

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF LAND MANAGEMENT

AUG 21 2015

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RECEIVED

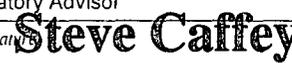
**APPLICATION FOR PERMIT TO DRILL OR REENTER**

1a. Type of work: <input checked="" type="checkbox"/> DRILL <input type="checkbox"/> REENTER		5. Lease Serial No. NMNM085893	
1b. Type of Well: <input checked="" type="checkbox"/> Oil Well <input type="checkbox"/> Gas Well <input type="checkbox"/> Other <input checked="" type="checkbox"/> Single Zone <input type="checkbox"/> Multiple Zone		6. If Indian, Allottee or Tribe Name	
2. Name of Operator OXY USA Inc. 16696		7. If Unit or CA Agreement, Name and No. Cedar Canyon 21 Federal Com. #4H	
3a. Address P.O. Box 50250 Midland, TX 79710		8. Lease Name and Well No.	
3b. Phone No. (include area code) 432-685-5717		9. API Well No. 43328 30-015-	
4. Location of Well (Report location clearly and in accordance with any State requirements.)* At surface 230 FNL 150 FEL NENE(A) At proposed prod. zone 672 FNL 181 FWL NWNW(D)		10. Field and Pool, or Exploratory Corral Draw Bone Spring	
14. Distance in miles and direction from nearest town or post office* 6 miles northeast from Loving, NM		11. Sec., T. R. M. or Blk. and Survey or Area Sec 21 T24S R29E	
15. Distance from proposed* location to nearest property or lease line, ft. (Also to nearest drig. unit line, if any) 150'		12. County or Parish Eddy	
16. No. of acres in lease 400 ac		13. State NM	
17. Spacing Unit dedicated to this well 160 ac		18. Distance from proposed location* to nearest well, drilling, completed, applied for, on this lease, ft. 170'	
19. Proposed Depth 8709'V 13387'M		20. BLM/BIA Bond No. on file NMB000862 ESB000226	
21. Elevations (Show whether DF, KDB, RT, GL., etc.) 2927.8' GL		22. Approximate date work will start* 05/01/2015	
		23. Estimated duration 35 days	

24. Attachments

The following, completed in accordance with the requirements of Onshore Oil and Gas Order No.1, must be attached to this form:

- |  |   |
|--|---|
| 1. Well plat certified by a registered surveyor.   | 4. Bond to cover the operations unless covered by an existing bond on file (see Item 20 above). |
| 2. A Drilling Plan.  | 5. Operator certification   |
| 3. A Surface Use Plan (if the location is on National Forest System Lands, the SUPO must be filed with the appropriate Forest Service Office). | 6. Such other site specific information and/or plans as may be required by the BLM.             |

25. Signature 	Name (Printed/Typed) David Stewart	Date 5/13/15
Title Sr. Regulatory Advisor david_stewart@oxy.com		
Approved by (Signature) 	Name (Printed/Typed) Steve Caffey	Date AUG 17 2015
Title FIELD MANAGER Office CARLSBAD FIELD OFFICE		

Application approval 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.  
Conditions of approval, if any, are attached.

**APPROVAL FOR TWO YEARS**

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.

(Continued on page 2)

\*(Instructions on page 2)

Carlsbad Controlled Water Basin

Must be in compliance with NMOCD Rule 5.9 prior to transporting/selling product.

  
8/11/15

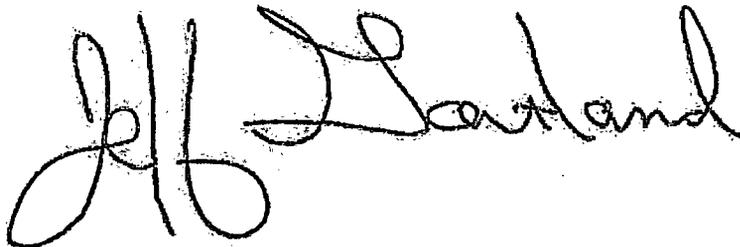
Approval Subject to General Requirements & Special Stipulations Attached

SEE ATTACHED FOR  
CONDITIONS OF APPROVAL

OPERATOR CERTIFICATION

I hereby certify that I, or someone under my direct supervision, have inspected the drill site and access route proposed herein; that I am familiar with the conditions that presently exist; that I have full knowledge of State and Federal laws applicable to this operation; that the statements made in this APD package are, to the best of my knowledge, true and correct; and that the work associated with the operations proposed herein will be performed in conformity with this APD package and the terms and conditions under which it is approved. I also certify that I, or the company I represent, am responsible for the operations conducted under this application. These statements are subject to the provisions of 18 U.S.C. 1001 for the filing of false statements. Executed this 13<sup>th</sup> day of May, 2014.

Name: Jeff Gartland  
Position: Reservoir Management Team Leader  
Address: 5 Greenway Plaza, Suite 110, Houston, TX 77046  
Telephone: 713-552-8587  
E-mail: (optional): jeff\_gartland@oxy.com  
Company: Occidental Permian LP / OXY USA Inc / OXY USA WTP LP  
Field Representative (if not above signatory): Dusty Weaver  
Address (if different from above): P.O. Box 50250 Midland, TX 79710  
Telephone (if different from above): 432-685-5723  
E-mail (if different from above): calvin\_weaver@oxy.com



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

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

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

RECEIVED

**WELL LOCATION AND ACREAGE DEDICATION PLAT**

API Number 30-015-43328	Pool Code 96238	Pool Name Cornal Draw Bone Springs
Property Code 315207	Property Name CEDAR CANYON "21" FEDERAL COM	Well Number 4H
OGRID No. 16694	Operator Name OXY USA INC.	Elevation 2927.8'

**Surface Location**

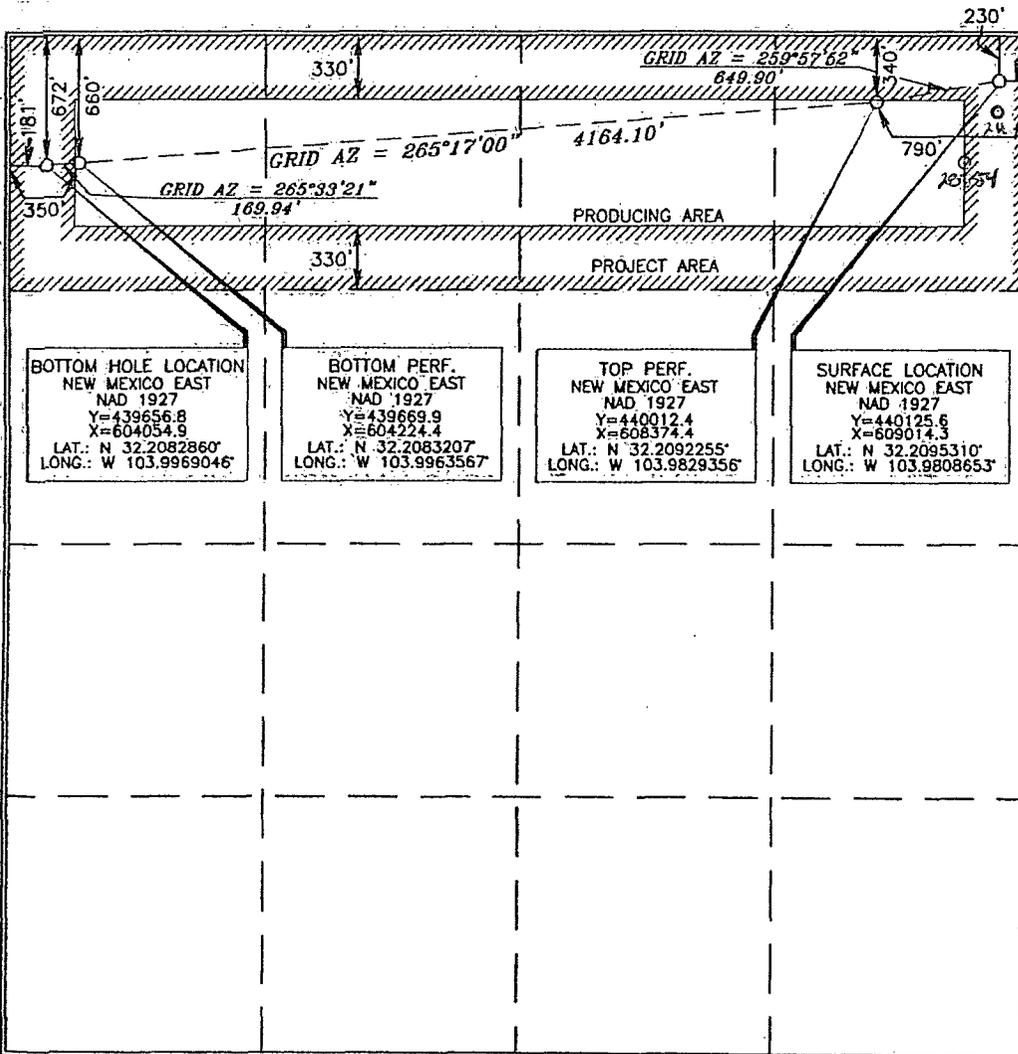
UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
A	21	24 SOUTH	29 EAST, N.M.P.M.		230'	NORTH	150'	EAST	EDDY

**Bottom Hole Location If Different From Surface**

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
D	21	24 SOUTH	29 EAST, N.M.P.M.		672'	NORTH	181'	WEST	EDDY

Dedicated Acres 160	Joint or Infill N	Consolidation Code	Order No.
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No allowable will be assigned to this completion until all interests have been consolidated or a non-standard unit has been approved by the division.



**OPERATOR CERTIFICATION**

I hereby certify that the information contained herein is true and complete to the best of my knowledge and belief, and that this organization either owns a working interest or unleased mineral interest in the land including the proposed bottom hole location or has a right to drill this well at this location pursuant to a contract with an owner of such a mineral or working interest, or to a voluntary pooling agreement or a compulsory pooling order heretofore entered by the division.

Signature: David Stewart Date: 5/13/15  
 Printed Name: David Stewart Sr. P. Eng. Adc  
 E-mail Address: david\_stewart@oxy.com

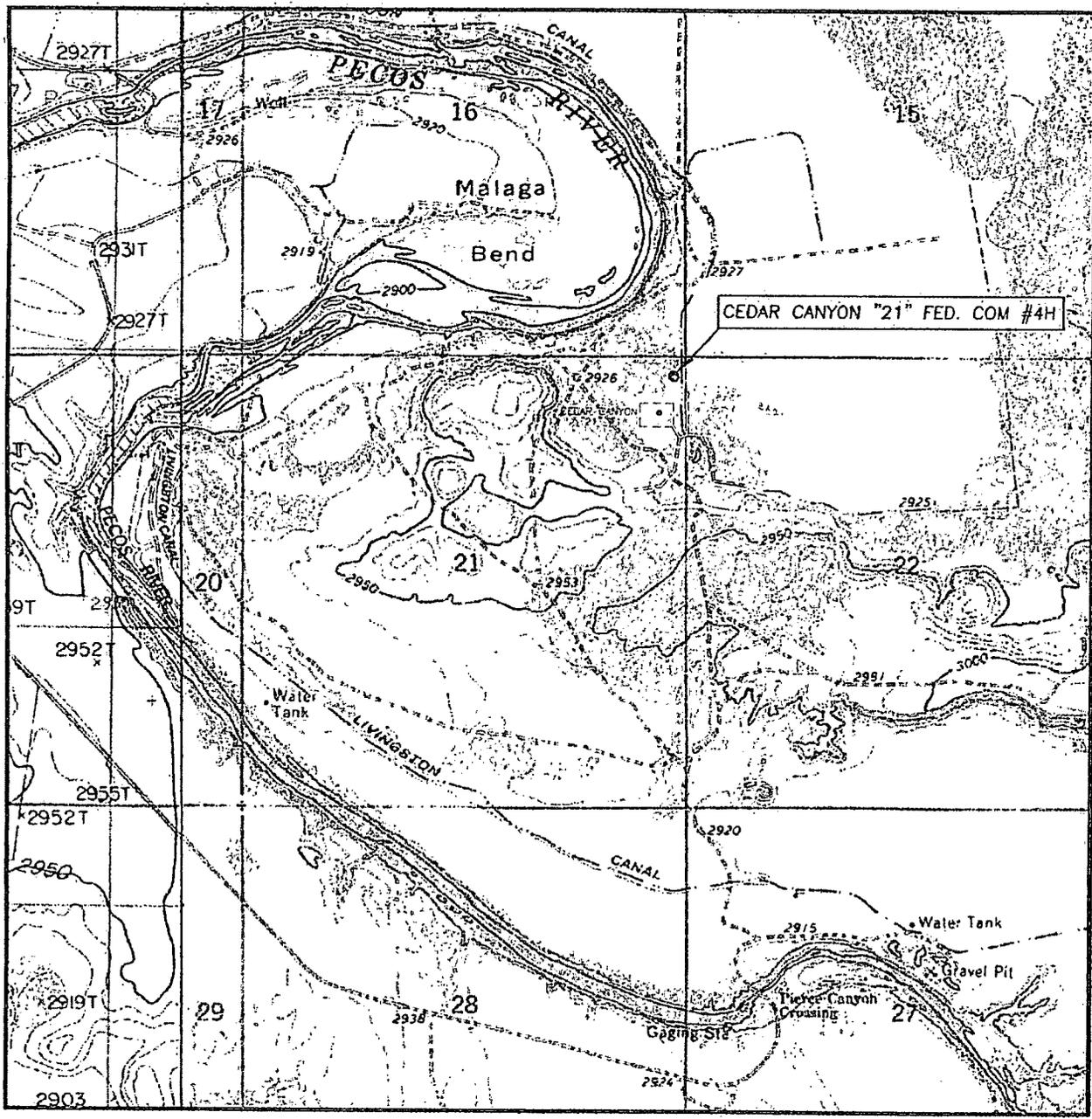
**SURVEYOR CERTIFICATION**

I hereby certify that the plat shown on this plat was plotted from field notes of actual surveys made by me or under my supervision and that the same is true and correct to the best of my belief.

Date of Survey: DECEMBER 4, 2013  
 Signature and Seal of Professional Surveyor: Jerry Olson  
 Certificate Number: 15079

LUM

# LOCATION VERIFICATION MAP



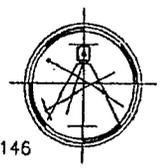
SCALE: 1" = 2000'

CONTOUR INTERVAL: 10'

SEC. 21 TWP. 24-S RGE. 29-E  
 SURVEY \_\_\_\_\_ N.M.P.M. \_\_\_\_\_  
 COUNTY \_\_\_\_\_ EDDY \_\_\_\_\_  
 DESCRIPTION 230' FNL & 150' FEL  
 ELEVATION \_\_\_\_\_ 2927.8' \_\_\_\_\_  
 OPERATOR \_\_\_\_\_ OXY USA INC. \_\_\_\_\_  
 LEASE CEDAR CANYON "21" FED. COM #4H

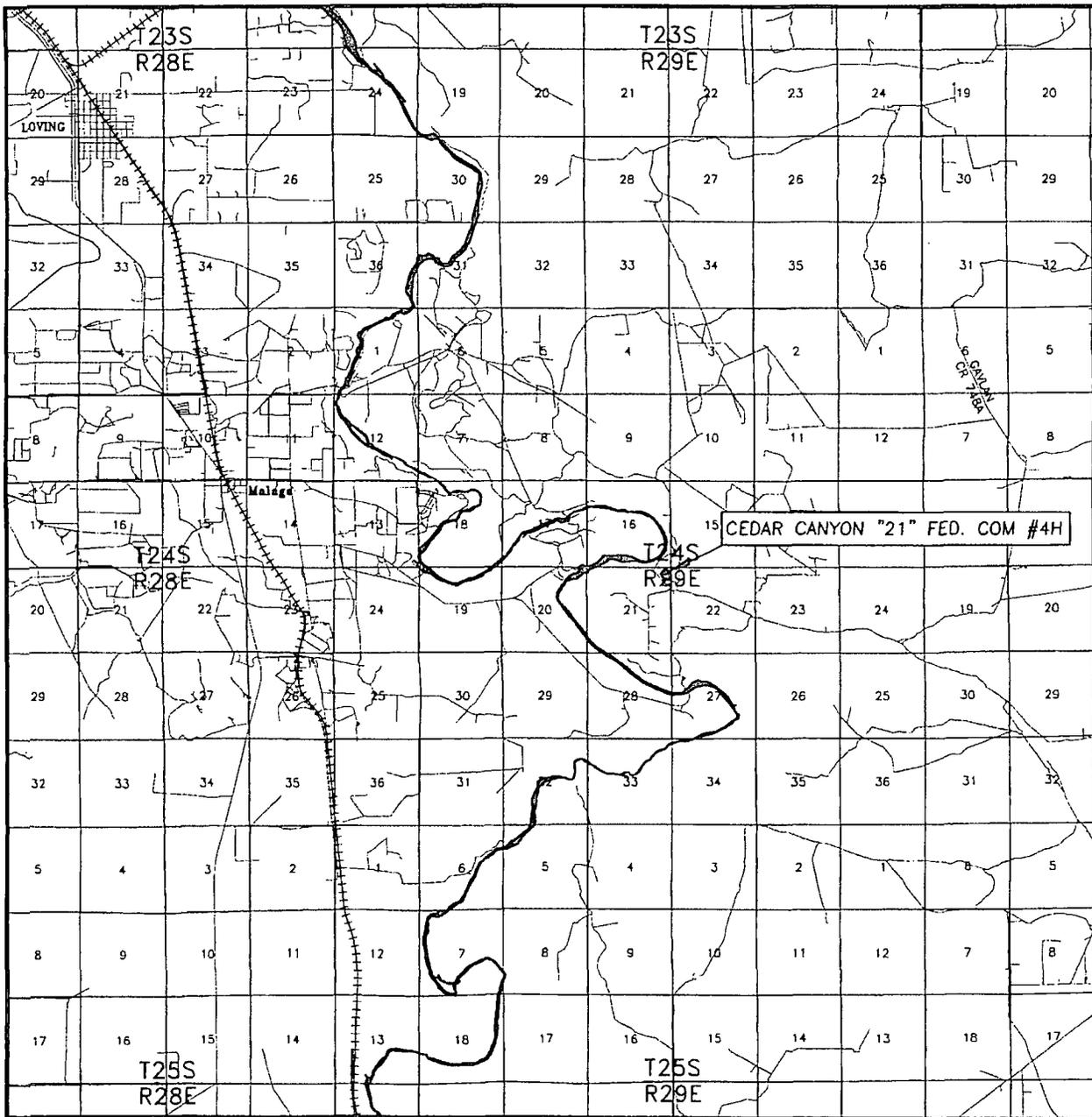
U.S.G.S. TOPOGRAPHIC MAP  
 PIERCE CANYON, N.M.

Asel Surveying  
 P.O. BOX 393 - 310 W. TAYLOR  
 HOBBS, NEW MEXICO - 575-393-9146



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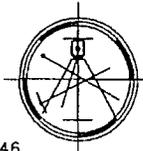
# VICINITY MAP



SEC. 21 TWP. 24-S RGE. 29-E  
 SURVEY N.M.P.M.  
 COUNTY EDDY  
 DESCRIPTION 230' FNL & 150' FEL  
 ELEVATION 2927.8'  
 OPERATOR OXY USA INC.

SCALE: 1" = 2 MILES

Asel Surveying  
 P.O. BOX 393 - 310 W. TAYLOR  
 HOBBS, NEW MEXICO - 575-393-9146



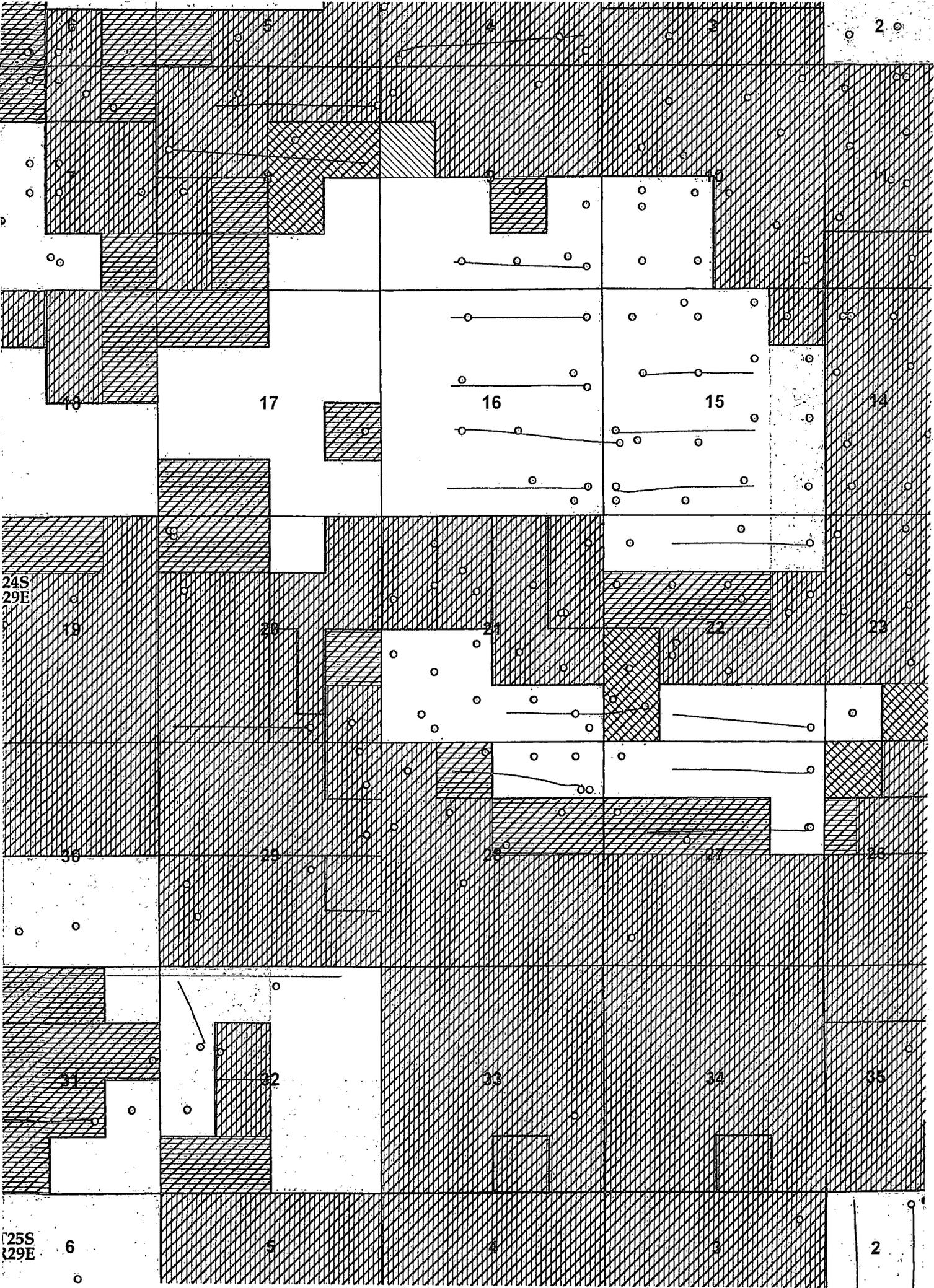
LEASE CEDAR CANYON "21" FED. COM #4H

DIRECTIONS FROM THE INTERSECTION OF U.S. HWY. #285 AND BLACK RIVER VILLAGE ROAD IN MALAGA, GO EAST ON COUNTY ROAD #720 FOR 0.8 MILES, TURN LEFT ON COUNTY ROAD #745 (HARROUN ROAD) AND GO NORTH FOR 1.0 MILES, TURN RIGHT AND GO EAST/NORTHEAST FOR 2.1 MILES, TURN RIGHT ON DOG TOWN ROAD AND GO SOUTHEAST FOR 1.3 MILES, TURN LEFT ON CALICHE ROAD AND GO EAST/SOUTHEAST FOR 2.1 MILES, CONTINUE SOUTH FOR 1.6 MILES, TURN LEFT AND GO NORTHEAST FOR 0.1 MILES, TURN LEFT ON PROPOSED ROAD AND GO NORTH FOR 513.0 FEET TO LOCATION.





