

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF LAND MANAGEMENT

OCD Artesia

FORM APPROVED  
OMB NO. 1004-0135  
Expires: July 31, 2010**SUNDRY NOTICES AND REPORTS ON WELLS**  
*Do not use this form for proposals to drill or to re-enter an abandoned well. Use form 3160-3 (APD) for such proposals.***SUBMIT IN TRIPLICATE - Other instructions on reverse side.**5. Lease Serial No.  
NMNM94651  
6. If Indian, Allottee or Tribe Name  
7. If Unit or CA/Agreement, Name and/or No.8. Well Name and No.  
CEDAR CANYON 29 FEDERAL COM 2H9. API Well No.  
30-015-42992-00-X110. Field and Pool, or Exploratory  
PIERCE CROSSING11. County or Parish, and State  
EDDY COUNTY, NM1. Type of Well  
☒ Oil Well ☐ Gas Well ☐ Other2. Name of Operator  
OXY USA INCORPORATED  
Contact: JANA MENDIOLA  
E-Mail: janalyn\_mendiola@oxy.com3a. Address  
5 GREENWAY PLAZA STE 110  
HOUSTON, TX 77046-05213b. Phone No. (include area code)  
Ph: 432-685-5936  
Fx: 432-685-57424. Location of Well (Footage, Sec., T., R., M., or Survey Description)  
Sec 29 T24S R29E NENE 230FNL 320FEL  
32.194454 N Lat, 103.998682 W Lon**12. CHECK APPROPRIATE BOX(ES) TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA**

TYPE OF SUBMISSION	TYPE OF ACTION			
<input checked="" type="checkbox"/> Notice of Intent	<input type="checkbox"/> Acidize	<input type="checkbox"/> Deepen	<input type="checkbox"/> Production (Start/Resume)	<input type="checkbox"/> Water Shut-Off
<input type="checkbox"/> Subsequent Report	<input type="checkbox"/> Alter Casing	<input type="checkbox"/> Fracture Treat	<input type="checkbox"/> Reclamation	<input type="checkbox"/> Well Integrity
<input type="checkbox"/> Final Abandonment Notice	<input type="checkbox"/> Casing Repair	<input type="checkbox"/> New Construction	<input type="checkbox"/> Recomplete	<input checked="" type="checkbox"/> Other
	<input type="checkbox"/> Change Plans	<input type="checkbox"/> Plug and Abandon	<input type="checkbox"/> Temporarily Abandon	Change to Original APD
	<input type="checkbox"/> Convert to Injection	<input type="checkbox"/> Plug Back	<input type="checkbox"/> 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 recompleate 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 shall be filed within 30 days following completion of the involved operations. If the operation results in a multiple completion or recompleation in a new interval, a Form 3160-4 shall be filed once testing has been completed. Final Abandonment Notices shall 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 approval for the following changes to the drilling plan:

Proposed TD - 13423'M 8545'V

1. Request casing design modification, to drill the well with smaller bit sizes:  
14-3/4" surface hole w/ 10-3/4" csg, 9-7/8" intermediate hole w/ 7-5/8" csg and 6-3/4" production hole w/ 5-1/2" & 4-1/2" csg. Details are below.

a. Surface Casing  
10-3/4" 45.5# J-55 BT&C new csg @ 0'400', 14-3/4" hole w/ 8.4# mud

Coll Rating (psi)-2090 Burst Rating (psi)-3580

NM OIL CONSERVATION  
ARTESIA DISTRICT

AUG 18 2015

RECEIVED

SEE ATTACHED FOR  
CONDITIONS OF APPROVALAccepted 8/18/15  
NMOCD

14. I hereby certify that the foregoing is true and correct. Electronic Submission #309795 verified by the BLM Well Information System For OXY USA INCORPORATED, sent to the Carlsbad Committed to AFMSS for processing by CHRISTOPHER WALLS on 08/06/2015 (15CRW0098SE)	
Name (Printed/Typed) DAVID STEWART	Title REGULATORY ADVISOR
Signature (Electronic Submission)	Date 07/21/2015
THIS SPACE FOR FEDERAL OR STATE OFFICE USE	
Approved By	Title
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.	
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.	
BUREAU OF LAND MANAGEMENT CARLSBAD FIELD OFFICE	
** BLM REVISED ** BLM REVISED ** BLM REVISED ** BLM REVISED ** BLM REVISED **	

## Additional data for EC transaction #309795 that would not fit on the form

### 32. Additional remarks, continued

SF Coll-15.99 SF Burst-1.42 SF Ten-5.96

#### b. Intermediate Casing

7-5/8" 26.4# L80 BT&C new csg @ 0-2850', 9-7/8" hole w/ 10.0# mud

Coll Rating (psi)-3400 Burst Rating (psi)-6020

SF Coll-5.30 SF Burst-1.37 SF Ten-3.58

#### c. Production Casing

5-1/2" 20# P-110 USF new csg @ 0-9077'M, 6-3/4" hole w/ 9.2# mud

Coll Rating (psi)-11100 Burst Rating (psi)-12600

SF Coll-2.67 SF Burst-1.26 SF Ten-2.30

4-1/2" 13.5# P-110 BT&C new csg @ 9077-13423'M, 6-3/4" hole w/ 9.2# mud

Coll Rating (psi)-10670 Burst Rating (psi)-12410

SF Coll-2.57 SF Burst-1.25 SF Ten-2.70

Collapse and burst loads calculated using Stress Check with anticipated loads, see attached for design assumptions

2. Cement program adjustment to the new bit/casing sizes. Cement program modifications detailed below.

a. Surface - Circulate cement to surface w/ 430sx PP cmt w/ 2% CaCl<sub>2</sub>, 14.8ppg 1:35 yield 1415# 24hr CS 150% Excess.

b. Intermediate - Circulate cement to surface w/ 570sx HES light PP cmt w/ 5% Salt + .1% HR-800, 12.9ppg 1.85 yield 824# 24hrs CS 125% Excess followed by 200sx PP cmt, 14.8ppg 1.33 yield 1789# 24hr CS 125% Excess.

c. Production - Cement w/ 210sx Tuned Light (TM) system cmt w/ 3#/sx Kol-Seal + .125#/sx Poly-E-Flake + .8% HR-601, 10.2ppg 3.05 yield 555# 24hr CS 25% Excess followed by 520sx Super H cmt w/ 3#/sx salt + .1% HR-800 + .3% CFR-3 + .5% Halad(R)-344 + 2#/sx Kol-Seal, 13.2ppg 1.65 yield 1462# 24hr CS 25% Excess. Estimated TOC @ 1925'.

Description of Cement Additives: Calcium Chloride, Salt (Accelerator); CFR-3 (Dispersant); Kol-Seal, Poly-E-Flake (Lost Circulation Additive); Halad-344 (Low Fluid Loss Control); HR-601, HR-800 (Retarder)

The above cement volumes could be revised pending the caliper measurement.

### 3. Mud Program

Depth	Mud WT	Vis Sec	Fluid Loss	Type
0-400'	8.5-9.0	40-55	50-75cc/30min	EnerSeal Spud Mud (MMH)
400-2850'	9.8-10	28-32	NC	NaCl Brine
2850'-TD	8.8-9.6	38-50	50-75cc/30min	EnerSeal (MMH)

4. The Operator will connect the BOP choke outlet to the choke manifold using a hose that meets all BLM requirements and will be inspected and approved by BLM personnel prior to spud.

## Revisions to Operator-Submitted EC Data for Sundry Notice #309795

	Operator Submitted	BLM Revised (AFMSS)
Sundry Type:	APDCH NOI	APDCH NOI
Lease:	NMNM94651	NMNM94651
Agreement:		
Operator:	OXY USA INC. P.O. BOX 50250 MIDLAND, TX 79710 Ph: 432-685-5936	OXY USA INCORPORATED 5 GREENWAY PLAZA STE 110 HOUSTON, TX 77046-0521 Ph: 713.350.4816
Admin Contact:	JANA MENDIOLA REGULATORY COORDINATOR E-Mail: janalyn_mendiola@oxy.com  Ph: 432-685-5936 Fx: 432-685-5742	JANA MENDIOLA REGULATORY COORDINATOR E-Mail: janalyn_mendiola@oxy.com  Ph: 432-685-5936 Fx: 432-685-5742
Tech Contact:	DAVID STEWART SR. REGULATORY ADVISOR E-Mail: david_stewart@oxy.com Cell: 432-634-5688 Ph: 432-685-5717 Fx: 432-685-5742	DAVID STEWART REGULATORY ADVISOR   Ph: 432.685.5717
Location:		
State:	NM	NM
County:	EDDY	EDDY
Field/Pool:	PIERCECROSSING BONESPRING	PIERCE CROSSING
Well/Facility:	CEDAR CANYON 29 FEDERAL COM 2H Sec 29 T24S R29E NENE 230FNL 320FEL 32.194924 N Lat, 103.998617 W Lon	CEDAR CANYON 29 FEDERAL COM 2H Sec 29 T24S R29E NENE 230FNL 320FEL 32.194454 N Lat, 103.998682 W Lon

