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

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

5. Lease Serial No.
NMNM77018

6. If Indian, Allottee or Tribe Name

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

1. Type of Well
☒ Oil Well ☐ Gas Well ☐ Other

8. Well Name and No.
WIDTH CC 6_7 FEDERAL COM 13H

2. Name of Operator
OXY USA INCORPORATED
Contact: SARAH E CHAPMAN
E-Mail: SARAH_CHAPMAN@OXY.COM

9. API Well No.
30-015-45572-00-X1

3a. Address
5 GREENWAY PLAZA SUITE 110
HOUSTON, TX 77046-0521

3b. Phone No. (include area code)
Ph: 713-350-4997

10. Field and Pool or Exploratory Area
PIERCE CROSSING-BONE SPRING

Carlsbad Field Office
OCD Artesia

4. Location of Well *(Footage, Sec., T., R., M., or Survey Description)*
Sec 6 T24S R29E 170FNL 1735FWL
32.253807 N Lat, 104.026733 W Lon

11. County or Parish, State
EDDY COUNTY, NM

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

TYPE OF SUBMISSION	TYPE OF ACTION			
☒ Notice of Intent	☐ Acidize	☐ Deepen	☐ Production (Start/Resume)	☐ Water Shut-Off
☐ Subsequent Report	☐ Alter Casing	☐ 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.

OXY USA Inc. respectfully requests to emend the approved APD and change the well name and number for API No. 30-015-45572 from the Width CC 6-7 Federal Com 13H to the Height CC 6-7 Federal Com 312H. Due to spacing changes the well will be drilled and completed in the 3rd Bone Spring.

Attached you will find updated:

Drill Plan
Connection Specs
BOP Diagram
Directional Plan and Plot
H2S Contingency Information
Spud Rig Data Sheet

RECEIVED
APR 25 2019
DISTRICT II-ARTESIA O.C.D.

SEE ATTACHED FOR
CONDITIONS OF APPROVAL

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

Electronic Submission #461464 verified by the BLM Well Information System
For OXY USA INCORPORATED, sent to the Carlsbad
Committed to AFMSS for processing by ZOTA STEVENS on 04/16/2019 (19ZS0017SE)

Name *(Printed/Typed)* SARAH E CHAPMAN — Title REGULATORY SPECIALIST

Signature (Electronic Submission) — Date 04/15/2019

THIS SPACE FOR FEDERAL OR STATE OFFICE USE

Approved By ZOTA STEVENS — Title PETROLEUM ENGINEER — Date 04/17/2019

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 Carlsbad

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)

**** BLM REVISED ** BLM REVISED ** BLM REVISED ** BLM REVISED ** BLM REVISED ****

KP 7-2519

Oxy USA Inc. - Height CC 6-7 Federal Com 312H

1. Geologic Formations

TVD of target	9600'	Pilot Hole Depth	N/A
MD at TD:	19969'	Deepest Expected fresh water:	106'

Delaware Basin

Formation	TVD - RKB	Expected Fluids
Rustler	106	
Salado	537	Salt
Castile	1,304	Salt
Lamar/Delaware	2,769	Oil/Gas/Brine
Bell Canyon	2,810	Oil/Gas/Brine
Cherry Canyon	3,678	Oil/Gas/Brine
Brushy Canyon	4,913	Losses
Bone Spring	6,501	Oil/Gas
1st Bone Spring	7,473	Oil/Gas
2nd Bone Spring	8,259	Oil/Gas
3rd Bone Spring	**9,354**	**Oil/Gas**

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

2. Casing Program

Hole Size (in)	Casing Interval		Csg. Size	Weight	Grade	Conn.	SF		Buoyant Body SF	Buoyant Joint SF
	From (ft)	To (ft)	(in)	(lbs)			Collapse	SF Burst	Tension	Tension
14.75	0	477	10.75	40.5	J-55	BTC	1.125	1.2	1.4	1.4
9.875	0	9311	7.625	26.4	L-80 HC	BTC	1.125	1.2	1.4	1.4
6.75	0	19969	5.5	20	P-110	DQX	1.125	1.2	1.4	1.4
							SF Values will meet or Exceed			

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

*Oxy requests the option to set casing shallower yet still below the salts if losses or hole conditions require this. Cement volumes may be adjusted if casing is set shallower and a DV tool may be run in case hole conditions merit pumping a second stage cement job to comply with permitted top of cement. If cement circulated to surface during first stage, we will drop a cancelation cone and not pump the second stage.

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

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 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

Casing String	# Sks	Wt. (lb/gal)	Yld (ft3/sack)	H20 (gal/sk)	500# Comp. Strength (hours)	Slurry Description
Surface (Lead)	N/A	N/A	N/A	N/A	N/A	N/A
Surface (Tail)	386	14.8	1.33	6.365	5:26	Class C Cement, Accelerator
Intermediate 1st Stage (Lead)	N/A	N/A	N/A	N/A	N/A	N/A
Intermediate 1st Stage (Tail)	546	13.2	1.65	8.640	11:54	Class H Cement, Retarder, Dispersant, Salt
Intermediate 2nd Stage (Tail Slurry) to be pumped as Bradenhead Squeeze from surface, down the Intermediate annulus						
Intermediate 2nd Stage (Lead)	N/A	N/A	N/A	N/A	N/A	N/A
Intermediate 2nd Stage (Tail)	661	12.9	1.92	10.41	23:10	Class C Cement, Accelerator
Production (Lead)	N/A	N/A	N/A	N/A	N/A	N/A
Production (Tail)	818	13.2	1.38	6.686	3:39	Class H Cement, Retarder, Dispersant, Salt

Casing String	Top (ft)	Bottom (ft)	% Excess
Surface (Lead)	N/A	N/A	N/A
Surface (Tail)	0	477	100%
Intermediate 1st Stage (Lead)	N/A	N/A	N/A
Intermediate 1st Stage (Tail)	5371	9311	5%
Intermediate 2nd Stage (Lead)	N/A	N/A	N/A
Intermediate 2nd Stage (Tail)	0	5371	10%
Production (Lead)	N/A	N/A	N/A
Production (Tail)	8811	19969	20%

4. Pressure Control Equipment

BOP installed and tested before drilling which hole?	Size?	Min. Required WP	Type	✓	Tested to:
9.875" Hole	13-5/8"	3M	Annular	✓	70% of working pressure
		3M	Blind Ram	✓	250 psi / 3000 psi
			Pipe Ram		
			Double Ram	✓	
			Other*		
6.75" Hole	13-5/8"	5M	Annular	✓	70% of working pressure
		5M	Blind Ram	✓	250 psi / 5000 psi
			Pipe Ram		
			Double Ram	✓	
			Other*		

*Specify if additional ram is utilized.

Oxy will utilize a 5M annular with a 10M BOPE stack. The 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. See attached schematics.

	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

As per the agreement reached in the Oxy/BLM face-to-face meeting on Feb 22, 2018, Oxy requests permission to allow BOP Break Testing under the following conditions:

- After a full BOP test is conducted on the first well on the pad.
- When skidding to drill an intermediate section that does not penetrate into the Wolfcamp.
- Full BOP test will be required prior to drilling any production hole.

5. Mud Program

Depth		Type	Weight (ppg)	Viscosity	Water Loss
From (ft)	To (ft)				
0	477	Water-Based Mud	8.6-8.8	40-60	N/C
477	9311	Saturated Brine-Based or Oil-Based Mud	8.0-10.0	35-45	N/C
9311	19969	Water-Based or Oil-Based Mud	9.5-12.0	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

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	ICP - TD
No	PEX	

7. Drilling Conditions

Condition	Specify what type and where?
BH Pressure at deepest TVD	5991 psi
Abnormal Temperature	No
BH Temperature at deepest TVD	157°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 isolation.

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 three 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.	Yes

• 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.	

Total estimated cuttings volume: 1409.4 bbls.

