

Well Name: MESA VERDE BS UNIT	Well Location: T24S / R32E / SEC 16 / SWSW / 32.2120105 / -103.6842747	County or Parish/State: LEA / NM
Well Number: 46H	Type of Well: OIL WELL	Allottee or Tribe Name:
Lease Number: NMNM55953	Unit or CA Name:	Unit or CA Number:
US Well Number: 3002548816	Well Status: Drilling Well	Operator: OXY USA INCORPORATED

Notice of Intent

Sundry ID: 2696925

Type of Submission: Notice of Intent

Date Sundry Submitted: 10/06/2022

Date proposed operation will begin: 10/09/2022

Type of Action: APD Change

Time Sundry Submitted: 02:35

Procedure Description: OXY USA Inc. respectfully requests approval to amend the subject well AAPD (casing, cement, mud programs). See the attached drill plan, directional, WH diagram and prod csg spec sheet for reference. SH and BH are not changing.

NOI Attachments

Procedure Description

- MesaVerdeBSUnit46H\_TNSWedge461\_5.500in\_20.00\_P110CY\_20221006143448.pdf
- MesaVerdeBSUnit46H\_13inADAPT\_10.75in\_7.625in\_10x10\_20221006143438.pdf
- MesaVerdeBSUnit46H\_DirectPlan\_20221006143424.pdf
- MesaVerdeBSUnit46H\_DirectPlot\_20221006143419.pdf
- MesaVerdeBSUnit46H\_DrillPlan\_20221006143358.pdf

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Conditions of Approval

Additional

MESA\_VERDE\_BS\_UNIT\_46H\_\_\_SUNDRY\_COA\_\_\_2696925\_20221118101016.pdf

Operator

I certify that the foregoing is true and correct. 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. Electronic submission of Sundry Notices through this system satisfies regulations requiring a

Operator Electronic Signature: LESLIE REEVES	Signed on: OCT 06, 2022 02:34 PM
Name: OXY USA INCORPORATED	
Title: Advisor Regulatory	
Street Address: 5 GREENWAY PLAZA, SUITE 110	
City: HOUSTON	State: TX
Phone: (713) 497-2492	
Email address: LESLIE_REEVES@OXY.COM	

Field

Representative Name:		
Street Address:		
City:	State:	Zip:
Phone:		
Email address:		

BLM Point of Contact

BLM POC Name: KEITH P IMMATTY	BLM POC Title: ENGINEER
BLM POC Phone: 5759884722	BLM POC Email Address: KIMMATTY@BLM.GOV
Disposition: Approved	Disposition Date: 02/05/2023
Signature: Keith Immatty	

# Oxy USA Inc. - Mesa Verde BS Unit 46H

## Drill Plan

### 1. Geologic Formations

TVD of Target (ft):	9780	Pilot Hole Depth (ft):	
Total Measured Depth (ft):	20787	Deepest Expected Fresh Water (ft):	927

### Delaware Basin

Formation	MD-RKB (ft)	TVD-RKB (ft)	Expected Fluids
Rustler	927	927	
Salado	1236	1236	Salt
Castile	3143	3143	Salt
Delaware	4744	4738	Oil/Gas/Brine
Bell Canyon	4766	4760	Oil/Gas/Brine
Cherry Canyon	5689	5651	Oil/Gas/Brine
Brushy Canyon	7067	6961	Losses
Bone Spring	8865	8671	Oil/Gas
Bone Spring 1st	10121	9740	Oil/Gas
Bone Spring 2nd			Oil/Gas
Bone Spring 3rd			Oil/Gas
Wolfcamp			Oil/Gas
Penn			Oil/Gas
Strawn			Oil/Gas

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

### 2. Casing Program

Section	Hole Size (in)	MD		TVD		Csg. OD (in)	Csg Wt. (ppf)	Grade	Conn.
		From (ft)	To (ft)	From (ft)	To (ft)				
Surface	14.75	0	987	0	987	10.75	45.5	J-55	BTC
Intermediate	9.875	0	9206	0	8990	7.625	26.4	L-80 HC	BTC
Production	6.75	0	20787	0	9780	5.5	20	P-110	Wedge 461

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

\*Oxy requests the option to run production casing with DQX, TORQ DQW, Wedge 425, Wedge 461, and/or Wedge 441 connections to accommodate hole conditions or drilling operations.

All Casing SF Values will meet or exceed those below			
SF Collapse	SF Burst	Body SF Tension	Joint SF Tension
1.125	1.2	1.4	1.4

## Annular Clearance Variance Request

As per the agreement reached in the Oxy/BLM face-to-face meeting on Feb 22, 2018, Oxy requests permission to allow deviation from the 0.422" annular clearance requirement from Onshore Order #2 under the following conditions:

1. Annular clearance to meet or exceed 0.422" between intermediate casing ID and production casing coupling only on the first 500' overlap between both casings.
2. Annular clearance less than 0.422" is acceptable for the curve and lateral portions of the production open hole section.

	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.	Y
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 3 <sup>rd</sup> 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 2 <sup>nd</sup> 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

Section	Stage	Slurry:	Sacks	Yield (ft <sup>3</sup> /ft)	Density (lb/gal)	Excess:	TOC	Placement	Description
Surface	1	Surface - Tail	826	1.33	14.8	100%	-	Circulate	Class C+Accel.
Int.	1	Intermediate 1S - Tail	258	1.65	13.2	5%	7,317	Circulate	Class H+Accel., Disper., Salt
Int.	2	Intermediate 2S - Tail BH	1129	1.71	13.3	25%	-	Bradenhead	Class C+Accel.
Prod.	1	Production - Tail	2686	1.38	13.2	25%	8,706	Circulate	Class H+Ret., Disper., Salt

## Offline Cementing

Oxy requests a variance to cement the 9.625" and/or 7.625" intermediate casing strings offline in accordance to the approved variance, EC Tran 461365.

The summarized operational sequence will be as follows:

Run casing as per normal operations. While running casing, conduct negative pressure test and confirm integrity of the float equipment (float collar and shoe).

Land casing.

Fill pipe with kill weight fluid, and confirm well is static.

If well Oxy requests a variance to cement the 9.625" and/or 7.625" intermediate casing strings offline in accordance to the approved variance, EC Tran 461365.

The summarized operational sequence will be as follows:

1. Run casing as per normal operations. While running casing, conduct negative pressure test and confirm integrity of the float equipment (float collar and shoe).
2. Land casing.
3. Fill pipe with kill weight fluid, and confirm well is static.
  - a. If well is not static notify BLM and kill well.
  - b. Once well is static notify BLM with intent to proceed with nipple down and offline cementing.
4. Set and pressure test annular packoff.
5. After confirmation of both annular barriers and internal barriers, nipple down BOP and install cap flange. If any barrier fails to test, the BOP stack will not be nipped down until after the cement job is completed.
6. Skid rig to next well on pad.
7. Confirm well is static before removing cap flange.
8. If well is not static notify BLM and kill well prior to cementing or nipping up for further remediation.
9. Install offline cement tool.
10. Rig up cement equipment.
  - a. Notify BLM prior to cement job.
11. Perform cement job.
12. Confirm well is static and floats are holding after cement job.
13. Remove cement equipment, offline cement tools and install night cap with pressure gauge for monitoring.

Oxy requests permission to adjust the CBL requirement after bradenhead cement jobs, on 7-5/8" intermediate casings, as per the agreement reached in the OXY/BLM meeting on September 5, 2019.

### Three string wells:

- CBL will be required on one well per pad
- If the pumped volume of cement is less than permitted in the APD, BLM will be notified and a CBL may be run
- Echometer will be used after bradenhead cement job to determine TOC before pumping top-out cement

#### 4. Pressure Control Equipment

BOP installed and tested before drilling which hole?	Size?	Min. Required WP	Type	✓	Tested to:	Deepest TVD Depth (ft) per Section:
9.875" Hole	13-5/8"	3M	Annular	✓	70% of working pressure	8990
		3M	Blind Ram	✓	250 psi / 3000 psi	
			Pipe Ram			
			Double Ram	✓		
			Other*			
6.75" Hole	13-5/8"	3M	Annular	✓	70% of working pressure	9780
		3M	Blind Ram	✓	250 psi / 3000 psi	
			Pipe Ram			
			Double Ram	✓		
			Other*			

\*Specify if additional ram is utilized

BOP/BOPE will be tested by an independent service company to 250 psi low and the high pressure indicated above per Onshore Order 2 requirements. The System may be upgraded to a higher pressure but still tested to the working pressure listed in the table above. If the system is upgraded all the components installed will be functional and tested.

Pipe rams will be operationally checked each 24 hour period. Blind rams will be operationally checked on each trip out of the hole. These checks will be noted on the daily tour sheets. Other accessories to the BOP equipment will include a Kelly cock and floor safety valve (inside BOP) and choke lines and choke manifold.