**OXY USA Inc.**

**Cedar Canyon 29 Federal Com. #2H**

**Casing Design Assumptions:**

**Burst Loads**

**CSG Test (Surface)**

- Internal: Displacement fluid + 70% CSG Burst rating
- External: Pore Pressure from section TD to surface

**CSG Test (Intermediate)**

- Internal: Displacement fluid + 70% CSG Burst rating
- External: Pore Pressure from the Intermediate hole TD to Surface CSG shoe and MW of the drilling mud that was in the hole when the CSG was run to surface

**CSG Test (Production)**

- Internal: Fresh water displacement fluid + 80% CSG Burst rating
- External: Pore Pressure from the well TD the Intermediate CSG shoe and MW of the drilling mud that was in the hole when the CSG was run to surface

**Gas Kick (Surface/Intermediate)**

- Internal: Gas Kick based on Pore Pressure or Fracture Gradient @ CSG shoe with a gas 0.115psi/ft Gas gradient to surface while drilling the next hole section (e.g. Gas Kick while drilling the production hole section is a burst load used to design the intermediate CSG)
- External: Pore Pressure from section TD to previous CSG shoe and MW of the drilling mud that was in the hole when the CSG was run to surface

**Stimulation (Production)**

- Internal: Displacement fluid + Max Frac treating pressure (not to exceed 80% CSG Burst rating)
- External: Pore Pressure from the well TD to the Intermediate CSG shoe and 8.5 ppg MWE to surface

**Collapse Loads**

**Lost Circulation (Surface/Intermediate)**

- Internal: Losses experienced while drilling the next hole section (e.g. losses while drilling the production hole section are used as a collapse load to design the intermediate CSG). After losses there will be a column of mud inside the CSG with an equivalent weight to the Pore Pressure of the lost circulation zone
- External: MW of the drilling mud that was in the hole when the CSG was run

**Cementing (Surface/Intermediate/Production)**

- Internal: Displacement Fluid
- External: Cement Slurries to TOC, MW to surface

**Full Evacuation (Production)**

- Internal: Atmospheric Pressure
- External: MW of the drilling mud that was in the hole when the CSG was run

**Tension Loads**

**Running CSG (Surface/Intermediate/Production)**

- Axial load of the buoyant weight of the string plus either 100 klb over-pull or string weight in air, whichever is less

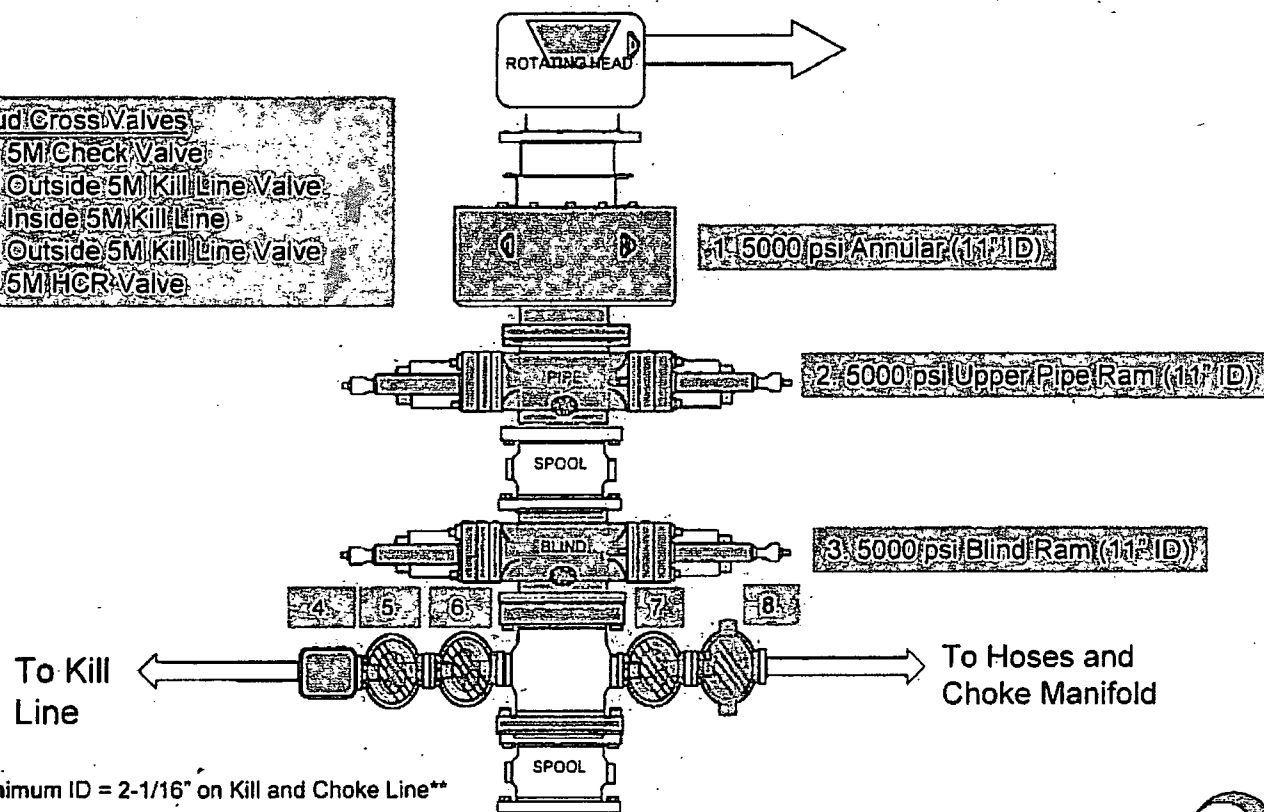
**Green Cement (Surface/Intermediate/Production)**

- Axial load of the buoyant weight of the string plus the cement plug bump pressure (Final displacement pressure + 500 psi )

Burst, Collapse and Tensile SF are calculated using Landmark's Stress Check (Casing Design) software.

# 5M BOP Stack

- Mud Cross Valves**
- 4 5M Check Valve
  - 5 Outside 5M Kill Line Valve
  - 6 Inside 5M Kill Line
  - 7 Outside 5M Kill Line Valve
  - 8 5M HCR Valve

