-103.569969
18,400.00	90.00	0.00	9,600.00	8,941.25	503.00	466,007.88	777,255.43	32.278823	-103.569969
18,500.00	90.00	0.00	9,600.00	9,041.25	503.00	466,107.88	777,254.72	32.279098	-103.569969
18,600.00	90.00	0.00	9,600.00	9,141.25	503.00	466,207.88	777,254.01	32.279373	-103.569969
18,700.00	90.00	0.00	9,600.00	9,241.25	503.00	466,307.88	777,253.30	32.279647	-103.569969
18,800.00	90.00	0.00	9,600.00	9,341.25	503.00	466,407.87	777,252.59	32.279922	-103.569969
18,900.00	90.00	0.00	9,600.00	9,441.25	503.00	466,507.87	777,251.88	32.280197	-103.569969
19,000.00	90.00	0.00	9,600.00	9,541.25	503.00	466,607.87	777,251.17	32.280472	-103.569969
19,100.00	90.00	0.00	9,600.00	9,641.25	503.00	466,707.87	777,250.46	32.280747	-103.569969
19,200.00	90.00	0.00	9,600.00	9,741.25	503.00	466,807.86	777,249.75	32.281022	-103.569969
19,300.00	90.00	0.00	9,600.00	9,841.25	503.00	466,907.86	777,249.04	32.281297	-103.569969
19,400.00	90.00	0.00	9,600.00	9,941.25	503.00	467,007.86	777,248.33	32.281571	-103.569969
19,500.00	90.00	0.00	9,600.00	10,041.25	503.00	467,107.85	777,247.62	32.281846	-103.569969
19,600.00	90.00	0.00	9,600.00	10,141.25	503.00	467,207.85	777,246.91	32.282121	-103.569969
19,700.00	90.00	0.00	9,600.00	10,241.25	503.00	467,307.85	777,246.20	32.282396	-103.569969
19,800.00	90.00	0.00	9,600.00	10,341.25	503.00	467,407.85	777,245.49	32.282671	-103.569969
19,895.00	90.00	0.00	9,600.00	10,436.25	503.00	467,502.84	777,244.82	32.282932	-103.569969
Cross Section @ 19895' MD, 0' FSL, 380' FEL									
19,900.00	90.00	0.00	9,600.00	10,441.25	503.00	467,507.84	777,244.78	32.282946	-103.569969
20,000.00	90.00	0.00	9,600.00	10,541.25	503.00	467,607.84	777,244.07	32.283221	-103.569969
20,100.00	90.00	0.00	9,600.00	10,641.25	503.00	467,707.84	777,243.36	32.283496	-103.569969
20,200.00	90.00	0.00	9,600.00	10,741.25	503.00	467,807.84	777,242.65	32.283770	-103.569969
20,300.00	90.00	0.00	9,600.00	10,841.25	503.00	467,907.83	777,241.94	32.284045	-103.569969
20,400.00	90.00	0.00	9,600.00	10,941.25	503.00	468,007.83	777,241.24	32.284320	-103.569969

Database:	EDM r5000.141_Prod US	**Local Co-ordinate Reference:**	Well Thistle Unit 7H
Company:	WCDSC Permian NM	**TVD Reference:**	RKB @ 3675.50ft
Project:	Lea County (NAD83 New Mexico East)	**MD Reference:**	RKB @ 3675.50ft
Site:	Sec 33-T23S-R33E	**North Reference:**	True
Well:	Thistle Unit 7H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Permit Plan 1		