BLM  
9500  
Plan



24S  
29E

25S  
29E

6

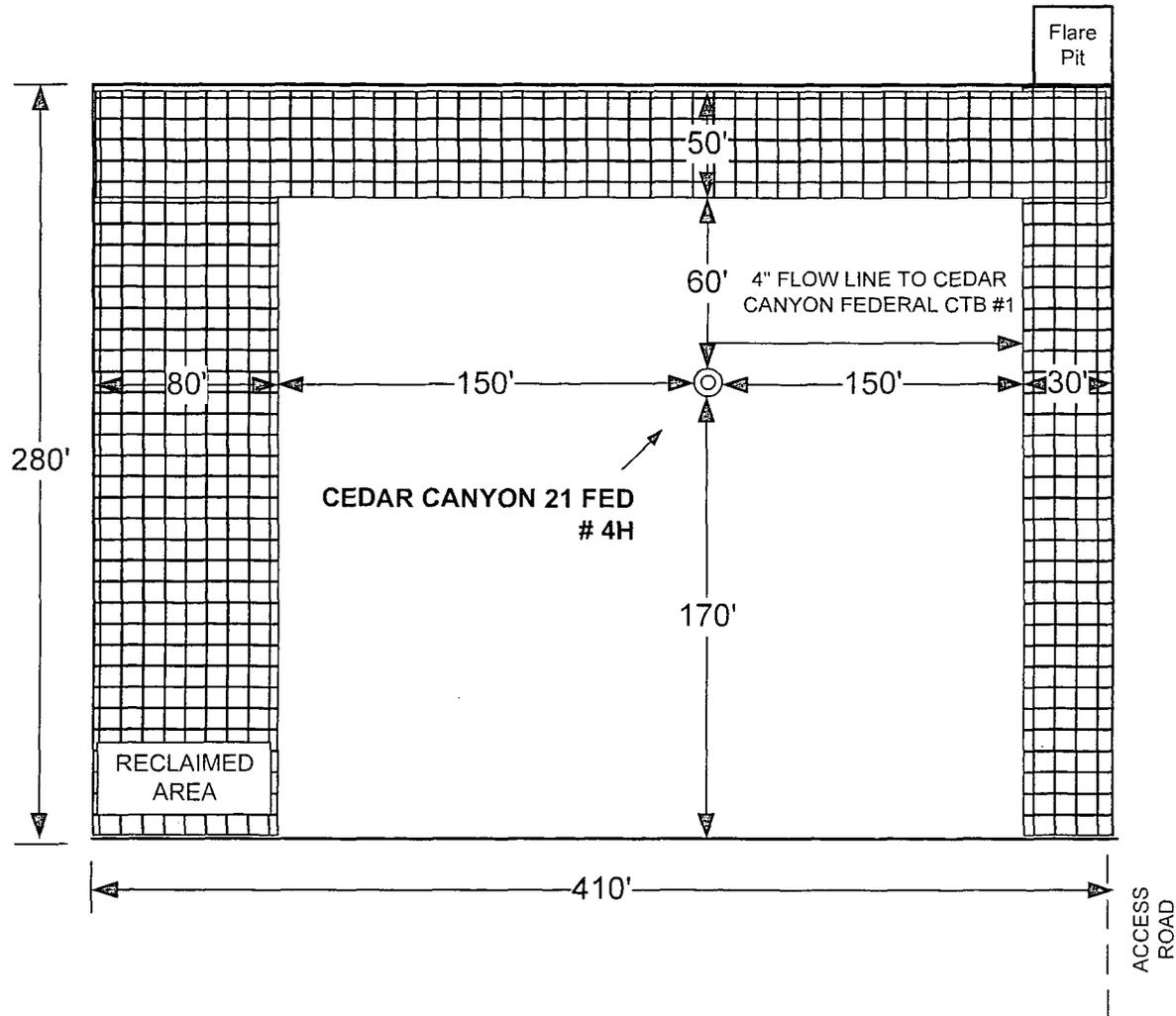
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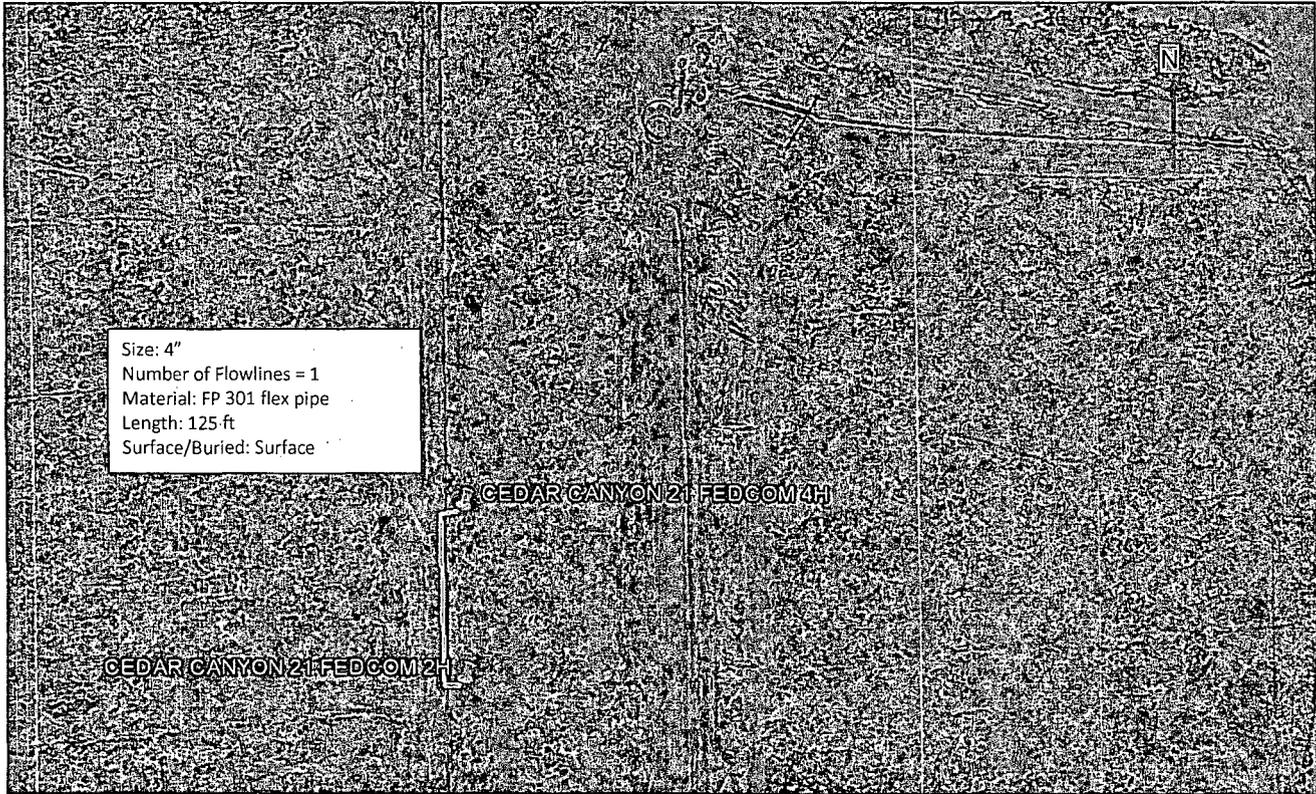
NORTH ↑

8' Diameter x 8' Deep Tinhorn  
Cellar

**FLEX 3 & ENSIGN RIG DIAGRAM**  
CEDAR CANYON 21 FED # 4H  
V-Door - East  
EDDY COUNTY, NEW MEXICO

REVISION BLOCK						ENGINEERING RECORD	
NO.	DATE	DESCRIPTION	BY	CHK	APP	BY	DATE

Well Site Facility Layout



*Note: Cedar Canyon 21 Fed Com 4H well flowline will be routed to well pad of Cedar Canyon 21-Fed Com 2H well. The flowline from Cedar Canyon 21 Fed Com 2H well will be on its own pad and is not shown as a separate flowline route. The central tank battery will be on Cedar Canyon 21 Fed Com 2H well pad.*

CEDAR CANYON 21 FED COM 4H

6

748

Cedar Canyon Federal CTR

Well Name	Cedar Canyon 21-4
Type	Surface
Pressure	125 psi
Number of Lines	1
Diameter	4 inch
Length	4,500 ft

Flawline Route Info.

**OXY USA Inc.**  
**Cedar Canyon 21 Federal Com #4H**  
**APD Drilling Data**

OPERATOR NAME / NUMBER: OXY USA Inc. - 16696

LEASE NAME / NUMBER: Cedar Canyon 21 Federal Com #4H Federal Lease No.-NMNM085893

STATE: NM

COUNTY: Eddy

POOL NAME/NUMBER: Corral Draw Bone Spring 96238

SURFACE LOCATION: 230 FNL 150 FEL NENE(A) Sec 21 T24S R29E  
 SL: LAT: 32.2095310N LONG:103.9808653W X:609014.3 Y:4440125.6 NAD: 27

TOP PERF: 340 FNL 790 FEL NENE(A) Sec 21 T24S R29E  
 SL: LAT: 32.2092255N LONG:103.9829356W X:608374.4 Y:4440012.4 NAD: 27

BOTTOM PERF: 660 FNL 350 FWL NWNW(D) Sec 21 T24S R29E  
 SL: LAT: 32.2083207N LONG:103.9963567W X:604224.4 Y:439669.9 NAD: 27

BOTTOM HOLE LOCATION: 672 FNL 181 FWL NWNW(D) Sec 21 T24S R29E  
 SL: LAT: 32.2082860N LONG:103.9969046W X:604054.9 Y:439656.8 NAD: 27

APPROX GR ELEV: 2927.8'

EST KB ELEV: 2951.8' (24' KB-GL)

**1. GEOLOGIC NAME OF SURFACE FORMATION**

a. Permian

**2. ESTIMATED TOPS OF GEOLOGICAL MARKERS & DEPTHS OF ANTICIPATED FRESH WATER, OIL OR GAS**

Formation	TVD - RKB	Expected Fluids
Top Rustler	260	--
Top Salado (Salt)	544	--
Top Castile	1372	--
Top Lamar/ Delaware	2961	--
Top Bell Canyon	3014	Form Water
Top Cherry Canyon	3694	Oil/Gas
Top Brushy Canyon	5062	Oil/Gas
Top 1 <sup>st</sup> Bone Spring	6631	Oil/Gas
Top 2 <sup>nd</sup> Bone Spring	7900	Oil/Gas
Top 3 <sup>rd</sup> Bone Spring	8744	Oil/Gas

- Fresh water may be present above the Rustler formation. Surface casing will be set below the top of the Rustler to protect any possible fresh water.

**GREATEST PROJECTED TD "LATERAL LP": 9133'MD / 8709'TVD**

**LATERAL GREATEST PROJECTED TD: 13387'MD/ 8620'TVD OBJECTIVE: 2<sup>nd</sup> Bone Spring**

**3. CASING PROGRAM (ALL NEW CASING)**

New Surface Casing ran in a 14.75" hole filled with 8.5 ppg mud

Hole Size (in)	Interval (ft)	OD (in)	Wt (ppf)	Grade	Conn	ID (in)	Tension (klb)	Burst (psi)	Collapse (psi)	Burst SF	Coll SF	Ten SF
14.75	0-400	11.75	47	J55	BTC	11	737	3070	1510	1.43	8.10	6.38

New Intermediate Casing ran in a 10.625" hole filled with 10 ppg mud

Hole Size (in)	Interval (ft)	OD (in)	Wt (ppf)	Grade	Conn	ID (in)	Tension (klb)	Burst (psi)	Collapse (psi)	Burst SF	Coll SF	Ten SF
10.625	0- <del>3100</del> 2960	8.625	32	J55	LTC	7.921*	417	3930	2530	1.31	2.39	2.27

See COA

New Production Casing ran in a 7.875" hole filled with 9.2 ppg mud

Hole Size (in)	Interval (ft)	OD (in)	Wt (ppf)	Grade	Conn	ID (in)	Tension (klb)	Burst (psi)	Collapse (psi)	Burst SF	Coll SF	Ten SF
7.875	0-13387	5.500	17	L80	BTC	4.892	397	7740	6290	1.22	1.48	1.75

\*SPECIAL DRIFT TO 7.875"

**Casing Design Assumptions:**

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

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

**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: 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 )

#### 4. CEMENT PROGRAM:

##### Surface Interval (125% Excess)

Interval	Amount sx	Ft of Fill	Type	Gal/Sk	PPG	Ft <sup>3</sup> /sk	24 Hr Comp
Tail: 0' – 400'	320	400	Premium Plus Cement 2% Calcium Chloride – Flake	6.39	14.8	1.35	1726

##### Intermediate Interval (125% Excess)

Interval	Amount sx	Ft of Fill	Type	Gal/Sk	PPG	Ft <sup>3</sup> /sk	24 Hr Comp
Lead: 0' – 2600'	620	2600	Halliburton Light Premium Plus Cement 5% Salt, 0.1% HR-800	9.84	12.9	1.85	846
Tail: 2600' – 3100'	190	500	Premium Plus cement	6.34	14.8	1.33	1779

##### Production Casing

Interval	Amount sx	Ft of Fill	Type	Gal/Sk	PPG	Ft <sup>3</sup> /sk	24 Hr Comp
Lead: 2100' – 7993' (100% Excess)	540	5893	Tuned Light Cement 3 lbm/sk Kol-Seal, 0.125 lbm/sk Poly-E-Flake, 0.25 lbm/sk HR-800	14.05	10.2	2.95	463 (500 psi in 25 hrs)
Tail: 7993' – 13387' (40% Excess)	800	5394	Super H Cement 0.5 % Halad-344, 0.4 % CFR-3, 3 lbm/sk Salt, 0.2% HR-601, 0.125 lbm/sk Poly-E-Flake, 3 lbm/sk Kol-Seal	8.56	13.2	1.66	1263

**Cement Additives:** Calcium Chloride–Flake, Salt (Accelerator)  
CFR-3 (Dispersant),  
Schotchlite HGS-6000 (Light Weight Additive)  
Halad-344 (Low Fluid Loss Control)  
Kol-Seal, Poly-E-Flake (Lost Circulation Additive)  
HR 601, HR 800 (Retarder)

The volumes indicated above may be revised depending on caliper measurement.

#### 5. DIRECTIONAL PLAN - Attached

#### 6. PRESSURE CONTROL EQUIPMENT

**Surface:** 0' – 400' None.

**Intermediate and Production:** 3100' MD/TVD – TD. Intermediate and Production hole will be drilled with a 13-5/8" 10M three ram stack with a 5M annular preventer and a 5M Choke Manifold.

- a. All BOP's and associated equipment will be tested in accordance with Onshore Order #2 (250/5000 psi on rams for 10 minutes each and 250/3500 psi for 10 minutes for annular preventer, equal to 70% of working pressure) with a third party BOP testing service before drilling out the surface casing shoe. A Multibowl wellhead system will be used in this well therefore the BOPE test will cover the test requirements for the Intermediate and Production sections.
- b. The Surface and Intermediate casings strings will be tested to 70% of their burst rating for 30 minutes. This will also test the seals of the lock down pins that hold the pack-off in place in the Multibowl wellhead system.
- c. Pipe rams will be function tested every 24 hours and blind rams will be tested each time the drill pipe is out of the hole. These functional tests will be documented on the daily driller's log. A 2" kill line and 3" choke line will be accommodated on the drilling spool below the ram-type BOP.

See  
CSA

- d. The BOPE test will be repeated within 21 days of the original test, on the first trip, if drilling the intermediate or production section takes more time than planned.
- e. Other accessory BOP equipment will include a floor safety valve, choke lines, and choke manifold having a 5000 psi working pressure rating and tested to 5000 psi.
- f. The Operator also requests a variance to connect the BOP choke outlet to the choke manifold using a co-flex hose manufactured by Contitech Rubber Industrial KFT. It is a 3" ID x 35' flexible hose with a 10,000 psi working pressure. It has been tested to 15,000 psi and is built to API Spec 16C. Once the flex line is installed it will be tied down with safety clamps (certifications attached).
- g. BOP & Choke manifold diagrams attached.

## 7. MUD PROGRAM:

Depth	Mud Wt, ppg	Vis, sec	Fluid Loss	Type System
0 – Surf Csg Shoe	8.5 – 9.0	28 – 38	NC	Fresh Water / Spud Mud
Surf – Int Csg Shoe	9.8 – 10	28 – 32	NC	Brine
Int Csg Shoe – KOP	8.8 – 9.2	28 – 34	NC	Cut Brine / Sweeps
KOP – TD	9.2 – 9.4	32 – 40	NC	Cut Brine / Sweeps

**Remarks:** 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.

## 8. CLOSED LOOP SYSTEM

A closed loop system will be utilized, consisting of above ground steel tanks and haul-off bins. Liquids, drilling fluids and cuttings will be disposed of at an approved facility.

## 9. AUXILIARY WELL CONTROL AND MONITORING EQUIPMENT

- a. A full opening drill pipe stabbing valve having the appropriate connections will be on the rig floor unobstructed and readily accessible at all times.
- b. Hydrogen Sulfide detection equipment will be in operation after drilling out the surface casing shoe until the production casing is cemented. Breathing equipment will be on location upon drilling the surface casing shoe until total depth is reached. **If Hydrogen Sulfide is encountered, measured amounts and formations will be reported to the BLM.**

## 10. POTENTIAL HAZARDS

- a. No abnormal temperatures or pressures are anticipated. The highest anticipated pressure gradient is **0.46 psi/ft**. Maximum anticipated bottom hole pressure is **4000 psi**.
- b. All personnel will be familiar with all aspects of safe operation of equipment being used to drill this well. Adequate flare lines will be installed off the mud/gas separator where gas may be flared safely.

## 11. ANTICIPATED STARTING DATE AND DURATION OF OPERATIONS

Road and location construction will begin after the BLM has approved the APD. Anticipated spud date will be as soon as possible after BLM approval and as soon as a rig will be available. Move in operations and drilling is expected to take 35 days. If production casing is run, then an additional 30 days will be needed to complete the well and construct surface facilities and/or lay flow lines in order to place well on production.

**12. WIRELINE LOGGING / MUD LOGGING / LWD**

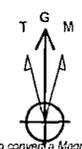
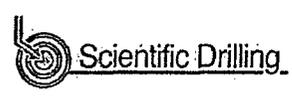
- a. No OH logs
- b. Mud loggers to be rigged up from surface casing shoe to TD
- c. MWD/ GR while drilling, from KOP to TD

**COMPANY PERSONNEL:**

<u>Name</u>	<u>Title</u>	<u>Office Phone</u>	<u>Mobile Phone</u>
Kacie Cruz	Drilling Engineer	(713) 350-4889	(281) 433-6594
Sebastian Millan	Drilling Engineer Supervisor	(713) 350-4950	(832) 528-3268
Roger Allen	Drilling Superintendent	(713) 215-7617	(281) 682-3919
Oscar Quintero	Drilling Manager	(713) 985-6343	(713) 689-4946



**CC 21 FC 4H**  
**Eddy County, New Mexico**  
**Northing: 440125.60**  
**Easting: 609014.30**  
**Design #1**



Azimuths to Grid North  
 True North: -0.19°  
 Magnetic North: 7.24°

Magnetic Field  
 Strength: 48281.1snT  
 Dip Angle: 60.03°  
 Date: 04/24/2014  
 Model: IGRF2010

To convert a Magnetic Direction to a Grid Direction, Add 7.23°  
 To convert a True Direction to a Grid Direction, Subtract 0.19°

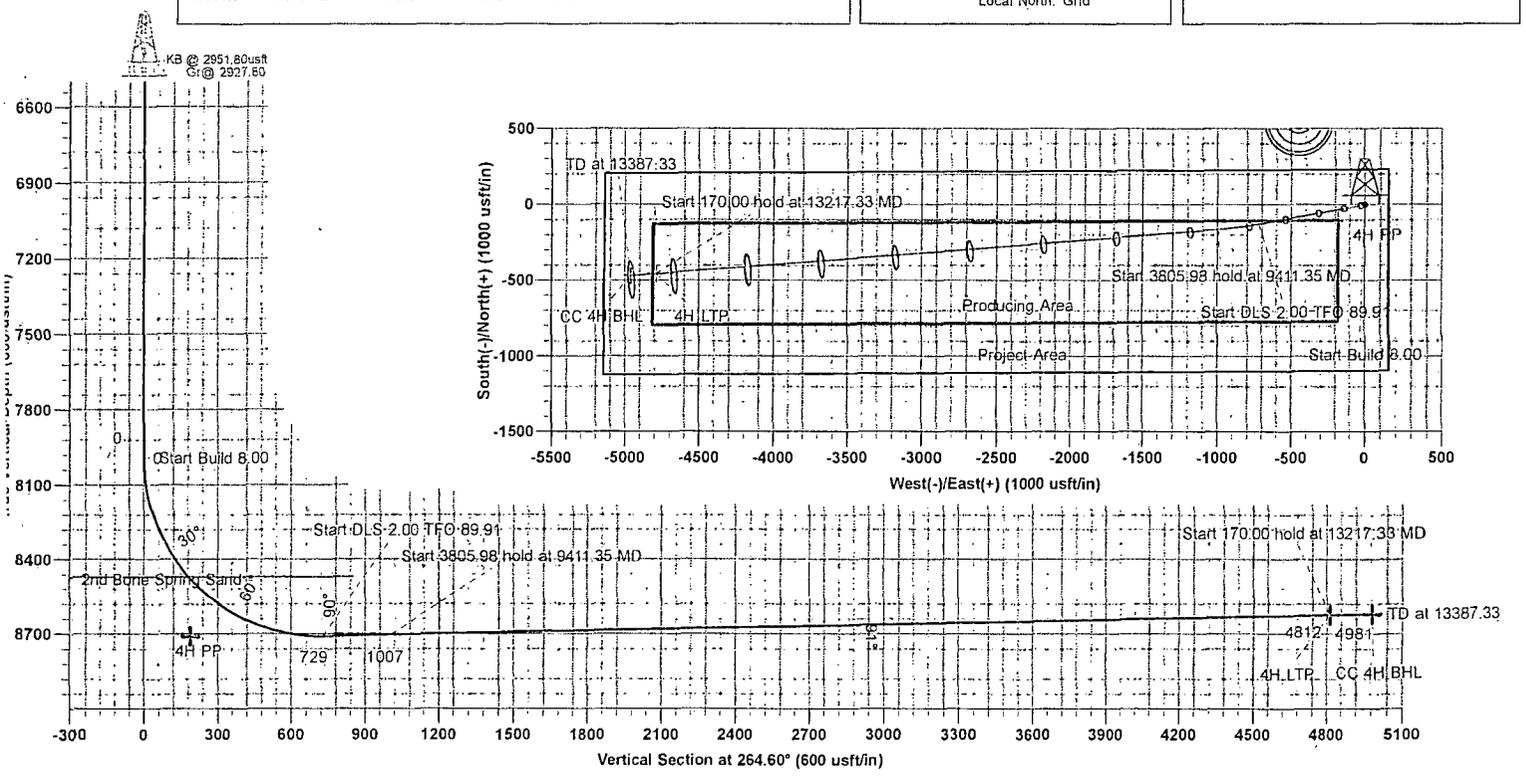
WELL DETAILS: CC 21 FC 4H						
Ground Level: 2927.80						
+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	
0.00	0.00	440125.60	609014.30	32.210	-103.981	