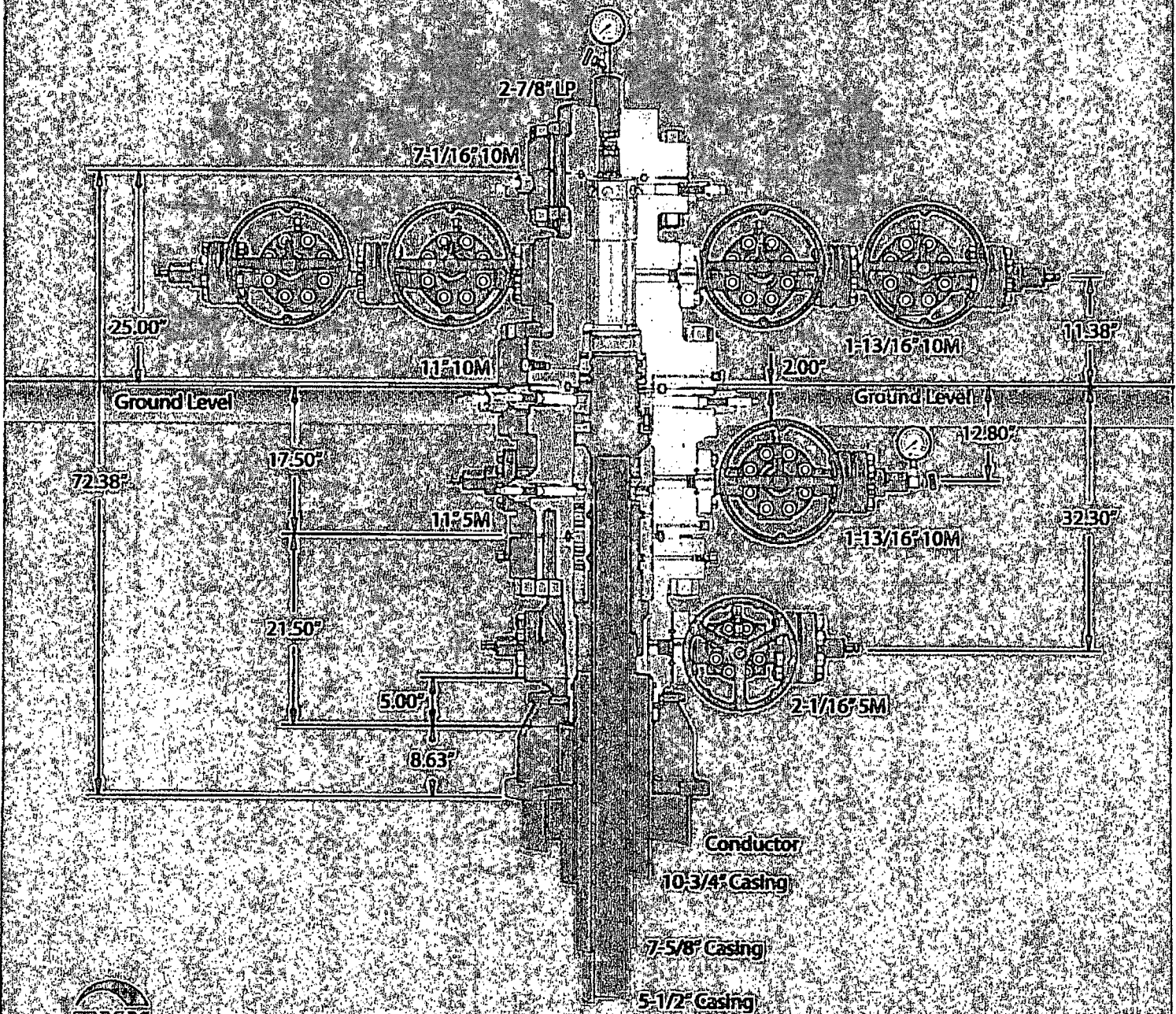


\*\* Minimum ID = 2-1/16" on Kill and Choke Line\*\*



# CAMERON

## 11" 10M MBS Wellhead

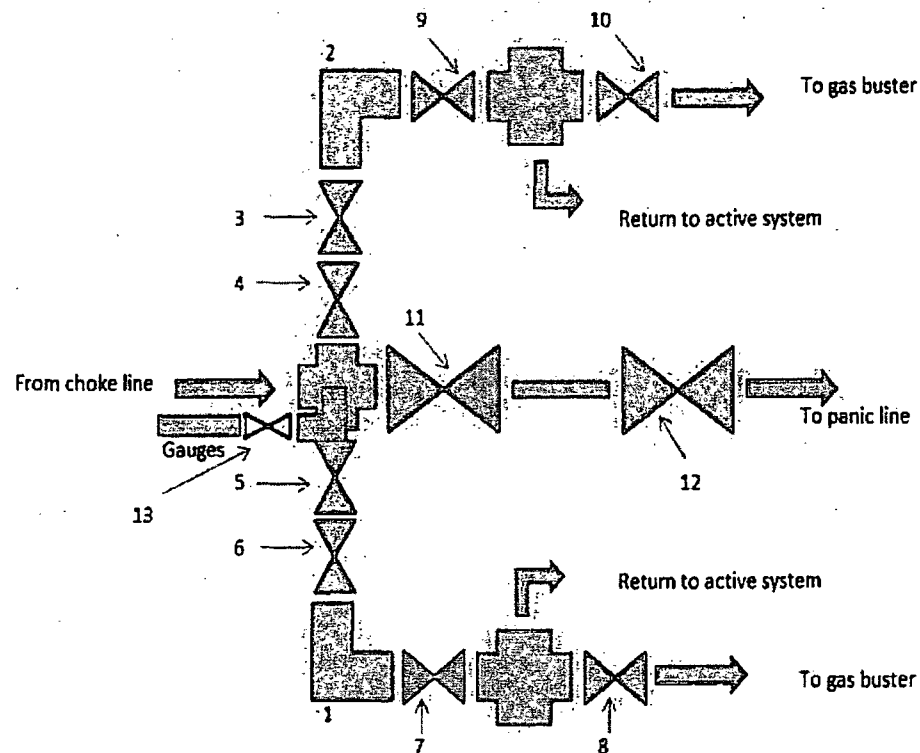


Barilla Draw

C6815

NOTES: 1. All dimensions are in feet and inches unless otherwise specified.  
2. All dimensions are to be maintained unless otherwise specified.

# 5M Choke Panel

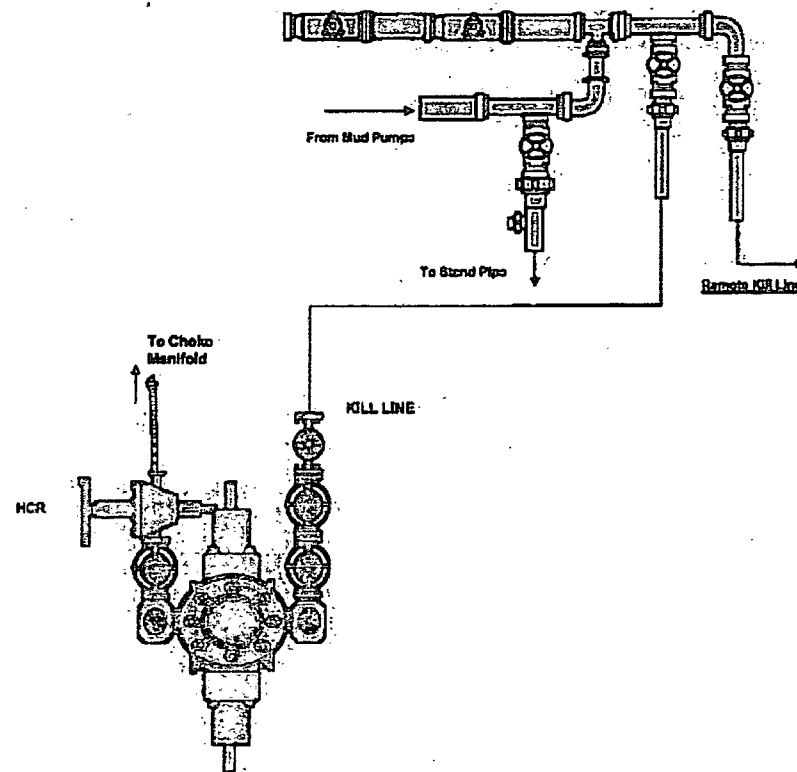


- 1- POWER CHOKE
- 2- MANUAL CHOKE
- 3- 2 1/16" CHOKEMANIFOLD VALVE
- 4- 2 1/16" CHOKEMANIFOLD VALVE
- 5- 2 1/16" CHOKEMANIFOLD VALVE
- 6- 2 1/16" CHOKEMANIFOLD VALVE
- 7- 2 1/16" CHOKEMANIFOLD VALVE
- 8- 2 1/16" CHOKEMANIFOLD VALVE
- 9- 2 1/16" CHOKEMANIFOLD VALVE
- 10- 2 1/16" CHOKEMANIFOLD VALVE
- 11- 3" CHOKEMANIFOLD VALVE
- 12- 3" CHOKEMANIFOLD VALVE
- 13- 2 1/16 CHOKE MANIFOLD VALVE



