

District I  
1625 N. French Dr., Hobbs, NM 88240  
District II  
1301 W. Grand Avenue, Artesia, NM 88210  
District III  
Rio Brazos Road, Aztec, NM 87410  
District IV  
1220 S. St. Francis Dr., Santa Fe, NM 87505

State of New Mexico  
Energy Minerals and Natural Resources

Oil Conservation Division  
1220 South St. Francis Dr.  
Santa Fe, NM 87505

Form C-101  
May 27, 2004

Submit to appropriate District Office

☐ AMENDED REPORT

APPLICATION FOR PERMIT TO DRILL, RE-ENTER, DEEPEN, PLUGBACK, OR ADD A ZONE

1 Operator Name and Address Corkran Energy, LP 2219 Westlake Drive, Ste 120 Austin, TX 78746		2 OGRID Number 243452
3 Property Code	4 Property Name ORLEANS 25 36125	5 API Number 35260
9 Proposed Pool 1 FOUR MILE DRAW; MORROW (GAS) 76960		10 Proposed Pool 2

7 Surface Location

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
B	25	18S	26E	B	660	N	1650	E	EDDY

8 Proposed 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

Additional Well Information

11 Work Type Code NEW WELL	12 Well Type Code GAS	13 Cable/Rotary	14 Lease Type Code STATE	15 Ground Level Elevation 3280
16 Multiple N	17 Proposed Depth 10600	18 Formation MORROW	19 Contractor	20 Spud Date 12/15/06
Depth to Groundwater 1000		Distance from nearest fresh water well 100		Distance from nearest surface water 35
Pit: Liner: Synthetic <input checked="" type="checkbox"/> 12_mils thick Clay <input type="checkbox"/> Pit Volume: 20000_bbls Drilling Method: Closed-Loop System <input type="checkbox"/> Fresh Water <input checked="" type="checkbox"/> Brine <input type="checkbox"/> Diesel/Oil-based <input type="checkbox"/> Gas/Air <input type="checkbox"/>				

21 Proposed Casing and Cement Program

Hole Size	Casing Size	Casing weight/foot	Setting Depth	Sacks of Cement	Estimated TOC
17.5	13.375	48	420	400	0
12.25	9.625	40	900	450	0
7.875	5.5	17	10600	800	76960
Tie back to Intermediate Casing					

22 Describe the proposed program. If this application is to DEEPEN or PLUG BACK, give the data on the present productive zone and proposed new productive zone. Describe the blowout prevention program, if any. Use additional sheets if necessary.

CEMENT TO COVER ALL OIL,  
GAS AND WATER BEARING  
ZONES

NOTIFY OCD OF SPUD &  
TIME TO WITNESS  
CEMENTING OF SURFACE &  
INTERMEDIATE CASING

23 I hereby certify that the information given above is true and complete to the best of my knowledge and belief. I further certify that the drilling pit will be constructed according to NMOCD guidelines ☒, a general permit ☐, or an (attached) alternative OCD-approved plan ☐.

Signature:

Printed name: Angela Lightner

Title: Consultant

E-mail Address: angela@rkford.com

Date: 11/28/06

Phone: 432-682-0440

OIL CONSERVATION DIVISION

Approved by:

BRYAN G. ARRANT  
DISTRICT II GEOLOGIST

Title:

Approval Date:

DEC 01 2006

Expiration Date:

DEC 01 2007

Conditions of Approval Attached ☐

## State of New Mexico

Energy, Minerals and Natural Resources Department

## DISTRICT I

1625 N. FRENCH DR., HOBBBS, NM 88240

## DISTRICT II

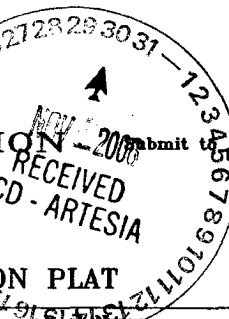
101 W. GRAND AVENUE, ARTESIA, NM 88210

## DISTRICT III

1000 R. H. HAZEN RD., AZTEC, NM 87410

## DISTRICT IV

1220 S. ST. FRANCIS DR., SANTA FE, NM 87505

OIL CONSERVATION DIVISION  
1220 SOUTH ST. FRANCIS DR.  
Santa Fe, New Mexico 87505

Form C-102

Revised October 12, 2005

Submit to Appropriate District Office

State Lease - 4 Copies

Fee Lease - 3 Copies

## WELL LOCATION AND ACREAGE DEDICATION PLAT

☐ AMENDED REPORT

API Number	Pool Code 76960	Well Name Four Mile Draw; Morrow
Property Code	Property Name ORLEANS 25	Well Number 1
OGRID No.	Operator Name CORKRAN ENERGY, LP	Elevation 3281'

## Surface Location

UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
B	25	18-S	26-E		660	NORTH	1650	EAST	EDDY

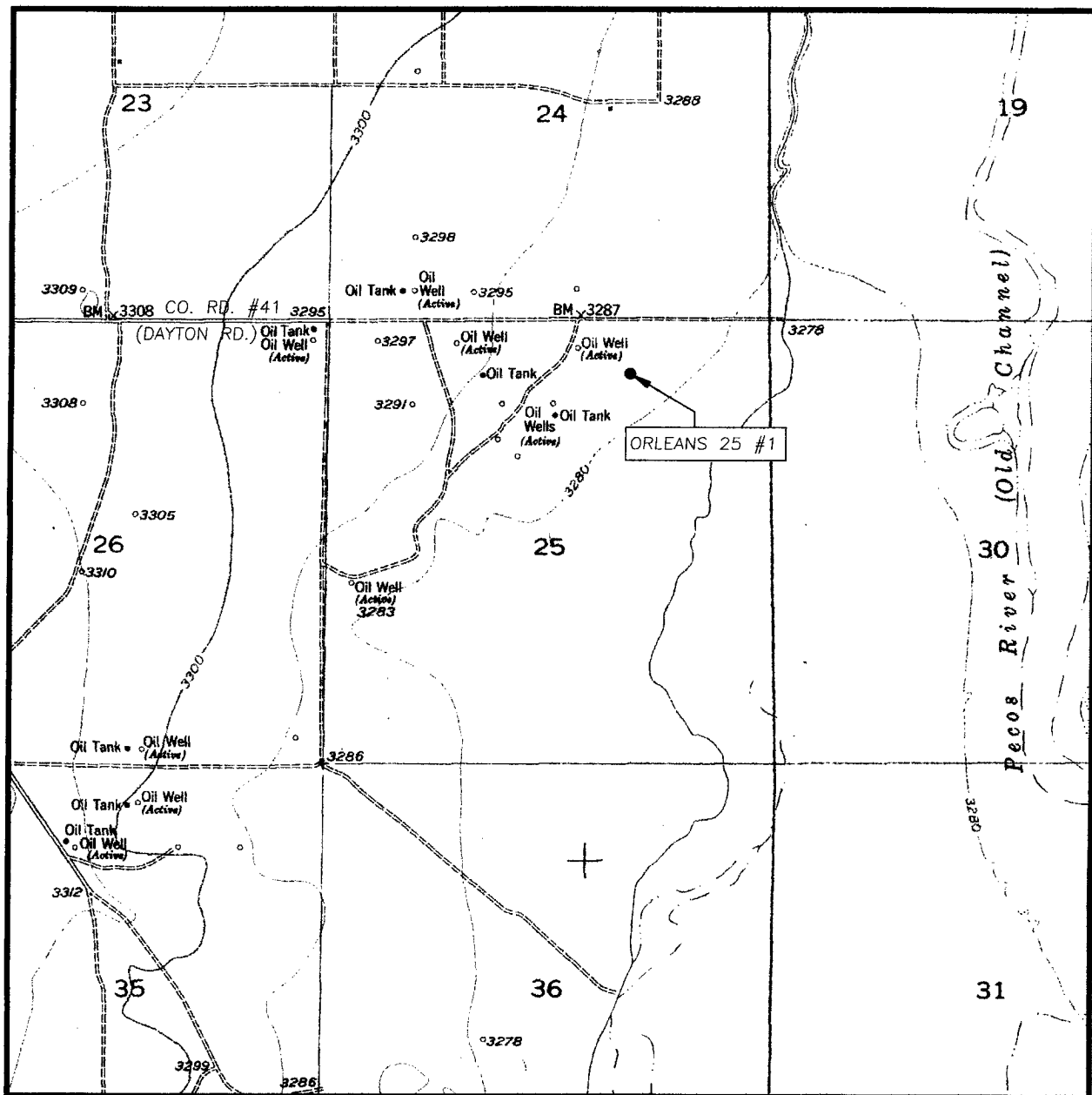
## Bottom Hole Location If Different From Surface

UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
Dedicated Acres 32c	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

<p>GEODETIC COORDINATES NAD 27 NME  Y=627150.5 N X=500532.7 E  LAT.=32.724133° N LONG.=104.331601° W</p>	<b>OPERATOR CERTIFICATION</b>  I hereby certify that the information 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 mineral or working interest, or to a voluntary pooling agreement or a compulsory pooling order heretofore entered by the division.  Angela Lightner 11-28-06 Signature Date  Angela Lightner Printed Name
	<b>SURVEYOR CERTIFICATION</b>  I hereby certify that the well location 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.  SEPTEMBER 27, 2006 Date Surveyed REV 10/10/06 JR Signature & Seal of Professional Surveyor  Certification No. GARY EIDSON 12641 BOONVILLE, MO. 64608

# LOCATION VERIFICATION MAP



SCALE: 1" = 2000'

CONTOUR INTERVAL:  
LAKE McMILLAN NORTH, N.M. - 10'

SEC. 25 TWP. 18-S RGE. 26-E

SURVEY N.M.P.M.

COUNTY EDDY STATE NEW MEXICO

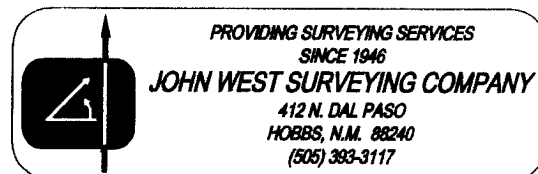
DESCRIPTION 660' FNL & 1650' FEL

ELEVATION 3281'

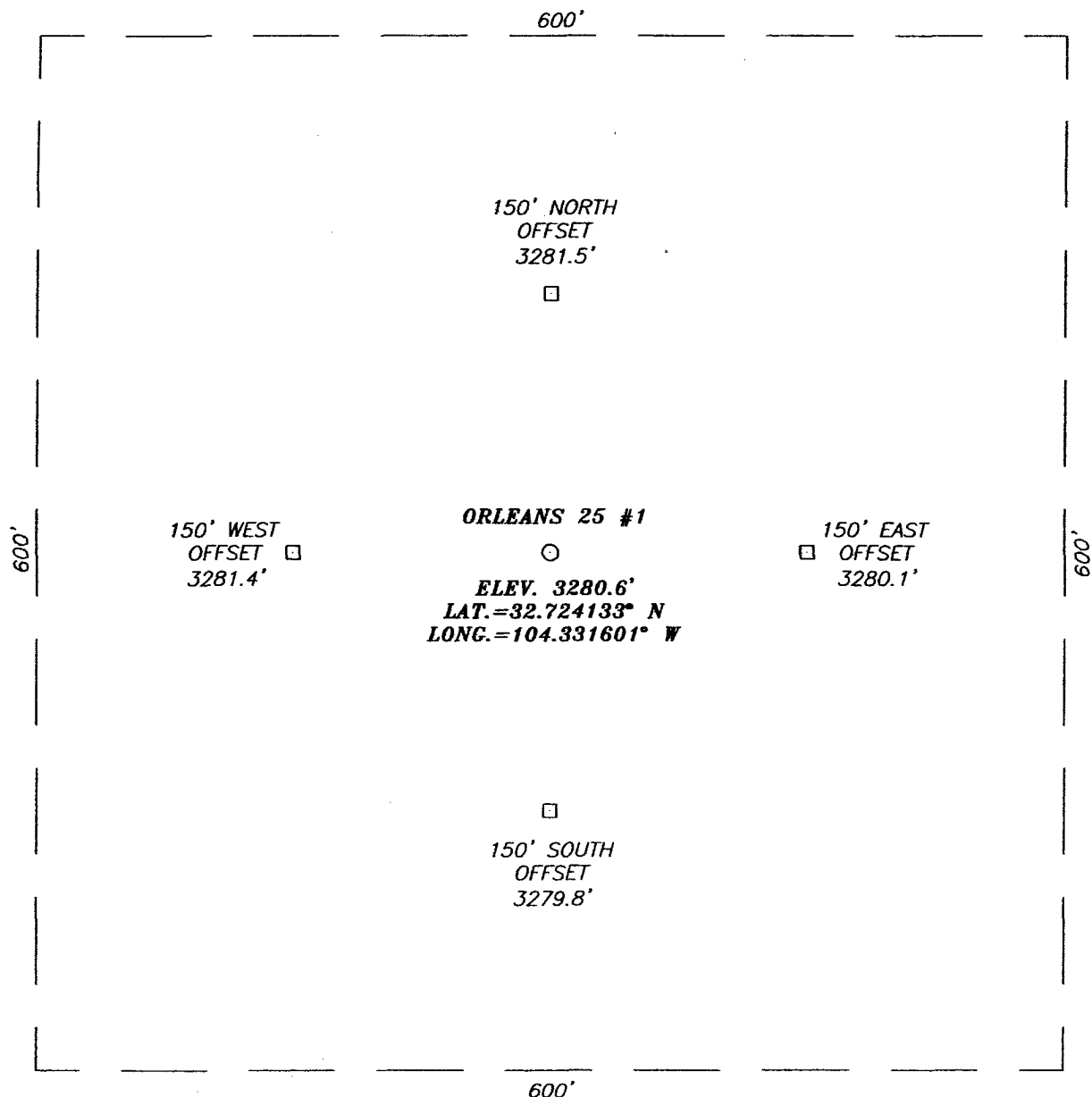
OPERATOR CORKRAN ENERGY, LP

LEASE ORLEANS 25

U.S.G.S. TOPOGRAPHIC MAP  
LAKE McMILLAN NORTH, N.M.

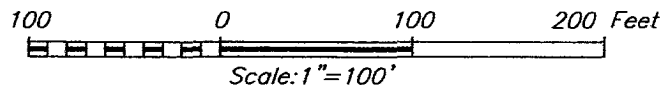


**SECTION 25, TOWNSHIP 18 SOUTH, RANGE 26 EAST, N.M.P.M.,**  
 EDDY COUNTY, NEW MEXICO



**DIRECTIONS TO LOCATION**

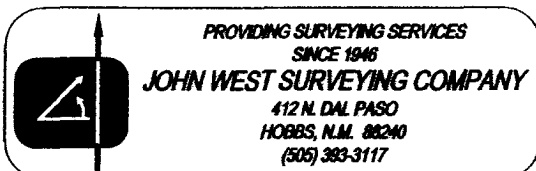
FROM THE INTERSECTION OF U.S. HWY. #285 AND  
 CO RD. #41 (DAYTON RD.) GO EAST ON CO. RD.  
 #41 APPROX. 3.7 MILES. THIS LOCATION IS  
 APPROX. 650 FEET SOUTH.