DESIGN TARGET DETAILS					
Name	TVD	+N/-S	+E/-W	Northing	Easting
CC 4H BHL	20.46	-468.82	-4959.36	439656.78	604054.94
4H LTP	8624.00	-455.70	-4789.90	439669.90	604224.40
4H PP	8709.00	-101.00	-179.80	440024.60	608834.50

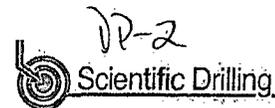
SECTION DETAILS										
MD	Inc	Azi	TVD	+N/-S	+E/-W	Deg	TFace	V Sect		
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7992.96	0.00	0.00	7992.96	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9132.82	91.19	260.00	8709.00	-126.95	-719.95	8.00	260.00	728.70		
9411.35	91.19	265.57	8703.21	-161.90	-998.11	2.00	89.91	1006.92		
13217.33	91.19	265.57	8624.00	-455.70	-4789.90	0.00	0.00	4811.53		
13387.33	91.19	265.57	8620.46	-468.82	-4959.36	0.00	0.00	4981.47		

SITE DETAILS: CC 21 Fed. Com 4H	
Site Centre Northing:	440125.60
Site Centre Easting:	609014.30
Positional Uncertainty:	0.00
Convergence:	0.19
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:	CompassC	Local Co-ordinate Reference:	Well CC 21 FC 4H
Company:	OXY	TVD Reference:	KB @ 2951.80usft
Project:	Eddy County, New Mexico	MD Reference:	KB @ 2951.80usft
Site:	Cedar Canyon 21 Fed. Com 4H	North Reference:	Grid
Well:	CC 21 FC 4H	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 21 Fed. Com 4H		
Site Position:	Northing:	440,125.60 usft	Latitude: 32.210
From: Map	Easting:	609,014.30 usft	Longitude: -103.981
Position Uncertainty:	0.00 usft	Slot Radius: 13-3/16 "	Grid Convergence: 0.19 °

Well:	CC 21 FC 4H			
Well Position	+N-S	0.00 usft	Northing: 440,125.60 usft	Latitude: 32.210
	+E-W	0.00 usft	Easting: 609,014.30 usft	Longitude: -103.981
Position Uncertainty	0.00 usft	Wellhead Elevation:	0.00 usft	Ground Level: 2,927.80 usft

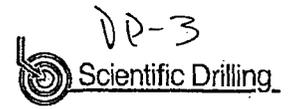
Wellbore:	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	04/24/14	7.42	60.03	48,281

Design:	Design #1			
Audit Notes:				
Version:	Phase:	PROTOTYPE	Tie On Depth: 0.00	
Vertical Section:	Depth From (TVD) (usft)	+N-S (usft)	+E-W (usft)	Direction (°)
	0.00	0.00	0.00	264.60

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
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
7,992.96	0.00	0.00	7,992.96	0.00	0.00	0.00	0.00	0.00	0.00	
9,132.82	91.19	260.00	8,709.00	-126.95	-719.95	8.00	8.00	0.00	260.00	
9,411.35	91.19	265.57	8,703.21	-161.90	-996.11	2.00	0.00	2.00	89.91	
13,217.33	91.19	265.57	8,624.00	-455.70	-4,789.90	0.00	0.00	0.00	0.00	4H LTP
13,387.33	91.19	265.57	8,620.46	-468.82	-4,959.36	0.00	0.00	0.00	0.00	

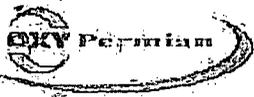


Scientific Drilling  
Planning Report

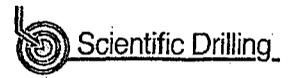


Database:	CompassC	Local Co-ordinate Reference:	Well CC 21 FC 4H
Company:	OXY	TVD Reference:	KB @ 2951.80usft
Project:	Eddy County, New Mexico	MD Reference:	KB @ 2951.80usft
Site:	Cedar Canyon 21 Fed. Com 4H.	North Reference:	Grid
Well:	CC 21 FC 4H	Survey Calculation Method:	Minimum Curvature
Wellbore:	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)	
0.00	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	0.00
200.00	0.00	0.00	200.00	0.00	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	0.00
400.00	0.00	0.00	400.00	0.00	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	0.00
600.00	0.00	0.00	600.00	0.00	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	0.00
800.00	0.00	0.00	800.00	0.00	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	0.00
1,000.00	0.00	0.00	1,000.00	0.00	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	0.00
1,200.00	0.00	0.00	1,200.00	0.00	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	0.00
1,400.00	0.00	0.00	1,400.00	0.00	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	0.00
1,600.00	0.00	0.00	1,600.00	0.00	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	0.00
1,800.00	0.00	0.00	1,800.00	0.00	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	0.00
2,000.00	0.00	0.00	2,000.00	0.00	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	0.00
2,200.00	0.00	0.00	2,200.00	0.00	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	0.00
2,400.00	0.00	0.00	2,400.00	0.00	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	0.00
2,600.00	0.00	0.00	2,600.00	0.00	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	0.00
2,800.00	0.00	0.00	2,800.00	0.00	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	0.00
3,000.00	0.00	0.00	3,000.00	0.00	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	0.00
3,200.00	0.00	0.00	3,200.00	0.00	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	0.00
3,400.00	0.00	0.00	3,400.00	0.00	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	0.00
3,600.00	0.00	0.00	3,600.00	0.00	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	0.00
3,800.00	0.00	0.00	3,800.00	0.00	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	0.00
4,000.00	0.00	0.00	4,000.00	0.00	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	0.00
4,200.00	0.00	0.00	4,200.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4,300.00	0.00	0.00	4,300.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4,400.00	0.00	0.00	4,400.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4,500.00	0.00	0.00	4,500.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4,600.00	0.00	0.00	4,600.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4,700.00	0.00	0.00	4,700.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4,800.00	0.00	0.00	4,800.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4,900.00	0.00	0.00	4,900.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5,000.00	0.00	0.00	5,000.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5,100.00	0.00	0.00	5,100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5,200.00	0.00	0.00	5,200.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5,300.00	0.00	0.00	5,300.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00



# Scientific Drilling Planning Report

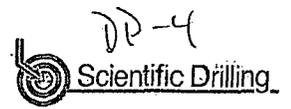


Database:	CompassC	Local Co-ordinate Reference:	Well CC 21 FC 4H
Company:	OXY	TVD Reference:	KB @ 2951.80usft
Project:	Eddy County, New Mexico	MD Reference:	KB @ 2951.80usft
Site:	Cedar Canyon 21 Fed. Com 4H	North Reference:	Grid
Well:	CC 21 FC 4H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1		

### Planned Survey

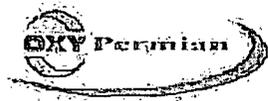
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N-S (usft)	+E-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
5,400.00	0.00	0.00	5,400.00	0.00	0.00	0.00	0.00	0.00	0.00	
5,500.00	0.00	0.00	5,500.00	0.00	0.00	0.00	0.00	0.00	0.00	
5,600.00	0.00	0.00	5,600.00	0.00	0.00	0.00	0.00	0.00	0.00	
5,700.00	0.00	0.00	5,700.00	0.00	0.00	0.00	0.00	0.00	0.00	
5,800.00	0.00	0.00	5,800.00	0.00	0.00	0.00	0.00	0.00	0.00	
5,900.00	0.00	0.00	5,900.00	0.00	0.00	0.00	0.00	0.00	0.00	
6,000.00	0.00	0.00	6,000.00	0.00	0.00	0.00	0.00	0.00	0.00	
6,100.00	0.00	0.00	6,100.00	0.00	0.00	0.00	0.00	0.00	0.00	
6,200.00	0.00	0.00	6,200.00	0.00	0.00	0.00	0.00	0.00	0.00	
6,300.00	0.00	0.00	6,300.00	0.00	0.00	0.00	0.00	0.00	0.00	
6,400.00	0.00	0.00	6,400.00	0.00	0.00	0.00	0.00	0.00	0.00	
6,500.00	0.00	0.00	6,500.00	0.00	0.00	0.00	0.00	0.00	0.00	
6,600.00	0.00	0.00	6,600.00	0.00	0.00	0.00	0.00	0.00	0.00	
6,700.00	0.00	0.00	6,700.00	0.00	0.00	0.00	0.00	0.00	0.00	
6,800.00	0.00	0.00	6,800.00	0.00	0.00	0.00	0.00	0.00	0.00	
6,900.00	0.00	0.00	6,900.00	0.00	0.00	0.00	0.00	0.00	0.00	
7,000.00	0.00	0.00	7,000.00	0.00	0.00	0.00	0.00	0.00	0.00	
7,100.00	0.00	0.00	7,100.00	0.00	0.00	0.00	0.00	0.00	0.00	
7,200.00	0.00	0.00	7,200.00	0.00	0.00	0.00	0.00	0.00	0.00	
7,300.00	0.00	0.00	7,300.00	0.00	0.00	0.00	0.00	0.00	0.00	
7,400.00	0.00	0.00	7,400.00	0.00	0.00	0.00	0.00	0.00	0.00	
7,500.00	0.00	0.00	7,500.00	0.00	0.00	0.00	0.00	0.00	0.00	
7,600.00	0.00	0.00	7,600.00	0.00	0.00	0.00	0.00	0.00	0.00	
7,700.00	0.00	0.00	7,700.00	0.00	0.00	0.00	0.00	0.00	0.00	
7,800.00	0.00	0.00	7,800.00	0.00	0.00	0.00	0.00	0.00	0.00	
7,900.00	0.00	0.00	7,900.00	0.00	0.00	0.00	0.00	0.00	0.00	
7,992.96	0.00	0.00	7,992.96	0.00	0.00	0.00	0.00	0.00	0.00	
8,000.00	0.56	260.00	8,000.00	-0.01	-0.03	0.03	8.00	8.00	0.00	
8,050.00	4.56	260.00	8,049.94	-0.39	-2.24	2.26	8.00	8.00	0.00	
8,100.00	8.56	260.00	8,099.60	-1.39	-7.86	7.96	8.00	8.00	0.00	
8,150.00	12.56	260.00	8,148.74	-2.98	-16.89	17.09	8.00	8.00	0.00	
8,200.00	16.56	260.00	8,197.13	-5.16	-29.27	29.62	8.00	8.00	0.00	
8,250.00	20.56	260.00	8,244.52	-7.92	-44.94	45.49	8.00	8.00	0.00	
8,300.00	24.56	260.00	8,290.68	-11.25	-63.83	64.60	8.00	8.00	0.00	
8,350.00	28.56	260.00	8,335.39	-15.14	-85.84	86.89	8.00	8.00	0.00	
8,400.00	32.56	260.00	8,378.44	-19.55	-110.88	112.22	8.00	8.00	0.00	
8,450.00	36.56	260.00	8,419.61	-24.48	-138.81	140.49	8.00	8.00	0.00	
8,500.00	40.56	260.00	8,458.69	-29.89	-169.50	171.56	8.00	8.00	0.00	
8,514.75	41.74	260.00	8,469.80	-31.57	-179.05	181.23	8.00	8.00	0.00	
<b>2nd Bone Spring Sand</b>										
8,550.00	44.56	260.00	8,495.51	-35.76	-202.79	205.26	8.00	8.00	0.00	
8,600.00	48.56	260.00	8,529.88	-42.06	-238.54	241.44	8.00	8.00	0.00	
8,650.00	52.56	260.00	8,561.64	-48.77	-276.56	279.93	8.00	8.00	0.00	
8,700.00	56.56	260.00	8,590.62	-55.84	-316.68	320.52	8.00	8.00	0.00	
8,750.00	60.56	260.00	8,616.70	-63.24	-358.68	363.04	8.00	8.00	0.00	
8,800.00	64.56	260.00	8,639.73	-70.95	-402.37	407.26	8.00	8.00	0.00	
8,850.00	68.56	260.00	8,659.61	-78.91	-447.54	452.98	8.00	8.00	0.00	
8,900.00	72.56	260.00	8,676.25	-87.10	-493.97	499.97	8.00	8.00	0.00	
8,950.00	76.56	260.00	8,689.55	-95.47	-541.42	548.00	8.00	8.00	0.00	
9,000.00	80.56	260.00	8,699.47	-103.98	-589.67	596.84	8.00	8.00	0.00	
9,050.00	84.56	260.00	8,705.94	-112.58	-638.49	646.25	8.00	8.00	0.00	
9,100.00	88.56	260.00	8,708.93	-121.25	-687.63	695.99	8.00	8.00	0.00	
9,132.82	91.19	260.00	8,709.00	-126.95	-719.95	728.70	8.00	8.00	0.00	

# Scientific Drilling Planning Report

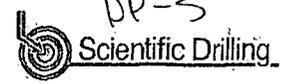


<b>Database:</b>	CompassC	<b>Local Co-ordinate Reference:</b>	Well CC 21 FC 4H
<b>Company:</b>	OXY	<b>TVD Reference:</b>	KB @ 2951.80usft
<b>Project:</b>	Eddy County, New Mexico	<b>MD Reference:</b>	KB @ 2951.80usft
<b>Site:</b>	Cedar Canyon 21 Fed. Com 4H	<b>North Reference:</b>	Grid
<b>Well:</b>	CC 21 FC 4H	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	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)		
9,200.00	91.19	261.34	8,707.61	-137.83	-786.23	795.71	2.00	0.00	2.00		
9,300.00	91.19	263.34	8,705.53	-151.15	-885.31	895.60	2.00	0.00	2.00		
9,400.00	91.19	265.34	8,703.45	-161.00	-984.79	995.58	2.00	0.00	2.00		
9,411.35	91.19	265.57	8,703.21	-161.90	-996.11	1,006.92	2.00	0.00	2.00		
9,500.00	91.19	265.57	8,701.37	-168.75	-1,084.47	1,095.54	0.00	0.00	0.00		
9,600.00	91.19	265.57	8,699.28	-176.47	-1,184.15	1,195.50	0.00	0.00	0.00		
9,700.00	91.19	265.57	8,697.20	-184.18	-1,283.83	1,295.47	0.00	0.00	0.00		
9,800.00	91.19	265.57	8,695.12	-191.90	-1,383.51	1,395.43	0.00	0.00	0.00		
9,900.00	91.19	265.57	8,693.04	-199.62	-1,483.19	1,495.40	0.00	0.00	0.00		
10,000.00	91.19	265.57	8,690.96	-207.34	-1,582.87	1,595.36	0.00	0.00	0.00		
10,100.00	91.19	265.57	8,688.88	-215.06	-1,682.55	1,695.32	0.00	0.00	0.00		
10,200.00	91.19	265.57	8,686.80	-222.78	-1,782.23	1,795.29	0.00	0.00	0.00		
10,300.00	91.19	265.57	8,684.72	-230.50	-1,881.91	1,895.25	0.00	0.00	0.00		
10,400.00	91.19	265.57	8,682.63	-238.22	-1,981.59	1,995.22	0.00	0.00	0.00		
10,500.00	91.19	265.57	8,680.55	-245.94	-2,081.27	2,095.18	0.00	0.00	0.00		
10,600.00	91.19	265.57	8,678.47	-253.66	-2,180.95	2,195.14	0.00	0.00	0.00		
10,700.00	91.19	265.57	8,676.39	-261.38	-2,280.63	2,295.11	0.00	0.00	0.00		
10,800.00	91.19	265.57	8,674.31	-269.10	-2,380.31	2,395.07	0.00	0.00	0.00		
10,900.00	91.19	265.57	8,672.23	-276.82	-2,479.99	2,495.04	0.00	0.00	0.00		
11,000.00	91.19	265.57	8,670.15	-284.54	-2,579.67	2,595.00	0.00	0.00	0.00		
11,100.00	91.19	265.57	8,668.07	-292.26	-2,679.35	2,694.96	0.00	0.00	0.00		
11,200.00	91.19	265.57	8,665.98	-299.98	-2,779.03	2,794.93	0.00	0.00	0.00		
11,300.00	91.19	265.57	8,663.90	-307.69	-2,878.71	2,894.89	0.00	0.00	0.00		
11,400.00	91.19	265.57	8,661.82	-315.41	-2,978.39	2,994.86	0.00	0.00	0.00		
11,500.00	91.19	265.57	8,659.74	-323.13	-3,078.07	3,094.82	0.00	0.00	0.00		
11,600.00	91.19	265.57	8,657.66	-330.85	-3,177.75	3,194.78	0.00	0.00	0.00		
11,700.00	91.19	265.57	8,655.58	-338.57	-3,277.43	3,294.75	0.00	0.00	0.00		
11,800.00	91.19	265.57	8,653.50	-346.29	-3,377.11	3,394.71	0.00	0.00	0.00		
11,900.00	91.19	265.57	8,651.42	-354.01	-3,476.79	3,494.68	0.00	0.00	0.00		
12,000.00	91.19	265.57	8,649.34	-361.73	-3,576.47	3,594.64	0.00	0.00	0.00		
12,100.00	91.19	265.57	8,647.25	-369.45	-3,676.15	3,694.60	0.00	0.00	0.00		
12,200.00	91.19	265.57	8,645.17	-377.17	-3,775.83	3,794.57	0.00	0.00	0.00		
12,300.00	91.19	265.57	8,643.09	-384.89	-3,875.51	3,894.53	0.00	0.00	0.00		
12,400.00	91.19	265.57	8,641.01	-392.61	-3,975.19	3,994.49	0.00	0.00	0.00		
12,500.00	91.19	265.57	8,638.93	-400.33	-4,074.87	4,094.46	0.00	0.00	0.00		
12,600.00	91.19	265.57	8,636.85	-408.05	-4,174.55	4,194.42	0.00	0.00	0.00		
12,700.00	91.19	265.57	8,634.77	-415.77	-4,274.23	4,294.39	0.00	0.00	0.00		
12,800.00	91.19	265.57	8,632.69	-423.48	-4,373.91	4,394.35	0.00	0.00	0.00		
12,900.00	91.19	265.57	8,630.60	-431.20	-4,473.59	4,494.31	0.00	0.00	0.00		
13,000.00	91.19	265.57	8,628.52	-438.92	-4,573.27	4,594.28	0.00	0.00	0.00		
13,100.00	91.19	265.57	8,626.44	-446.64	-4,672.95	4,694.24	0.00	0.00	0.00		
13,200.00	91.19	265.57	8,624.36	-454.36	-4,772.63	4,794.21	0.00	0.00	0.00		
13,217.33	91.19	265.57	8,624.00	-455.70	-4,789.90	4,811.53	0.00	0.00	0.00		
13,300.00	91.19	265.57	8,622.28	-462.08	-4,872.31	4,894.17	0.00	0.00	0.00		
13,387.33	91.19	265.57	8,620.46	-468.82	-4,959.36	4,981.47	0.00	0.00	0.00		



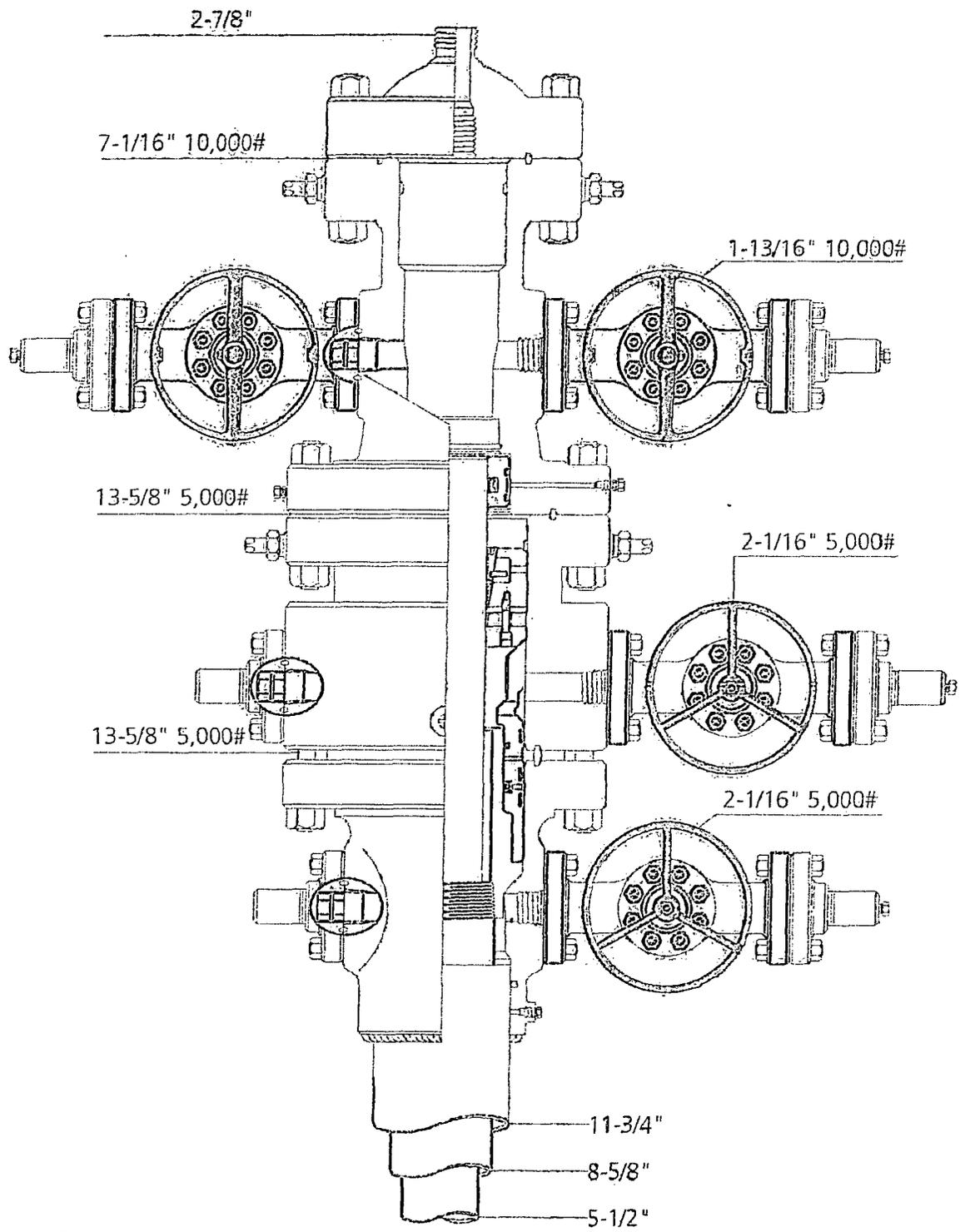
**Scientific Drilling**  
Planning Report



Database:	CompassC	Local Co-ordinate Reference:	Well CC 21 FC 4H
Company:	OXY	TVD Reference:	KB @ 2951.80usft
Project:	Eddy County, New Mexico	MD Reference:	KB @ 2951.80usft
Site:	Cedar Canyon 21 Fed. Com 4H	North Reference:	Grid
Well:	CC 21 FC 4H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1		

Design Targets									
Target Name	Dip Angle	Dip Dir.	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
hit/miss target	(°)	(°)	(usft)	(usft)	(usft)	(usft)	(usft)		
CC 4H BHL	0.00	0.00	8,620.46	-468.82	-4,959.36	439,656.78	604,054.94	32.208	-103.997
- plan misses target center by 0.01usft at 13387.33usft MD (8620.46 TVD, -468.82 N, -4959.36 E)									
- Point									
4H LTP	0.00	0.00	8,624.00	-455.70	-4,789.90	439,669.90	604,224.40	32.208	-103.996
- plan hits target center									
- Point									
4H PP	0.00	0.00	8,709.00	-101.00	-179.80	440,024.60	608,834.50	32.209	-103.981
- plan misses target center by 182.90usft at 8665.19usft MD (8570.74 TVD, -50.88 N, -288.54 E)									
- Point									