	Formation integrity test will be performed per Onshore Order #2.
	On Exploratory wells or 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. Will be tested in accordance with Onshore Oil and Gas Order #2 III.B.1.i.
	A variance is requested for the use of a flexible choke line from the BOP to Choke Manifold. See attached for specs and hydrostatic test chart.
Y	Are anchors required by manufacturer?
	A multibowl or a unionized multibowl wellhead system will be employed. The wellhead and connection to the BOPE will meet all API 6A requirements. The BOP will be tested per Onshore Order #2 after installation on the surface casing which will cover testing requirements for a maximum of 30 days. If any seal subject to test pressure is broken the system must be tested. We will test the flange connection of the wellhead with a test port that is directly in the flange. We are proposing that we will run the wellhead through the rotary prior to cementing surface casing as discussed with the BLM on October 8, 2015.  See attached schematics.

## BOP Break Testing Request

Oxy requests permission to adjust the BOP break testing requirements as per the agreement reached in the OXY/BLM meeting on September 5, 2019.

BOP break test under the following conditions:

- After a full BOP test is conducted
- When skidding to drill an intermediate section where ICP is set into the third Bone Spring or shallower.

If the kill line is broken prior to skid, two tests will be performed.

- 1) Wellhead flange, co-flex hose, kill line connections and upper pipe rams
- 2) Wellhead flange, HCR valve, check valve, upper pipe rams

If the kill line is not broken prior to skid, only one test will be performed.

- 1) Wellhead flange, co-flex hose, check valve, upper pipe rams

**Oxy will use Cameron ADAPT wellhead system that uses an OEC top flange connection. This connection has been fully vetted and verified by API to Spec 6A and carries an API monogram.**



## 5. Mud Program

Section	Depth - MD		Depth - TVD		Type	Weight (ppg)	Viscosity	Water Loss
	From (ft)	To (ft)	From (ft)	To (ft)				
Surface	0	987	0	987	Water-Based Mud	8.6 - 8.8	40-60	N/C
Intermediate	987	9206	987	8990	Saturated Brine-Based or Oil-Based Mud	8.0 - 10.0	35-45	N/C
Production	9206	20787	8990	9780	Water-Based or Oil-Based Mud	8.0 - 9.6	38-50	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. The following is a general list of products: Barite, Bentonite, Gypsum, Lime, Soda Ash, Caustic Soda, Nut Plug, Cedar Fiber, Cotton Seed Hulls, Drilling Paper, Salt Water Clay, CACL2. Oxy will use a closed mud system.

What will be used to monitor the loss or gain of fluid?	PVT/MD Totco/Visual Monitoring
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## 6. Logging and Testing Procedures

Logging, Coring and Testing.	
Yes	Will run GR 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.
No	Drill stem test? If yes, explain
No	Coring? If yes, explain

Additional logs planned		Interval
No	Resistivity	
No	Density	
No	CBL	
Yes	Mud log	Bone Spring – TD
No	PEX	

## 7. Drilling Conditions

Condition	Specify what type and where?
BH Pressure at deepest TVD	4883 psi
Abnormal Temperature	No
BH Temperature at deepest TVD	159°F

Pump high viscosity sweeps as needed for hole cleaning. The mud system will be monitored visually/manually as well as with an electronic PVT. The necessary mud products for additional weight and fluid loss control will be on location at all times. Appropriately weighted mud will be used to isolate potential gas, oil, and water zones until such time as casing can be cemented into place for zonal

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

	Yes/No
Will the well be drilled with a walking/skidding operation? If yes, describe. We plan to drill the 3 well pad in batch by section: all surface sections, intermediate sections and production sections. The wellhead will be secured with a night cap whenever the rig is not over the well.	Yes
Will more than one drilling rig be used for drilling operations? If yes, describe. Oxy requests the option to contract a Surface Rig to drill, set surface casing, and cement for this well. If the timing between rigs is such that Oxy would not be able to preset surface, the Primary Rig will MIRU and drill the well in its entirety per the APD. Please see the attached document for information on the spudder rig.	Yes

**Total Estimated Cuttings Volume:** 1500 bbls

### Attachments

- ☒ Directional Plan
- ☒ H2S Contingency Plan
- ☒ Flex III Attachments
- ☒ Spudder Rig Attachment
- ☒ Premium Connection Specs

## 9. Company Personnel

Name	Title	Office Phone	Mobile Phone
Rosstin McDonald	Drilling Engineer	225-278-9460	225-278-9460
Filip Krneta	Drilling Engineer Supervisor	713-350-4751	832-244-4980
Simon Benavides	Drilling Superintendent	713-522-8652	281-684-6897
Diego Tellez	Drilling Manager	713-350-4602	713-303-4932

# **OXY**

**PRD NM DIRECTIONAL PLANS (NAD 1983)**

**Mesa Verde BS Unit**

**Mesa Verde BS Unit 46H**

**Wellbore #1**

**Plan: Permitting Plan**

## **Standard Planning Report**

**28 September, 2022**

# OXY

## Planning Report

<b>Database:</b>	HOPSPP	<b>Local Co-ordinate Reference:</b>	Well Mesa Verde BS Unit 46H
<b>Company:</b>	ENGINEERING DESIGNS	<b>TVD Reference:</b>	RKB=26.5' @ 3600.00ft
<b>Project:</b>	PRD NM DIRECTIONAL PLANS (NAD 1983)	<b>MD Reference:</b>	RKB=26.5' @ 3600.00ft
<b>Site:</b>	Mesa Verde BS Unit	<b>North Reference:</b>	Grid
<b>Well:</b>	Mesa Verde BS Unit 46H	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Permitting Plan		

<b>Project</b>	PRD NM DIRECTIONAL PLANS (NAD 1983)		
<b>Map System:</b>	US State Plane 1983	<b>System Datum:</b>	Mean Sea Level
<b>Geo Datum:</b>	North American Datum 1983		
<b>Map Zone:</b>	New Mexico Eastern Zone		Using geodetic scale factor

Site		Mesa Verde BS Unit			
Site Position:		Northing:	441,628.38 usft	Latitude:	32.212703
From:	Map	Easting:	726,045.01 usft	Longitude:	-103.736102
Position Uncertainty:	49.91 ft	Slot Radius:	13.200 in	Grid Convergence:	0.32 °

Well		Mesa Verde BS Unit 46H				
Well Position	+N/-S	-158.82 ft	Northing:	441,469.57 usft	Latitude:	32.212011
	+E/-W	16,031.32 ft	Easting:	742,075.47 usft	Longitude:	-103.684275
Position Uncertainty		1.00 ft	Wellhead Elevation:		Ground Level:	3,573.50 ft

<b>Wellbore</b>	Wellbore #1				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	HDGM_FILE	12/10/2019	6.60	59.85	47,834.50000000

<b>Design</b>	Permitting Plan				
<b>Audit Notes:</b>					
<b>Version:</b>	<b>Phase:</b>	PROTOTYPE	<b>Tie On Depth:</b>	0.00	
<b>Vertical Section:</b>	<b>Depth From (TVD) (ft)</b>	<b>+N/-S (ft)</b>	<b>+E/-W (ft)</b>	<b>Direction (°)</b>	
	0.00	0.00	0.00	6.01	

<b>Plan Survey Tool Program</b>	<b>Date</b>	9/28/2022			
<b>Depth From (ft)</b>	<b>Depth To (ft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Remarks</b>	
1	0.00	20,787.28	Permitting Plan (Wellbore #1)	B001Mb_MWD+HRGM	
				OWSG MWD + HRGM	

<b>Plan Sections</b>										
<b>Measured Depth (ft)</b>	<b>Inclination (°)</b>	<b>Azimuth (°)</b>	<b>Vertical Depth (ft)</b>	<b>+N/-S (ft)</b>	<b>+E/-W (ft)</b>	<b>Dogleg Rate (°/100ft)</b>	<b>Build Rate (°/100ft)</b>	<b>Turn Rate (°/100ft)</b>	<b>TFO (°)</b>	<b>Target</b>
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
3,705.00	0.00	0.00	3,705.00	0.00	0.00	0.00	0.00	0.00	0.00	
5,504.57	18.00	138.39	5,475.13	-209.58	186.12	1.00	1.00	0.00	138.39	
9,305.67	18.00	138.39	9,090.27	-1,087.63	965.91	0.00	0.00	0.00	0.00	
10,343.40	90.35	359.63	9,780.49	-526.00	1,111.03	10.00	6.97	-13.37	-137.26	FTP (Mesa Verde)
20,787.28	90.35	359.63	9,717.08	9,917.46	1,043.64	0.00	0.00	0.00	0.00	PBHL (Mesa Verde)

