

ATS-08-468

AUG 29 2008

OCD-ARTESIA

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Form 3160-3  
(April 2004)

S

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF LAND MANAGEMENT

APPLICATION FOR PERMIT TO DRILL OR REENTER

FORM APPROVED  
OMB No 1004-0137  
Expires March 31, 2007

5. Lease Serial No.  
NM-14124

6. If Indian, Allottee or Tribe Name

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

8. Lease Name and Well No. 37374  
Marquardt Federal No. 8

9. API Well No.  
30-015-36602

10. Field and Pool, or Exploratory  
Delaware Black River 94451

11. Sec., T. R. M. or Blk. and Survey or Area  
1-25S-26E

12. County or Parish  
Eddy

13. State  
NM

1a. Type of Work: ☒ DRILL ☐ REENTER

1b. Type of Well ☒ Oil Well ☐ Gas Well ☐ Other ☒ Single Zone ☐ Multiple Zone

2. Name of Operator  
Cimarex Energy Co. of Colorado 162683

3a. Address  
PO Box 140907  
Irving, TX 75014

3b. Phone No. (include area code)  
972-401-3111

4. Location of Well (Report location clearly and in accordance with any State requirements. \*)  
At Surface 330' FSL & 660' FWL - M  
At proposed prod. Zone 2310' FSL & 660' FWL - L Horizontal Delaware Test

14. Distance in miles and direction from nearest town or post office\*

15. Distance from proposed\* location to nearest property or lease line, ft. (Also to nearest drg. unit line if any) 330'

16. No of acres in lease  
1,280.48

17. Spacing Unit dedicated to this well  
W2SW 80

18. Distance from proposed location\* to nearest well, drilling, completed, applied for, on this lease, ft. N/A

19. Proposed Depth  
Pilot Hole 6,000'  
MD 4,923' TVD 3,042'

20. BLM/BIA Bond No. on File  
NM-2575

21. Elevations (Show whether DF, KDB, RT, GL, etc.)  
3,305' GR

22. Approximate date work will start\*  
05.15.08

23. Estimated duration  
20-25 days

24. Attachments

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

- Well plat certified by a registered surveyor
- A Drilling Plan
- A Surface Use Plan (if the location is on National Forest System Lands, the SUPO shall be filed with the appropriate Forest Service Office)

- Bond to cover the operations unless covered by an existing bond on file (see Item 20 above)
- Operator Certification
- Such other site specific information and/or plans as may be required by the authorized officer

25. Signature Zeno Farris Name (Printed/Typed) Zeno Farris Date 04.17.08

Title

Manager Operations Administration

Approved By (Signature) /s/ Don Peterson Name (Printed/Typed) /s/ Don Peterson Date AUG 19 2008

Office CARLSBAD FIELD OFFICE

**NOTE: NEW PIT RULE**  
19-15-17 NMAC PART 17  
A form C-144 must be approved  
before starting drilling operations.

olds legal or equitable title to those rights in the subject lease which would entitle the applicant to

**APPROVAL FOR TWO YEARS**

it a crime for any person knowingly and willfully to make to any department or agency of the United  
is as to any matter within its jurisdiction

\*(Instructions on page 2)

CARLSBAD CONTROLLED WATER BASIN

SEE ATTACHED FOR  
CONDITIONS OF APPROVAL

APPROVAL SUBJECT TO  
GENERAL REQUIREMENTS  
AND SPECIAL STIPULATIONS  
ATTACHED

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF LAND MANAGEMENT  
**OCD-ARTESIA**

APPROVED  
#004-0135  
es July 31, 1996

**SUNDRY NOTICES AND REPORTS ON WELLS**  
*Do not use this form for proposals to drill or to re-enter an  
abandoned well. Use form 3160-3 (APD) for such proposals.*

**SUBMIT IN TRIPLICATE - Other instructions on reverse side**

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

2. Name of Operator  
Cimarex Energy Co. of Colorado

3a. Address  
PO Box 140907; Irving, TX 75014-0907

3b. Phone No. (include area code)  
972-401-3111

4. Location of Well (Footage, Sec., T., R., M., or Survey Description)  
SHL 330 FSL & 660 FWL BHL 2310 FSL & 660 FWL  
1-25S-26E 1-25S-26E

5. Lease Serial No.

NM-14124

6. If Indian, Allottee or Tribe Name

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

8. Well Name and No.

Marquardt Federal No. 8

9. API Well No.

30-015-

10. Field and Pool, or Exploratory Area

Delaware Black River

11. County or Parish, State

Eddy County, NM

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

TYPE OF SUBMISSION	TYPE OF ACTION			
<input checked="" type="checkbox"/> Notice of Intent	<input type="checkbox"/> Acidize	<input type="checkbox"/> Deepen	<input type="checkbox"/> Production (Start/Resume)	<input type="checkbox"/> Water Shut-Off
<input type="checkbox"/> Subsequent Report	<input type="checkbox"/> Alter Casing	<input type="checkbox"/> Fracture Treat	<input type="checkbox"/> Reclamation	<input type="checkbox"/> Well Integrity
<input type="checkbox"/> Final Abandonment Notice	<input type="checkbox"/> Casing Repair	<input type="checkbox"/> New Construction	<input type="checkbox"/> Recomplete	<input checked="" type="checkbox"/> Other <u>Change proposed</u>
	<input checked="" type="checkbox"/> Change Plans	<input type="checkbox"/> Plug and Abandon	<input type="checkbox"/> Temporarily Abandon	<u>access road</u>
	<input type="checkbox"/> Convert to Injection	<input type="checkbox"/> Plug Back	<input type="checkbox"/> Water Disposal	

13. Describe Proposed or Completed Operation (clearly state all pertinent details, included estimated starting date of any proposed work and approximate duration thereof. If the proposal is to deepen directionally or recompleat horizontally, give subsurface locations and measured and true vertical depths of all pertinent markers and zones. Attach the bond under which the work will be performed or provide the Bond No. on file with BLM/BIA. Required subsequent reports shall be filed within 30 days following completion of the involved operations. If the operation results in a multiple completion or recompleat in a new interval, a Form 3160-4 shall be filed once testing has been completed. Final Abandonment Notices shall be filed only after all requirements, including reclamation, have been completed, and the operator has determined that the site is ready for final inspection.)

Please see attached revised road plats indicating our new proposed access road to this well (per BLM request).

No ROW is required as road stays on-lease.

14. I hereby certify that the foregoing is true and correct  
Name (Printed/Typed)

Natalie Krueger

Signature

Title

Regulatory Analyst

Date

June 4, 2008

**THIS SPACE FOR FEDERAL OR STATE OFFICE USE**

Approved by

/s/ Don Peterson

Title

FIELD MANAGER

Date

AUG 19 2008

Office

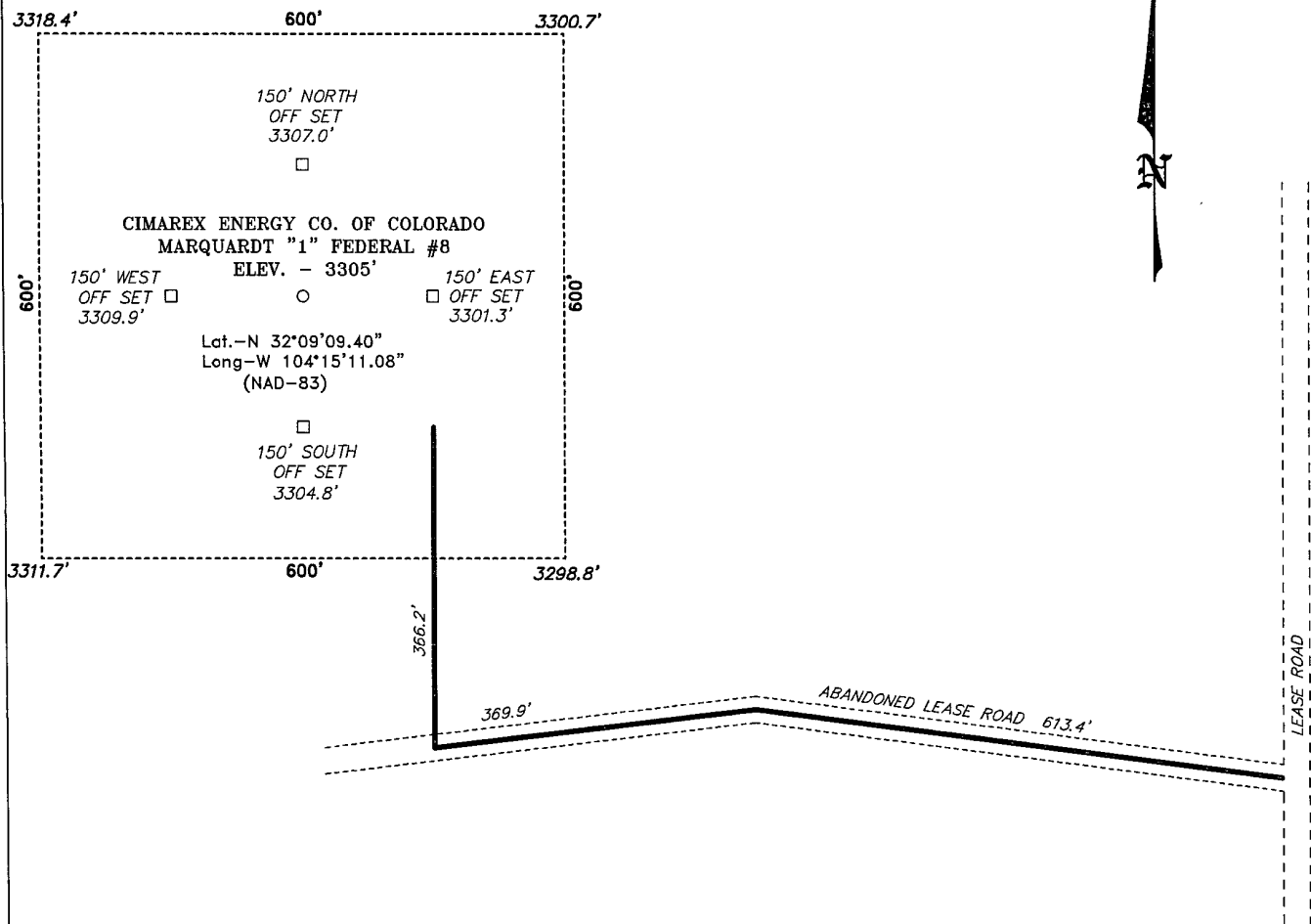
**CARLSBAD FIELD OFFICE**

Conditions of Approval, if any, are attached. Approval of this notice does not warrant or certify that the applicant holds legal or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations thereon.

Title 18 U.S.C. Section 1001, makes it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

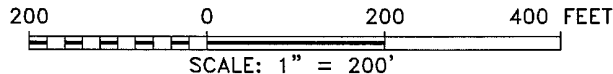
(Instructions on reverse)

SECTION 1, TOWNSHIP 25 SOUTH, RANGE 26 EAST, N.M.P.M.,  
EDDY COUNTY, NEW MEXICO.



Directions to Location:

FROM JUNCTION OF BLACK RIVER VILLAGE AND OLD  
CAVERN HWY, GO SOUTH 3.7 MILES TO LEASE ROAD,  
THENCE GO WEST ON LEASE ROAD 2.0 MILES TO  
LEASE ROAD, ON LEASE ROAD GO SOUTH 1.0 MILES  
TO PROPOSED LEASE ROAD.



**BASIN SURVEYS** P.O. BOX 1786-HOBBS, NEW MEXICO

W.O. Number: 19361 Drawn By: J. SMALL

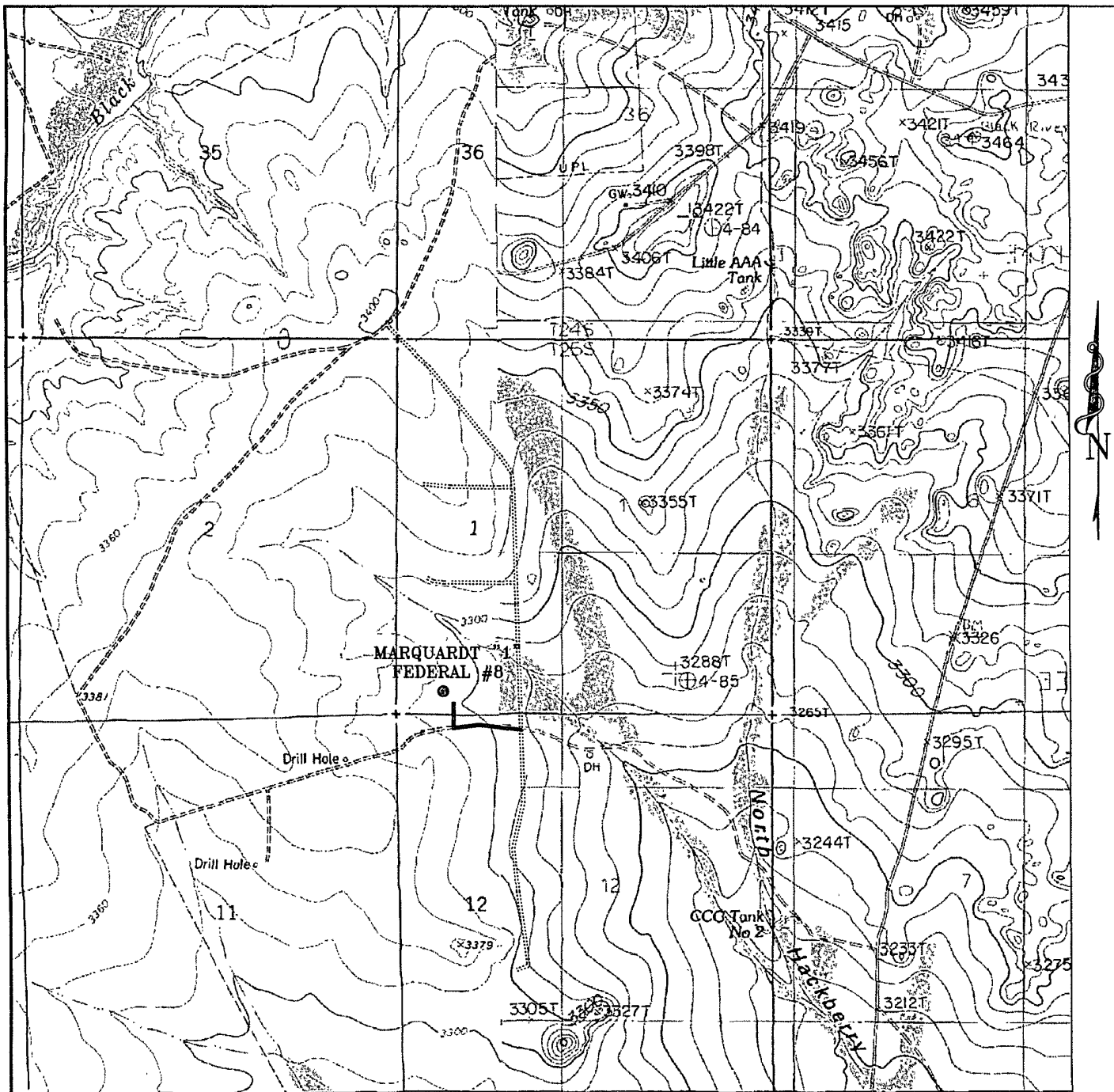
Date: 03-24-2008 Disk: JMS 19361W

**CIMAREX ENERGY CO. OF COLORADO**

REF: MARQUARDT "1" FEDERAL #8 / WELL PAD TOPO

THE MARQUARDT "1" FEDERAL #8 LOCATED 330'  
FROM THE SOUTH LINE AND 660' FROM THE WEST LINE OF  
SECTION 1, TOWNSHIP 25 SOUTH, RANGE 26 EAST,  
N.M.P.M., EDDY COUNTY, NEW MEXICO.