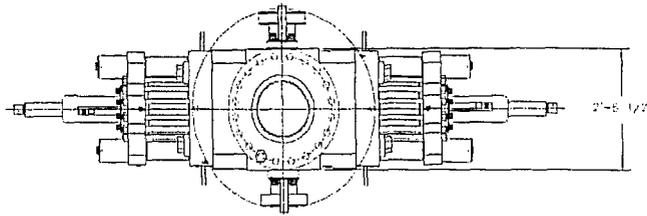
Formations						
Measured Depth	Vertical Depth	Name	Lithology	Dip	Dip Direction	
(usft)	(usft)			(°)	(°)	
8,514.75	8,469.80	2nd Bone Spring Sand		0.00		



Permian Basin  
MBS



Make	Jeanette	Date	1-31-13	Working Pressure	#	21073221
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**LEGEND**

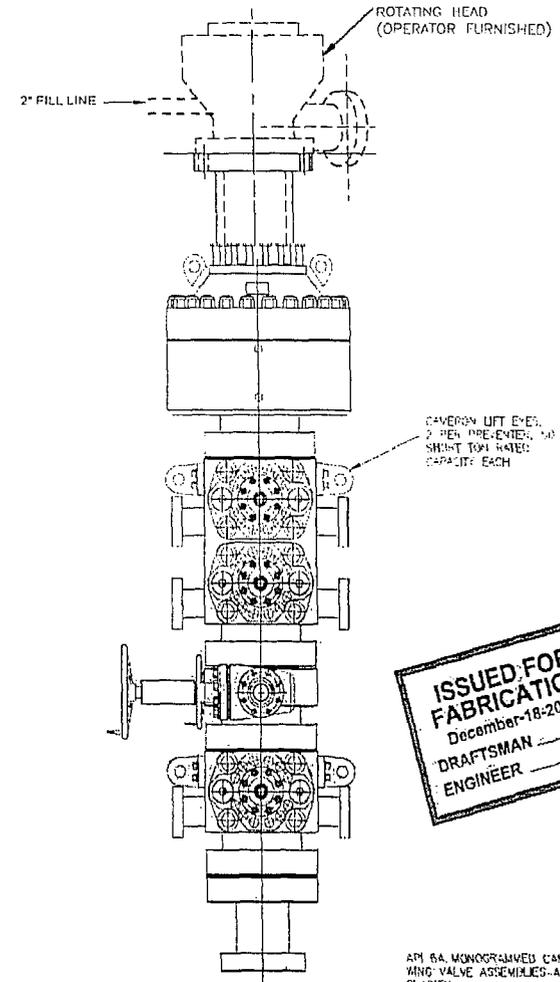
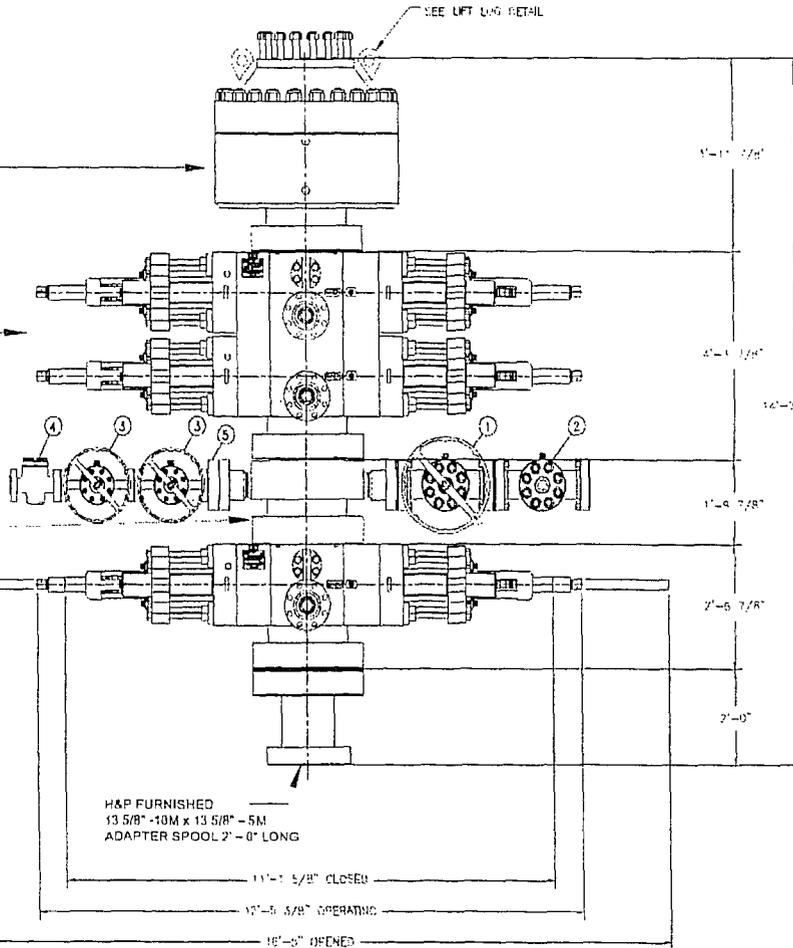
- ① - 1 1/16"-10M FLANGED END GATE VALVE
- ② - 1 1/16"-10M FLANGED END GATE VALVE WITH DOUBLE ACTING HYDRAULIC ACTUATOR
- ③ - 1 1/16"-10M FLANGED END GATE VALVE
- ④ - 1 1/16"-10M FLANGED END GATE VALVE
- ⑤ - DOUBLE STUDDED ASSEMBLY

SHAFFER BOLTES-COVER SPHERICAL ANNUULAR PREVENTER (API 14-2 MONOGRAMMED, 13 5/8"-10M WPI, 150" BOTTOM FLANGE x 48" STUCCED TOP WEIGHT = 14,000 LBS WITH SHAFFER API 16A HOT OIL RESISTANT ADHERENTIVE ELEMENT)

CAMERON LW DOUBLE RAM-TYPE PREVENTER (API 16A MONOGRAMMED, 13 5/8"-10M WPI, WITH 5" CAMERON PIPE RAMS (CAMRAM FRONT PACKERS & TOP SEALS) IN TOP CAVITY AND CAMERON LW SHEARING PILING RAMS IN BOTTOM CAVITY, BOTTOM FLANGE x STUCCED TOP (WEIGHT = 21,100 LBS. WITH RAMS)

13 5/8"-10M WPI CAMERON DRILLING SPOOL (API 16A MONOGRAMMED), STUCCED TOP x FLANGED BOTTOM WITH 4 1 1/16"-10M WPI FLANGED OUTLETS (WEIGHT APPROXIMATELY 6,000 LBS)

CAMERON LW SINGLE RAM-TYPE PREVENTER (API 16A MONOGRAMMED, 13 5/8"-10M WPI, WITH 5" CAMERON PIPE RAMS (CAMRAM FRONT PACKERS & TOP SEALS), BOTTOM FLANGE x STUCCED TOP WEIGHT = 10,000 LBS



**ISSUED FOR FABRICATION**  
December-18-2007  
DRAFTSMAN \_\_\_\_\_  
ENGINEER \_\_\_\_\_

API 16A MONOGRAMMED CAMERON CHOKER AND FILLING VALVE ASSEMBLIES ARE NOT SHOWN FOR CLARITY

WEIGHTS DO NOT INCLUDE HOSES, ADAPTER SPOOLS OR QUICK CONNECT FITTINGS

**13 5/8" - 10M BOP STACK WITH 13 5/8" - 5M ANNULAR**

**PROPRIETARY**

THIS DRAWING AND THE IDEAS AND INFORMATION INCLUDED IN THIS DRAWING ARE PROPRIETARY AND ARE NOT TO BE REPRODUCED, DISTRIBUTED OR DISCLOSED IN ANY MANNER WITHOUT THE PRIOR WRITTEN CONSENT OF A DESIGNATED OFFICER OF HELMERICH & PAYNE INT'L DRILLING CO.

**HELMERICH & PAYNE INTERNATIONAL DRILLING CO.**

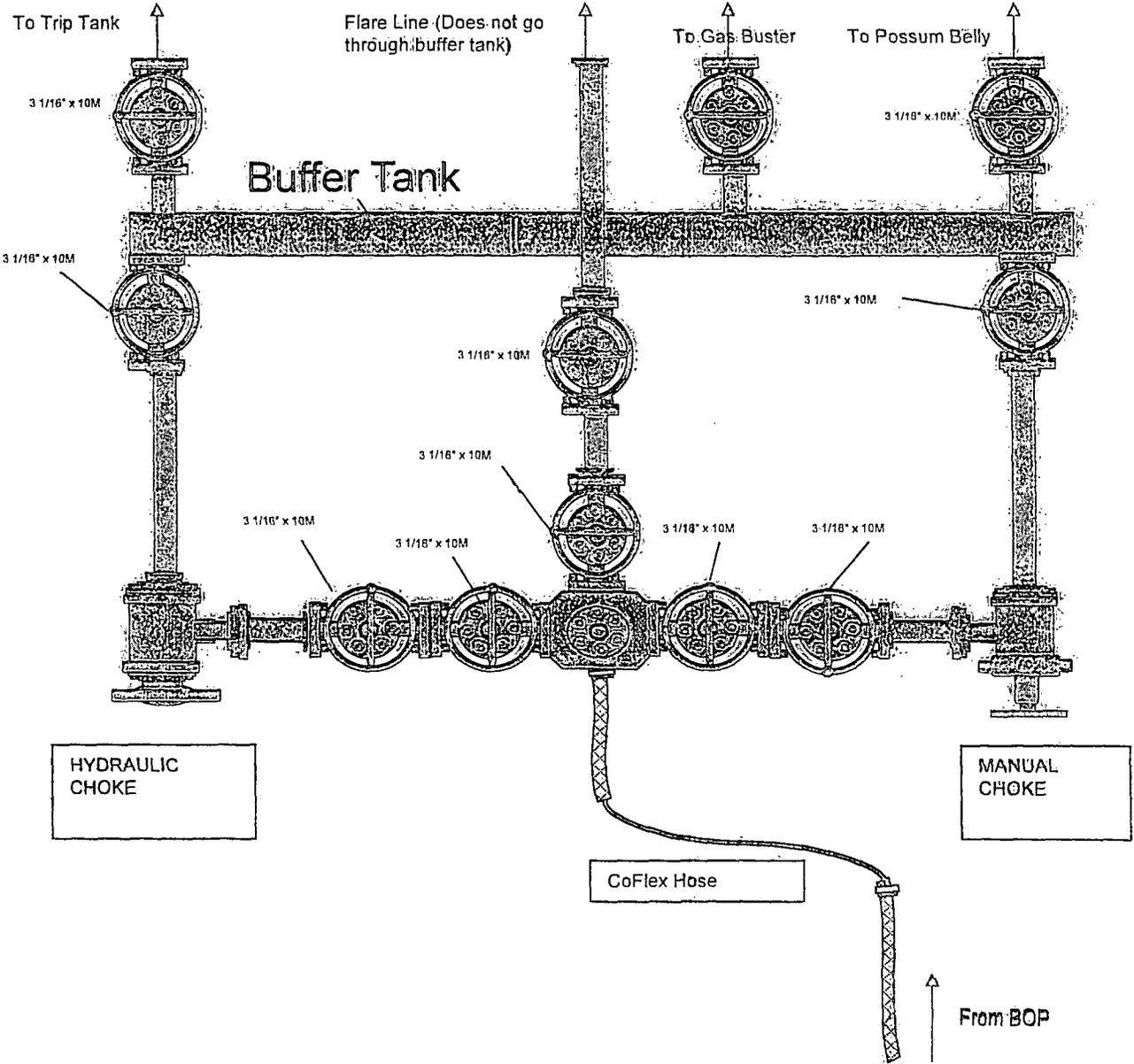
ENGINEERING APPROVAL		DATE	TITLE
AV	ADDED SHEET 01	12/18/07	13 5/8" - 10M BOP 3 RAM STACK 'FLEXRIG3'
JGC	ADDED TO SPACER, ADAPTER SPOOL	4-16-07	CUSTOMER: H&P
JGC	ADDED TO SPACER, ADAPTER SPOOL	4-24-07	PROJECT: FLEXRIG3
VAL	ADDED ADAPTER SPOOL	07-07-07	DRAWN: NTS
VAL	CONNECTED BOP STACK	06-13-02	DATE: 06-05-02
REV	DATE	DESCRIPTION	BY

SCALE: 3/4"=1' SHEET: 1 OF 1

210-P1-07

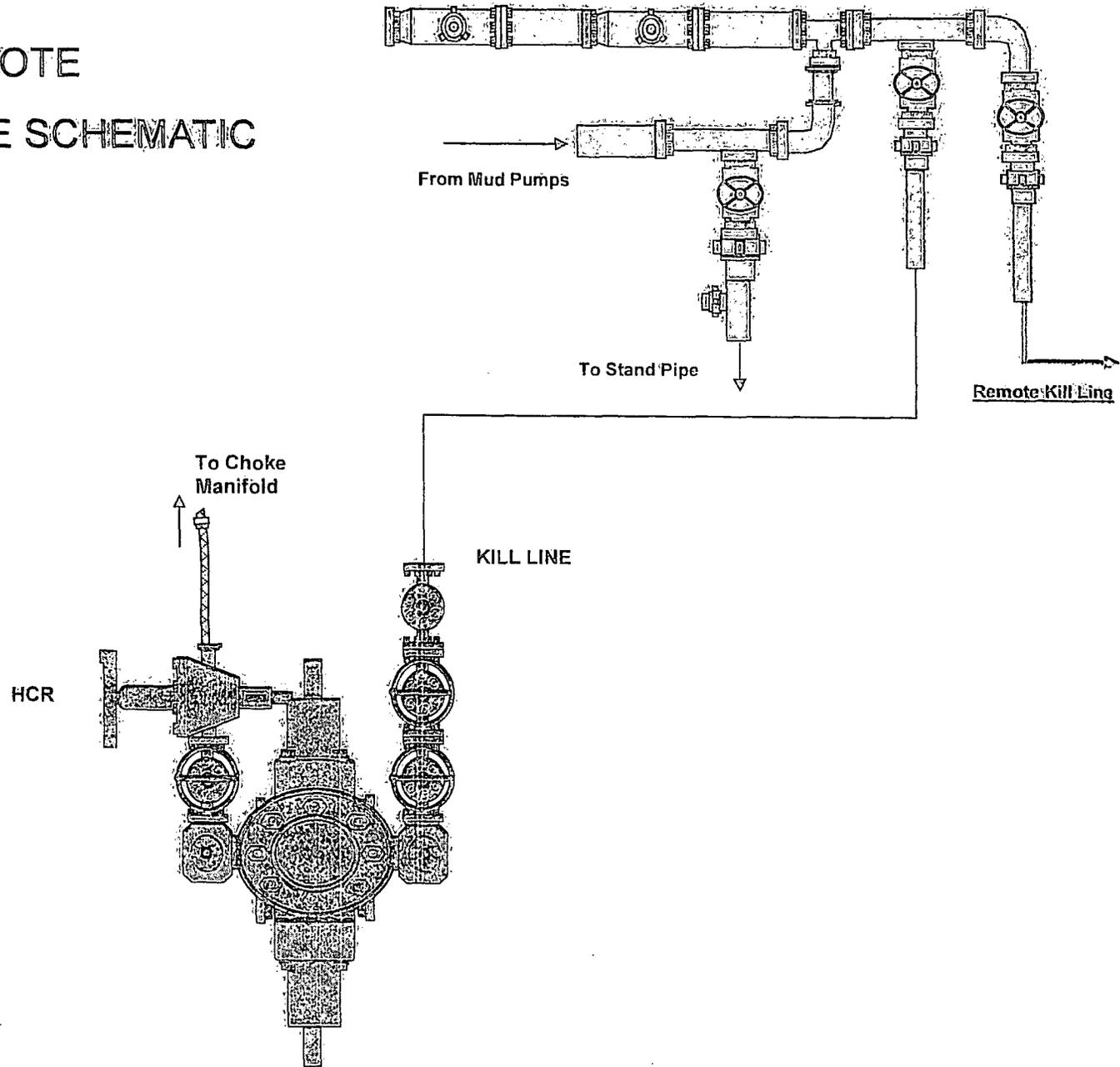
BOP-1

# FLEX3 STD CHOKE MANIFOLD (COMPREHENSIVE)



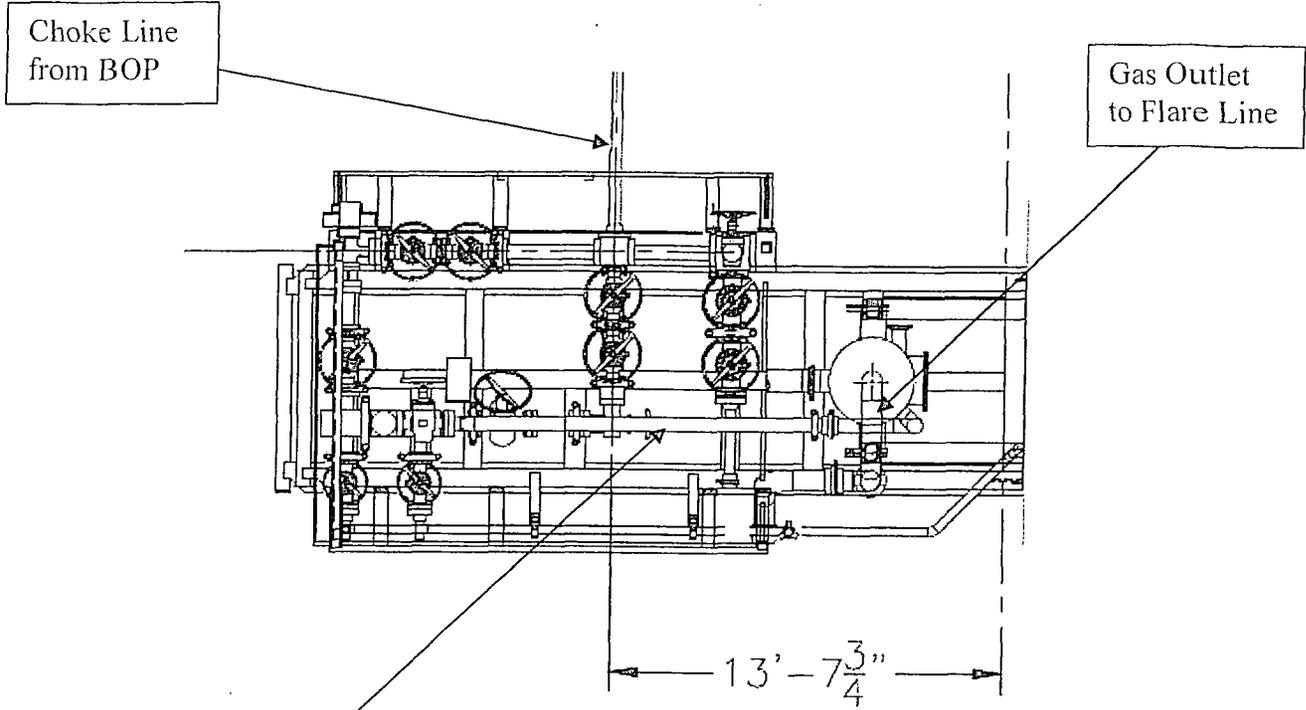
CM-1

# 10M REMOTE KILL LINE SCHEMATIC

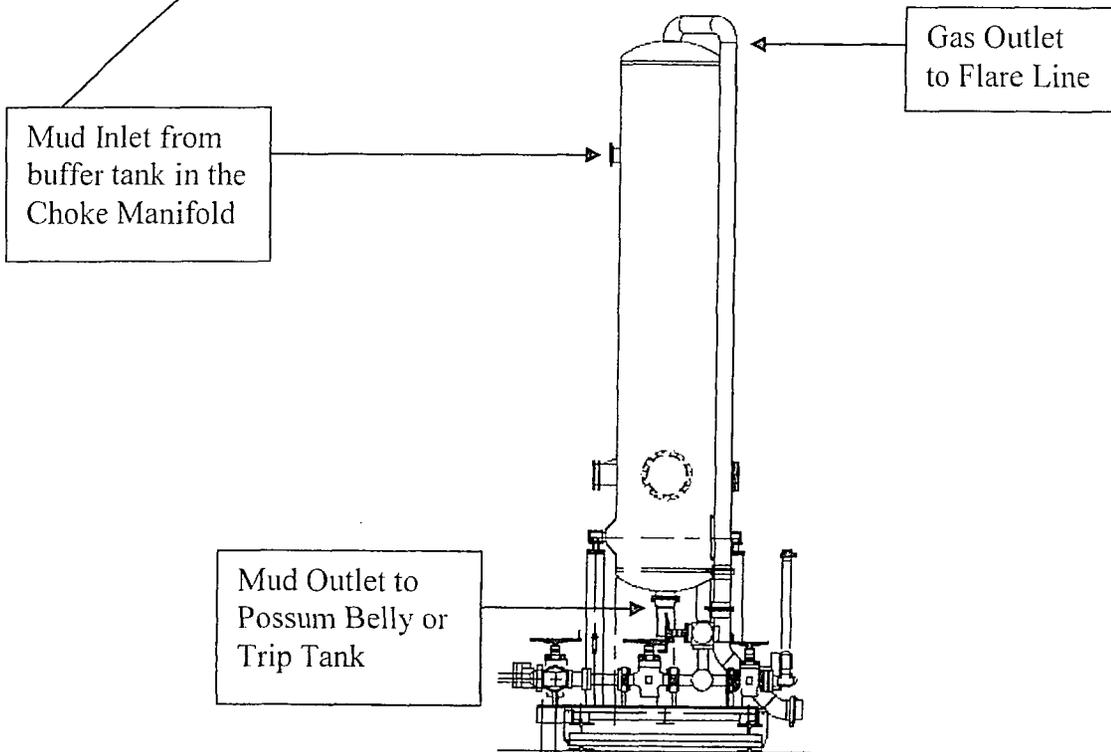


CM-2

### Choke Manifold – Gas Separator (Top View)

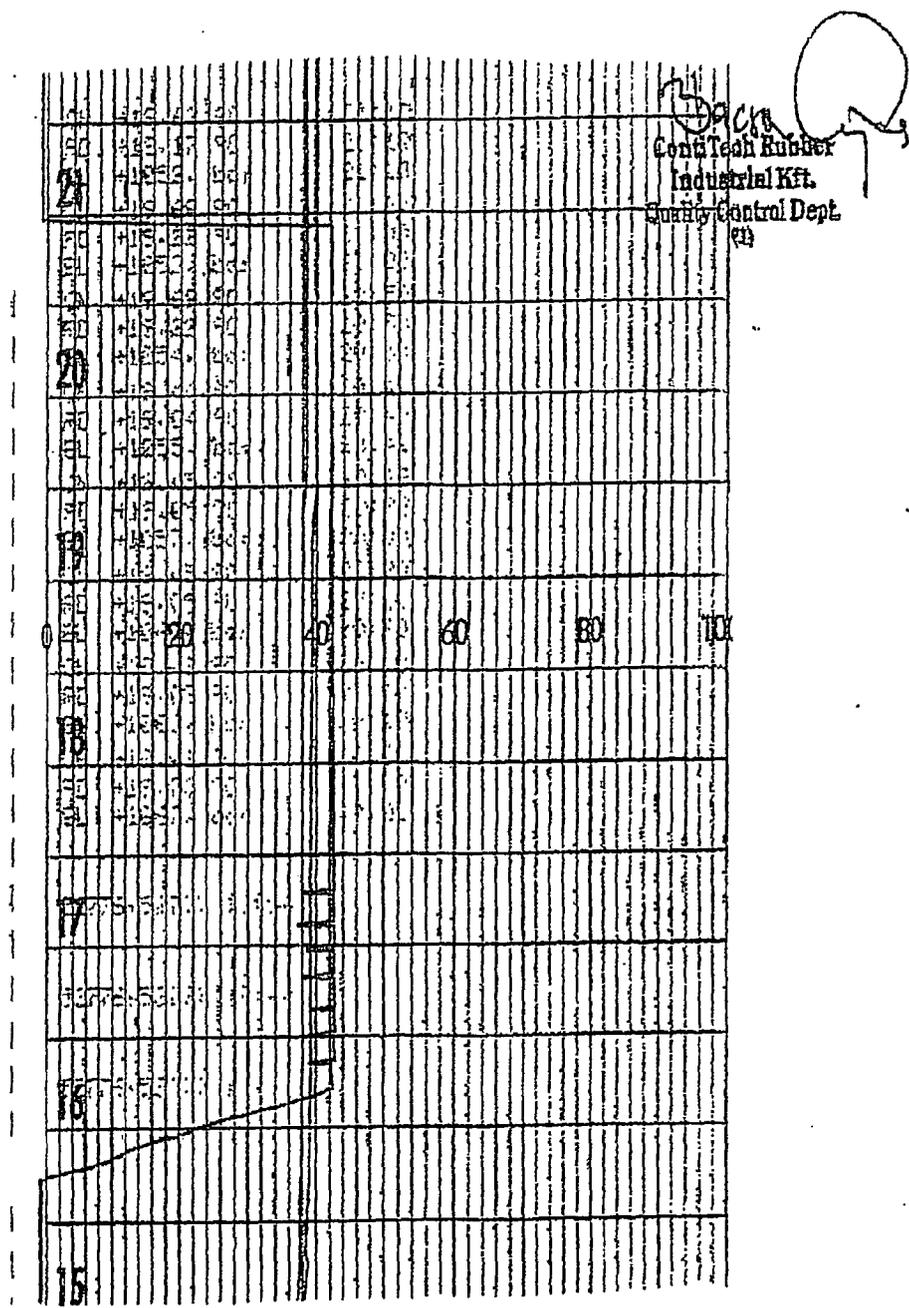


### Choke Manifold – Gas Separator (Side View)





Coflex Hose Certification





**Phoenix Beattie Corp**

11535 Brittonshire Park Drive  
Houston, TX 77041  
Tel: (832) 327-0141  
Fax: (832) 327-0148  
E-mail: mail@phoenixbeattie.com  
www.phoenixbeattie.com