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

9. Company Personnel

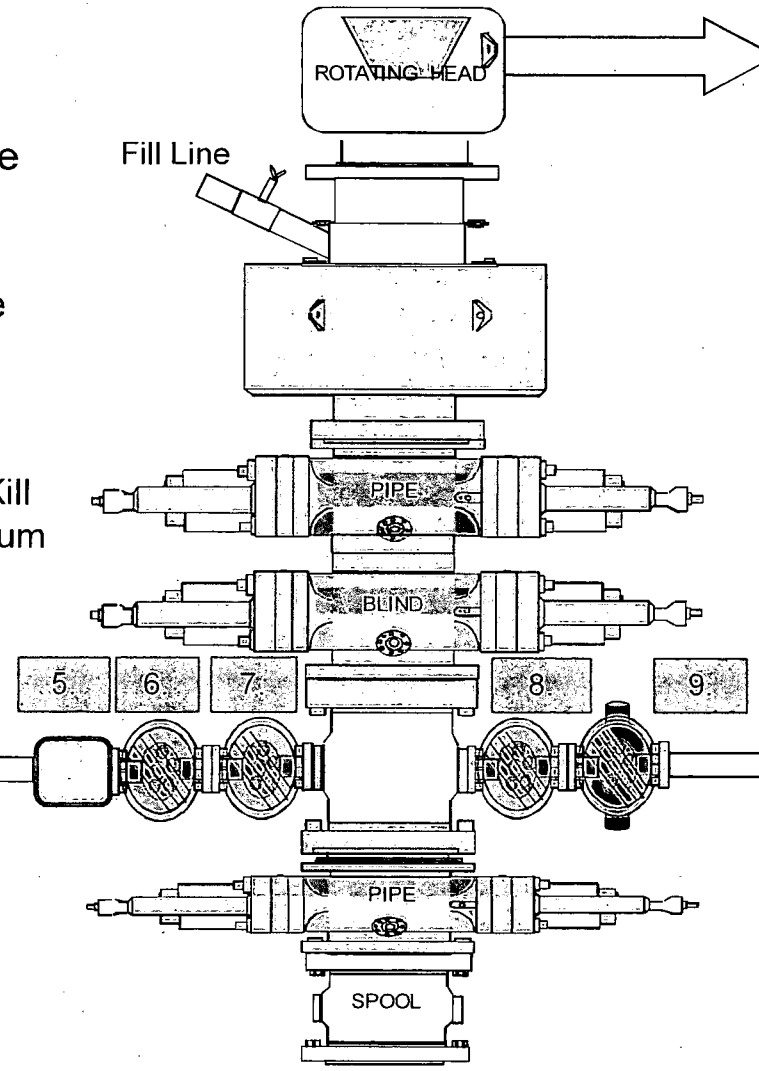
Name	Title	Office Phone	Mobile Phone
TBD	Drilling Engineer		
TBD	Drilling Engineer Supervisor		
Simon Benavides	Drilling Superintendent	713-522-8652	281-684-6897
John Willis	Drilling Manager	713-366-5556	713-259-1417

5/10M BOP Stack

Mud Cross Valves:

5. 10M Check Valve
6. Outside 10M Kill Line Valve
7. Inside 10M Kill Line
8. Outside10M Kill Line Valve
9. 10M HCR Valve

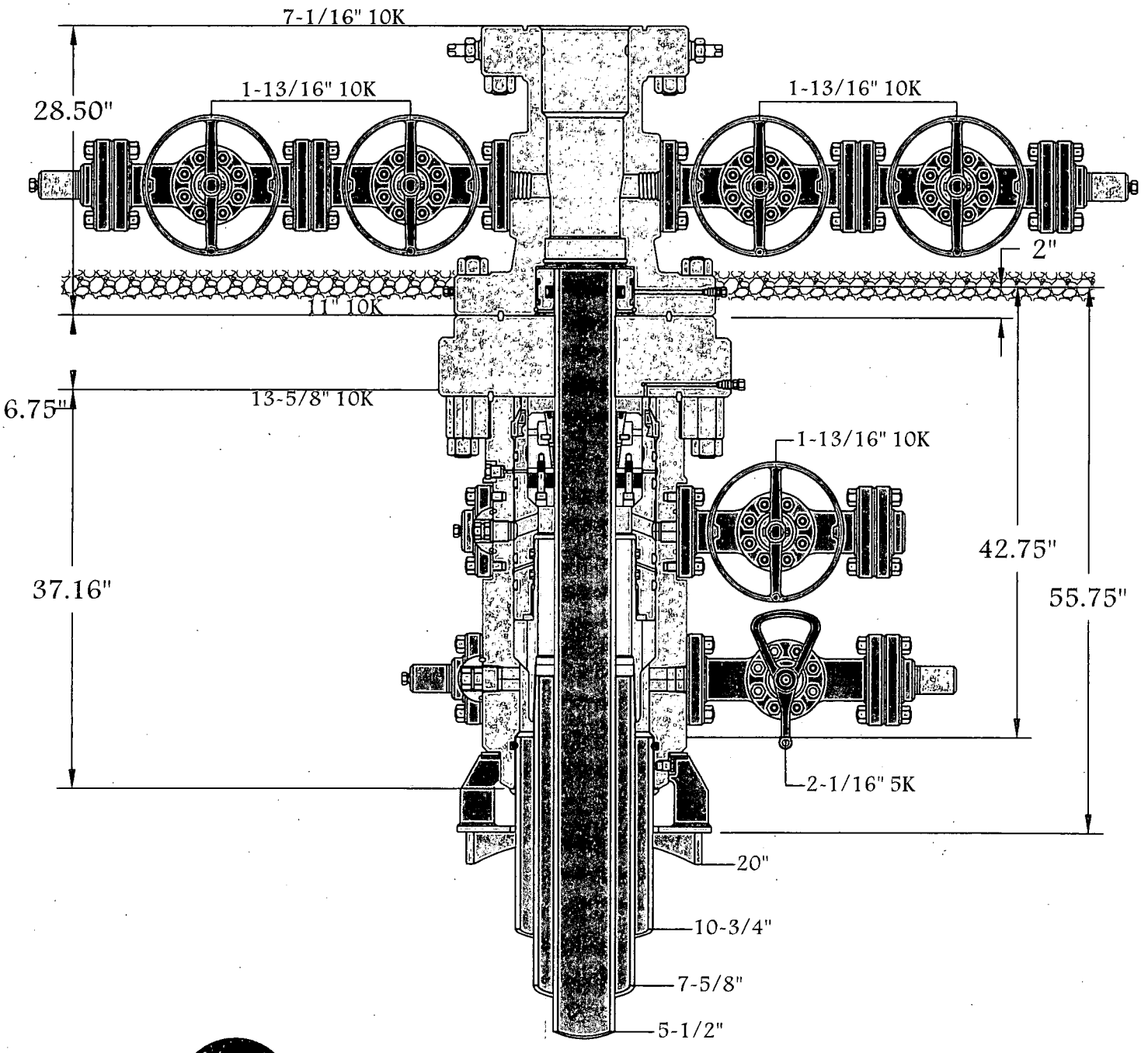
*Minimum ID = 2-1/16" on Kill Line side and 3" minimum ID on choke line side



1. 5,000 psi Annular (13-5/8" ID)
2. 10,000 psi Upper Pipe Ram (13-5/8" ID)
3. 10,000 psi Blind Ram (13-5/8" ID)
4. 10,000 psi Lower Pipe Ram (13-5/8" ID)

To Kill Line

To Co-Flex and Choke Manifold



OXY

13-5/8" 10K MN-DS

CAMERON
A Schlumberger Company

Name:	Date:	Working Pressure:	#

PERFORMANCE DATA

TMK UP DQX **5.500 in** **20.00 lbs/ft** **P-110**
Technical Data Sheet

Tubular Parameters

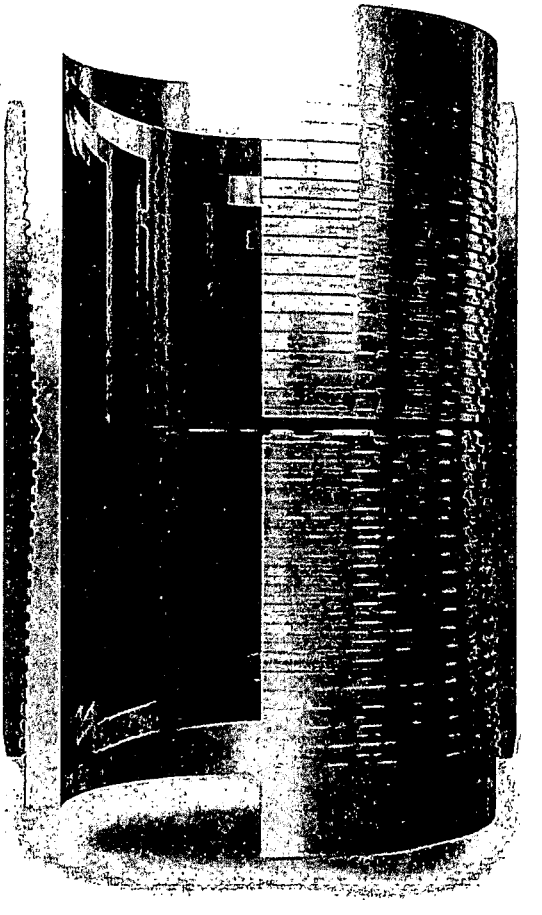
Size	5.500	in	Minimum Yield	110,000	psi
Nominal Weight	20.00	lbs/ft	Minimum Tensile	125,000	psi
Grade	P-110		Yield Load	641,000	lbs
PE Weight	19.81	lbs/ft	Tensile Load	729,000	lbs
Wall Thickness	0.361	in	Min. Internal Yield Pressure	12,600	psi
Nominal ID	4.778	in	Collapse Pressure	11,100	psi
Drift Diameter	4.653	in			
Nom. Pipe Body Area	5.828	in²			

Connection Parameters

Connection OD	6.050	in
Connection ID	4.778	in
Make-Up Loss	4.122	in
Critical Section Area	5.828	in²
Tension Efficiency	100.0	%
Compression Efficiency	100.0	%
Yield Load In Tension	641,000	lbs
Min. Internal Yield Pressure	12,600	psi
Collapse Pressure	11,100	psi

