ATS-12-674

Form 3160-3
(March 2012)

Split Estate

OCD-ARTESIA

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

APPLICATION FOR PERMIT TO DRILL OR REENTER

FORM APPROVED
OMB No. 1004-0137
Expires October 31, 2014

TES 8/17/2012

5. Lease Serial No.
SHL: VO-4990, BHL: NMLC-068712

6. If Indian, Allotee or Tribe Name
NA

1a. Type of work. ☑ DRILL ☐ REENTER

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

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

8. Lease Name and Well No
MUDCAT FEDERAL COM #2H <39407>

2. Name of Operator MURCHISON OIL & GAS, INC. <15363>

9 API Well No.
30-015-40617

3a. Address 1100 MIRA VISTA BLVD.
PLANO, TX 75093-4698

3b Phone No. *(include area code)*
972-931-0700

10 Field and Pool, or Exploratory
EMPIRE; GLORIETA-YESO <96210>

4. Location of Well *(Report location clearly and in accordance with any State requirements *)*
At surface 1115' FSL & 150' FEL, LOT P
At proposed prod. zone 990' FSL & 330' FWL, LOT M

11 Sec., T. R. M. or Blk. and Survey or Area
SEC. 11, T17S, R28E

14. Distance in miles and direction from nearest town or post office*
APPROXIMATELY 15 MILES NW OF ARTESIA, NEW MEXICO

12 County or Parish
EDDY

13. State
NM

15 Distance from proposed* location to nearest property or lease line, ft (Also to nearest drig. unit line, if any)	16 No. of acres in lease	17. Spacing Unit dedicated to this well
150' FEL	VO-4990: 320 AC NMLC-068712. 320 AC	160 AC
18 Distance from proposed location* to nearest well, drilling, completed, applied for, on this lease, ft.	**19 Proposed Depth**	**20 BLM/BIA Bond No. on file**
823' at TD to Bobcat Fed Com #1	8,255' MD, 3,873' TVD	NM 2163
21. Elevations (Show whether DF, KDB, RT, GL, etc.)	**22. Approximate date work will start***	**23. Estimated duration**
3,591' GL	11/19/2012	20 DAYS

24. Attachments

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

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

25 Signature	Name *(Printed/Typed)*	Date
Michael S Daugherty	MICHAEL S. DAUGHERTY	5/10/12
Title: COO		

Approved by *(Signature)*	Name *(Printed/Typed)*	Date
/s/ Don Peterson	/s/ Don Peterson	AUG 13 2012
Title: for FIELD MANAGER	Office: CARLSBAD FIELD OFFICE	

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

APPROVAL FOR TWO YEARS

Title 18 U.S.C. Section 1001 and Title 43 U.S.C. Section 1212, make it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

(Continued on page 2)

*(Instructions on page 2)

Approval Subject to General Requirements & Special Stipulations Attached

Roswell Controlled Water Basin

RECEIVED
AUG 17 2012
NMOCD ARTESIA

SEE ATTACHED FOR CONDITIONS OF APPROVAL

Murchison Oil & Gas, Inc.
Mudcat Fed Com #2H
SL: 1,115' FSL & 150' FEL, Lot P, Sec. 11, T17S, R28E
BHL: 990' FSL & 330' FWL, Lot E, Sec. 11, T17S, R28E
Eddy County, New Mexico

CERTIFICATION

I hereby certify that I, or persons under my direct supervision, have inspected the proposed drill site and access route; that I am familiar with the conditions which presently exist; that the statements made in this plan are, to the best of my knowledge, true and correct; and that the work associated with the operations proposed herein will be performed by Murchison Oil & Gas, Inc. and its contractors and subcontractors in conformity with this plan and the terms and conditions under which it is approved.

24 April 12
Date

Jack Rankin
VP, Operations
Murchison Oil & Gas, Inc.

STATEMENT ACCEPTING RESPONSIBILITY FOR OPERATIONS

Murchison Oil & Gas Inc.
1100 Mira Vista Boulevard
Plano, Texas 75093-4698

The undersigned accepts all applicable terms, conditions, stipulations and restrictions covering operations conducted on the leased land or portion thereof, as described below:

Lease No:	SHL: LS # VO-4990 BHL: LS # NMLC-068712
Well Name:	Mudcat Fed Com #2H
Legal Description of Land:	SHL: 1,115' FSL & 150' FEL, Unit P BHL: 990' FSL & 330' FWL, Unit M Sec. 11, T17S, R28E Eddy County, New Mexico
Formation(s) (if applicable):	Paddock
Bond Coverage:	$150,000 statewide bond of Murchison Oil & Gas, Inc.
BLM Bond File No:	Personal Statewide Bond NM 2163

24 April '12
Date

Jack Rankin
VP, Operations
Murchison Oil & Gas Inc.

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 & Natural Resources Department
OIL CONSERVATION DIVISION
1220 South St. Francis Dr.
Santa Fe, NM 87505

Form C-102
Revised October 15, 2009
Submit one copy to appropriate District Office

☐ AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

1 API Number	2 Pool Code	3 Pool Name
30-015-40617	96210	Empire; Glorieta-Yeso

4 Property Code	5 Property Name	6 Well Number
39407	MUDCAT FEDERAL COM	2H

7 OGRID No.	8 Operator Name	9 Elevation
15363	MURCHISON OIL & GAS, INC.	3591.1

10 Surface Location

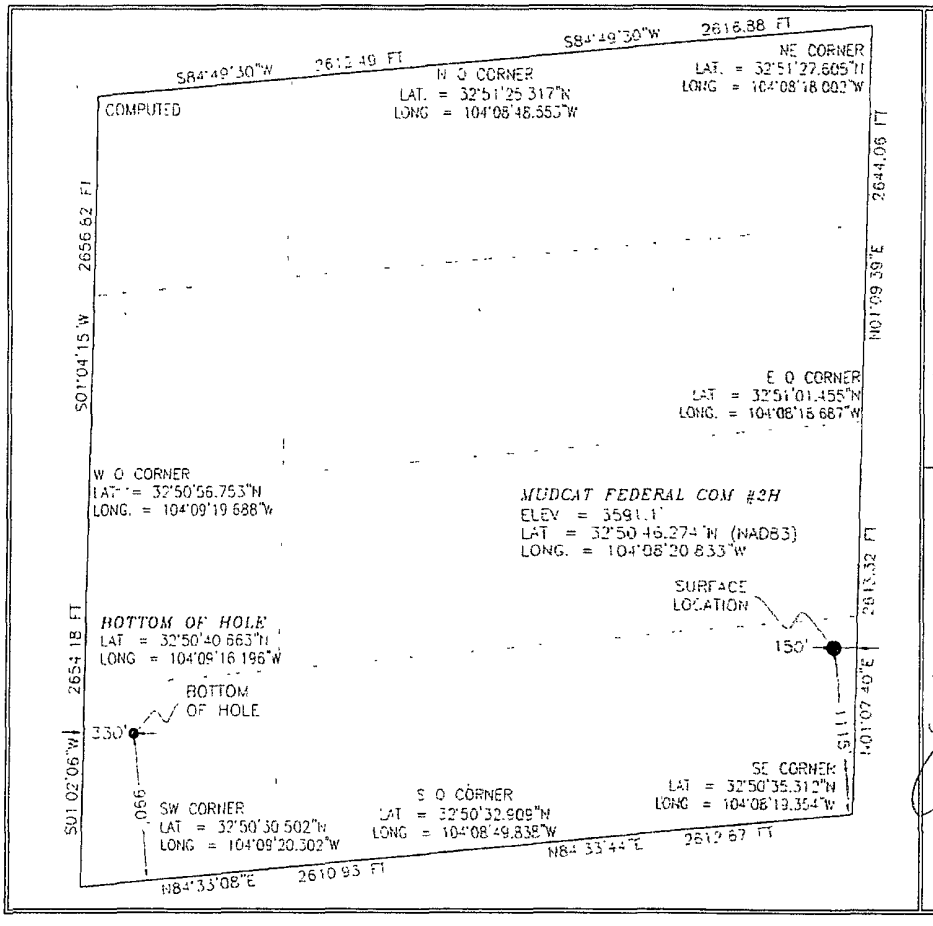
UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
P	11	17 S	28 E		1115	SOUTH	150	EAST	EDDY

11 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
M	11	17 S	28 E		990	SOUTH	330	WEST	EDDY

12 Dedicated Acres	13 Joint or Infill	14 Consolidation Code	15 Order No.
160			

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.



17 OPERATOR CERTIFICATION

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

Signature — Date: 5/7/12

Printed Name: Michael S. Daugherty
COO

18 SURVEYOR CERTIFICATION

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.

MARCH 5, 2012
Date of Survey

Signature and Seal of Professional Surveyor:
NEW MEXICO — REGISTERED LAND SURVEYOR

Certificate Number: FELIXON F. JARAMILLO, PLS 12797 — SURVEY NO. 803

ATTACHMENT TO FORM 3160-3
Murchison Oil & Gas, Inc.
Mudcat Federal Com #2H
SL: 1,115' FSL & 150' FEL, Unit P
BHL: 990' FSL & 330' FWL, Unit M
Sec 11, T17S, R28E
Eddy County, New Mexico

1. ESTIMATED FORMATION TOPS

	DEPTH (RKB)	SUBSEA
Tansil	490	3468'
Yates	613'	2990'
Seven Rivers	858'	2745'
Queen	1403'	2200'
Grayburg	1790'	1805'
San Andres	2188'	1415'
Glorieta	3553'	50'
Paddock	3613'	-10'

PROPOSED BHL DEPTHS: TVD 3873' and MD 8,255'

2. ESTIMATED DEPTHS OF ANTICIPATED FRESH WATER, OIL, OR GAS

Anticipated Formation Tops: RKB +/- 3603' Ground Elevation: 3591'

Fresh Water	50' – 300'	Surface Fresh Water Sands
Oil/Gas	1403'	Queen
Oil/Gas	2188'	San Andres
Oil/Gas	3613'	Yeso

3. CASING PROGRAM

Casing Size	Hole Size	From To	Weight	Grade	Joint	Condition	Purpose
14"	Conductor	0 – 120'					Conductor
9.625"	12.25"	0' – 352'	36 #	J-55	ST&C	New	Surface
7"	8.75"	0' – 3699'	26 #	L-80	BT&C	New	Production
4.5"	6.125"	3549' – 8255'	11.6#	L-80	BT&C	New	Liner

Casing Size	Casing ID	Burst Rating, psi	Safety Factor	Collapse Rating, psi	Safety Factor	Tension Rating, 1000 lbs.	Safety Factor
9.625"	8.921"	3520	8.94	2020	15.31	394	12.24
7"	6.276"	7240	1.38	5410	2.92	641	3.34
4.5"	4"	7780	1.42	6350	3.61	291	5.31

Equivalent or adequate grades and weights of casing may be substituted at time casing is run, depending on availability.