Survey Date: 03-18-2008 Sheet 1 of 1 Sheets



**MARQUARDT "1" FEDERAL #8**  
 Located 330' FSL and 660' FWL  
 Section 1, Township 25 South, Range 26 East,  
 N.M.P.M., Lea County, New Mexico.

**basin**  
**surveys**  
 focused on excellence  
 in the oilfield

P.O. Box 1786  
 1120 N. West County Rd.  
 Hobbs, New Mexico 88241  
 (505) 393-7316 - Office  
 (505) 392-3074 - Fax  
 basinsurveys.com

W.O. Number: JMS 19361T

Survey Date: 03-18-2008

Scale: 1" = 2000'

Date: 03-24-2008

**CIMAREX**  
**ENERGY CO.**  
**OF COLORADO**

DISTRICT I  
1625 N. French Dr., Hobbs, NM 88240

DISTRICT II  
1301 W. Grand Avenue, Artesia, NM 88210

DISTRICT III  
1000 Rio Brazos Rd., Aztec, NM 87410

DISTRICT IV  
1220 S. St. Francis Dr., Santa Fe, NM 87505

State of New Mexico  
Energy, Minerals and Natural Resources Department

Form C-102  
Revised October 12, 2005

Submit to Appropriate District Office  
State Lease - 4 Copies  
Fee Lease - 3 Copies

**OIL CONSERVATION DIVISION**  
1220 South St. Francis Dr.  
Santa Fe, New Mexico 87505

☐ AMENDED REPORT

**WELL LOCATION AND ACREAGE DEDICATION PLAT**

API Number	Pool/Code 96451	Pool Name Black River, Delaware
Property Code	Property Name MARQUARDT "1" FEDERAL	Well Number 8
OGRID No. 162683	Operator Name CIMAREX ENERGY CO. OF COLORADO	Elevation 3305'

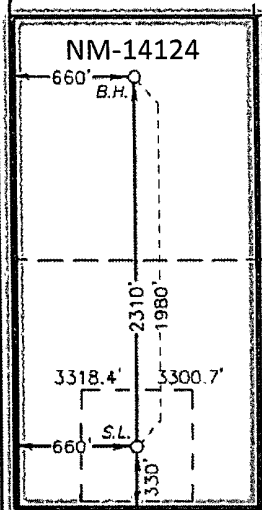
**Surface Location**

UL or lot No. M	Section 1	Township 25 S	Range 26 E	Lot Idn	Feet from the 330	North/South line SOUTH	Feet from the 660	East/West line WEST	County EDDY
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**Bottom Hole Location If Different From Surface**

UL or lot No. L	Section 1	Township 25 S	Range 26 E	Lot Idn	Feet from the 2310	North/South line SOUTH	Feet from the 660	East/West line WEST	County EDDY
Dedicated Acres 80	Joint or Infill	Consolidation Code	Order No.						

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

	<b>BOTTOM HOLE LOCATION</b> Lat - N32°09'29.40" Long - W104°15'11.08" NMSPC- N 421285.946 E 566173.333 (NAD-83)	<b>OPERATOR CERTIFICATION</b>  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 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.  Zeno Farris 04-17-08 Signature Date  Zeno Farris Printed Name
	<b>SURFACE LOCATION</b> Lat - N32°09'09.81" Long - W104°15'11.32" NMSPC- N 419306.415 E 566153.951 (NAD-83)	

Application to Drill  
**Marquardt Federal No. 8**  
Cimarex Energy Co. of Colorado  
Unit M, Section 1  
T25S-R26E, Eddy County, NM

In response to questions asked under Section II B of Bulletin NTL-6, the following information is provided for your consideration:

1. Location:     SHL    330' FSL & 660' FWL  
                      BHL    2310' FSL & 660' FWL
2. Elevation above sea level:     3,305'   GR
3. Geologic name of surface formation:     Quaternary Alluvium Deposits
4. Drilling tools and associated equipment:     Conventional rotary drilling rig using fluid as a circulating medium for solids removal.
5. Proposed drilling depth:     Pilot Hole 6,000'             MD 4,923'             TVD 3,042'
6. Estimated tops of geological markers:

Top Salt	315'
Base Salt	1,719'
Bell Canyon	1,922'
Cherry Canyon	2,935'
Brushy Canyon	3,855'
Bone Spring	5,431'
7. Possible mineral bearing formation:

Cherry Canyon	Oil
Bell Canyon	Oil

8. Proposed drilling Plan

In 11" hole, set 8½" casing @ 440' and cement to surface. *(In case of excessive lost returns from 0-350,' POOH and ream hole with 14¼" bit and set 11¼" casing from 0-350.' Drill 11" hole to 440' and set 8½" casing from 0-440.')* In 7½" hole, drill to Pilot Hole TD 6,000.' Run open hole logs. Plug back pilot hole with cement plug from 5,331' to 6,000' and tag. Set additional cement plug from 4000' to 4200' and tag. Then set another cement plug from 2,563' to 3,063' (250' above and below KOP). Dress off cement plug.

Mill window from 2,808' to 2,818' and kick off 7½" lateral @ 2,813.' Drill 7½" hole through curve and set & cement 5½" casing at 3,173' MD (3,042' TVD). Drill lateral 4¼" hole from 3,174' MD to 4,923' MD (3,042' TVD). Attempt natural open-hole completion. If natural flow is not possible with open-hole completion, attempt completion with 2½" slotted liner and no cement (liner hanger @ 2,973' MD). If not viable, attempt completion with 2½" Peak Completion Assembly (RSB packer @ 2,973' MD).

Application to Drill  
**Marquardt Federal No. 8**  
Cimarex Energy Co. of Colorado  
Unit M, Section 1  
T25S-R26E, Eddy County, NM

9. Proposed Mud Circulating System:

**Pilot Hole**

Depth	Mud Wt	Visc	Fluid Loss	Type Mud
0' to 440'	8.4 - 8.6	30-32	NC	FW spud mud. Add FW to control weight & viscosity and add paper to prevent seepage.
440' to 6,000'	9.9 - 10.0	28-29	NC	Brine. Sweep as needed to clean hole.

**Lateral**

Depth	Mud Wt	Visc	Fluid Loss	Type Mud
KOP MD 4,876' to TVD 2,813' to TVD 2,978'	9.0	28-30	NC	Cut brine. Sweep as needed to clean hole.

Sufficient mud materials will be kept on location at all times in order to combat lost circulation or unexpected kicks. In order to run DSTs, open hole logs, and casing, the viscosity and water loss may have to be adjusted in order to meet these needs.

10. Casing Program:

Pilot Hole	Hole Size	Depth	Casing OD	Weight	Thread	Collar	Grade
Surface	11"	0' to 440'	New 8 7/8"	24#	8-R	STC	J-55
<b>or</b>							
Surface Contingency (in case of excessive lost returns)	14 3/4"	0' to 350'	New 11 1/4"	42#	8-R	STC	H-40
	11"	0' to 440'	New 8 7/8"	24#	8-R	STC	J-55
Lateral	Hole Size	Depth	Casing OD	Weight	Thread	Collar	Grade
Intermediate	7 1/2"	0' to MD 3,173' TVD 3,042'	New 5 1/2"	17#	8-R	*BTC & LTC	J-55
Open Hole Lateral	4 3/4"	MD 3,173' TVD 3,042' to MD 4,923' TVD 3,042'	open hole				
* BTC (First 410') & LTC (remainder of casing)							
<b>or</b>							
Lateral Liner Contingency	4 3/4"	MD 3,173' TVD 3,042' to MD 4,923' TVD 3,042'	New 2 3/8"	6.5#	8-R	LTC	J-55
<b>or</b>							
Peak Completion Assembly	4 3/4"	MD 3,173' TVD 3,042' to MD 4,923' TVD 3,042'	New 2 3/8"	6.5#	8-R	LTC	J-55

11. Cementing:

Surface	500 sx Class C + 2% CaCl <sub>2</sub> (wt 14.8, yld 1.34) <b>TOC Surface</b>
Surface Contingency	11 1/4" casing: 310 sx Class C + 2% Si + 0.236# D-130 (14.8, yld 1.34), TOC 0' 8 7/8" casing: 500 sx Class C + 2% CaCl <sub>2</sub> (wt 14.8, yld 1.34), TOC 0'
Intermediate	Lead: 600 sx Class C Light + 1/4# Flocele + 1# Gilsonite + 6% Gel + 12% Salt (wt 12.4, yld 2.37) Tail: 400 sx Class C Neat + 2% CaCl <sub>2</sub> (wt 14.8, yld 1.34) <b>TOC Surface</b>
Lateral Liner Contingency	If hole stability problems exist, set 2 3/8" 6.5# J-55 slotted liner. Set liner hanger @ MD 2,973.' TOL MD 2,973' and BOL MD 4,923.' No cement.
Peak Completion Assembly Contingency	If open hole completion is tight, run 2 3/8" J-55 slotted liner. Set RSB Packer @ MD 2,973.' TOL MD 2,973' and BOL MD 4,923.' No cement. Frac as needed.

Fresh water zones will be protected by setting 8 7/8" casing at 440' and cementing to surface (or by implementing the surface casing contingency plan). Hydrocarbon zones will be protected by setting 5 1/2" casing at 3,181' and cementing to surface.

<u>Collapse Factor</u>	<u>Burst Factor</u>	<u>Tension Factor</u>
1.125	1.125	1.6

Application to Drill  
**Marquardt Federal No. 8**  
Cimarex Energy Co. of Colorado  
Unit M, Section 1  
T25S-R26E, Eddy County, NM

12. Pressure control Equipment:

Exhibit "E". A 11" 5000 PSI working pressure B.O.P. consisting of one set of blind rams and one set of pipe rams and a 5000 # annular type preventer. A choke manifold and 120 gallon accumulator with floor and remote operating stations and auxiliary power system. Rotating head below 315'. A kelly cock will be installed and maintained in operable condition and a drill string safety valve in the open position will be available on the rig floor.

BOP unit will be hydraulically operated. BOP will be nipped up and operated at least once a day while drilling and the blind rams will be operated when out of hole during trips. No abnormal pressure or temperature is expected while drilling. From the base of the surface pipe through the running of production casing, the well will be equipped with a 5000 psi BOP system.

We are requesting a variance for testing the 8 $\frac{5}{8}$ " surface casing from Onshore Order No. 2, which states that all casing strings below the conductor shall be pressure tested to 0.22 psi per foot or 1500 psi, whichever is greater, but not to exceed 70% of the manufacturer's stated maximum internal yield. We are requesting to test the 8 $\frac{5}{8}$ " casing to 1000 psi using rig pumps. The BOP will be tested to 3000 psi by an independent service company.

13. Testing, Logging and Coring Program:

- A. Mud logging program: No mud logging program.
- B. Electric logging program: CNL / LDT / CAL / GR, DLL / CAL / GR
- C. No DSTs or cores are planned at this time.

14. Potential Hazards:

No abnormal pressures or temperatures are expected. In accordance with Onshore Order 6, Cimarex has encountered H<sub>2</sub>S in a one-time encounter in an Intra-salt Pocket and while drilling and completing wells in the Delaware Mountain Group. In this regard, attached is an H<sub>2</sub>S Drilling Operations Plan. The ROEs encountered do not meet the BLM's minimum requirements for the submission of a "Public Protection Plan" for the drilling and completion of this well. Adequate flare lines will be installed off the mud / gas separator where gas may be flared safely. All personnel will be familiar with all aspects of safe operation of equipment being used.

Estimated BHP                      **2300 psi**                      Estimated BHT                      **110°**

15. Road and location construction will begin after BLM approval of APD. Anticipated spud date as soon as approved.

Drilling expected to take                      10-15 days

If production casing is run an additional 30 days will be required to complete and construct surface facilities.

16. Other Facets of Operations:

After running casing, cased hole gamma ray neutron collar logs will be run from total depth over possible pay intervals.

Delaware                      pay will be perforated and stimulated.