Make-Up Torques

Min. Make-Up Torque	11,600	ft-lbs
Opt. Make-Up Torque	12,900	ft-lbs
Max. Make-Up Torque	14,100	ft-lbs
Yield Torque	20,600	ft-lbs



Printed on: July-29-2014

TMK IPSCO

PERFORMANCE DATA

TMK UP SF TORQ™ **5.500 in** **20.00 lbs/ft** **P110 HC**
Technical Data Sheet

Tubular Parameters

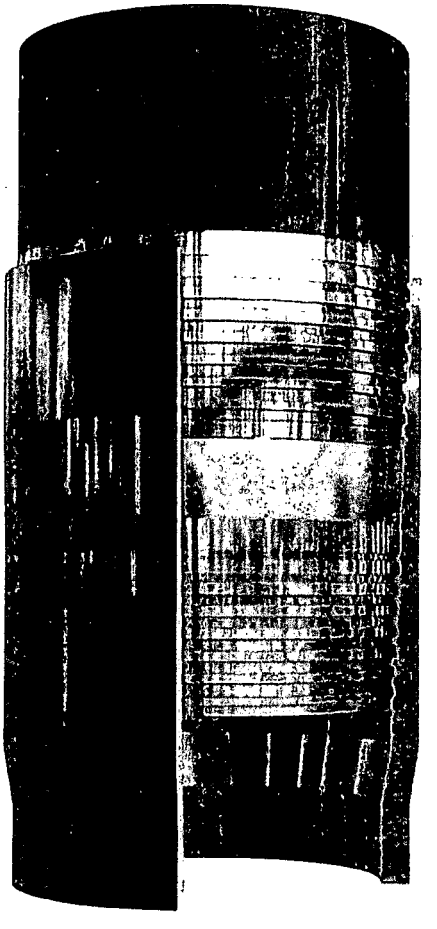
Size	5.500	in	Minimum Yield	110,000	psi
Nominal Weight	20.00	lbs/ft	Minimum Tensile	125,000	psi
Grade	P110 HC		Yield Load	641,000	lbs
PE Weight	19.81	lbs/ft	Tensile Load	728,000	lbs
Wall Thickness	0.361	in	Min. Internal Yield Pressure	12,640	psi
Nominal ID	4.778	in	Collapse Pressure	12,780	psi
Drift Diameter	4.653	in			
Nom. Pipe Body Area	5.828	in²			

Connection Parameters

Connection OD	5.777	in
Connection ID	4.734	in
Make-Up Loss	5.823	in
Critical Section Area	5.875	in²
Tension Efficiency	90.0	%
Compression Efficiency	90.0	%
Yield Load In Tension	576,000	lbs
Min. Internal Yield Pressure	12,640	psi
Collapse Pressure	12,780	psi
Uniaxial Bending	83	°/ 100 ft

Make-Up Torques

Min. Make-Up Torque	15,700	ft-lbs
Opt. Make-Up Torque	19,600	ft-lbs
Max. Make-Up Torque	21,600	ft-lbs
Operating Torque	29,000	ft-lbs
Yield Torque	36,000	ft-lbs



Printed on: February-22-2018

TMK IPSCO

PERFORMANCE DATA

TMK UP TORQ™ DQW **5.500 in** **20.00 lbs/ft** **P110 CY**

Technical Data Sheet

Tubular Parameters

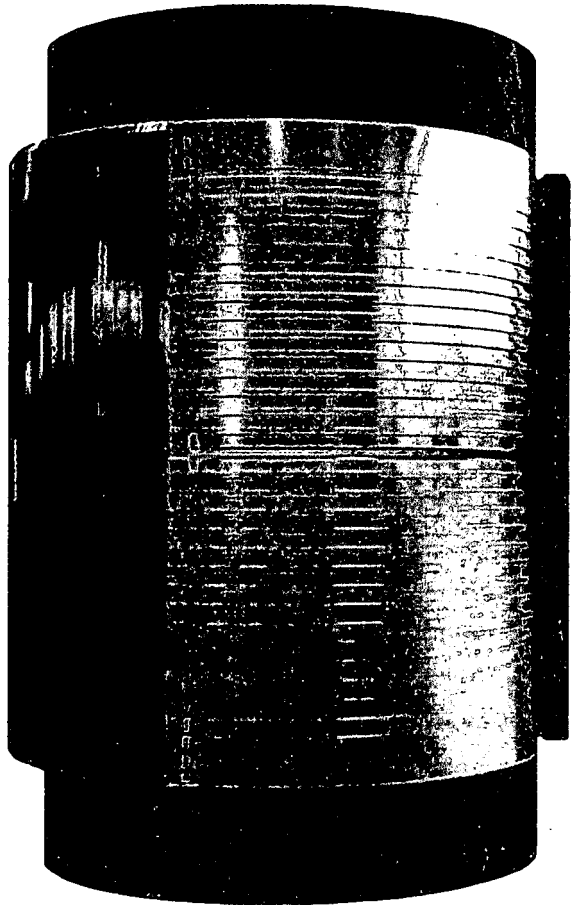
Size	5.500	in	Minimum Yield	110,000	psi
Nominal Weight	20.00	lbs/ft	Minimum Tensile	125,000	psi
Grade	P110 CY		Yield Load	641,000	lbs
PE Weight	19.81	lbs/ft	Tensile Load	729,000	lbs
Wall Thickness	0.361	in	Min. Internal Yield Pressure	12,640	psi
Nominal ID	4.778	in	Collapse Pressure	11,110	psi
Drift Diameter	4.653	in			
Nom. Pipe Body Area	5.828	in²			

Connection Parameters

Connection OD	6.050	in
Connection ID	4.778	in
Make-Up Loss	4.324	in
Critical Section Area	5.828	in²
Tension Efficiency	100.0	%
Compression Efficiency	100.0	%
Yield Load in Tension	641,000	lbs
Min. Internal Yield Pressure	12,640	psi
Collapse Pressure	11,110	psi
Uniaxial Bending	92	°/ 100 ft

Make-Up Torques

Min. Make-Up Torque	14,000	ft-lbs
Opt. Make-Up Torque	16,000	ft-lbs
Max. Make-Up Torque	18,000	ft-lbs
Operating Torque	36,800	ft-lbs
Yield Torque	46,000	ft-lbs



Printed on: March-05-2019

TMK IPSCO

Project: PRD NM DIRECTIONAL PLANS (NAD 1983)
Site: HEIGHT CC 6_7 FED COM
Well: Height CC 6_7 Federal Com 312H
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

T G M

Azimuths to Grid North
True North: -0.16°
Magnetic North: 6.90°

Magnetic Field
Strength: 47924.1snT
Dip Angle: 60.00°
Date: 4/11/2019
Model: HDGM

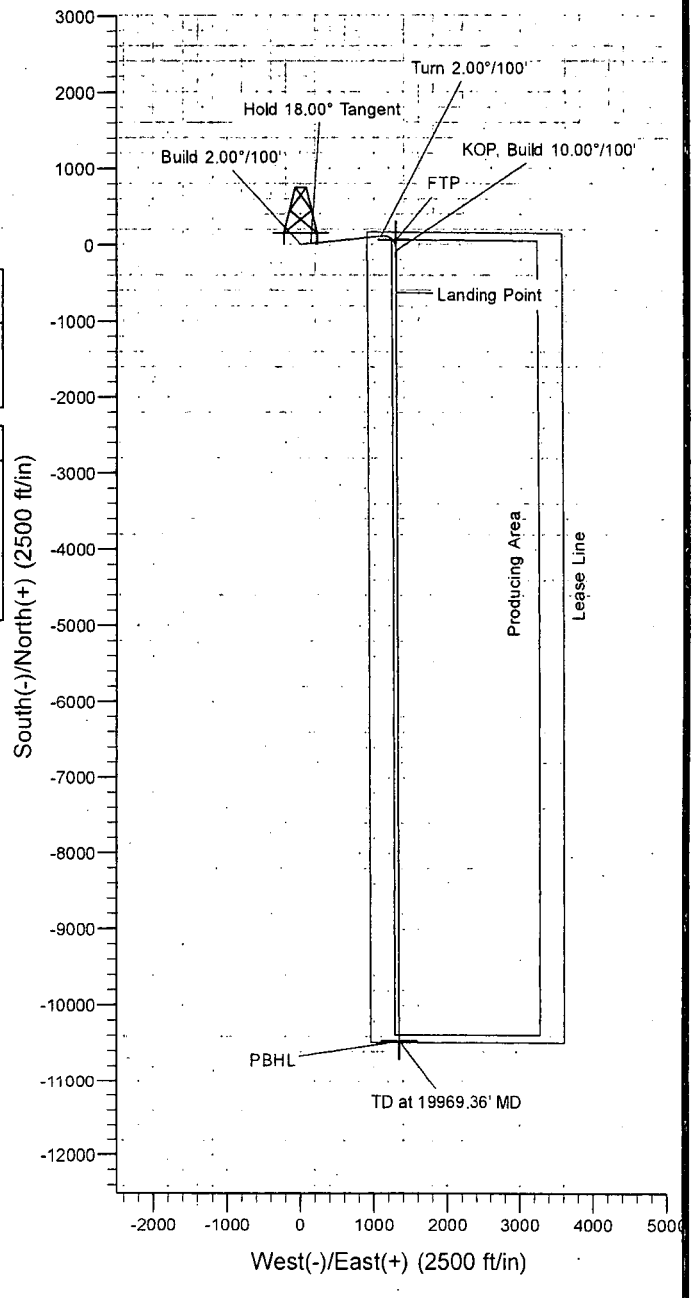
WELL DETAILS: Height CC 6_7 Federal Com 312H