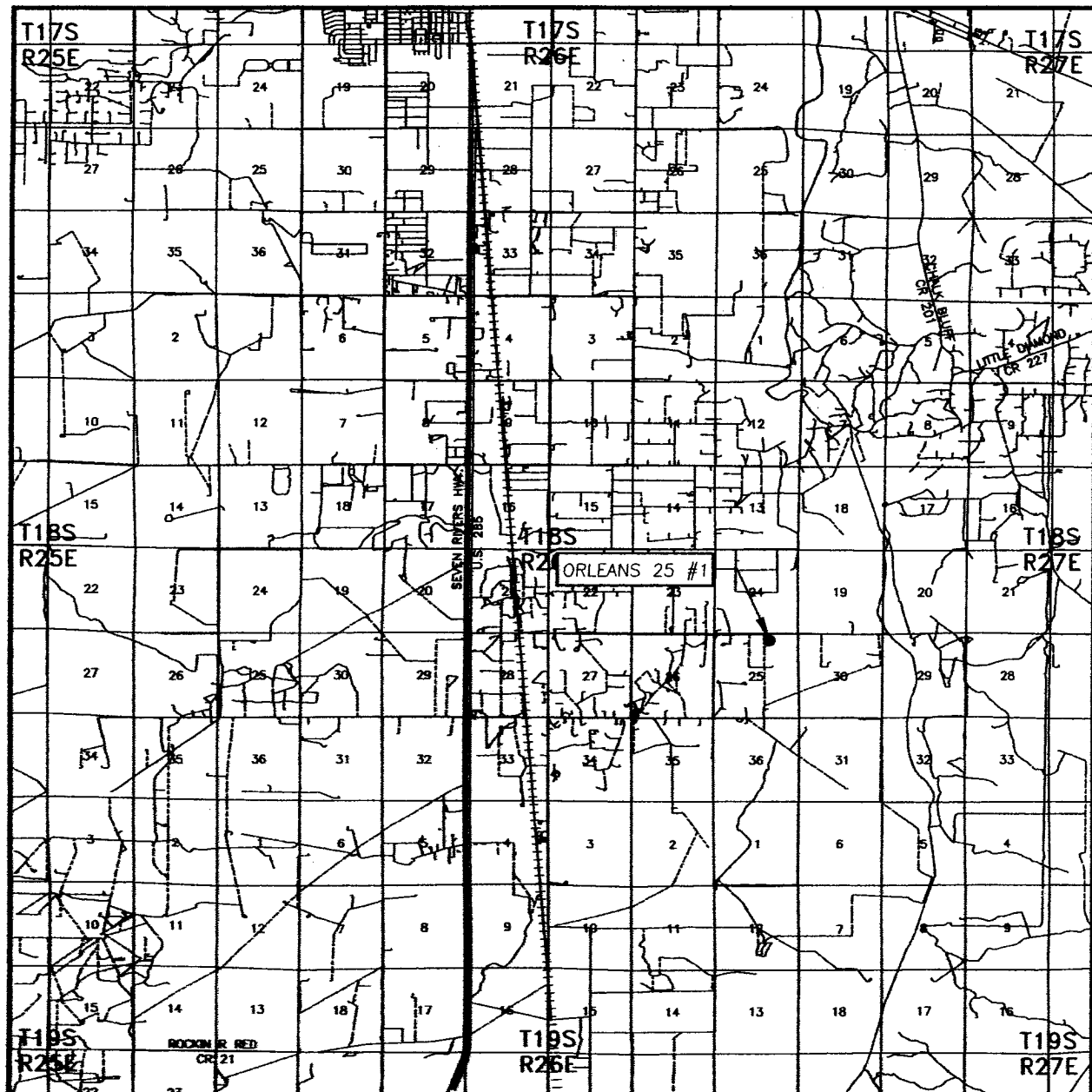
**CORKRAN ENERGY, LP**

ORLEANS 25 #1 WELL  
 LOCATED 660 FEET FROM THE NORTH LINE  
 AND 1650 FEET FROM THE EAST LINE OF SECTION 25,  
 TOWNSHIP 18 SOUTH, RANGE 26 EAST, N.M.P.M.,  
 EDDY COUNTY, NEW MEXICO.

Survey Date: 09/27/06	Sheet 1 of 1 Sheets
W.O. Number: 06.11.1522	Dr By: J.R.
Date: 10/04/06	Disk: CD#6
06111522	Scale: 1"=100'

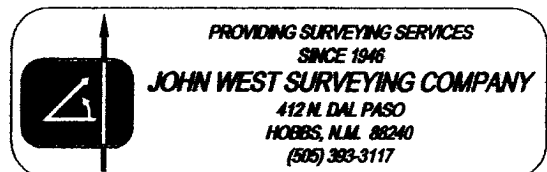


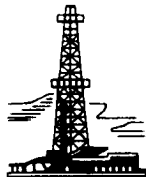
# VICINITY MAP



SCALE: 1" = 2 MILES

SEC. 25 TWP. 18-S RGE. 26-E  
 SURVEY N.M.P.M.  
 COUNTY EDDY STATE NEW MEXICO  
 DESCRIPTION 660' FNL & 1650' FEL  
 ELEVATION 3281'  
 OPERATOR CORKRAN ENERGY, LP  
 LEASE ORLEANS 25





# R. K. FORD & ASSOCIATES

*Engineering, Drilling & Completion*

415 W. Wall • Wilco Building • Suite 1700  
Midland, Texas 79701



November 29, 2006

Mr. Bryan Arrant,

I have enclosed the C-101 and C-102 for the Orleans 25 #1 well. On November 20, we discussed the problem with the dedicated acreage being in the Four Mile Draw; Morrow (Gas) pool and the e-permit not letting me make changes to it. You advised that I could do the C-101 and C-102 forms the old way. You should have all the pertinent information to complete the filing. Please review this well for permit approval. If you need further information please contact me.

Thank you,

*Angela Lightner*

Angela Lightner

[angela@rkford.com](mailto:angela@rkford.com)

432-682-0440



# R. K. FORD & ASSOCIATES

*Engineering, Drilling & Completion*

415 W. Wall • Wilco Building • Suite 1700  
Midland, Texas 79701

November 7, 2006

I have enclosed the casing & cement program, mud program and H2S contingency plan for the Corkran Energy, LP - Orleans 25 #1 well. Please review these as well as the permit submitted online. The changes have been made on the permit as you requested on your email dated 10-23-06. If more information is needed please contact me.

Thank you,

Angela Lightner  
432-682-0440  
angela@rkford.com

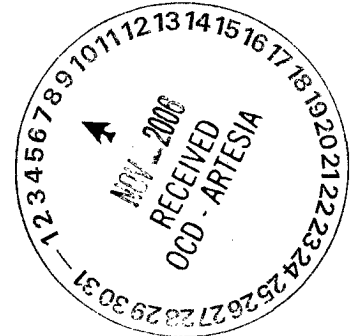




Proposal No: 180267313A

**Corkran Energy**  
Orleans 25 #1

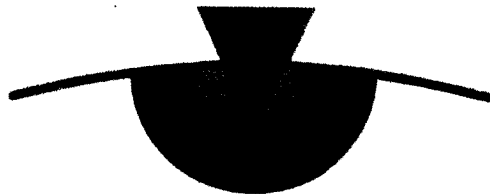
S 25, T 18S, R 26E  
Eddy County, New Mexico  
October 25, 2006



### Well Recommendation

**Prepared for:**  
Mr. Court Adkins  
R.K. Ford & Associates

**Prepared by:**  
Tanya Gonzalez  
Specifications Writer



# POWERVISION®

POWERPRO • POWERTRAX • POWERLINK

**Service Point:**

Artesia

Bus Phone: (505) 746-3140

Fax: (505) 746-2293

**Service Representatives:**

Van Harris

Senior Account Manager

Bus Phone: (432) 683-2781

Fax: (432) 683-5947



Operator Name: Corkran Energy  
 Well Name: Orleans 25 #1  
 Job Description: 13-3/8" Surface Casing  
 Date: October 25, 2006



Proposal No: 180267313A

## WELL DATA

### ANNULAR GEOMETRY

ANNULAR I.D. (in)	DEPTH(ft)	
	MEASURED	TRUE VERTICAL
17.500 HOLE	400	400

### SUSPENDED PIPES

DIAMETER (in)		WEIGHT (lbs/ft)	DEPTH(ft)	
O.D.	I.D.		MEASURED	TRUE VERTICAL
13.375	12.615	54.5	400	400

Float Collar set @ 360 ft  
 Mud Density 8.30 ppg  
 Est. Static Temp. 83 ° F  
 Est. Circ. Temp. 80 ° F

### VOLUME CALCULATIONS

400 ft x 0.6946 cf/ft with 100 % excess = 555.7 cf  
 40 ft x 0.8680 cf/ft with 0 % excess = 34.7 cf (inside pipe)  
**TOTAL SLURRY VOLUME = 590.4 cf**  
 = 105 bbls

Operator Name: Corkran Energy  
Well Name: Orleans 25 #1  
Job Description: 13-3/8" Surface Casing  
Date: October 25, 2006



Proposal No: 180267313A

## FLUID SPECIFICATIONS

<u>FLUID</u>	<u>VOLUME CU-FT</u>	<u>VOLUME FACTOR</u>	<u>AMOUNT AND TYPE OF CEMENT</u>
Cement Slurry	590	/ 1.3	= 440 sacks Class C Cement + 2% bwoc Calcium Chloride + 0.25 lbs/sack Cello Flake + 56.3% Fresh Water
Displacement		55.7 bbls	Displacement

## **CEMENT PROPERTIES**

	<b>SLURRY NO. 1</b>
Slurry Weight (ppg)	14.80
Slurry Yield (cf/sack)	1.35
Amount of Mix Water (gps)	6.35
Estimated Pumping Time - 70 BC (HH:MM)	3:30

Operator Name: Corkran Energy  
 Well Name: Orleans 25 #1  
 Job Description: 9-5/8" Intermediate Casing  
 Date: October 25, 2006



Proposal No: 180267313A

## WELL DATA

### ANNULAR GEOMETRY

ANNULAR I.D. (in)	DEPTH(ft)	
	MEASURED	TRUE VERTICAL
12.615 CASING	400	400
12.250 HOLE	900	900

### SUSPENDED PIPES

DIAMETER (in)		WEIGHT (lbs/ft)	DEPTH(ft)	
O.D.	I.D.		MEASURED	TRUE VERTICAL
9.625	8.755	43.5	900	900

Float Collar set @ 860 ft  
 Mud Density 8.50 ppg  
 Est. Static Temp. 87 ° F  
 Est. Circ. Temp. 80 ° F

### VOLUME CALCULATIONS

400 ft	x	0.3627 cf/ft	with	0 % excess	=	145.1 cf
249 ft	x	0.3132 cf/ft	with	50 % excess	=	117.1 cf
251 ft	x	0.3132 cf/ft	with	50 % excess	=	117.8 cf
40 ft	x	0.4181 cf/ft	with	0 % excess	=	16.7 cf (inside pipe)
<b>TOTAL SLURRY VOLUME</b>					=	396.7 cf
					=	71 bbls

**Operator Name:** Corkran Energy  
**Well Name:** Orleans 25 #1  
**Job Description:** 9-5/8" Intermediate Casing  
**Date:** October 25, 2006



**Proposal No:** 180267313A

### FLUID SPECIFICATIONS

<u>FLUID</u>	<u>VOLUME CU-FT</u>	<u>VOLUME FACTOR</u>	<u>AMOUNT AND TYPE OF CEMENT</u>
Lead Slurry	262	/ 2.4	= 110 sacks (50:50) Poz (Fly Ash):Class C Cement + 5% bwow Sodium Chloride + 0.25 lbs/sack Cello Flake + 10% bwoc Bentonite + 139.7% Fresh Water
Tail Slurry	134	/ 1.3	= 100 sacks Class C Cement + 2% bwoc Calcium Chloride + 56.4% Fresh Water
Displacement			64.0 bbls Displacement

### **CEMENT PROPERTIES**

	<b>SLURRY NO. 1</b>	<b>SLURRY NO. 2</b>
Slurry Weight (ppg)	11.80	14.80
Slurry Yield (cf/sack)	2.45	1.34
Amount of Mix Water (gps)	14.07	6.36
Estimated Pumping Time - 70 BC (HH:MM)	5:00	3:00

**Operator Name:** Corkran Energy  
**Well Name:** Orleans 25 #1  
**Job Description:** 5-1/2" Production Casing  
**Date:** October 25, 2006



**Proposal No:** 180267313A

## WELL DATA

### ANNULAR GEOMETRY

ANNULAR I.D. (in)	DEPTH(ft)	
	MEASURED	TRUE VERTICAL
8.755 CASING	900	900
8.500 HOLE	9,600	9,600

### SUSPENDED PIPES

DIAMETER (in)		WEIGHT (lbs/ft)	DEPTH(ft)	
O.D.	I.D.		MEASURED	TRUE VERTICAL
5.500	4.892	17	9,600	9,600

Float Collar set @	9,560 ft
Mud Density	9.00 ppg
Est. Static Temp.	153 ° F
Est. Circ. Temp.	135 ° F

### VOLUME CALCULATIONS

4,500 ft	x	0.2291 cf/ft	with	35 % excess	=	1391.6 cf
40 ft	x	0.1305 cf/ft	with	0 % excess	=	5.2 cf (inside pipe)
<b>TOTAL SLURRY VOLUME</b>					=	1396.8 cf
					=	249 bbls

**Operator Name:** Corkran Energy  
**Well Name:** Orleans 25 #1  
**Job Description:** 5-1/2" Production Casing  
**Date:** October 25, 2006



**Proposal No:** 180267313A

### FLUID SPECIFICATIONS

Spacer 500.0 gals Mud Clean II @ 8.5 ppg

<u>FLUID</u>	<u>VOLUME CU-FT</u>	<u>VOLUME FACTOR</u>	<u>AMOUNT AND TYPE OF CEMENT</u>
Cement Slurry	1397	/ 1.	= 1080 sacks (50:50) Poz (Fly Ash):Class H Cement + 5% bwow Sodium Chloride + 0.5% bwoc FL-25 + 2% bwoc Bentonite + 0.5% bwoc FL-52A + 58.3% Fresh Water

Displacement 222.2 bbls Displacement

### **CEMENT PROPERTIES**

#### **SLURRY NO. 1**

Slurry Weight (ppg)	14.20
Slurry Yield (cf/sack)	1.30
Amount of Mix Water (gps)	5.87
Estimated Pumping Time - 70 BC (HH:MM)	4:00
Fluid Loss (cc/30min) at 1000 psi and ° F	90.0



## CONDITIONS

**BJ Services' performance of services and sale of materials is expressly conditioned upon the applicability of the Terms and Conditions contained in the current BJ Services Price Book. The Terms and Conditions include, among other things, an indemnity in favor of BJ Services from Customer for damage to the well bore, reservoir damage, loss of the hole, blowouts and loss of control of the well, even if caused by the negligence or other fault of BJ Services. The Terms and Conditions also limit the warranties provided by the BJ Services and the remedies to which Customer may be entitled in the event of a breach of warranty by BJ Services. For these reasons, we strongly recommend that you carefully review a copy of the Terms and Conditions. If you do not have a copy of the BJ Services Price Book, you can view the Terms and Conditions on BJ Services Web Site, [www.bjservices.com](http://www.bjservices.com). By requesting that BJ Services perform the services described herein, Customer acknowledges that such Terms and Conditions are applicable to the services. Further, by requesting the services, Customer warrants that its representative on the well location or other service site will be fully authorized to acknowledge such Terms and Conditions by executing a Field Receipt or other document presented by BJ Services containing such Terms and Conditions.**

**In the event that Customer and BJ Services have executed a Master Services Agreement covering the work to be performed, such Master Services Agreement shall govern in place of the Terms and Conditions. If you are interested in entering into Master Services Agreement with BJ Services, please contact us through the "Go BJ" button on the BJ Services Web Site.**

**Operator Name:** Corkran Energy  
**Well Name:** Orleans 25 #1  
**Date:** October 25, 2006



**Proposal No:** 180267313A

## **PRODUCT DESCRIPTIONS**

### **Bentonite**

Commonly called gel, it is a clay material used as a cement extender and to control excessive free water.