## Delivery Note

<b>Customer Order Number</b>	370-369-001	<b>Delivery Note Number</b>	003078	<b>Page</b>	2
<b>Customer / Invoice Address</b> HELMERICH & PAYNE INT'L DRILLING CO 1437 SOUTH BOULDER TULSA, OK 74119		<b>Delivery / Address</b> HELMERICH & PAYNE IDC ATTN: JOE STEPHENSON - RIG 370 13609 INDUSTRIAL ROAD HOUSTON, TX 77015			

<b>Customer Acc No</b>	<b>Phoenix Beattie Contract Manager</b>	<b>Phoenix Beattie Reference</b>	<b>Date</b>
H01	JJL	006330	05/23/2008

Item No	Beattie Part Number / Description	Qty Ordered	Qty Sent	Qty To Follow
4	SC725-132CS SAFETY CLAMP 132MM 7.25T C/S GALVANIZED C/W BOLTS	1	1	0
5	00CERT-HYDRO HYDROSTATIC PRESSURE TEST CERTIFICATE	1	1	0
6	00CERT-LOAD LOAD TEST CERTIFICATES	1	1	0
7	00FREIGHT INBOUND / OUTBOUND FREIGHT PRE-PAY & ADD TO FINAL INVOICE NOTE: MATERIAL MUST BE ACCOMPANIED BY PAPERWORK INCLUDING THE PURCHASE ORDER, RIG NUMBER TO ENSURE PROPER PAYMENT	1	1	0

Phoenix Beattie Inspection Signature :

Received In Good Condition : Signature

Print Name

Date

All goods remain the property of Phoenix Beattie until paid for in full. Any damage or shortage on this delivery must be advised within 5 days. Returns may be subject to a handling charge.

Coflex Hose Certification

Form No 100/12



**Phoenix Beattie Corp**

11535 Britton Park Drive  
Houston, TX 77041  
Tel: (832) 327-0142  
Fax: (832) 327-0148  
E-mail: mail@phoenixbeattie.com  
www.phoenixbeattie.com

**Delivery Note**

<b>Customer Order Number</b>	370-359-001	<b>Delivery Note Number</b>	003078	<b>Page</b>	1
<b>Customer / Invoice Address</b> HELMERICH & PAYNE INT'L DRILLING CO 1437 SOUTH BOULDER TULSA, OK 74119		<b>Delivery / Address</b> HELMERICH & PAYNE IDC ATTN: JOE STEPHENSON - RIG 370 13609 INDUSTRIAL ROAD HOUSTON, TX 77015			

<b>Customer Acc No</b>	<b>Phoenix Beattie Contract Manager</b>	<b>Phoenix Beattie Reference</b>	<b>Date</b>
H01	JJL	006330	05/23/2008

Item No	Beattie Part Number / Description	Qty Ordered	Qty Sent	Qty To Follow
1	HP10CK3A-35-4F1 3" 10K 16C C&K HOSE x 35ft OAL CW 4.1/16" API SPEC FLANGE E/ End 1: 4.1/16" 10Kpsi API Spec 6A Type 6BX Flange End 2: 4.1/16" 10Kpsi API Spec 6A Type 6BX Flange c/w BX155 Standard ring groove at each end Suitable for H2S Service Working pressure: 10,000psi Test pressure: 15,000psi Standard: API 16C Full specification Armor Guarding: Included Fire Rating: Not Included Temperature rating: -20 Deg C to +100 Deg C	1	1	0
2	SECK3-HPF3 LIFTING & SAFETY EQUIPMENT TO SUIT HP10CK3-35-F1 2 x 160mm ID Safety Clamps 2 x 244mm ID Lifting Collars & element C's 2 x 7ft Stainless Steel wire rope 3/4" OD 4 x 7.75t Shackles	1	1	0
3	SC725-200CS SAFETY CLAMP 200MM 7.25T C/S GALVANISED	1	1	0

Continued...

All goods remain the property of Phoenix Beattie until paid for in full. Any damage or shortage on this delivery must be advised within 5 days. Returns may be subject to a handling charge.



CERTIFICATE OF CONFORMITY

Supplier : CONTITECH RUBBER INDUSTRIAL KFT.  
Equipment: 6 pcs. Choke and Kill Hose with installed couplings  
Type: 3" x 10,67 m WP: 10000 psi  
Supplier File Number : 412638  
Date of Shipment : April. 2008  
Customer : Phoenix Beattie Co.  
Customer P.o. : 002491  
Referenced Standards  
/ Codes / Specifications : API Spec 16 C  
Serial No.: 52754,52755,52776,52777,52778,52782

STATEMENT OF CONFORMITY

We hereby certify that the above items/equipment supplied by us are in conformity with the terms, conditions and specifications of the above Purchaser Order and that these items/equipment were fabricated inspected and tested in accordance with the referenced standards, codes and specifications and meet the relevant acceptance criteria and design requirements.

COUNTRY OF ORIGIN HUNGARY/EU

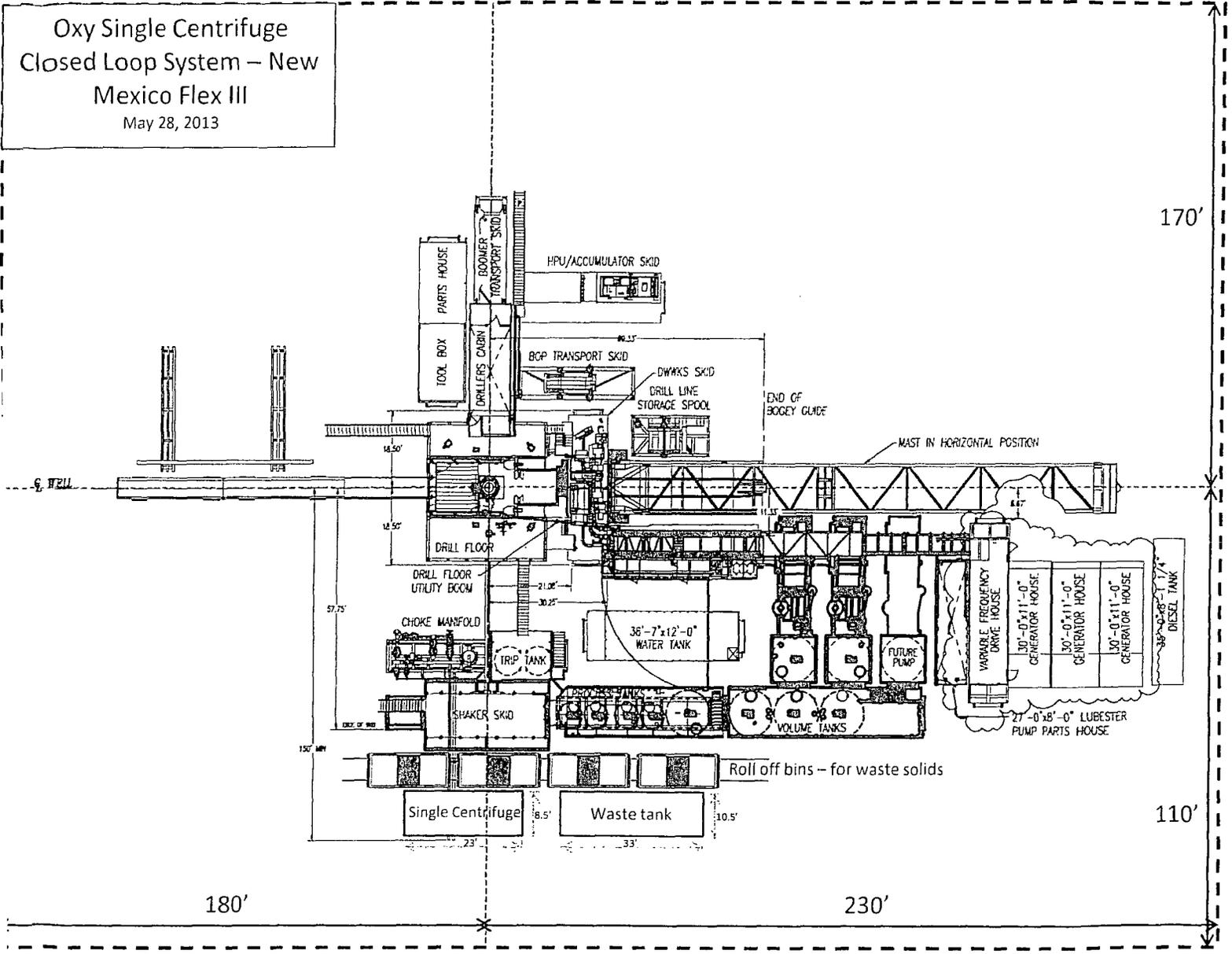
Signed : 

Position: Q.C. Manager

ContiTech Rubber  
Industrial Kft.  
Quality Control Dept.  
(1)

Date: 04. April. 2008

Oxy Single Centrifuge  
Closed Loop System – New  
Mexico Flex III  
May 28, 2013



Single Centrifuge

Waste tank

Roll off bins – for waste solids

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  
DIESEL TANK

36'-7"x12'-0" WATER TANK

VOLUME TANKS

FUTURE PUMP

SHAKER SKID

TRIP TANK

CHOKE MANIFOLD

DRILL FLOOR UTILITY BOOM

DRILL FLOOR

END OF BOGEY GUIDE

MAST IN HORIZONTAL POSITION

DRUMS SKID

GRILL LINE STORAGE SPOOL

BCP TRANSPORT SKID

HPU/ACCUMULATOR SKID

TOOL BOX

PARTS HOUSE

BOOMER TRANSPORT SKID

DRILLERS CABIN

S. WELL

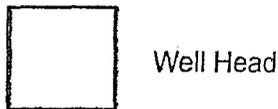
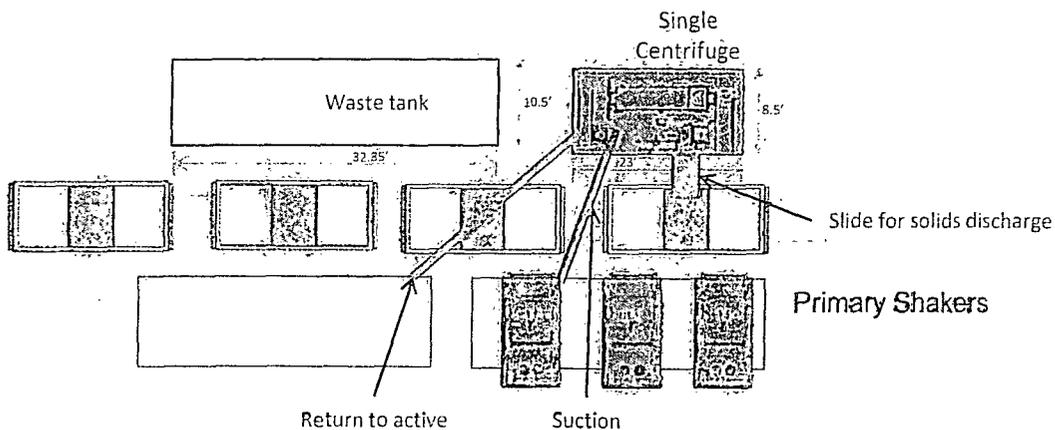
180'

230'

170'

110'

Oxy



Oxy Single Centrifuge  
Closed Loop System – New  
Mexico Flex III  
May 28, 2013

▲ H2S Detectors. At least three detectors will be installed: bell nipple, rig floor and Shakers.

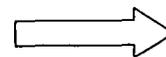
● Briefing Areas. At least two briefing areas will be placed, 90 deg off.

■ 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.

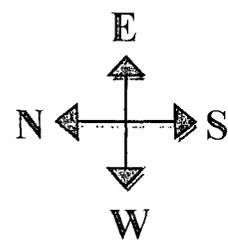
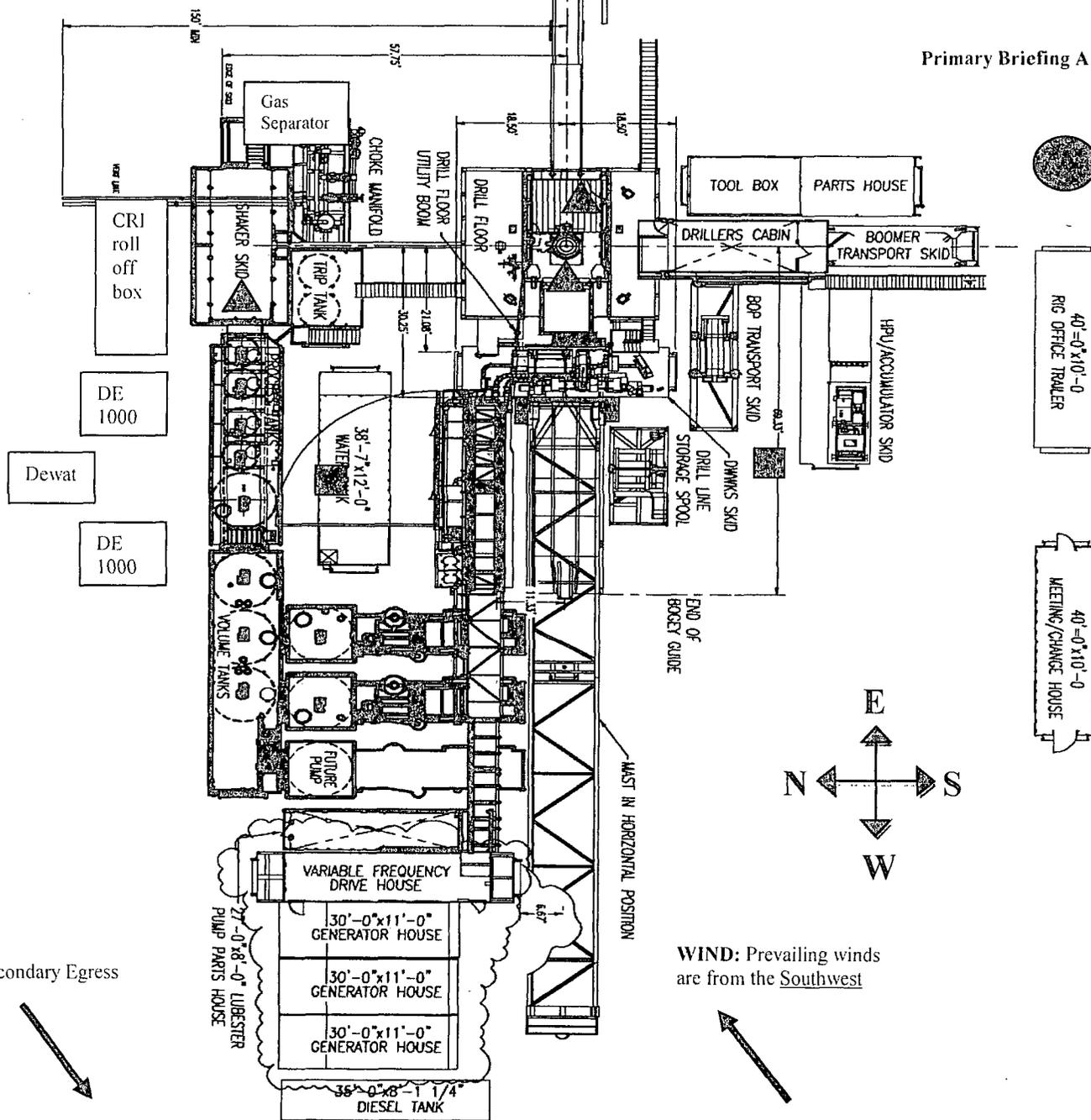
Secondary Briefing Area

Rig Layout



Exit to road. Caution sign placed here.

Primary Briefing Area

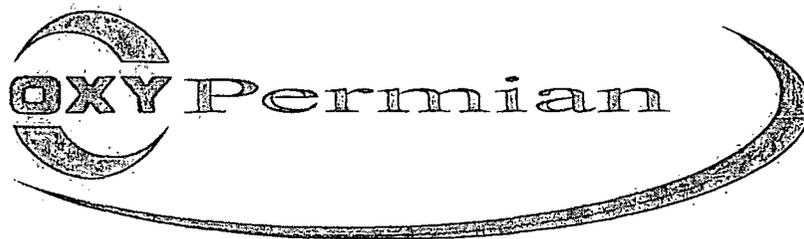


WIND: Prevailing winds are from the Southwest



Secondary Egress





**Permian Drilling  
Hydrogen Sulfide Drilling Operations Plan  
Cedar Canyon 21 Fed Com 4H**

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.



# Permian Drilling Hydrogen Sulfide Drilling Operations Plan New Mexico

## Scope

This contingency plan establishes guidelines for the public, all company employees, and contract employees who's work activities may involve exposure to hydrogen sulfide (H2S) gas.

While drilling this well, it is possible to encounter H2S bearing formations. At all times, the first barrier to control H2S emissions will be the drilling fluid, which will have a density high enough to control influx.

## Objective

1. Provide an immediate and predetermined response plan to any condition when H2S is detected. All H2S detections in excess of 10 parts per million (ppm) concentration are considered an Emergency.
2. Prevent any and all accidents, and prevent the uncontrolled release of hydrogen sulfide into the atmosphere.
3. Provide proper evacuation procedures to cope with emergencies.
4. Provide immediate and adequate medical attention should an injury occur.

### Discussion

Implementation:	This plan with all details is to be fully implemented before drilling to <u>commence</u> .
Emergency response Procedure:	This section outlines the conditions and denotes steps to be taken in the event of an emergency.
Emergency equipment Procedure:	This section outlines the safety and emergency equipment that will be required for the drilling of this well.
Training provisions:	This section outlines the training provisions that must be adhered to prior to drilling.
Drilling emergency call lists:	Included are the telephone numbers of all persons to be contacted should an emergency exist.
Briefing:	This section deals with the briefing of all people involved in the drilling operation.
Public safety:	Public safety personnel will be made aware of any potential evacuation and any additional support needed.
Check lists:	Status check lists and procedural check lists have been included to insure adherence to the plan.
General information:	A general information section has been included to supply support information.

## Hydrogen Sulfide Training

All personnel, whether regularly assigned, contracted, or employed on an unscheduled basis, will receive training from a qualified instructor in the following areas prior to commencing drilling operations on the well:

1. The hazards and characteristics of H<sub>2</sub>S.
2. Proper use and maintenance of personal protective equipment and life support systems.
3. H<sub>2</sub>S detection.
4. Proper use of H<sub>2</sub>S detectors, alarms, warning systems, briefing areas, evacuation procedures and prevailing winds.
5. Proper techniques for first aid and rescue procedures.
6. Physical effects of hydrogen sulfide on the human body.
7. Toxicity of hydrogen sulfide and sulfur dioxide.
8. Use of SCBA and supplied air equipment.
9. First aid and artificial respiration.
10. Emergency rescue.

In addition, supervisory personnel will be trained in the following areas:

1. The effects of H<sub>2</sub>S on metal components. If high tensile strength tubular is to be used, personnel will be trained in their special maintenance requirements.
2. Corrective action and shut-in procedures when drilling a well, blowout prevention and well control procedures.
3. The contents and requirements of the H<sub>2</sub>S Drilling Operations Plan.

H<sub>2</sub>S training refresher must have been taken within one year prior to drilling the well. Specifics on the well to be drilled will be discussed during the pre-spud meeting. H<sub>2</sub>S and well control (choke) drills will be performed while drilling the well, at least on a weekly basis. This plan shall be available in the well site. All personnel will be required to carry the documentation proving that the H<sub>2</sub>S training has been taken.

### Service company and visiting personnel

- A. Each service company that will be on this well will be notified if the zone contains H<sub>2</sub>S.
- B. Each service company must provide for the training and equipment of their employees before they arrive at the well site.
- C. Each service company will be expected to attend a well site briefing

## Emergency Equipment Requirements

### 1. Well control equipment

The well shall have hydraulic BOP equipment for the anticipated pressures. Equipment is to be tested on installation and follow Oxy Well Control standard, as well as BLM Onshore Order #2.

*Special control equipment:*

- A. Hydraulic BOP equipment with remote control on ground. Remotely operated choke.
- B. Rotating head
- C. Gas buster equipment shall be installed before drilling out of surface pipe.

### 2. Protective equipment for personnel

- A. Four (4) 30-minute positive pressure air packs (2 at each briefing area) on location.
- B. Adequate fire extinguishers shall be located at strategic locations.
- C. Radio / cell telephone communication will be available at the rig.
  - Rig floor and trailers.
  - Vehicle.

### 3. Hydrogen sulfide sensors and alarms

- A. H2S sensor with alarms will be located on the rig floor, at the bell nipple, and at the flow line. These monitors will be set to alarm at 10 ppm with strobe light, and audible alarm.
- B. Hand operated detectors with tubes.
- C. H2S monitor tester (to be provided by contract Safety Company.)
- D. There shall be one combustible gas detector on location at all times.

### 4. Visual Warning Systems

- A. One sign located at each location entrance with the following language:

**Caution – potential poison gas  
Hydrogen sulfide  
No admittance without authorization**

*Wind sock – wind streamers:*

- A. One 36" (in length) wind sock located at protection center, at height visible from rig floor.
- B. One 36" (in length) wind sock located at height visible from pit areas.

*Condition flags*

- A. One each condition flag to be displayed to denote conditions.

**green – normal conditions**  
**yellow – potential danger**  
**red – danger, H2S present**

- B. Condition flag shall be posted at each location sign entrance.