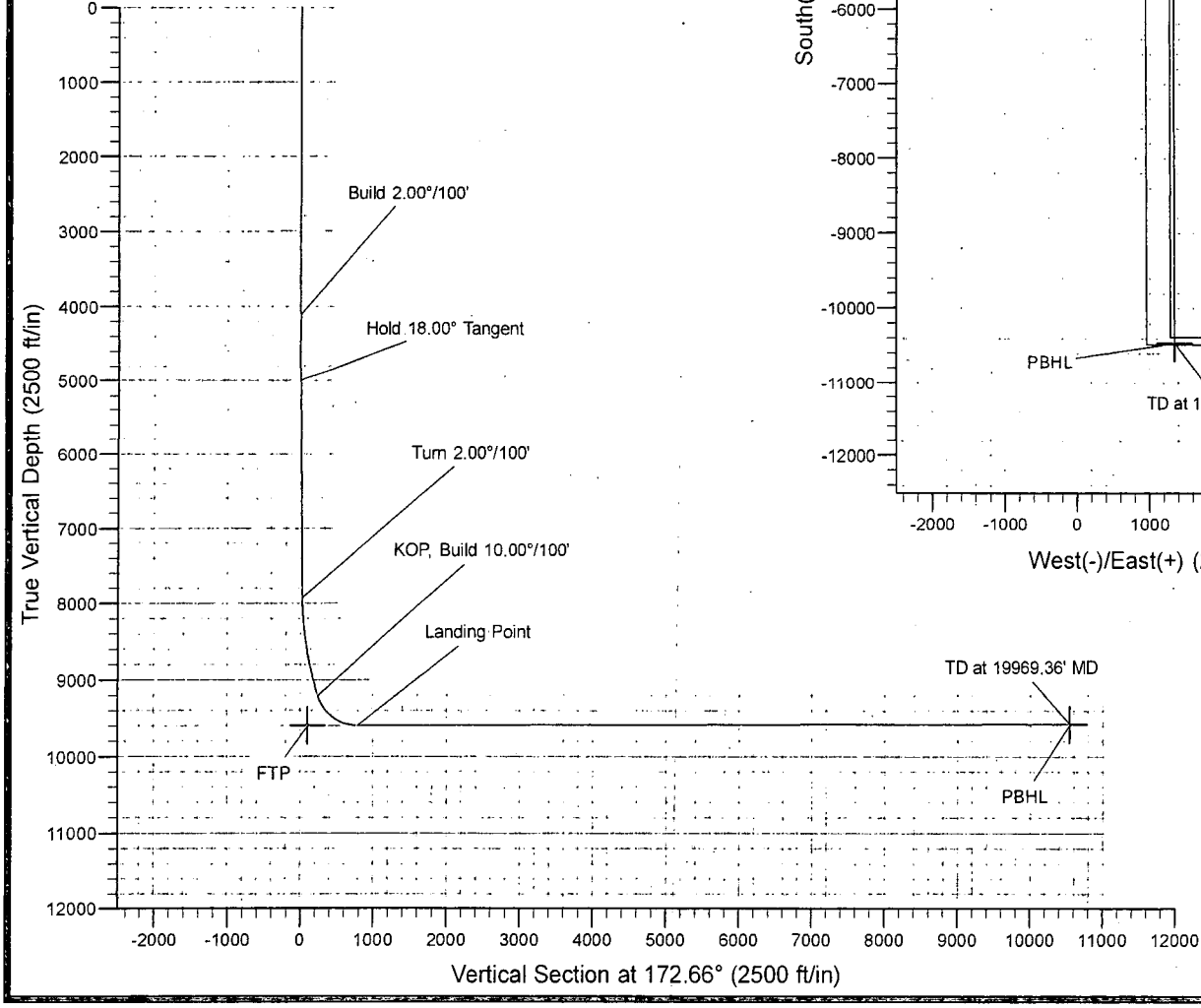
Ground Level: 2957.20

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
0.00	0.00	456203.78	636116.76	32° 15' 13.706991 N	104° 1' 36.246215 W

SECTION DETAILS

MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	Annotation
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
4107.00	0.00	0.00	4107.00	0.00	0.00	0.00	0.00	0.00	Build 2.00°/100'
5006.96	18.00	84.24	4992.23	14.07	139.49	2.00	84.24	3.85	Hold 18.00° Tangent
8089.21	18.00	84.24	7923.64	109.68	1087.11	0.00	0.00	30.03	Turn 2.00°/100'
9411.22	18.00	179.72	9203.74	-77.41	1295.04	2.00	136.30	242.13	KOP, Build 10.00°/100'
10132.36	90.11	179.72	9599.64	-623.47	1297.76	10.00	0.00	784.06	Landing Point
19969.36	90.11	179.72	9580.00	-10460.32	1346.62	0.00	0.00	10546.65	TD at 19969.36' MD





OXY

PRD NM DIRECTIONAL PLANS (NAD 1983)
HEIGHT CC 6_7 FED COM
Height CC 6_7 Federal Com 312H

Wellbore #1

Plan: Permitting Plan

Standard Planning Report

11 April, 2019

Database:	HOPSPP	**Local Co-ordinate Reference:**	Well Height CC 6_7 Federal Com 312H
Company:	ENGINEERING DESIGNS	**TVD Reference:**	RKB=26.5' @ 2983.70ft
Project:	PRD NM DIRECTIONAL PLANS (NAD 1983)	**MD Reference:**	RKB=26.5' @ 2983.70ft
Site:	HEIGHT CC 6_7 FED COM	**North Reference:**	Grid
Well:	Height CC 6_7 Federal Com 312H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Permitting Plan		

Project PRD NM DIRECTIONAL PLANS (NAD 1983)

Map System:	US State Plane 1983	**System Datum:**	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	New Mexico Eastern Zone		Using geodetic scale factor

Site HEIGHT CC 6_7 FED COM

Site Position:		**Northing:**	0.00 usft	**Latitude:**	30° 59' 18.403714 N
From:	Map	**Easting:**	0.00 usft	**Longitude:**	106° 3' 38.987298 W
Position Uncertainty:	50.00 ft	**Slot Radius:**	13.200 in	**Grid Convergence:**	-0.89 °

Well Height CC 6_7 Federal Com 312H

Well Position	**+N/-S**	456,093:03 ft	**Northing:**	456,203.78 usft	**Latitude:**	32° 15' 13.706991 N
	+E/-W	635,962.34 ft	**Easting:**	636,116.76 usft	**Longitude:**	104° 1' 36.246215 W
Position Uncertainty		2.00 ft	**Wellhead Elevation:**	0.00 ft	**Ground Level:**	2,957.20 ft

Wellbore Wellbore #1

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	4/11/2019	7.07	60.00	47,924

Design Permitting Plan

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	172.66

Plan Sections

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	TFO (°)	Target
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
4,107.00	0.00	0.00	4,107.00	0.00	0.00	0.00	0.00	0.00	0.00	
5,006.96	18.00	84.24	4,992.23	14.07	139.49	2.00	2.00	0.00	84.24	
8,089.21	18.00	84.24	7,923.64	109.68	1,087.11	0.00	0.00	0.00	0.00	
9,411.22	18.00	179.72	9,203.74	-77.41	1,295.04	2.00	0.00	7.22	136.30	
10,132.36	90.11	179.72	9,599.64	-623.47	1,297.76	10.00	10.00	0.00	0.00	
19,969.36	90.11	179.72	9,580.00	-10,460.32	1,346.62	0.00	0.00	0.00	0.00	PBHL (Height CC

Database:	HOPSPP	**Local Co-ordinate Reference:**	Well Height CC 6_7 Federal Com 312H
Company:	ENGINEERING DESIGNS	**TVD Reference:**	RKB=26.5' @ 2983.70ft
Project:	PRD NM DIRECTIONAL PLANS (NAD 1983)	**MD Reference:**	RKB=26.5' @ 2983.70ft
Site:	HEIGHT CC 6_7 FED COM	**North Reference:**	Grid
Well:	Height CC 6_7 Federal Com 312H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	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
3,800.00	0.00	0.00	3,800.00	0.00	0.00	0.00	0.00	0.00	0.00
3,900.00	0.00	0.00	3,900.00	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
4,100.00	0.00	0.00	4,100.00	0.00	0.00	0.00	0.00	0.00	0.00
4,107.00	0.00	0.00	4,107.00	0.00	0.00	0.00	0.00	0.00	0.00
4,200.00	1.86	84.24	4,199.98	0.15	1.50	0.04	2.00	2.00	0.00
4,300.00	3.86	84.24	4,299.85	0.65	6.47	0.18	2.00	2.00	0.00
4,400.00	5.86	84.24	4,399.49	1.50	14.89	0.41	2.00	2.00	0.00
4,500.00	7.86	84.24	4,498.77	2.70	26.78	0.74	2.00	2.00	0.00
4,600.00	9.86	84.24	4,597.57	4.25	42.10	1.16	2.00	2.00	0.00
4,700.00	11.86	84.24	4,695.77	6.14	60.85	1.68	2.00	2.00	0.00
4,800.00	13.86	84.24	4,793.26	8.37	82.99	2.29	2.00	2.00	0.00
4,900.00	15.86	84.24	4,889.91	10.95	108.51	3.00	2.00	2.00	0.00
5,000.00	17.86	84.24	4,985.61	13.86	137.36	3.79	2.00	2.00	0.00
5,006.96	18.00	84.24	4,992.23	14.07	139.49	3.85	2.00	2.00	0.00
5,100.00	18.00	84.24	5,080.72	16.96	168.10	4.64	0.00	0.00	0.00