The proposed well will be tested and potentialized as                      **an oil well.**



**Project:** Eddy County, NM  
**Site:** Marquardt "1" Federal  
**Well:** #8

**Wellbore:** Wellbore #1  
**Plan:** Plan #1 (#8/Wellbore #1)  
**Rig:** TBD



#### SECTION DETAILS

MD	Inc	Azi	TVD	+N/-S	+E/-W	DLeg	TFace	VSec	Annotation
0 00	0 00	0 00	0.00	0.00	0 00	0 00	0 00	0.00	
2812.82	0 00	0 00	2812.82	0.00	0 00	0 00	0 00	0.00	KOP at 2,813' MD
3172.82	90 00	0 56	3042.00	229.17	2 24	25.00	0 56	229.18	EOC at 3,173' MD
4923.26	90 00	0 56	3042.00	1979.53	19 38	0.00	0 00	1979.63	TD at 4,923.26' MD

#### WELLBORE TARGET DETAILS (MAP CO-ORDINATES)

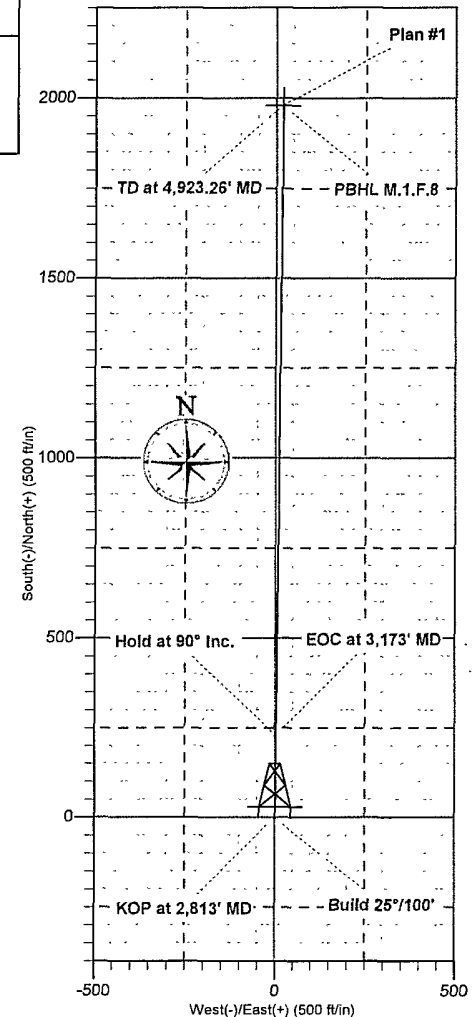
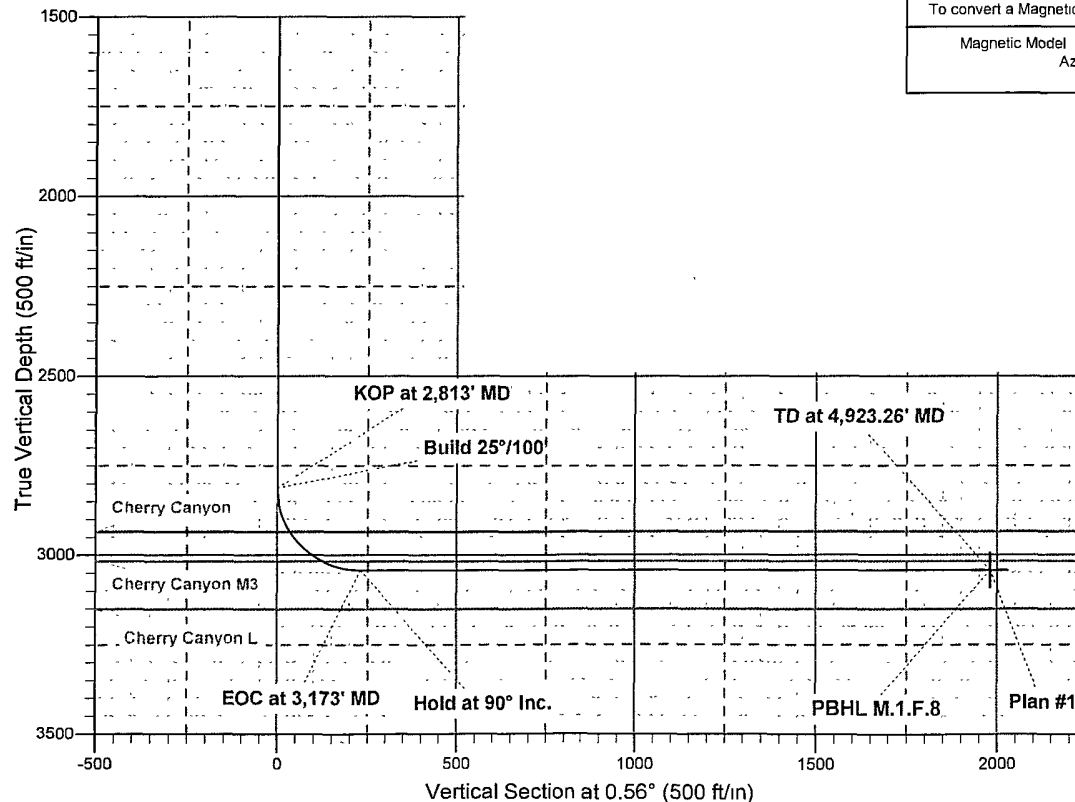
Name	TVD	+N/-S	+E/-W	Northing	Easting	Shape
PBHL M 1 F 8	3042.00	1979.53	19.38	421285.95	566173.33	Point

#### Surface Location:

US State Plane 1983  
 New Mexico Eastern Zone  
 Elevation GL 3,305 + KB 10 @ 3315.00ft (TBD)  
 Northing 419306.41 Easting 566153.95 Latitude 32° 9' 9.815 N Longitude 104° 15' 11.318 W

To convert a Magnetic Direction to a Grid Direction, Add 8.26°

Magnetic Model BGGM2007 Date: 09-Apr-08  
 Azimuths to Grid North



# **Cimarex Energy Co.**

**Eddy County, NM  
Marquardt "1" Federal  
#8**

**Wellbore #1**

**Plan: Plan #1**

## **Sperry Drilling Services Proposal Report**

**09 April, 2008**

Well Coordinates: 419,306.42 N, 566,153.95 E (32° 09' 09.81" N, 104° 15' 11.32" W)  
Ground Level: 3,305.00 ft

Local Coordinate Origin:	Centered on Well #8
Viewing Datum:	GL 3,305 + KB 10 @ 3315.00ft (TBD)
TVDs to System:	N
North Reference:	Grid
Unit System:	API - U.S. Survey Feet

Version: 2003.16 Build: 42B

**HALLIBURTON**

**HALLIBURTON****Plan Report for #8 - Plan #1**

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	Toolface Azimuth (°)
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
2,812.82	0.00	0.00	2,812.82	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>KOP at 2,813' MD - Build 25°/100'</b>										
2,900.00	21.80	0.56	2,897.91	16.38	0.16	16.38	25.00	25.00	0.00	0.56
3,000.00	46.80	0.56	2,979.87	72.28	0.71	72.28	25.00	25.00	0.00	0.00
3,100.00	71.80	0.56	3,030.53	157.58	1.54	157.59	25.00	25.00	0.00	0.00
3,172.82	90.00	0.56	3,042.00	229.18	2.24	229.19	25.00	25.00	0.00	0.00
<b>EOC at 3,173' MD - Hold at 90° Inc.</b>										
3,200.00	90.00	0.56	3,042.00	256.35	2.51	256.37	0.00	0.00	0.00	0.00
3,300.00	90.00	0.56	3,042.00	356.35	3.49	356.37	0.00	0.00	0.00	0.00
3,400.00	90.00	0.56	3,042.00	456.34	4.47	456.37	0.00	0.00	0.00	0.00
3,500.00	90.00	0.56	3,042.00	556.34	5.45	556.37	0.00	0.00	0.00	0.00
3,600.00	90.00	0.56	3,042.00	656.33	6.43	656.37	0.00	0.00	0.00	0.00
3,700.00	90.00	0.56	3,042.00	756.33	7.41	756.37	0.00	0.00	0.00	0.00
3,800.00	90.00	0.56	3,042.00	856.33	8.38	856.37	0.00	0.00	0.00	0.00
3,900.00	90.00	0.56	3,042.00	956.32	9.36	956.37	0.00	0.00	0.00	0.00
4,000.00	90.00	0.56	3,042.00	1,056.32	10.34	1,056.37	0.00	0.00	0.00	0.00
4,100.00	90.00	0.56	3,042.00	1,156.31	11.32	1,156.37	0.00	0.00	0.00	0.00
4,200.00	90.00	0.56	3,042.00	1,256.31	12.30	1,256.37	0.00	0.00	0.00	0.00
4,300.00	90.00	0.56	3,042.00	1,356.30	13.28	1,356.37	0.00	0.00	0.00	0.00
4,400.00	90.00	0.56	3,042.00	1,456.30	14.26	1,456.37	0.00	0.00	0.00	0.00
4,500.00	90.00	0.56	3,042.00	1,556.29	15.24	1,556.37	0.00	0.00	0.00	0.00
4,600.00	90.00	0.56	3,042.00	1,656.29	16.22	1,656.37	0.00	0.00	0.00	0.00
4,700.00	90.00	0.56	3,042.00	1,756.28	17.20	1,756.37	0.00	0.00	0.00	0.00
4,800.00	90.00	0.56	3,042.00	1,856.28	18.18	1,856.37	0.00	0.00	0.00	0.00
4,900.00	90.00	0.56	3,042.00	1,956.27	19.15	1,956.37	0.00	0.00	0.00	0.00
4,923.26	90.00	0.56	3,042.00	1,979.53	19.38	1,979.63	0.00	0.00	0.00	0.00

**HALLIBURTON****Plan Report for #8 - Plan #1****Plan Annotations**

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
2,812.82	2,812.82	0.00	0.00	KOP at 2,813' MD
2,812.82	2,812.82	0.00	0.00	Build 25°/100'
3,172.82	3,042.00	229.18	2.24	EOC at 3,173' MD
3,172.82	3,042.00	229.18	2.24	Hold at 90° Inc.
4,923.26	3,042.00	1,979.53	19.38	TD at 4,923.26' MD

**Vertical Section Information**

Angle Type	Target	Azimuth (°)	Origin Type	Origin +N/-S (ft)	Origin +E/-W (ft)	Start TVD (ft)
Target	PBHL M.1.F.8	0.56	Slot	0.00	0.00	3,042.00

**Survey tool program**

From (ft)	To (ft)	Survey/Plan	Survey Tool
0.00	4,923.26	Plan #1	MWD

**Formation Details**

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
	3,151.00	Cherry Canyon L		0.00	
2,941.68	2,935.00	Cherry Canyon		0.00	
3,064.77	3,017.00	Cherry Canyon M3		0.00	

**Targets associated with this wellbore**

Target Name	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Shape
PBHL M.1.F.8	3,042.00	1,979.53	19.38	Point

**North Reference Sheet for Marquardt "1" Federal - #8 - Wellbore #1**

All data is in US Feet unless otherwise stated. Directions and Coordinates are relative to Grid North Reference.

Vertical Depths are relative to GL 3,305 + KB 10 @ 3315.00ft (TBD). Northing and Easting are relative to #8

Coordinate System is US State Plane 1983, New Mexico Eastern Zone using datum North American Datum 1983, ellipsoid GRS 1980

Projection method is Transverse Mercator (Gauss-Kruger)

Central Meridian is -104.33°, Longitude Origin: 0° 0' 0.000 E°, Latitude Origin: 0° 0' 0.000 N°

False Easting: 541,337.50ft, False Northing: 0.00ft, Scale Reduction: 0.99990980

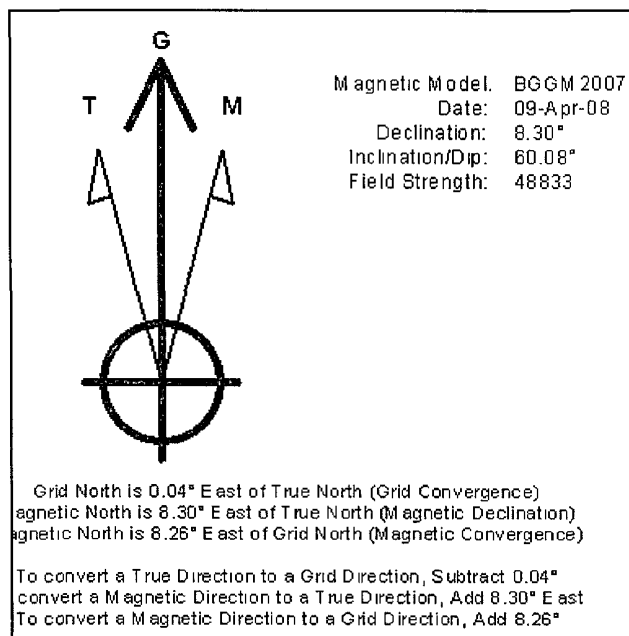
Grid Coordinates of Well: 419,306.42 ft N, 566,153.95 ft E

Geographical Coordinates of Well: 32° 09' 09.81" N, 104° 15' 11.32" W

Grid Convergence at Surface is: 0.04°

Based upon Minimum Curvature type calculations, at a Measured Depth of 4,923.26ft  
the Bottom Hole Displacement is 1,979.63ft in the Direction of 0.56° (Grid).

Magnetic Convergence at surface is: -8.26° ( 9 April 2008, , BGGM2007)



Cimarex Energy Co.  
#8 - Plan #1

Eddy County, NM  
Marquardt "1" Federal  
Your Ref:

Measured UTM Coordinates			Sub-Sea	Vertical	Local Coordinates	
Depth	Incl.	Azim.	Vertical	Dogleg	Northings	Eastings
Northings	Eastings		Depth	Depth		
(ft)	(ft)		Section	Rate	(ft)	(ft)
(ft)	(ft)		(ft)	(°/100ft)		
0.00	0.000	0.000	-3315.00	0.00	0.00 N	0.00 E
419306.415 N	566153.951 E		0.00	0.00		
30.00	0.000	0.000	-3285.00	30.00	0.00 N	0.00 E
419306.415 N	566153.951 E		0.00	0.00		
60.00	0.000	0.000	-3255.00	60.00	0.00 N	0.00 E
419306.415 N	566153.951 E		0.00	0.00		
90.00	0.000	0.000	-3225.00	90.00	0.00 N	0.00 E
419306.415 N	566153.951 E		0.00	0.00		
120.00	0.000	0.000	-3195.00	120.00	0.00 N	0.00 E
419306.415 N	566153.951 E		0.00	0.00		
150.00	0.000	0.000	-3165.00	150.00	0.00 N	0.00 E
419306.415 N	566153.951 E		0.00	0.00		
180.00	0.000	0.000	-3135.00	180.00	0.00 N	0.00 E
419306.415 N	566153.951 E		0.00	0.00		
210.00	0.000	0.000	-3105.00	210.00	0.00 N	0.00 E
419306.415 N	566153.951 E		0.00	0.00		
240.00	0.000	0.000	-3075.00	240.00	0.00 N	0.00 E
419306.415 N	566153.951 E		0.00	0.00		
270.00	0.000	0.000	-3045.00	270.00	0.00 N	0.00 E
419306.415 N	566153.951 E		0.00	0.00		
300.00	0.000	0.000	-3015.00	300.00	0.00 N	0.00 E
419306.415 N	566153.951 E		0.00	0.00		
330.00	0.000	0.000	-2985.00	330.00	0.00 N	0.00 E
419306.415 N	566153.951 E		0.00	0.00		
360.00	0.000	0.000	-2955.00	360.00	0.00 N	0.00 E
419306.415 N	566153.951 E		0.00	0.00		
390.00	0.000	0.000	-2925.00	390.00	0.00 N	0.00 E
419306.415 N	566153.951 E		0.00	0.00		
420.00	0.000	0.000	-2895.00	420.00	0.00 N	0.00 E
419306.415 N	566153.951 E		0.00	0.00		
450.00	0.000	0.000	-2865.00	450.00	0.00 N	0.00 E
419306.415 N	566153.951 E		0.00	0.00		
480.00	0.000	0.000	-2835.00	480.00	0.00 N	0.00 E
419306.415 N	566153.951 E		0.00	0.00		
510.00	0.000	0.000	-2805.00	510.00	0.00 N	0.00 E
419306.415 N	566153.951 E		0.00	0.00		
540.00	0.000	0.000	-2775.00	540.00	0.00 N	0.00 E
419306.415 N	566153.951 E		0.00	0.00		
570.00	0.000	0.000	-2745.00	570.00	0.00 N	0.00 E
419306.415 N	566153.951 E		0.00	0.00		
600.00	0.000	0.000	-2715.00	600.00	0.00 N	0.00 E
419306.415 N	566153.951 E		0.00	0.00		
630.00	0.000	0.000	-2685.00	630.00	0.00 N	0.00 E
419306.415 N	566153.951 E		0.00	0.00		
660.00	0.000	0.000	-2655.00	660.00	0.00 N	0.00 E
419306.415 N	566153.951 E		0.00	0.00		
690.00	0.000	0.000	-2625.00	690.00	0.00 N	0.00 E
419306.415 N	566153.951 E		0.00	0.00		