# OXY

## Planning Report

<b>Database:</b>	HOPSPP	<b>Local Co-ordinate Reference:</b>	Well Mesa Verde BS Unit 46H
<b>Company:</b>	ENGINEERING DESIGNS	<b>TVD Reference:</b>	RKB=26.5' @ 3600.00ft
<b>Project:</b>	PRD NM DIRECTIONAL PLANS (NAD 1983)	<b>MD Reference:</b>	RKB=26.5' @ 3600.00ft
<b>Site:</b>	Mesa Verde BS Unit	<b>North Reference:</b>	Grid
<b>Well:</b>	Mesa Verde BS Unit 46H	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Permitting Plan		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	0.00
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00
400.00	0.00	0.00	400.00	0.00	0.00	0.00	0.00	0.00	0.00
500.00	0.00	0.00	500.00	0.00	0.00	0.00	0.00	0.00	0.00
600.00	0.00	0.00	600.00	0.00	0.00	0.00	0.00	0.00	0.00
700.00	0.00	0.00	700.00	0.00	0.00	0.00	0.00	0.00	0.00
800.00	0.00	0.00	800.00	0.00	0.00	0.00	0.00	0.00	0.00
900.00	0.00	0.00	900.00	0.00	0.00	0.00	0.00	0.00	0.00
1,000.00	0.00	0.00	1,000.00	0.00	0.00	0.00	0.00	0.00	0.00
1,100.00	0.00	0.00	1,100.00	0.00	0.00	0.00	0.00	0.00	0.00
1,200.00	0.00	0.00	1,200.00	0.00	0.00	0.00	0.00	0.00	0.00
1,300.00	0.00	0.00	1,300.00	0.00	0.00	0.00	0.00	0.00	0.00
1,400.00	0.00	0.00	1,400.00	0.00	0.00	0.00	0.00	0.00	0.00
1,500.00	0.00	0.00	1,500.00	0.00	0.00	0.00	0.00	0.00	0.00
1,600.00	0.00	0.00	1,600.00	0.00	0.00	0.00	0.00	0.00	0.00
1,700.00	0.00	0.00	1,700.00	0.00	0.00	0.00	0.00	0.00	0.00
1,800.00	0.00	0.00	1,800.00	0.00	0.00	0.00	0.00	0.00	0.00
1,900.00	0.00	0.00	1,900.00	0.00	0.00	0.00	0.00	0.00	0.00
2,000.00	0.00	0.00	2,000.00	0.00	0.00	0.00	0.00	0.00	0.00
2,100.00	0.00	0.00	2,100.00	0.00	0.00	0.00	0.00	0.00	0.00
2,200.00	0.00	0.00	2,200.00	0.00	0.00	0.00	0.00	0.00	0.00
2,300.00	0.00	0.00	2,300.00	0.00	0.00	0.00	0.00	0.00	0.00
2,400.00	0.00	0.00	2,400.00	0.00	0.00	0.00	0.00	0.00	0.00
2,500.00	0.00	0.00	2,500.00	0.00	0.00	0.00	0.00	0.00	0.00
2,600.00	0.00	0.00	2,600.00	0.00	0.00	0.00	0.00	0.00	0.00
2,700.00	0.00	0.00	2,700.00	0.00	0.00	0.00	0.00	0.00	0.00
2,800.00	0.00	0.00	2,800.00	0.00	0.00	0.00	0.00	0.00	0.00
2,900.00	0.00	0.00	2,900.00	0.00	0.00	0.00	0.00	0.00	0.00
3,000.00	0.00	0.00	3,000.00	0.00	0.00	0.00	0.00	0.00	0.00
3,100.00	0.00	0.00	3,100.00	0.00	0.00	0.00	0.00	0.00	0.00
3,200.00	0.00	0.00	3,200.00	0.00	0.00	0.00	0.00	0.00	0.00
3,300.00	0.00	0.00	3,300.00	0.00	0.00	0.00	0.00	0.00	0.00
3,400.00	0.00	0.00	3,400.00	0.00	0.00	0.00	0.00	0.00	0.00
3,500.00	0.00	0.00	3,500.00	0.00	0.00	0.00	0.00	0.00	0.00
3,600.00	0.00	0.00	3,600.00	0.00	0.00	0.00	0.00	0.00	0.00
3,700.00	0.00	0.00	3,700.00	0.00	0.00	0.00	0.00	0.00	0.00
3,705.00	0.00	0.00	3,705.00	0.00	0.00	0.00	0.00	0.00	0.00
3,800.00	0.95	138.39	3,800.00	-0.59	0.52	-0.53	1.00	1.00	0.00
3,900.00	1.95	138.39	3,899.96	-2.48	2.20	-2.24	1.00	1.00	0.00
4,000.00	2.95	138.39	3,999.87	-5.68	5.04	-5.12	1.00	1.00	0.00
4,100.00	3.95	138.39	4,099.69	-10.18	9.04	-9.17	1.00	1.00	0.00
4,200.00	4.95	138.39	4,199.38	-15.98	14.19	-14.41	1.00	1.00	0.00
4,300.00	5.95	138.39	4,298.93	-23.08	20.50	-20.81	1.00	1.00	0.00
4,400.00	6.95	138.39	4,398.30	-31.48	27.96	-28.38	1.00	1.00	0.00
4,500.00	7.95	138.39	4,497.45	-41.17	36.57	-37.12	1.00	1.00	0.00
4,600.00	8.95	138.39	4,596.36	-52.16	46.32	-47.03	1.00	1.00	0.00
4,700.00	9.95	138.39	4,695.01	-64.44	57.23	-58.09	1.00	1.00	0.00
4,800.00	10.95	138.39	4,793.35	-78.00	69.27	-70.32	1.00	1.00	0.00
4,900.00	11.95	138.39	4,891.36	-92.84	82.45	-83.70	1.00	1.00	0.00
5,000.00	12.95	138.39	4,989.00	-108.96	96.77	-98.24	1.00	1.00	0.00
5,100.00	13.95	138.39	5,086.26	-126.35	112.21	-113.92	1.00	1.00	0.00
5,200.00	14.95	138.39	5,183.09	-145.01	128.78	-130.74	1.00	1.00	0.00
5,300.00	15.95	138.39	5,279.48	-164.93	146.47	-148.70	1.00	1.00	0.00

# OXY

## Planning Report

<b>Database:</b>	HOPSPP	<b>Local Co-ordinate Reference:</b>	Well Mesa Verde BS Unit 46H
<b>Company:</b>	ENGINEERING DESIGNS	<b>TVD Reference:</b>	RKB=26.5' @ 3600.00ft
<b>Project:</b>	PRD NM DIRECTIONAL PLANS (NAD 1983)	<b>MD Reference:</b>	RKB=26.5' @ 3600.00ft
<b>Site:</b>	Mesa Verde BS Unit	<b>North Reference:</b>	Grid
<b>Well:</b>	Mesa Verde BS Unit 46H	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Permitting Plan		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
5,400.00	16.95	138.39	5,375.38	-186.10	165.27	-167.78	1.00	1.00	0.00
5,500.00	17.95	138.39	5,470.78	-208.52	185.19	-188.00	1.00	1.00	0.00
5,504.57	18.00	138.39	5,475.13	-209.58	186.12	-188.95	1.00	1.00	0.00
5,600.00	18.00	138.39	5,565.89	-231.62	205.70	-208.82	0.00	0.00	0.00
5,700.00	18.00	138.39	5,661.00	-254.72	226.21	-229.65	0.00	0.00	0.00
5,800.00	18.00	138.39	5,756.11	-277.82	246.73	-250.48	0.00	0.00	0.00
5,900.00	18.00	138.39	5,851.21	-300.92	267.24	-271.30	0.00	0.00	0.00
6,000.00	18.00	138.39	5,946.32	-324.02	287.76	-292.13	0.00	0.00	0.00
6,100.00	18.00	138.39	6,041.43	-347.12	308.27	-312.96	0.00	0.00	0.00
6,200.00	18.00	138.39	6,136.54	-370.22	328.79	-333.78	0.00	0.00	0.00
6,300.00	18.00	138.39	6,231.65	-393.32	349.30	-354.61	0.00	0.00	0.00
6,400.00	18.00	138.39	6,326.75	-416.42	369.82	-375.44	0.00	0.00	0.00
6,500.00	18.00	138.39	6,421.86	-439.52	390.33	-396.26	0.00	0.00	0.00
6,600.00	18.00	138.39	6,516.97	-462.62	410.85	-417.09	0.00	0.00	0.00
6,700.00	18.00	138.39	6,612.08	-485.72	431.36	-437.92	0.00	0.00	0.00
6,800.00	18.00	138.39	6,707.19	-508.82	451.88	-458.74	0.00	0.00	0.00
6,900.00	18.00	138.39	6,802.29	-531.92	472.39	-479.57	0.00	0.00	0.00
7,000.00	18.00	138.39	6,897.40	-555.02	492.91	-500.40	0.00	0.00	0.00
7,100.00	18.00	138.39	6,992.51	-578.12	513.42	-521.22	0.00	0.00	0.00
7,200.00	18.00	138.39	7,087.62	-601.22	533.94	-542.05	0.00	0.00	0.00
7,300.00	18.00	138.39	7,182.73	-624.32	554.45	-562.88	0.00	0.00	0.00
7,400.00	18.00	138.39	7,277.83	-647.42	574.97	-583.70	0.00	0.00	0.00
7,500.00	18.00	138.39	7,372.94	-670.52	595.48	-604.53	0.00	0.00	0.00
7,600.00	18.00	138.39	7,468.05	-693.62	616.00	-625.36	0.00	0.00	0.00
7,700.00	18.00	138.39	7,563.16	-716.72	636.51	-646.18	0.00	0.00	0.00
7,800.00	18.00	138.39	7,658.27	-739.82	657.03	-667.01	0.00	0.00	0.00
7,900.00	18.00	138.39	7,753.37	-762.92	677.54	-687.84	0.00	0.00	0.00
8,000.00	18.00	138.39	7,848.48	-786.02	698.05	-708.66	0.00	0.00	0.00
8,100.00	18.00	138.39	7,943.59	-809.12	718.57	-729.49	0.00	0.00	0.00
8,200.00	18.00	138.39	8,038.70	-832.22	739.08	-750.32	0.00	0.00	0.00
8,300.00	18.00	138.39	8,133.81	-855.32	759.60	-771.14	0.00	0.00	0.00
8,400.00	18.00	138.39	8,228.91	-878.42	780.11	-791.97	0.00	0.00	0.00
8,500.00	18.00	138.39	8,324.02	-901.52	800.63	-812.79	0.00	0.00	0.00
8,600.00	18.00	138.39	8,419.13	-924.63	821.14	-833.62	0.00	0.00	0.00
8,700.00	18.00	138.39	8,514.24	-947.73	841.66	-854.45	0.00	0.00	0.00
8,800.00	18.00	138.39	8,609.34	-970.83	862.17	-875.27	0.00	0.00	0.00
8,900.00	18.00	138.39	8,704.45	-993.93	882.69	-896.10	0.00	0.00	0.00
9,000.00	18.00	138.39	8,799.56	-1,017.03	903.20	-916.93	0.00	0.00	0.00
9,100.00	18.00	138.39	8,894.67	-1,040.13	923.72	-937.75	0.00	0.00	0.00
9,200.00	18.00	138.39	8,989.78	-1,063.23	944.23	-958.58	0.00	0.00	0.00
9,300.00	18.00	138.39	9,084.88	-1,086.33	964.75	-979.41	0.00	0.00	0.00
9,305.67	18.00	138.39	9,090.27	-1,087.63	965.91	-980.59	0.00	0.00	0.00
9,400.00	12.73	108.08	9,181.35	-1,101.79	985.51	-992.61	10.00	-5.58	-32.13
9,500.00	13.50	63.02	9,278.98	-1,099.91	1,006.44	-988.55	10.00	0.76	-45.06
9,600.00	19.98	35.85	9,374.84	-1,080.72	1,026.90	-967.33	10.00	6.48	-27.17
9,700.00	28.51	22.95	9,465.99	-1,044.81	1,046.26	-929.59	10.00	8.54	-12.90
9,800.00	37.73	15.79	9,549.69	-993.25	1,063.94	-876.46	10.00	9.22	-7.16
9,900.00	47.23	11.15	9,623.37	-927.63	1,079.41	-809.58	10.00	9.50	-4.65
10,000.00	56.87	7.75	9,684.80	-849.93	1,092.18	-730.97	10.00	9.64	-3.40
10,100.00	66.58	5.03	9,732.12	-762.51	1,101.88	-643.02	10.00	9.71	-2.72
10,200.00	76.33	2.69	9,763.89	-668.04	1,108.21	-548.41	10.00	9.75	-2.34
10,300.00	86.10	0.54	9,779.14	-569.38	1,110.97	-450.00	10.00	9.77	-2.15
10,343.40	90.35	359.63	9,780.49	-526.00	1,111.03	-406.85	10.00	9.78	-2.10
10,400.00	90.35	359.63	9,780.14	-469.41	1,110.67	-350.61	0.00	0.00	0.00
10,500.00	90.35	359.63	9,779.53	-369.41	1,110.02	-251.23	0.00	0.00	0.00