Database:	HOPSPP	**Local Co-ordinate Reference:**	Well Height CC 6_7 Federal Com 312H
Company:	ENGINEERING DESIGNS	**TVD Reference:**	RKB=26.5' @ 2983.70ft
Project:	PRD NM DIRECTIONAL PLANS (NAD 1983)	**MD Reference:**	RKB=26.5' @ 2983.70ft
Site:	HEIGHT CC 6_7 FED COM	**North Reference:**	Grid
Well:	Height CC 6_7 Federal Com 312H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	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)
5,200.00	18.00	84.24	5,175.82	20.06	198.84	5.49	0.00	0.00	0.00
5,300.00	18.00	84.24	5,270.93	23.16	229.59	6.34	0.00	0.00	0.00
5,400.00	18.00	84.24	5,366.04	26.26	260.33	7.19	0.00	0.00	0.00
5,500.00	18.00	84.24	5,461.14	29.37	291.07	8.04	0.00	0.00	0.00
5,600.00	18.00	84.24	5,556.25	32.47	321.82	8.89	0.00	0.00	0.00
5,700.00	18.00	84.24	5,651.35	35.57	352.56	9.74	0.00	0.00	0.00
5,800.00	18.00	84.24	5,746.46	38.67	383.31	10.59	0.00	0.00	0.00
5,900.00	18.00	84.24	5,841.57	41.77	414.05	11.44	0.00	0.00	0.00
6,000.00	18.00	84.24	5,936.67	44.87	444.79	12.29	0.00	0.00	0.00
6,100.00	18.00	84.24	6,031.78	47.98	475.54	13.13	0.00	0.00	0.00
6,200.00	18.00	84.24	6,126.88	51.08	506.28	13.98	0.00	0.00	0.00
6,300.00	18.00	84.24	6,221.99	54.18	537.03	14.83	0.00	0.00	0.00
6,400.00	18.00	84.24	6,317.10	57.28	567.77	15.68	0.00	0.00	0.00
6,500.00	18.00	84.24	6,412.20	60.38	598.52	16.53	0.00	0.00	0.00
6,600.00	18.00	84.24	6,507.31	63.48	629.26	17.38	0.00	0.00	0.00
6,700.00	18.00	84.24	6,602.42	66.59	660.00	18.23	0.00	0.00	0.00
6,800.00	18.00	84.24	6,697.52	69.69	690.75	19.08	0.00	0.00	0.00
6,900.00	18.00	84.24	6,792.63	72.79	721.49	19.93	0.00	0.00	0.00
7,000.00	18.00	84.24	6,887.73	75.89	752.24	20.78	0.00	0.00	0.00
7,100.00	18.00	84.24	6,982.84	78.99	782.98	21.63	0.00	0.00	0.00
7,200.00	18.00	84.24	7,077.95	82.09	813.72	22.48	0.00	0.00	0.00
7,300.00	18.00	84.24	7,173.05	85.20	844.47	23.32	0.00	0.00	0.00
7,400.00	18.00	84.24	7,268.16	88.30	875.21	24.17	0.00	0.00	0.00
7,500.00	18.00	84.24	7,363.26	91.40	905.96	25.02	0.00	0.00	0.00
7,600.00	18.00	84.24	7,458.37	94.50	936.70	25.87	0.00	0.00	0.00
7,700.00	18.00	84.24	7,553.48	97.60	967.45	26.72	0.00	0.00	0.00
7,800.00	18.00	84.24	7,648.58	100.71	998.19	27.57	0.00	0.00	0.00
7,900.00	18.00	84.24	7,743.69	103.81	1,028.93	28.42	0.00	0.00	0.00
8,000.00	18.00	84.24	7,838.79	106.91	1,059.68	29.27	0.00	0.00	0.00
8,089.21	18.00	84.24	7,923.64	109.68	1,087.11	30.03	0.00	0.00	0.00
8,100.00	17.84	84.73	7,933.91	109.99	1,090.41	30.13	2.00	-1.44	4.51
8,200.00	16.47	89.65	8,029.46	111.49	1,119.84	32.41	2.00	-1.38	4.92
8,300.00	15.22	95.39	8,125.66	110.34	1,147.09	37.02	2.00	-1.24	5.74
8,400.00	14.15	102.06	8,222.40	106.56	1,172.11	43.97	2.00	-1.07	6.67
8,500.00	13.29	109.68	8,319.56	100.13	1,194.89	53.25	2.00	-0.86	7.62
8,600.00	12.68	118.17	8,417.01	91.08	1,215.39	64.85	2.00	-0.61	8.49
8,700.00	12.37	127.28	8,514.64	79.41	1,233.59	78.74	2.00	-0.32	9.12
8,800.00	12.37	136.63	8,612.33	65.14	1,249.46	94.93	2.00	0.00	9.35
8,900.00	12.68	145.75	8,709.96	48.28	1,262.99	113.37	2.00	0.31	9.12
9,000.00	13.29	154.25	8,807.41	28.86	1,274.16	134.06	2.00	0.61	8.49
9,100.00	14.15	161.87	8,904.57	6.90	1,282.96	156.97	2.00	0.86	7.62
9,200.00	15.22	168.54	9,001.31	-17.58	1,289.37	182.07	2.00	1.07	6.67
9,300.00	16.46	174.29	9,097.51	-44.55	1,293.39	209.32	2.00	1.24	5.75
9,400.00	17.84	179.21	9,193.07	-73.96	1,295.01	238.71	2.00	1.38	4.92
9,411.22	18.00	179.72	9,203.74	-77.41	1,295.04	242.13	2.00	1.44	4.51
9,500.00	26.88	179.72	9,285.72	-111.27	1,295.21	275.73	10.00	10.00	0.00
9,600.00	36.88	179.72	9,370.53	-164.01	1,295.47	328.08	10.00	10.00	0.00
9,700.00	46.88	179.72	9,444.89	-230.68	1,295.80	394.24	10.00	10.00	0.00
9,800.00	56.88	179.72	9,506.55	-309.25	1,296.19	472.22	10.00	10.00	0.00
9,900.00	66.88	179.72	9,553.62	-397.33	1,296.63	559.64	10.00	10.00	0.00
10,000.00	76.88	179.72	9,584.69	-492.25	1,297.10	653.84	10.00	10.00	0.00
10,100.00	86.88	179.72	9,598.80	-591.12	1,297.59	751.96	10.00	10.00	0.00
10,132.36	90.11	179.72	9,599.64	-623.47	1,297.76	784.06	10.00	10.00	0.00
10,200.00	90.11	179.72	9,599.51	-691.10	1,298.09	851.19	0.00	0.00	0.00