### **Calcium Chloride**

A powdered, flaked or pelletized material used to decrease thickening time and increase the rate of strength development.

### **Cello Flake**

Graded (3/8 to 3/4 inch) cellophane flakes used as a lost circulation material.

### **Class C Cement**

Intended for use from surface to 6000 ft., and for conditions requiring high early strength and/or sulfate resistance.

### **Class H Cement**

Class H cement is an API type, all purpose oil well cement which is used without modification in wells up to 8,000 ft. It possesses a moderate sulfate resistance. With the use of accelerators or retarders, it can be used in a wide range of well depths and temperatures.

### **FL-25**

An all purpose salt-tolerant fluid loss additive that provides exceptional fluid loss control across a wide range of temperatures and salinity conditions and remedial cementing applications.

### **FL-52A**

A water soluble, high molecular weight fluid loss additive used in medium to low density slurries. It is functional from low to high temperature ranges.

### **Mud Clean II**

A water-base mud wash designed for use ahead of cement slurries to aid in mud and drilling debris removal and to prevent contamination of the cement slurry. It should be used only when water-base mud is used.

### **Poz (Fly Ash)**

A synthetic pozzolan, (primarily Silicon Dioxide). When blended with cement, Pozzolan can be used to create lightweight cement slurries used as either a filler slurry or a sulfate resistant completion cement.

### **Sodium Chloride**

At low concentrations, it is used to protect against clay swelling. At high concentrations, it is used to increase the





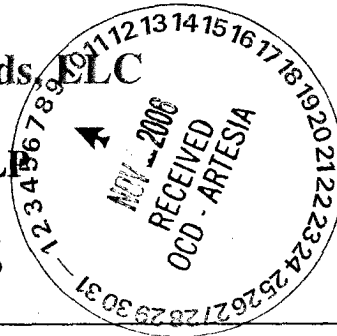
# Newpark Drilling Fluids, LLC

**Corkran Energy, LP**

**Orleans 25 #1**

Section 25, T-18-S, R-26-E

Eddy County, New Mexico



## PROGRAM HIGHLIGHTS:

**TOTAL DEPTH** : 9,600'

**CASING REQUIREMENTS** : Interval 1: 0' - 420' set 13-3/8" casing.  
: Interval 2: 420' - 900' set 9-5/8" casing.  
: Interval 4: 900' - 9,600' set 5-1/2" casing.

**MUD WEIGHT REQUIREMENTS** : 8.6 - 8.8 ppg @ 0' - 420'  
: 8.4-8.5 ppg @ 420' - 900'  
: 8.4-8.5 ppg @ 900' - 6,000'  
: 8.5-9.0 ppg @ 6,000' - 7,600'  
: 9.0-9.4 ppg @ 7,600' - 9,600'

**DAYS TO REACH TD** : 19 - 23

**COST ESTIMATE**

**WAREHOUSE** : Artesia, New Mexico (800) 592-4627  
: Lovington, New Mexico  
: David Volz, Distribution Manager

**PERMIAN BASIN PERSONNEL** : Midland, Texas (800) 592-4627  
: Joe Henderson, Permian Basin Business Unit Manager  
: Al Boudreaux, Sales Manager  
: Doug Thomas, Sales  
: Ken Anthony, Technical Engineer  
: Mike Davis, Technical Engineer

## MUD PROPERTIES SUMMARY:

Depth (feet)	Weight (ppg)	Viscosity (sec/1000cc)	Fluid Loss (cc/30min)	PV (cps)	YP (lb/100ft <sup>2</sup> )	Mud Type
0' - 420' 13-3/8" Casing	8.6 - 8.8	36 - 38	N/C	6 - 10	6 - 20	Spud Mud
420' - 900' 9-5/8" Casing	8.4 - 8.5	28 - 29	N/C	0 - 1	0 - 1	Fresh Water
900' - 6,000'	8.4 - 8.5	28 - 29	N/C	0 - 1	0 - 1	Fresh Water
6,000' - 7,600'	8.5 - 9.0	28 - 29	N/C	0 - 1	0 - 1	Fresh Water-3% KCL
7,600' - 9,600' 5-1/2" Casing	9.0 - 9.4	32 - 38	12 - 8 cc	4 - 10	4 - 12	Dynazan/White Starch

**Note:** The mud weight schedule is intended as a guideline only. Actual mud weights used should be determined by hole conditions and drilling parameters. Drilling with a minimum amount of overbalance will reduce the possibility of losing returns and/or of differentially sticking the drill string.



# Newpark Drilling Fluids, LLC



## Corkran Energy, LP

### Orleans 25 #1

Section 25, T-18-S,R-26-E  
Eddy County, New Mexico

#### PROGRAM HIGHLIGHTS (CONT'D):

#### HOLE & CASING DESIGN:

INTERVAL	DEPTH (feet)	BIT SIZE	CASING (OD)	ANTICIPATED MUD WT. (ppg)
INTERVAL 1	0' - 420'	17-1/4"	13-3/8"	8.6 - 8.8
INTERVAL 2	420' - 900'	12-1/4"	9-5/8"	8.4 - 8.5
INTERVAL 3	900' - 9,600'	7-7/8"	5-1/2"	8.5 - 9.4

#### SOLIDS CONTROL:

INTERVAL	RECOMMENDED SOLIDS CONTROL EQUIPMENT
INTERVAL 1	One linear motion shale shaker.
INTERVAL 2	Reserve.
INTERVAL 3	Reserve.
INTERVAL 4	One linear motion shale shaker.

#### ESTIMATED FORMATION TOPS:

FORMATION	DEPTH
Queen	450'
Grayberg	940'
San Andres	1,210'
Bone Springs	3,650'
3 <sup>rd</sup> Bone Springs	5,900'
Wolfcamp	5,980'
Penn Shale	7,550'
Canyon	7,800'
Strawn	8,250'
Atoka	8,465'
Atoka Clastics	8,890'
Top Morrow	8,980'
Morrow Clastics ( "B" Zone)	9,195'
Lower Morrow ( "C" Zone)	9,305'
Lower "C" Pay Sand	9,350'
Mississippian (Barnett Shale)	9,465'
Mississippian (Chester Limestone)	9,535'
<b>Total Depth</b>	<b>9,600'</b>



# Newpark Drilling Fluids, LLC



## Corkran Energy, LP

Orleans 25 #1

Section 25, T-18-S,R-26-E

Eddy County, New Mexico

Interval 1: 17-1/2" Hole

Interval: 0' - 420'

Casing: 13-3/8"

Days: 1

### Drilling Fluid Properties:

Depth	Weight	Viscosity	PV	YP	pH	Fluid Loss	LG Solids
(feet)	(ppg)	(sec/1000cc)	(cps)	(lb/100ft <sup>2</sup> )	(value)	(cc/30min)	(%)
0' - 420'	8.6 - 8.8	36 - 38	6-10	6-20	9 - 10	N/C	<6

### Drilling Fluid Recommendations:

Spud with a conventional "spud mud". Use **NewGel** and native solids to maintain a sufficient viscosity to keep the hole clean. Compound pumps to provide adequate volume to produce required annular velocity to clean hole. Mix **Soda Ash** for pH control. Mix **Paper** as needed to control seepage loss. Run fresh water at flow line for dilution and volume.

At total depth of interval, mix in pre-mix pit, 100 barrels of fresh water; **NewGel** for a viscosity of 70 sec/1000cc, add 0.25 ppb of **Super Sweep**. Pump this pill prior to trip to run surface casing.

### Materials Consumption

100	sx	New Gel
15	sx	Paper
5	sx	Soda Ash
1	bx	Super Sweep



# Newpark Drilling Fluids, LLC



## Corkran Energy, LP

### Orleans 25 #1

Section 25, T-18-S,R-26-E  
Eddy County, New Mexico

---

#### Maintenance Procedure: Interval 1

**Fluid Loss** - Fluid loss control is not necessary in this interval.

**Mud Weight** - Maintain minimum fluid densities. Run water and premixes as needed to maintain volume and weight as specified. Drilling with a minimum amount of overbalance will reduce the possibility of losing returns and/or of differentially sticking the drill string.

**Rheology** - Solids content is the primary factor that will affect rheology.

**Alkalinity** - Maintain pH in the 9.0-10.0 range with **Soda Ash**.

**Hole Cleaning** - Optimum hydraulics and rheological properties should be maintained to provide maximum hole cleaning and minimize washout of the well bore..

**Mud Losses Down hole** - Loss of circulation is a possibility through this interval. Use **Fiber Plug** and **Fiber Seal**. Keep the hole full at all times, and avoid excessive swabbing and/or surge actions when tripping pipe. Bring pumps on the hole gradually anytime circulation has been interrupted, increasing pump strokes only after full returns are established.

**Solids Control** - Maintain low gravity solids at <6% by volume. The shakers should be equipped with the finest mesh screens that will handle the circulating volume.



# Newpark Drilling Fluids, LLC



## Corkran Energy, LP

### Orleans 25 #1

Section 25, T-18-S,R-26-E  
Eddy County, New Mexico

Interval 2: 12-1/4" Hole  
Interval: 420' - 900'  
Casing: 9-5/8"  
Days: 2

#### Drilling Fluid Properties:

Depth (feet)	Weight (ppg)	Viscosity (sec/1000cc)	PV (cps)	YP (lb/100ft <sup>2</sup> )	pH (value)	Fluid Loss (cc/30min)	LG Solids (%)
420' - 900'	8.4 - 8.5	28 - 29	0 - 1	0 - 1	9.0-10.0	N/C	<6

#### Drilling Fluid Recommendations:

Drill out below Surface Casing with Fresh water. Circulate through a controlled portion of the reserve pit for maximum gravitational solids removal. Mix **Paper** to control seepage losses. Mix **Caustic Soda** to maintain pH at 9-10. Mix one gallon of **New-55** at flowline every 250' to promote solids settling. Sweep hole with 5-lbs of **Super Sweep** every 500 feet drilled. Severe losses may require dry drilling to casing point.

Water flows on offset wells have contained in excess of 400-ppm of H<sub>2</sub>S. We recommend setting up H<sub>2</sub>S monitors for this and succeeding intervals. At total depth sweep the hole using 100-barrels of system fluid, **NewGel** for a 70 sec/1000cc viscosity and 0.25 pounds per barrel of **Super Sweep**.

#### Materials Consumption

40 sx NewGel  
20 sx Paper  
15 sx Caustic  
1 cn New 55  
1 bx Super Sweep



# Newpark Drilling Fluids, LLC



## Corkran Energy, LP

### Orleans 25 #1

Section 25, T-18-S,R-26-E  
Eddy County, New Mexico

---

#### Maintenance Procedure: Interval 2

**Fluid Loss** - Fluid loss control is not necessary in this interval.

**Mud Weight** - Maintain minimum fluid densities. Run water and premixes as needed to maintain volume and weight as specified.

**Alkalinity** - Maintain pH in the 9.0-10.0 range with **Caustic**.

**Hole Cleaning** - Optimum hydraulics and rheological properties should be maintained to provide maximum hole cleaning and minimize washout of the well bore. Sweeping the hole with fresh water mud pills made of fresh water, **NewGel** for a 80-90 sec/1000cc viscosity and 0.25 ppb of **Super Sweep** every 500' will provide additional hole cleaning.

**Mud Losses Down hole** - Loss of circulation is a possibility through this interval. Use **Fiber Plug** and **Fiber Seal**. Keep the hole full at all times, and avoid excessive swabbing and/or surge actions when tripping pipe. Bring pumps on the hole gradually anytime circulation has been interrupted, increasing pump strokes only after full returns are established.

**Solids Control** - Maintain low gravity solids at <6% by volume. Circulating the reserve will provide gravitational solids control.



# Newpark Drilling Fluids, LLC



## Corkran Energy, LP

### Orleans 25 #1

Section 25, T-18-S,R-26-E  
Eddy County, New Mexico

Interval 3: 7-7/8" Hole  
Interval: 900' - 6,000'  
Casing: -  
Days: 9

### Drilling Fluid Properties:

Depth	Weight	Viscosity	PV	YP	pH	Fluid Loss	LC Solids
(feet)	(ppg)	(sec/1000c G)	(cps)	(lb/100ft <sup>2</sup> )	(value)	(cc/30min)	(%)
900' - 6,000'	8.4 - 8.5	28 - 29	0 - 1	0 - 1	9.0-10.0	N/C	<6

### Drilling Fluid Recommendations:

Drill out below Intermediate Casing with fresh water. Circulate through the remaining portion of the reserve pit for gravitational solids removal. Use sweeps of **Paper** to control seepage loss. Use **Caustic Soda** for pH control. Mix one gallon of **New-55** at flow line every 250' to promote solids settling. Sweep hole with 2-lbs of **Super Sweep** every 500 feet drilled.

### Materials Consumption

50 sx Paper  
20 sx Caustic Soda  
4 cn New 55  
2 bx Super Sweep



# Newpark Drilling Fluids, LLC



## Corkran Energy, LP

### Orleans 25 #1

Section 25, T-18-S,R-26-E  
Eddy County, New Mexico

---

#### Maintenance Procedure: Interval 3

**Fluid Loss** - Fluid loss control is not necessary in this interval.

**Mud Weight** - Maintain minimum fluid densities. Run water and premixes as needed to maintain volume and weight as specified. Drilling with a minimum amount of overbalance will reduce the possibility of losing returns and/or of differentially sticking the drill string.