# OXY

## Planning Report

<b>Database:</b>	HOPSPP	<b>Local Co-ordinate Reference:</b>	Well Mesa Verde BS Unit 46H
<b>Company:</b>	ENGINEERING DESIGNS	<b>TVD Reference:</b>	RKB=26.5' @ 3600.00ft
<b>Project:</b>	PRD NM DIRECTIONAL PLANS (NAD 1983)	<b>MD Reference:</b>	RKB=26.5' @ 3600.00ft
<b>Site:</b>	Mesa Verde BS Unit	<b>North Reference:</b>	Grid
<b>Well:</b>	Mesa Verde BS Unit 46H	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Permitting Plan		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
10,600.00	90.35	359.63	9,778.93	-269.42	1,109.38	-151.85	0.00	0.00	0.00
10,700.00	90.35	359.63	9,778.32	-169.42	1,108.73	-52.47	0.00	0.00	0.00
10,800.00	90.35	359.63	9,777.71	-69.43	1,108.09	46.91	0.00	0.00	0.00
10,900.00	90.35	359.63	9,777.11	30.57	1,107.44	146.29	0.00	0.00	0.00
11,000.00	90.35	359.63	9,776.50	130.57	1,106.80	245.67	0.00	0.00	0.00
11,100.00	90.35	359.63	9,775.89	230.56	1,106.15	345.05	0.00	0.00	0.00
11,200.00	90.35	359.63	9,775.29	330.56	1,105.50	444.43	0.00	0.00	0.00
11,300.00	90.35	359.63	9,774.68	430.55	1,104.86	543.81	0.00	0.00	0.00
11,400.00	90.35	359.63	9,774.07	530.55	1,104.21	643.19	0.00	0.00	0.00
11,500.00	90.35	359.63	9,773.46	630.55	1,103.57	742.57	0.00	0.00	0.00
11,600.00	90.35	359.63	9,772.86	730.54	1,102.92	841.95	0.00	0.00	0.00
11,700.00	90.35	359.63	9,772.25	830.54	1,102.28	941.32	0.00	0.00	0.00
11,800.00	90.35	359.63	9,771.64	930.53	1,101.63	1,040.70	0.00	0.00	0.00
11,900.00	90.35	359.63	9,771.04	1,030.53	1,100.99	1,140.08	0.00	0.00	0.00
12,000.00	90.35	359.63	9,770.43	1,130.53	1,100.34	1,239.46	0.00	0.00	0.00
12,100.00	90.35	359.63	9,769.82	1,230.52	1,099.70	1,338.84	0.00	0.00	0.00
12,200.00	90.35	359.63	9,769.21	1,330.52	1,099.05	1,438.22	0.00	0.00	0.00
12,300.00	90.35	359.63	9,768.61	1,430.51	1,098.41	1,537.60	0.00	0.00	0.00
12,400.00	90.35	359.63	9,768.00	1,530.51	1,097.76	1,636.98	0.00	0.00	0.00
12,500.00	90.35	359.63	9,767.39	1,630.51	1,097.12	1,736.36	0.00	0.00	0.00
12,600.00	90.35	359.63	9,766.79	1,730.50	1,096.47	1,835.74	0.00	0.00	0.00
12,700.00	90.35	359.63	9,766.18	1,830.50	1,095.83	1,935.12	0.00	0.00	0.00
12,800.00	90.35	359.63	9,765.57	1,930.50	1,095.18	2,034.50	0.00	0.00	0.00
12,900.00	90.35	359.63	9,764.96	2,030.49	1,094.53	2,133.88	0.00	0.00	0.00
13,000.00	90.35	359.63	9,764.36	2,130.49	1,093.89	2,233.26	0.00	0.00	0.00
13,100.00	90.35	359.63	9,763.75	2,230.48	1,093.24	2,332.64	0.00	0.00	0.00
13,200.00	90.35	359.63	9,763.14	2,330.48	1,092.60	2,432.02	0.00	0.00	0.00
13,300.00	90.35	359.63	9,762.54	2,430.48	1,091.95	2,531.40	0.00	0.00	0.00
13,400.00	90.35	359.63	9,761.93	2,530.47	1,091.31	2,630.78	0.00	0.00	0.00
13,500.00	90.35	359.63	9,761.32	2,630.47	1,090.66	2,730.16	0.00	0.00	0.00
13,600.00	90.35	359.63	9,760.72	2,730.46	1,090.02	2,829.54	0.00	0.00	0.00
13,700.00	90.35	359.63	9,760.11	2,830.46	1,089.37	2,928.92	0.00	0.00	0.00
13,800.00	90.35	359.63	9,759.50	2,930.46	1,088.73	3,028.30	0.00	0.00	0.00
13,900.00	90.35	359.63	9,758.89	3,030.45	1,088.08	3,127.68	0.00	0.00	0.00
14,000.00	90.35	359.63	9,758.29	3,130.45	1,087.44	3,227.05	0.00	0.00	0.00
14,100.00	90.35	359.63	9,757.68	3,230.44	1,086.79	3,326.43	0.00	0.00	0.00
14,200.00	90.35	359.63	9,757.07	3,330.44	1,086.15	3,425.81	0.00	0.00	0.00
14,300.00	90.35	359.63	9,756.47	3,430.44	1,085.50	3,525.19	0.00	0.00	0.00
14,400.00	90.35	359.63	9,755.86	3,530.43	1,084.86	3,624.57	0.00	0.00	0.00
14,500.00	90.35	359.63	9,755.25	3,630.43	1,084.21	3,723.95	0.00	0.00	0.00
14,600.00	90.35	359.63	9,754.64	3,730.42	1,083.56	3,823.33	0.00	0.00	0.00
14,700.00	90.35	359.63	9,754.04	3,830.42	1,082.92	3,922.71	0.00	0.00	0.00
14,800.00	90.35	359.63	9,753.43	3,930.42	1,082.27	4,022.09	0.00	0.00	0.00
14,900.00	90.35	359.63	9,752.82	4,030.41	1,081.63	4,121.47	0.00	0.00	0.00
15,000.00	90.35	359.63	9,752.22	4,130.41	1,080.98	4,220.85	0.00	0.00	0.00
15,100.00	90.35	359.63	9,751.61	4,230.41	1,080.34	4,320.23	0.00	0.00	0.00
15,200.00	90.35	359.63	9,751.00	4,330.40	1,079.69	4,419.61	0.00	0.00	0.00
15,300.00	90.35	359.63	9,750.39	4,430.40	1,079.05	4,518.99	0.00	0.00	0.00
15,400.00	90.35	359.63	9,749.79	4,530.39	1,078.40	4,618.37	0.00	0.00	0.00
15,500.00	90.35	359.63	9,749.18	4,630.39	1,077.76	4,717.75	0.00	0.00	0.00
15,600.00	90.35	359.63	9,748.57	4,730.39	1,077.11	4,817.13	0.00	0.00	0.00
15,700.00	90.35	359.63	9,747.97	4,830.38	1,076.47	4,916.51	0.00	0.00	0.00
15,800.00	90.35	359.63	9,747.36	4,930.38	1,075.82	5,015.89	0.00	0.00	0.00
15,900.00	90.35	359.63	9,746.75	5,030.37	1,075.18	5,115.27	0.00	0.00	0.00
16,000.00	90.35	359.63	9,746.15	5,130.37	1,074.53	5,214.65	0.00	0.00	0.00