720.00	0.000	0.000	-2595.00	720.00	0.00 N	0.00 E
419306.415 N	566153.951 E	0.00	0.00	0.00		
750.00	0.000	0.000	-2565.00	750.00	0.00 N	0.00 E
419306.415 N	566153.951 E	0.00	0.00	0.00		
780.00	0.000	0.000	-2535.00	780.00	0.00 N	0.00 E
419306.415 N	566153.951 E	0.00	0.00	0.00		
810.00	0.000	0.000	-2505.00	810.00	0.00 N	0.00 E
419306.415 N	566153.951 E	0.00	0.00	0.00		
840.00	0.000	0.000	-2475.00	840.00	0.00 N	0.00 E
419306.415 N	566153.951 E	0.00	0.00	0.00		
870.00	0.000	0.000	-2445.00	870.00	0.00 N	0.00 E
419306.415 N	566153.951 E	0.00	0.00	0.00		
900.00	0.000	0.000	-2415.00	900.00	0.00 N	0.00 E
419306.415 N	566153.951 E	0.00	0.00	0.00		
930.00	0.000	0.000	-2385.00	930.00	0.00 N	0.00 E
419306.415 N	566153.951 E	0.00	0.00	0.00		
960.00	0.000	0.000	-2355.00	960.00	0.00 N	0.00 E
419306.415 N	566153.951 E	0.00	0.00	0.00		
990.00	0.000	0.000	-2325.00	990.00	0.00 N	0.00 E
419306.415 N	566153.951 E	0.00	0.00	0.00		
1020.00	0.000	0.000	-2295.00	1020.00	0.00 N	0.00 E
419306.415 N	566153.951 E	0.00	0.00	0.00		
1050.00	0.000	0.000	-2265.00	1050.00	0.00 N	0.00 E
419306.415 N	566153.951 E	0.00	0.00	0.00		
1080.00	0.000	0.000	-2235.00	1080.00	0.00 N	0.00 E
419306.415 N	566153.951 E	0.00	0.00	0.00		
1110.00	0.000	0.000	-2205.00	1110.00	0.00 N	0.00 E
419306.415 N	566153.951 E	0.00	0.00	0.00		
1140.00	0.000	0.000	-2175.00	1140.00	0.00 N	0.00 E
419306.415 N	566153.951 E	0.00	0.00	0.00		
1170.00	0.000	0.000	-2145.00	1170.00	0.00 N	0.00 E
419306.415 N	566153.951 E	0.00	0.00	0.00		
1200.00	0.000	0.000	-2115.00	1200.00	0.00 N	0.00 E
419306.415 N	566153.951 E	0.00	0.00	0.00		
1230.00	0.000	0.000	-2085.00	1230.00	0.00 N	0.00 E
419306.415 N	566153.951 E	0.00	0.00	0.00		
1260.00	0.000	0.000	-2055.00	1260.00	0.00 N	0.00 E
419306.415 N	566153.951 E	0.00	0.00	0.00		
1290.00	0.000	0.000	-2025.00	1290.00	0.00 N	0.00 E
419306.415 N	566153.951 E	0.00	0.00	0.00		
1320.00	0.000	0.000	-1995.00	1320.00	0.00 N	0.00 E
419306.415 N	566153.951 E	0.00	0.00	0.00		
1350.00	0.000	0.000	-1965.00	1350.00	0.00 N	0.00 E
419306.415 N	566153.951 E	0.00	0.00	0.00		
1380.00	0.000	0.000	-1935.00	1380.00	0.00 N	0.00 E
419306.415 N	566153.951 E	0.00	0.00	0.00		
1410.00	0.000	0.000	-1905.00	1410.00	0.00 N	0.00 E
419306.415 N	566153.951 E	0.00	0.00	0.00		
1440.00	0.000	0.000	-1875.00	1440.00	0.00 N	0.00 E
419306.415 N	566153.951 E	0.00	0.00	0.00		
1470.00	0.000	0.000	-1845.00	1470.00	0.00 N	0.00 E
419306.415 N	566153.951 E	0.00	0.00	0.00		
1500.00	0.000	0.000	-1815.00	1500.00	0.00 N	0.00 E
419306.415 N	566153.951 E	0.00	0.00	0.00		
1530.00	0.000	0.000	-1785.00	1530.00	0.00 N	0.00 E
419306.415 N	566153.951 E	0.00	0.00	0.00		
1560.00	0.000	0.000	-1755.00	1560.00	0.00 N	0.00 E
419306.415 N	566153.951 E	0.00	0.00	0.00		
1590.00	0.000	0.000	-1725.00	1590.00	0.00 N	0.00 E
419306.415 N	566153.951 E	0.00	0.00	0.00		
1620.00	0.000	0.000	-1695.00	1620.00	0.00 N	0.00 E
419306.415 N	566153.951 E	0.00	0.00	0.00		
1650.00	0.000	0.000	-1665.00	1650.00	0.00 N	0.00 E
419306.415 N	566153.951 E	0.00	0.00	0.00		

1680.00	0.000	0.000	-1635.00	1680.00	0.00 N	0.00 E
419306.415 N	566153.951 E	0.00	0.00	0.00		
1710.00	0.000	0.000	-1605.00	1710.00	0.00 N	0.00 E
419306.415 N	566153.951 E	0.00	0.00	0.00		
1740.00	0.000	0.000	-1575.00	1740.00	0.00 N	0.00 E
419306.415 N	566153.951 E	0.00	0.00	0.00		
1770.00	0.000	0.000	-1545.00	1770.00	0.00 N	0.00 E
419306.415 N	566153.951 E	0.00	0.00	0.00		
1800.00	0.000	0.000	-1515.00	1800.00	0.00 N	0.00 E
419306.415 N	566153.951 E	0.00	0.00	0.00		
1830.00	0.000	0.000	-1485.00	1830.00	0.00 N	0.00 E
419306.415 N	566153.951 E	0.00	0.00	0.00		
1860.00	0.000	0.000	-1455.00	1860.00	0.00 N	0.00 E
419306.415 N	566153.951 E	0.00	0.00	0.00		
1890.00	0.000	0.000	-1425.00	1890.00	0.00 N	0.00 E
419306.415 N	566153.951 E	0.00	0.00	0.00		
1920.00	0.000	0.000	-1395.00	1920.00	0.00 N	0.00 E
419306.415 N	566153.951 E	0.00	0.00	0.00		
1950.00	0.000	0.000	-1365.00	1950.00	0.00 N	0.00 E
419306.415 N	566153.951 E	0.00	0.00	0.00		
1980.00	0.000	0.000	-1335.00	1980.00	0.00 N	0.00 E
419306.415 N	566153.951 E	0.00	0.00	0.00		
2010.00	0.000	0.000	-1305.00	2010.00	0.00 N	0.00 E
419306.415 N	566153.951 E	0.00	0.00	0.00		
2040.00	0.000	0.000	-1275.00	2040.00	0.00 N	0.00 E
419306.415 N	566153.951 E	0.00	0.00	0.00		
2070.00	0.000	0.000	-1245.00	2070.00	0.00 N	0.00 E
419306.415 N	566153.951 E	0.00	0.00	0.00		
2100.00	0.000	0.000	-1215.00	2100.00	0.00 N	0.00 E
419306.415 N	566153.951 E	0.00	0.00	0.00		
2130.00	0.000	0.000	-1185.00	2130.00	0.00 N	0.00 E
419306.415 N	566153.951 E	0.00	0.00	0.00		
2160.00	0.000	0.000	-1155.00	2160.00	0.00 N	0.00 E
419306.415 N	566153.951 E	0.00	0.00	0.00		
2190.00	0.000	0.000	-1125.00	2190.00	0.00 N	0.00 E
419306.415 N	566153.951 E	0.00	0.00	0.00		
2220.00	0.000	0.000	-1095.00	2220.00	0.00 N	0.00 E
419306.415 N	566153.951 E	0.00	0.00	0.00		
2250.00	0.000	0.000	-1065.00	2250.00	0.00 N	0.00 E
419306.415 N	566153.951 E	0.00	0.00	0.00		
2280.00	0.000	0.000	-1035.00	2280.00	0.00 N	0.00 E
419306.415 N	566153.951 E	0.00	0.00	0.00		
2310.00	0.000	0.000	-1005.00	2310.00	0.00 N	0.00 E
419306.415 N	566153.951 E	0.00	0.00	0.00		
2340.00	0.000	0.000	-975.00	2340.00	0.00 N	0.00 E
419306.415 N	566153.951 E	0.00	0.00	0.00		
2370.00	0.000	0.000	-945.00	2370.00	0.00 N	0.00 E
419306.415 N	566153.951 E	0.00	0.00	0.00		
2400.00	0.000	0.000	-915.00	2400.00	0.00 N	0.00 E
419306.415 N	566153.951 E	0.00	0.00	0.00		
2430.00	0.000	0.000	-885.00	2430.00	0.00 N	0.00 E
419306.415 N	566153.951 E	0.00	0.00	0.00		
2460.00	0.000	0.000	-855.00	2460.00	0.00 N	0.00 E
419306.415 N	566153.951 E	0.00	0.00	0.00		
2490.00	0.000	0.000	-825.00	2490.00	0.00 N	0.00 E
419306.415 N	566153.951 E	0.00	0.00	0.00		
2520.00	0.000	0.000	-795.00	2520.00	0.00 N	0.00 E
419306.415 N	566153.951 E	0.00	0.00	0.00		
2550.00	0.000	0.000	-765.00	2550.00	0.00 N	0.00 E
419306.415 N	566153.951 E	0.00	0.00	0.00		
2580.00	0.000	0.000	-735.00	2580.00	0.00 N	0.00 E
419306.415 N	566153.951 E	0.00	0.00	0.00		
2610.00	0.000	0.000	-705.00	2610.00	0.00 N	0.00 E
419306.415 N	566153.951 E	0.00	0.00	0.00		



2640.00	0.000	0.000	-675.00	2640.00	0.00 N	0.00 E
419306.415 N	566153.951 E		0.00	0.00		
2670.00	0.000	0.000	-645.00	2670.00	0.00 N	0.00 E
419306.415 N	566153.951 E		0.00	0.00		
2700.00	0.000	0.000	-615.00	2700.00	0.00 N	0.00 E
419306.415 N	566153.951 E		0.00	0.00		
2730.00	0.000	0.000	-585.00	2730.00	0.00 N	0.00 E
419306.415 N	566153.951 E		0.00	0.00		
2760.00	0.000	0.000	-555.00	2760.00	0.00 N	0.00 E
419306.415 N	566153.951 E		0.00	0.00		
2790.00	0.000	0.000	-525.00	2790.00	0.00 N	0.00 E
419306.415 N	566153.951 E		0.00	0.00		
2820.00	1.796	0.561	-495.00	2820.00	0.11 N	0.00 E
419306.528 N	566153.952 E		0.11	5.99		
2850.00	9.296	0.561	-465.16	2849.84	3.01 N	0.03 E
419309.425 N	566153.980 E		3.01	25.00		
2880.00	16.796	0.561	-435.96	2879.04	9.78 N	0.10 E
419316.191 N	566154.047 E		9.78	25.00		
2910.00	24.296	0.561	-407.89	2907.11	20.30 N	0.20 E
419326.712 N	566154.150 E		20.30	25.00		
2940.00	31.796	0.561	-381.43	2933.57	34.39 N	0.34 E
419340.807 N	566154.288 E		34.39	25.00		
2970.00	39.296	0.561	-357.04	2957.96	51.82 N	0.51 E
419358.234 N	566154.458 E		51.82	25.00		
3000.00	46.796	0.561	-335.13	2979.87	72.28 N	0.71 E
419378.696 N	566154.659 E		72.28	25.00		
3030.00	54.296	0.561	-316.08	2998.92	95.43 N	0.93 E
419401.842 N	566154.885 E		95.43	25.00		
3060.00	61.796	0.561	-300.21	3014.79	120.86 N	1.18 E
419427.277 N	566155.134 E		120.87	25.00		
3090.00	69.296	0.561	-287.80	3027.20	148.15 N	1.45 E
419454.565 N	566155.402 E		148.16	25.00		
3120.00	76.796	0.561	-279.06	3035.94	176.82 N	1.73 E
419483.239 N	566155.682 E		176.83	25.00		
3150.00	84.296	0.561	-274.13	3040.87	206.39 N	2.02 E
419512.809 N	566155.972 E		206.40	25.00		
3180.00	90.000	0.561	-273.00	3042.00	236.35 N	2.31 E
419542.770 N	566156.265 E		236.37	19.01		
3210.00	90.000	0.561	-273.00	3042.00	266.35 N	2.61 E
419572.768 N	566156.559 E		266.37	0.00		
3240.00	90.000	0.561	-273.00	3042.00	296.35 N	2.90 E
419602.767 N	566156.853 E		296.37	0.00		
3270.00	90.000	0.561	-273.00	3042.00	326.35 N	3.20 E
419632.766 N	566157.146 E		326.37	0.00		
3300.00	90.000	0.561	-273.00	3042.00	356.35 N	3.49 E
419662.764 N	566157.440 E		356.37	0.00		
3330.00	90.000	0.561	-273.00	3042.00	386.35 N	3.78 E
419692.763 N	566157.734 E		386.37	0.00		
3360.00	90.000	0.561	-273.00	3042.00	416.35 N	4.08 E
419722.761 N	566158.028 E		416.37	0.00		
3390.00	90.000	0.561	-273.00	3042.00	446.34 N	4.37 E
419752.760 N	566158.321 E		446.37	0.00		
3420.00	90.000	0.561	-273.00	3042.00	476.34 N	4.66 E
419782.758 N	566158.615 E		476.37	0.00		
3450.00	90.000	0.561	-273.00	3042.00	506.34 N	4.96 E
419812.757 N	566158.909 E		506.37	0.00		
3480.00	90.000	0.561	-273.00	3042.00	536.34 N	5.25 E
419842.756 N	566159.202 E		536.37	0.00		
3510.00	90.000	0.561	-273.00	3042.00	566.34 N	5.55 E
419872.754 N	566159.496 E		566.37	0.00		
3540.00	90.000	0.561	-273.00	3042.00	596.34 N	5.84 E
419902.753 N	566159.790 E		596.37	0.00		
3570.00	90.000	0.561	-273.00	3042.00	626.34 N	6.13 E
419932.751 N	566160.084 E		626.37	0.00		