SURFACE CASING:

Tension — Calculated using weight of casing times landing depth without utilizing buoyancy effects

Collapse — Calculated with full internal evacuation and a collapse force equal to the mud gradient in which the casing will be run. The effects of axial load on collapse will be considered.

Burst — In all cases a conservative fracture pressure will be used such that it represents the upper limit of potential fracture gradients up to a 1.0 psi/ft. gradient. The effects of tension on burst will not be utilized.

INTERMEDIATE CASING:

Tension — Calculated using weight of casing times landing depth without utilizing buoyancy effects

Collapse — Calculated with full internal evacuation and a collapse force equal to the mud gradient in which the casing will be run. The effects of axial load on collapse will be considered.

Burst — In all cases a conservative fracture pressure will be used such that it represents the upper limit of potential fracture gradients up to a 1.0 psi/ft. gradient. The effects of tension on burst will not be utilized

PRODUCTION CASING:

Tension — Calculated using weight of casing times landing depth without utilizing buoyancy effects.

Collapse — Calculated with full internal evacuation and a collapse force equal to the mud gradient in which the casing will be run. The effects of axial load on collapse will be considered.

Burst — Maximum surface treating pressure will be limited to 85% of the rated burst pressure.

4. PRESSURE CONTROL EQUIPMENT: Blowout Preventer (See Attached Diagrams)
A BOP equivalent to Diagram 1 will be nippled up and used during the intermediate and main hole sections. The BOP Stack, choke, kill lines, Kelly cock, inside BOP, etc., will be hydro tested to 3000 psi and 1500 psi on both intermediate and main hole sections by an approved pressure tester. The annular will be tested to 1500 psi. In addition to the rated working pressure tests, a low pressure (250 psi) test will be required. These tests will be performed:

a) upon installation
b) after any component changes
c) 14 days after a previous test
d) as required by well conditions.

A function test to insure that the preventors are operating correctly will be performed on each trip. See the attached Diagram 1 for the minimum criteria for the 5000 psi choke manifold.

5. MUD PROGRAM

DEPTH	MUD TYPE	WEIGHT	FV	PV	YP	FL	Ph
0 – 352' 250	Fresh Water/Native	8.3-8.6	36-38	3-5	5-7		
352'-3699'	Brine	10-10.2	29-30	1-2	1-2		
3699' - 8255'	Brine	8.7-8.9	34-36	2-3	2-3	12-15	

Used.

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

Database:	EDM 5000 1 Single User Db	Local Co-ordinate Reference:	Well Mudcat 2H
Company:	Murchison Oil and Gas	TVD Reference:	WELL @ 3603 1usft (HWD 4)
Project:	Paddock	MD Reference:	WELL @ 3603 1usft (HWD 4)
Site:	Mudcat 2H	North Reference:	Grid
Well:	Mudcat 2H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Mudcat 2H		
Design:	120312 Mudcat 2H Plan		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
Start Build 12.00									
3,699.2	59 90	263 05	3,613 1	-28 8	-236.3	238 0	12 00	12.00	0 00
Paddock - 7" Production Casing									
3,700.0	60.00	263 05	3,613 5	-28 9	-237 0	238 7	12 00	12 00	0.00
Start Build 5.00									
3,800.0	65.00	263.05	3,659 7	-39 6	-325.0	327 4	5.00	5.00	0.00
Start Build 3.00									
3,900.0	68.00	263.05	3,699.5	-50 7	-416 0	419 1	3 00	3.00	0 00
Start Build 3.00									
4,000.0	71 00	263.05	3,734 5	-62 0	-509.0	512.8	3 00	3.00	0 00
Start Build 4.00									
4,100.0	75.00	263.05	3,763.8	-73 6	-603 9	608 4	4.00	4.00	0 00
Start Build 3.00									
4,200 0	78.00	263.05	3,787.1	-85 4	-700 4	705.6	3.00	3.00	0 00
Start Build 3.00									
4,300.0	81.00	263.05	3,805 3	-97.3	-798.0	803 9	3.00	3 00	0 00
Start Build 4.00									
4,400.0	85.00	263.05	3,817 5	-109.3	-896.5	903.1	4 00	4 00	0.00
Start Build 3.69									
4,500.0	88.69	263.05	3,823 0	-121.4	-995.6	1 003.0	3 69	3 69	0 00
4,565.0	91.09	263 05	3,823 1	-129.2	-1 060 1	1.068.0	3 69	3.69	0 00
Start DLS 1.00 TFO -141.67									
4,565 6	91 09	263.05	3,823 1	-129 3	-1,060 7	1,068 5	1 00	-0.78	-0.62
Start DLS 0.00 TFO 71.64									
4,600 0	91.09	263 05	3,822 5	-133 5	-1,094.9	1,103 0	0 00	0 00	0.00
4,700 0	91 09	263.05	3,820 6	-145 6	-1,194 1	1 202 9	0.00	0.00	0.00
4,800.0	91.09	263.05	3,818.7	-157 7	-1 293 4	1,302.9	0.00	0.00	0.00
4,900 0	91.09	263.05	3,816.8	-169 8	-1,392 6	1,402 9	0.00	0.00	0.00
5,000 0	91.09	263.05	3,814.9	-181.9	-1,491 8	1,502.9	0.00	0.00	0.00
5,100.0	91.09	263.05	3,813.0	-194 0	-1 591 1	1,602.9	0.00	0.00	0.00
5,200.0	91.09	263.05	3,811 1	-206 1	-1,690 3	1,702 9	0.00	0 00	0 00
5,300.0	91.09	263.05	3,809 2	-218 2	-1,789.6	1,802.8	0.00	0.00	0.00
5,400.0	91.09	263 05	3,807.3	-230 3	-1,888 8	1,902.8	0.00	0 00	0 00
5,500.0	91.09	263 05	3,805 4	-242 4	-1,988.1	2,002 8	0.00	0.00	0 00
5,600 0	91 09	263.05	3,803.5	-254 5	-2,087 3	2,102 8	0.00	0.00	0.00
5,700.0	91 09	263 05	3,801.6	-266 6	-2,186 6	2,202 8	0.00	0 00	0.00
5,800 0	91.09	263.05	3,799 7	-278 7	-2 285.8	2,302 7	0 00	0.00	0.00
5,900 0	91.09	263.05	3,797 8	-290 8	-2,385.1	2 402.7	0.00	0.00	0 00
6,000.0	91 09	263.05	3,795.9	-302 9	-2 484 3	2,502 7	0 00	0.00	0.00
6,100.0	91.09	263 05	3,794 0	-315.0	-2,583.6	2,602 7	0 00	0.00	0.00
6,200.0	91.09	263.05	3,792 1	-327 0	-2,682.8	2.702 7	0 00	0.00	0.00
6,300.0	91.09	263.05	3,790 2	-339 1	-2,782 1	2,802 7	0.00	0 00	0 00
6,400.0	91 09	263.05	3,788.4	-351 2	-2,881.3	2,902.6	0.00	0.00	0 00
6,500.0	91.09	263.05	3,786 5	-363 3	-2 980 6	3,002 6	0.00	0.00	0.00
6,600.0	91.09	263 05	3,784.6	-375 4	-3 079 8	3,102 6	0.00	0 00	0.00
6,700 0	91 09	263 05	3,782 7	-387 5	-3,179.1	3,202.6	0 00	0.00	0 00
6,800.0	91 09	263 05	3,780.8	-399 6	-3 278 3	3,302 6	0.00	0.00	0.00
6,900.0	91.09	263.06	3,778.9	-411.7	-3,377 6	3,402.5	0 00	0 00	0.00
7,000.0	91 09	263.06	3,777 0	-423 8	-3,476 8	3,502 5	0 00	0.00	0 00
7,100.0	91.09	263.06	3,775.1	-435 9	-3 576 0	3,602.5	0.00	0.00	0 00
7,200.0	91.09	263.06	3,773 2	-448 0	-3 675.3	3,702.5	0 00	0.00	0 00
7,300.0	91.09	263.06	3,771.3	-460 0	-3,774.5	3,802 5	0 00	0.00	0.00

Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well Mudcat 2H
Company:	Murchison Oil and Gas	TVD Reference:	WELL @ 3603 1usft (HWD 4)
Project:	Paddock	MD Reference:	WELL @ 3603.1usft (HWD 4)
Site:	Mudcat 2H	North Reference:	Grid
Well:	Mudcat 2H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Mudcat 2H		
Design:	120312 Mudcat 2H Plan		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
7,400 0	91 09	263 06	3,769.4	-472 1	-3,873.8	3,902.5	0.00	0.00	0.00
7,500 0	91 09	263.06	3,767.5	-484 2	-3,973.0	4,002.4	0.00	0.00	0 00
7,600 0	91 09	263 06	3,765 6	-496 3	-4 072 3	4,102.4	0.00	0.00	0.00
7,700.0	91 09	263 06	3,763 7	-508 4	-4,171 5	4,202 4	0 00	0 00	0.00
7,800 0	91 09	263.06	3,761 8	-520 5	-4 270 8	4 302 4	0.00	0.00	0 00
7,900.0	91.09	263 06	3,759.9	-532 6	-4 370 0	4,402 4	0.00	0.00	0 00
8 000 0	91.09	263.06	3 757.9	-544 6	-4,469 3	4,502 4	0.00	0 00	0.00
8,100 0	91 09	263 06	3 756 0	-556 7	-4 568 5	4,602 3	0 00	0.00	0 00
8,200.0	91 09	263.06	3.754 1	-568 8	-4,667 8	4 702.3	0.00	0.00	0.00
8,255 0	91 09	263.06	3.753 1	-575 4	-4 722.3	4,757.3	0 00	0.00	0 00
TD at 8255.0									