# OXY

## Planning Report

<b>Database:</b>	HOPSPP	<b>Local Co-ordinate Reference:</b>	Well Mesa Verde BS Unit 46H
<b>Company:</b>	ENGINEERING DESIGNS	<b>TVD Reference:</b>	RKB=26.5' @ 3600.00ft
<b>Project:</b>	PRD NM DIRECTIONAL PLANS (NAD 1983)	<b>MD Reference:</b>	RKB=26.5' @ 3600.00ft
<b>Site:</b>	Mesa Verde BS Unit	<b>North Reference:</b>	Grid
<b>Well:</b>	Mesa Verde BS Unit 46H	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Permitting Plan		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
16,100.00	90.35	359.63	9,745.54	5,230.37	1,073.89	5,314.03	0.00	0.00	0.00
16,200.00	90.35	359.63	9,744.93	5,330.36	1,073.24	5,413.40	0.00	0.00	0.00
16,300.00	90.35	359.63	9,744.32	5,430.36	1,072.59	5,512.78	0.00	0.00	0.00
16,400.00	90.35	359.63	9,743.72	5,530.35	1,071.95	5,612.16	0.00	0.00	0.00
16,500.00	90.35	359.63	9,743.11	5,630.35	1,071.30	5,711.54	0.00	0.00	0.00
16,600.00	90.35	359.63	9,742.50	5,730.35	1,070.66	5,810.92	0.00	0.00	0.00
16,700.00	90.35	359.63	9,741.90	5,830.34	1,070.01	5,910.30	0.00	0.00	0.00
16,800.00	90.35	359.63	9,741.29	5,930.34	1,069.37	6,009.68	0.00	0.00	0.00
16,900.00	90.35	359.63	9,740.68	6,030.33	1,068.72	6,109.06	0.00	0.00	0.00
17,000.00	90.35	359.63	9,740.07	6,130.33	1,068.08	6,208.44	0.00	0.00	0.00
17,100.00	90.35	359.63	9,739.47	6,230.33	1,067.43	6,307.82	0.00	0.00	0.00
17,200.00	90.35	359.63	9,738.86	6,330.32	1,066.79	6,407.20	0.00	0.00	0.00
17,300.00	90.35	359.63	9,738.25	6,430.32	1,066.14	6,506.58	0.00	0.00	0.00
17,400.00	90.35	359.63	9,737.65	6,530.31	1,065.50	6,605.96	0.00	0.00	0.00
17,500.00	90.35	359.63	9,737.04	6,630.31	1,064.85	6,705.34	0.00	0.00	0.00
17,600.00	90.35	359.63	9,736.43	6,730.31	1,064.21	6,804.72	0.00	0.00	0.00
17,700.00	90.35	359.63	9,735.82	6,830.30	1,063.56	6,904.10	0.00	0.00	0.00
17,800.00	90.35	359.63	9,735.22	6,930.30	1,062.92	7,003.48	0.00	0.00	0.00
17,900.00	90.35	359.63	9,734.61	7,030.30	1,062.27	7,102.86	0.00	0.00	0.00
18,000.00	90.35	359.63	9,734.00	7,130.29	1,061.62	7,202.24	0.00	0.00	0.00
18,100.00	90.35	359.63	9,733.40	7,230.29	1,060.98	7,301.62	0.00	0.00	0.00
18,200.00	90.35	359.63	9,732.79	7,330.28	1,060.33	7,401.00	0.00	0.00	0.00
18,300.00	90.35	359.63	9,732.18	7,430.28	1,059.69	7,500.38	0.00	0.00	0.00
18,400.00	90.35	359.63	9,731.58	7,530.28	1,059.04	7,599.75	0.00	0.00	0.00
18,500.00	90.35	359.63	9,730.97	7,630.27	1,058.40	7,699.13	0.00	0.00	0.00
18,600.00	90.35	359.63	9,730.36	7,730.27	1,057.75	7,798.51	0.00	0.00	0.00
18,700.00	90.35	359.63	9,729.75	7,830.26	1,057.11	7,897.89	0.00	0.00	0.00
18,800.00	90.35	359.63	9,729.15	7,930.26	1,056.46	7,997.27	0.00	0.00	0.00
18,900.00	90.35	359.63	9,728.54	8,030.26	1,055.82	8,096.65	0.00	0.00	0.00
19,000.00	90.35	359.63	9,727.93	8,130.25	1,055.17	8,196.03	0.00	0.00	0.00
19,100.00	90.35	359.63	9,727.33	8,230.25	1,054.53	8,295.41	0.00	0.00	0.00
19,200.00	90.35	359.63	9,726.72	8,330.24	1,053.88	8,394.79	0.00	0.00	0.00
19,300.00	90.35	359.63	9,726.11	8,430.24	1,053.24	8,494.17	0.00	0.00	0.00
19,400.00	90.35	359.63	9,725.50	8,530.24	1,052.59	8,593.55	0.00	0.00	0.00
19,500.00	90.35	359.63	9,724.90	8,630.23	1,051.95	8,692.93	0.00	0.00	0.00
19,600.00	90.35	359.63	9,724.29	8,730.23	1,051.30	8,792.31	0.00	0.00	0.00
19,700.00	90.35	359.63	9,723.68	8,830.22	1,050.65	8,891.69	0.00	0.00	0.00
19,800.00	90.35	359.63	9,723.08	8,930.22	1,050.01	8,991.07	0.00	0.00	0.00
19,900.00	90.35	359.63	9,722.47	9,030.22	1,049.36	9,090.45	0.00	0.00	0.00
20,000.00	90.35	359.63	9,721.86	9,130.21	1,048.72	9,189.83	0.00	0.00	0.00
20,100.00	90.35	359.63	9,721.25	9,230.21	1,048.07	9,289.21	0.00	0.00	0.00
20,200.00	90.35	359.63	9,720.65	9,330.20	1,047.43	9,388.59	0.00	0.00	0.00
20,300.00	90.35	359.63	9,720.04	9,430.20	1,046.78	9,487.97	0.00	0.00	0.00
20,400.00	90.35	359.63	9,719.43	9,530.20	1,046.14	9,587.35	0.00	0.00	0.00
20,500.00	90.35	359.63	9,718.83	9,630.19	1,045.49	9,686.73	0.00	0.00	0.00
20,600.00	90.35	359.63	9,718.22	9,730.19	1,044.85	9,786.11	0.00	0.00	0.00
20,700.00	90.35	359.63	9,717.61	9,830.19	1,044.20	9,885.48	0.00	0.00	0.00
20,787.28	90.35	359.63	9,717.08	9,917.46	1,043.64	9,972.23	0.00	0.00	0.00



OXY  
Planning Report

Database:	HOPSPP	Local Co-ordinate Reference:	Well Mesa Verde BS Unit 46H
Company:	ENGINEERING DESIGNS	TVD Reference:	RKB=26.5' @ 3600.00ft
Project:	PRD NM DIRECTIONAL PLANS (NAD 1983)	MD Reference:	RKB=26.5' @ 3600.00ft
Site:	Mesa Verde BS Unit	North Reference:	Grid
Well:	Mesa Verde BS Unit 46H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Permitting Plan		

Design Targets									
Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (usft)	Easting (usft)	Latitude	Longitude
PBHL (Mesa Verde BS - plan hits target center - Point	0.00	0.00	9,717.08	9,917.46	1,043.64	451,386.57	743,119.06	32.239252	-103.680706
FTP (Mesa Verde BS - plan hits target center - Point	0.00	0.00	9,780.49	-526.00	1,111.03	440,943.59	743,186.45	32.210546	-103.680693

Formations						
Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)	
927.00	927.00	RUSTLER				
1,236.00	1,236.00	SALADO				
3,143.00	3,143.00	CASTILE				
4,743.68	4,738.00	DELAWARE				
4,766.05	4,760.00	BELL CANYON				
5,689.49	5,651.00	CHERRY CANYON				
7,066.87	6,961.00	BRUSHY CANYON				
8,864.83	8,671.00	BONE SPRING				