5. Mud Program

The mud program is designed to minimize the risk of having H2S and other formation fluids at surface. Proper mud weight and safe drilling practices will be applied. H2S scavengers will be used to minimize the hazards while drilling. Below is a summary of the drilling program.

*Mud inspection devices:*

Garrett gas train or hatch tester for inspection of sulfide concentration in mud system.

6. Metallurgy

- A. Drill string, casing, tubing, wellhead, blowout preventers, drilling spools or adapters, kill lines, choke manifold, lines and valves shall be suitable for the H2S service.
- B. All the elastomers, packing, seals and ring gaskets shall be suitable for H2S service.

7. Well Testing

No drill stem test will be performed on this well.

8. Evacuation plan

Evacuation routes should be established prior to well spud for each well and discussed with all rig personnel.

9. Designated area

- A. Parking and visitor area: all vehicles are to be parked at a predetermined safe distance from the wellhead.
- B. There will be a designated smoking area.
- C. Two briefing areas on either side of the location at the maximum allowable distance from the well bore so they offset prevailing winds perpendicularly, or at a 45-degree angle if wind direction tends to shift in the area.

**Emergency procedures**

- A. In the event of any evidence of H<sub>2</sub>S level above 10 ppm, take the following steps:
  - 1. The Driller will pick up off bottom, shut down the pumps, slow down the pipe rotation.
  - 2. Secure and don escape breathing equipment, report to the upwind designated safe briefing / muster area.
  - 3. All personnel on location will be accounted for and emergency search should begin for any missing, the Buddy System will be implemented.
  - 4. Order non-essential personnel to leave the well site, order all essential personnel out of the danger zone and upwind to the nearest designated safe briefing / muster area.
  - 5. Entrance to the location will be secured to a higher level than our usual "Meet and Greet" requirement, and the proper condition flag will be displayed at the entrance to the location.
  - 6. Take steps to determine if the H<sub>2</sub>S level can be corrected or suppressed and, if so, proceed as required.
- B. If uncontrollable conditions occur:
  - 1. Take steps to protect and/or remove any public in the down-wind area from the rig – partial evacuation and isolation. Notify necessary public safety personnel and appropriate regulatory entities (i.e. BLM) of the situation.

2. Remove all personnel to the nearest upwind designated safe briefing / muster area or off location.
3. Notify public safety personnel of safe briefing / muster area.
4. An assigned crew member will blockade the entrance to the location. No unauthorized personnel will be allowed entry to the location.
5. Proceed with best plan (at the time) to regain control of the well. Maintain tight security and safety procedures.

C. Responsibility:

1. Designated personnel.
  - a. Shall be responsible for the total implementation of this plan.
  - b. Shall be in complete command during any emergency.
  - c. Shall designate a back-up.

All personnel:

1. On alarm, don escape unit and report to the nearest upwind designated safe briefing / muster area upw
2. Check status of personnel (buddy system).
3. Secure breathing equipment.
4. Await orders from supervisor.

Drill site manager:

1. Don escape unit if necessary and report to nearest upwind designated safe briefing / muster area.
2. Coordinate preparations of individuals to return to point of release with tool pusher and driller (using the buddy system).
3. Determine H2S concentrations.
4. Assess situation and take control measures.

Tool pusher:

1. Don escape unit Report to up nearest upwind designated safe briefing / muster area.
2. Coordinate preparation of individuals to return to point of release with tool pusher drill site manager (using the buddy system).
3. Determine H2S concentration.
4. Assess situation and take control measures.

Driller:

1. Don escape unit, shut down pumps, continue

- rotating DP.
  - 2. Check monitor for point of release.
  - 3. Report to nearest upwind designated safe briefing / muster area.
  - 4. Check status of personnel (in an attempt to rescue, use the buddy system).
  - 5. Assigns least essential person to notify Drill Site Manager and tool pusher by quickest means in case of their absence.
  - 6. Assumes the responsibilities of the Drill Site Manager and tool pusher until they arrive should they be absent.
- Derrick man  
Floor man #1  
Floor man #2
- 1. Will remain in briefing / muster area until instructed by supervisor.
- Mud engineer:
- 1. Report to nearest upwind designated safe briefing / muster area.
  - 2. When instructed, begin check of mud for ph and H2S level. (Garett gas train.)
- Safety personnel:
- 1. Mask up and check status of all personnel and secure operations as instructed by drill site manager.

**Taking a kick**

When taking a kick during an H2S emergency, all personnel will follow standard Well control procedures after reporting to briefing area and masking up.

**Open-hole logging**

All unnecessary personnel off floor. Drill Site Manager and safety personnel should monitor condition, advise status and determine need for use of air equipment.

**Running casing or plugging**

Following the same "tripping" procedure as above. Drill Site Manager and safety personnel should determine if all personnel have access to protective equipment.

### Ignition procedures

The decision to ignite the well is the responsibility of the operator (Oxy Drilling Management). The decision should be made only as a last resort and in a situation where it is clear that:

1. Human life and property are endangered.
2. There is no hope controlling the blowout under the prevailing conditions at the well.

#### Instructions for igniting the well

1. Two people are required for the actual igniting operation. They must wear self-contained breathing units and have a safety rope attached. One man (tool pusher or safety engineer) will check the atmosphere for explosive gases with the gas monitor. The other man is responsible for igniting the well.
2. Primary method to ignite: 25 mm flare gun with range of approximately 500 feet.
3. Ignite upwind and do not approach any closer than is warranted.
4. Select the ignition site best for protection, and which offers an easy escape route.
5. Before firing, check for presence of combustible gas.
6. After lighting, continue emergency action and procedure as before.
7. All unassigned personnel will remain in briefing area until instructed by supervisor or directed by the Drill Site Manager.

**Remember:** After well is ignited, burning hydrogen sulfide will convert to sulfur dioxide, which is also highly toxic. **Do not assume the area is safe after the well is ignited.**

**Status check list**

Note: All items on this list must be completed before drilling to production casing point.

1. H2S sign at location entrance.
2. Two (2) wind socks located as required.
3. Four (4) 30-minute positive pressure air packs (2 at each Briefing area) on location for all rig personnel and mud loggers.
4. Air packs inspected and ready for use.
5. Cascade system and hose line hook-up as needed.
6. Cascade system for refilling air bottles as needed.
7. Condition flag on location and ready for use.
8. H2S detection system hooked up and tested.
9. H2S alarm system hooked up and tested.
10. Hand operated H2S detector with tubes on location.
11. 1 – 100' length of nylon rope on location.
12. All rig crew and supervisors trained as required.
13. All outside service contractors advised of potential H2S hazard on well.
14. No smoking sign posted and a designated smoking area identified.
15. Calibration of all H2S equipment shall be noted on the IADC report.

Checked by: \_\_\_\_\_ Date: \_\_\_\_\_

**Procedural check list during H<sub>2</sub>S events**

**Perform each tour:**

1. Check fire extinguishers to see that they have the proper charge.
2. Check breathing equipment to ensure that it is in proper working order.
3. Make sure all the H<sub>2</sub>S detection system is operative.

**Perform each week:**

1. Check each piece of breathing equipment to make sure that demand or forced air regulator is working. This requires that the bottle be opened and the mask assembly be put on tight enough so that when you inhale, you receive air or feel air flow.
2. BOP skills (well control drills).
3. Check supply pressure on BOP accumulator stand by source.
4. Check breathing equipment mask assembly to see that straps are loosened and turned back, ready to put on.
5. Check pressure on breathing equipment air bottles to make sure they are charged to full volume. ( Air quality checked for proper air grade "D" before bringing to location)
6. Confirm pressure on all supply air bottles.
7. Perform breathing equipment drills with on-site personnel.
8. Check the following supplies for availability.
  - A. Emergency telephone list.
  - B. Hand operated H<sub>2</sub>S detectors and tubes.

### General evacuation plan

1. When the company approved supervisor (Drill Site Manager, consultant, rig pusher, or driller) determines the H2S gas cannot be limited to the well location and the public will be involved, he will activate the evacuation plan.
2. Drill Site Manager or designee will notify local government agency that a hazardous condition exists and evacuation needs to be implemented.
3. Company or contractor safety personnel that have been trained in the use of H2S detection equipment and self-contained breathing equipment will monitor H2S concentrations, wind directions, and area of exposure. They will delineate the outer perimeter of the hazardous gas area. Extension to the evacuation area will be determined from information gathered.
4. Law enforcement personnel (state police, police dept., fire dept., and sheriff's dept.) Will be called to aid in setting up and maintaining road blocks. Also, they will aid in evacuation of the public if necessary.
5. After the discharge of gas has been controlled, company safety personnel will determine when the area is safe for re-entry.

**Important: Law enforcement personnel will not be asked to come into a contaminated area. Their assistance will be limited to uncontaminated areas. Constant radio contact will be maintained with them.**

### Emergency actions

#### Well blowout – if emergency

1. Evacuate all personnel to “Safe Briefing / Muster Areas” or off location if needed.
2. If sour gas – evacuate rig personnel.
3. If sour gas – evacuate public within 3000 ft radius of exposure.
4. Don SCBA and shut well in if possible using the buddy system.
5. Notify Drilling Superintendent and call 911 for emergency help (fire dept and ambulance) if needed.
6. Implement the Blowout Contingency Plan, and Drilling Emergency Action Plan.
6. Give first aid as needed.

#### Person down location/facility

1. If immediately possible, contact 911. Give location and wait for confirmation.
2. Don SCBA and perform rescue operation using buddy system.

### Toxic effects of hydrogen sulfide

Hydrogen sulfide is extremely toxic. The acceptable ceiling concentration for eight-hour exposure is 10 ppm, which is .001% by volume. Hydrogen sulfide is heavier than air (specific gravity – 1.192) and colorless. It forms an explosive mixture with air between 4.3 and 46.0 percent by volume. Hydrogen sulfide is almost as toxic as hydrogen cyanide and is between five and six times more toxic than carbon monoxide. Toxicity data for hydrogen sulfide and various other gases are compared in table i. Physical effects at various hydrogen sulfide exposure levels are shown in table ii.

Table i  
Toxicity of various gases

Common name	Chemical formula	Specific gravity (sc=1)	Threshold limit (1)	Hazardous limit (2)	Lethal concentration (3)
Hydrogen Cyanide	Hcn	0.94	10 ppm	150 ppm/hr	300 ppm
Hydrogen Sulfide	H <sub>2</sub> S	1.18	10 ppm	250 ppm/hr	600 ppm
Sulfur Dioxide	So <sub>2</sub>	2.21	5 ppm	-	1000 ppm
Chlorine	Cl <sub>2</sub>	2.45	1 ppm	4 ppm/hr	1000 ppm
Carbon Monoxide	Co	0.97	50 ppm	400 ppm/hr	1000 ppm
Carbon Dioxide	Co <sub>2</sub>	1.52	5000 ppm	5%	10%
Methane	Ch <sub>4</sub>	0.55	90,000 ppm	Combustible above 5% in air	

- 1) threshold limit – concentration at which it is believed that all workers may be repeatedly exposed day after day without adverse effects.
- 2) hazardous limit – concentration that will cause death with short-term exposure.
- 3) lethal concentration – concentration that will cause death with short-term exposure.

### Toxic effects of hydrogen sulfide

Table ii  
Physical effects of hydrogen sulfide

<u>Percent (%)</u>	<u>Ppm</u>	<u>Concentration</u> Grains <u>100 std. Ft3*</u>	<u>Physical effects</u>
0.001	<10	00.65	Obvious and unpleasant odor.

0.002	10	01.30	Safe for 8 hours of exposure.
0.010	100	06.48	Kill smell in 3 – 15 minutes. May sting eyes and throat.
0.020	200	12.96	Kills smell shortly; stings eyes and throat.
0.050	500	32.96	Dizziness; breathing ceases in a few minutes; needs prompt artificial respiration.
0.070	700	45.36	Unconscious quickly; death will result if not rescued promptly.
0.100	1000	64.30	Unconscious at once; followed by death within minutes.

\*at 15.00 psia and 60°f.

Use of self-contained breathing equipment (SCBA)

1. Written procedures shall be prepared covering safe use of SCBA's in dangerous atmosphere, which might be encountered in normal operations or in emergencies. Personnel shall be familiar with these procedures and the available SCBA.
2. SCBA's shall be inspected frequently at random to insure that they are properly used, cleaned, and maintained.
3. Anyone who may use the SCBA's shall be trained in how to insure proper face-piece to face seal. They shall wear SCBA's in normal air and then wear them in a test atmosphere. (note: such items as facial hair {beard or sideburns} and eyeglasses will not allow proper seal.) Anyone that may be reasonably expected to wear SCBA's should have these items removed before entering a toxic atmosphere. A special mask must be obtained for anyone who must wear eyeglasses or contact lenses.
4. Maintenance and care of SCBA's:
  - a. A program for maintenance and care of SCBA's shall include the following:
    1. Inspection for defects, including leak checks.
    2. Cleaning and disinfecting.
    3. Repair.
    4. Storage.
  - b. Inspection, self-contained breathing apparatus for emergency use shall be inspected monthly.
    1. Fully charged cylinders.
    2. Regulator and warning device operation.
    3. Condition of face piece and connections.
    4. Rubber parts shall be maintained to keep them pliable and prevent deterioration.
  - c. Routinely used SCBA's shall be collected, cleaned and disinfected as frequently as necessary to insure proper protection is provided.
5. Persons assigned tasks that requires use of self-contained breathing equipment shall be certified physically fit (medically cleared) for breathing equipment usage at least annually.
6. SCBA's should be worn when:
  - A. Any employee works near the top or on top of any tank unless test reveals less than 10 ppm of H<sub>2</sub>S.

- B. When breaking out any line where H<sub>2</sub>S can reasonably be expected.
- C. When sampling air in areas to determine if toxic concentrations of H<sub>2</sub>S exists.
- D. When working in areas where over 10 ppm H<sub>2</sub>S has been detected.
- E. At any time there is a doubt as to the H<sub>2</sub>S level in the area to be entered.

**Rescue**  
**First aid for H<sub>2</sub>S poisoning**

Do not panic!

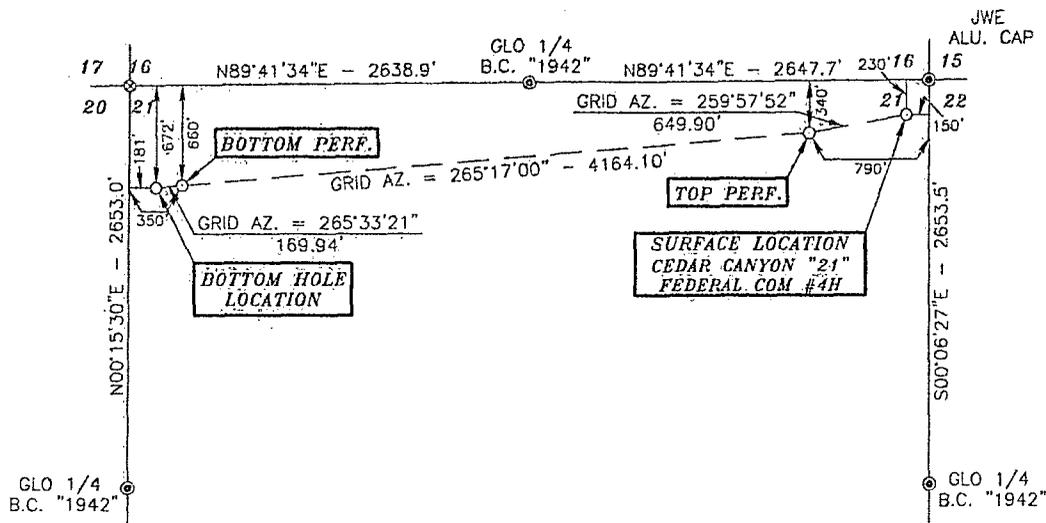
Remain calm -- think!

1. Don SCBA breathing equipment.
2. Remove victim(s) utilizing buddy system to fresh air as quickly as possible. (go up-wind from source or at right angle to the wind. Not down wind.)
3. Briefly apply chest pressure -- arm lift method of artificial respiration to clean the victim's lungs and to avoid inhaling any toxic gas directly from the victim's lungs.
4. Provide for prompt transportation to the hospital, and continue giving artificial respiration if needed.
5. Hospital(s) or medical facilities need to be informed, before-hand, of the possibility of H<sub>2</sub>S gas poisoning -- no matter how remote the possibility is.
6. Notify emergency room personnel that the victim(s) has been exposed to H<sub>2</sub>S gas.

Besides basic first aid, everyone on location should have a good working knowledge of artificial respiration.

Revised CM 6/27/2012

SECTION 21, TOWNSHIP 24 SOUTH, RANGE 29 EAST, N.M.P.M.,  
EDDY COUNTY NEW MEXICO



Basis of Bearings -- GPS Geodetic Measurements  
NAD East Zone (83) North American Datum of 1983

DRIVING DIRECTIONS:  
FROM THE INTERSECTION OF U.S. HWY.  
#285 AND BLACK RIVER VILLAGE ROAD IN  
MALAGA, GO EAST ON COUNTY ROAD #720  
FOR 0.8 MILES, TURN LEFT ON COUNTY  
ROAD #745 (HARROUN ROAD) AND GO  
NORTH FOR 1.0 MILES, TURN RIGHT AND GO  
EAST/NORTHEAST FOR 2.1 MILES, TURN  
RIGHT ON DOG TOWN ROAD AND GO  
SOUTHEAST FOR 1.3 MILES, TURN LEFT ON  
CALICHE ROAD AND GO EAST/SOUTHEAST  
FOR 2.1 MILES, CONTINUE SOUTH FOR 1.6  
MILES, TURN LEFT AND GO NORTHEAST FOR  
0.1 MILES, TURN LEFT ON PROPOSED ROAD  
AND GO NORTH FOR 513.0 FEET TO  
LOCATION.

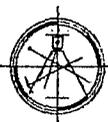


**SURVEYORS CERTIFICATE**

I, TERRY J. ASEL, NEW MEXICO PROFESSIONAL SURVEYOR NO. 15079, DO HEREBY CERTIFY THAT I CONDUCTED AND AM RESPONSIBLE FOR THIS SURVEY, THAT THIS SURVEY IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF, AND MEETS THE "MINIMUM STANDARDS FOR SURVEYING IN NEW MEXICO" AS ADOPTED BY THE NEW MEXICO STATE BOARD OF REGISTRATION FOR PROFESSIONAL ENGINEERS AND SURVEYORS.

*Terry J. Asel* 5/6/2014  
Terry J. Asel, P.M., R.P.L.S. No. 15079

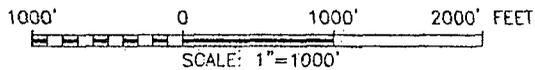
Asel Surveying



P.O. BOX 393 - 310 W. TAYLOR  
HOBBBS, NEW MEXICO - 575-393-9146

**LEGEND**

- ⊙ - DENOTES FOUND MONUMENT AS NOTED
- ⊙ - DENOTES CALCULATED CORNER

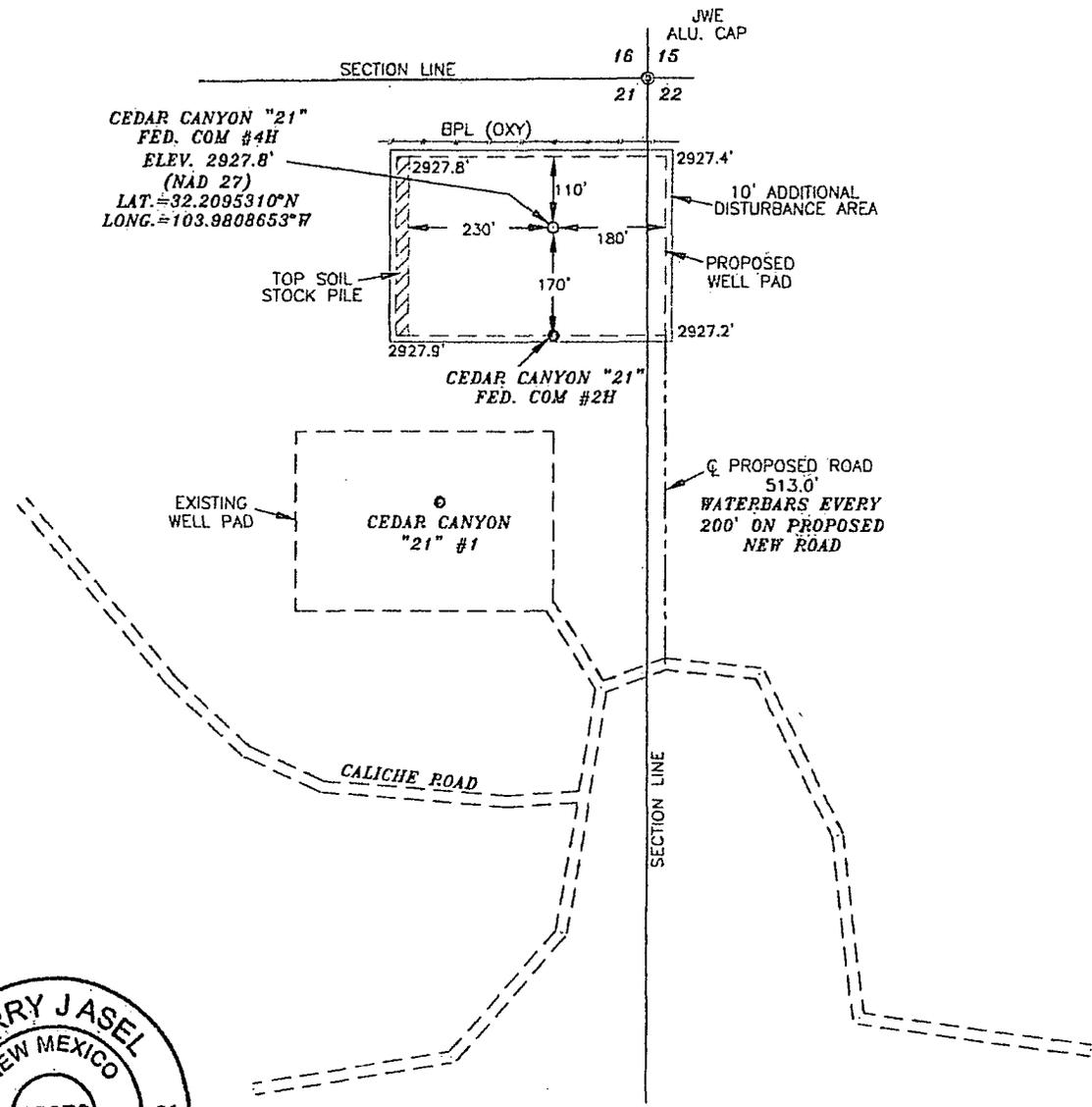


**OXY USA INC.**

CEDAR CANYON "21" FEDERAL COM #4H  
LOCATED AT 230' FNL & 150' FEL IN SECTION  
21, TOWNSHIP 24 SOUTH, RANGE 29 EAST,  
N.M.P.M., EDDY COUNTY, NEW MEXICO

Survey Date: 12/04/13	Sheet 1 of 1 Sheets
W.O. Number: 131204WL-c (Rev. A)	Drawn By: KA Rev: A
Date: 05/02/14	131204WL-c Scale: 1"=1000'

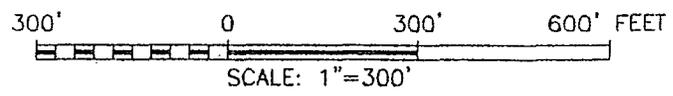
# OXY USA INC. CEDAR CANYON "21" FED. COM #4H SITE PLAN