**Alkalinity** - Maintain pH in the 9.0-10.0 range with **Caustic**.

**Hole Cleaning** - Optimum hydraulics and rheological properties should be maintained to provide maximum hole cleaning and minimize washout of the well bore. Sweeping the hole with fresh water mud pills made of fresh water, **NewGel** for a 80-90 sec/1000cc viscosity and 0.25 ppb of **Super Sweep** every 500' will provide additional hole cleaning.

**Mud Losses Down hole** - Loss of circulation is a possibility through this interval. Use **Fiber Plug** and **Fiber Seal**. Keep the hole full at all times, and avoid excessive swabbing and/or surge actions when tripping pipe. Bring pumps on the hole gradually anytime circulation has been interrupted, increasing pump strokes only after full returns are established.

**Solids Control** - Maintain low gravity solids at <6% by volume. Circulating the reserve will provide gravitational solids control. The shakers should be equipped with 150-200 mesh screens at displacement. An attempt to screen down to the finest mesh possible that will handle the volume being circulated.





# Newpark Drilling Fluids, LLC



## Corkran Energy, LP

### Orleans 25 #1

Section 25, T-18-S, R-26-E  
Eddy County, New Mexico

Interval 4: 7-7/8" Hole  
Interval: 6,000' - 7, 600'  
Casing: -  
Days: 3

### Drilling Fluid Properties:

Depth	Weight	Viscosity	PV	YP	API Fluid Loss	pH	LG Solids
(feet)	(ppg)	(sec/1000cc)	(cps)	(lb/100ft <sup>3</sup> )	(cc/30min)	(value)	(%)
6,000' - 7, 600'	8.6 - 9.0	28 - 29	0 - 1	0 - 1	N/C	9 - 10	<6

### Drilling Fluid Recommendations:

At 6,000' add 3% **Potassium Chloride (KCL)** for inhibition. Continue circulating through the remaining portion of the reserve pit for gravitational solids removal. Use sweeps of **Paper** to control seepage loss. Use **Caustic Soda** for pH control. Mix one gallon of **New-55** at flowline every 250' to promote solids settling. Sweep hole with 2-lbs of **Super Sweep** every 500 feet drilled.

Maintain sufficient 10-ppg brine water on location to increase mud weight if pressure is encountered.

### Materials Consumption

250 sx KCL  
15 sx Paper  
8 sx Caustic  
1 bx Super Sweep  
1 cn New-55



# Newpark Drilling Fluids, LLC



## Corkran Energy, LP Orleans 25 #1

Section 25, T-18-S,R-26-E  
Eddy County, New Mexico

---

### Maintenance Procedure: Interval 4

**Fluid Loss** - Fluid loss control is not necessary in this interval.

**Mud Weight** - Maintain minimum fluid densities. Run water and premixes as needed to maintain volume and weight as specified. Drilling with a minimum amount of overbalance will reduce the possibility of losing returns and/or of differentially sticking the drill string.

**Alkalinity** - Maintain pH in the 9.0-10.0 range with **Caustic**.

**Hole Cleaning** - Optimum hydraulics and rheological properties should be maintained to provide maximum hole cleaning and minimize washout of the well bore. Sweeping the hole with fresh water mud pills made of fresh water, **SaltGel** for a 80-90 sec/1000cc viscosity and 0.25 ppb of **Super Sweep** every 500' will provide additional hole cleaning.

**Mud Losses Down hole** - Loss of circulation is a possibility through this interval. Use **Fiber Plug** and **Fiber Seal**. Keep the hole full at all times, and avoid excessive swabbing and/or surge actions when tripping pipe. Bring pumps on the hole gradually anytime circulation has been interrupted, increasing pump strokes only after full returns are established.

**Solids Control** - Maintain low gravity solids at <6% by volume. Circulating the reserve will provide gravitational solids control. The shakers should be equipped with 150-200 mesh screens at displacement. An attempt to screen down to the finest mesh possible that will handle the volume being circulated.



# Newpark Drilling Fluids, LLC



## Corkran Energy, LP

### Orleans 25 #1

Section 25, T-18-S,R-26-E  
Eddy County, New Mexico

Interval 5: 7-7/8" Hole  
Interval: 7,600' - 9,600'  
Casing: 5-1/2"  
Days: 6

### Drilling Fluid Properties:

Depth	Weight	Viscosity	PV	YP	API Fluid Loss	pH	LG Solids
(feet)	(ppg)	(sec/1000cc)	(cps)	(lb/100ft <sup>3</sup> )	(cc/30min)	(value)	(%)
7,600' - 9,600'	8.6 - 9.0	32 - 38	6 - 12	8 - 14	12 - 8 cc	9 - 10	<6

### Drilling Fluid Recommendations:

At 7,600' confine circulation to steel pits. Adjust and maintain pH with **Caustic Soda**. Treat the system with **Newcide** to prevent bacterial degradation of organic materials. Mix **Dynazan** for a 32 sec/1000-cc viscosity. Mix **Starch** (White) to control API filtrate at <12cc.

At 8,900' reduce API filtrate to <8-cc with **Starch** (White). Increase the viscosity to 36-38 sec/1000cc with **Dynazan** for hole cleaning and a firm-thin wall cake.

At total depth fill pre-mix pit with 80 barrels of system fluid. Mix **Dynazan** for a 80 sec/1000cc viscosity. Sweep with 40-barrels and spot the additional 40-barrels on bottom for logging and casing operations.

### Materials Consumption

90 sx Starch (White)  
48 sx Dynazan  
20 sx Caustic Soda  
5 cn Newcide  
5 cn Defoamer



# Newpark Drilling Fluids, LLC



## Corkran Energy, LP Orleans 25 #1

Section 25, T-18-S,R-26-E  
Eddy County, New Mexico

---

### Maintenance Procedure: Interval 5

**Fluid Loss** - Fluid loss control should be maintained with **White Starch**.

**Mud Weight** - Maintain minimum fluid densities. Run water and premixes as needed to maintain volume and weight as specified. Drilling with a minimum amount of overbalance will reduce the possibility of losing returns and/or of differentially sticking the drill string.

**Alkalinity** - Maintain pH in the 9.0-10.0 range with **Caustic**.

**Hole Cleaning** - Optimum hydraulics and rheological properties should be maintained to provide maximum hole cleaning and minimize washout of the well bore. Sweeping the hole with fresh water mud pills made of fresh water, **Dynazan** for a 80-90 sec/1000cc viscosity and 0.25 ppb of **Super Sweep** every 500' will provide additional hole cleaning.

**Mud Losses Down hole** - Loss of circulation is a possibility through this interval. Use **Fiber Plug** and **Fiber Seal**. Keep the hole full at all times, and avoid excessive swabbing and/or surge actions when tripping pipe. Bring pumps on the hole gradually anytime circulation has been interrupted, increasing pump strokes only after full returns are established.

**Solids Control** - Maintain low gravity solids at <6% by volume. Circulating the reserve will provide gravitational solids control. The shakers should be equipped with 150-200 mesh screens at displacement. An attempt to screen down to the finest mesh possible that will handle the volume being circulated.



# Newpark Drilling Fluids, LLC



**Corkran Energy, LP**

**Orleans 25 #1**

Section 25, T-18-S, R-26-E  
Eddy County, New Mexico

---

## ENGINEER / WAREHOUSE INFORMATION

**WELL NAME:** Orleans 25 #1

**LOCATION:** Section 25, T-18-S, R-26-E  
Eddy County, New Mexico

**MUD ENGINEER:** Lynn Pearson Carlsbad, New Mexico  
Bill Stewart Hobbs, New Mexico

(800) 592-4627 or (432) 697-8661. Both 24 hours.

**WAREHOUSE:** Artesia, New Mexico

Water Base Mud Plant Snyder, Texas

Oil Base Mud Plant Monahans, Texas

(800) 592-4627 or (432) 697-8661. Both 24 hours.



# Newpark Drilling Fluids, LLC



**Corkran Energy, LP**

**Orleans 25 #1**

Section 25, T-18-S,R-26-E

Eddy County, New Mexico

---

## **Lost Circulation Procedures**

**Seepage Losses** – Mud consumed at the rate of 2.0-2.5 barrels per barrel of hole drilled (18.5± bbls of mud per 100' of 8-1/2" hole drilled) can be expected. The 1.0-1.5 bbls lost per barrel of hole drilled is due to mud retained on cuttings and filtration losses down hole. Volumes in excess of 20 bbls per 100' of hole should be considered seepage losses and the following remedial action taken:

1. Discontinue drilling and circulate cuttings out of the hole at a reduced rate for 5 minutes. Pull one stand and stop pumps to see if the hole is standing full. Keep pipe moving while checking fluid level.
2. If the hole is standing full while static, the seepage losses may be from excessive cuttings, out of gauge hole or circulating pressure losses (ECD). Break circulation slowly and return to drilling, carefully monitoring mud consumption rates and static hole conditions on connections.
3. If the hole is taking fluid while static, prepare a 50-60 bbl pill of 45-50 viscosity mud with 10-20 ppb of Fiber-Plug and 10-20 ppb of Fiber-Seal, and spot near bottom. Pull five stands and check static level of fluid in the hole. Keep hole full at all times and monitor the mud loss rate.
4. If little or no improvement is noted after pumping the 50-60 barrel LCM pill, prepare a balanced, high-filtrate (50cc/30min@100psi) water based pill (40 bbls). This pill can be formulated with Dynazan or New Gel (flocculated with CaCl<sub>2</sub> or Lime) and Barite. Pull pipe above the suspected loss zone and spot the pill outside the drill pipe at 1 barrel per minute. Pull out of the pill, close the hydril and if a float collar is in the string, pump down the annulus until sufficient backpressure is established. Hold the maximum allowable backpressure (300-900 psi) for 2-4 hours, open the hydril and establish full circulation before going to bottom.



# Newpark Drilling Fluids, LLC



## Corkran Energy, LP

### Orleans 25 #1

Section 25, T-18-S,R-26-E  
Eddy County, New Mexico

---

#### **Severe Losses:**

1. Should complete returns be lost, stop the pumps and pull the pipe into the casing while pumping through the fill-up line to keep the hole full.
2. Allow the hole to remain static while filling with mud on the annulus side, monitoring the rate of mud loss.
3. Build 50-60 bbl pill of 45-50-viscosity mud with 10-20 ppb of Fiber-Plug and 10-20 ppb of Fiber-Seal, and spot near bottom. Pull five stands and check static level of fluid in the hole. Keep hole full at all times and monitor the mud loss rate. Should the hole stand full, allow 4-6 hours of healing time before staging back to bottom slowly and resuming drilling.
4. Should only partial returns be established, repeat the LCM pill once more. If complete loss of circulation persist, or if only partial returns can be established after the 2<sup>nd</sup> LCM pill, prepare a balanced, high-filtrate (50cc/30min@100psi) water based pill (40 bbls). Pull pipe above the suspected loss zone and spot the pill outside the drill pipe at 1 barrel per minute. Pull out of the pill, close the hydril and if a float collar is in the string, pump down the annulus until sufficient backpressure is established. Hold the maximum allowable backpressure (300-900 psi) for 2-4 hours, open the hydril and establish full circulation before going to bottom.
5. Should the LCM pills fail to establish returns, be prepared to squeeze cement into loss zone.

Loss of circulation is a possibility on any well. Although each well is different, there are some basic procedures and drilling practices that can aid in reducing the severity and in some, cases prevent lost circulation. Below is a list of several parameters, which may prove helpful.

1. Maintain viscosities as low as possible and still clean the hole.
2. Maintain mud weights as low as possible without jeopardizing safety.
3. Use slower tripping speeds to prevent swabbing and surging.
4. Break circulation in stages while tripping in the hole.
5. Rotate pipe while breaking circulation.



# Newpark Drilling Fluids, LLC



## Corkran Energy, LP

### Orleans 25 #1

Section 25, T-18-S,R-26-E  
Eddy County, New Mexico

---

## **Solids Control**

The most important contributing factor to good mud properties for this well, is a low native solids content. A good solids control plan can reduce over-all cost with increased penetration rates, lower cost on chemical additions and whole mud replacement.

The solids control equipment for this well should include:

- High Speed Linear Motion shale shaker with fine mesh screens.
- Desilter.

### **Shale Shaker**

Use a high-speed linear motion shale shaker with fine mesh screens. It is imperative to remove cuttings as quickly as possible before they have a chance to mechanically break up in the circulating system. Initial screen sizes should be 80-100 mesh. Screen down to smaller mesh screens as soon as practicable to reduce the amount of solids being dispersed into the fluid system.

### **Desilter**

Will be employed to remove solids in the 176 to 74 micron range. The desilter should have 6-8 hydro clones (six inch or larger) to work properly. A centrifugal pump should supply the feed line with a minimum of 35 psi on the desilter chamber.





# Newpark Drilling Fluids, LLC



## Corkran Energy, LP

### Orleans 25 #1

Section 25, T-18-S,R-26-E

Eddy County, New Mexico

---

## Hydraulics

While drilling the deep mature shales in the Permian Basin, it is important to maintain an API filtrate to prevent hydration of the clays contained in those shales. Equally important is to maintain a Laminar Hydraulic Profile in the annulus while drilling those shales. These shale exhibit a high degree of erosion when the annular profile is in turbulent flow.

The annular velocity in the well bore is a measure to control hole cleaning and to determine the annular hydraulic profile. Critical velocity is the point at which flow transitions from laminar to turbulent flow. Mud weight, Plastic Viscosity, Yield Point, Pump Rate, Hole Diameter and tool diameter all are factors in determining critical velocity.

If adjusting the pump rate will affect the bit nozzle optimization, then the rheology can be adjusted to bring the annular profile into laminar flow.

$$\tau_c = \frac{1.08 PV + 1.08 \sqrt{PV^2 + 9.26(dh-dp)^2} YP M}{M (dh-dp)}$$

PV = Plastic Viscosity

YP = Yield Point

M = Mud Weight (ppg)

Dh = Diameter of hole (inches)

Dp = Diameter of pipe (inches)

$\tau_c$  = Critical Velocity in feet per second.



# Newpark Drilling Fluids, LLC



## Corkran Energy, LP

### Orleans 25 #1

Section 25, T-18-S,R-26-E

Eddy County, New Mexico

---

### Filtration Control & Filter Cake Quality:

Sealing permeable zones in the well bore has long been accepted as a major function of a drilling fluid. The cost of the filtration control represents a major portion of the mud cost. Traditionally, most of this cost has resulted from controlling the filtration rate as opposed to controlling the filter cake quality. This is understandable since a definitive number is more a comfortable target than a subjective evaluation of a filter cake.