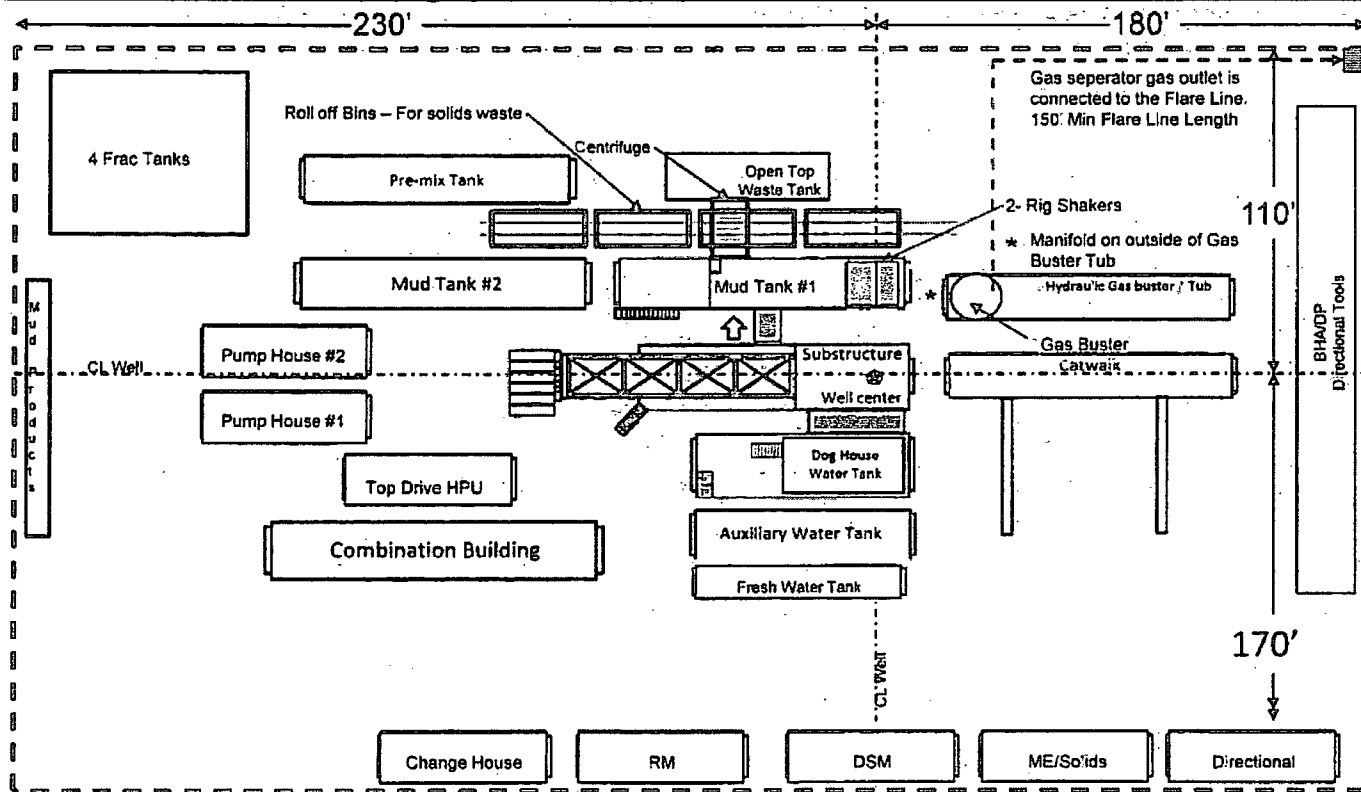


# 10M Remote Kill Line Schematic



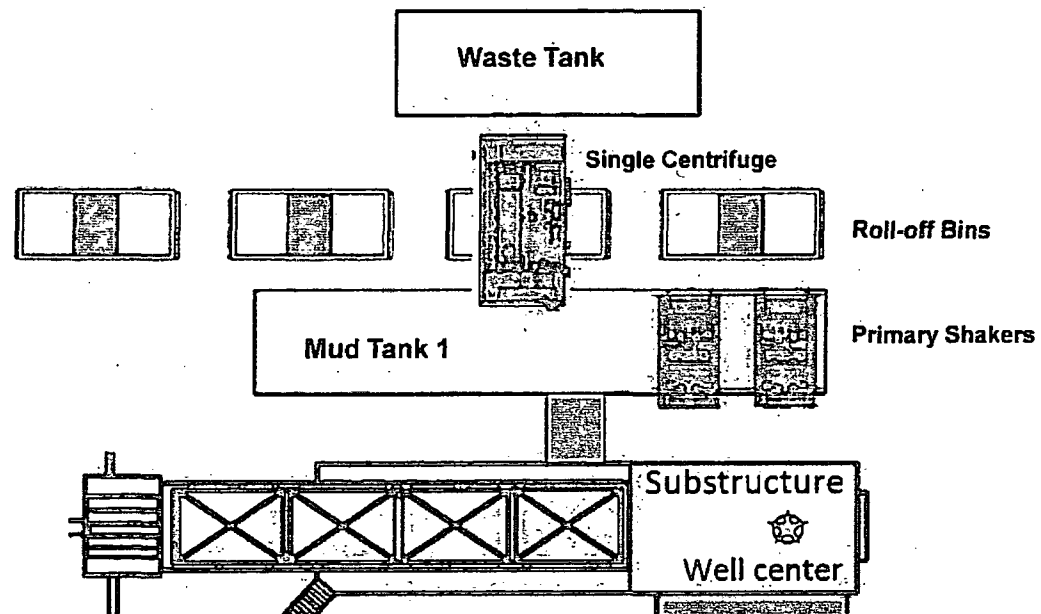
# Oxy Single Centrifuge - Closed Loop System

## New Mexico - Canelson Drilling Rig



# Oxy Single Centrifuge - Closed Loop System

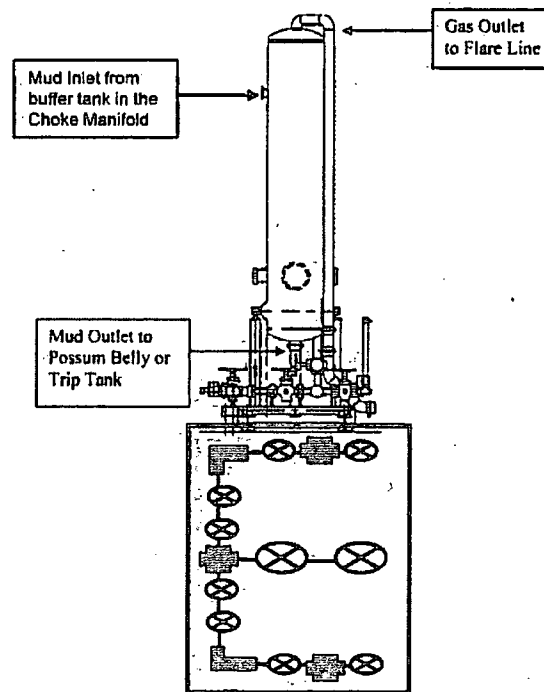
New Mexico - Canelson Drilling Rig

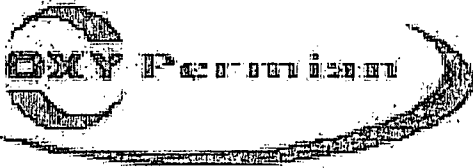


# Choke Manifold – Gas Separator

New Mexico – Canelson Drilling Rig

Choke Manifold – Gas Separator (Side View)





**OXY**

Eddy County, New Mexico  
Cedar Canyon 29 Federal 2H  
CC 29 F 2H

Wellbore #1

Plan: Design #1

## Standard Planning Report

12 June, 2014



[www.scientificdrilling.com](http://www.scientificdrilling.com)



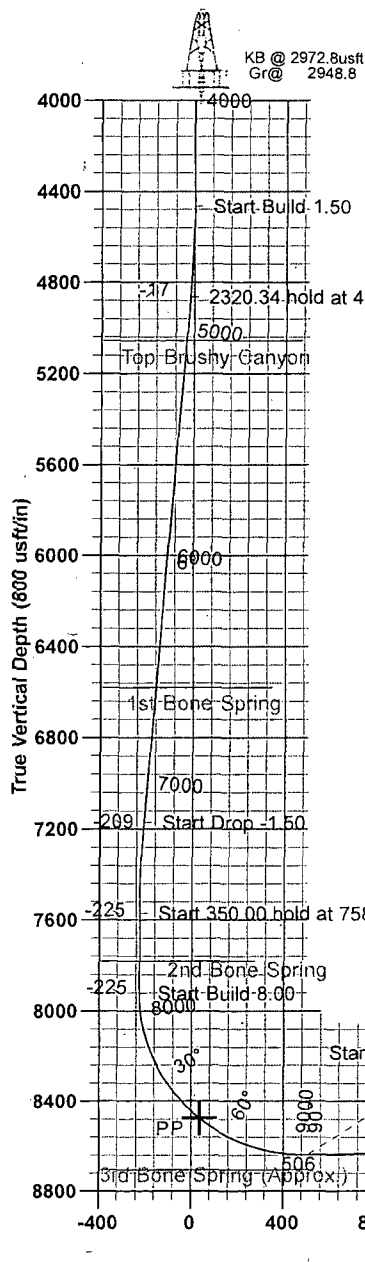
**CC 29 F 2H**  
**Eddy County, New Mexico**  
**Northing: 434794.60**  
**Easting: 603540.40**  
**Design #1**



Azimuths to Grid North  
 True North: -0.18°  
 Magnetic North: 7.24°

Magnetic Field  
 Strength: 48261.2snT  
 Dip Angle: 60.01°  
 Date: 5/27/2014  
 Model: IGRF2010

To convert Magnetic North to Grid, Add 7.24°  
 To convert True North to Grid, Subtract 0.18°



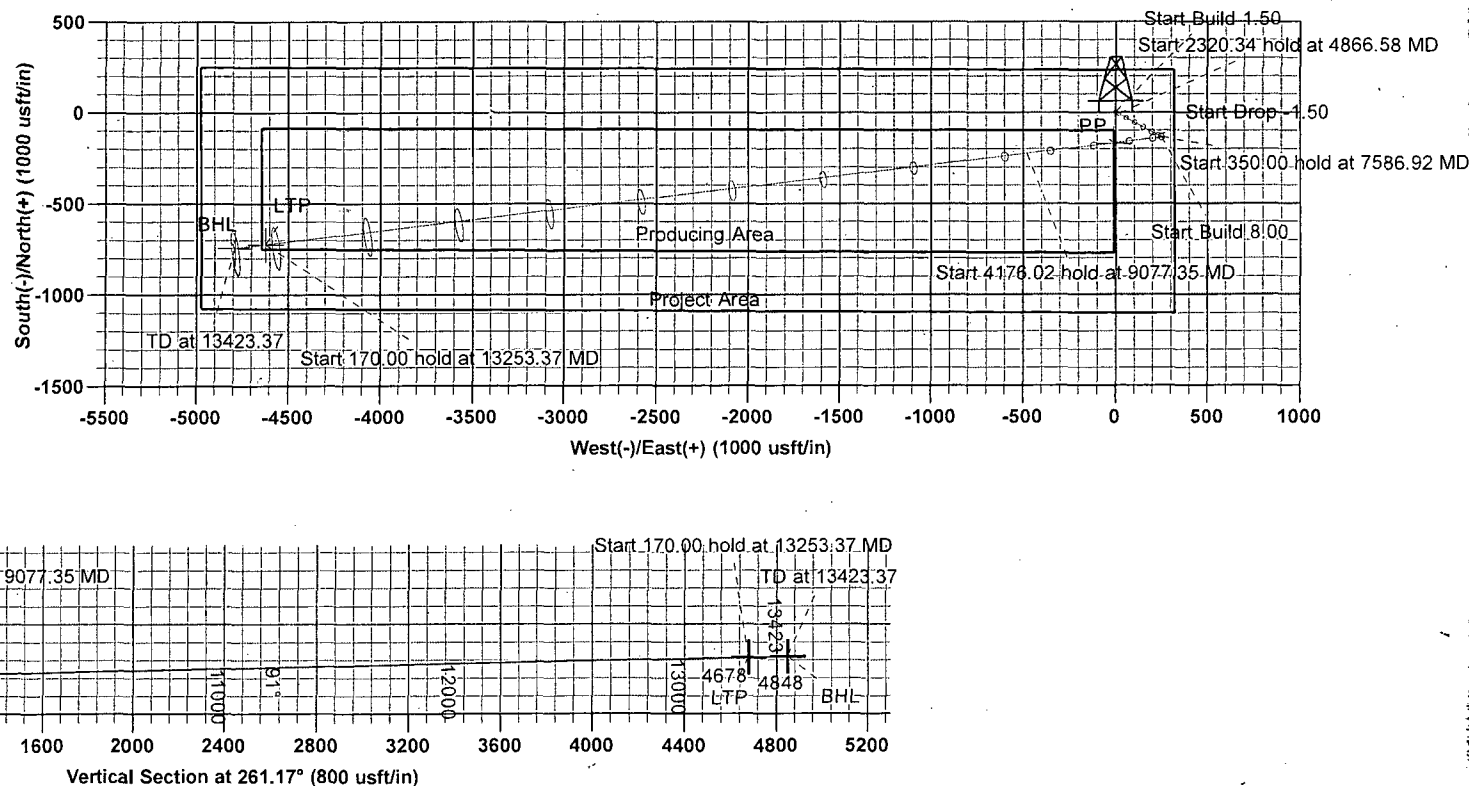
WELL DETAILS CC 29 F 2H					
Ground Level: 2948.8					
+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
0.0	0.0	434794.60	603540.40	32° 11' 41.728 N	103° 59' 55.022 W