Plan Annotations					
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates			
		+N/-S (ft)	+E/-W (ft)	Comment	
3,705.00	3,705.00	0.00	0.00	Build 1°/100'	
5,504.57	5,475.13	-209.58	186.12	Hold 18° Tangent	
9,305.67	9,090.27	-1,087.63	965.91	KOP, Build & Turn 10°/100'	
10,343.40	9,780.49	-526.00	1,111.03	Landing Point	
20,787.28	9,717.08	9,917.46	1,043.64	TD at 20787.28' MD	



Project: PRD NM DIRECTIONAL PLANS (NAD 1983)  
 Site: Mesa Verde BS Unit  
 Well: Mesa Verde BS Unit 46H  
 Wellbore: Wellbore #1  
 Design: Permitting Plan

## PROJECT DETAILS: NM DIRECTIONAL PLANS (NAD 1983)

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

System Datum: Mean Sea Level

## WELL DETAILS: Mesa Verde BS Unit 46H

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
0.00	0.00	441469.57	3573.50 742075.47	32.212010	-103.684275

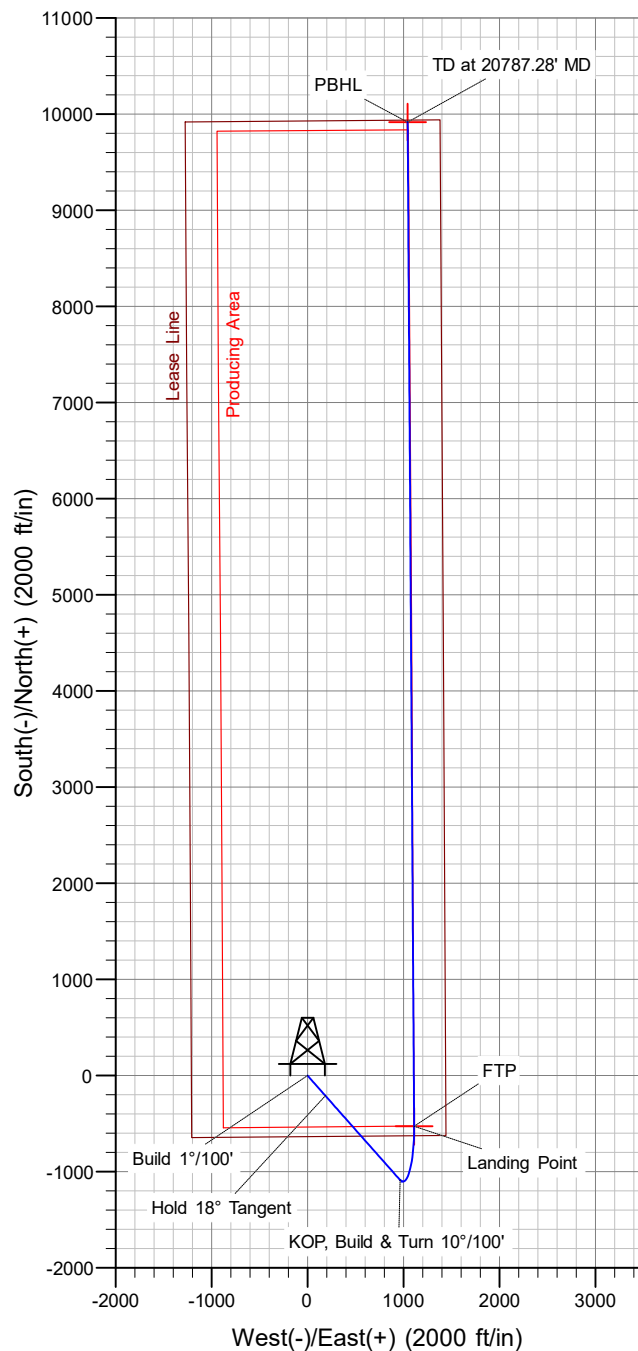
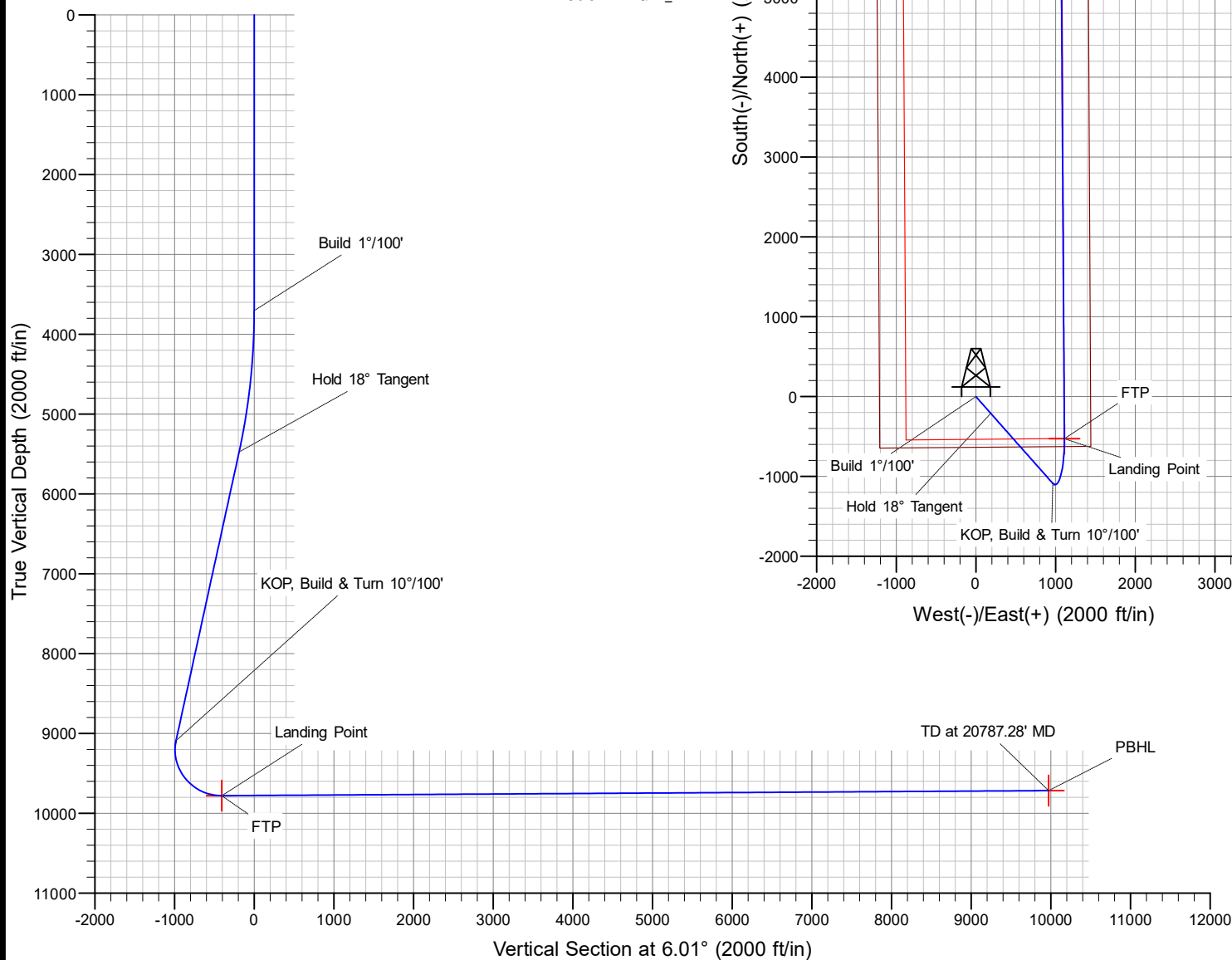
## SECTION DETAILS