Database:	HOPSPP	**Local Co-ordinate Reference:**	Well Height CC 6_7 Federal Com 312H
Company:	ENGINEERING DESIGNS	**TVD Reference:**	RKB=26.5' @ 2983.70ft
Project:	PRD NM DIRECTIONAL PLANS (NAD 1983)	**MD Reference:**	RKB=26.5' @ 2983.70ft
Site:	HEIGHT CC 6_7 FED COM	**North Reference:**	Grid
Well:	Height CC 6_7 Federal Com 312H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	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)
10,300.00	90.11	179.72	9,599.31	-791.10	1,298.59	950.43	0.00	0.00	0.00
10,400.00	90.11	179.72	9,599.11	-891.10	1,299.09	1,049.68	0.00	0.00	0.00
10,500.00	90.11	179.72	9,598.91	-991.10	1,299.58	1,148.92	0.00	0.00	0.00
10,600.00	90.11	179.72	9,598.71	-1,091.10	1,300.08	1,248.17	0.00	0.00	0.00
10,700.00	90.11	179.72	9,598.51	-1,191.10	1,300.58	1,347.41	0.00	0.00	0.00
10,800.00	90.11	179.72	9,598.31	-1,291.10	1,301.07	1,446.65	0.00	0.00	0.00
10,900.00	90.11	179.72	9,598.11	-1,391.09	1,301.57	1,545.90	0.00	0.00	0.00
11,000.00	90.11	179.72	9,597.91	-1,491.09	1,302.07	1,645.14	0.00	0.00	0.00
11,100.00	90.11	179.72	9,597.71	-1,591.09	1,302.56	1,744.38	0.00	0.00	0.00
11,200.00	90.11	179.72	9,597.51	-1,691.09	1,303.06	1,843.63	0.00	0.00	0.00
11,300.00	90.11	179.72	9,597.31	-1,791.09	1,303.56	1,942.87	0.00	0.00	0.00
11,400.00	90.11	179.72	9,597.11	-1,891.09	1,304.05	2,042.11	0.00	0.00	0.00
11,500.00	90.11	179.72	9,596.91	-1,991.09	1,304.55	2,141.36	0.00	0.00	0.00
11,600.00	90.11	179.72	9,596.71	-2,091.08	1,305.05	2,240.60	0.00	0.00	0.00
11,700.00	90.11	179.72	9,596.51	-2,191.08	1,305.54	2,339.84	0.00	0.00	0.00
11,800.00	90.11	179.72	9,596.31	-2,291.08	1,306.04	2,439.09	0.00	0.00	0.00
11,900.00	90.11	179.72	9,596.11	-2,391.08	1,306.54	2,538.33	0.00	0.00	0.00
12,000.00	90.11	179.72	9,595.92	-2,491.08	1,307.03	2,637.57	0.00	0.00	0.00
12,100.00	90.11	179.72	9,595.72	-2,591.08	1,307.53	2,736.82	0.00	0.00	0.00
12,200.00	90.11	179.72	9,595.52	-2,691.08	1,308.03	2,836.06	0.00	0.00	0.00
12,300.00	90.11	179.72	9,595.32	-2,791.07	1,308.52	2,935.31	0.00	0.00	0.00
12,400.00	90.11	179.72	9,595.12	-2,891.07	1,309.02	3,034.55	0.00	0.00	0.00
12,500.00	90.11	179.72	9,594.92	-2,991.07	1,309.52	3,133.79	0.00	0.00	0.00
12,600.00	90.11	179.72	9,594.72	-3,091.07	1,310.01	3,233.04	0.00	0.00	0.00
12,700.00	90.11	179.72	9,594.52	-3,191.07	1,310.51	3,332.28	0.00	0.00	0.00
12,800.00	90.11	179.72	9,594.32	-3,291.07	1,311.01	3,431.52	0.00	0.00	0.00
12,900.00	90.11	179.72	9,594.12	-3,391.07	1,311.50	3,530.77	0.00	0.00	0.00
13,000.00	90.11	179.72	9,593.92	-3,491.06	1,312.00	3,630.01	0.00	0.00	0.00
13,100.00	90.11	179.72	9,593.72	-3,591.06	1,312.50	3,729.25	0.00	0.00	0.00
13,200.00	90.11	179.72	9,593.52	-3,691.06	1,312.99	3,828.50	0.00	0.00	0.00
13,300.00	90.11	179.72	9,593.32	-3,791.06	1,313.49	3,927.74	0.00	0.00	0.00
13,400.00	90.11	179.72	9,593.12	-3,891.06	1,313.99	4,026.98	0.00	0.00	0.00
13,500.00	90.11	179.72	9,592.92	-3,991.06	1,314.48	4,126.23	0.00	0.00	0.00
13,600.00	90.11	179.72	9,592.72	-4,091.06	1,314.98	4,225.47	0.00	0.00	0.00
13,700.00	90.11	179.72	9,592.52	-4,191.05	1,315.48	4,324.71	0.00	0.00	0.00
13,800.00	90.11	179.72	9,592.32	-4,291.05	1,315.97	4,423.96	0.00	0.00	0.00
13,900.00	90.11	179.72	9,592.12	-4,391.05	1,316.47	4,523.20	0.00	0.00	0.00
14,000.00	90.11	179.72	9,591.92	-4,491.05	1,316.97	4,622.45	0.00	0.00	0.00
14,100.00	90.11	179.72	9,591.72	-4,591.05	1,317.47	4,721.69	0.00	0.00	0.00
14,200.00	90.11	179.72	9,591.52	-4,691.05	1,317.96	4,820.93	0.00	0.00	0.00
14,300.00	90.11	179.72	9,591.32	-4,791.05	1,318.46	4,920.18	0.00	0.00	0.00
14,400.00	90.11	179.72	9,591.12	-4,891.04	1,318.96	5,019.42	0.00	0.00	0.00
14,500.00	90.11	179.72	9,590.92	-4,991.04	1,319.45	5,118.66	0.00	0.00	0.00
14,600.00	90.11	179.72	9,590.72	-5,091.04	1,319.95	5,217.91	0.00	0.00	0.00
14,700.00	90.11	179.72	9,590.52	-5,191.04	1,320.45	5,317.15	0.00	0.00	0.00
14,800.00	90.11	179.72	9,590.32	-5,291.04	1,320.94	5,416.39	0.00	0.00	0.00
14,900.00	90.11	179.72	9,590.12	-5,391.04	1,321.44	5,515.64	0.00	0.00	0.00
15,000.00	90.11	179.72	9,589.92	-5,491.04	1,321.94	5,614.88	0.00	0.00	0.00
15,100.00	90.11	179.72	9,589.72	-5,591.03	1,322.43	5,714.12	0.00	0.00	0.00
15,200.00	90.11	179.72	9,589.52	-5,691.03	1,322.93	5,813.37	0.00	0.00	0.00
15,300.00	90.11	179.72	9,589.32	-5,791.03	1,323.43	5,912.61	0.00	0.00	0.00
15,400.00	90.11	179.72	9,589.13	-5,891.03	1,323.92	6,011.85	0.00	0.00	0.00
15,500.00	90.11	179.72	9,588.93	-5,991.03	1,324.42	6,111.10	0.00	0.00	0.00
15,600.00	90.11	179.72	9,588.73	-6,091.03	1,324.92	6,210.34	0.00	0.00	0.00

Database:	HOPSPP	**Local Co-ordinate Reference:**	Well Height CC 6_7 Federal Com 312H
Company:	ENGINEERING DESIGNS	**TVD Reference:**	RKB=26.5' @ 2983.70ft
Project:	PRD NM DIRECTIONAL PLANS (NAD 1983)	**MD Reference:**	RKB=26.5' @ 2983.70ft
Site:	HEIGHT CC 6_7 FED COM	**North Reference:**	Grid
Well:	Height CC 6_7 Federal Com 312H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	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)
15,700.00	90.11	179.72	9,588.53	-6,191.03	1,325.41	6,309.58	0.00	0.00	0.00
15,800.00	90.11	179.72	9,588.33	-6,291.02	1,325.91	6,408.83	0.00	0.00	0.00
15,900.00	90.11	179.72	9,588.13	-6,391.02	1,326.41	6,508.07	0.00	0.00	0.00
16,000.00	90.11	179.72	9,587.93	-6,491.02	1,326.90	6,607.32	0.00	0.00	0.00
16,100.00	90.11	179.72	9,587.73	-6,591.02	1,327.40	6,706.56	0.00	0.00	0.00
16,200.00	90.11	179.72	9,587.53	-6,691.02	1,327.90	6,805.80	0.00	0.00	0.00
16,300.00	90.11	179.72	9,587.33	-6,791.02	1,328.39	6,905.05	0.00	0.00	0.00
16,400.00	90.11	179.72	9,587.13	-6,891.02	1,328.89	7,004.29	0.00	0.00	0.00
16,500.00	90.11	179.72	9,586.93	-6,991.01	1,329.39	7,103.53	0.00	0.00	0.00
16,600.00	90.11	179.72	9,586.73	-7,091.01	1,329.88	7,202.78	0.00	0.00	0.00
16,700.00	90.11	179.72	9,586.53	-7,191.01	1,330.38	7,302.02	0.00	0.00	0.00
16,800.00	90.11	179.72	9,586.33	-7,291.01	1,330.88	7,401.26	0.00	0.00	0.00
16,900.00	90.11	179.72	9,586.13	-7,391.01	1,331.37	7,500.51	0.00	0.00	0.00
17,000.00	90.11	179.72	9,585.93	-7,491.01	1,331.87	7,599.75	0.00	0.00	0.00
17,100.00	90.11	179.72	9,585.73	-7,591.01	1,332.37	7,698.99	0.00	0.00	0.00
17,200.00	90.11	179.72	9,585.53	-7,691.00	1,332.86	7,798.24	0.00	0.00	0.00
17,300.00	90.11	179.72	9,585.33	-7,791.00	1,333.36	7,897.48	0.00	0.00	0.00
17,400.00	90.11	179.72	9,585.13	-7,891.00	1,333.86	7,996.72	0.00	0.00	0.00
17,500.00	90.11	179.72	9,584.93	-7,991.00	1,334.35	8,095.97	0.00	0.00	0.00
17,600.00	90.11	179.72	9,584.73	-8,091.00	1,334.85	8,195.21	0.00	0.00	0.00
17,700.00	90.11	179.72	9,584.53	-8,191.00	1,335.35	8,294.46	0.00	0.00	0.00
17,800.00	90.11	179.72	9,584.33	-8,291.00	1,335.84	8,393.70	0.00	0.00	0.00
17,900.00	90.11	179.72	9,584.13	-8,390.99	1,336.34	8,492.94	0.00	0.00	0.00
18,000.00	90.11	179.72	9,583.93	-8,490.99	1,336.84	8,592.19	0.00	0.00	0.00
18,100.00	90.11	179.72	9,583.73	-8,590.99	1,337.34	8,691.43	0.00	0.00	0.00
18,200.00	90.11	179.72	9,583.53	-8,690.99	1,337.83	8,790.67	0.00	0.00	0.00
18,300.00	90.11	179.72	9,583.33	-8,790.99	1,338.33	8,889.92	0.00	0.00	0.00
18,400.00	90.11	179.72	9,583.13	-8,890.99	1,338.83	8,989.16	0.00	0.00	0.00
18,500.00	90.11	179.72	9,582.93	-8,990.99	1,339.32	9,088.40	0.00	0.00	0.00
18,600.00	90.11	179.72	9,582.73	-9,090.98	1,339.82	9,187.65	0.00	0.00	0.00
18,700.00	90.11	179.72	9,582.54	-9,190.98	1,340.32	9,286.89	0.00	0.00	0.00
18,800.00	90.11	179.72	9,582.34	-9,290.98	1,340.81	9,386.13	0.00	0.00	0.00
18,900.00	90.11	179.72	9,582.14	-9,390.98	1,341.31	9,485.38	0.00	0.00	0.00
19,000.00	90.11	179.72	9,581.94	-9,490.98	1,341.81	9,584.62	0.00	0.00	0.00
19,100.00	90.11	179.72	9,581.74	-9,590.98	1,342.30	9,683.86	0.00	0.00	0.00
19,200.00	90.11	179.72	9,581.54	-9,690.98	1,342.80	9,783.11	0.00	0.00	0.00
19,300.00	90.11	179.72	9,581.34	-9,790.97	1,343.30	9,882.35	0.00	0.00	0.00
19,400.00	90.11	179.72	9,581.14	-9,890.97	1,343.79	9,981.59	0.00	0.00	0.00
19,500.00	90.11	179.72	9,580.94	-9,990.97	1,344.29	10,080.84	0.00	0.00	0.00
19,600.00	90.11	179.72	9,580.74	-10,090.97	1,344.79	10,180.08	0.00	0.00	0.00
19,700.00	90.11	179.72	9,580.54	-10,190.97	1,345.28	10,279.33	0.00	0.00	0.00
19,800.00	90.11	179.72	9,580.34	-10,290.97	1,345.78	10,378.57	0.00	0.00	0.00
19,900.00	90.11	179.72	9,580.14	-10,390.97	1,346.28	10,477.81	0.00	0.00	0.00
19,969.36	90.11	179.72	9,580.00	-10,460.32	1,346.62	10,546.65	0.00	0.00	0.00