SECTION DETAILS									
MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	
4466.6	0.00	0.00	4466.6	0.0	0.0	0.00	0.00	0.0	
4866.6	6.00	118.76	4866.9	-10.1	18.3	1.50	118.76	-16.6	
7186.9	6.00	118.76	7173.5	-126.8	231.0	0.00	0.00	-208.7	
7586.9	0.00	0.00	7572.8	-136.8	249.3	1.50	180.00	-225.3	
7936.9	0.00	0.00	7922.7	-136.8	249.3	0.00	0.00	-225.3	
9077.4	91.23	263.12	8638.8	-224.4	-477.1	8.00	263.12	505.9	
13253.4	91.23	263.12	8548.8	-724.2	-4622.1	0.00	0.00	4678.5	
13423.4	91.23	263.12	8545.1	-744.5	-4790.8	0.00	0.00	4848.3	

DESIGN TARGET DETAILS					
Name	TVD	+N/-S	+E/-W	Northing	Easting
PP	8475.6	-170.0	-9.7	434624.60	603530.70
BHL	8545.1	-744.5	-4790.8	434050.06	598749.56
LTP	8548.8	-724.2	-4622.1	434070.40	598918.30

**SITE DETAILS:**  
 Cedar Canyon 29 Federal 2H  
 Site Centre Northing: 434794.60  
 Easting: 603540.40  
 Positional Uncertainty: 0.0  
 Convergence: 0.18  
 Local North: Grid

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





# Scientific Drilling Planning Report

Database:	EDM5000.1 Single User Db	Local Co-ordinate Reference:	Well CC 29 F 2H
Company:	OXY	TVD Reference:	KB @ 2972.8usft
Project:	Eddy County New Mexico	MD Reference:	KB @ 2972.8usft
Site:	Cedar Canyon 29 Federal 2H	North Reference:	Grid
Well:	CC 29 F 2H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1		

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

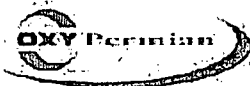
Site:	Cedar Canyon 29 Federal 2H				
Site Position:		Northing:	434,794.60 usft	Latitude:	32° 11' 41.728 N
From:	Map	Easting:	603,540.40 usft	Longitude:	103° 59' 55.022 W
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.18 °

Well:	CC:29-F:2H					
Well Position	+N/-S	0.0 usft	Northing:	434,794.60 usft	Latitude:	32° 11' 41.728 N
	+E/-W	0.0 usft	Easting:	603,540.40 usft	Longitude:	103° 59' 55.022 W
Position Uncertainty		0.0 usft	Wellhead Elevation:	0.0 usft	Ground Level:	2,948.8 usft

Wellbore					
Wellbore #1					
Magnetics	Model Name	Sample Date	Declination	Dip Angle	Field Strength
			(°)	(°)	(nT)
	IGRF2010	5/27/2014	7.42	60.01	48,261

Design:		Design #1		
Audit Notes:				
Version:		Phase:	PROTOTYPE	Tie On Depth: 0.0
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W	Direction
	(usft)	(usft)	(usft)	(°)
	0.0	0.0	0.0	261.17

Plan Sections										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	
4,466.6	0.00	0.00	4,466.6	0.0	0.0	0.00	0.00	0.00	0.00	
4,866.6	6.00	118.76	4,865.9	-10.1	18.3	1.50	1.50	0.00	118.76	
7,186.9	6.00	118.76	7,173.5	-126.8	231.0	0.00	0.00	0.00	0.00	
7,586.9	0.00	0.00	7,572.7	-136.8	249.3	1.50	-1.50	0.00	180.00	
7,936.9	0.00	0.00	7,922.7	-136.8	249.3	0.00	0.00	0.00	0.00	
9,077.4	91.23	263.12	8,638.8	-224.4	-477.1	8.00	8.00	0.00	263.12	
13,253.4	91.23	263.12	8,548.8	-724.2	-4,622.1	0.00	0.00	0.00	0.00	CC29F LTP
13,423.4	91.23	263.12	8,545.1	-744.5	-4,790.8	0.00	0.00	0.00	0.00	



# Scientific Drilling Planning Report

Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well: CC 29 F 2H
Company:	OXY	TVD Reference:	KB @ 2972.8usft
Project:	Eddy County New Mexico	MD Reference:	KB @ 2972.8usft
Site:	Cedar Canyon 29 Federal 2H	North Reference:	Grid
Well:	CC 29 F 2H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1		

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/S (usft)	+E/W (usft)	Vertical Section (usft)	Dogleg Rate (#/100usft)	Build Rate (#/100usft)	Turn Rate (#/100usft)
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00
100.0	0.00	0.00	100.0	0.0	0.0	0.0	0.00	0.00	0.00
200.0	0.00	0.00	200.0	0.0	0.0	0.0	0.00	0.00	0.00
300.0	0.00	0.00	300.0	0.0	0.0	0.0	0.00	0.00	0.00
317.8	0.00	0.00	317.8	0.0	0.0	0.0	0.00	0.00	0.00
* Top Rustler									
400.0	0.00	0.00	400.0	0.0	0.0	0.0	0.00	0.00	0.00
500.0	0.00	0.00	500.0	0.0	0.0	0.0	0.00	0.00	0.00
600.0	0.00	0.00	600.0	0.0	0.0	0.0	0.00	0.00	0.00
700.0	0.00	0.00	700.0	0.0	0.0	0.0	0.00	0.00	0.00
717.8	0.00	0.00	717.8	0.0	0.0	0.0	0.00	0.00	0.00
* Top Salado (salt)									
800.0	0.00	0.00	800.0	0.0	0.0	0.0	0.00	0.00	0.00
900.0	0.00	0.00	900.0	0.0	0.0	0.0	0.00	0.00	0.00
1,000.0	0.00	0.00	1,000.0	0.0	0.0	0.0	0.00	0.00	0.00
1,100.0	0.00	0.00	1,100.0	0.0	0.0	0.0	0.00	0.00	0.00
1,200.0	0.00	0.00	1,200.0	0.0	0.0	0.0	0.00	0.00	0.00
1,300.0	0.00	0.00	1,300.0	0.0	0.0	0.0	0.00	0.00	0.00
1,339.8	0.00	0.00	1,339.8	0.0	0.0	0.0	0.00	0.00	0.00
* Top Castile (anhydrite)									
1,400.0	0.00	0.00	1,400.0	0.0	0.0	0.0	0.00	0.00	0.00
1,500.0	0.00	0.00	1,500.0	0.0	0.0	0.0	0.00	0.00	0.00
1,600.0	0.00	0.00	1,600.0	0.0	0.0	0.0	0.00	0.00	0.00
1,700.0	0.00	0.00	1,700.0	0.0	0.0	0.0	0.00	0.00	0.00
1,800.0	0.00	0.00	1,800.0	0.0	0.0	0.0	0.00	0.00	0.00
1,900.0	0.00	0.00	1,900.0	0.0	0.0	0.0	0.00	0.00	0.00
2,000.0	0.00	0.00	2,000.0	0.0	0.0	0.0	0.00	0.00	0.00
2,100.0	0.00	0.00	2,100.0	0.0	0.0	0.0	0.00	0.00	0.00
2,200.0	0.00	0.00	2,200.0	0.0	0.0	0.0	0.00	0.00	0.00
2,300.0	0.00	0.00	2,300.0	0.0	0.0	0.0	0.00	0.00	0.00
2,400.0	0.00	0.00	2,400.0	0.0	0.0	0.0	0.00	0.00	0.00
2,500.0	0.00	0.00	2,500.0	0.0	0.0	0.0	0.00	0.00	0.00
2,600.0	0.00	0.00	2,600.0	0.0	0.0	0.0	0.00	0.00	0.00
2,700.0	0.00	0.00	2,700.0	0.0	0.0	0.0	0.00	0.00	0.00
2,800.0	0.00	0.00	2,800.0	0.0	0.0	0.0	0.00	0.00	0.00
2,895.8	0.00	0.00	2,895.8	0.0	0.0	0.0	0.00	0.00	0.00
* Top Lamar / Delaware									
2,900.0	0.00	0.00	2,900.0	0.0	0.0	0.0	0.00	0.00	0.00
2,965.8	0.00	0.00	2,965.8	0.0	0.0	0.0	0.00	0.00	0.00
* Top Bell Canyon									
3,000.0	0.00	0.00	3,000.0	0.0	0.0	0.0	0.00	0.00	0.00
3,100.0	0.00	0.00	3,100.0	0.0	0.0	0.0	0.00	0.00	0.00
3,200.0	0.00	0.00	3,200.0	0.0	0.0	0.0	0.00	0.00	0.00
3,300.0	0.00	0.00	3,300.0	0.0	0.0	0.0	0.00	0.00	0.00
3,400.0	0.00	0.00	3,400.0	0.0	0.0	0.0	0.00	0.00	0.00
3,500.0	0.00	0.00	3,500.0	0.0	0.0	0.0	0.00	0.00	0.00
3,600.0	0.00	0.00	3,600.0	0.0	0.0	0.0	0.00	0.00	0.00
3,643.8	0.00	0.00	3,643.8	0.0	0.0	0.0	0.00	0.00	0.00
* Top Cherry Canyon									
3,700.0	0.00	0.00	3,700.0	0.0	0.0	0.0	0.00	0.00	0.00
3,800.0	0.00	0.00	3,800.0	0.0	0.0	0.0	0.00	0.00	0.00
3,900.0	0.00	0.00	3,900.0	0.0	0.0	0.0	0.00	0.00	0.00
4,000.0	0.00	0.00	4,000.0	0.0	0.0	0.0	0.00	0.00	0.00