Design Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
Mudcat 2H Paddock Inte	0.00	0.00	3,613.0	-28 8	-236.3	671,602 10	600,745 54	32° 50' 45.993 N	104° 8' 23 603 W
- plan misses target center by 0.1usft at 3699.2usft MD (3613 1 TVD, -28.8 N, -236 2 E)									
- Point									
Mudcat 2H BHL	0.00	0.00	3,753 1	-575 4	-4,722.3	671,055 52	596,259.88	32° 50' 40 663 N	104° 9' 16 196 W
- plan hits target center									
- Point									

Casing Points

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
352 0	352.0	9 5/8" Surface Casing	9-5/8	12-1/4
3,699.2	3,613.1	7" Production Casing	7	8-3/4
8,255 0	3 753 1	4 1/2" Production Liner	4-1/2	6-1/8

Formations

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
613 1	613.1	Yates		0.00	
858.1	858 1	Seven Rivers		0.00	
1,403 1	1,403 1	Queen		0 00	
2,188 1	2,188 1	San Andres		0.00	
3,597 4	3,553.1	Glorietta		0.00	
3,699.2	3,613 1	Paddock		0.00	

Database:	EDM 5000 1 Single User Db	Local Co-ordinate Reference:	Well Mudcat 2H
Company:	Murchison Oil and Gas	TVD Reference:	WELL @ 3603 1usft (HWD 4)
Project:	Paddock	MD Reference:	WELL @ 3603 1usft (HWD 4)
Site:	Mudcat 2H	North Reference:	Grid
Well:	Mudcat 2H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Mudcat 2H		
Design:	120312 Mudcat 2H Plan		

Plan Annotations

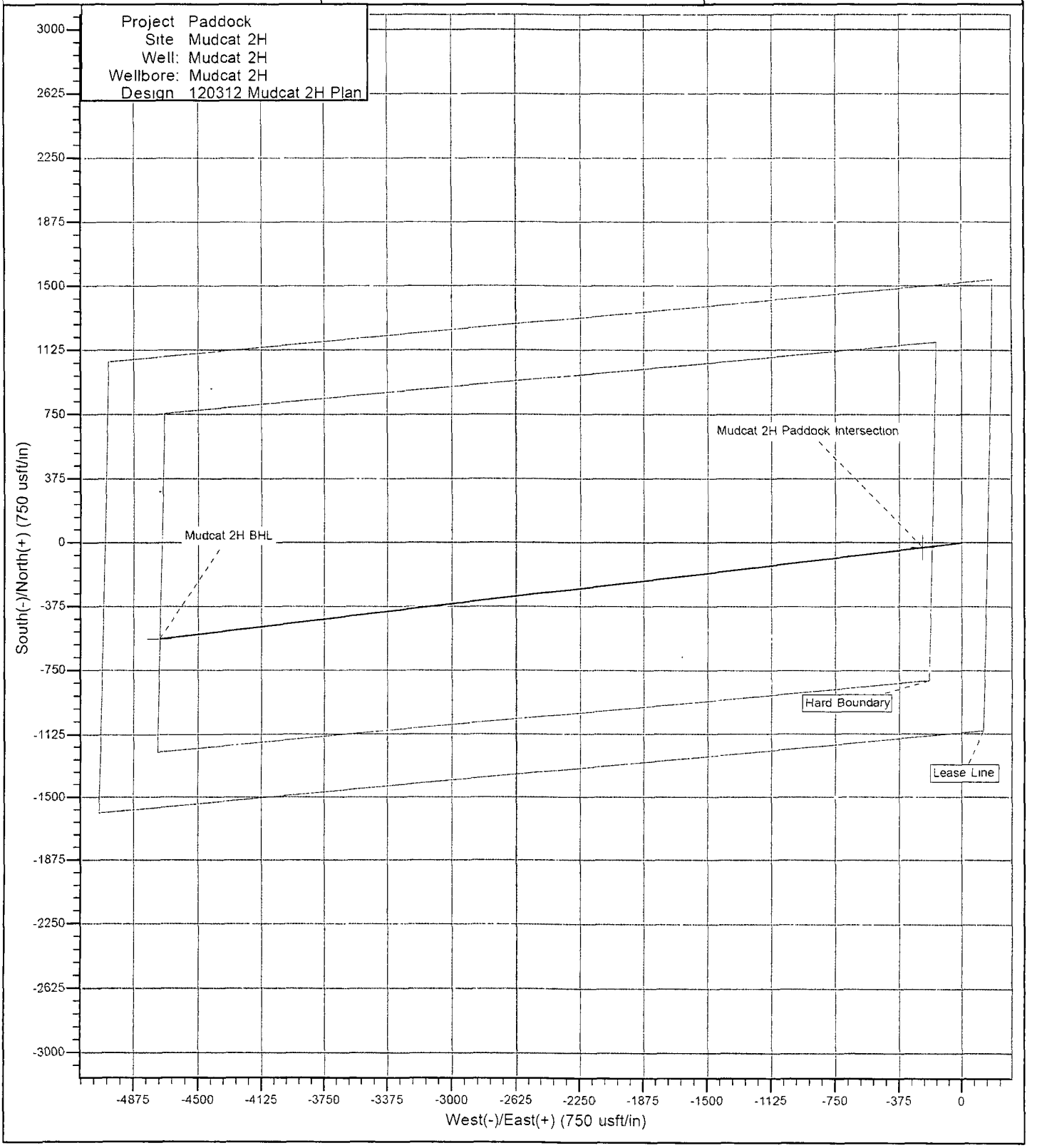
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	+E/-W (usft)	Comment
3,200.0	3,200.0	0.0	0.0	Start Build 12.00
3,300.0	3,299.3	-1.3	-10.4	Start DLS 12.00 TFO 0.00
3,400.0	3,394.2	-5.0	-41.0	Start DLS 12.00 TFO 0.00
3,500.0	3,480.6	-11.0	-90.5	Start Build 12.00
3,600.0	3,554.8	-19.1	-156.8	Start Build 12.00
3,700.0	3,613.5	-28.9	-237.0	Start Build 5.00
3,800.0	3,659.7	-39.6	-325.0	Start Build 3.00
3,900.0	3,699.5	-50.7	-416.0	Start Build 3.00
4,000.0	3,734.5	-62.0	-509.0	Start Build 4.00
4,100.0	3,763.8	-73.6	-603.9	Start Build 3.00
4,200.0	3,787.1	-85.4	-700.4	Start Build 3.00
4,300.0	3,805.3	-97.3	-798.0	Start Build 4.00
4,400.0	3,817.5	-109.3	-896.5	Start Build 3.69
4,565.0	3,823.1	-129.2	-1,060.1	Start DLS 1.00 TFO -141.67
4,565.6	3,823.1	-129.3	-1,060.7	Start DLS 0.00 TFO 71.64
8,255.0	3,753.1	-575.4	-4,722.3	TD at 8255.0

MURCHISON OIL & GAS, INC

MOJO

T M Azimuths to True North Magnetic North 7 79° Magnetic Field Strength: 48891 2snT Dip Angle 60 67° Date 12/03/2012 Model IGRF200510	COMPANY DETAILS Murchison Oil and Gas Drilling Calculation Method: Minimum Curvature Error System: ISCWSA Scan Method. Closest Approach 3D Error Surface Elliptical Conic Warning Method: Error Ratio	PROJECT DETAILS Paddock Geodetic System: US State Plane 1983 Datum North American Datum 1983 Ellipsoid GRS 1980 Zone New Mexico Eastern Zone System Datum: Mean Sea Level

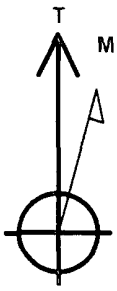
Project Paddock
Site Mudcat 2H
Well: Mudcat 2H
Wellbore: Mudcat 2H
Design 120312 Mudcat 2H Plan



MURCHISON OIL & GAS, INC.

MOJO

COMPANY DETAILS: Murchison Oil and Gas
Drilling Calculation Method. Minimum Curvature Error System. ISCWSA Scan Method Closest Approach 3D Error Surface: Elliptical Conic Warning Method Error Ratio



Azimuths to True North
Magnetic North 7 79°

Magnetic Field
Strength. 48891.2snT
Dip Angle. 60 67°
Date: 12/03/2012
Model: IGRF200510

ANNOTATIONS

TVD	MD	Inc	Azi	+N/-S	+E/-W	VSect	Departure	Annotation
3200 0	3200 0	0 00	0 11	0 0	0 0	0 0	0 0	Start Build 12 00
3299 3	3300 0	12 00	263 16	-1 2	-10 4	10.4	10 4	Start DLS 12 00 TFO 0 00
3394 2	3400 0	24 00	263 16	-4 9	-41 0	41 3	41.3	Start DLS 12 00 TFO 0.00
3480 6	3500 0	36 00	263 16	-10 9	-90 5	91.2	91 2	Start Build 12 00
3554 8	3600 0	48 00	263.16	-18 8	-156.9	158 0	158.0	Start Build 12.00
3613 5	3700 0	60 00	263 16	-28 5	-237 0	238 7	238 7	Start Build 5 00
3659 7	3800 0	65 00	263.16	-39 0	-325 1	327 4	327 4	Start Build 3 00
3699.5	3900 0	68.00	263.16	-49 9	-416 1	419 1	419.1	Start Build 3 00
3734 5	4000 0	71 00	263 16	-61 1	-509 1	512 8	512 8	Start Build 4 00
3763 8	4100 0	75 00	263 16	-72.5	-604 0	608.4	608 4	Start Build 3 00
3787 1	4200 0	78 00	263 16	-84 1	-700.6	705 6	705.6	Start Build 3 00
3805 3	4300 0	81 00	263 16	-95 8	-798 2	803.9	803 9	Start Build 4.00
3817 5	4400 0	85.00	263 16	-107 6	-896 7	903.1	903 1	Start Build 3 69
3823 1	4565 0	91 09	263 16	-127 3	-1060 4	1068 0	1068 0	Start DLS 1 00 TFO -141 67
3823 1	4565 6	91 09	263.15	-127 3	-1060 9	1068.5	1068 5	Start DLS 0 00 TFO 71 64
3753.1	8255 0	91 09	263 17	-566 8	-4723 4	4757.3	4757 3	TD at 8255 0