The primary objectives of filtration are:

- Minimize damage to the production zones.
- Optimize formation evaluation.
- Avoid differential pressure sticking of the pipe.
- Avoid under gauged holes due to thick filter cakes.

These objectives are achieved by focusing on important design factors:

- Compatibility of filtrate with formation solids.
- Thin, impermeable, and deformable filter cakes.
- Lubricious and shearable filter cakes.

### **Filtration Control Mechanisms:**

There are four basic mechanisms for controlling filtration control and reducing the filter cake permeability. Understanding these mechanisms along with how filtration control products function is important.

1. **Bridging-** Bridging reduces filtration rates and permeability by plugging or blocking the pore spaces at the face of the filter medium. It generally requires solids about one-third the diameter of the pore space to form a bridge. New Gel, Calcium Carbonate, Lost Circulation Materials, Starch, and Soltex (LST-MD) are primary bridging materials.
2. **Bonding-** Bonding is the connecting or binding of solids together. New Pac, Dynazan, WL-100 and other high molecular weight polymers function as bonding materials. Secondly, these materials function as bridging materials as well as increasing the viscosity of the filtrate.
3. **Deflocculation-** Deflocculants reduce the electro-chemical attraction between solids. This allows solids to be filtered individually, as opposed to flocs, and also reduces the void spaces in the cake created by flocs of solids. Lignite, Chrome Ligno-Sulphonates, Desco, and other low molecular weight polymers perform as deflocculants.
4. **Viscosity-** Fluid loss decreases proportional to the increase in viscosity of the filtrate. Temperature alone will change the filtrate viscosity. Therefore, filtration control is more difficult at high temperatures. Any soluble material added to the fluid will viscosify the filtrate.



# Newpark Drilling Fluids, LLC



## Corkran Energy, LP

### Orleans 25 #1

Section 25, T-18-S,R-26-E  
Eddy County, New Mexico

---

#### **Hydration, Flocculation, and Deflocculation**

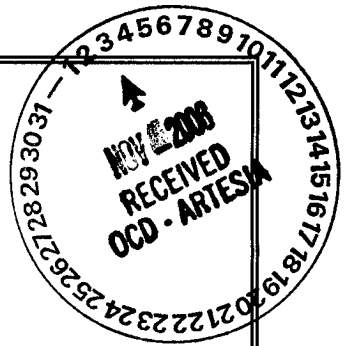
The degree of hydration and flocculation of the filtered solids influence filter cake permeability. The effectiveness in permeability reduction may be demonstrated by ranking of clay solids according to their surface characteristics:

1. Dehydration/Aggregated/Flocculated (high permeability)
2. Hydrated/Flocculated (medium permeability)
3. Hydrated/Deflocculated (low permeability)

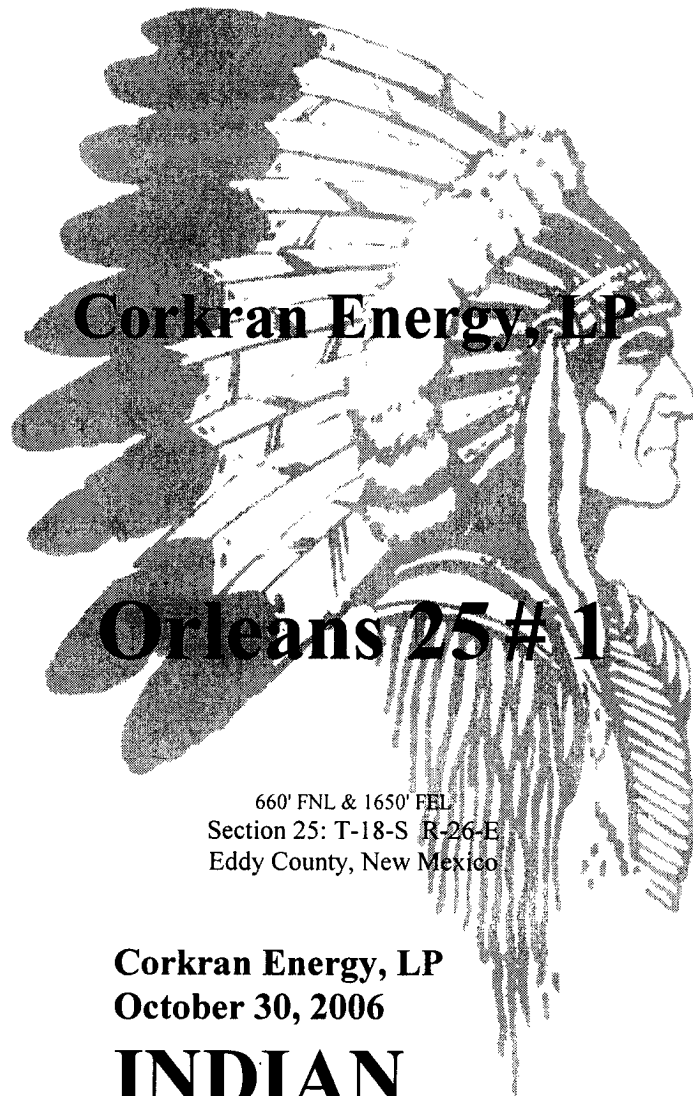
Since fluid loss and filter cake quality are important design factors, it is important to understand the predominate electro-chemical state of the solids. Initially, cake permeability is reduced as pre-hydrated bentonite is added to the system. When flocculated, these hydrated solids promote deformability or permeability reduction with increased pressure. This results from the compaction of hydrated flocs. With deflocculation, permeability is further decreased, as the void spaces created by the flocs diminish.

During drilling operations, hydrated solids are eventually dehydrated as the solids content increases and/or the system is converted to an inhibitive fluid. At this point, a decision must be made on the basis of economic and operational objectives. More pre-hydrated bentonite and/or other products may be added. These other products include New Pac, Calcium Carbonate, CMC, starch, or one of the new generation polymers.

Fluid loss control is a very complex process. The major factors that affect the process include time, pressure, temperature, filtrate viscosity, solids hydration, flocculation and filter cake erodability. Effective evaluation of the process requires that all factors be given strong consideration. Testing the fluids relative to the various factors is necessary to understand how a fluid may perform under down-hole conditions.



## ***CONTINGENCY PLAN***



660' FNL & 1650' FFL  
Section 25: T-18-S R-26-E  
Eddy County, New Mexico

**Prepared For:**  
**Date Prepared:**

**Corkran Energy, LP**  
**October 30, 2006**

**Prepared By:**

**INDIAN**  
**Fire & Safety, Inc.**

# TABLE OF CONTENTS

## H2S CONTINGENCY PLAN

- 1. SCOPE..... 1
- 2. OBJECTIVE..... 1
- 3. DISCUSSION OF PLAN..... 2

## EMERGENCY PROCEDURES

- 1. EMERGENCY REACTION STEPS..... 3-5

## IGNITION PROCEDURES

- 1. RESPONSIBILITY..... 6
- 2. INSTRUCTIONS FOR IGNITING THE WELL..... 7

## TRAINING PROGRAM

- 1. TRAINING REQUIREMENTS..... 8

## EMERGENCY EQUIPMENT REQUIREMENTS..... 9-11

## CHECK LISTS

- 1. STATUS CHECK LIST..... 12
- 2. PROCEDURAL CHECK LIST..... 13

## EVACUATION PLAN..... 14

- 1. EMERGENCY ACTIONS..... 15
- 2. PHONE LIST – GOVERNMENT AGENCIES..... 16
- 3. PHONE LIST – COMPANY CONTACTS..... 16 a-b

## MAPS & PLATS

- 1. MAP OF WELLSITE & PUBLIC WITHIN  
RADIUS OF EXPOSURE..... 17

## GENERAL INFORMATION

- 1. 100 PPM RADIUS CHART..... 18
- 2. 500 PPM RADIUS CHART..... 19
- 3. TOXIC EFFECTS OF HYDROGEN SULFIDE POISONING.... 20-21
- 4. USE OF SELF-CONTAINED BREATHING EQUIPMENT..... 22-23
- 5. RESCUE – FIRST AID FOR H2S POISONING..... 24

## HYDROGEN SULFIDE CONTINGENCY PLAN

### SCOPE

THIS CONTINGENCY PLAN ESTABLISHES GUIDELINES FOR THE PUBLIC, ALL COMPANY EMPLOYEES WHO'S WORK ACTIVITIES MAY INVOLVE EXPOSURE TO HYDROGEN SULFIDE (H<sub>2</sub>S) GAS.

### OBJECTIVE

1. PREVENT ANY AND ALL ACCIDENTS, AND PREVENT THE UNCONTROLLED RELEASE OF HYDROGEN SULFIDE INTO THE ATMOSPHERE.
2. PROVIDE PROPER EVACUATION PROCEDURES TO COPE WITH EMERGENCIES.
3. PROVIDE IMMEDIATE AND ADEQUATE MEDICAL ATTENTION SHOULD AN INJURY OCCUR.

## H2S CONTINGENCY PLAN

### DISCUSSION

#### GEOLOGICAL PROGNOSIS

#### IMPLEMENTATION:

THIS PLAN WITH ALL DETAILS IS TO BE FULLY IMPLEMENTED BEFORE DRILLING TO PRODUCTION CASING POINT.

#### 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 TO PRODUCTION CASING POINT.

#### 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 THE DRILLING OF THIS WELL.

#### 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.

## H2S CONTINGENCY PLAN

### EMERGENCY PROCEDURES

- A. IN THE EVENT OF ANY EVIDENCE OF H2S LEVEL ABOVE 10 PPM, TAKE THE FOLLOWING STEPS:
  - 1. SECURE BREATHING EQUIPMENT.
  - 2. ORDER NON-ESSENTIAL PERSONNEL OUT OF DANGER ZONE.
  - 3. TAKE STEPS TO DETERMINE IF THE H2S LEVEL CAN BE CORRECTED OR SUPPRESSED AND, IF SO, PROCEED IN NORMAL OPERATION.
- 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 THE BUREAU OF LAND MANAGEMENT OF THE SITUATION.
  - 2. REMOVE ALL PERSONNEL TO SAFE BREATHING AREA.
  - 3. NOTIFY PUBLIC SAFETY PERSONNEL TO SAFE BREATHING AREA.
  - 4. 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.



## **EMERGENCY PROCEDURES**

\*(Procedures are the same for both Drilling and Tripping)

- |                   |   |
|-------------------|---|
| ALL PERSONNEL:    | <ol style="list-style-type: none"><li>1. ON ALARM, DON ESCAPE UNIT AND REPORT IN UP WIND BRIEFING AREA.</li><li>2. CHECK STATUS OF PERSONNEL (BUDDY SYSTEM).</li><li>3. SECURE BREATHING EQUIPMENT.</li><li>4. AWAIT ORDERS FROM SUPERVISOR.</li></ol>  |
| DRILLING FOREMAN: | <ol style="list-style-type: none"><li>1. REPORT TO UP WIND BRIEFING AREA.</li><li>2. DON BREATHING EQUIPMENT AND RETURN TO POINT OF RELEASE WITH TOOL PUSHER OR DRILLER (BUDDY SYSTEM).</li><li>3. DETERMINE H<sub>2</sub>S CONCENTRATIONS.</li><li>4. ASSESS SITUATION AND TAKE CONTROL MEASURES.</li></ol>  |
| TOOL PUSHER:      | <ol style="list-style-type: none"><li>1. REPORT TO UP WIND BRIEFING AREA.</li><li>2. DON BREATHING EQUIPMENT AND RETURN TO POINT OF RELEASE WITH DRILLING FOREMAN OR DRILLER (BUDDY SYSTEM).</li><li>3. DETERMINE H<sub>2</sub>S CONCENTRATION.</li><li>4. ASSESS SITUATION AND TAKE CONTROL MEASURES.</li></ol>  |
| DRILLER:          | <ol style="list-style-type: none"><li>1. DON ESCAPE UNIT.</li><li>2. CHECK MONITOR FOR POINT OF RELEASE.</li><li>3. REPORT TO BRIEFING AREA.</li><li>4. CHECK STATUS OF PERSONNEL (IN AN ATTEMPT TO RESCUE, USE THE BUDDY SYSTEM).</li><li>5. ASSIGNS LEAST ESSENTIAL PERSON TO NOTIFY DRILLING FOREMAN AND TOOL PUSHER BY QUICKEST MEANS IN CASE OF THEIR ABSENCE.</li><li>6. ASSUMES THE RESPONSIBILITIES OF THE DRILLING FORMAN AND TOOL PUSHER UNTIL THEY ARRIVE SHOULD THEY BE ABSENT.</li></ol> |

## **EMERGENCY PROCEDURES**

DERRICK MAN  
FLOOR MAN #1  
FLOOR MAN #2

1. WILL REMAIN IN BRIEFING AREA UNTIL INSTRUCTED BY SUPERVISOR.

MUD ENGINEER:

1. REPORT TO BRIEFING AREA.
2. WHEN INSTRUCTED, BEGIN CHECK OF MUD FOR PH AND H<sub>2</sub>S LEVEL. (GARETT GAS TRAIN.)

SAFETY PERSONNEL:

1. MASK UP AND CHECK STATUS OF ALL PERSONNEL AND SECURE OPERATIONS AS INSTRUCTED BY DRILLING FOREMAN AND REPORT TO BRIEFING AREA.

## **TAKING A KICK**

WHEN TAKING A KICK DURING AN H<sub>2</sub>S EMERGENCY, ALL PERSONNEL WILL FOLLOW STANDARD BOP PROCEDURES AFTER REPORTING TO BRIEFING AREA AND MASKING UP.

## **OPEN-HOLE LOGGING**

ALL UNNECESSARY PERSONNEL OFF FLOOR. DRILLING FOREMAN AND SAFETY PERSONNEL SHOULD MONITOR CONDITION, ADVISE STATUS AND DETERMINE NEED FOR USE OF AID EQUIPMENT.

## **RUNNING CASING OR PLUGGING**

FOLLOWING THE SAME "TRIPPING" PROCEDURE AS ABOVE. DRILLING FOREMAN AND SAFETY PERSONNEL SHOULD DETERMINE IF ALL PERSONNEL HAVE ACCESS TO PROTECTIVE EQUIPMENT.

## H2S CONTINGENCY PLAN

### IGNITION PROCEDURES

THE DECISION TO IGNITE THE WELL IS THE RESPONSIBILITY OF COMPANY FOREMAN. IN THE EVENT HE IS INCAPACITATED, IT BECOMES THE RESPONSIBILITY OF THE CONTRACT RIG TOOL PUSHER. 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.

NOTIFY THE DISTRICT OFFICE IF TIME PERMITS, BUT DO NOT DELAY IF HUMAN LIFE IS IN DANGER.

INITIATE FIRST PHASE OF EVACUATION PLAN.