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Company:	ENGINEERING DESIGNS	**TVD Reference:**	RKB=26.5' @ 2983.70ft
Project:	PRD NM DIRECTIONAL PLANS (NAD 1983)	**MD Reference:**	RKB=26.5' @ 2983.70ft
Site:	HEIGHT CC 6_7 FED COM	**North Reference:**	Grid
Well:	Height CC 6_7 Federal Com 312H	**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 (Height CC 6_7 - plan hits target center - Point	0.00	0.00	9,580.00	-10,460.32	1,346.62	445,744.32	637,463.27	32° 13' 30.162953 N	104° 1' 20.918139
FTP (Height CC 6_7 - plan misses target center by 319.06ft at 9620.87ft MD (9386.99 TVD, -176.84 N, 1295.54 E) - Point	0.00	0.00	9,600.00	60.71	1,294.36	456,264.48	637,411.01	32° 15' 14.270845 N	104° 1' 21.172143

Plan Annotations

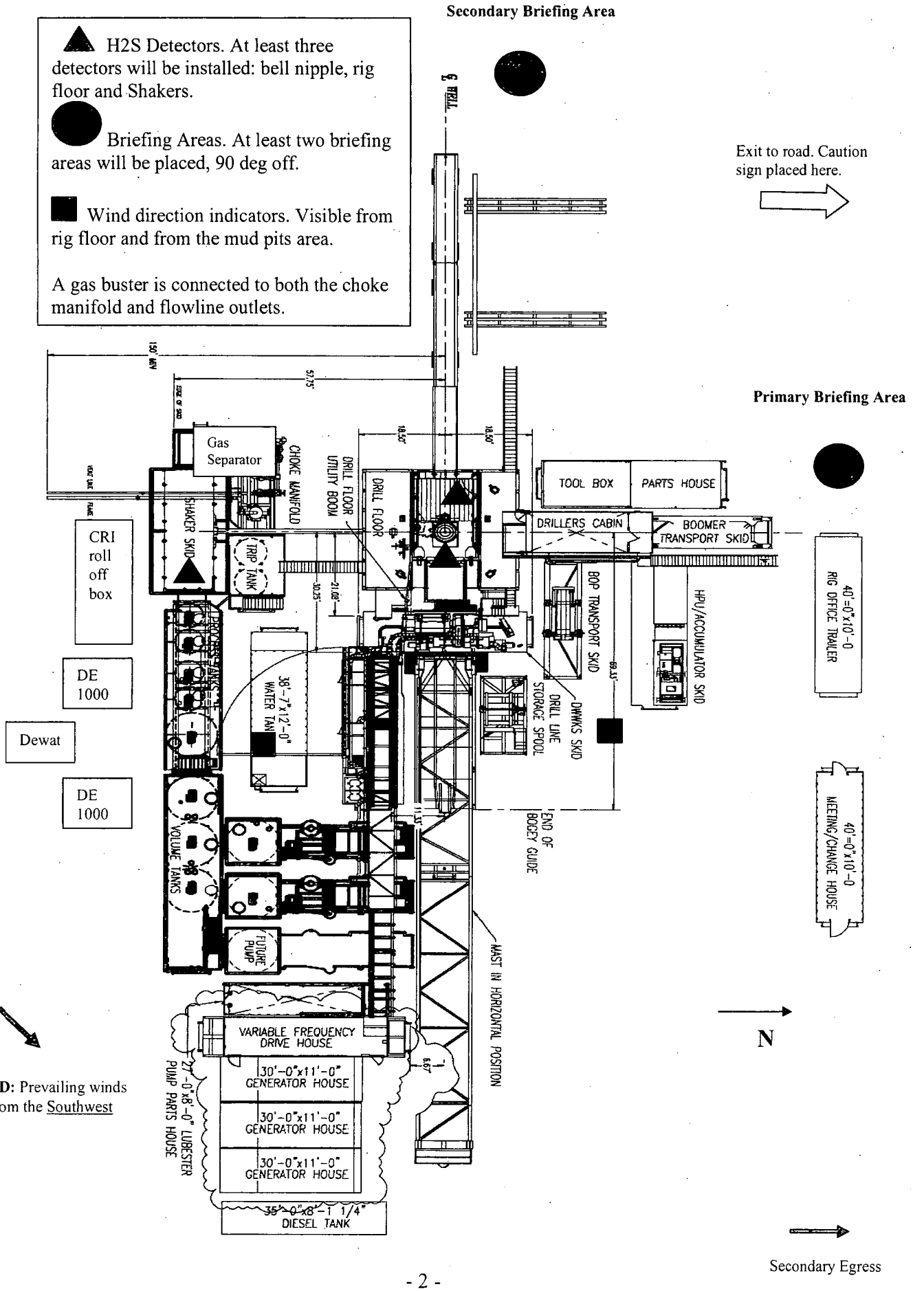
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates +N/-S (ft)	Local Coordinates +E/-W (ft)	Comment
4,107.00	4,107.00	0.00	0.00	Build 2.00°/100'
5,006.96	4,992.23	14.07	139.49	Hold 18.00° Tangent
8,089.21	7,923.64	109.68	1,087.11	Turn 2.00°/100'
9,411.22	9,203.75	-77.41	1,295.04	KOP, Build 10.00°/100'
10,132.36	9,599.64	-623.47	1,297.76	Landing Point
19,969.36	9,580.00	-10,460.32	1,346.62	TD at 19969.36' MD

Permian Drilling
Hydrogen Sulfide Drilling Operations Plan
Height CC 6-7 Federal Com 312H

Open drill site. No homes or buildings are near the proposed location.

1. Escape

   Personnel shall escape upwind of wellbore in the event of an emergency gas release. Escape can take place through the lease road on the Southeast side of the location. Personnel need to move to a safe distance and block the entrance to location. If the primary route is not an option due to the wind direction, then a secondary egress route should be taken.