REFERENCE INFORMATION

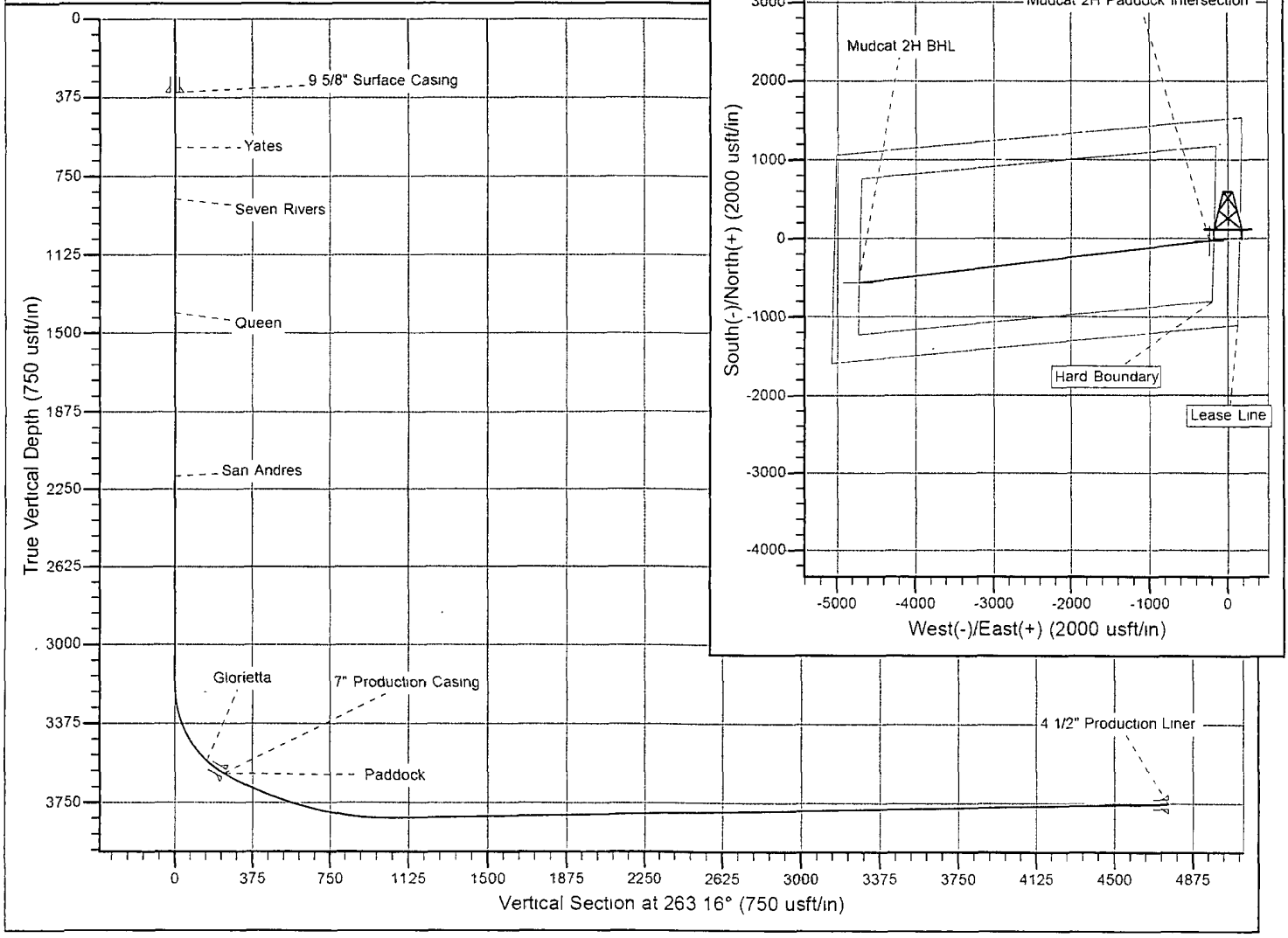
Co-ordinate (N/E) Reference	Well Mudcat 2H, True North
Vertical (TVD) Reference	WELL @ 3603 1usft (HWD 4)
Section (VS) Reference	Slot - (0 0N, 0 0E)
Measured Depth Reference	WELL @ 3603 1usft (HWD 4)
Calculation Method	Minimum Curvature

FORMATION TOP DETAILS

TVDPath	MDPath	Formation	DipAngle	DipDir
613 1	613 1	Yates	0.00	
858 1	858 1	Seven Rivers	0 00	
1403 1	1403 1	Queen	0 00	
2188 1	2188.1	San Andres	0 00	
3553 1	3597.4	Glorietta	0 00	
3613 1	3699.2	Paddock	0 00	

CASING DETAILS

TVD	MD	Name	Size
352 0	352 0	9 5/8" Surface Casing	9-5/8
3613 1	3699 2	7" Production Casing	7
3753.1	8255 0	4 1/2" Production Liner	4-1/2