- LEGEND**
- ▨ - DENOTES STOCK PILE AREA
  - - DENOTES PROPOSED WELL PAD
  - - DENOTES PROPOSED ROAD

**SURVEYORS CERTIFICATE**

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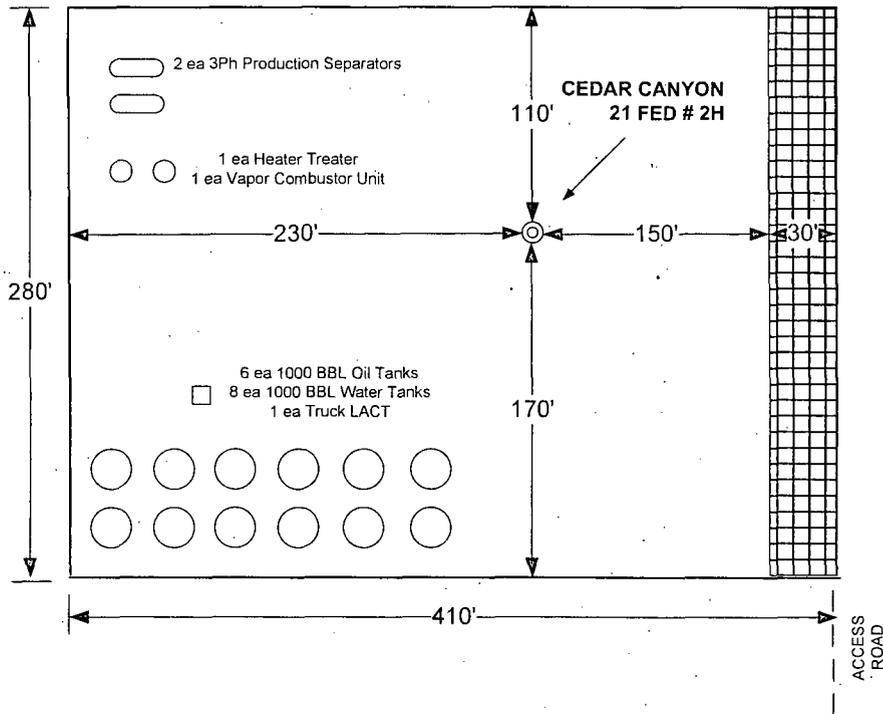
*Terry J. Asel* 12/17/2013  
Terry J. Asel N.M. R.P.L.S. No. 15079

<b>OXY USA INC.</b>		
CEDAR CANYON "21" FED. COM #4H WELL PAD LOCATED AT 230' FNL & 150' FEL IN SECTION 21, TOWNSHIP 24 SOUTH, RANGE 29 EAST, N.M.P.M., EDDY COUNTY, NEW MEXICO		
Survey Date: 12/04/13	Sheet 1 of 1 Sheets	
W.O. Number: 131204WL-c	Drawn By: KA	Rev:
Date: 12/12/13	131204WL-c	Scale: 1"=300'

Asel Surveying



P.O. BOX 393 - 310 W. TAYLOR  
HOBBS, NEW MEXICO - 575-393-9146



REVISION BLOCK

ENGINEERING RECORD

FACILITY LAYOUT DIAGRAM  
CEDAR CANYON 21 FED # 2H

NO.	DATE	DESCRIPTION	BY	CHK	APP	BY	DATE
						KAO	12/15/14

EDDY COUNTY, NEW MEXICO

## SURFACE USE PLAN OF OPERATIONS - Amended

Operator Name/Number:	OXY USA Inc.	16696
Lease Name/Number:	Cedar Canyon 21 Federal Com. #4H	
Pool Name/Number:	Corral Draw Bone Spring	96238
Surface Location:	230 FNL 150 FEL NENE(A) Sec 21 T24S R29E	Federal Lease No. NMNM085893
Bottom Hole Location:	672 FNL 181 FWL NWNW(D) Sec 21 T24S R29E	

### 1. Existing Roads

- A copy of a USGS "Pierce Canyon, NM" quadrangle map is attached showing the proposed location. The well location is spotted on this map, which shows the existing road system.
- The well was staked by Terry J. Asel, Certificate No. 15079 on 12/4/13, certified 5/6/14.
- Directions to Location: From the Intersection of USH 285 and Black River Village Road in Malaga, go east on CR 720 for 0.8 miles. Turn left on CR 745 and go north for 1.0 miles. Turn right and go east/northeast for 2.1 miles. Turn right and go southeast for 1.3 miles. Turn left on caliche road and go east/southeast for 2.1 miles, continue south for 1.6 miles. Turn left and go northeast for 0.1 miles. Turn left on proposed road and go north for 513' to location.

### 2. New or Reconstructed Access Roads:

- A new access road will be built. The access road will run approximately 513' north from an existing road.
- The maximum width of the road will be 15'. It will be crowned and made up of 6" of rolled and compacted caliche. Water will be deflected, as necessary, to avoid accumulation and prevent surface erosion.
- Surface material will be native caliche. This material will be obtained from a BLM approved pit nearest in proximity to the location. The average grade will be approximately 1%.
- No cattle guards, grates or fence cuts will be required. No turnouts are planned.
- Blade, water & repair an existing caliche road as needed.
- Water bars will be incorporated every 200' during the construction of the road, see attached.

### 3. Location of Existing Wells:

Existing wells within a one mile radius of the proposed well are shown on attached plat.

### 4. Location of Existing and/or Proposed Production Facilities.

- In the event the well is found productive, the Cedar Canyon 21 Federal central tank battery would be utilized and the necessary production equipment will be installed at the well site. See proposed Production Facilities Layout diagram.
- Electric line information is not available at this time, but if necessary will follow a route approved by the BLM.
- All flowlines will adhere to API Standards, see attached for detail and route.

### 5. Location and types of Water Supply.

This well will be drilled using a combination of water mud systems. It will be obtained from commercial water stations in the area and will be hauled to location by transport truck using existing and proposed roads.

### 6. Construction Materials:

#### Primary

All caliche utilized for the drilling pad and proposed access road will be obtained from an existing BLM/State/Fee approved pit or from prevailing deposits found on the location. Will use BLM recommended extra caliche from other locations close by for roads, if available.

## SURFACE USE PLAN OF OPERATIONS

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Lease Name/Number:	Cedar Canyon 21 Federal Com. #4H	
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Existing wells within a one mile radius of the proposed well are shown on attached plat.

### 4. Location of Existing and/or Proposed Production Facilities.

- In the event the well is found productive, the Cedar Canyon Federal central tank battery would be utilized and the necessary production equipment will be installed at the well site. See proposed Production Facilities Layout diagram.
- Electric line information is not available at this time, but If necessary will follow a route approved by the BLM.
- All flowlines will adhere to API Standards, see attached for detail and route.

### 5. Location and types of Water Supply.

This well will be drilled using a combination of water mud systems. It will be obtained from commercial water stations in the area and will be hauled to location by transport truck using existing and proposed roads.

### 6. Construction Materials:

## Secondary

The secondary way of obtaining caliche to build locations and roads will be by "turning over" the location. This means, caliche will be obtained from the actual well site. A caliche permit will be obtained from BLM prior to pushing up any caliche. 2400 cubic yards is max amount of caliche needed for pad and roads. Amount will vary for each pad. The procedure below has been approved by BLM personnel:

- A. The top 6" of topsoil is pushed off and stockpiled along the side of the location.
- B. An approximate 120' X 120' area is used within the proposed well site to remove caliche.
- C. Subsoil is removed and piled along side the 120' X 120' area within the pad site.
- D. When caliche is found, material will be stockpiled within the pad site to build the location and road.
- E. Then subsoil is pushed back in the hole and caliche is spread accordingly across entire location and road.
- F. Once well is drilled the stockpiled top soil will be used for interim reclamation and spread along areas where caliche is picked up and the location size is reduced. Neither caliche nor subsoil will be stockpiled outside of the well pad. Topsoil will be stockpiled along the edge of the pad as depicted in attached plat.

## 7. Methods of Handling Waste Material:

- a. A closed loop system will be utilized consisting of above ground steel tanks and haul-off bins. Disposal of liquids, drilling fluids and cuttings will be disposed of at an approved facility.
  1. Solids - CRI
  2. Liquids - Laguna
- b. All trash, junk, and other waste material will be contained in trash cages or bins to prevent scattering. When the job is completed, all contents will be removed and disposed of in an approved sanitary landfill.
- c. The supplier, including broken sacks, will pick up slats remaining after completion of well.
- d. A Porto-john will be provided for the rig crews. This equipment will be properly maintained during the drilling and completion operations and will be removed when all operations are complete.
- e. Disposal of fluids to be transported will be by the following companies:  
TFH Ltd. - Laguna SWD Facility

## 8. Ancillary Facilities: None needed

## 9. Well Site Layout

The proposed well site layout with dimensions of the pad layout and equipment location.

V-Door - East

CL Tanks- North

Pad - 280' X 410'

## 10. Plans for Surface Reclamation:

- a. After concluding the drilling and/or completion operations, if the well is found non-commercial, the caliche will be removed from the pad and transported to the original caliche pit or used for other drilling locations. The road will be reclaimed as directed by the BLM. The original top soil will again be returned to the pad and contoured, as close as possible, to the original topography.
- b. If the well is deemed commercially productive, caliche from areas of the pad site not required for operations will be reclaimed. The original top soil will be returned to the area of the drill pad not necessary to operate the well. These unused areas of the drill pad will be contoured, as close as possible, to match the original topography, and the area will be seeded with an approved BLM mixture to re-establish vegetation.

## 11. Surface Ownership

The surface is owned by a private landowner and a surface agreement is currently being discussed. The surface is owned by B&D Holding, LLC, C/O Charles Dixon, 36338 W. 287th St., Paola KS, 66071. The minerals are owned and administered by the U.S. Government. The surface is of limited use except for the grazing of livestock and the production of oil & gas.

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- E. Then subsoil is pushed back in the hole and caliche is spread accordingly across entire location and road.
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**12. Other Information**

a. The vegetation cover is generally sparse consisting of mesquite, yucca, shinnery oak, sandsage and perennial native range grass. The topsoil is sandy in nature. Wildlife in the area is also sparse consisting of deer, coyotes, rabbits, rodents, reptiles, dove and quail.

b. There is no permanent or live water in the general proximity of the location.

c. There are no dwellings within 1 miles of the proposed well site.

d. Cultural Resources Examination - this well is located in the Permian Basin MOA (Paid 5/29/13 Receipt 2802419).

Pad + 1/4 mile road	<u>\$1,507.00</u>	\$0.19/ft over 1/4 mile	<u>\$0.00</u>	<u>\$1,507.00</u>
Pipeline - up to 1mile	<u>\$1,391.00</u>	\$290 per 1/4 mile	<u>\$0.00</u>	<u>\$1,391.00</u>
Total	<u>\$2,898.00</u>		<u>\$0.00</u>	<u>\$2,898.00</u>

e. Notice of this application will also be mailed to the following:

None with 1 mile of surface location

**13. Bond Coverage:**

Bond Coverage is Individual-NMB000862, Nationwide-ESB00226

**Operators Representatives:**

The OXY Permian representatives responsible for ensuring compliance of the surface use plan are listed below.

Don Kendrick  
Production Coordinator  
1502 West Commerce Dr.  
Carlsbad, NM 88220  
Office Phone: 575-628-4132  
Cellular: 575-602-1484

Charles Wagner  
Manager Field Operations  
1502 West Commerce Dr.  
Carlsbad, NM 88220  
Office Phone: 575-628-4151  
Cellular: 575-725-8306

Roger Allen  
Drilling Superintendent  
P.O. Box 4294  
Houston, TX 77210  
Office Phone: 713-215-7617  
Cellular: 281-682-3919

Calvin (Dusty) Weaver  
Operation Specialist  
P.O. Box 50250  
Midland, TX 79710  
Office Phone: 432-685-5723  
Cellular: 806-893-3067

Sebastian Millan  
Drilling Engineering Supervisor  
P.O. Box 4294  
Houston, TX 77210  
Office Phone: 713-350-4950  
Cellular:832-528-3268

Kacie Cruz  
Drilling Engineer  
P.O. Box 4294  
Houston, TX 77210  
Office Phone: 713-350-4889  
Cellular: 281-433-6594

**12. Other Information**

- a. The vegetation cover is generally sparse consisting of mesquite, yucca, shinnery oak, sandsage and perennial native range grass. The topsoil is sandy in nature. Wildlife in the area is also sparse consisting of deer, coyotes, rabbits, rodents, reptiles, dove and quail.
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New Mexico Staking Form

Date Staked: 11-12-13

Lease/Well Name: Gedra Canyon #1 Fed Com #4H

Legal Description: D30 FNL 150 FEL Sec 21 T24S R29C

Latitude: 32.12' 34.75" N and 83

Longitude: 103.58' 50.87"

Move Information: 0

County: Eddy

Surface Owner/Tenant: McDonald

Nearest Residence: 1 1/2 miles

Nearest Water Well: \_\_\_\_\_

V-Door: EAST

Road Description: Road into SE corner from SOUTH

New Road: \_\_\_\_\_

Upgrade Existing Road: \_\_\_\_\_

Interim Reclamation: 30' WEST 30' EAST 50' NORTH

Source of Caliche: \_\_\_\_\_

Top Soil: West

Onsite Date Performed: 11-12-13

Onsite Attendees: Legion Bromley - BLM Jim Wilson - Oxy  
Terry Hsel - Hsel Survey

Special Notes: \_\_\_\_\_

Well-Site Evaluation Field Form

Operator Name: OXY Well Name Cedar Canyon 21 2nd Com 4H  
 SHL: Section 21, T. 24 S. R. 29 E. Footage 150 FZ L & 230 FAL  
 Well Type: Horizontal Vertical  Oil Gas Other \_\_\_\_\_ NOS/APD Received? NOS APD  
 Surface Management Agency (SMA): BLM  STATE Other McDonald SMA Contacted?  Yes No  
 Operator Representative/ Contact Name: Jim Wilson Phone \_\_\_\_\_  
 BLM Onsite Representatives Brumley Date 11-12-2013

Description & Topography: (cut & fill, etc.) Zlot

Soils: (reseeding strips, etc.) loam, mesquite

Cave Area: \_\_\_\_\_

Hydrogeology: (playas, floodplain, drainages, erosive soils, plant indicators, etc.) \_\_\_\_\_

Wildlife: (habitat, LPC, SDL, etc.) \_\_\_\_\_

Range Improvements: (fences, etc.) \_\_\_\_\_

Well Infrastructure

V-Door Direction: E Topsoil: west

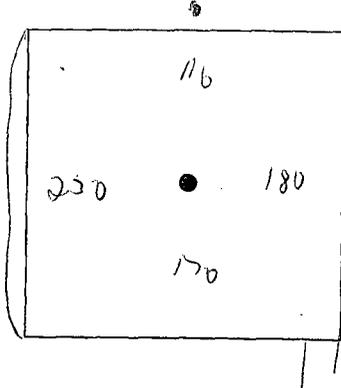
Pad Size: 80x40

Road Route: \_\_\_\_\_

Prod. Facility Placement: \_\_\_\_\_

Interim Rec: 80' 11 30'

Other: single photo south



Evaluation: (Moved?) \_\_\_\_\_

**PECOS DISTRICT  
CONDITIONS OF APPROVAL**

**NM OIL CONSERVATION  
ARTESIA DISTRICT  
AUG 21 2015**

OPERATOR'S NAME:	OXY USA Inc	<b>RECEIVED</b>
LEASE NO.:	NM85893	
WELL NAME & NO.:	4H-Cedar Canyon 21 Federal Com	
SURFACE HOLE FOOTAGE:	230'/N & 150'/E	
BOTTOM HOLE FOOTAGE:	672'/N & 181'/W	
LOCATION:	Sec. 21, T. 24 S., R. 29 E.	
COUNTY:	Eddy County, New Mexico	

**TABLE OF CONTENTS**

Standard Conditions of Approval (COA) apply to this APD. If any deviations to these standards exist or special COAs are required, the section with the deviation or requirement will be checked below.

- General Provisions**
- Permit Expiration**
- Archaeology, Paleontology, and Historical Sites**
- Noxious Weeds**
- Special Requirements**
  - Communitization Agreement
  - Cave/Karst
  - VRM
- Construction**
  - Notification
  - Topsoil
  - Closed Loop System
  - Federal Mineral Material Pits
  - Well Pads
  - Roads
- Road Section Diagram**
- Drilling**
  - Cement Requirements
  - Medium Cave/Karst
  - Logging Requirements
  - Waste Material and Fluids
- Production (Post Drilling)**
  - Well Structures & Facilities
  - Pipelines
- Interim Reclamation**
- Final Abandonment & Reclamation**

## **I. GENERAL PROVISIONS**

The approval of the Application For Permit To Drill (APD) is in compliance with all applicable laws and regulations: 43 Code of Federal Regulations 3160, the lease terms, Onshore Oil and Gas Orders, Notices To Lessees, New Mexico Oil Conservation Division (NMOCD) Rules, National Historical Preservation Act As Amended, and instructions and orders of the Authorized Officer. Any request for a variance shall be submitted to the Authorized Officer on Form 3160-5, Sundry Notices and Report on Wells.

## **II. PERMIT EXPIRATION**

If the permit terminates prior to drilling and drilling cannot be commenced within 60 days after expiration, an operator is required to submit Form 3160-5, Sundry Notices and Reports on Wells, requesting surface reclamation requirements for any surface disturbance. However, if the operator will be able to initiate drilling within 60 days after the expiration of the permit, the operator must have set the conductor pipe in order to allow for an extension of 60 days beyond the expiration date of the APD. (Filing of a Sundry Notice is required for this 60 day extension.)

## **III. ARCHAEOLOGICAL, PALEONTOLOGY & HISTORICAL SITES**

Any cultural and/or paleontological resource discovered by the operator or by any person working on the operator's behalf shall immediately report such findings to the Authorized Officer. The operator is fully accountable for the actions of their contractors and subcontractors. The operator shall suspend all operations in the immediate area of such discovery until written authorization to proceed is issued by the Authorized Officer. An evaluation of the discovery shall be made by the Authorized Officer to determine the appropriate actions that shall be required to prevent the loss of significant cultural or scientific values of the discovery. The operator shall be held responsible for the cost of the proper mitigation measures that the Authorized Officer assesses after consultation with the operator on the evaluation and decisions of the discovery. Any unauthorized collection or disturbance of cultural or paleontological resources may result in a shutdown order by the Authorized Officer.

## **IV. NOXIOUS WEEDS**

The operator shall be held responsible if noxious weeds become established within the areas of operations. Weed control shall be required on the disturbed land where noxious weeds exist, which includes the roads, pads, associated pipeline corridor, and adjacent land affected by the establishment of weeds due to this action. The operator shall consult with the Authorized Officer for acceptable weed control methods, which include following EPA and BLM requirements and policies.

## V. SPECIAL REQUIREMENT(S)

### **Communitization Agreement**

A Communitization Agreement covering the acreage dedicated to this well must be filed for approval with the BLM. The effective date of the agreement shall be prior to any sales. In addition, the well sign shall include the surface and bottom hole lease numbers. When the Communitization Agreement number is known, it shall also be on the sign.

### **Watershed**

- The entire well pad will be bermed to prevent oil, salt, and other chemical contaminants from leaving the well pad. Topsoil shall not be used to construct the berm. No water flow from the uphill side(s) of the pad shall be allowed to enter the well pad. The berm shall be maintained through the life of the well and after interim reclamation has been completed.
- Any water erosion that may occur due to the construction of the well pad during the life of the well will be quickly corrected and proper measures will be taken to prevent future erosion.
- Exhaust noise from pump jack engines must be muffled or otherwise controlled so as not to exceed 75 db measured at 30 ft. from the source of the noise.

### **Cave**

#### **Construction Mitigation**

In order to mitigate the impacts from construction activities on cave and karst resources, the following Conditions of Approval will apply to this APD:

- In the event that any underground voids are encountered during construction activities, construction activities will be halted and the BLM will be notified immediately.
- No Blasting to prevent geologic structure instabilities.
- Pad Berming to minimize effects of any spilled contaminants.

#### **Drilling Mitigation**

Federal regulations and standard Conditions of Approval applied to all APDs require that adequate measures are taken to prevent contamination to the environment. Due to the extreme sensitivity of the cave and karst resources in this project area, the following additional Conditions of Approval will be added to this APD.

To prevent cave and karst resource contamination the following will be required.

- Closed Mud System Using Steel Tanks with All Fluids and Cuttings Hauled Off.
- Rotary drilling with fresh water where cave or karst features are expected to prevent contamination of freshwater aquifers.
- Directional Drilling allowed after at least 100 feet below the cave occurrence zone to prevent additional impacts resulting from directional drilling.
- Lost Circulation zones logged and reported in the drilling report so BLM can assess the situation and work with the operator on corrective actions.
- Additional drilling, casing, and cementing procedures to protect cave zones and fresh water aquifers. See Drilling COAs.

### **Production Mitigation**

In order to mitigate the impacts from production activities and due to the nature of karst terrain, the following Conditions of Approval will apply to this APD:

- Tank battery liners and berms to minimize the impact resulting from leaks.
- Leak detection system to provide an early alert to operators when a leak has occurred.
- Automatic shut off, check valves, or similar systems will be installed for pipelines and tanks to minimize the effects of line failures used in production or drilling.

### **Residual and Cumulative Mitigation**

- Nontoxic fluorescent dyes will be added to the drilling fluid when the hole is spudded and will be circulated to the bottom of the karst layers. This provides data as part of a long-term monitoring study.
- Annual pressure monitoring will be performed by the operator. If the test results indicate a casing failure has occurred, remedial action will be undertaken to correct the problem to the BLM's approval.

### **Plugging and Abandonment Mitigation**

**Abandonment Cementing:** Upon well abandonment in high cave karst areas additional plugging conditions of approval may be required. The BLM will assess the situation and work with the operator to ensure proper plugging of the wellbore.

### **VRM**

Above-ground structures including meter housing that are not subject to safety requirements are painted a flat non-reflective paint color, Shale Green from the BLM Standard Environmental Color Chart (CC-001: June 2008).

All above ground structures including but not limited to pumpjacks, storage tanks, production equipment, etc. would be shorter than 8 feet to minimize visual impacts to the natural features of the landscape.

Upon abandonment, a ground level abandoned well marker would be installed.

## **VI. CONSTRUCTION**

### **A. NOTIFICATION**

The BLM shall administer compliance and monitor construction of the access road and well pad. Notify the Carlsbad Field Office at (575) 234-5909 at least 3 working days prior to commencing construction of the access road and/or well pad.

When construction operations are being conducted on this well, the operator shall have the approved APD and Conditions of Approval (COA) on the well site and they shall be made available upon request by the Authorized Officer.

### **B. TOPSOIL**

The operator shall strip the top portion of the soil (root zone) from the entire well pad area and stockpile the topsoil along the edge of the well pad as depicted in the APD. The root zone is typically six (6) inches in depth. All the stockpiled topsoil will be redistributed over the interim reclamation areas. Topsoil shall not be used for berming the pad or facilities. For final reclamation, the topsoil shall be spread over the entire pad area for seeding preparation.

Other subsoil (below six inches) stockpiles must be completely segregated from the topsoil stockpile. Large rocks or subsoil clods (not evident in the surrounding terrain) must be buried within the approved area for interim and final reclamation.

### **C. CLOSED LOOP SYSTEM**

Tanks are required for drilling operations: No Pits.

The operator shall properly dispose of drilling contents at an authorized disposal site.

### **D. FEDERAL MINERAL MATERIALS PIT**

Payment shall be made to the BLM prior to removal of any federal mineral materials. Call the Carlsbad Field Office at (575) 234-5972.

### **E. WELL PAD SURFACING**

Surfacing of the well pad is not required.

If the operator elects to surface the well pad, the surfacing material may be required to be removed at the time of reclamation. The well pad shall be constructed in a manner which creates the smallest possible surface disturbance, consistent with safety and operational needs.