3600.00	90.000	0.561	-273.00	3042.00	656.33 N	6.43 E
419962.750	N 566160.377	E 656.37	0.00			
3630.00	90.000	0.561	-273.00	3042.00	686.33 N	6.72 E
419992.748	N 566160.671	E 686.37	0.00			
3660.00	90.000	0.561	-273.00	3042.00	716.33 N	7.01 E
420022.747	N 566160.965	E 716.37	0.00			
3690.00	90.000	0.561	-273.00	3042.00	746.33 N	7.31 E
420052.745	N 566161.258	E 746.37	0.00			
3720.00	90.000	0.561	-273.00	3042.00	776.33 N	7.60 E
420082.744	N 566161.552	E 776.37	0.00			
3750.00	90.000	0.561	-273.00	3042.00	806.33 N	7.89 E
420112.743	N 566161.846	E 806.37	0.00			
3780.00	90.000	0.561	-273.00	3042.00	836.33 N	8.19 E
420142.741	N 566162.140	E 836.37	0.00			
3810.00	90.000	0.561	-273.00	3042.00	866.32 N	8.48 E
420172.740	N 566162.433	E 866.37	0.00			
3840.00	90.000	0.561	-273.00	3042.00	896.32 N	8.78 E
420202.738	N 566162.727	E 896.37	0.00			
3870.00	90.000	0.561	-273.00	3042.00	926.32 N	9.07 E
420232.737	N 566163.021	E 926.37	0.00			
3900.00	90.000	0.561	-273.00	3042.00	956.32 N	9.36 E
420262.735	N 566163.315	E 956.37	0.00			
3930.00	90.000	0.561	-273.00	3042.00	986.32 N	9.66 E
420292.734	N 566163.608	E 986.37	0.00			
3960.00	90.000	0.561	-273.00	3042.00	1016.32 N	9.95 E
420322.733	N 566163.902	E 1016.37	0.00			
3990.00	90.000	0.561	-273.00	3042.00	1046.32 N	10.24 E
420352.731	N 566164.196	E 1046.37	0.00			
4020.00	90.000	0.561	-273.00	3042.00	1076.31 N	10.54 E
420382.730	N 566164.489	E 1076.37	0.00			
4050.00	90.000	0.561	-273.00	3042.00	1106.31 N	10.83 E
420412.728	N 566164.783	E 1106.37	0.00			
4080.00	90.000	0.561	-273.00	3042.00	1136.31 N	11.13 E
420442.727	N 566165.077	E 1136.37	0.00			
4110.00	90.000	0.561	-273.00	3042.00	1166.31 N	11.42 E
420472.725	N 566165.371	E 1166.37	0.00			
4140.00	90.000	0.561	-273.00	3042.00	1196.31 N	11.71 E
420502.724	N 566165.664	E 1196.37	0.00			
4170.00	90.000	0.561	-273.00	3042.00	1226.31 N	12.01 E
420532.722	N 566165.958	E 1226.37	0.00			
4200.00	90.000	0.561	-273.00	3042.00	1256.31 N	12.30 E
420562.721	N 566166.252	E 1256.37	0.00			
4230.00	90.000	0.561	-273.00	3042.00	1286.30 N	12.59 E
420592.720	N 566166.545	E 1286.37	0.00			
4260.00	90.000	0.561	-273.00	3042.00	1316.30 N	12.89 E
420622.718	N 566166.839	E 1316.37	0.00			
4290.00	90.000	0.561	-273.00	3042.00	1346.30 N	13.18 E
420652.717	N 566167.133	E 1346.37	0.00			
4320.00	90.000	0.561	-273.00	3042.00	1376.30 N	13.48 E
420682.715	N 566167.427	E 1376.37	0.00			
4350.00	90.000	0.561	-273.00	3042.00	1406.30 N	13.77 E
420712.714	N 566167.720	E 1406.37	0.00			
4380.00	90.000	0.561	-273.00	3042.00	1436.30 N	14.06 E
420742.712	N 566168.014	E 1436.37	0.00			
4410.00	90.000	0.561	-273.00	3042.00	1466.30 N	14.36 E
420772.711	N 566168.308	E 1466.37	0.00			
4440.00	90.000	0.561	-273.00	3042.00	1496.29 N	14.65 E
420802.710	N 566168.602	E 1496.37	0.00			
4470.00	90.000	0.561	-273.00	3042.00	1526.29 N	14.94 E
420832.708	N 566168.895	E 1526.37	0.00			
4500.00	90.000	0.561	-273.00	3042.00	1556.29 N	15.24 E
420862.707	N 566169.189	E 1556.37	0.00			
4530.00	90.000	0.561	-273.00	3042.00	1586.29 N	15.53 E
420892.705	N 566169.483	E 1586.37	0.00			

4560.00	90.000	0.561	-273.00	3042.00	1616.29 N	15.83 E
420922.704	N	566169.776 E	1616.37	0.00		
4590.00	90.000	0.561	-273.00	3042.00	1646.29 N	16.12 E
420952.702	N	566170.070 E	1646.37	0.00		
4620.00	90.000	0.561	-273.00	3042.00	1676.29 N	16.41 E
420982.701	N	566170.364 E	1676.37	0.00		
4650.00	90.000	0.561	-273.00	3042.00	1706.28 N	16.71 E
421012.699	N	566170.658 E	1706.37	0.00		
4680.00	90.000	0.561	-273.00	3042.00	1736.28 N	17.00 E
421042.698	N	566170.951 E	1736.37	0.00		
4710.00	90.000	0.561	-273.00	3042.00	1766.28 N	17.29 E
421072.697	N	566171.245 E	1766.37	0.00		
4740.00	90.000	0.561	-273.00	3042.00	1796.28 N	17.59 E
421102.695	N	566171.539 E	1796.37	0.00		
4770.00	90.000	0.561	-273.00	3042.00	1826.28 N	17.88 E
421132.694	N	566171.832 E	1826.37	0.00		
4800.00	90.000	0.561	-273.00	3042.00	1856.28 N	18.18 E
421162.692	N	566172.126 E	1856.37	0.00		
4830.00	90.000	0.561	-273.00	3042.00	1886.28 N	18.47 E
421192.691	N	566172.420 E	1886.37	0.00		
4860.00	90.000	0.561	-273.00	3042.00	1916.27 N	18.76 E
421222.689	N	566172.714 E	1916.37	0.00		
4890.00	90.000	0.561	-273.00	3042.00	1946.27 N	19.06 E
421252.688	N	566173.007 E	1946.37	0.00		
4920.00	90.000	0.561	-273.00	3042.00	1976.27 N	19.35 E
421282.687	N	566173.301 E	1976.37	0.00		
4923.26	90.000	0.561	-273.00	3042.00	1979.53 N	19.38 E
421285.946	N	566173.333 E	1979.63	0.00		

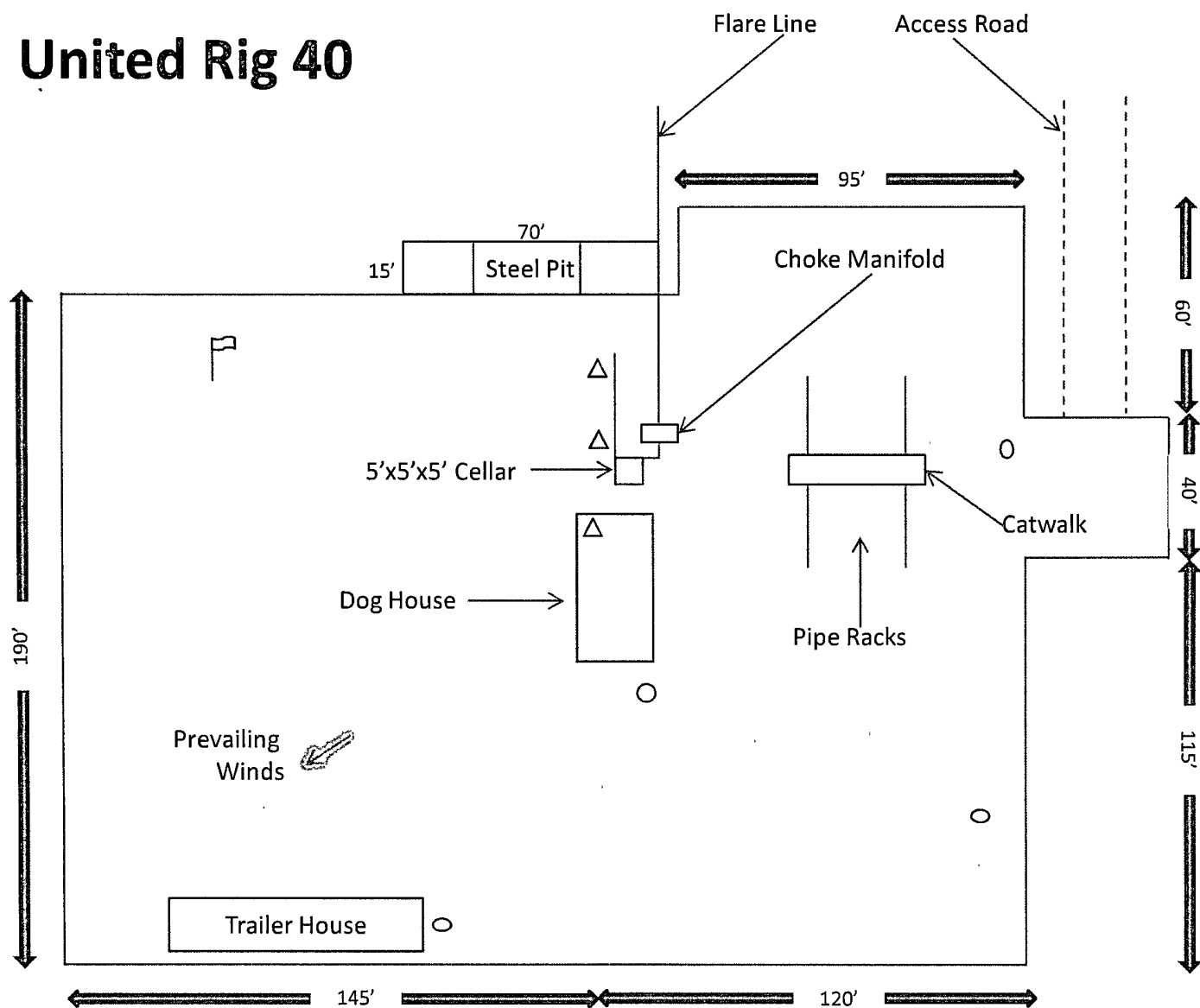
All data are in feet unless otherwise stated. Directions and coordinates are relative to Grid North.  
Vertical depths are relative to GL 3,305 + KB 10. Northings and Eastings are relative to well.





The Dogleg Severity is in Degrees per 100 feet.  
Vertical Section is from slot and calculated along an Azimuth of 0.561° (Grid).

Coordinate System is North American Datum 1983 US State Plane 1983, New Mexico Eastern Zone.  
Grid Convergence at Surface is 0.043°.

Based upon Minimum Curvature type calculations, at a Measured Depth of 4923.26ft., the Bottom Hole Displacement is 1979.63ft., in the Direction of 0.561° (Grid).

# United Rig 40



-  Wind Direction Indicators  
(wind sock or streamers)
-  H2S Monitors  
(alarms at bell nipple and shale shaker)
-  Briefing Areas
-  Remote BOP Closing Unit

**SEE ATTACHED FOR  
CONDITIONS OF APPROVAL**

Exhibit D – Rig Diagram  
**Marquardt Federal No. 8**  
 Cimarex Energy Co. of Colorado  
 1-25S-26E  
 SHL 330' FSL & 660' FWL  
 BHL 2310' FSL & 660' FWL  
 Eddy County, NM

SR & A

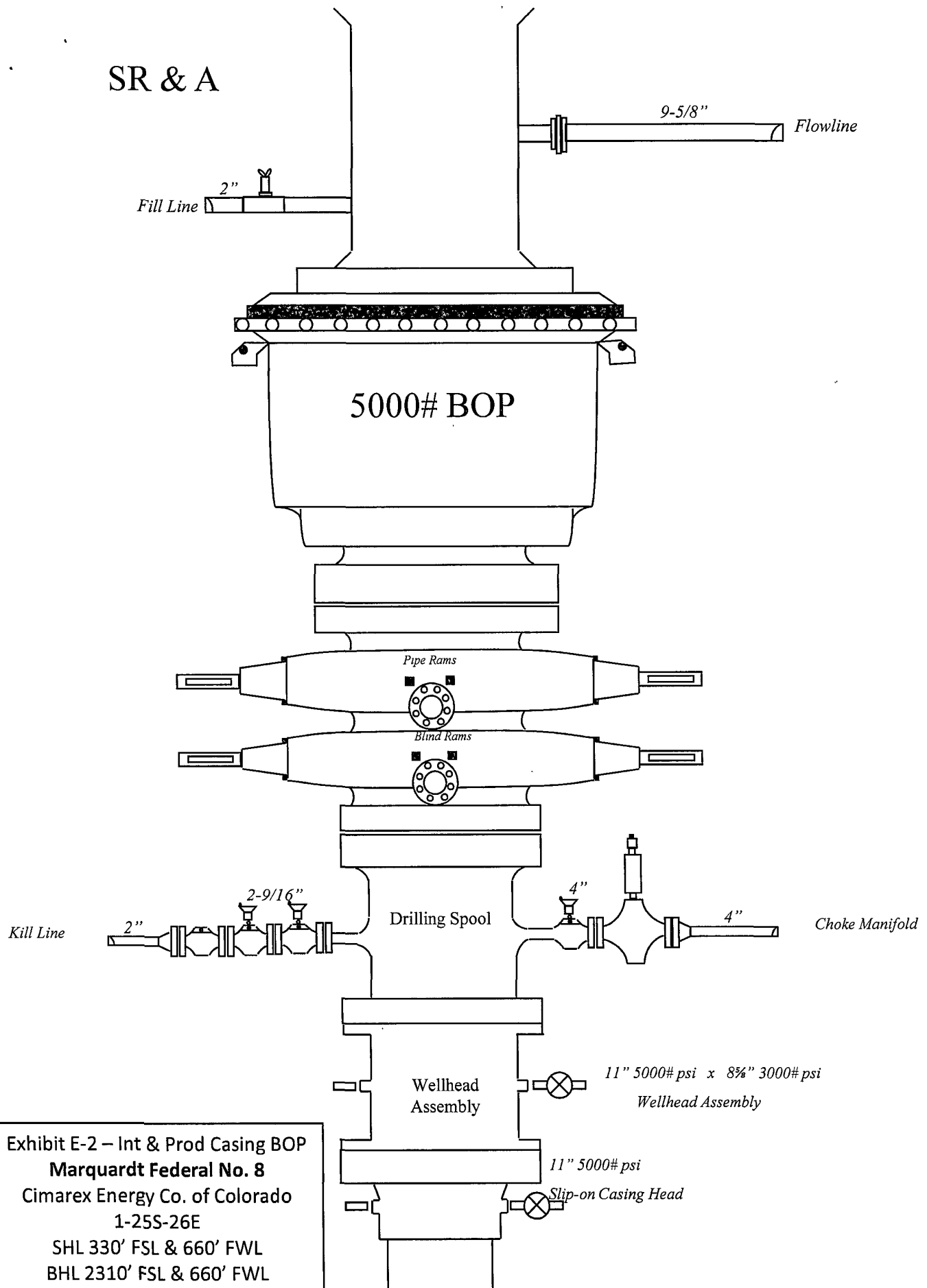


Exhibit E-2 – Int & Prod Casing BOP  
**Marquardt Federal No. 8**  
Cimarex Energy Co. of Colorado  
1-25S-26E  
SHL 330' FSL & 660' FWL  
BHL 2310' FSL & 660' FWL  
Eddy County, NM