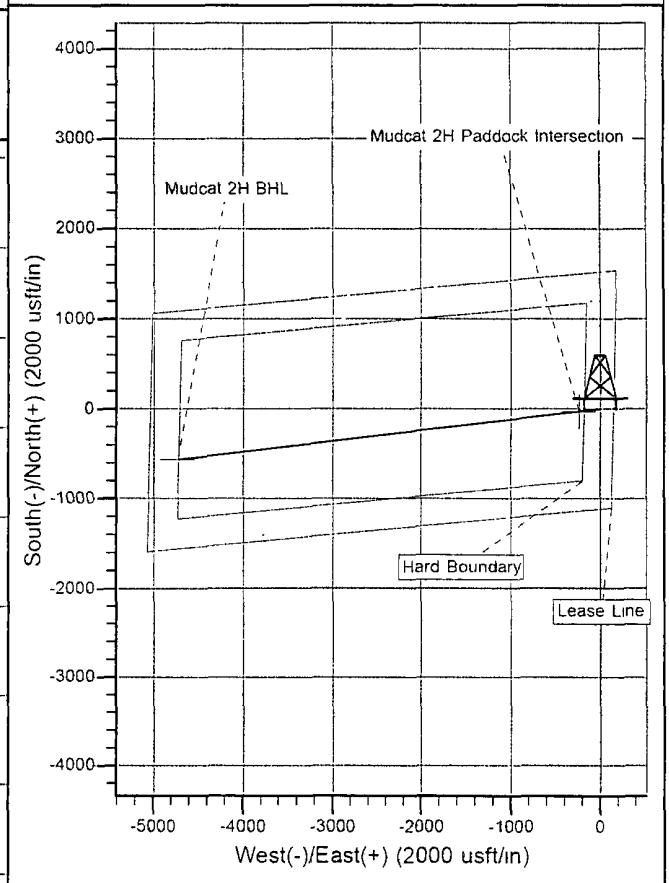


EXHIBIT F-1

MUDCAT FED COM #2H

BOP STACK

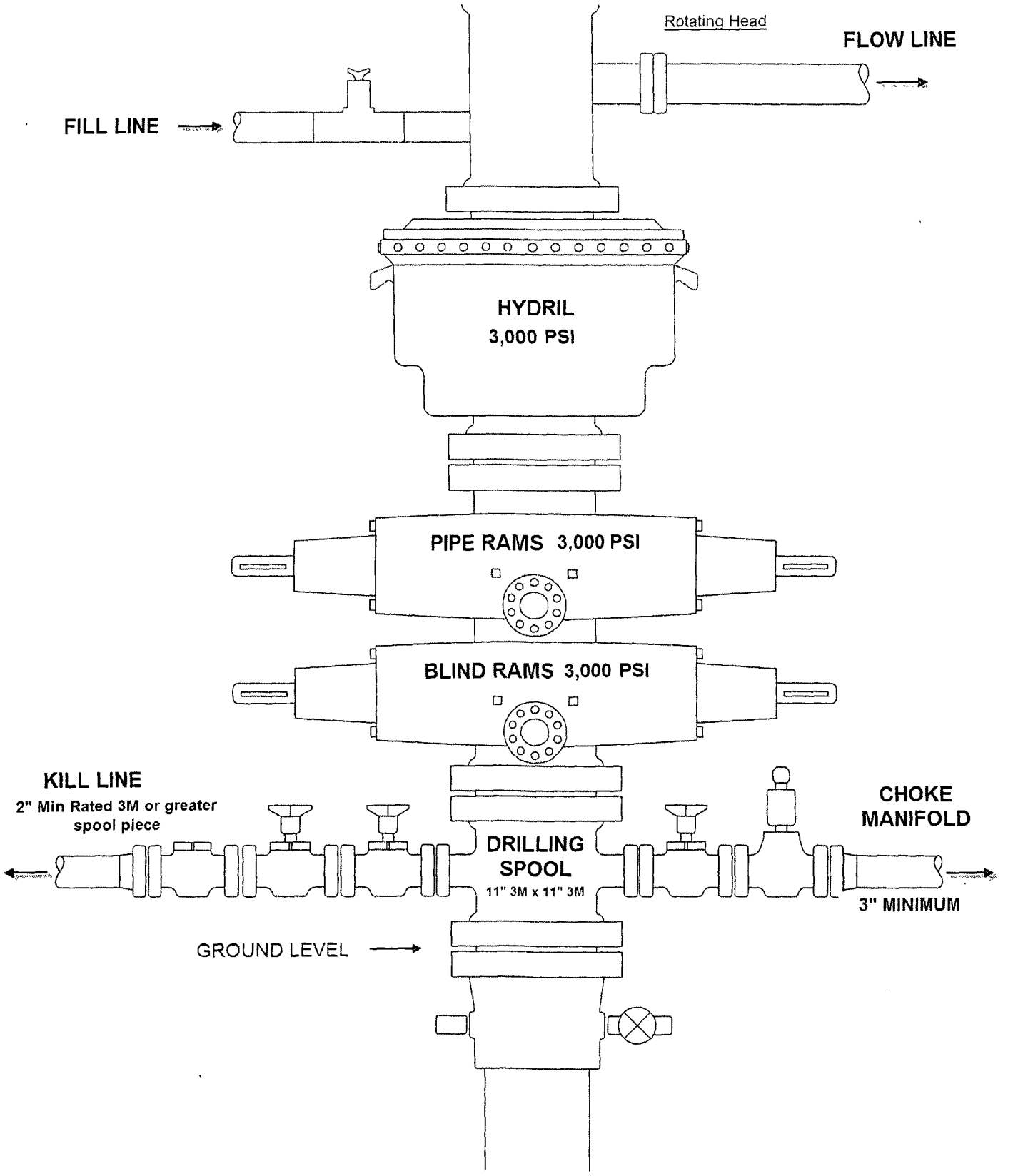


EXHIBIT F-2

MUDCAT FED COM #2H

Choke Manifold

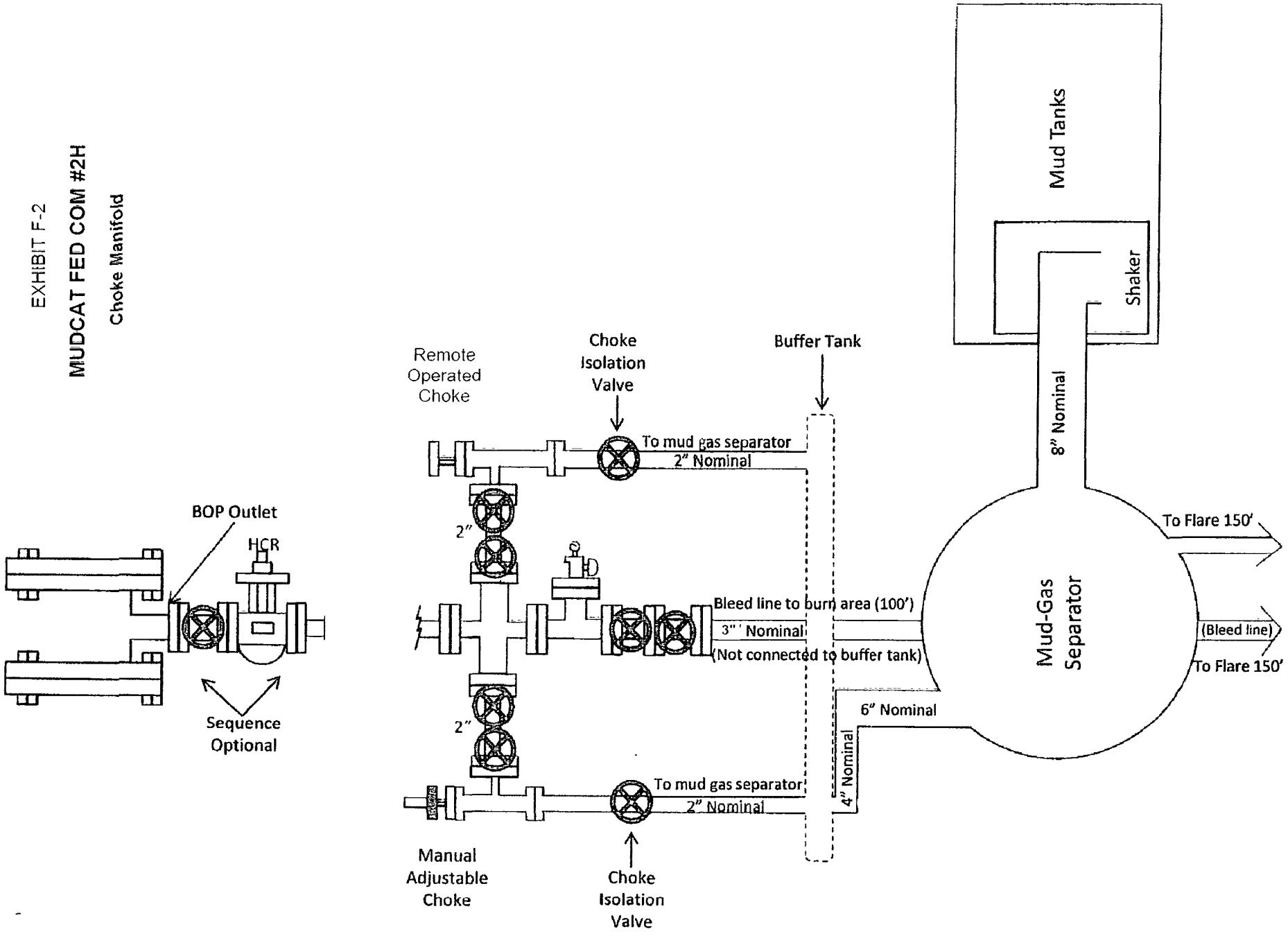


EXHIBIT F-3

MUDCAT FED COM #2H

CHOKE MANIFOLD (3M PSI DESIGN)