Secondary Briefing Area
H2S Detectors. At least three detectors will be installed: bell nipple, rig floor and Shakers.
Briefing Areas. At least two briefing areas will be placed, 90 deg off.
Wind direction indicators. Visible from rig floor and from the mud pits area.
A gas buster is connected to both the choke manifold and flowline outlets.
Exit to road. Caution sign placed here.
Primary Briefing Area
Gas Separator
CHOKE MANIFOLD
DRILL FLOOR UTILITY BOOM
DRILL FLOOR
SHAKER SKID
TRIP TANK
TOOL BOX
PARTS HOUSE
DRILLERS CABIN
BOOMER TRANSPORT SKID
BOP TRANSPORT SKID
HPU/ACCUMULATOR SKID
DRILL LINE STORAGE SPOOL
DWKKS SKID
CRI roll off box
DE 1000
Dewat
DE 1000
38'-7"x12'-0" WATER TANK
VOLUME TANKS
FUTURE PUMP
END OF BOGEY GUIDE
MAST IN HORIZONTAL POSITION
40'-0"x10'-0 RIG OFFICE TRAILER
40'-0"x10'-0 MEETING/CHANGE HOUSE
VARIABLE FREQUENCY DRIVE HOUSE
30'-0"x11'-0" GENERATOR HOUSE
30'-0"x11'-0" GENERATOR HOUSE
30'-0"x11'-0" GENERATOR HOUSE
27'-0"x8'-0" LUBESTER PUMP PARTS HOUSE
35'-0"x8'-1 1/4" DIESEL TANK
N
WIND: Prevailing winds are from the Southwest
Secondary Egress

OXY USA Inc
APD ATTACHMENT: SPUDDER RIG DATA

OPERATOR NAME / NUMBER: OXY USA Inc

1. SUMMARY OF REQUEST:

Oxy USA respectfully requests approval for the following operations for the surface hole in the drill plan:

1. Utilize a spudder rig to pre-set surface casing for time and cost savings.

2. Description of Operations

1. Spudder rig will move in to drill the surface hole and pre-set surface casing on the well.
    a. 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).
    b. The spudder rig will utilize fresh water-based mud to drill the surface hole to TD. Solids control will be handled entirely on a closed loop basis. No earth pits will be used.
2. The wellhead will be installed and tested as soon as the surface casing is cut off and the WOC time has been reached.
3. A blind flange at the same pressure rating as the wellhead will be installed to seal the wellbore. Pressure will be monitored with needle valves installed on two wingvalves.
    a. A means for intervention will be maintained while the drilling rig is not over the well.
4. Spudder rig operations are expected to take 2-3 days per well on the pad.
5. The BLM will be contacted and notified 24 hours prior to commencing spudder rig operations.
6. Drilling operations will begin with a larger rig and a BOP stack equal to or greater than the pressure rating that was permitted will be nippled up and tested on the wellhead before drilling operations resume on each well.
    a. The larger rig will move back onto the location within 90 days from the point at which the wells are secured and the spudder rig is moved off location.
    b. The BLM will be contacted / notified 24 hours before the larger rig moves back on the pre-set locations.
7. Oxy will have supervision on the rig to ensure compliance with all BLM and NMOCD regulations and to oversee operations.
8. Once the rig is removed, Oxy will secure the wellhead area by placing a guard rail around the cellar area.

Spudder Rig Layout

PECOS DISTRICT
DRILLING CONDITIONS OF APPROVAL

OPERATOR'S NAME:	**OXY USA INC**
LEASE NO.:	**NMNM13996**
WELL NAME & NO.:	**HEIGHT CC 6-7 FED COM 31H**
SURFACE HOLE FOOTAGE:	**170'/N & 1735'/W**
BOTTOM HOLE FOOTAGE	**20'/S & 2260'/W**
LOCATION:	**Sec. 6, T24S, R29E**
COUNTY:	**EDDY, NEW MEXICO**

COA

Al previous COAs still apply expect the following:

H2S	○ Yes	◉ No	
Potash	◉ None	○ Secretary	○ R-111-P
Cave/Karst Potential	○ Low	◉ Medium	○ High
Variance	○ None	◉ Flex Hose	○ Other
Wellhead	○ Conventional	◉ Multibowl	○ Both
Other	☐ 4 String Area	☐ Capitan Reef	☐ WIPP
Other	☐ Fluid Filled	☐ Cement Squeeze	☐ Pilot Hole
Special Requirements	☐ Water Disposal	☐ COM	☐ Unit

A. HYDROGEN SULFIDE

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

B. CASING

1. The **10-3/4** inch surface casing shall be set at approximately **477** feet (a minimum of 70 feet (Eddy County) into the Rustler Anhydrite and above the salt) and cemented to the surface.

    a. If cement does not circulate to the surface, the appropriate BLM office shall be notified and a temperature survey utilizing an electronic type temperature survey with surface log readout will be used or a cement bond log shall be run to verify the top of the cement. Temperature survey will be run a minimum of six hours after pumping cement and ideally between 8-10 hours after completing the cement job.
    b. Wait on cement (WOC) time for a primary cement job will be a minimum of **8 hours** or 500 pounds compressive strength, whichever is greater. (This is to

include the lead cement)

c. Wait on cement (WOC) time for a remedial job will be a minimum of 4 hours after bringing cement to surface or 500 pounds compressive strength, whichever is greater.
d. If cement falls back, remedial cementing will be done prior to drilling out that string.

Operator shall filled 1/3rd casing with fluid while running intermediate casing to maintain collapse safety factor.

2. The minimum required fill of cement behind the **7-5/8** inch intermediate casing is: Operator has proposed a two stage cement job, the depth may be adjusted as long as the cement is changed proportionally.

a. First stage:Cement to circulate to **5327 ft**. **Additional cement may be required. Excess calculates to 4%.**

Operator shall Bradenhead Squeeze from surface on the 2nd stage.

b. Second stage above :Cement to surface. If cement does not circulate, contact the appropriate BLM office. **Additional cement may be required. Excess calculates to 10%.**

Wait on cement (WOC) time for a primary cement job is to include the lead cement slurry due to cave/karst or potash.

- In Medium Cave/Karst Areas if cement does not circulate to surface on the first two casing strings, the cement on the 3rd casing string must come to surface.

Annular spacing variance is approved.

3. The minimum required fill of cement behind the **5-1/2** inch production casing is:
   c. Cement should tie-back at least **200 feet** into previous casing string. Operator shall provide method of verification. **Additional cement may be required. Excess calculates to 23%.**

C. PRESSURE CONTROL

1. Variance approved to use flex line from BOP to choke manifold. Manufacturer's specification to be readily available. No external damage to flex line. Flex line to be installed as straight as possible (no hard bends).

2. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the surface casing shoe shall be **3000 (3M)** psi.

3. Operator has proposed a multi-bowl wellhead assembly. This assembly will only be tested when installed on the intermediate casing. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the surface casing shoe shall be **5000 (5M)** psi.

   a. Wellhead shall be installed by manufacturer's representatives, submit documentation with subsequent sundry.

b. If the welding is performed by a third party, the manufacturer's representative shall monitor the temperature to verify that it does not exceed the maximum temperature of the seal.
c. Manufacturer representative shall install the test plug for the initial BOP test.
d. If the cement does not circulate and one inch operations would have been possible with a standard wellhead, the well head shall be cut off, cementing operations performed and another wellhead installed.
e. Whenever any seal subject to test pressure is broken, all the tests in OOGO2.III.A.2.i must be followed.

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

1. Unless the production casing has been run and cemented or the well has been properly plugged, the drilling rig shall not be removed from over the hole without prior approval.

a. In the event the operator has proposed to drill multiple wells utilizing a skid/walking rig. Operator shall secure the wellbore on the current well, after installing and testing the wellhead, by installing a blind flange of like pressure rating to the wellhead and a pressure gauge that can be monitored while drilling is performed on the other well(s).
b. When the operator proposes to set surface casing with Spudder Rig
   - Notify the BLM when moving in and removing the Spudder Rig.
   - Notify the BLM when moving in the 2nd Rig. Rig to be moved in within 90 days of notification that Spudder Rig has left the location.

- BOP/BOPE test to be conducted per Onshore Oil and Gas Order No. 2 as soon as 2nd Rig is rigged up on well.

2. Floor controls are required for 3M or Greater systems. These controls will be on the rig floor, unobstructed, readily accessible to the driller and will be operational at all times during drilling and/or completion activities. Rig floor is defined as the area immediately around the rotary table; the area immediately above the substructure on which the draw works are located, this does not include the dog house or stairway area.

3. The record of the drilling rate along with the GR/N well log run from TD to surface (horizontal well – vertical portion of hole) shall be submitted to the BLM office as well as all other logs run on the borehole 30 days from completion. If available, a digital copy of the logs is to be submitted in addition to the paper copies. The Rustler top and top and bottom of Salt are to be recorded on the Completion Report.

A. CASING

1. Changes to the approved APD casing program need prior approval if the items substituted are of lesser grade or different casing size or are Non-API. The Operator can exchange the components of the proposal with that of superior strength (i.e. changing from J-55 to N-80, or from 36# to 40#). Changes to the approved cement program need prior approval if the altered cement plan has less volume or strength or if the changes are substantial (i.e. Multistage tool, ECP, etc.). The initial wellhead installed on the well will remain on the well with spools used as needed.

2. Wait on cement (WOC) for Potash Areas: After cementing but before commencing any tests, the casing string shall stand cemented under pressure until both of the following conditions have been met: 1) cement reaches a minimum compressive strength of 500 psi for all cement blends, 2) until cement has been in place at least 24 hours. WOC time will be recorded in the driller's log.

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.

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.

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