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
20,500.00	90.00	0.00	9,600.00	11,041.25	503.00	468,107.83	777,240.53	32.284595	-103.569969
20,600.00	90.00	0.00	9,600.00	11,141.25	503.00	468,207.82	777,239.82	32.284870	-103.569969
20,700.00	90.00	0.00	9,600.00	11,241.25	503.00	468,307.82	777,239.11	32.285145	-103.569969
20,800.00	90.00	0.00	9,600.00	11,341.25	503.00	468,407.82	777,238.40	32.285420	-103.569969
20,900.00	90.00	0.00	9,600.00	11,441.25	503.00	468,507.82	777,237.69	32.285695	-103.569969
21,000.00	90.00	0.00	9,600.00	11,541.25	503.00	468,607.81	777,236.98	32.285969	-103.569969
21,100.00	90.00	0.00	9,600.00	11,641.25	503.00	468,707.81	777,236.27	32.286244	-103.569969
21,200.00	90.00	0.00	9,600.00	11,741.25	503.00	468,807.81	777,235.56	32.286519	-103.569969
21,300.00	90.00	0.00	9,600.00	11,841.25	503.00	468,907.81	777,234.85	32.286794	-103.569969
21,400.00	90.00	0.00	9,600.00	11,941.25	503.00	469,007.80	777,234.14	32.287069	-103.569969
21,500.00	90.00	0.00	9,600.00	12,041.25	503.00	469,107.80	777,233.43	32.287344	-103.569969
21,600.00	90.00	0.00	9,600.00	12,141.25	503.00	469,207.80	777,232.72	32.287619	-103.569969
21,700.00	90.00	0.00	9,600.00	12,241.25	503.00	469,307.79	777,232.01	32.287893	-103.569969
21,800.00	90.00	0.00	9,600.00	12,341.25	503.00	469,407.79	777,231.30	32.288168	-103.569969
21,900.00	90.00	0.00	9,600.00	12,441.25	503.00	469,507.79	777,230.59	32.288443	-103.569969
22,000.00	90.00	0.00	9,600.00	12,541.25	503.00	469,607.79	777,229.88	32.288718	-103.569969
22,100.00	90.00	0.00	9,600.00	12,641.25	503.00	469,707.78	777,229.17	32.288993	-103.569969
22,200.00	90.00	0.00	9,600.00	12,741.25	503.00	469,807.78	777,228.46	32.289268	-103.569969
22,300.00	90.00	0.00	9,600.00	12,841.25	503.00	469,907.78	777,227.75	32.289543	-103.569969
22,400.00	90.00	0.00	9,600.00	12,941.25	503.00	470,007.78	777,227.04	32.289818	-103.569969
22,500.00	90.00	0.00	9,600.00	13,041.25	503.00	470,107.77	777,226.33	32.290092	-103.569969
22,600.00	90.00	0.00	9,600.00	13,141.25	503.00	470,207.77	777,225.62	32.290367	-103.569969
22,700.00	90.00	0.00	9,600.00	13,241.25	503.00	470,307.77	777,224.91	32.290642	-103.569969
22,800.00	90.00	0.00	9,600.00	13,341.25	503.00	470,407.76	777,224.21	32.290917	-103.569969
22,900.00	90.00	0.00	9,600.00	13,441.25	503.00	470,507.76	777,223.50	32.291192	-103.569969
23,000.00	90.00	0.00	9,600.00	13,541.25	503.00	470,607.76	777,222.79	32.291467	-103.569969
23,100.00	90.00	0.00	9,600.00	13,641.25	503.00	470,707.76	777,222.08	32.291742	-103.569969
23,200.00	90.00	0.00	9,600.00	13,741.25	503.00	470,807.75	777,221.37	32.292017	-103.569969
23,300.00	90.00	0.00	9,600.00	13,841.25	503.00	470,907.75	777,220.66	32.292291	-103.569969
23,400.00	90.00	0.00	9,600.00	13,941.25	503.00	471,007.75	777,219.95	32.292566	-103.569969
23,500.00	90.00	0.00	9,600.00	14,041.25	503.00	471,107.75	777,219.24	32.292841	-103.569969
23,600.00	90.00	0.00	9,600.00	14,141.25	503.00	471,207.74	777,218.53	32.293116	-103.569969
23,700.00	90.00	0.00	9,600.00	14,241.25	503.00	471,307.74	777,217.82	32.293391	-103.569969
23,800.00	90.00	0.00	9,600.00	14,341.25	503.00	471,407.74	777,217.11	32.293666	-103.569969
23,900.00	90.00	0.00	9,600.00	14,441.25	503.00	471,507.74	777,216.40	32.293941	-103.569969
24,000.00	90.00	0.00	9,600.00	14,541.25	503.00	471,607.73	777,215.69	32.294215	-103.569969
24,100.00	90.00	0.00	9,600.00	14,641.25	503.00	471,707.73	777,214.98	32.294490	-103.569969
24,200.00	90.00	0.00	9,600.00	14,741.25	503.00	471,807.73	777,214.27	32.294765	-103.569969
24,300.00	90.00	0.00	9,600.00	14,841.25	503.00	471,907.72	777,213.56	32.295040	-103.569969
24,400.00	90.00	0.00	9,600.00	14,941.25	503.00	472,007.72	777,212.85	32.295315	-103.569969
24,500.00	90.00	0.00	9,600.00	15,041.25	503.00	472,107.72	777,212.14	32.295590	-103.569969
24,600.00	90.00	0.00	9,600.00	15,141.25	503.00	472,207.72	777,211.43	32.295865	-103.569969
24,700.00	90.00	0.00	9,600.00	15,241.25	503.00	472,307.71	777,210.72	32.296140	-103.569969
24,800.00	90.00	0.00	9,600.00	15,341.25	503.00	472,407.71	777,210.01	32.296414	-103.569969
24,900.00	90.00	0.00	9,600.00	15,441.25	503.00	472,507.71	777,209.30	32.296689	-103.569969
25,000.00	90.00	0.00	9,600.00	15,541.25	503.00	472,607.71	777,208.59	32.296964	-103.569969
25,071.32	90.00	0.00	9,600.00	15,612.57	503.00	472,679.02	777,208.09	32.297160	-103.569969
LTP @ 25071' MD, 100' FNL, 380' FEL									
25,100.00	90.00	0.00	9,600.00	15,641.25	503.00	472,707.70	777,207.88	32.297239	-103.569969
25,151.32	90.00	0.00	9,600.00	15,692.57	503.00	472,759.02	777,207.52	32.297380	-103.569969
PBHL; 20' FNL, 380' FEL									
25,151.33	90.00	0.00	9,600.00	15,692.58	503.00	472,759.03	777,207.52	32.297380	-103.569969