# Scientific Drilling

## Planning Report

Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well CC 29 F 2H
Company:	OXY	TVD Reference:	KB @ 2972.8usft
Project:	Eddy County, New Mexico	MD Reference:	KB @ 2972.8usft
Site:	Cedar Canyon 29 Federal 2H	North Reference:	Grid
Well:	CC 29 F 2H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1		

Planned Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
4,100.0	0.00	0.00	4,100.0	0.0	0.0	0.0	0.00	0.00	0.00	
4,200.0	0.00	0.00	4,200.0	0.0	0.0	0.0	0.00	0.00	0.00	
4,300.0	0.00	0.00	4,300.0	0.0	0.0	0.0	0.00	0.00	0.00	
4,400.0	0.00	0.00	4,400.0	0.0	0.0	0.0	0.00	0.00	0.00	
4,466.6	0.00	0.00	4,466.6	0.0	0.0	0.0	0.00	0.00	0.00	
Start Build 1.50										
4,500.0	0.50	118.76	4,500.0	-0.1	0.1	-0.1	1.50	1.50	0.00	
4,600.0	2.00	118.76	4,600.0	-1.1	2.0	-1.8	1.50	1.50	0.00	
4,700.0	3.50	118.76	4,699.9	-3.4	6.2	-5.6	1.50	1.50	0.00	
4,800.0	5.00	118.76	4,799.6	-7.0	12.7	-11.5	1.50	1.50	0.00	
4,866.6	6.00	118.76	4,865.9	-10.1	18.3	-16.6	1.50	1.50	0.00	
Start 2320.34 hold at 4866.58 MD										
4,900.0	6.00	118.76	4,899.1	-11.8	21.4	-19.3	0.00	0.00	0.00	
5,000.0	6.00	118.76	4,998.5	-16.8	30.6	-27.6	0.00	0.00	0.00	
5,056.6	6.00	118.76	5,054.8	-19.6	35.8	-32.3	0.00	0.00	0.00	
Top Brushy Canyon										
5,100.0	6.00	118.76	5,098.0	-21.8	39.7	-35.9	0.00	0.00	0.00	
5,200.0	6.00	118.76	5,197.4	-26.8	48.9	-44.2	0.00	0.00	0.00	
5,300.0	6.00	118.76	5,296.9	-31.9	58.1	-52.5	0.00	0.00	0.00	
5,400.0	6.00	118.76	5,396.3	-36.9	67.2	-60.8	0.00	0.00	0.00	
5,500.0	6.00	118.76	5,495.8	-41.9	76.4	-69.0	0.00	0.00	0.00	
5,600.0	6.00	118.76	5,595.3	-47.0	85.5	-77.3	0.00	0.00	0.00	
5,700.0	6.00	118.76	5,694.7	-52.0	94.7	-85.6	0.00	0.00	0.00	
5,800.0	6.00	118.76	5,794.2	-57.0	103.9	-93.9	0.00	0.00	0.00	
5,900.0	6.00	118.76	5,893.6	-62.0	113.0	-102.2	0.00	0.00	0.00	
6,000.0	6.00	118.76	5,993.1	-67.1	122.2	-110.4	0.00	0.00	0.00	
6,100.0	6.00	118.76	6,092.5	-72.1	131.4	-118.7	0.00	0.00	0.00	
6,200.0	6.00	118.76	6,192.0	-77.1	140.5	-127.0	0.00	0.00	0.00	
6,300.0	6.00	118.76	6,291.4	-82.2	149.7	-135.3	0.00	0.00	0.00	
6,400.0	6.00	118.76	6,390.9	-87.2	158.9	-143.6	0.00	0.00	0.00	
6,500.0	6.00	118.76	6,490.3	-92.2	168.0	-151.9	0.00	0.00	0.00	
6,590.0	6.00	118.76	6,579.8	-96.8	176.3	-159.3	0.00	0.00	0.00	
1st Bone Spring										
6,600.0	6.00	118.76	6,589.8	-97.3	177.2	-160.1	0.00	0.00	0.00	
6,700.0	6.00	118.76	6,689.2	-102.3	186.3	-168.4	0.00	0.00	0.00	
6,800.0	6.00	118.76	6,788.7	-107.3	195.5	-176.7	0.00	0.00	0.00	
6,900.0	6.00	118.76	6,888.1	-112.3	204.7	-185.0	0.00	0.00	0.00	
7,000.0	6.00	118.76	6,987.6	-117.4	213.8	-193.3	0.00	0.00	0.00	
7,100.0	6.00	118.76	7,087.0	-122.4	223.0	-201.5	0.00	0.00	0.00	
7,186.9	6.00	118.76	7,173.5	-126.8	231.0	-208.7	0.00	0.00	0.00	
Start Drop -1.50										
7,200.0	5.80	118.76	7,186.5	-127.4	232.1	-209.8	1.50	-1.50	0.00	
7,300.0	4.30	118.76	7,286.1	-131.7	239.9	-216.8	1.50	-1.50	0.00	
7,400.0	2.80	118.76	7,385.9	-134.6	245.3	-221.7	1.50	-1.50	0.00	
7,500.0	1.30	118.76	7,485.8	-136.4	248.4	-224.5	1.50	-1.50	0.00	
7,586.9	0.00	0.00	7,572.7	-136.8	249.3	-225.3	1.50	-1.50	-136.63	
Start 350.00 hold at 7586.92 MD										
7,600.0	0.00	0.00	7,585.8	-136.8	249.3	-225.3	0.00	0.00	0.00	
7,700.0	0.00	0.00	7,685.8	-136.8	249.3	-225.3	0.00	0.00	0.00	
7,797.0	0.00	0.00	7,782.8	-136.8	249.3	-225.3	0.00	0.00	0.00	
2nd Bone Spring										
7,800.0	0.00	0.00	7,785.8	-136.8	249.3	-225.3	0.00	0.00	0.00	
7,900.0	0.00	0.00	7,885.8	-136.8	249.3	-225.3	0.00	0.00	0.00	



Scientific Drilling  
Planning Report

Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well: CC 29 F 2H
Company:	OXY	TVD Reference:	KB @ 2972.8usft
Project:	Eddy County, New Mexico	MD Reference:	KB @ 2972.8usft
Site:	Cedar Canyon 29 Federal 2H	North Reference:	Grid
Well:	CC 29 F 2H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1		