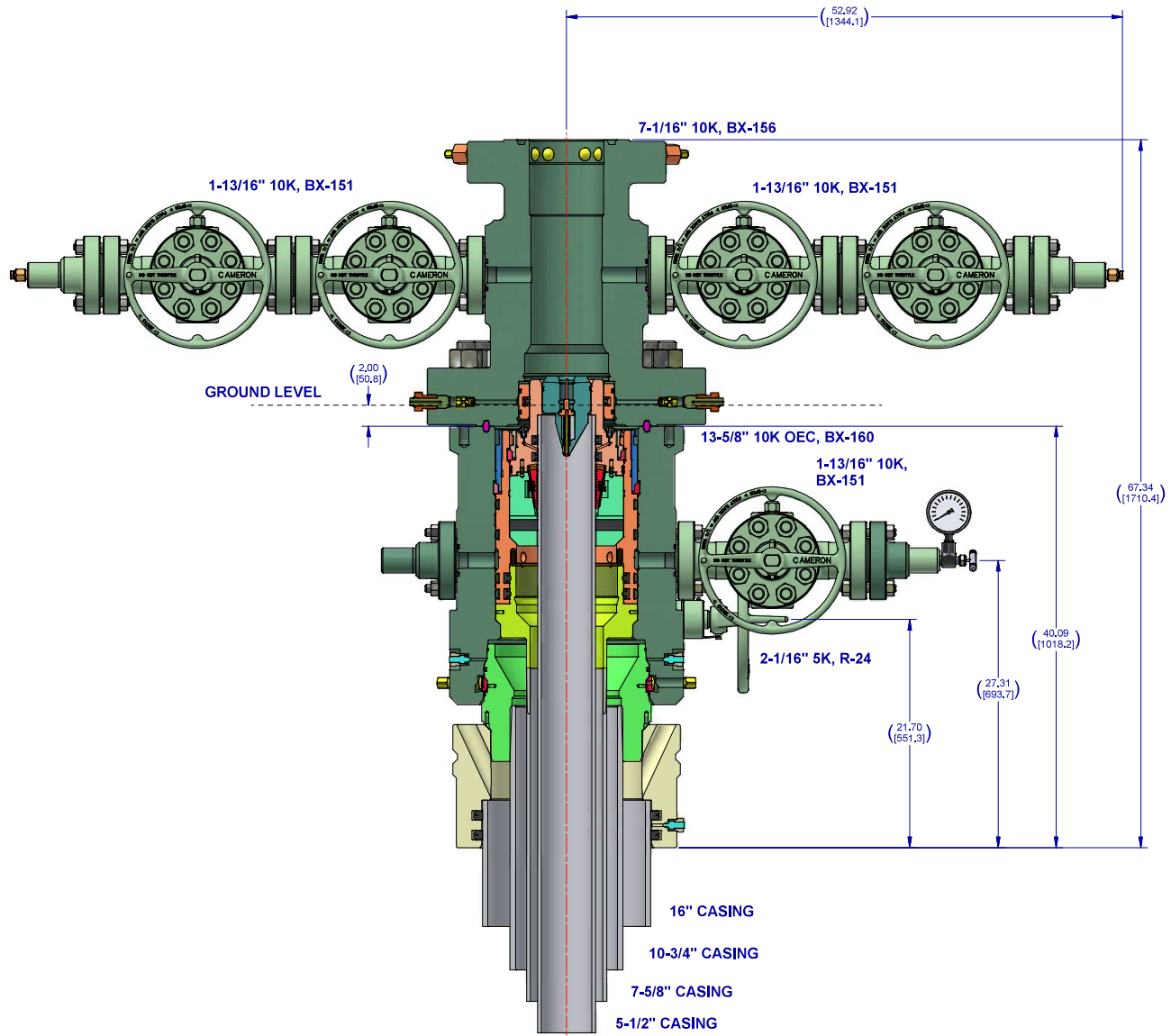
MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	Vsect	Annotation
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
3705.00	0.00	0.00	3705.00	0.00	0.00	0.00	0.00	0.00	Build 1°/100'
5504.57	18.00	138.39	5475.13	-209.58	186.12	1.00	138.39	-188.95	Hold 18° Tangent
9305.67	18.00	138.39	9090.27	-1087.63	965.91	0.00	0.00	-980.59	KOP, Build & Turn 10°/100'
10343.40	90.35	359.63	9780.49	-526.00	1111.03	10.00	-137.26	-406.85	Landing Point
20787.28	90.35	359.63	9717.08	9917.46	1043.64	0.00	0.00	9972.22	TD at 20787.28' MD



Azimuths to Grid North  
 True North: -0.35°  
 Magnetic North: 6.25°

Magnetic Field  
 Strength: 47834.5nT  
 Dip Angle: 59.85°  
 Date: 12/10/2019  
 Model: HDGM\_FILE






Notes:

1. THIS IS A PROPOSAL DRAWING AND DIMENSIONS SHOWN ARE SUBJECT TO CHANGE DURING THE FINAL DESIGN PROCESS.

2. DIGITALLY ENABLED SOLUTIONS, CHOKES AND ESD'S AVAILABLE ON REQUEST

CONFIDENTIAL					
SURFACE TREATMENT		DO NOT SCALE		 <b>CAMERON</b> A Schlumberger Company	SURFACE SYSTEMS
DRAWN BY		DATE			
D. GOTTUNG		2 Dec 21			
MATERIAL & HEAT TREAT		DATE		OXY 13-5/8" 10K ADAPT 16" X 10-3/4" X 7-5/8" X 5-1/2"	
CHECKED BY		DATE			
D. GOTTUNG		2 Dec 21			
APPROVED BY		DATE		SHEET 4 of 4	
D. GOTTUNG		2 Dec 21			
ESTIMATED WEIGHT:		6515.617 LBS 2955.434 KG		SD-053434-94-05	
INTERNAL USE BOM				REV: 01	



5.500" 20.00 lb/ft P110-CY  
TenarisHydril Wedge 461™ Matched  
Strength



Special Data Sheet  
TH DS-20.0359  
12 August 2020  
Rev 00

Nominal OD	5.500 in.	Wall Thickness	0.361 in.	Grade	P110-CY
Min Wall Thickness	87.5%	Type	CASING	Connection OD Option	MATCHED STRENGTH

Pipe Body Data

Geometry			Performance		
Nominal OD	5.500 in.	Nominal ID	4.778 in.	Body Yield Strength	641 x 1000 lbs
Nominal Weight	20.00 lbs/ft	Wall Thickness	0.361 in.	Internal Yield	12640 psi
Standard Drift Diameter	4.653 in.	Plain End Weight	19.83 lbs/ft	SMYS	110000 psi
Special Drift Diameter	N/A	OD Tolerance	API	Collapse Pressure	11110 psi

Connection Data

Geometry		Performance		Make-up Torques	
Matched Strength OD	6.050 in.	Tension Efficiency	100%	Minimum	17000 ft-lbs
Make-up Loss	3.775 in.	Joint Yield Strength	641 x 1000 lbs	Optimum	18000 ft-lbs
Threads per in.	3.40	Internal Yield	12640 psi	Maximum	21600 ft-lbs
Connection OD Option	MATCHED STRENGTH	Compression Efficiency	100%	Operational Limit Torques	
Coupling Length	7.714 in.	Compression Strength	641 x 1000 lbs	Operating Torque	32000 ft-lbs
		Bending	92 °/100 ft	Yield Torque	38000 ft-lbs
		Collapse	11110 psi	Buck-On Torques	
				Minimum	21600 ft-lbs
				Maximum	23100 ft-lbs

Notes

\*If you need to use torque values that are higher than the maximum indicated, please contact a local Tenaris technical sales representative

## PECOS DISTRICT DRILLING CONDITIONS OF APPROVAL

### OPERATOR REQUEST FOR CASING, CEMENT AND MUD PROGRAM ADJUSTMENT. ALL PREVIOUS COAs STILL APPLY.

OPERATOR'S NAME:	OXY USA INC.
WELL NAME & NO.:	MESA VERDE BS UNIT/ 46H
SURFACE HOLE FOOTAGE:	635'/S & 1210'/W
BOTTOM HOLE FOOTAGE:	20'/N & 2318'/W
LOCATION:	SECTION 16, T24S, R32E, NMPM
COUNTY:	Eddy County, New Mexico

COA

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

**Cameron ADAPT wellhead verified to be API 6A compliant and is OK for use.**

#### A. CASING

##### Alternate Casing Design:

1. The **10-3/4** inch surface casing shall be set at approximately **987** feet (a minimum of 25 feet (Lea County) into the Rustler Anhydrite and above the salt) and cemented to the surface.
  - a. If cement does not circulate to the surface, the appropriate BLM office shall be notified and a temperature survey utilizing an electronic type temperature survey with surface log readout will be used or a cement bond log shall be run to verify the top of the cement. Temperature survey will be run a minimum of six hours after pumping cement and ideally between 8-10 hours after completing the cement job.
  - b. Wait on cement (WOC) time for a primary cement job will be a minimum of **8 hours** or 500 pounds compressive strength, whichever is greater. (This is to include the lead cement)

- c. Wait on cement (WOC) time for a remedial job will be a minimum of 4 hours after bringing cement to surface or 500 pounds compressive strength, whichever is greater.
  - d. If cement falls back, remedial cementing will be done prior to drilling out that string.
2. The **7-5/8** inch intermediate casing shall be set at approximately **9,206** feet. **KEEP CASING FULL WITH APPROPRIATE FLUID WEIGHT TO MEET COLLAPSE SF.** The minimum required fill of cement behind the **7-5/8** inch intermediate casing is:

**Option 1 (Single Stage):**

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

**Option 2:**

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

- a. First stage to DV tool: Cement to circulate. If cement does not circulate off the DV tool, contact the appropriate BLM office before proceeding with second stage cement job.
  - b. Second stage above DV tool:
    - Cement to surface. If cement does not circulate, contact the appropriate BLM office.  
**Wait on cement (WOC) time for a primary cement job is to include the lead cement slurry due to cave/karst or potash.**
3. The **5-1/2** inch production casing shall be set at approximately **20,787** feet. The minimum required fill of cement behind the **5-1/2** inch production casing is:

**Option 1 (Single Stage):**

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

**Option 2:**

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

- a. First stage to DV tool: Cement to circulate. If cement does not circulate off the DV tool, contact the appropriate BLM office before proceeding with second stage cement job.
- b. Second stage above DV tool:
  - Cement should tie-back at least **200 feet** into previous casing string. Operator shall provide method of verification.