### **F. EXCLOSURE FENCING (CELLARS & PITS)**

**Exclosure Fencing**

The operator will install and maintain exclosure fencing for all open well cellars to prevent access to public, livestock, and large forms of wildlife before and after drilling operations until the pit is free of fluids and the operator initiates backfilling. (For examples of exclosure fencing design, refer to BLM's Oil and Gas Gold Book, Exclosure Fence Illustrations, Figure 1, Page 18.)

**G. ON LEASE ACCESS ROADS****Road Width**

The access road shall have a driving surface that creates the smallest possible surface disturbance and does not exceed fourteen (14) feet in width. The maximum width of surface disturbance, when constructing the access road, shall not exceed twenty-five (25) feet.

**Surfacing**

Surfacing material is not required on the new access road driving surface. If the operator elects to surface the new access road or pad, the surfacing material may be required to be removed at the time of reclamation.

Where possible, no improvements should be made on the unsurfaced access road other than to remove vegetation as necessary, road irregularities, safety issues, or to fill low areas that may sustain standing water.

The Authorized Officer reserves the right to require surfacing of any portion of the access road at any time deemed necessary. Surfacing may be required in the event the road deteriorates, erodes, road traffic increases, or it is determined to be beneficial for future field development. The surfacing depth and type of material will be determined at the time of notification.

**Crowning**

Crowning shall be done on the access road driving surface. The road crown shall have a grade of approximately 2% (i.e., a 1" crown on a 14' wide road). The road shall conform to Figure 1; cross section and plans for typical road construction.

**Ditching**

Ditching shall be required on both sides of the road.

**Turnouts**

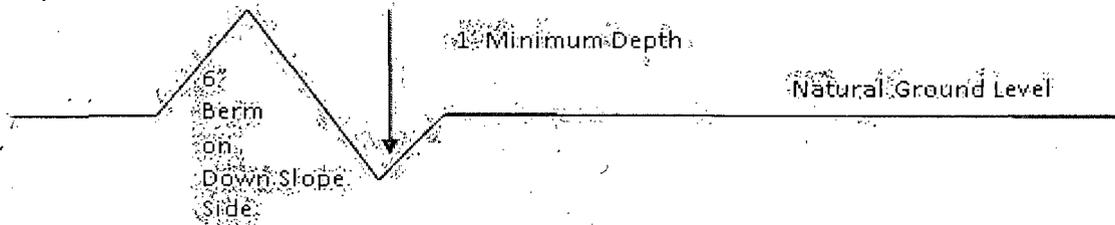
Vehicle turnouts shall be constructed on the road. Turnouts shall be intervisible with interval spacing distance less than 1000 feet. Turnouts shall conform to Figure 1; cross section and plans for typical road construction.

**Drainage**

Drainage control systems shall be constructed on the entire length of road (e.g. ditches, sidehill out-sloping and in-sloping, lead-off ditches, culvert installation, and low water crossings).

A typical lead-off ditch has a minimum depth of 1 foot below and a berm of 6 inches above natural ground level. The berm shall be on the down-slope side of the lead-off ditch.

### Cross Section of a Typical Lead-off Ditch



All lead-off ditches shall be graded to drain water with a 1 percent minimum to 3 percent maximum ditch slope. The spacing interval are variable for lead-off ditches and shall be determined according to the formula for spacing intervals of lead-off ditches, but may be amended depending upon existing soil types and centerline road slope (in %);

### Formula for Spacing Interval of Lead-off Ditches

Example - On a 4% road slope that is 400 feet long, the water flow shall drain water into a lead-off ditch. Spacing interval shall be determined by the following formula:

$$400 \text{ foot road with } 4\% \text{ road slope: } \frac{400'}{4\%} + 100' = 200' \text{ lead-off ditch interval}$$

### Cattleguards

An appropriately sized cattleguard sufficient to carry out the project shall be installed and maintained at fence/road crossings. Any existing cattleguards on the access road route shall be repaired or replaced if they are damaged or have deteriorated beyond practical use. The operator shall be responsible for the condition of the existing cattleguards that are in place and are utilized during lease operations.

### Fence Requirement

Where entry is granted across a fence line, the fence shall be braced and tied off on both sides of the passageway prior to cutting. The operator shall notify the private surface landowner or the grazing allotment holder prior to crossing any fences.

### Public Access

Public access on this road shall not be restricted by the operator without specific written approval granted by the Authorized Officer.

**Construction Steps**

1. Salvage topsoil
2. Construct road

3. Redistribute topsoil
4. Revegetate slopes

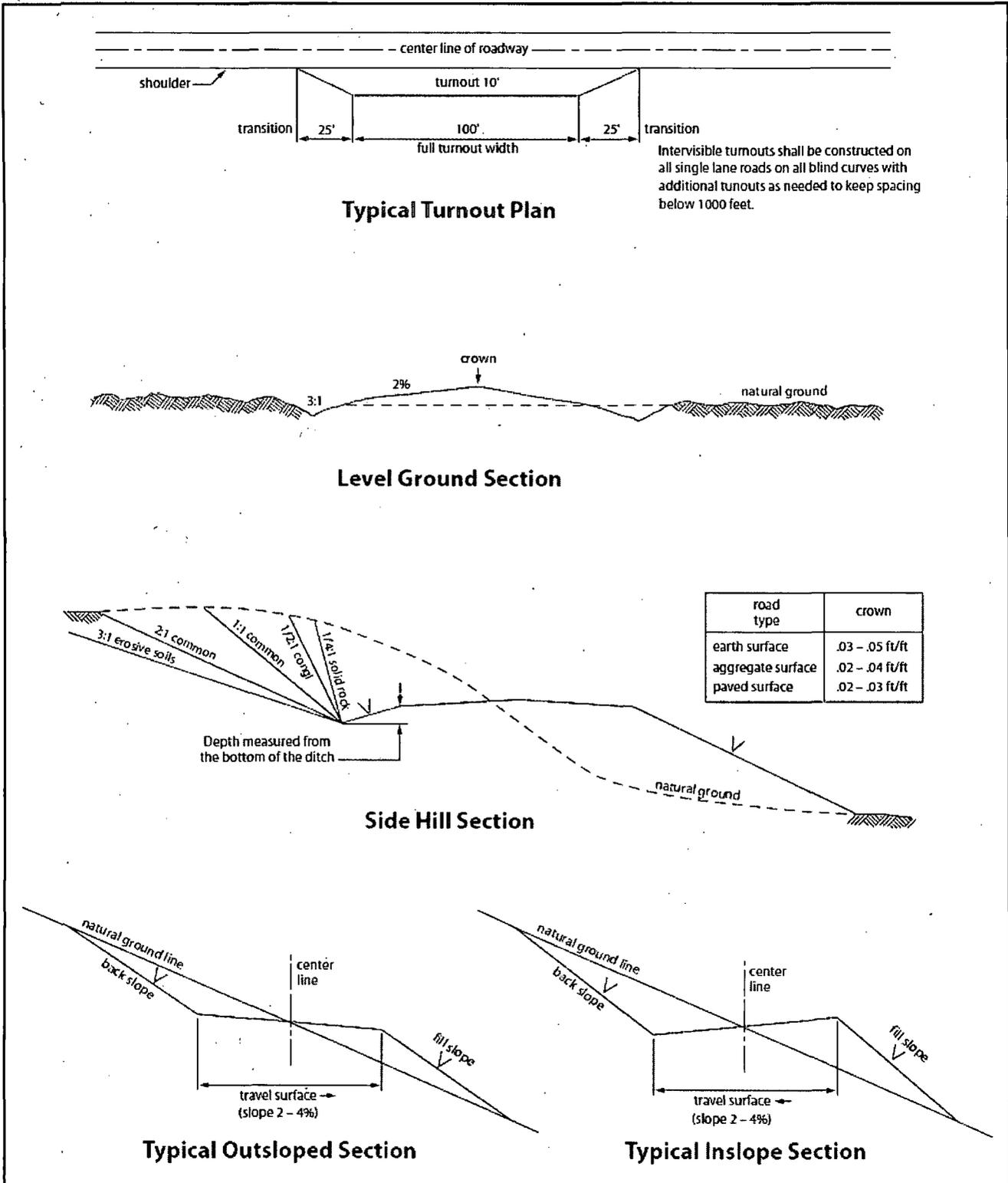


Figure 1. Cross-sections and plans for typical road sections representative of BLM resource or FS local and higher-class roads.

## VII. DRILLING

### 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 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.

**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.**

### **Medium Cave/Karst**

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

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

1. The 11-3/4 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 11-3/4" 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 8-5/8 inch intermediate casing, which shall be set at approximately 2960 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.**

**If cement does not circulate to surface on the intermediate casing, the cement on the production casing must come to surface.**

**Formation below the 8-5/8" 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 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.

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## IX. PRODUCTION (POST DRILLING)

### A. WELL STRUCTURES & FACILITIES

#### **Placement of Production Facilities**

Production facilities should be placed on the well pad to allow for maximum interim recontouring and revegetation of the well location.

#### **Exclosure Netting (Open-top Tanks)**

Immediately following active drilling or completion operations, the operator will take actions necessary to prevent wildlife and livestock access, including avian wildlife, to all open-topped tanks that contain or have the potential to contain salinity sufficient to cause harm to wildlife or livestock, hydrocarbons, or Resource Conservation and Recovery Act of 1976-exempt hazardous substances. At a minimum, the operator will net, screen, or cover open-topped tanks to exclude wildlife and livestock and prevent mortality. If the operator uses netting, the operator will cover and secure the open portion of the tank to prevent wildlife entry. The operator will net, screen, or cover the tanks until the operator removes the tanks from the location or the tanks no longer contain substances that could be harmful to wildlife or livestock. Use a maximum netting mesh size of 1 ½ inches. The netting must not be in contact with fluids and must not have holes or gaps.

#### **Chemical and Fuel Secondary Containment and Exclosure Screening**

The operator will prevent all hazardous, poisonous, flammable, and toxic substances from coming into contact with soil and water. At a minimum, the operator will install and maintain an impervious secondary containment system for any tank or barrel containing hazardous, poisonous, flammable, or toxic substances sufficient to contain the contents of the tank or barrel and any drips, leaks, and anticipated precipitation. The operator will dispose of fluids within the containment system that do not meet applicable state or U. S. Environmental Protection Agency livestock water standards in accordance with state law; the operator must not drain the fluids to the soil or ground. The operator will design, construct, and maintain all secondary containment systems to prevent wildlife and livestock exposure to harmful substances. At a minimum, the operator will install effective wildlife and livestock exclosure systems such as fencing, netting, expanded metal mesh, lids, and grate covers. Use a maximum netting mesh size of 1 ½ inches.

#### **Open-Vent Exhaust Stack Exclosures**

The operator will construct, modify, equip, and maintain all open-vent exhaust stacks on production equipment to prevent birds and bats from entering, and to discourage perching, roosting, and nesting. (*Recommended exclosure structures on open-vent exhaust stacks are in the shape of a cone.*) Production equipment includes, but may not be limited to, tanks, heater-treaters, separators, dehydrators, flare stacks, in-line units, and compressor mufflers.

#### **Containment Structures**

Proposed production facilities such as storage tanks and other vessels will have a secondary containment structure that is constructed to hold the capacity of 1.5 times the

largest tank, plus freeboard to account for precipitation, unless more stringent protective requirements are deemed necessary.

#### **Painting Requirement**

All above-ground structures including meter housing that are not subject to safety requirements shall be painted a flat non-reflective paint color, **Shale Green** from the BLM Standard Environmental Color Chart (CC-001: June 2008).

#### **VRM Facility Requirement**

Low-profile tanks not greater than eight-feet-high shall be used.

### **B. PIPELINES**

#### **STANDARD STIPULATIONS FOR SURFACE INSTALLED PIPELINES**

**A copy of the application (Grant, Sundry Notice, APD) and attachments, including stipulations, survey plat and/or map, will be on location during construction. BLM personnel may request to you a copy of your permit during construction to ensure compliance with all stipulations.**

Holder agrees to comply with the following stipulations to the satisfaction of the Authorized Officer:

1. The holder shall indemnify the United States against any liability for damage to life or property arising from the occupancy or use of public lands under this grant.
2. The holder shall comply with all applicable Federal laws and regulations existing or hereafter enacted or promulgated. In any event, the holder shall comply with the Toxic Substances Control Act of 1976 as amended, 15 USC 2601 *et seq.* (1982) with regards to any toxic substances that are used, generated by or stored on the right-of-way or on facilities authorized under this right-of-way grant. (See 40 CFR, Part 702-799 and especially, provisions on polychlorinated biphenyls, 40 CFR 761.1-761.193.) Additionally, any release of toxic substances (leaks, spills, etc.) in excess of the reportable quantity established by 40 CFR, Part 117 shall be reported as required by the Comprehensive Environmental Response, Compensation, and Liability Act, section 102b. A copy of any report required or requested by any Federal agency or State government as a result of a reportable release or spill of any toxic substances shall be furnished to the authorized officer concurrent with the filing of the reports to the involved Federal agency or State government.
3. The holder agrees to indemnify the United States against any liability arising from the release of any hazardous substance or hazardous waste (as these terms are defined in the Comprehensive Environmental Response, Compensation and Liability Act of 1980, 42 U.S.C. 9601, *et seq.* or the Resource Conservation and Recovery Act, 42 U.S.C. 6901, *et seq.*) on the Right-of-Way (unless the release or threatened release is wholly unrelated to activity of the Right-of-Way holder's activity on the Right-of-Way), or resulting from the activity of the Right-of-Way holder on the Right-of-Way. This agreement applies without regard to whether a release is caused by the holder, its agent, or unrelated third

parties.

4. The holder shall be liable for damage or injury to the United States to the extent provided by 43 CFR Sec. 2883.1-4. The holder shall be held to a standard of strict liability for damage or injury to the United States resulting from pipe rupture, fire, or spills caused or substantially aggravated by any of the following within the right-of-way or permit area:

- a. Activities of the holder including, but not limited to construction, operation, maintenance, and termination of the facility.
- b. Activities of other parties including, but not limited to:
  - (1) Land clearing.
  - (2) Earth-disturbing and earth-moving work.
  - (3) Blasting.
  - (4) Vandalism and sabotage.
- c. Acts of God.

The maximum limitation for such strict liability damages shall not exceed one million dollars (\$1,000,000) for any one event, and any liability in excess of such amount shall be determined by the ordinary rules of negligence of the jurisdiction in which the damage or injury occurred.

This section shall not impose strict liability for damage or injury resulting primarily from an act of war or from the negligent acts or omissions of the United States.

5. If, during any phase of the construction, operation, maintenance, or termination of the pipeline, any oil, salt water, or other pollutant should be discharged from the pipeline system, impacting Federal lands, the control and total removal, disposal, and cleaning up of such oil, salt water, or other pollutant, wherever found, shall be the responsibility of the holder, regardless of fault. Upon failure of the holder to control, dispose of, or clean up such discharge on or affecting Federal lands, or to repair all damages resulting therefrom, on the Federal lands, the Authorized Officer may take such measures as he deems necessary to control and clean up the discharge and restore the area, including, where appropriate, the aquatic environment and fish and wildlife habitats, at the full expense of the holder. Such action by the Authorized Officer shall not relieve the holder of any responsibility as provided herein.

6. All construction and maintenance activity will be confined to the authorized right-of-way width of 20 feet. If the pipeline route follows an existing road or buried pipeline right-of-way, the surface pipeline must be installed no farther than 10 feet from the edge of the road or buried pipeline right-of-way. If existing surface pipelines prevent this distance, the proposed surface pipeline must be installed immediately adjacent to the outer surface pipeline. All construction and maintenance activity will be confined to existing roads or right-of-ways.

7. No blading or clearing of any vegetation will be allowed unless approved in writing

by the Authorized Officer.

8. The holder shall install the pipeline on the surface in such a manner that will minimize suspension of the pipeline across low areas in the terrain. In hummocky or dune areas, the pipeline will be "snaked" around hummocks and dunes rather than suspended across these features.

9. The pipeline shall be buried with a minimum of 24 inches under all roads, "two-tracks," and trails. Burial of the pipe will continue for 20 feet on each side of each crossing. The condition of the road, upon completion of construction, shall be returned to at least its former state with no bumps or dips remaining in the road surface.

10. The holder shall minimize disturbance to existing fences and other improvements on public lands. The holder is required to promptly repair improvements to at least their former state. Functional use of these improvements will be maintained at all times. The holder will contact the owner of any improvements prior to disturbing them. When necessary to pass through a fence line, the fence shall be braced on both sides of the passageway prior to cutting of the fence. No permanent gates will be allowed unless approved by the Authorized Officer.

11. In those areas where erosion control structures are required to stabilize soil conditions, the holder will install such structures as are suitable for the specific soil conditions being encountered and which are in accordance with sound resource management practices.

12. Excluding the pipe, all above-ground structures not subject to safety requirement shall be painted by the holder to blend with the natural color of the landscape. The paint used shall be a color which simulates "Standard Environmental Colors" – **Shale Green**, Munsell Soil Color No. 5Y 4/2; designated by the Rocky Mountain Five State Interagency Committee.

13. The pipeline will be identified by signs at the point of origin and completion of the right-of-way and at all road crossings. At a minimum, signs will state the holder's name, BLM serial number, and the product being transported. Signs will be maintained in a legible condition for the life of the pipeline.

14. The holder shall not use the pipeline route as a road for purposes other than routine maintenance as determined necessary by the Authorized Officer in consultation with the holder. The holder will take whatever steps are necessary to ensure that the pipeline route is not used as a roadway.

15. Any cultural and/or paleontological resource (historic or prehistoric site or object) discovered by the holder, or any person working on his behalf, on public or Federal land shall be immediately reported to the authorized officer. Holder shall suspend all operations in the immediate area of such discovery until written authorization to proceed is issued by the authorized officer. An evaluation of the discovery will be made by the

authorized officer to determine appropriate cultural or scientific values. The holder will be responsible for the cost of evaluation and any decision as to proper mitigation measures will be made by the authorized officer after consulting with the holder.

16. The operator shall be held responsible if noxious weeds become established within the areas of operations. Weed control shall be required on the disturbed land where noxious weeds exist, which includes the roads, powerline corridor, and adjacent land affected by the establishment of weeds due to this action. The operator shall consult with the Authorized Officer for acceptable weed control methods, which include following EPA and BLM requirements and policies.

17. Surface pipelines must be less than or equal to 4 inches and a working pressure below 125 psi.

## **X. INTERIM RECLAMATION**

During the life of the development, all disturbed areas not needed for active support of production operations should undergo interim reclamation in order to minimize the environmental impacts of development on other resources and uses.

Within six (6) months of well completion, operators should work with BLM surface management specialists (Jim Amos: 575-234-5909) to devise the best strategies to reduce the size of the location. Interim reclamation should allow for remedial well operations, as well as safe and efficient removal of oil and gas.

During reclamation, the removal of caliche is important to increasing the success of revegetating the site. Removed caliche that is free of contaminants may be used for road repairs, fire walls or for building other roads and locations. In order to operate the well or complete workover operations, it may be necessary to drive, park and operate on restored interim vegetation within the previously disturbed area. Disturbing revegetated areas for production or workover operations will be allowed. If there is significant disturbance and loss of vegetation, the area will need to be revegetated. Communicate with the appropriate BLM office for any exceptions/exemptions if needed.

All disturbed areas after they have been satisfactorily prepared need to be reseeded with the seed mixture provided below.

Upon completion of interim reclamation, the operator shall submit a Sundry Notices and Reports on Wells, Subsequent Report of Reclamation (Form 3160-5).

## **X. FINAL ABANDONMENT & RECLAMATION**

At final abandonment, well locations, production facilities, and access roads must undergo "final" reclamation so that the character and productivity of the land are restored.

Earthwork for final reclamation must be completed within six (6) months of well plugging. All pads, pits, facility locations and roads must be reclaimed to a satisfactory revegetated, safe, and stable condition, unless an agreement is made with the landowner or BLM to keep the road and/or pad intact.

After all disturbed areas have been satisfactorily prepared, these areas need to be revegetated with the seed mixture provided below. Seeding should be accomplished by drilling on the contour whenever practical or by other approved methods. Seeding may need to be repeated until revegetation is successful, as determined by the BLM.

Operators shall contact a BLM surface protection specialist prior to surface abandonment operations for site specific objectives (Jim Amos: 575-234-5909).

authorized officer to determine appropriate cultural or scientific values. The holder will be responsible for the cost of evaluation and any decision as to proper mitigation measures will be made by the authorized officer after consulting with the holder.

16. The operator shall be held responsible if noxious weeds become established within the areas of operations. Weed control shall be required on the disturbed land where noxious weeds exist, which includes the roads, powerline corridor, and adjacent land affected by the establishment of weeds due to this action. The operator shall consult with the Authorized Officer for acceptable weed control methods, which include following EPA and BLM requirements and policies.

17. Surface pipelines must be less than or equal to 4 inches and a working pressure below 125 psi.

## **X. INTERIM RECLAMATION**

During the life of the development, all disturbed areas not needed for active support of production operations should undergo interim reclamation in order to minimize the environmental impacts of development on other resources and uses.

Within six (6) months of well completion, operators should work with BLM surface management specialists (Jim Amos: 575-234-5909) to devise the best strategies to reduce the size of the location. Interim reclamation should allow for remedial well operations, as well as safe and efficient removal of oil and gas.

During reclamation, the removal of caliche is important to increasing the success of revegetating the site. Removed caliche that is free of contaminants may be used for road repairs, fire walls or for building other roads and locations. In order to operate the well or complete workover operations, it may be necessary to drive, park and operate on restored interim vegetation within the previously disturbed area. Disturbing revegetated areas for production or workover operations will be allowed. If there is significant disturbance and loss of vegetation, the area will need to be revegetated. Communicate with the appropriate BLM office for any exceptions/exemptions if needed.

All disturbed areas after they have been satisfactorily prepared need to be reseeded with the seed mixture provided below.

Upon completion of interim reclamation, the operator shall submit a Sundry Notices and Reports on Wells, Subsequent Report of Reclamation (Form 3160-5).

## **X. FINAL ABANDONMENT & RECLAMATION**

## Seed Mixture 1 for Loamy Sites

The holder shall seed all disturbed areas with the seed mixture listed below. The seed mixture shall be planted in the amounts specified in pounds of pure live seed (PLS)\* per acre. There shall be no primary or secondary noxious weeds in the seed mixture. Seed will be tested and the viability testing of seed will be done in accordance with State law(s) and within nine (9) months prior to purchase. Commercial seed will be either certified or registered seed. The seed container will be tagged in accordance with State law(s) and available for inspection by the authorized officer.

Seed will be planted using a drill equipped with a depth regulator to ensure proper depth regulator to ensure proper depth of planting where drilling is possible. The seed mixture will be evenly and uniformly planted over the disturbed area (small/heavier seeds have a tendency to drop the bottom of the drill and are planted first). The holder shall take appropriate measures to ensure this does not occur. Where drilling is not possible, seed will be broadcast and the area shall be raked or chained to cover the seed. When broadcasting the seed, the pounds per acre are to be doubled. The seeding will be repeated until a satisfactory stand is established as determined by the authorized officer. Evaluation of growth will not be made before completion of at least one full growing season after seeding.

Species to be planted in pounds of pure live seed\* per acre:

Species	lb/acre
Plains lovegrass ( <i>Eragrostis intermedia</i> )	0.5
Sand dropseed ( <i>Sporobolus cryptandrus</i> )	1.0
Sideoats grama ( <i>Bouteloua curtipendula</i> )	5.0
Plains bristlegrass ( <i>Setaria macrostachya</i> )	2.0

\*Pounds of pure live seed:

Pounds of seed x percent purity x percent germination = pounds pure live seed