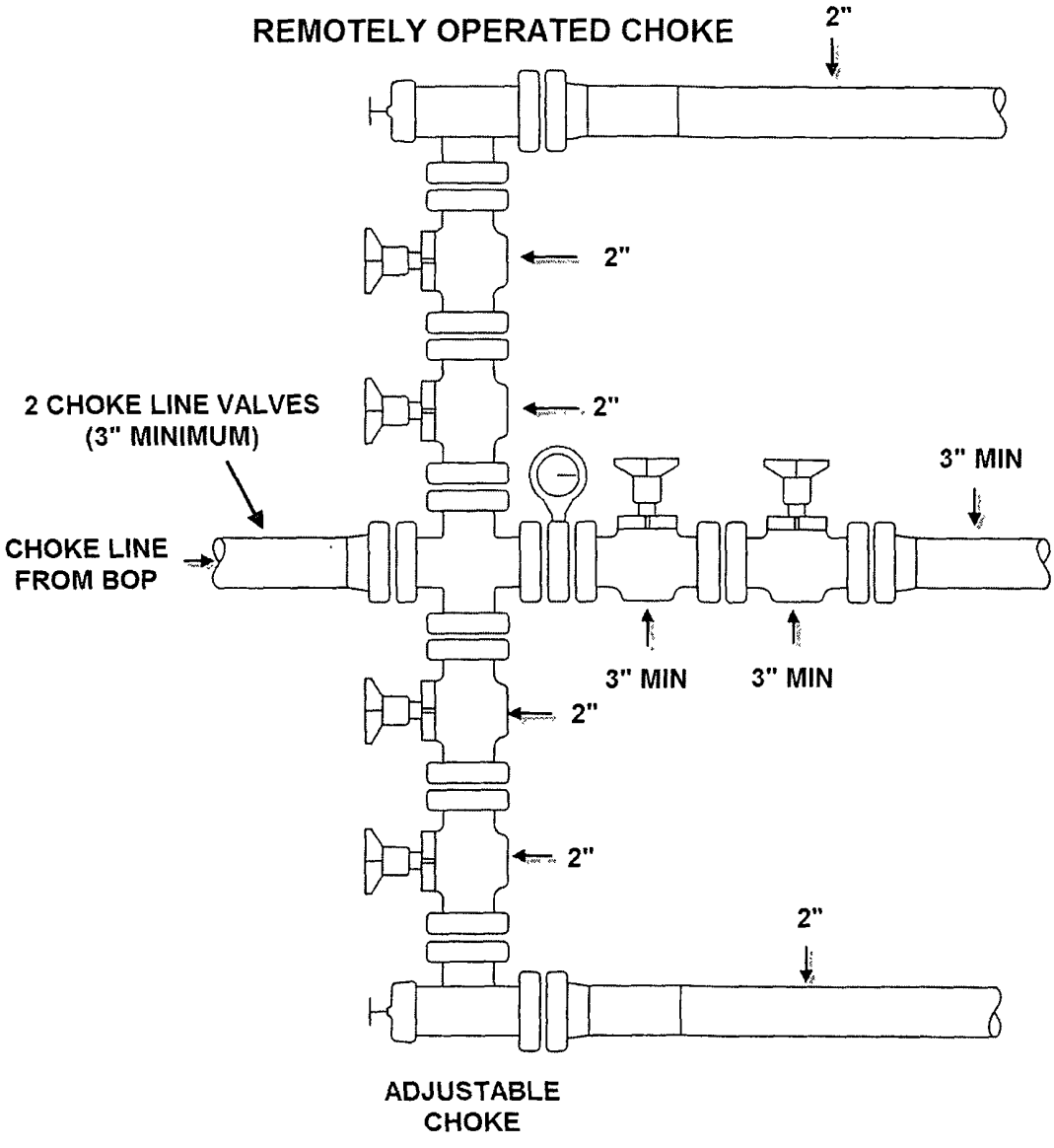
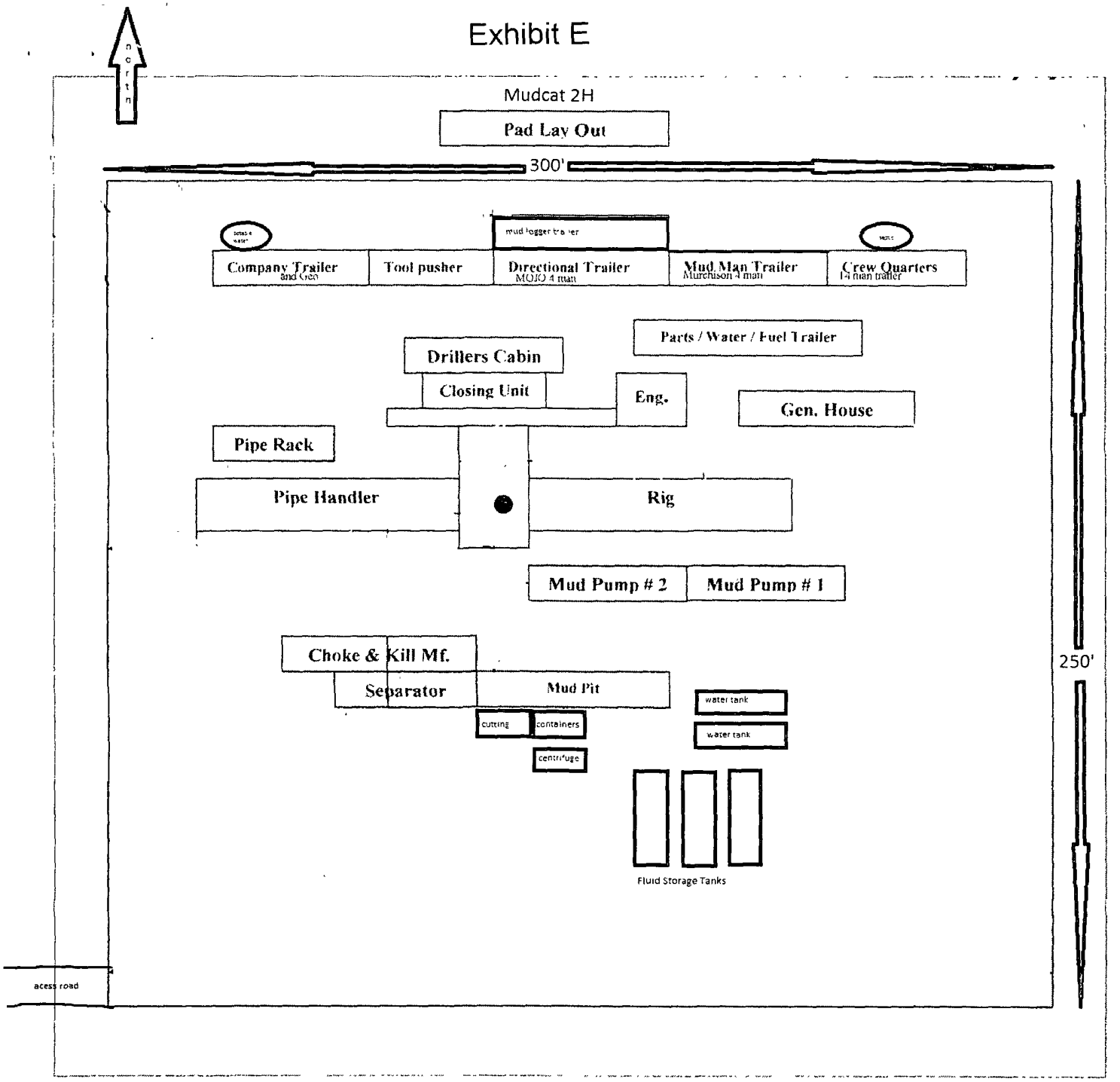
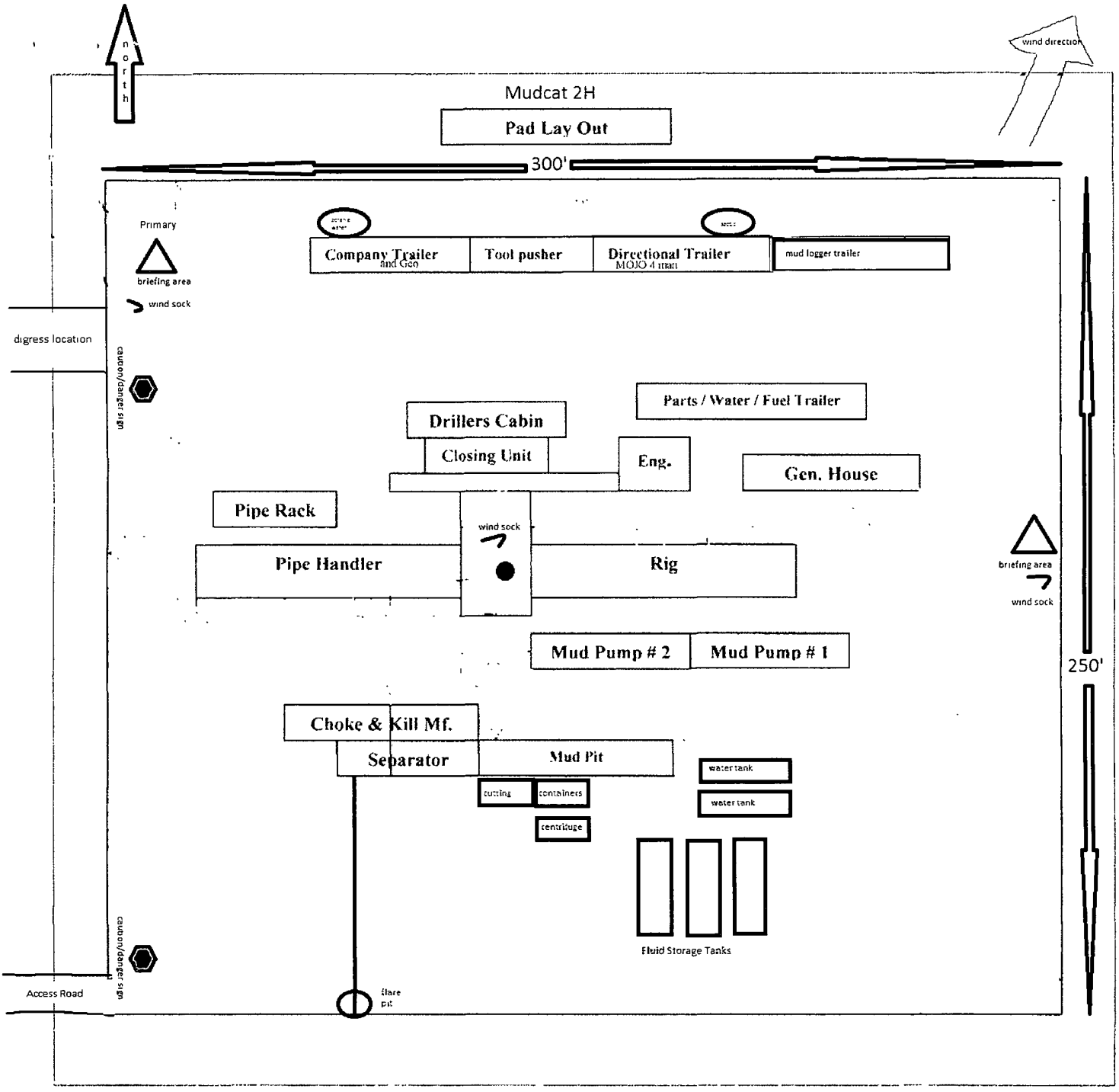


Exhibit E


NORTH
Mudcat 2H
Pad Lay Out
300'
250'
mud logger trailer
Company Trailer
and Geo
Tool pusher
Directional Trailer
MOKO 4 man
Mud Man Trailer
Murchison 4 man
Crew Quarters
14 man trailer
Parts / Water / Fuel Trailer
Drillers Cabin
Closing Unit
Eng.
Gen. House
Pipe Rack
Pipe Handler
Rig
Mud Pump # 2
Mud Pump # 1
Choke & Kill Mf.
Separator
Mud Pit
cutting
containers
centrifuge
water tank
water tank
Fluid Storage Tanks
acess road


north
wind direction
Mudcat 2H
Pad Lay Out
300'
Primary
briefing area
wind sock
digress location
caution/danger sign
Company Trailer
and Geo
Tool pusher
Directional Trailer
MOJO 4 man
mud logger trailer
Parts / Water / Fuel Trailer
Drillers Cabin
Closing Unit
Eng.
Gen. House
Pipe Rack
wind sock
Pipe Handler
Rig
briefing area
wind sock
Mud Pump # 2
Mud Pump # 1
250'
Choke & Kill Mf.
Separator
Mud Pit
water tank
water tank
cutting
containers
centrifuge
Fluid Storage Tanks
caution/danger sign
Access Road
flare pit

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 & Natural Resources Department
OIL CONSERVATION DIVISION
1220 South St. Francis Dr.
Santa Fe, NM 87505

Form C-102
Revised October 15,2009
Submit one copy to appropriate
District Office

☐ AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

[1] API Number	[2] Pool Code	[3] Pool Name
	96210	Empire; Glorieta-Yeso

[4] Property Code	[5] Property Name	[6] Well Number
	MUDCAT FEDERAL COM	2H

[7] OGRID No.	[8] Operator Name	[9] Elevation
15363	MURCHISON OIL & GAS, INC.	3591.1

[10] Surface Location

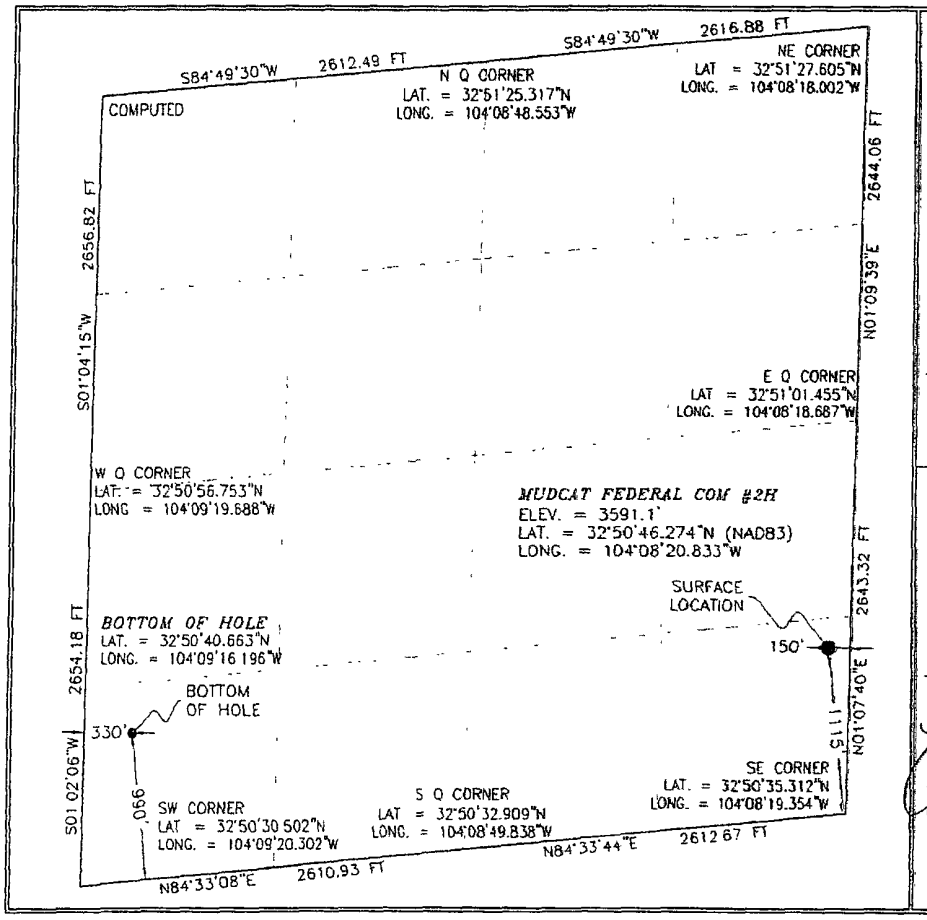
UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
P	11	17 S	28 E		1115	SOUTH	150	EAST	EDDY

[11] 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
M	11	17 S	28 E		990	SOUTH	330	WEST	EDDY

[12] Dedicated Acres	[13] Joint or Infill	[14] Consolidation Code	[15] Order No.
160			

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.