Database:	EDM r5000.141_Prod US	**Local Co-ordinate Reference:**	Well Thistle Unit 7H
Company:	WCDSC Permian NM	**TVD Reference:**	RKB @ 3675.50ft
Project:	Lea County (NAD83 New Mexico East)	**MD Reference:**	RKB @ 3675.50ft
Site:	Sec 33-T23S-R33E	**North Reference:**	True
Well:	Thistle Unit 7H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Permit Plan 1		

Plan Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates +N/-S (ft)	Local Coordinates +E/-W (ft)	Comment
9,056.71	9,027.04	-75.00	503.00	KOP @ 9057' MD, 50' FSL, 380' FEL
9,300.29	9,263.35	-24.00	503.00	FTP @ 9300' MD, 100' FSL, 380' FEL
14,615.00	9,600.00	5,156.25	503.00	Cross Section @ 14615' MD, 0' FSL, 380' FEL
19,895.00	9,600.00	10,436.25	503.00	Cross Section @ 19895' MD, 0' FSL, 380' FEL
25,071.32	9,600.00	15,612.57	503.00	LTP @ 25071' MD, 100' FNL, 380' FEL
25,151.32	9,600.00	15,692.57	503.00	PBHL; 20' FNL, 380' FEL

PECOS DISTRICT
DRILLING OPERATIONS
CONDITIONS OF APPROVAL

OPERATOR'S NAME:	Devon Energy Production Company, LP
LEASE NO.:	NMNM94186
WELL NAME & NO.:	7H-Thistle Unit
SURFACE HOLE FOOTAGE:	124'/S & 883'/E
BOTTOM HOLE FOOTAGE	20'/N & 380'/E
LOCATION:	Section 33, T.23 S., R.33 E., NMPM
COUNTY:	Lea County, New Mexico

Potash	◉ None	○ Secretary	○ R-111-P
Cave/Karst Potential	◉ Low	○ Medium	○ High
Variance	○ None	◉ Flex Hose	○ Other
Wellhead	◉ Conventional	○ Multibowl	
Other	☐4 String Area	☐Capitan Reef	☐WIPP

All previous COAs still apply, except for the following:

A. CASING

1. The **13 3/8** inch surface casing shall be set at approximately **1380** feet (a minimum of 25 feet into the Rustler Anhydrite and above the salt) and cemented to the surface.

    a. If cement does not circulate to the surface, the appropriate BLM office shall be notified and a temperature survey utilizing an electronic type temperature survey with surface log readout will be used or a cement bond log shall be run to verify the top of the cement. Temperature survey will be run a minimum of six hours after pumping cement and ideally between 8-10 hours after completing the cement job.

    b. Wait on cement (WOC) time for a primary cement job will be a minimum of **8 hours** or 500 pounds compressive strength, whichever is greater. (This is to include the lead cement)

    c. Wait on cement (WOC) time for a remedial job will be a minimum of 4 hours after bringing cement to surface or 500 pounds compressive strength, whichever is greater.

    d. If cement falls back, remedial cementing will be done prior to drilling out that string.

2. The minimum required fill of cement behind the **9 5/8** inch intermediate casing, which shall be set at approximately **5150** feet, is:

Option 1 (Single Stage):

- Cement to surface. If cement does not circulate see B.1.a, c-d above. **Excess calculates to 7% - additional cement will be required.**

Option 2:

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

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

b. Second stage above DV tool:

- Cement to surface. If cement does not circulate, contact the appropriate BLM office.

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

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

B. 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 **3000 (3M)** psi.

3. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the **9 5/8** intermediate casing shoe shall be **5000 (5M)** psi.

MHH 01172019

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)

☒ Chaves and Roosevelt Counties
Call the Roswell Field Office, 2909 West Second St., Roswell NM 88201.
During office hours call (575) 627-0272.
After office hours call (575)

☒ 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

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.

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.

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: 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.

   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.