## IGNITION PROCEDURES

### INSTRUCTIONS FOR IGNITING THE WELL

1. TWO PEOPLE ARE REQUIRED FOR THE ACTUAL IGNITING OPERATION. THEY MUST WEAR SELF-CONTAINED BREATHING UNITS AND HAVE SAFETY ROPE ATTACHED. ONE MAN (TOOL PUSHER OR SAFETY ENGINEER) WILL CHECK THE ATMOSPHERE FOR EXPLOSIVE GASES WITH THE EXPLOSIMETER. THE OTHER MAN (DRILLING FOREMAN) IS RESPONSIBLE FOR IGNITING THE WELL.
2. PRIMARY METHOD TO IGNITE: 25 MM FLARE GUN WITH RANGE OF APPROXIMATELY 500 FEET.
3. IGNITE UP WIND 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 LIMIT THEIR ACTIONS TO THOSE DIRECTED BY THE DRILLING FOREMAN.

**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.

## H2S CONTINGENCY PLAN

### TRAINING REQUIREMENTS

WHEN WORKING IN AN AREA WHERE HYDROGEN SULFIDE GAS (H<sub>2</sub>S) MIGHT BE ENCOUNTERED, DEFINITE TRAINING REQUIREMENTS MUST BE CARRIED OUT. ALL COMPANIES WILL INSURE THAT ALL PERSONNEL AT THE WELL SITE WILL HAVE HAD ADEQUATE TRAINING IN THE FOLLOWING:

1. HAZARDS AND CHARACTERISTICS OF H<sub>2</sub>S.
2. PHYSICAL EFFECTS OF HYDROGEN SULFIDE ON THE HUMAN BODY.
3. TOXICITY OF HYDROGEN SULFIDE AND SULFUR DIOXIDE.
4. H<sub>2</sub>S DETECTION.
5. EMERGENCY RESCUE.
6. RESUSCITATORS.
7. FIRST AID AND ARTIFICIAL RESPIRATION.
8. EFFECTS OF H<sub>2</sub>S ON METALS.
9. LOCATION SAFETY.

### 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.

## H2S CONTINGENCY PLAN

### EMERGENCY EQUIPMENT REQUIREMENTS

#### 1. SIGNS

- A. ONE SIGN LOCATED AT LOCATION ENTRANCE WITH THE FOLLOWING LANGUAGE:

**(LEASE)**  
**CAUTION – POTENTIAL POISON GAS**  
**HYDROGEN SULFIDE**  
**NO ADMITTANCE WITHOUT AUTHORIZATION**

#### 2. 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.

#### 3. HYDROGEN SULFIDE DETECTOR AND ALARMS

- A. H2S MONITORS 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 RED LIGHT, AND TO ALARM AT 15 PPM WITH RED LIGHT AND AUDIBLE ALARM.
- B. HAND OPERATED DETECTORS WITH TUBES.
- C. H2S MONITOR TESTER.

#### 4. CONDITION FLAGS

- A. ONE EACH OF ORANGE, YELLOW, AND RED CONDITION FLAGS TO BE DISPLAYED TO DENOTE CONDITIONS.

**ORANGE – NORMAL CONDITIONS**

**YELLOW – POTENTIAL DANGER**

**RED – DANGER, H2S PRESENT**

- B. CONDITION FLAG SHALL BE POSTED AT LOCATION SIGN ENTRANCE.

## H2S CONTINGENCY PLAN

### EMERGENCY EQUIPMENT REQUIREMENTS

#### 5. AUXILIARY RESCUE EQUIPMENT

- A. STRETCHER
- B. 100' LENGTH OF 5/8" NYLON ROPE.

#### 6. MUD INSPECTION DEVICES

GARRETT GAS TRAIN OR HACH TESTER FOR INSPECTION OF SULFIDE CONCENTRATION IN MUD SYSTEM.

#### 7. FIRE EXTINGUISHER

ADEQUATE FIRE EXTINGUISHERS SHALL BE LOCATED AT STRATEGIC LOCATIONS.

#### 8. BLOW OUT PREVENTION EQUIPMENT

THE WELL SHALL HAVE HYDRAULIC BOP EQUIPMENT FOR THE ANTICIPATED BHP OF 1500 PSI. EQUIPMENT IS TO BE TESTED ON INSTALLATION.

#### 9. COMBUSTIBLE GAS DETECTOR

THERE SHALL BE ONE COMBUSTIBLE GAS DETECTOR ON LOCATION AT ALL TIMES.

#### 10. BOP TESTING

BOP AND CHOKE LINE AND KILL LINE WILL BE TESTED.

#### 11. AUDIO SYSTEM

RADIO COMMUNICATION WILL BE AVAILABLE AT THE RIG.

- A. RIG FLOOR OR TRAILER
- B. VEHICLE

#### 12. SPECIAL CONTROL EQUIPMENT

- A. HYDRAULIC BOP EQUIPMENT WITH REMOTE CONTROL ON GROUND.
- B. ROTATING HEAD

## H2S CONTINGENCY PLAN

### EMERGENCY EQUIPMENT REQUIREMENTS

#### 13. EVACUATION PLAN

EVACUATION ROUTES SHOULD BE ESTABLISHED PRIOR TO SPUDDING EACH WELL AND DISCUSSED WITH ALL RIG PERSONNEL.

#### 14. DESIGNATED AREA

- A. PARKING AND VISITOR AREA: ALL VEHICLES ARE TO BE PARKED AT A PREDETERMINED SAFE DISTANCE FROM THE WELLHEAD. THIS WILL BE THE DESIGNATED SMOKING AREA.
- B. 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.
- C. PROTECTION CENTERS OR IF A MOVABLE TRAILER IS USED, IT SHOULD BE DEPT UPWIND OF EXISTING WINDS. WHEN WIND IS FROM THE PREVAILING DIRECTIONS, BOTH PROTECTION CENTERS SHOULD BE ACCESSIBLE.



## H2S CONTINGENCY PLAN

### STATUS CHECK LIST

NOTE: ALL ITEMS ON THIS LIST MUST BE COMPLETED BEFORE DRILLING TO PRODUCTION CASING POINT .

1. SIGN AT LOCATION ENTRANCE.
2. TWO (2) WIND SOCKS LOCATED AS REQUIRED.
3. TWO (2) 30-MINUTE PRESSURE DEMAND AIR PACKS ON LOCATION FOR ALL RIG PERSONNEL AND MUD LOGGERS.
4. AIR PACK INSPECTED FOR READY USE.
5. CASCADE SYSTEM AND HOSE LINE HOOK-UP.
6. CASCADE SYSTEM FOR REFILLING AIR BOTTLES.
7. SAFE BREATHING AREAS SET UP.
8. CONDITION FLAG ON LOCATION AND READY FOR USE.
9. H2S DETECTION SYSTEM HOOKED UP.
10. H2S ALARM SYSTEM HOOKED UP AND READY.
11. OXYGEN RESUSCITATOR ON LOCATION AND TESTED FOR USE.
12. STRETCHER ON LOCATION AT SAFETY TRAILER.
13. 1 – 100' LENGTH OF NYLON ROPE ON LOCATION.
14. ALL RIG CREW AND SUPERVISORS TRAINED AS REQUIRED.
15. ALL OUTSIDE SERVICE CONTRACTORS ADVISED OF POTENTIAL H2S HAZARD ON WELL.
16. NO SMOKING SIGN POSTED.
17. HAND OPERATED H2S DETECTOR WITH TUBES ON LOCATION.

CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

## H2S CONTINGENCY PLAN

### PROCEDURAL CHECK LIST

#### **PERFORM EACH TOUR:**

1. CHECK FIRE EXTINGUISHERS TO SEE THAT THEY HAVE THE PROPER CHARGE.
2. CHECK BREATHING EQUIPMENT TO ENSURE THAT IT HAS NOT BEEN TAMPERED WITH.
3. MAKE SURE ALL THE H2S DETECTION SYSTEM IS OPERATIVE.

#### **PERFORM EACH WEEK:**

1. CHECK EACH PIECE OF BREATHING EQUIPMENT TO MAKE SURE THAT DEMAND 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.
2. BLOW OUT PREVENTER SKILLS.
3. CHECK SUPPLY PRESSURE ON BOP ACCUMULATOR STAND BY SOURCE.
4. CHECK ALL SKA-PAC UNITS FOR OPERATION: DEMAND REGULATOR, ESCAPE BOTTLE AIR VOLUMES, SUPPLY BOTTLE OF AIR VOLUME.
5. CHECK BREATHING EQUIPMENT MASK ASSEMBLY TO SEE THAT STRAPS ARE LOOSENEED AND TURNED BACK, READY TO PUT ON.
6. CHECK PRESSURE ON BREATHING EQUIPMENT AIR BOTTLES TO MAKE SURE THEY ARE CHARGED TO FULL VOLUME.
7. CONFIRM PRESSURE ON ALL SUPPLY AIR BOTTLES.
8. PERFORM BREATHING EQUIPMENT DRILLS WITH ON-SITE PERSONNEL.
9. CHECK THE FOLLOWING SUPPLIES FOR AVAILABILITY.
  - A. EMERGENCY TELEPHONE LIST.
  - B. HAND OPERATED H2S DETECTORS AND TUBES.

## H2S CONTINGENCY PLAN

### GENERAL EVACUATION PLAN

THE DIRECT LINES OF ACTION PREPARED BY INDIAN FIRE & SAFETY, INC. TO PROTECT THE PUBLIC FROM HAZARDOUS GAS SITUATIONS ARE AS FOLLOWS:

1. WHEN THE COMPANY APPROVED SUPERVISOR (DRILLING FOREMAN, 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. ESCAPE ROUTES ARE NOTED ON AREA MAP.
2. "COMPANY MAN" OR DESIGNEE WILL NOTIFY LOCAL GOVERNMENT AGENCY THAT A HAZARDOUS CONDITION EXISTS AND EVACUATION NEEDS TO BE IMPLEMENTED.
3. COMPANY 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.

**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.**

5. AFTER THE DISCHARGE OF GAS HAS BEEN CONTROLLED, COMPANY SAFETY PERSONNEL WILL DETERMINE WHEN THE AREA IS SAFE FOR RE-ENTRY.

## H2S CONTINGENCY PLAN

### EMERGENCY ACTIONS

#### WELL BLOWOUT – IF EMERGENCY

1. EVACUATE ALL PERSONNEL IF POSSIBLE.
2. IF SOUR GAS – EVACUATE RIG PERSONNEL.
3. IF SOUR GAS – EVACUATE PUBLIC WITHIN 3000 FT RADIUS OF EXPOSURE.
4. DON SCBA AND RESCUE.
5. CALL 911 FOR EMERGENCY HELP (FIRE DEPT AND AMBULANCE) AND NOTIFY SR. DRILLING FOREMAN AND DISTRICT FOREMAN.
6. GIVE FIRST AID.

#### PERSON DOWN LOCATION/FACILITY

1. IF IMMEDIATELY POSSIBLE, CONTACT 911. GIVE LOCATION AND WAIT FOR CONFIRMATION.
2. DON SCBA AND RESCUE.

## EMERGENCY PHONE LIST

### GOVERNMENTAL AGENCIES

Eddy County Sheriff's Office 911

Non emergency ..... 505-746-9888

Fire Departments 911

Artesia - Non-emergency ..... 505-746-5050

Atoka - Non-emergency..... 505-746-5050

Carlsbad - Non-emergency..... 505-885-2111

BLM

Carlsbad ..... 505-361-2822

State Police Department 911

Non-emergency ..... 505-437-1313

City of Carlsbad

..... 505-885-2111

Ambulance 911

Artesia - Non Emergency..... 505-746-5050

Atoka - Non-Emergency..... 505-746-5050

Carlsbad - Non Emergency..... 505-885-2111

Hospitals

Artesia ..... 505-748-3333

AEROCARE ..... 806-747-8923

## **Emergency Contact List**

**Corkran Energy, LP**  
512-329-6140

Bob Demet  
432-685-1960

### **R.K. Ford & Associates**

Randy Ford:  
Home: 432-570-7216  
Cell: 432-559-2222  
Alt. Cell: 432-559-3351  
Office: 432-682-0440

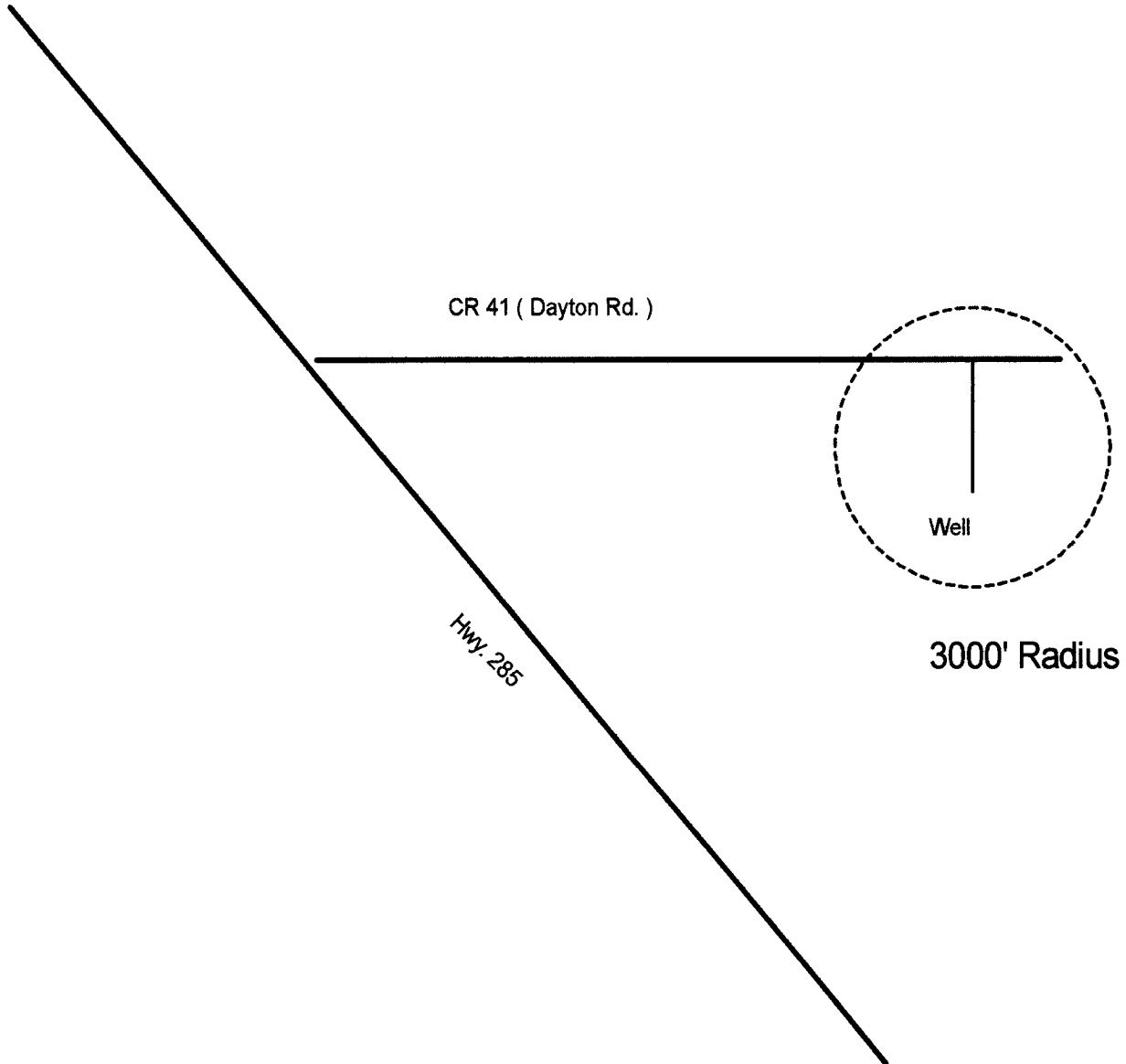
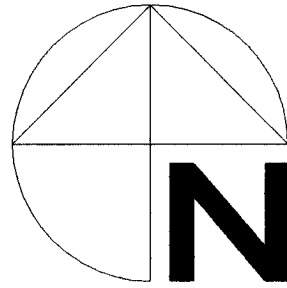
Court Adkins:  
Home: 432-687-3002  
Cell: 432-664-1070  
Office: 432-682-0440