Planned Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (%/100usft)	Build Rate (%/100usft)	Turn Rate (%/100usft)	
7,936.9	0.00	0.00	7,922.7	-136.8	249.3	-225.3	0.00	0.00	0.00	
Start Build 8.00										
8,000.0	5.05	263.12	7,985.7	-137.2	246.5	-222.6	8.00	8.00	0.00	
8,100.0	13.05	263.12	8,084.4	-139.1	230.9	-206.9	8.00	8.00	0.00	
8,200.0	21.05	263.12	8,180.0	-142.6	201.9	-177.6	8.00	8.00	0.00	
8,300.0	29.05	263.12	8,270.5	-147.6	159.9	-135.3	8.00	8.00	0.00	
8,400.0	37.05	263.12	8,354.2	-154.2	105.8	-80.8	8.00	8.00	0.00	
8,500.0	45.05	263.12	8,429.6	-162.0	40.6	-15.3	8.00	8.00	0.00	
8,600.0	53.05	263.12	8,495.1	-171.0	-34.3	60.1	8.00	8.00	0.00	
8,700.0	61.05	263.12	8,549.4	-181.1	-117.5	143.9	8.00	8.00	0.00	
8,800.0	69.05	263.12	8,591.6	-191.9	-207.5	234.5	8.00	8.00	0.00	
8,900.0	77.05	263.12	8,620.7	-203.4	-302.4	330.0	8.00	8.00	0.00	
9,000.0	85.05	263.12	8,636.3	-215.2	-400.4	428.6	8.00	8.00	0.00	
9,077.4	91.23	263.12	8,638.8	-224.4	-477.1	505.9	8.00	8.00	0.00	
Start 4176.02 hold at 9077.35 MD										
9,100.0	91.23	263.12	8,638.3	-227.1	-499.5	528.5	0.00	0.00	0.00	
9,200.0	91.23	263.12	8,636.1	-239.1	-598.8	628.4	0.00	0.00	0.00	
9,300.0	91.23	263.12	8,634.0	-251.1	-698.1	728.3	0.00	0.00	0.00	
9,400.0	91.23	263.12	8,631.8	-263.0	-797.3	828.3	0.00	0.00	0.00	
9,500.0	91.23	263.12	8,629.7	-275.0	-896.6	928.2	0.00	0.00	0.00	
9,600.0	91.23	263.12	8,627.5	-287.0	-995.8	1,028.1	0.00	0.00	0.00	
9,700.0	91.23	263.12	8,625.4	-298.9	-1,095.1	1,128.0	0.00	0.00	0.00	
9,800.0	91.23	263.12	8,623.2	-310.9	-1,194.4	1,227.9	0.00	0.00	0.00	
9,900.0	91.23	263.12	8,621.1	-322.9	-1,293.6	1,327.9	0.00	0.00	0.00	
10,000.0	91.23	263.12	8,618.9	-334.8	-1,392.9	1,427.8	0.00	0.00	0.00	
10,100.0	91.23	263.12	8,616.7	-346.8	-1,492.1	1,527.7	0.00	0.00	0.00	
10,200.0	91.23	263.12	8,614.6	-358.8	-1,591.4	1,627.6	0.00	0.00	0.00	
10,300.0	91.23	263.12	8,612.4	-370.8	-1,690.6	1,727.5	0.00	0.00	0.00	
10,400.0	91.23	263.12	8,610.3	-382.7	-1,789.9	1,827.4	0.00	0.00	0.00	
10,500.0	91.23	263.12	8,608.1	-394.7	-1,889.2	1,927.4	0.00	0.00	0.00	
10,600.0	91.23	263.12	8,606.0	-406.7	-1,988.4	2,027.3	0.00	0.00	0.00	
10,700.0	91.23	263.12	8,603.8	-418.6	-2,087.7	2,127.2	0.00	0.00	0.00	
10,800.0	91.23	263.12	8,601.7	-430.6	-2,186.9	2,227.1	0.00	0.00	0.00	
10,900.0	91.23	263.12	8,599.5	-442.6	-2,286.2	2,327.0	0.00	0.00	0.00	
11,000.0	91.23	263.12	8,597.4	-454.5	-2,385.4	2,427.0	0.00	0.00	0.00	
11,100.0	91.23	263.12	8,595.2	-466.5	-2,484.7	2,526.9	0.00	0.00	0.00	
11,200.0	91.23	263.12	8,593.0	-478.5	-2,584.0	2,626.8	0.00	0.00	0.00	
11,300.0	91.23	263.12	8,590.9	-490.4	-2,683.2	2,726.7	0.00	0.00	0.00	
11,400.0	91.23	263.12	8,588.7	-502.4	-2,782.5	2,826.6	0.00	0.00	0.00	
11,500.0	91.23	263.12	8,586.6	-514.4	-2,881.7	2,926.5	0.00	0.00	0.00	
11,600.0	91.23	263.12	8,584.4	-526.3	-2,981.0	3,026.5	0.00	0.00	0.00	
11,700.0	91.23	263.12	8,582.3	-538.3	-3,080.3	3,126.4	0.00	0.00	0.00	
11,800.0	91.23	263.12	8,580.1	-550.3	-3,179.5	3,226.3	0.00	0.00	0.00	
11,900.0	91.23	263.12	8,578.0	-562.2	-3,278.8	3,326.2	0.00	0.00	0.00	
12,000.0	91.23	263.12	8,575.8	-574.2	-3,378.0	3,426.1	0.00	0.00	0.00	
12,100.0	91.23	263.12	8,573.7	-586.2	-3,477.3	3,526.1	0.00	0.00	0.00	
12,200.0	91.23	263.12	8,571.5	-598.1	-3,576.5	3,626.0	0.00	0.00	0.00	
12,300.0	91.23	263.12	8,569.3	-610.1	-3,675.8	3,725.9	0.00	0.00	0.00	
12,400.0	91.23	263.12	8,567.2	-622.1	-3,775.1	3,825.8	0.00	0.00	0.00	
12,500.0	91.23	263.12	8,565.0	-634.0	-3,874.3	3,925.7	0.00	0.00	0.00	
12,600.0	91.23	263.12	8,562.9	-646.0	-3,973.6	4,025.6	0.00	0.00	0.00	
12,700.0	91.23	263.12	8,560.7	-658.0	-4,072.8	4,125.6	0.00	0.00	0.00	
12,800.0	91.23	263.12	8,558.6	-669.9	-4,172.1	4,225.5	0.00	0.00	0.00	
12,900.0	91.23	263.12	8,556.4	-681.9	-4,271.3	4,325.4	0.00	0.00	0.00	



# Scientific Drilling Planning Report

Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well: CC 29 F 2H
Company:	OXY	TVD Reference:	KB @ 2972.8usft
Project:	Eddy County, New Mexico	MD Reference:	KB @ 2972.8usft
Site:	Cedar Canyon 29 Federal 2H	North Reference:	Grid
Well:	CC 29 F 2H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #11		
Design:	Design #11		

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
13,000.0	91.23	263.12	8,554.3	-693.9	-4,370.6	4,425.3	0.00	0.00	0.00
13,100.0	91.23	263.12	8,552.1	-705.8	-4,469.9	4,525.2	0.00	0.00	0.00
13,200.0	91.23	263.12	8,549.9	-717.8	-4,569.1	4,625.2	0.00	0.00	0.00
13,253.4	91.23	263.12	8,548.8	-724.2	-4,622.1	4,678.5	0.00	0.00	0.00
Start 170.00 hold at 13253.37 MD									
13,300.0	91.23	263.12	8,547.8	-729.8	-4,668.4	4,725.1	0.00	0.00	0.00
13,400.0	91.23	263.12	8,545.6	-741.7	-4,767.6	4,825.0	0.00	0.00	0.00
13,423.4	91.23	263.12	8,545.1	-744.5	-4,790.8	4,848.3	0.00	0.00	0.00
180° FWLL - 335° FSL									

Design Targets									
Target Name hit/miss target Shape	Dip Angle (°)	Dip Dir (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
CC29F 2H PP - plan misses target center by 1.9usft at 8568.7usft MD (8475.7 TVD, -168.1 N, -9.8 E) - Point	0.00	0.00	8,475.6	-170.0	-9.7	434,624.60	603,530.70	32° 11' 40.046 N	103° 59' 55.141 W
CC29F 2H BHL - plan hits target center - Point	0.00	0.00	8,545.1	-744.5	-4,790.8	434,050.06	598,749.56	32° 11' 34.504 N	104° 0' 50.801 W
CC29F LTP - plan hits target center - Point	0.00	0.00	8,548.8	-724.2	-4,622.1	434,070.40	598,918.30	32° 11' 34.700 N	104° 0' 48.837 W

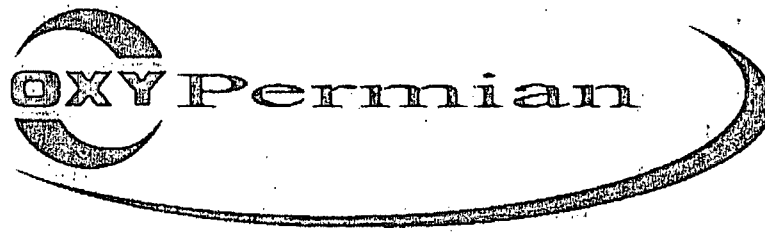
Formations						
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)	
317.8	317.8	Top Rustler		0.00		
717.8	717.8	Top Salado (salt)		0.00		
1,339.8	1,339.8	Top Castile (anhydrite)		0.00		
2,895.8	2,895.8	Top Lamar / Delaware		0.00		
2,965.8	2,965.8	Top Bell Canyon		0.00		
3,643.8	3,643.8	Top Cherry Canyon		0.00		
5,056.6	5,054.8	Top Brushy Canyon		0.00		
6,590.0	6,579.8	1st Bone Spring		0.00		
7,797.0	7,782.8	2nd Bone Spring		0.00		



# Scientific Drilling Planning Report

Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well: CC 29 F 2H
Company:	OXY	TVD Reference:	KB @ 2972.8usft
Project:	Eddy County New Mexico	MD Reference:	KB @ 2972.8usft
Site:	Cedar Canyon 29 Federal 2H	North Reference:	Grid
Well:	CC 29 F 2H	Survey/Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1		