## GENERAL REQUIREMENTS

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

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

☒ Eddy County

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

☒ Lea County

Call the Hobbs Field Station, 414 West Taylor, Hobbs NM 88240, (575)  
689-5981

1. Unless the production casing has been run and cemented or the well has been properly plugged, the drilling rig shall not be removed from over the hole without prior approval.
  - a. In the event the operator has proposed to drill multiple wells utilizing a skid/walking rig. Operator shall secure the wellbore on the current well, after installing and testing the wellhead, by installing a blind flange of like pressure rating to the wellhead and a pressure gauge that can be monitored while drilling is performed on the other well(s).
  - b. When the operator proposes to set surface casing with Spudder Rig
    - Notify the BLM when moving in and removing the Spudder Rig.
    - Notify the BLM when moving in the 2<sup>nd</sup> Rig. Rig to be moved in within 90 days of notification that Spudder Rig has left the location.
    - BOP/BOPE test to be conducted per Onshore Oil and Gas Order No. 2 as soon as 2nd Rig is rigged up on well.

2. Floor controls are required for 3M or Greater systems. These controls will be on the rig floor, unobstructed, readily accessible to the driller and will be operational at all times during drilling and/or completion activities. Rig floor is defined as the area immediately around the rotary table; the area immediately above the substructure on which the draw works are located, this does not include the dog house or stairway area.
3. The record of the drilling rate along with the GR/N well log run from TD to surface (horizontal well – vertical portion of hole) shall be submitted to the BLM office as well as all other logs run on the borehole 30 days from completion. If available, a digital copy of the logs is to be submitted in addition to the paper copies. The Rustler top and top and bottom of Salt are to be recorded on the Completion Report.

A. CASING

1. Changes to the approved APD casing program need prior approval if the items substituted are of lesser grade or different casing size or are Non-API. The Operator can exchange the components of the proposal with that of superior strength (i.e. changing from J-55 to N-80, or from 36# to 40#). Changes to the approved cement program need prior approval if the altered cement plan has less volume or strength or if the changes are substantial (i.e. Multistage tool, ECP, etc.). The initial wellhead installed on the well will remain on the well with spools used as needed.
2. Wait on cement (WOC) for Potash Areas: After cementing but before commencing any tests, the casing string shall stand cemented under pressure until both of the following conditions have been met: 1) cement reaches a minimum compressive strength of 500 psi for all cement blends, 2) until cement has been in place at least 24 hours. WOC time will be recorded in the driller's log. The casing integrity test can be done (prior to the cement setting up) immediately after bumping the plug.
3. Wait on cement (WOC) for Water Basin: After cementing but before commencing any tests, the casing string shall stand cemented under pressure until both of the following conditions have been met: 1) cement reaches a minimum compressive strength of 500 psi at the shoe, 2) until cement has been in place at least 8 hours. WOC time will be recorded in the driller's log. See individual casing strings for details regarding lead cement slurry requirements. The casing integrity test can be done (prior to the cement setting up) immediately after bumping the plug.
4. Provide compressive strengths including hours to reach required 500 pounds compressive strength prior to cementing each casing string. Have well specific cement details onsite prior to pumping the cement for each casing string.
5. No pea gravel permitted for remedial or fall back remedial without prior authorization from the BLM engineer.



6. On that portion of any well approved for a 5M BOPE system or greater, a pressure integrity test of each casing shoe shall be performed. Formation at the shoe shall be tested to a minimum of the mud weight equivalent anticipated to control the formation pressure to the next casing depth or at total depth of the well. This test shall be performed before drilling more than 20 feet of new hole.
7. If hardband drill pipe is rotated inside casing, returns will be monitored for metal. If metal is found in samples, drill pipe will be pulled and rubber protectors which have a larger diameter than the tool joints of the drill pipe will be installed prior to continuing drilling operations.
8. Whenever a casing string is cemented in the R-111-P potash area, the NMOCD requirements shall be followed.

B. PRESSURE CONTROL

1. All blowout preventer (BOP) and related equipment (BOPE) shall comply with well control requirements as described in Onshore Oil and Gas Order No. 2 and API RP 53 Sec. 17.
2. If a variance is approved for a flexible hose to be installed from the BOP to the choke manifold, the following requirements apply: The flex line must meet the requirements of API 16C. Check condition of flexible line from BOP to choke manifold, replace if exterior is damaged or if line fails test. Line to be as straight as possible with no hard bends and is to be anchored according to Manufacturer's requirements. The flexible hose can be exchanged with a hose of equal size and equal or greater pressure rating. Anchor requirements, specification sheet and hydrostatic pressure test certification matching the hose in service, to be onsite for review. These documents shall be posted in the company man's trailer and on the rig floor.
3. 5M or higher system requires an HCR valve, remote kill line and annular to match. The remote kill line is to be installed prior to testing the system and tested to stack pressure.
4. If the operator has proposed a multi-bowl wellhead assembly in the APD. The following requirements must be met:
  - a. Wellhead shall be installed by manufacturer's representatives, submit documentation with subsequent sundry.
  - b. If the welding is performed by a third party, the manufacturer's representative shall monitor the temperature to verify that it does not exceed the maximum temperature of the seal.
  - c. Manufacturer representative shall install the test plug for the initial BOP test.
  - d. Whenever any seal subject to test pressure is broken, all the tests in OOGO2.III.A.2.i must be followed.

- e. If the cement does not circulate and one inch operations would have been possible with a standard wellhead, the well head shall be cut off, cementing operations performed and another wellhead installed.
5. The appropriate BLM office shall be notified a minimum of 4 hours in advance for a representative to witness the tests.
- a. In a water basin, for all casing strings utilizing slips, these are to be set as soon as the crew and rig are ready and any fallback cement remediation has been done. The casing cut-off and BOP installation can be initiated four hours after installing the slips, which will be approximately six hours after bumping the plug. For those casing strings not using slips, the minimum wait time before cut-off is eight hours after bumping the plug. BOP/BOPE testing can begin after cut-off or once cement reaches 500 psi compressive strength (including lead when specified), whichever is greater. However, if the float does not hold, cut-off cannot be initiated until cement reaches 500 psi compressive strength (including lead when specified).
  - b. In potash areas, for all casing strings utilizing slips, these are to be set as soon as the crew and rig are ready and any fallback cement remediation has been done. For all casing strings, casing cut-off and BOP installation can be initiated at twelve hours after bumping the plug. However, **no tests** shall commence until the cement has had a minimum of 24 hours setup time, except the casing pressure test can be initiated immediately after bumping the plug (only applies to single stage cement jobs).
  - c. The tests shall be done by an independent service company utilizing a test plug not a cup or J-packer. The operator also has the option of utilizing an independent tester to test without a plug (i.e. against the casing) pursuant to Onshore Order 2 with the pressure not to exceed 70% of the burst rating for the casing. Any test against the casing must meet the WOC time for water basin (8 hours) or potash (24 hours) or 500 pounds compressive strength, whichever is greater, prior to initiating the test (see casing segment as lead cement may be critical item).
  - d. The test shall be run on a 5000 psi chart for a 2-3M BOP/BOP, on a 10000 psi chart for a 5M BOP/BOPE and on a 15000 psi chart for a 10M BOP/BOPE. If a linear chart is used, it shall be a one hour chart. A circular chart shall have a maximum 2 hour clock. If a twelve hour or twenty-four hour chart is used, tester shall make a notation that it is run with a two hour clock.
  - e. The results of the test shall be reported to the appropriate BLM office.
  - f. All tests are required to be recorded on a calibrated test chart. A copy of the BOP/BOPE test chart and a copy of independent service company test will be submitted to the appropriate BLM office.

- g. The BOP/BOPE test shall include a low pressure test from 250 to 300 psi. The test will be held for a minimum of 10 minutes if test is done with a test plug and 30 minutes without a test plug. This test shall be performed prior to the test at full stack pressure.
- h. BOP/BOPE must be tested by an independent service company within 500 feet of the top of the Wolfcamp formation if the time between the setting of the intermediate casing and reaching this depth exceeds 20 days. This test does not exclude the test prior to drilling out the casing shoe as per Onshore Order No. 2.

#### C. DRILLING MUD

Mud system monitoring equipment, with derrick floor indicators and visual and audio alarms, shall be operating before drilling into the Wolfcamp formation, and shall be used until production casing is run and cemented.

#### D. WASTE MATERIAL AND FLUIDS

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

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

**KPI – 10/7/2022**

**District I**  
1625 N. French Dr., Hobbs, NM 88240  
Phone:(575) 393-6161 Fax:(575) 393-0720  
**District II**  
811 S. First St., Artesia, NM 88210  
Phone:(575) 748-1283 Fax:(575) 748-9720  
**District III**  
1000 Rio Brazos Rd., Aztec, NM 87410  
Phone:(505) 334-6178 Fax:(505) 334-6170  
**District IV**  
1220 S. St Francis Dr., Santa Fe, NM 87505  
Phone:(505) 476-3470 Fax:(505) 476-3462

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

CONDITIONS  
  
Action 182907

CONDITIONS

Operator: OXY USA INC P.O. Box 4294 Houston, TX 772104294	OGRID: 16696
	Action Number: 182907
	Action Type: [C-103] NOI Change of Plans (C-103A)

CONDITIONS

Created By	Condition	Condition Date
pkautz	None	2/22/2023