**DRILLING OPERATIONS  
CHOKE MANIFOLD  
SM SERVICE**

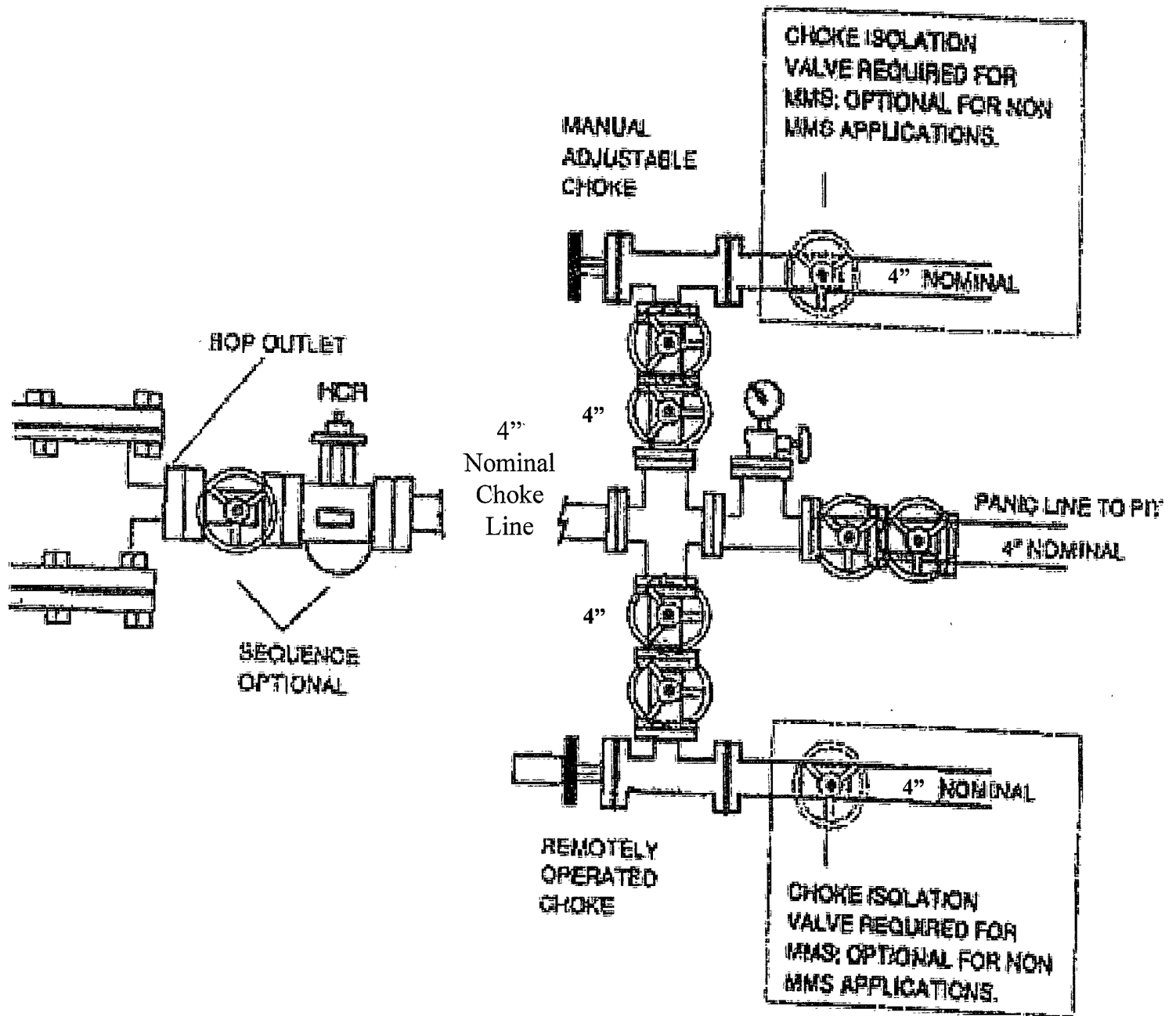


Exhibit E-1 – Choke Manifold Diagram  
**Marquardt Federal No. 8**  
 Cimarex Energy Co. of Colorado  
 1-25S-26E  
 SHL 330' FSL & 660' FWL  
 BHL 2310' FSL & 660' FWL  
 Eddy County, NM

Hydrogen Sulfide Drilling Operations Plan

**Marquardt Federal No. 8**

Cimarex Energy Co. of Colorado

Unit M, Section 1

T25S-R26E, Eddy County, NM

H<sub>2</sub>S equipment will be rigged up at Surface. The plan should be implemented before drilling out from the surface.

1. Due to a one-time encounter on a previous well, an Intra-salt Pocket was charged with H<sub>2</sub>S and a burnable amount of hydrocarbons.

First Potential Problem Zone:

Initial suspected problem zone	Salt Zone @ 1,333'
Potential Open Flow Capacity	1 mcf
Expected H <sub>2</sub> S Concentration	11,000 ppm
100' ROE	6'
500' ROE	3'

Cimarex will have 24-hour H<sub>2</sub>S Safety Supervisors on location while drilling the first 2,000' on this well.

2. Second Potential Problem Zone:

Initial suspected problem zone	Delaware Mountain Group @ 1,800'
Potential Open Flow Capacity	100 mcf
Expected H <sub>2</sub> S Concentration	1,000 ppm
100' ROE	24'
500' ROE	11'

3. All Company and Contract personnel admitted on location must be trained by a qualified H<sub>2</sub>S safety instructor to the following:
  - A. Characteristics of H<sub>2</sub>S
  - B. Physical effects and hazards
  - C. Proper use of safety equipment and life support systems.
  - D. Principle and operation of H<sub>2</sub>S detectors, warning system and briefing areas.
  - E. Evacuation procedure, routes and first aid.
  - F. Proper use of 30 minute pressure demand air pack.
4. H<sub>2</sub>S Detection and Alarm Systems:
  - A. H<sub>2</sub>S detectors and audio alarm system to be located at bell nipple, end of flow line (mud pit) and on derrick floor or doghouse.
5. Windsock and/or wind streamers:
  - A. Windsock at mudpit area should be high enough to be visible.
  - B. Windsock at briefing area should be high enough to be visible.
6. Condition Flags and Signs:
  - A. Warning sign on access road to location.
  - B. Flags to be displayed on sign at entrance to location. Green flag indicates normal safe condition. Yellow flag indicates potential pressure and danger. Red flag indicates danger (H<sub>2</sub>S present in dangerous concentration). Only emergency personnel admitted to location.

Hydrogen Sulfide Drilling Operations Plan

**Marquardt Federal No. 8**

Cimarex Energy Co. of Colorado

Unit M, Section 1

T25S-R26E, Eddy County, NM

7. Well control equipment:

A. See exhibit "E"

8. Communication:

A. While working under masks chalkboards will be used for communication.

B. Hand signals will be used where chalk board is inappropriate.

C. Two way radio will be used to communicate off location in case of emergency help is required. In most cases cellular telephones will be available at most drilling foreman's trailer or living quarters.

9. Drillstem Testing:

No DSTs or cores are planned at this time.

10. Drilling contractor supervisor will be required to be familiar with the effects H<sub>2</sub>S has on tubular goods and other mechanical equipment.

11. If H<sub>2</sub>S is encountered, mud system will be altered if necessary to maintain control of formation. A mud gas separator will be brought into service along with H<sub>2</sub>S scavengers if necessary.



H<sub>2</sub>S Contingency Plan  
**Marquardt Federal No. 8**  
Cimarex Energy Co. of Colorado  
Unit M, Section 1  
T25S-R26E, Eddy County, NM

**Emergency Procedures**

In the event of a release of gas containing H<sub>2</sub>S, the first responder(s) must:

- ★ Isolate the area and prevent entry by other persons into the 100 ppm ROE.
- ★ Evacuate any public places encompassed by the 100 ppm ROE.
- ★ Be equipped with H<sub>2</sub>S monitors and air packs in order to control the release.
- ★ Use the "buddy system" to ensure no injuries occur during the response.
- ★ Take precautions to avoid personal injury during this operation.
- ★ Contact operator and/or local officials to aid in operation. See list of phone numbers attached.
- ★ Have received training in the:
  - ◆ Detection of H<sub>2</sub>S, and
  - ◆ Measures for protection against the gas,
  - ◆ Equipment used for protection and emergency response.

**Ignition of Gas Source**

Should control of the well be considered lost and ignition considered, take care to protect against exposure to Sulfur Dioxide (SO<sub>2</sub>). Intentional ignition must be coordinated with the NMOCD and local officials. Additionally, the NM State Police may become involved. NM State Police shall be the Incident Command on scene of any major release. Take care to protect downwind whenever there is an ignition of the gas.

**Characteristics of H<sub>2</sub>S and SO<sub>2</sub>**

Common Name	Chemical Formula	Specific Gravity	Threshold Limit	Hazardous Limit	Lethal Concentration
Hydrogen Sulfide	H <sub>2</sub> S	1.189 Air=1	10 ppm	100 ppm/hr	600 ppm
Sulfur Dioxide	SO <sub>2</sub>	2.21 Air=1	2 ppm	N/A	1000 ppm

**Contacting Authorities**

Cimarex Energy Co. of Colorado's personnel must liaise with local and state agencies to ensure a proper response to a major release. Additionally, the OCD must be notified of the release as soon as possible but no later than 4 hours. Agencies will ask for information such as type and volume of release, wind direction, location of release, etc. Be prepared with all information available including directions to site. The following call list of essential and potential responders has been prepared for use during a release. Cimarex Energy Co. of Colorado's response must be in coordination with the State of New Mexico's "Hazardous Materials Emergency Response Plan" (HMER).

H<sub>2</sub>S Contingency Plan Emergency Contacts  
**Marquardt Federal No. 8**  
Cimarex Energy Co. of Colorado  
Unit M, Section 1  
T25S-R26E, Eddy County, NM

<b><u>Company Office</u></b>			
Cimarex Energy Co. of Colorado		800-969-4789	
Co. Office and After-Hours Menu			
<b><u>Key Personnel</u></b>			
<b>Name</b>	<b>Title</b>	<b>Office</b>	<b>Mobile</b>
Doug Park	Drilling Manager	972-443-6463	972-333-1407
Dee Smith	Drilling Super	972-443-6491	972-882-1010
Jim Evans	Drilling Super	972-443-6451	972-465-6564
Dorsey Rogers	Field Super		505-200-6105
Roy Shirley	Field Super		432-634-2136
<hr/>			
<b><u>Artesia</u></b>			
Ambulance		911	
State Police		575-746-2703	
City Police		575-746-2703	
Sheriff's Office		575-746-9888	
<b>Fire Department</b>		<b>575-746-2701</b>	
Local Emergency Planning Committee		575-746-2122	
New Mexico Oil Conservation Division		575-748-1283	
<hr/>			
<b><u>Carlsbad</u></b>			
Ambulance		911	
State Police		575-885-3137	
City Police		575-885-2111	
Sheriff's Office		575-887-7551	
<b>Fire Department</b>		<b>575-887-3798</b>	
Local Emergency Planning Committee		575-887-6544	
US Bureau of Land Management		575-887-6544	
<hr/>			
<b><u>Santa Fe</u></b>			
New Mexico Emergency Response Commission (Santa Fe)		505-476-9600	
New Mexico Emergency Response Commission (Santa Fe) 24 Hrs		505-827-9126	
New Mexico State Emergency Operations Center		505-476-9635	
<hr/>			
<b><u>National</u></b>			
National Emergency Response Center (Washington, D.C.)		800-424-8802	
<hr/>			
<b><u>Medical</u></b>			
Flight for Life - 4000 24th St.; Lubbock, TX		806-743-9911	
Aerocare - R3, Box 49F; Lubbock, TX		806-747-8923	
Med Flight Air Amb - 2301 Yale Blvd S.E., #D3; Albuquerque, NM		505-842-4433	
SB Air Med Service - 2505 Clark Carr Loop S.E.; Albuquerque, NM		505-842-4949	
<hr/>			
<b><u>Other</u></b>			
Boots & Coots IWC		800-256-9688	or 281-931-8884
Cudd Pressure Control		432-699-0139	or 432-563-3356
Halliburton		575-746-2757	
B.J. Services		575-746-3569	
<hr/>			

Surface Use Plan  
**Marquardt Federal No. 8**  
Cimarex Energy Co. of Colorado  
Unit M, Section 1  
T25S-R26E, Eddy County, NM

1. Existing Roads: Area maps, Exhibit "B" is a reproduction of Eddy Co. General Highway Map. Exhibit "C" is a reproduction of a USGS Topographic Map, showing existing roads and proposed roads. All existing roads will be maintained in a condition equal to or better than current conditions. Any new roads will be constructed to BLM specifications.
  - A. Exhibit "A" shows the proposed well site as staked.
  - B. From junction of Black River Village and Old Cavern Hwy, go South 3.7 miles to lease road. Thence go West on lease road 2.0 miles to lease road. On lease road, go South 1.0 miles to proposed lease road.
2. Planned Access Roads: 960' of on-lease access road is proposed.
3. Location of Existing Wells in a One-Mile Radius - Exhibit A
  - A. Water wells - None known
  - B. Disposal wells - None known
  - C. Drilling wells - None known
  - D. Producing wells - As shown on Exhibit "A"
  - E. Abandoned wells - As shown on Exhibit "A"
4. If on completion this well is a producer, Cimarex Energy Co. of Colorado will furnish maps and/or plats showing on site facilities or off site facilities if needed. This will be accompanied by a Sundry Notice.
5. Location and Type of Water Supply:

Water will be purchased locally from a commercial source and trucked over the access roads or piped in flexible lines laid on top of the ground.
6. Source of Construction Material:

If possible, construction will be obtained from the excavation of drill site. If additional material is needed, it will be purchased from a local source and transported over the access route as shown on Exhibit "C".
7. Methods of Handling Waste Material:
  - A. Drill cuttings will be separated by a series of solids removal equipment and stored in steel containment pits and then hauled to a state-approved disposal facility.
  - 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 land fill.
  - C. Salts remaining after completion of well will be picked up by supplier including broken sacks.
  - D. Sewage from living quarters will drain into holding tanks and be cleaned out periodically. A Porta-John will be provided for the rig crews. This equipment will be properly maintained during the drilling operations and removed upon completion of the well.
  - E. Drilling fluids will be contained in steel pits in a closed circulating system. Fluids will be cleaned and reused. Water produced during testing will be contained in the steel pits and disposed of at a state approved disposal facility. Any oil or condensate produced will be stored in test tanks until sold and hauled from the site.