[17] OPERATOR CERTIFICATION

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

Signature 5/7/12 Date

Printed Name Michael S. Daugherty
COO

[18] SURVEYOR CERTIFICATION

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.

MARCH 5, 2012
Date of Survey

Signature and Seal of Professional Surveyor:
PHILIMON F. JARAMILLO
NEW MEXICO
REGISTERED LAND SURVEYOR

Certificate Number: PHILMON F. JARAMILLO, PLS 12797
SURVEY NO. 803

MURCHISON OIL & GAS, INC.

HYDROGEN SULFIDE (H2S) CONTINGENCY PLAN FOR DRILLING / COMPLETING / WORKOVER / FACILITY WITH THE EXPECTATION OF H2S IN EXCESS OF 100 PPM

Murchison Oil & Gas, Inc.
NEW DRILL WELL
Mudcat Fed Com #2H
SL: 1,115' FSL & 150' FEL, Unit P
BHL: 990' FSL & 330' FWL, Unit M
Sec 11, T17S, R28E
Eddy County, New Mexico

TABLE OF CONTENTS

GENERAL H2S EMERGENCY ACTIONS

In the event of any evidence of H2S emergency, the following plan will be initiated:

1. All personnel will immediately evacuate to an upwind and if possible uphill "safe area."
2. If for any reason a person must enter the hazardous area, they must wear a SCBA (self-contained breathing apparatus).
3. Always use the "buddy system."
4. Isolate the well/problem if possible.
5. Account for all personnel.
6. Display the proper colors warning all unsuspecting personnel of the danger at hand.
7. Contact the company representative as soon as possible if not at the location (use the enclosed call list as instructed).

At this point the company representative will evaluate the situation and coordinate the necessary duties to bring the situation under control, and if necessary, the notification of emergency response agencies and residents.

EMERGENCY PROCEDURES FOR AN UNCONTROLLABLE RELEASE OF H2S

1. All personnel will don the self-contained breathing apparatus.
2. Remove all personnel to the "safe area" (always use the "buddy system").
3. Contact company representative if not on location.
4. Set in motion the steps to protect and/or remove the general public to any upwind "safe area." Maintain strict security and safety procedures while dealing with the source.
5. No entry to any unauthorized personnel.
6. Notify the appropriate agencies: City Police - City streets
   State Police - State Roads
   County Sheriff - County Roads
7. Call the NMOCD.

If at this time the supervising person determines the release of H2S cannot be contained to the site location and the general public is in harm's way, he will immediately notify public safety personnel.

EMERGENCY CALL LIST

	Office	Cell	Home
Jack Rankin	972-931-0700	713-582-3859	281-894-7065
Greg Boans	575-628-3932	575-706-0667	575-887-9181

EMERGENCY RESPONSE NUMBERS

State Police	**888-442-6677**
Eddy County Sheriff - Carlsbad	**575-396-3611**
Eddy County Emergency Management - Carlsbad	**575-887-7551**
State Emergency Response Center (SERC)	**575-476-9620**
Artesia Police / Fire / Ambulance Department	**575-746-5000**
New Mexico Oil Conservation Division - Artesia	**575-748-1283**
Callaway Safety Equipment, Inc.	**575-392-2973**

PROTECTION OF THE GENERAL (ROE) RADIUS OF EXPOSURE

In the event greater than 100 ppm H2S is present, the ROE calculations will be done to determine if the following conditions exist and whether the Plan must be activated:

* 100 ppm at any public area (any place not associated with this site)

* 500 ppm at any public road (any road which the general public may travel).

* 100 ppm radius of 3000' will be assumed if there is insufficient data to do the calculations, and there is a reasonable expectation that H2S could be present in concentrations greater than 100 ppm in the gas mixture.

Calculation for the 100 ppm ROE: (H2S concentrations in decimal form)

ROE = [(1.589)(H2S concentration)(Q)] (^0.6258) 10,000 ppm + = .01
1,000 ppm + = .001

Calculation for the 500 ppm ROE: 100 ppm + = .0001
10 ppm + = .00001

ROE = [(0.4546)(H2S concentration)(Q)] (^0.6258)

EXAMPLE: If a well/facility has been determined to have 650 ppm H2S in the gas mixture and the well/facility is producing at a gas rate of 200 MCFD then:

ROE for 100 ppm ROE=[(1.589)(.00065)(200,000)] ^0.6258
ROE=28.1'

ROE for 500 ppm ROE=[(.4546)(.00065)(200,000)] ^0.6258
ROE=12.8'

These calculations will be forwarded to the appropriate NMOCD district office when applicable.

PUBLIC EVACUATION PLAN

When the supervisor has determined that the general public will be involved, the following plan will be implemented.

1. Notification of the emergency response agencies of the hazardous condition and implement evacuation procedures.
2. A trained person in H2S safety shall monitor with detection equipment the H2S concentration, wind and area of exposure. This person will determine the outer perimeter of the hazardous area. The extent of the evacuation area will be determined from the data being collected. Monitoring shall continue until the situation has been resolved. All monitoring equipment shall be UL approved for use in Class I Groups A, B, C & D, Division I hazardous locations. All monitors will have a minimum capability of measuring H2S, oxygen, and flammable values.
3. Law enforcement shall be notified to set up necessary barriers and maintain such for the duration of the situation as well as aid in the evacuation procedure.
4. The company representative shall stay in communication with all agencies throughout the duration of the situation and inform such agencies when the situation has been contained and the affected area is safe to enter.

PROCEDURE FOR IGNITING AN UNCONTROLLABLE CONDITION

The decision to ignite a well should be a last resort with one, if not both, of the following conditions:

1. Human life and/or property are endangered.
2. There is no hope of bringing the situation under control with the prevailing conditions at the site.

Instructions for Igniting the Well:

1. Two people are required. They must be equipped with positive pressure, self-contained breathing apparatus and "D"-ring style, full body, OSHA approved safety harness. Non-flammable rope will be attached.
2. One of the people will be a qualified safety person who will test the atmosphere for H2S, oxygen and LFL. The other person will be the designated company representative.
3. Ignite upwind from a distance no closer than necessary. Make sure that the ignition site has the maximum escape avenue available. A 25mm flare gun with a range of approximately +/- 500 feet shall be used to ignite the gas.
4. Before igniting, check for the presence of combustible gases.
5. After igniting, continue emergency actions and procedures as before.

REQUIRED EMERGENCY EQUIPMENT

1. **Breathing Apparatus**
   - Rescue Packs (SCBA) – 1 unit shall be placed at each breathing area, 2 shall be stored in the safety trailer.
   - Work / Escape Packs – 4 packs shall be stored on the rig floor with sufficient air hose not to restrict work activity.
   - Emergency Escape Packs – 4 packs shall be stored in the doghouse for emergency evacuation.

2. **Signage and Flagging**
   - One Color Code Condition Sign will be placed at the entrance to the site reflecting the possible conditions at the site.
   - A Colored Condition flag will be on display reflecting the condition at the site at that time.

3. **Briefing Area**
   - Two perpendicular areas will be designated by signs and readily accessible.

4. **Windsocks**
   - Two windsocks will be placed in strategic locations, visible from all angles.

5. **H2S Detectors and Alarms**
   - The stationary detector with three (3) sensors will be placed in the upper dog house if equipped, set to visually alarm @ 10 ppm and audible alarm @ 15 ppm. Calibrate a minimum of every 30 days or as needed. The three sensors will be placed in the following places: (Gas sample tubes will be stored in the safety trailer):
     - Rig Floor
     - Bell Nipple
     - End of flow line or where well bore fluid is being discharged

6. **Auxiliary Rescue Equipment**
   - Stretcher
   - Two OSHA full body harnesses
   - 100' of 5/8" OSHA approved rope
   - One 20 lb. Class ABC fire extinguisher
   - Communication via cell phones on location and vehicles on location

USING SELF-CONTAINED BREATHING AIR EQUIPMENT (SCBA)

1. SCBA should be worn when any of the following are performed:
   - Working near the top or on top of a tank
   - Disconnecting any line where H2S can reasonably be expected.
   - Sampling air in the area to determine if toxic concentrations of H2S exist.
   - Working in areas where over 10 ppm of H2S has been detected.
   - At any time there is a doubt of the level of H2S in the area.
2. All personnel shall be trained in the use of SCBA prior to working in a potentially hazardous location.
3. Facial hair and standard eyeglasses are not allowed with SCBA.
4. Contact lenses are never allowed with SCBA.
5. When breaking out any line where H2S can reasonably be expected.
6. After each use, the SCBA unit shall be cleaned, disinfected, serviced and inspected.
7. All SCBA shall be inspected monthly.