Plan Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates			
		+N/-S (usft)	-E/+W (usft)	Comment	
4,466.6	4,466.6	0.0	0.0	Start Build 1.50	
4,866.6	4,865.9	-10.1	18.3	Start 2320.34 hold at 4866.58 MD	
7,186.9	7,173.5	-126.8	231.0	Start Drop -1.50	
7,586.9	7,572.7	-136.8	249.3	Start 350.00 hold at 7586.92 MD	
7,936.9	7,922.7	-136.8	249.3	Start Build 8.00	
9,077.4	8,638.8	-224.4	-477.1	Start 4176.02 hold at 9077.35 MD	
13,253.4	8,548.8	-724.2	-4,622.1	Start 170.00 hold at 13253.37 MD	
13,423.4	8,545.1	-744.5	-4,790.8	180' FWLL	
13,423.4	8,545.1	-744.5	-4,790.8	335' FSLL	
13,423.4	8,545.1	-744.5	-4,790.8	TD at 13423.37	

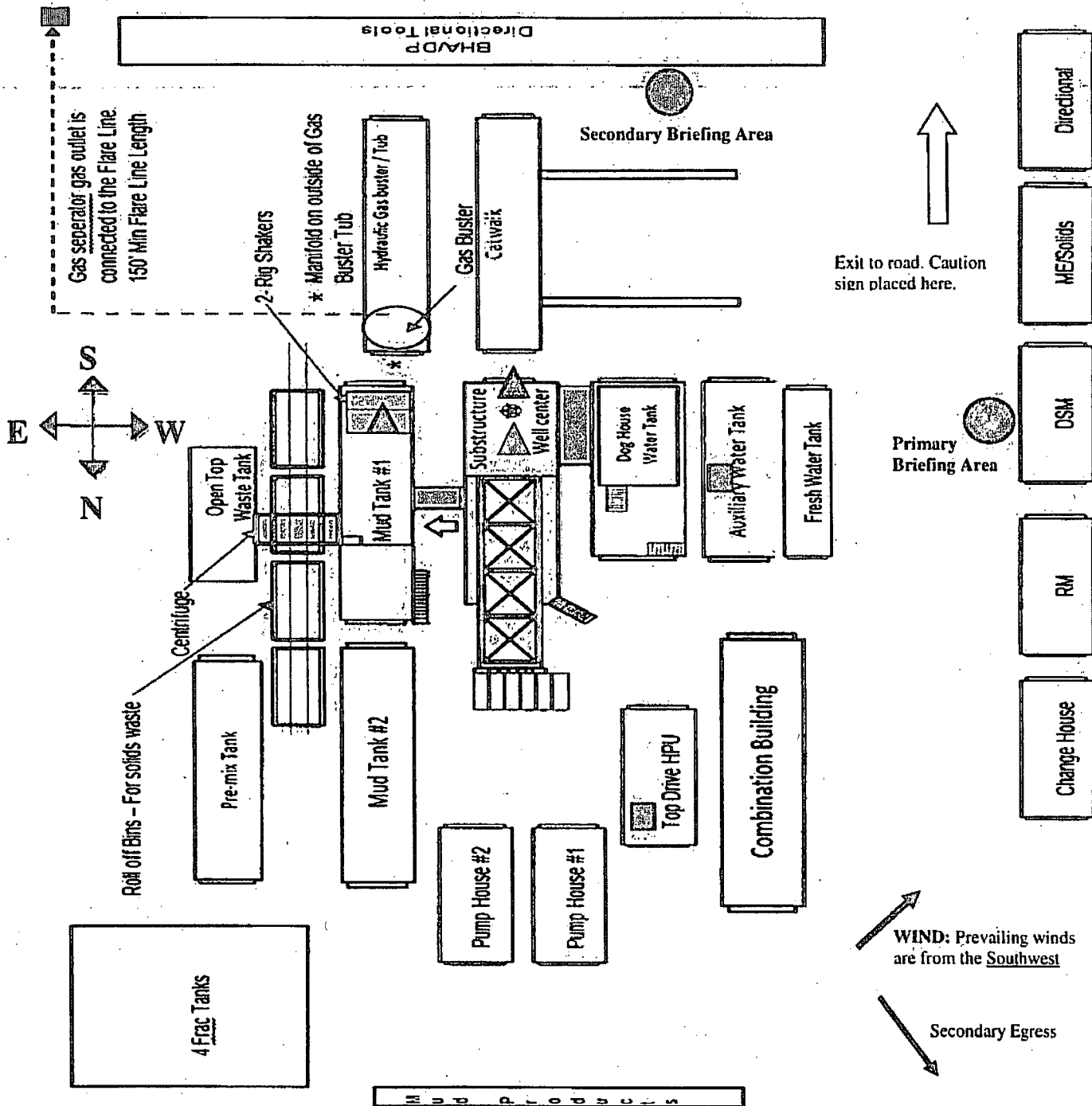


## **Permian Drilling Hydrogen Sulfide Drilling Operations Plan Cedar Canyon 29 Federal Com 2H**

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 SOUTHWEST 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.



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.

## PECOS DISTRICT CONDITIONS OF APPROVAL

OPERATOR'S NAME:	OXY USA Inc
LEASE NO.:	NM94651
WELL NAME & NO.:	2H-Cedar Canyon 29 Federal Com
SURFACE HOLE FOOTAGE:	230'N & 320'E
BOTTOM HOLE FOOTAGE:	991'N & 181'W
LOCATION:	Section 29, T.24 S., R. 29 E., NMPM
COUNTY:	Eddy County, New Mexico

### A. DRILLING OPERATIONS 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

1. **Hydrogen Sulfide (H<sub>2</sub>S) monitors shall be installed prior to drilling out the surface shoe. If H<sub>2</sub>S 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.**
2. Unless the production casing has been run and cemented or the well has been properly plugged, the drilling rig shall not be removed from over the hole without prior approval. **If the drilling rig is removed without approval – an Incident of Non-Compliance will be written and will be a “Major” violation.**
3. Floor controls are required for 3M or Greater systems. These controls will be on the rig floor, unobstructed, readily accessible to the driller and will be operational at all times during drilling and/or completion activities. Rig floor is defined as the area immediately around the rotary table; the area immediately above the substructure on which the draw works is located, this does not include the dog house or stairway area.

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

## **B. CASING**

Changes to the approved APD casing program need prior approval if the items substituted are of lesser grade or different casing size. 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.).

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

### **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.

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

**Possibility of water flows in the Castile and Salado.**

**Possibility of lost circulation in the Rustler, Salado, and Delaware.**

**Medium Cave/Karst**

1. The **10-3/4** inch surface casing shall be set at approximately **400** feet (a minimum of 25 feet into the Rustler Anhydrite and above the salt) and cemented to the surface. **If salt is encountered, set casing at least 25 feet above the salt.**
  - 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 is to include the lead cement slurry.**



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

**Formation below the 10-3/4 inch shoe to be tested according to Onshore Order 2.III.B.1.i. Test to be done as a mud equivalency test using the mud weight necessary for the pore pressure of the formation below the shoe and the mud weight for the bottom of the hole. Report results to BLM office.**

- 2. The minimum required fill of cement behind the 7-5/8 inch intermediate casing, which shall be set at approximately **2850** feet, is:

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

**Formation below the 7-5/8 inch shoe to be tested according to Onshore Order 2.III.B.1.i. Test to be done as a mud equivalency test using the mud weight necessary for the pore pressure of the formation below the shoe (not the mud weight required to prevent dissolving the salt formation) and the mud weight for the bottom of the hole. Report results to BLM office.**

**Centralizers required on horizontal leg, must be type for horizontal service and a minimum of one every other joint.**

- 3. The minimum required fill of cement behind the 5-1/2 x 4-1/2 inch production casing is:

☒ Cement as proposed by operator. Operator shall provide method of verification.

- 4. If hardband drill pipe is rotated inside casing, returns will be monitored for metal. If metal is found in samples, drill pipe will be pulled and rubber protectors which have a larger diameter than the tool joints of the drill pipe will be installed prior to continuing drilling operations.

### C. PRESSURE CONTROL

1. All blowout preventer (BOP) and related equipment (BOPE) shall comply with well control requirements as described in Onshore Oil and Gas Order No. 2 and API RP 53 Sec. 17.
2. Variance approved to use flex line from BOP to choke manifold. 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.** If the BLM inspector questions the straightness of the hose, a BLM engineer will be contacted and will review in the field or via picture supplied by inspector to determine if changes are required (operator shall expect delays if this occurs).
3. **Operator has proposed a multi-bowl wellhead assembly. This assembly will only be tested when installed on the surface casing. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the surface casing shoe shall be 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. Operator shall perform the intermediate casing integrity test to 70% of the casing burst. This will test the multi-bowl seals.
  - 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.

**5M 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. 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. The tests shall be done by an independent service company utilizing a test plug **not a cup or J-packer**.
  - c. 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.
  - d. The results of the test shall be reported to the appropriate BLM office.
  - e. 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.**
  - f. 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.

#### **D. DRILL STEM TEST**

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

## **E. 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.

**KGR 08112015**