Surface Use Plan  
**Marquardt Federal No. 8**  
Cimarex Energy Co. of Colorado  
Unit M, Section 1  
T25S-R26E, Eddy County, NM

8. Ancillary Facilities:

- A. No camps or airstrips to be constructed.

9. Well Site Layout:

- A. Exhibit "D" shows location and rig layout.
- C. Mud pits in the closed circulating system will be steel pits and the cuttings will be stored in steel containment pits.
- D. Cuttings will be stored in steel pits until they are hauled to a state-approved disposal facility.
- E. If the well is a producer, those areas of the location not essential to production facilities will be reclaimed and seeded per BLM requirements.

10. Plans for Restoration of Surface:

Rehabilitation of the location will start in a timely manner after all drilling operations cease. The type of reclamation will depend on whether the well is a producer or a dry hole.

Drainage systems, if any, will be reshaped to the original configuration with provisions made to alleviate erosion. These may need to be modified in certain circumstances to prevent inundation of the location's pad and surface facilities. After the area has been shaped and contoured, topsoil from the spoil pile will be placed over the disturbed area to the extent possible. Revegetation procedures will comply with BLM standards.

If the well is a dry hole, the pad and road area will be recountoured to match the existing terrain. Topsoil will be spread to the extent possible. Revegetation will comply with BLM standards.

Should the well be a producer, the previously noted procedures will apply to those areas which are not required for production facilities.

11. Other Information

- A. Topography consists of a sloping plane with loose tan sands. Vegetation is mainly yucca, mesquite and shin oak.
- B. The wellsite is on surface owned by Department of the Interior, Bureau of Land Management. The land is used mainly for farming, cattle ranching, recreational use, and oil and gas production.
- C. An Archaeological survey will be conducted on the location and proposed roads, and this report will be filed with the Bureau of Land Management in the Carlsbad BLM office.
- D. There are no known dwellings within 1½ miles of this location.

Operator Certification Statement  
**Marquardt Federal No. 8**  
Cimarex Energy Co. of Colorado  
Unit M, Section 1  
T25S-R26E, Eddy County, NM

Operator's Representative

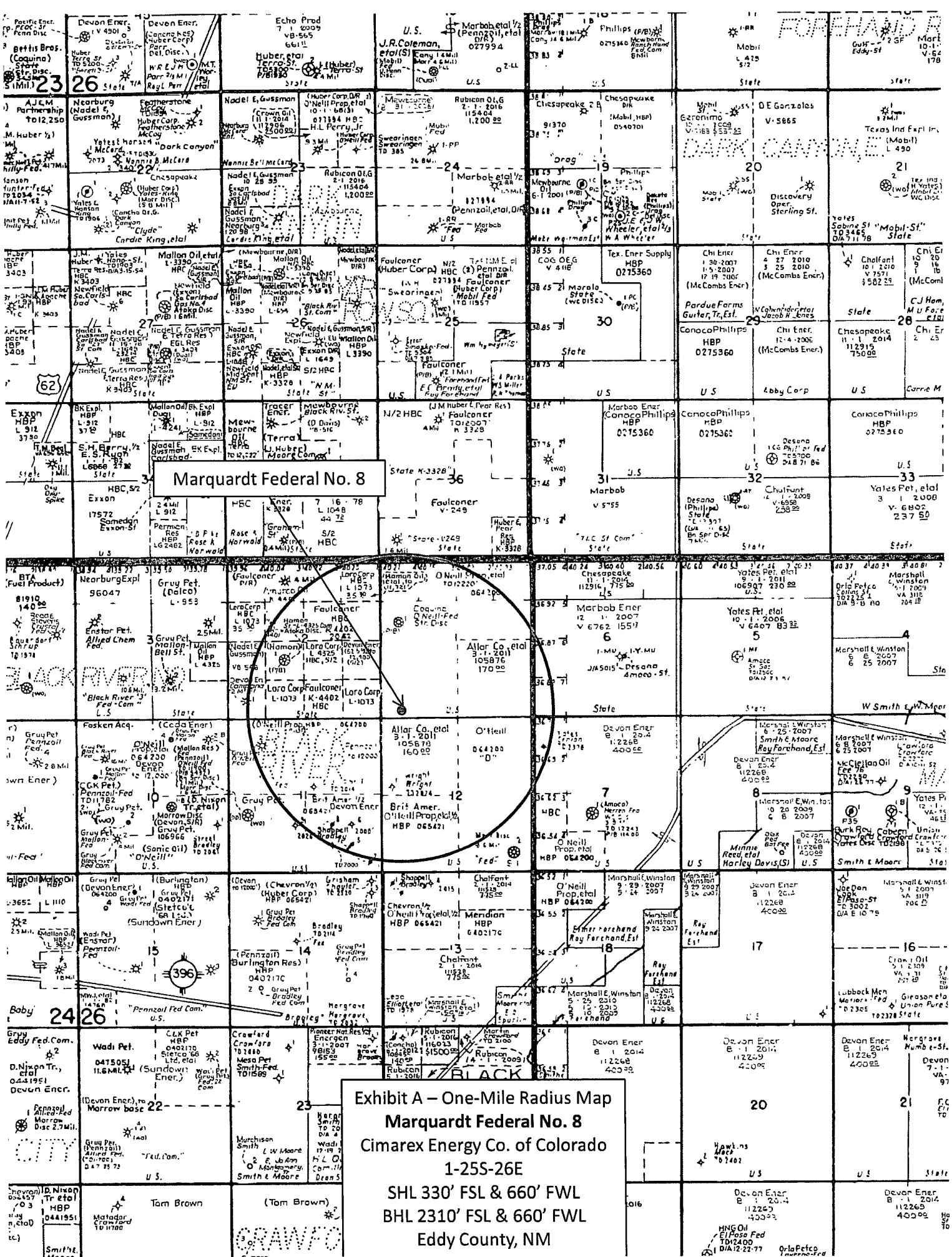
Cimarex Energy Co. of Colorado  
P.O. Box 140907  
Irving, TX 75014  
Office Phone: (972) 443-6489  
Zeno Farris

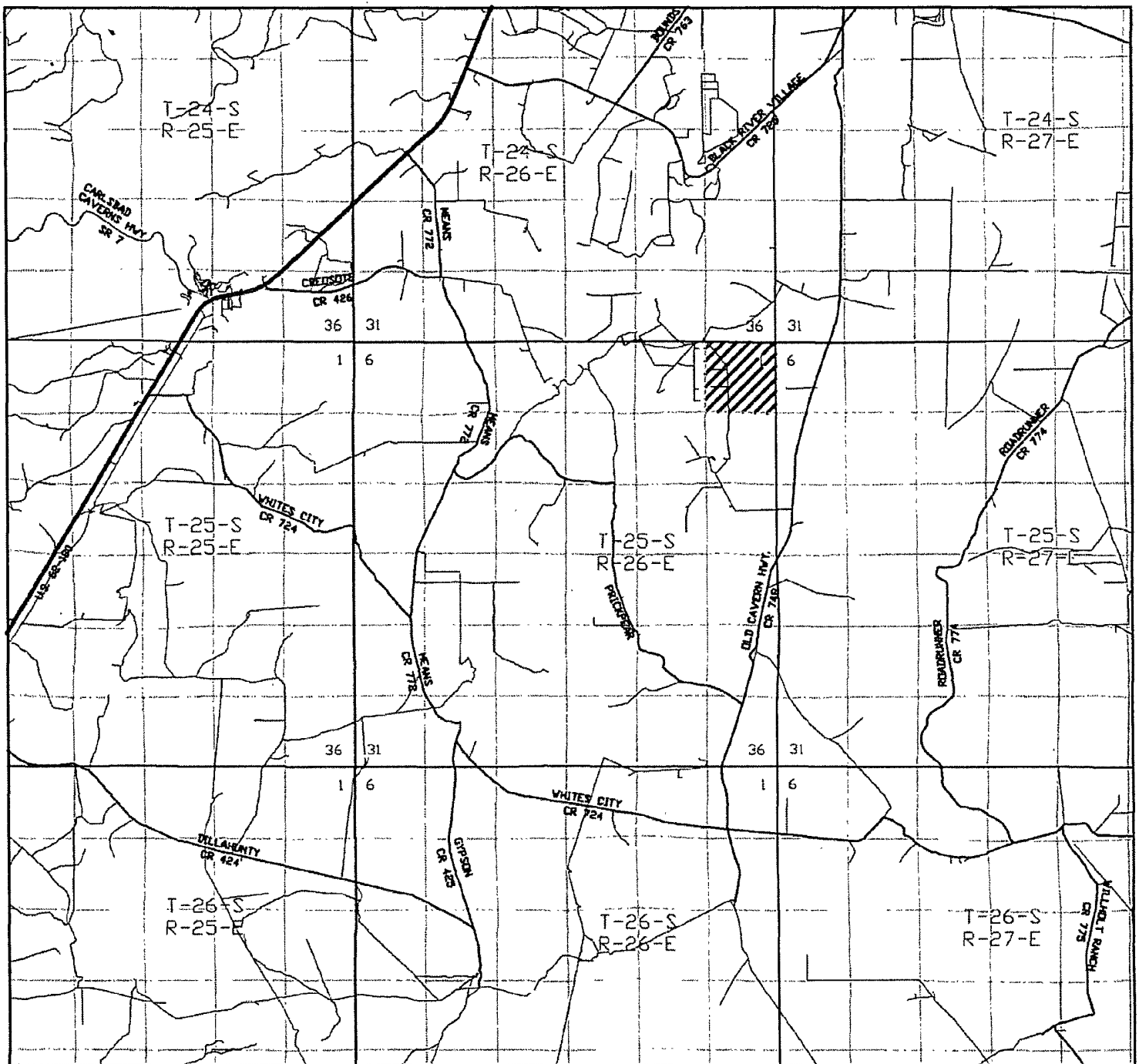
**CERTIFICATION:** I hereby certify that the statements and plans made in this APD are, to the best of my knowledge, true and correct; and that the work associated with the operations proposed herein will be performed by Cimarex Energy Co. of Colorado and/or its contractors/subcontractors and is in conformity with this plan and the terms and conditions under which it is approved. This statement is subject to the provision of U.S.C. 1001 for the filing of a false statement.

NAME: Zeno Farris  
Zeno Farris

DATE: April 17, 2008

TITLE: Manager Operations Administration





MARQUARDT "1" FEDERAL #8  
 Located 330' FSL and 660' FWL  
 Section 1, Township 25 South, Range 26 East,  
 N.M.P.M., Lea County, New Mexico.

**basin**  
**surveys**  
 focused on excellence  
 in the oilfield

P.O. Box 1786  
 1120 N. West County Rd.  
 Hobbs, New Mexico 88241  
 (505) 393-7316 ~ Office  
 (505) 392-3074 ~ Fax  
 basinsurveys.com

W.O. Number: JMS 19361TR

Survey Date: 03-18-2008

Scale: 1" = 2 MILES

Date: 03-24-2008

**CIMAREX**  
**ENERGY CO.**  
**OF COLORADO**

Exhibit B

## PECOS DISTRICT CONDITIONS OF APPROVAL

OPERATOR'S NAME:	CIMAREX ENERGY CO OF COLORADO
LEASE NO.:	NM-14124
WELL NAME & NO.:	Marquardt Federal No. 8
SURFACE HOLE FOOTAGE:	330' FSL & 660' FWL
BOTTOM HOLE FOOTAGE:	2310' FSL & 660' FWL
LOCATION:	Section 1, T. 25 S., R. 26 E., NMPM
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**
  - Pad Orientation
  - Cave/Karst
- ☐ **Construction**
  - Notification
  - Topsoil
  - Reserve Pit
  - Federal Mineral Material Pits
  - Well Pads
  - Roads
- ☐ **Road Section Diagram**
- ☒ **Drilling**
- ☐ **Production (Post Drilling)**
  - Well Structures & Facilities
- ☐ **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)**

### **V-DOOR NORTH.**

\*\* Depending on location, additional Drilling, Casing, and Cementing procedures may be required by engineering to protect critical karst groundwater recharge areas.

#### **Cave/Karst Surface Mitigation**

The following stipulations will be applied to minimize impacts during construction, drilling and production.

##### **Berming:**

Tank batteries will be bermed to contain 1 ½ times the content of the largest tank.

Bermed areas will be lined with a 4 oz. felt liner to prevent tears or punctures and a permanent 20 mil plastic liner.

##### **Leak Detection System:**

A method of detecting leaks is required. The method could incorporate gauges to measure loss, situating valves and lines so they can be visually inspected, or installing electronic sensors to alarm when a leak is present. Leak detection plan will be submitted to BLM for approval.

##### **Automatic Shut-off Systems:**

Automatic shut off, check valves, or similar systems will be installed for pipelines and tanks to minimize the effects of catastrophic line failures used in production or drilling.

##### **Closed Mud System Using Steel Tanks with All Fluids and Cuttings Hauled Off.**

A closed mud system using steel tanks for all cuttings and fluids is required. All fluids and cuttings will be hauled off site for disposal. No pits are allowed.

#### **Cave/Karst Subsurface Mitigation**

The following stipulations will be applied to protect cave/karst and ground water concerns:

##### **Fresh Water Drilling:**

The surface interval down to the bottom of the karst zone will be drilled with fresh water.