RESCUE & FIRST AID FOR VICTIMS OF H2S POISONING

- Do not panic.
- Remain calm and think.
- Put on the breathing apparatus.
- Remove the victim to the safe breathing area as quickly as possible, upwind and uphill from source or crosswind to achieve upwind.
- Notify emergency response personnel.
- Provide artificial respiration and/or CPR as necessary.
- Remove all contaminated clothing to avoid further exposure.
- A minimum of two (2) personnel on location shall be trained in CPR and First Aid.

TOXIC EFFECTS OF H2S POISONING

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 is colorless and transparent. Hydrogen Sulfide is almost as toxic as Hydrogen Cyanide and is 5-6 times more toxic that Carbon Monoxide. Occupational exposure limits for Hydrogen sulfide and other gasses are compared below in Table 1. Toxicity table for H2S and physical effects are shown in Table II.

Table 1

Permissible Exposure Limits of Various Gasses

Common Name	Symbol	Sp. Gravity	TLV	STEL	IDLH
Hydrogen Cyanide	HCN	.94	4.7 ppm	C	
Hydrogen Sulfide	H2S	1.192	10 ppm	15 ppm	100 ppm
Sulfide Dioxide	SO2	2.21	2 ppm	5 ppm	
Chlorine	CL	2.45	.5 ppm	1 ppm	
Carbon Monoxide	CO	.97	25 ppm	200 ppm	
Carbon Dioxide	CO2	1.52	5000 ppm	30,000 ppm	
Methane	CH4	.55	4.7% LEL	14% UEL	

Definitions

A. TLV – Threshold Limit Value is the concentration employees may be exposed to based on a TWA (time weighted average) for eight (8) hours in one day for 40 hours in one (1) week. This is set by ACGIH (American Conference of Governmental Hygienists and regulated by OSHA.

B. STEL – Short Term Exposure Limit is the 15 minute average concentration an employee may be exposed to providing that the highest exposure never exceeds the OEL (Occupational Exposure Limit). The OEL for H2S is 19 PPM.

C. IDLH – Immediately Dangerous to Life and Health is the concentration that has been determined by the ACGIH to cause serious health problems or death if exposed to this level. The IDLH for H2S is 100 PPM.

D. TWA – Time Weighted Average is the average concentration of any chemical or gas for an eight (8) hour period. This is the concentration that any employee may be exposed to based on an TWA.

TABLE II

Toxicity Table of H2S

Percent %	PPM	Physical Effects
.0001	1	Can smell less than 1 ppm.
.001	10	TLV for 8 hours of exposure
.0015	15	STEL for 15 minutes of exposure
.01	100	Immediately Dangerous to Life & Health. Kills sense of smell in 3 to 5 minutes.
.02	200	Kills sense of smell quickly, may burn eyes and throat.
.05	500	Dizziness, cessation of breathing begins in a few minutes.
.07	700	Unconscious quickly, death will result if not rescued promptly.
.10	1000	Death will result unless rescued promptly. Artificial resuscitation may be necessary.

PHYSICAL PROPERTIES OF H2S

The properties of all gases are usually described in the context of seven major categories:

COLOR
ODOR
VAPOR DENSITY
EXPLOSIVE LIMITS
FLAMMABILITY
SOLUBILITY (IN WATER)
BOILING POINT

Hydrogen Sulfide is no exception. Information from these categories should be considered in order to provide a fairly complete picture of the properties of the gas.

COLOR – TRANSPARENT
Hydrogen Sulfide is colorless so it is invisible. This fact simply means that you can't rely on your eyes to detect its presence, a fact that makes the gas extremely dangerous to be around.

ODOR – ROTTEN EGGS
Hydrogen Sulfide has a distinctive offensive smell, similar to "rotten eggs." For this reason it earned its common name "sour gas." However, H2S, even in low concentrations, is so toxic that it attacks and quickly impairs a victim's sense of smell, so it could be fatal to rely on your nose as a detection device.

VAPOR DENSITY – SPECIFIC GRAVITY OF 1.192
Hydrogen Sulfide is heavier than air so it tends to settle in low-lying areas like pits, cellars or tanks. If you find yourself in a location where H2S is known to exist, protect yourself. Whenever possible, work in an area upwind and keep to higher ground.

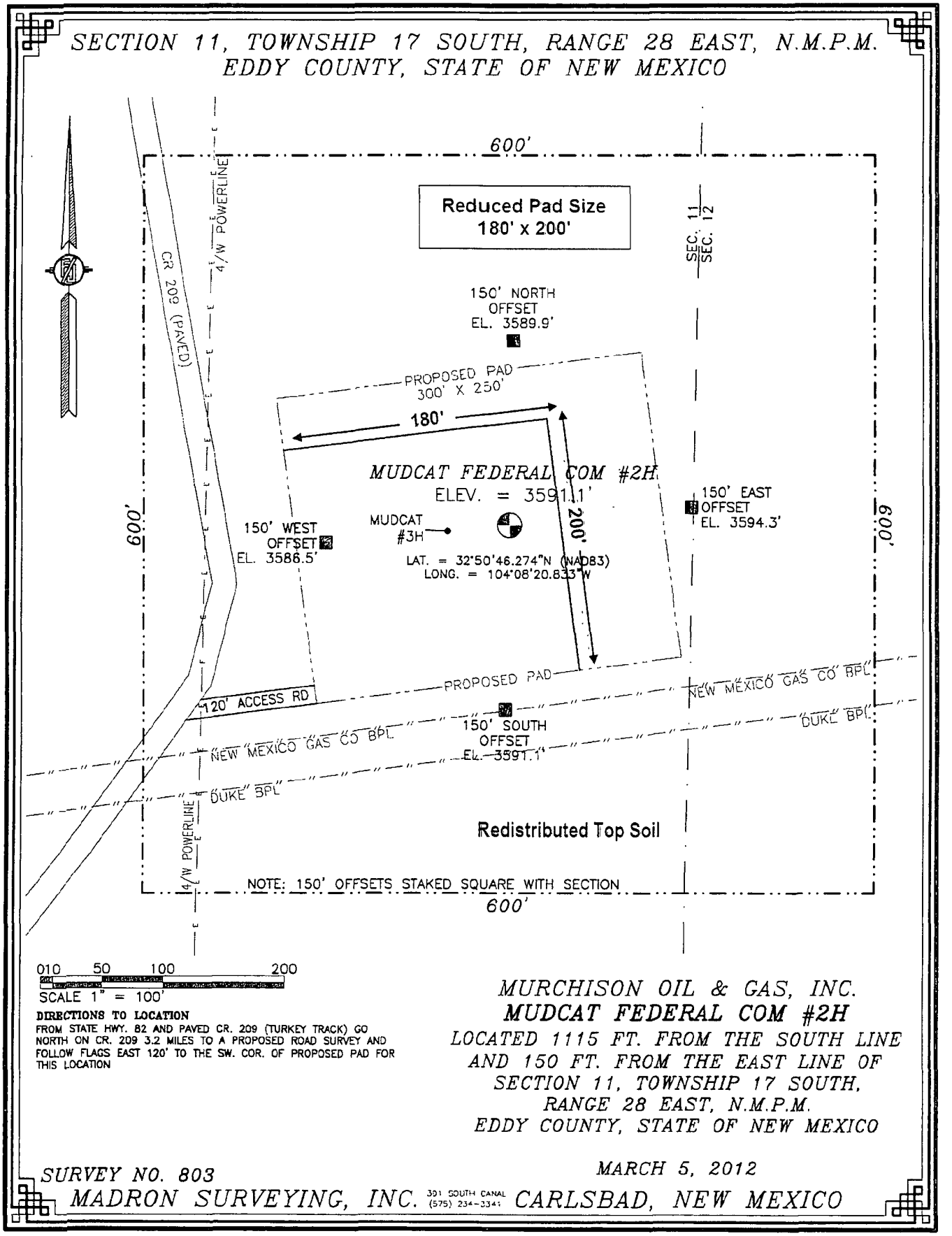
EXPLOSIVE LIMITS – 4.3% TO 46%
Mixed with the right proportion of air or oxygen, H2S will ignite and burn or explode, producing another alarming element of danger besides poisoning.

FLAMMABILITY
Hydrogen Sulfide will burn readily with a distinctive clear blue flame, producing Sulfur Dioxide (SO2), another hazardous gas that irritates the eyes and lungs.

SOLUBILITY – 4 TO 1 RATIO WITH WATER
Hydrogen Sulfide can be dissolved in liquids, which means that it can be present in any container or vessel used to carry or hold well fluids including oil, water, emulsion and sludge. The solubility of H2S is dependent on temperature and pressure, but if conditions are right, simply agitating a fluid containing H2S may release the gas into the air.

BOILING POINT – (-76 degrees Fahrenheit)
Liquefied Hydrogen Sulfide boils at a very low temperature, so it is usually found as a gas.

EXHIBIT G-2 INTERIM RECLAMATION



DIRECTIONS TO LOCATION
FROM STATE HWY. 82 AND PAVED CR. 209 (TURKEY TRACK) GO NORTH ON CR. 209 3.2 MILES TO A PROPOSED ROAD SURVEY AND FOLLOW FLAGS EAST 120' TO THE SW. COR. OF PROPOSED PAD FOR THIS LOCATION

MURCHISON OIL & GAS, INC.
MUDCAT FEDERAL COM #2H
LOCATED 1115 FT. FROM THE SOUTH LINE AND 150 FT. FROM THE EAST LINE OF SECTION 11, TOWNSHIP 17 SOUTH, RANGE 28 EAST, N.M.P.M. EDDY COUNTY, STATE OF NEW MEXICO

SURVEY NO. 803
MARCH 5, 2012
MADRON SURVEYING, INC. 301 SOUTH CANAL (575) 234-3341 *CARLSBAD, NEW MEXICO*

PECOS DISTRICT
CONDITIONS OF APPROVAL

OPERATOR'S NAME:	Murchison Oil & Gas
LEASE NO.:	LC068712
WELL NAME & NO.:	2H Mudcat Federal Com
SURFACE HOLE FOOTAGE:	1115' FSL & 150' FEL
BOTTOM HOLE FOOTAGE	990' FSL & 330' FWL
LOCATION:	Section 11, T.17 S., R.28 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.