**Indian Fire & Safety, Inc.**  
**3317 W. County Road**  
**505-393-3093 - office**  
**800-530-8693 – toll free**  
**505-392-6274 – fax**

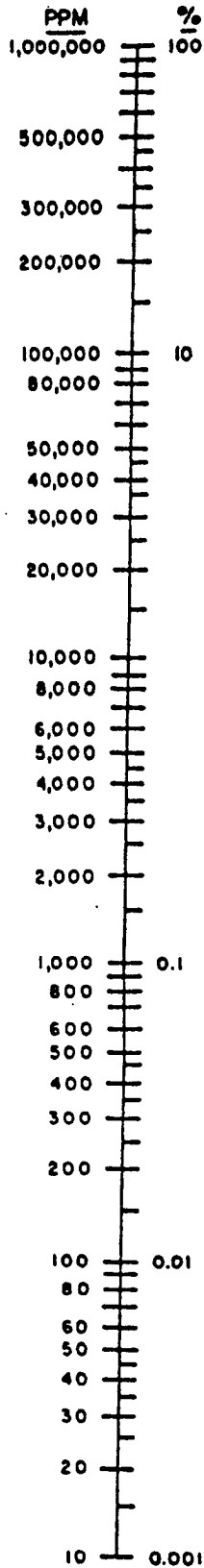
**Personnel Contact List**

	<b>Cell Phone</b>	<b>Home Phone</b>
Lanny Taylor	631-9755	392-6161
James Spurgeon	390-8582	492-9354
Scott Dudenhoeffer	631-9753	392-4833
Steve Henry	631-9704	393-8688
Sam Abney	631-9712	393-5427
Curtis Newton	631-1255	393-3762
Chris Spurgeon	806-215-1087	806-592-0079

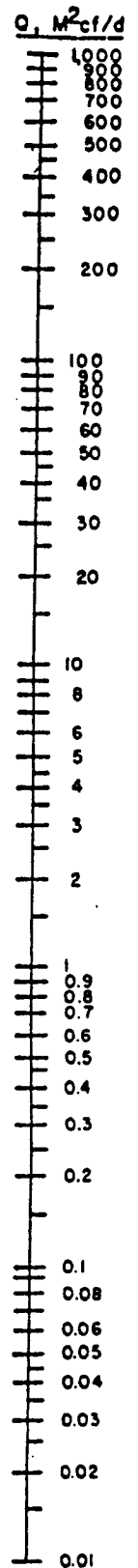
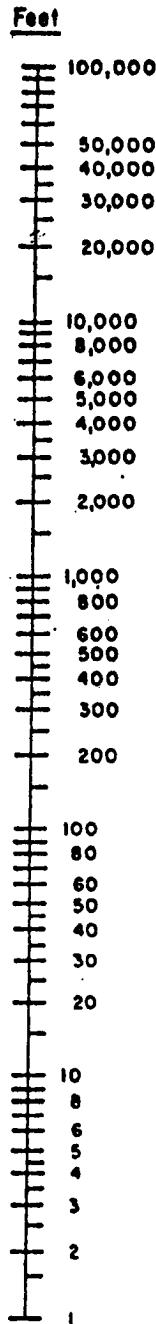
CORKRAN ENERGY, LP  
Orleans 25 State # 1  
Sec. 25, T-18-S, R-26-E  
Eddy County, NM







# HYDROGEN SULFIDE 100 PPM EXPOSURE RADIUS



At X = 3000 Ft.  
Q = 226,547 PPM

At X = 50 Ft.  
Q = 326.4 PPM

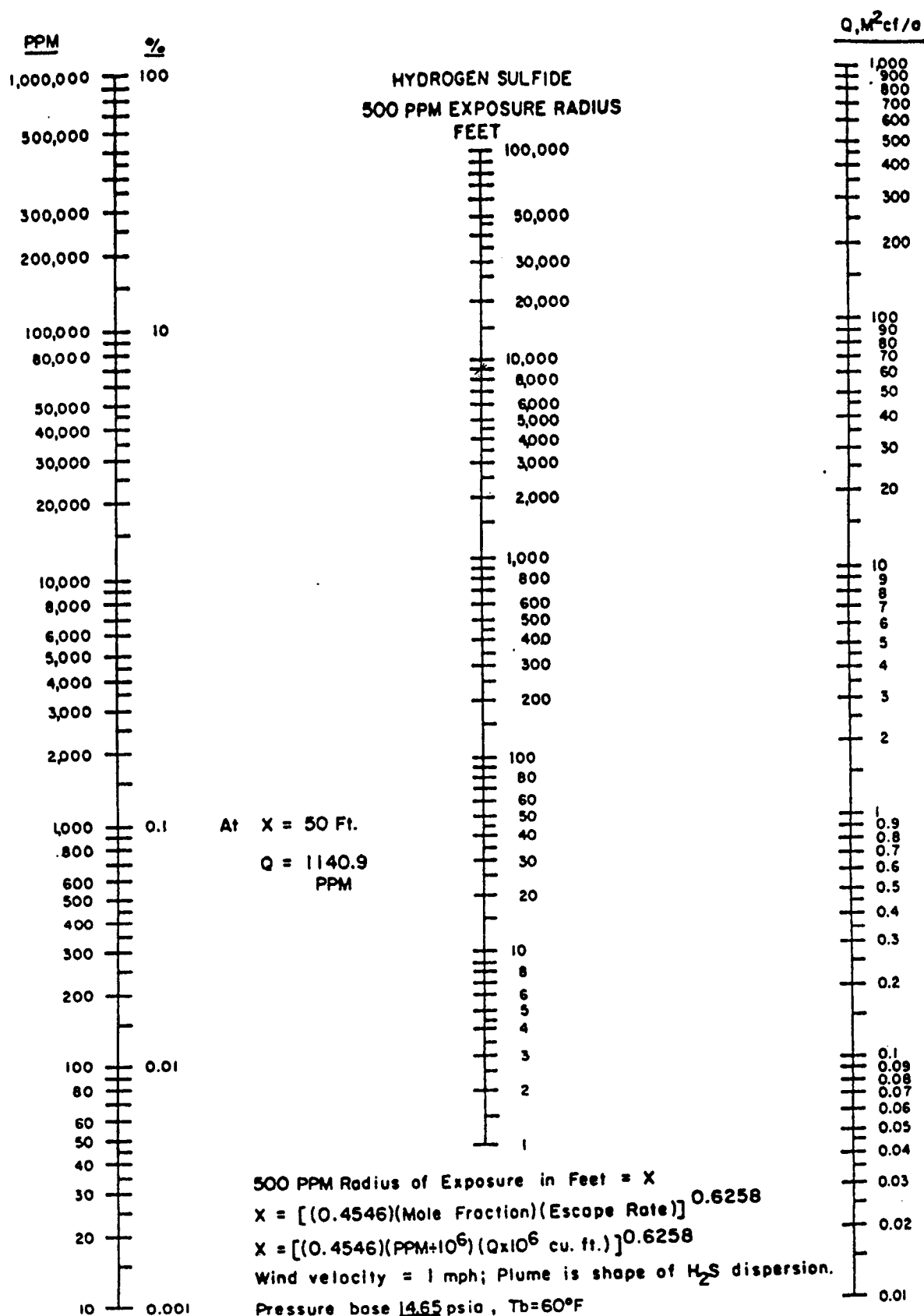
Below 100 PPM  
Rule 36 N.A.

$$100 \text{ PPM Radius of Exposure in Feet} = X$$

$$X = [(1.589)(\text{Mole Fraction})(\text{Escape Rate})]^{0.6258}$$

$$= [(1.589)(\text{PPM})(Q \text{ in } M^2\text{cf/d})]^{0.6258}$$

P<sub>b</sub> 14.65 psia T 60 °F



## H2S CONTINGENCY PLAN

### 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	H2S	1.18	10 PPM	250 PPM/HR	600 PPM
SULFUR DIOXIDE	SO2	2.21	5 PPM	-	1000 PPM
CHLORINE	CL2	2.45	1 PPM	4 PPM/HR	1000 PPM
CARBON MONOXIDE	CO	0.97	50 PPM	400 PPM/HR	1000 PPM
CARBON DIOXIDE	CO2	1.52	5000 PPM	5%	10%
METHANE	CH4	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.

## H2S CONTINGENCY PLAN

### TOXIC EFFECTS OF HYDROGEN SULFIDE

TABLE II  
PHYSICAL EFFECTS OF HYDROGEN SULFIDE

<u>PERCENT (%)</u>	<u>PPM</u>	<u>CONCENTRATION</u>	<u>PHYSICAL EFFECTS</u>
		<u>GRAINS</u> <u>100 STD. FT3*</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.

## H2S CONTINGENCY PLAN

### USE OF SELF-CONTAINED BREATHING EQUIPMENT

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 FOR THE FOLLOWING PERMANENT RECORDS KEPT OF THESE INSPECTIONS.
    1. FULLY CHARGED CYLINDERS.
    2. REGULATOR AND WARNING DEVICE OPERATION.
    3. CONDITION OF FACE PIECE AND CONNECTIONS.
    4. ELASTOMER OR RUBBER PARTS SHALL BE STRETCHED OR MASSAGED 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.

## H2S CONTINGENCY PLAN

### USE OF SELF-CONTAINED BREATHING EQUIPMENT

5. PERSONS ASSIGNED TASKS THAT REQUIRES USE OF SELF-CONTAINED BREATHING EQUIPMENT SHALL BE CERTIFIED PHYSICALLY FIT FOR BREATHING EQUIPMENT USAGE BY THE LOCAL COMPANY PHYSICIAN 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 H2S.
  - B. WHEN BREAKING OUT ANY LINE WHERE H2S CAN REASONABLY BE EXPECTED.
  - C. WHEN SAMPLING AIR IN AREAS TO DETERMINE IF TOXIC CONCENTRATIONS OF H2S EXISTS.
  - D. WHEN WORKING IN AREAS WHERE OVER 10 PPM H2S HAS BEEN DETECTED.
  - E. AT ANY TIME THERE IS A DOUBT AS TO THE H2S LEVEL IN THE AREA TO BE ENTERED.

## H2S CONTINGENCY PLAN

### RESCUE FIRST AID FOR H2S POISONING

#### DO NOT PANIC!

REMAIN CALM – THINK!

1. HOLD YOUR BREATH. (DO NOT INHALE FIRST; STOP BREATHING.)
2. PUT ON BREATHING APPARATUS.
3. REMOVE VICTIM(S) TO FRESH AIR AS QUICKLY AS POSSIBLE. (GO UP-WIND FROM SOURCE OR AT RIGHT ANGLE TO THE WIND. NOT DOWN WIND.)
4. 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.
5. PROVIDE FOR PROMPT TRANSPORTATION TO THE HOSPITAL, AND CONTINUE GIVING ARTIFICIAL RESPIRATION IF NEEDED.
6. HOSPITAL(S) OR MEDICAL FACILITIES NEED TO BE INFORMED, BEFORE-HAND, OF THE POSSIBILITY OF H2S GAS POISONING – NO MATTER HOW REMOTE THE POSSIBILITY IS.
7. NOTIFY EMERGENCY ROOM PERSONNEL THAT THE VICTIM(S) HAS BEEN EXPOSED TO H2S GAS.

BESIDES BASIC FIRST AID, EVERYONE ON LOCATION SHOULD HAVE A GOOD WORKING KNOWLEDGE OF ARTIFICIAL RESPIRATION, AS WELL AS FIRST AID FOR EYES AND SKIN CONTACT WITH LIQUID H2S. EVERYONE NEEDS TO MASTER THESE NECESSARY SKILLS.