##### **Fluorescent Dyes:**

Nontoxic Fluorescent dyes will be added when the hole is spudded and be circulated to the bottom of the karst layers. These dyes will track the fluids, if lost circulation occurs. Arrangements need to be made to have BLM witness the dye being injected prior to spudding the hole.

##### **Florescene Dye (Acid Yellow 73):**

Thirty-two (32) ounces dry powder Florescene (Acid Yellow 73) dye will be added to the drilling fluid before the well is spudded AND to the pre-flush fluids of the surface interval of casing.

These dyes will track the fluids if lost circulation occurs.

Arrangements will be made to have BLM witness the dye being injected prior to spudding the hole and before the pre-flush of the surface casing. Contact the BLM drilling on call phone at (575) 361-2822 to make arrangements.

These dyes will track the fluids if lost circulation occurs.

Arrangements will be made to have BLM witness the dye being added prior to spudding the hole and before the pre-flush of the surface casing. Contact the BLM drilling on call phone at (575) 361-2822 to make arrangements.

**Lost Circulation:**

ALL lost circulation zones from the surface to the base of the cave occurrence zone will be logged and reported in the drilling report.

Regardless of the type of drilling machinery used, if a void of four feet or more and circulation losses greater than 70 percent occur simultaneously while drilling in any cave-bearing zone, the BLM will be notified immediately by the operator. The BLM will assess the situation and work with the operator on corrective actions to resolve the problem.

**Delayed Blasting:**

Any blasting will be phased and time delayed.

**No Blasting:**

No blasting will be utilized for pad construction. The pad will be constructed and leveled by adding the necessary fill and caliche.

**Abandonment Cementing:**

Upon well abandonment the well bore will be cemented completely from 100 feet below the bottom of the cave bearing zone to the surface.

**Pressure Testing:**

Annual pressure monitoring will be performed by the operator on all casing annuli and reported in a sundry notice. If the test results indicated a casing failure has occurred, remedial action will be undertaken to correct the problem to the BLM's approval.

## **VI. CONSTRUCTION**

### **V-DOOR NORTH**

#### **A. NOTIFICATION**

The BLM shall administer compliance and monitor construction of the access road and well pad. Notify the Carlsbad Field Office at (505) 234-5972 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 stockpile the topsoil of the well pad. The topsoil to be stripped is approximately 6 inches in depth. The topsoil shall not be used to backfill the reserve pit and will be used for interim and final reclamation.

#### **C. RESERVE PITS**

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**

If the operator elects to surface the access road and/or well pad, mineral materials extracted during construction of the reserve pit may be used for surfacing the well pad and access road and other facilities on the lease.

Payment shall be made to the BLM prior to removal of any additional federal mineral materials from any site other than the reserve pit. Call the Carlsbad Field Office at (505) 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. 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 thirty (30) 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**

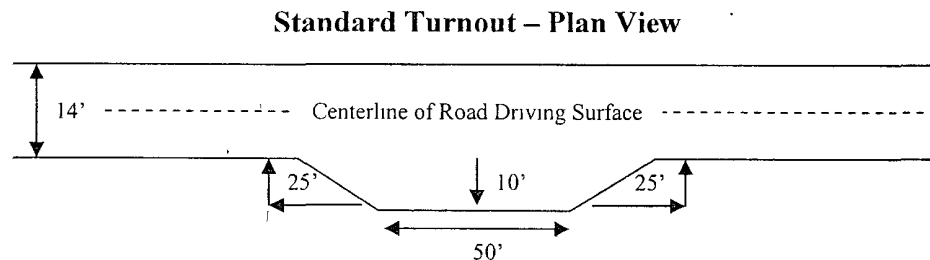
Crowning shall be done on the access road driving surface. The road crown shall have a grade of approximately 2% (i.e., a 1" crown on a 14' wide road). The road shall conform to Figure 1; cross section and plans for typical road construction.

### **Ditching**

Ditching shall be required on both sides of the road.

### **Turnouts**

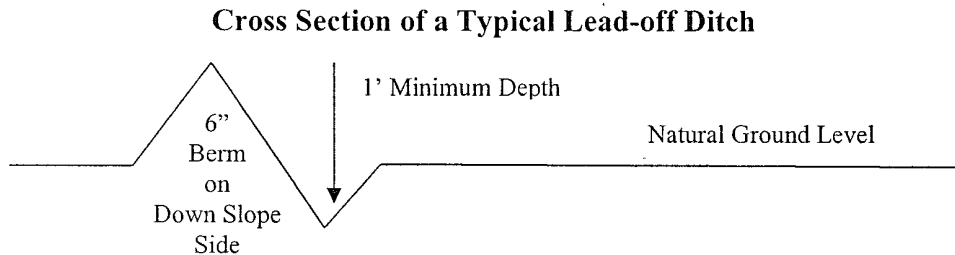
Vehicle turnouts shall be constructed on the road. Turnouts shall be intervisible with interval spacing distance less than 1000 feet. Turnouts shall be constructed on all blind curves. Turnouts shall conform to the following diagram:



### **Drainage**

Drainage control systems shall be constructed on the entire length of road (e.g. ditches, sidehill outsloping and insloping, 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.



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:

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

#### **Culvert Installations**

Appropriately sized culvert(s) shall be installed at the deep waterway channel flow crossing.

#### **Cattleguards**

An appropriately sized cattleguard(s) sufficient to carry out the project shall be installed and maintained at fence crossing(s).

Any existing cattleguard(s) on the access road 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 cattleguard(s) that are in place and are utilized during lease operations.

A gate shall be constructed and fastened securely to H-braces.

**Fence Requirement**

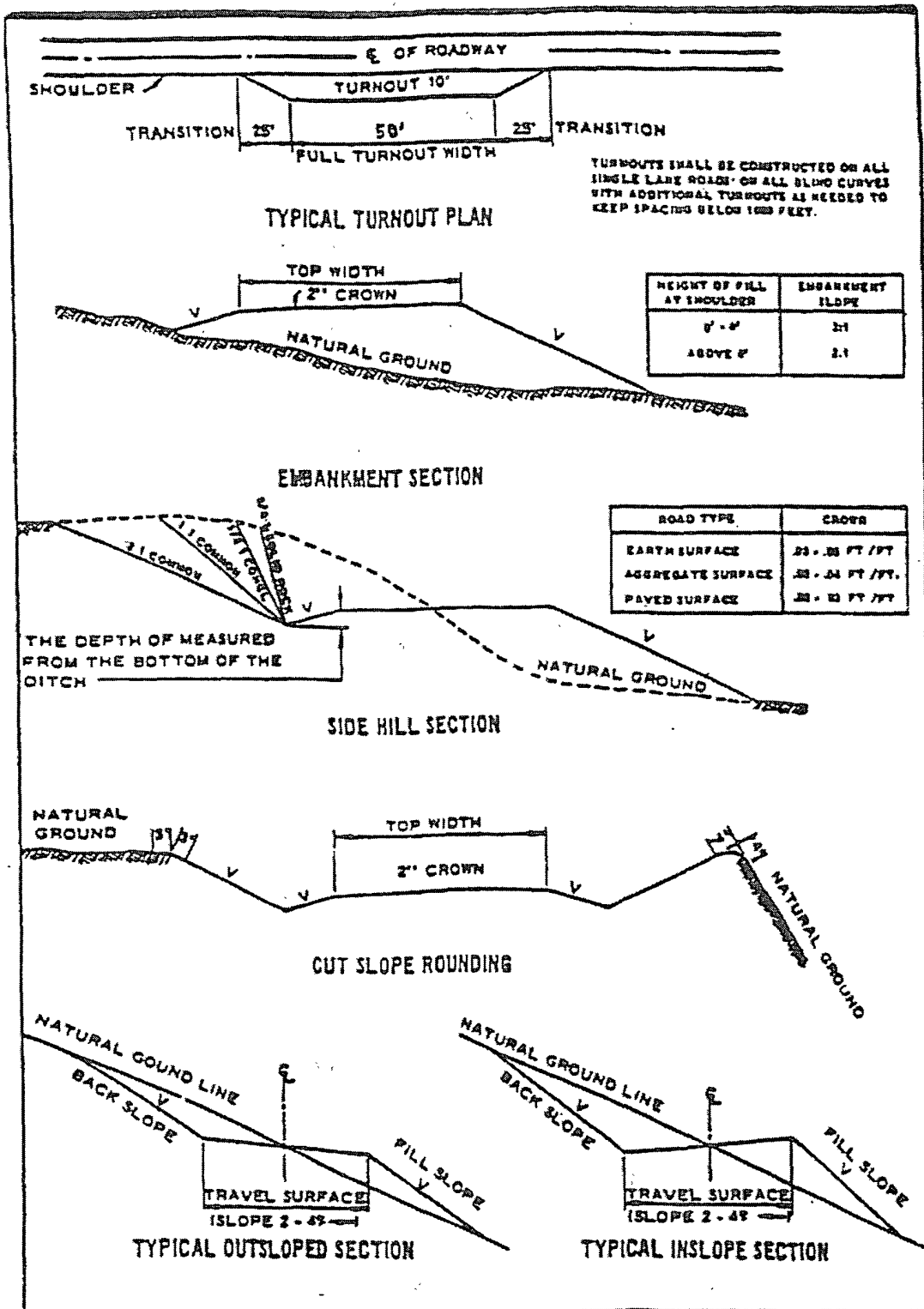
Where entry is required across a fence line, the fence shall be braced and tied off on both sides of the passageway prior to cutting.

The operator shall notify the private surface landowner or the grazing allotment holder prior to crossing any fence(s).

**Public Access**

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

Figure 1 – Cross Sections and Plans For Typical Road Sections





## **VII. DRILLING**

### **A. DRILLING OPERATIONS REQUIREMENTS**

The BLM is to be notified a minimum of 4 hours in advance for a representative to witness:

- a. Spudding well
- b. Setting and/or Cementing of all casing strings
- c. BOPE tests

☒ **Eddy County**

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

1. **Although Hydrogen Sulfide has not been reported in this section, it is always a potential hazard. Hydrogen Sulfide has been reported in Sections 11, 13 & 14. It is recommended that monitoring equipment be onsite for potential Hydrogen Sulfide. If Hydrogen Sulfide is encountered, please report measured amounts 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.
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 are located, this does not include the dog house or stairway area.

### **B. CASING**

**Changes to the approved APD casing and cement program require submitting a sundry and receiving approval prior to work. Failure to obtain approval prior to work will result in an Incident of Non-Compliance being issued.**

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

**Provide compressive strengths including hours to reach required 500 pounds compressive strength prior to cementing each casing string.**

**Wait on cement (WOC) time for a primary cement job will be a minimum 18 hours for a water basin, 24 hours in the potash area, or 500 pounds compression strength, whichever is greater. (This is to include the lead cement).**

**WOC for water basin or potash applies to entire wellbore.**

**NO PEA GRAVEL PERMITTED FOR REMEDIAL OR FALL BACK  
REMEDIAL DUE TO HIGH CAVE/KARST AREA.**

**Wildcat Delaware**

**High potential for cave/karst type features**

**Possible lost circulation in Delaware**

1. The **8-5/8** inch surface casing shall be set at **approximately 440 feet within the Castile Formation** and cemented to the surface.

**Surface contingency: In case of excessive lost returns from 0-350', POOH and ream hole with 14-3/4" bit, set and cement to surface 11-3/4" casing from 0-350'. Drill 11" hole to 440' and set and cement to surface 8-5/8" casing from 0-440'.**

- 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 a surface log readout will be used or a cement bond log shall be run to verify the top of the cement.
- b. Wait on cement (WOC) time for a primary cement job will be a minimum 18 hours for a water basin, 24 hours in the potash area, or 500 pounds compressive strength, whichever is greater. (This is to include the lead cement).
- c. Wait on cement (WOC) time for a remedial job will be a minimum of 4 hours after bringing cement to surface or 500 pounds compressive strength, whichever is greater.
- d. If cement falls back, remedial cementing will be done prior to drilling out that string.

**Formation below the 8-5/8" shoe to be tested according to Onshore Order 2.III.B.1.i.**

**Notify the Carlsbad Field Office I&E Staff at (575) 361-2822 to witness tagging plugs.**

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

2. The minimum required fill of cement behind the 5-1/2 inch intermediate casing is:

☒ Cement to surface. If cement does not circulate see B.1.a-d above.

3. The minimum required fill of cement behind the 2-7/8 inch production casing is:

☒ Cement not required. Three possibilities – open hole, liner or Peak System.  
The liner or Peak System will not be cemented.

**If used, the seal on Peak System's Iso-Pack liner or regular liner is to be tested per Onshore Oil and Gas Order 2.III.B.1.b. Please call BLM for witness of seal test.**

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. The appropriate BLM office shall be notified a minimum of 4 hours in advance for a representative to witness the tests.

a. The tests shall be done by an independent service company.

b. The results of the test shall be reported to the appropriate BLM office.

c. 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.

d. 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.

e. **A variance to test only the surface casing to the reduced pressure of 1000 psi with the rig pumps is approved. The BOP will be tested to 3000 psi by an independent service company.**

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

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

**LB 8/14/08**

## **VIII. 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.

#### **Containment Structures**

The containment structure shall be constructed to hold the capacity of the entire contents of the largest tank, plus 24 hour production, unless more stringent protective requirements are deemed necessary by the Authorized Officer.

#### **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, Munsell Soil Color Chart # 5Y 4/2

## **IX. INTERIM RECLAMATION & RESERVE PIT CLOSURE**

### **A. INTERIM RECLAMATION**

If the well is a producer, interim reclamation shall be conducted on the well site in accordance with the orders of the Authorized Officer. The operator shall submit a Sundry Notices and Reports on Wells (Notice of Intent), Form 3160-5, prior to conducting 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.

The operators should work with BLM surface management specialists to devise the best strategies to reduce the size of the location. Any reductions 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 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.

#### Seed Mixture 4, for Gypsum 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 of planting where drilling is possible. The seed mixture will be evenly and uniformly planted over the disturbed area (smaller/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:

<u>Species</u>	<u>lb/acre</u>
Alkali Sacaton ( <i>Sporobolus airoides</i> )	1.0
DWS $\subseteq$ Four-wing saltbush ( <i>Atriplex canescens</i> )	5.0

$\subseteq$ DWS: DeWinged Seed

\*Pounds of pure live seed:

Pounds of seed x percent purity x percent germination = pounds pure live seed  
(Insert Seed Mixture Here)

## **X. FINAL ABANDONMENT & REHABILITATION REQUIREMENTS**

Upon abandonment of the well and/or when the access road is no longer in service the Authorized Officer shall issue instructions and/or orders for surface reclamation and restoration of all disturbed areas.

On private surface/federal mineral estate land the reclamation procedures on the road and well pad shall be accomplished in accordance with the private surface land owner agreement.