## DISTRICT I

1000 N. FRANKLIN DR., SANTA FE, NM 87505

## State of New Mexico

County, Minerals and Natural Resources Department

## DISTRICT II

1000 N. FRANKLIN DR., SANTA FE, NM 87505

## OIL CONSERVATION DIVISION

1220 SOUTH ST. FRANCIS DR.

Santa Fe, New Mexico 87505

Form C-104

Revised October 12, 2005

Submit to Appropriate District Office

Plate Lease - 6 Copies

Fee Lease - 3 Copies

## DISTRICT III

1000 N. FRANKLIN DR., SANTA FE, NM 87505

## DISTRICT IV

1000 N. FRANKLIN DR., SANTA FE, NM 87505

## WELL LOCATION AND ACREAGE DEDICATION PLAT

☐ AMENDED REPORT

API Number	Pool Code	Pool Name
Property Code	Property Name <b>ORLEANS 25</b>	Well Number <b>1</b>
GROUP No.	Operator Name <b>CORKRAN ENERGY, LP</b>	Elevation <b>3281'</b>

## Surface Location

UL or Lot No.	Section	Township	Range	Lat. Mm	Feet from the	North/South Line	Feet from the	East/West Line	County
<b>B</b>	<b>25</b>	<b>18-S</b>	<b>26-E</b>		<b>660</b>	<b>NORTH</b>	<b>1650</b>	<b>EAST</b>	<b>EDDY</b>

## Bottom Hole Location If Different From Surface

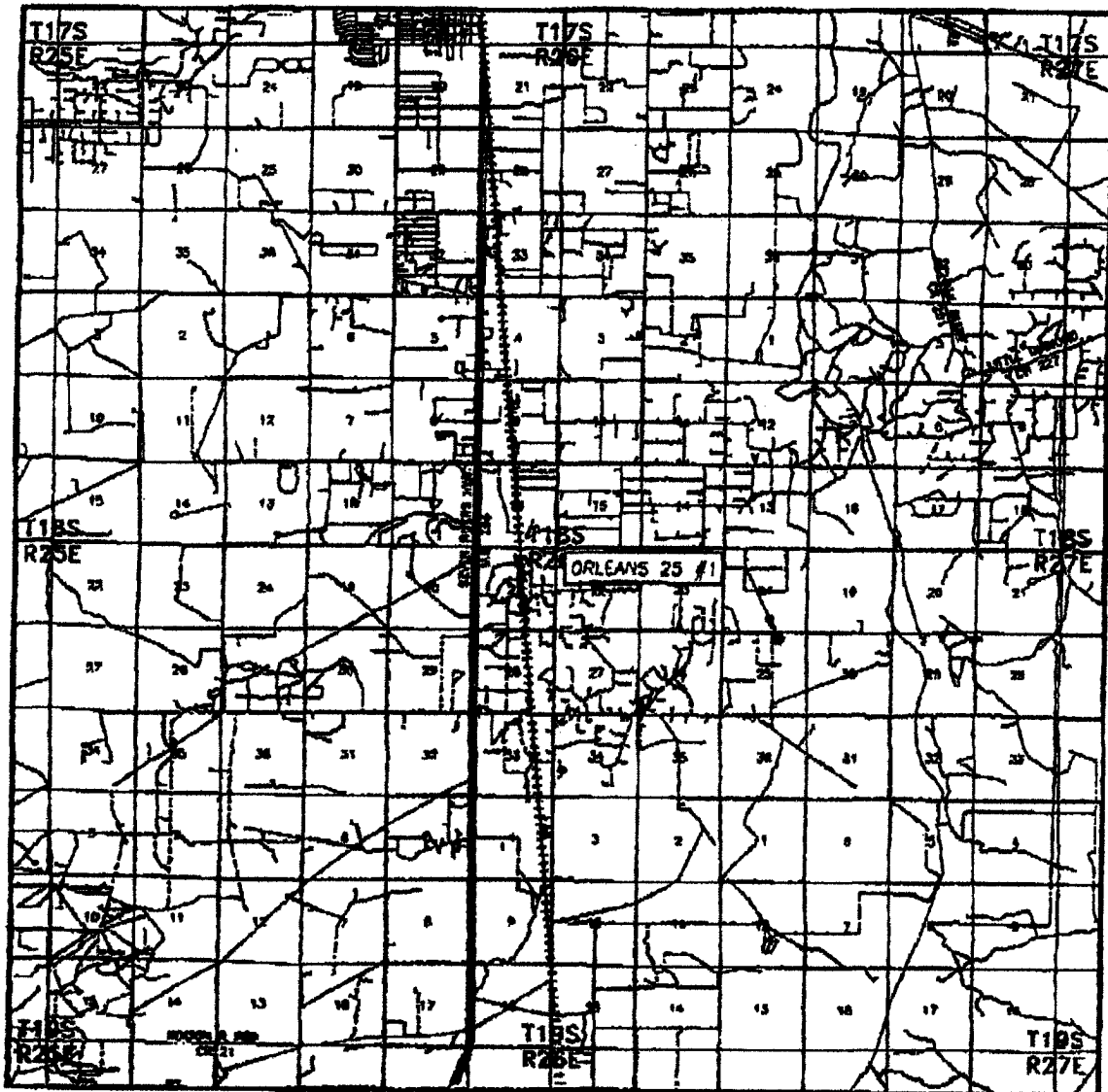
UL or Lot No.	Section	Township	Range	Lat. Mm	Feet from the	North/South Line	Feet from the	East/West Line	County
Dedicated Acres	Joint or InHH	Consolidation Code	Order No.						

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>OPERATOR CERTIFICATION</b> I hereby certify that the information herein is true and complete to the best of my knowledge and belief, and that this information was obtained from a working interest or mineral interest interest in the land including the proposed bottom hole location or has a right to drill this well at the location pursuant to a contract with an owner of such mineral or working interest, or in a voluntary pooling agreement or a compulsory pooling order heretofore entered by the division.	
	Signature _____ Date _____ Printed Name _____	
	<b>SURVEYOR CERTIFICATION</b> I hereby certify that the well location shown on this plat was plotted from field notes of recent surveys made by me or under my supervision, and that the same is true and correct to the best of my belief.	
	SEPTEMBER 27, 2006 Date Surveyed BY: 10/10/06 JR Signature: <i>GARY E. JOHNSON</i> Professional Surveyor 	
GEODETIC COORDINATES NAD 27 NME Y=627150.5 N X=500532.7 E LAT.=32.724133° N LONG.=104.331601° W		
Certificate No. GARY E. JOHNSON 12841 000012 E. JOHNSON 3229		

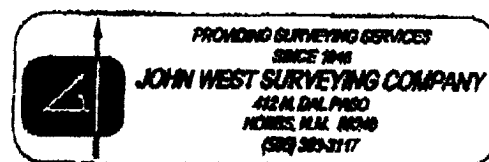


## VICINITY MAP

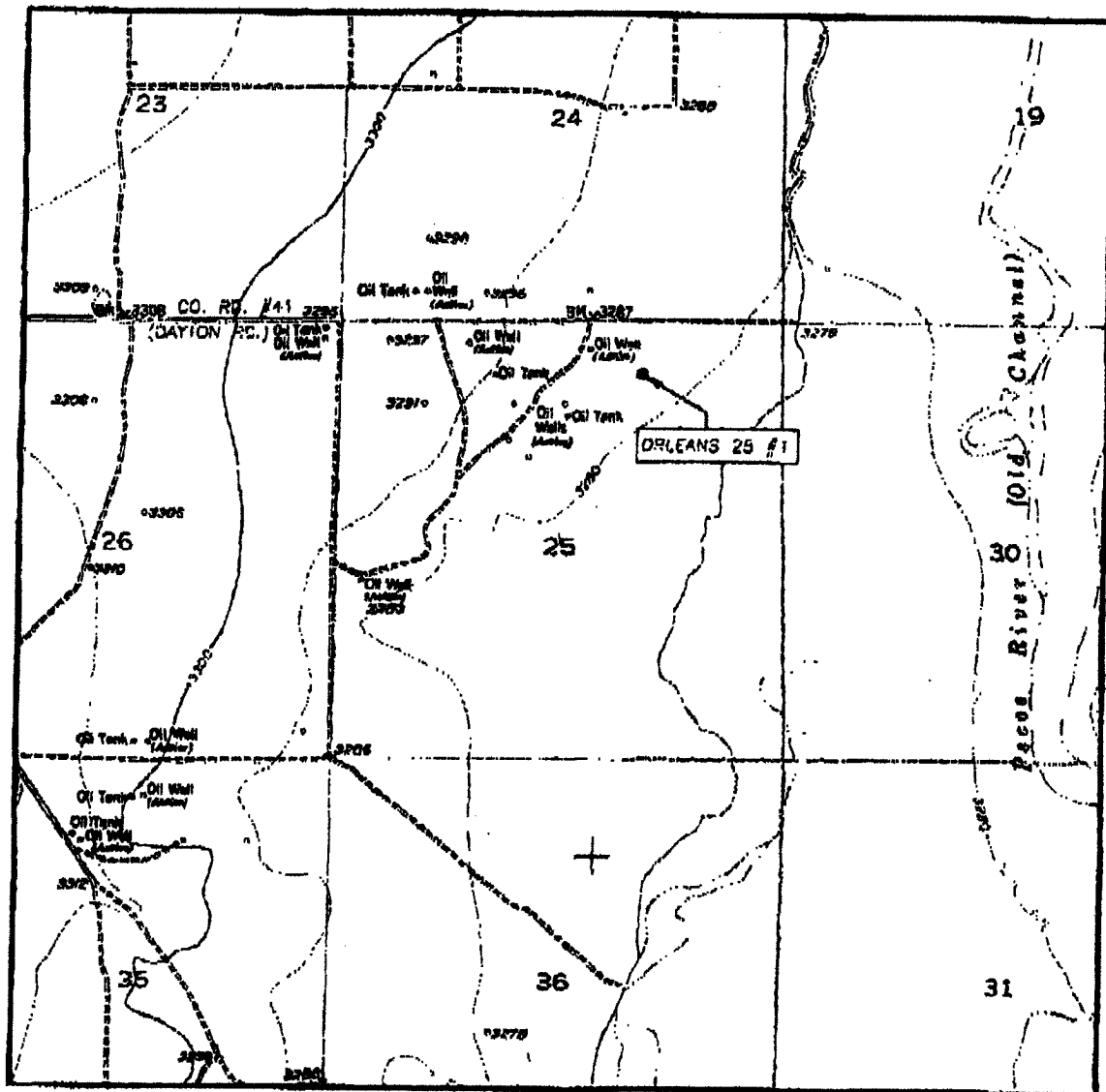


SCALE: 1" = 2 MILES

SEC. 25 TWP. 18-S RGE. 26-E  
 SURVEY N.M.P.M.  
 COUNTY EDDY STATE NEW MEXICO  
 DESCRIPTION 660' FNL & 1650' FEL  
 ELEVATION 3281'  
 OPERATOR CORKRAN ENERGY, LP  
 LEASE ORLEANS 25



# LOCATION VERIFICATION MAP



SCALE: 1" = 2000'

CONTOUR INTERVAL:  
LAKE McMILLAN NORTH, N.M. - 10'

SEC. 25 TWP. 18-S RGE. 26-E

SURVEY N.M.P.M.

COUNTY EDDY STATE NEW MEXICO

DESCRIPTION 660' FNL & 1650' FEL

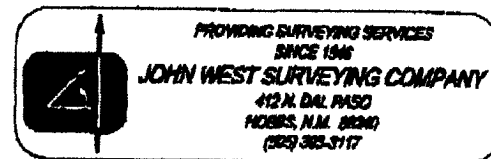
ELEVATION 3281'

OPERATOR CORKRAN ENERGY, LP

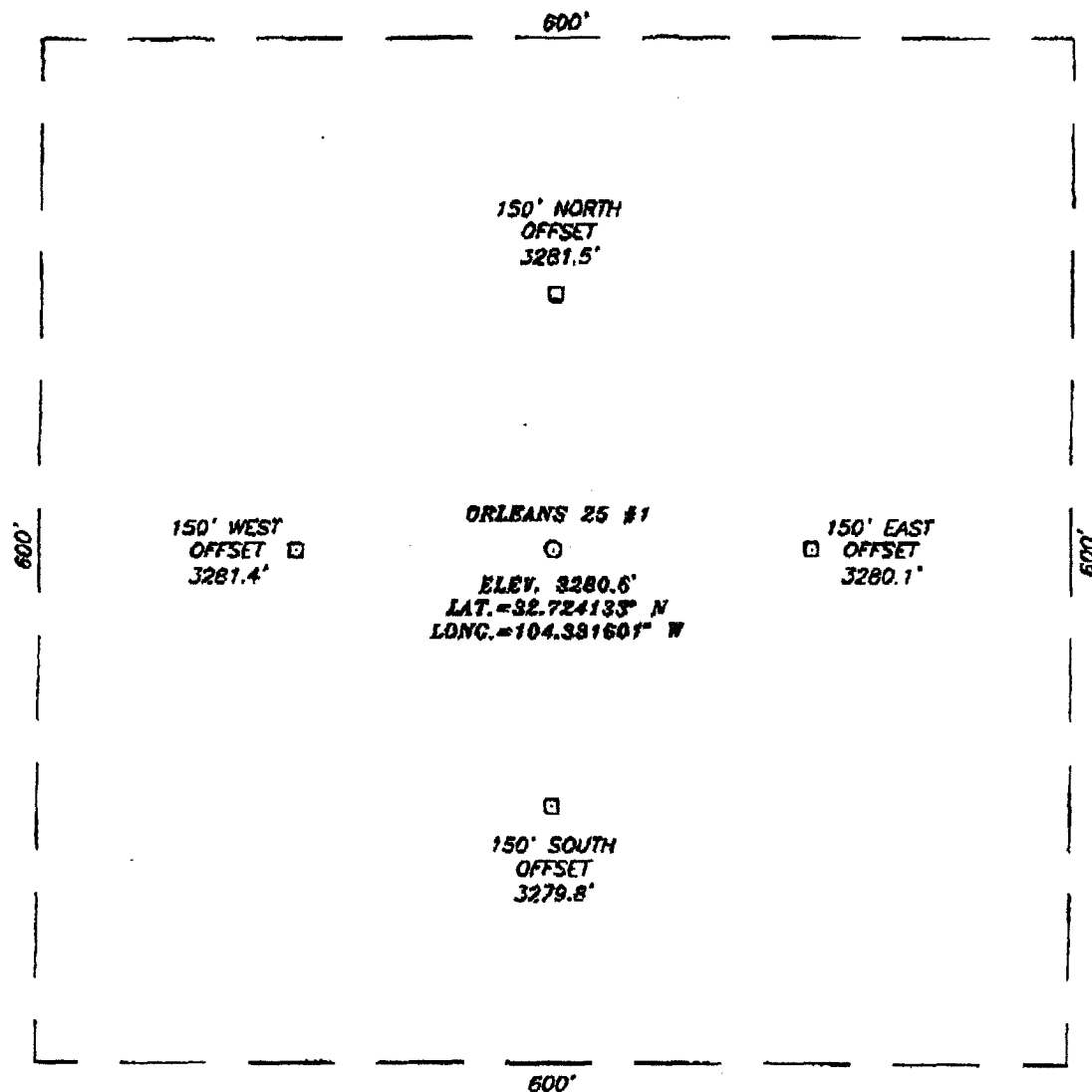
LEASE ORLEANS 25

U.S.G.S. TOPOGRAPHIC MAP

LAKE McMILLAN NORTH, N.M.



**SECTION 25, TOWNSHIP 18 SOUTH, RANGE 26 EAST, N.M.P.M.,**  
**EDDY COUNTY, NEW MEXICO**



**DIRECTIONS TO LOCATION**

FROM THE INTERSECTION OF U.S. HWY. #285 AND  
 CO RD. #41 (DAYTON RD.) GO EAST ON CO. RD.  
 #41 APPROX. 3.7 MILES. THIS LOCATION IS  
 APPROX. 650 FEET SOUTH.



**CORKRAN ENERGY, LP**

ORLEANS 25 #1 WELL  
 LOCATED 850 FEET FROM THE NORTH LINE  
 AND 1650 FEET FROM THE EAST LINE OF SECTION 25.  
 TOWNSHIP 18 SOUTH, RANGE 26 EAST, N.M.P.M.  
 EDDY COUNTY, NEW MEXICO.

Survey Date: 09/27/06	Sheet 1 of 1 Sheets
W.O. Number: 06.11.1522	Dr By: J.R.
Date: 10/04/06	Rev 1:10/10/06
Disk: CD#6	06111522
	Scale: 1"=100'

