

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENTCarlsbad Field Office
FORM APPROVED
OMB NO. 1004-0137
Expires: January 31, 2018**SUNDRY NOTICES AND REPORTS ON WELLS**
*Do not use this form for proposals to drill or to re-enter an abandoned well. Use form 3160-3 (APD) for such proposals.*5. Lease Serial No.
NM C064200

6. If Indian, Allottee or Tribe Name

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

8. Well Name and No.
RIVERBOAT 12/1 W0PA FED COM 1H9. API Well No.
30-015-4530510. Field and Pool or Exploratory Area
PURPLE SAGE WOLFCAMP11. County or Parish, State
EDDY COUNTY, NM**SUBMIT IN TRIPLICATE - Other instructions on page 2**

1. Type of Well

☐ Oil Well ☒ Gas Well ☐ Other2. Name of Operator
CIMAREX ENERGY CO.Contact: AMITHY E CRAWFORD
E-Mail: acrawford@cimarex.com3a. Address
600 N. MARIENFELD SUITE 600
MIDLAND, TX 797013b. Phone No. (include area code)
Ph: 432-620-19094. Location of Well (Footage, Sec., T., R., M., or Survey Description)
Sec 12 T24S R26E 285FSL 449FEL**12. CHECK THE APPROPRIATE BOX(ES) TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA**

TYPE OF SUBMISSION	TYPE OF ACTION			
☒ Notice of Intent	☐ Acidize	☐ Deepen	☐ Production (Start/Resume)	☐ Water Shut-Off
☐ Subsequent Report	☐ Alter Casing	☐ Hydraulic Fracturing	☐ Reclamation	☐ Well Integrity
☐ Final Abandonment Notice	☐ Casing Repair	☐ New Construction	☐ Recomplete	☒ Other
	☐ Change Plans	☐ Plug and Abandon	☐ Temporarily Abandon	Change to Original APD
	☐ Convert to Injection	☐ Plug Back	☐ Water Disposal	

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

Cimarex Respectfully requests to change the SHL of the Riverboat 12/1 W0PA Federal Com 1H well. The move will be located within the already approved pad and there will no new surface disturbance.

RECEIVED

Cimarex Respectfully requests to change the drilling program as approved in the original APD in its entirety. Changes to the Casing program, Cement program, Mud program, BOPs ect. were made. Please update COAs for the new drilling program attached.

APR 25 2019

The Rig layout, including v-door and flare line may change depending on rig availability. The pad dimensions and orientation will remain the same. There will be no additional disturbance if a rig layout change is necessary to accommodate the drilling rig.

DISTRICT II-ARTESIA O.C.D.

SHL

Surface good SL 4-3-2019 Engineering Good. 25. All COAs shall apply.

14. I hereby certify that the foregoing is true and correct.

Electronic Submission #441221 verified by the BLM Well Information System
For CIMAREX ENERGY CO., sent to the Carlsbad
Committed to AFMSS for processing by MUSTAFA HAQUE on 10/25/2018 ()

Name (Printed/Typed) AMITHY E CRAWFORD

Title REGULATORY ANALYST

Signature (Electronic Submission)

Date 10/25/2018

THIS SPACE FOR FEDERAL OR STATE OFFICE USE

Approved By

Title

Date

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

Office

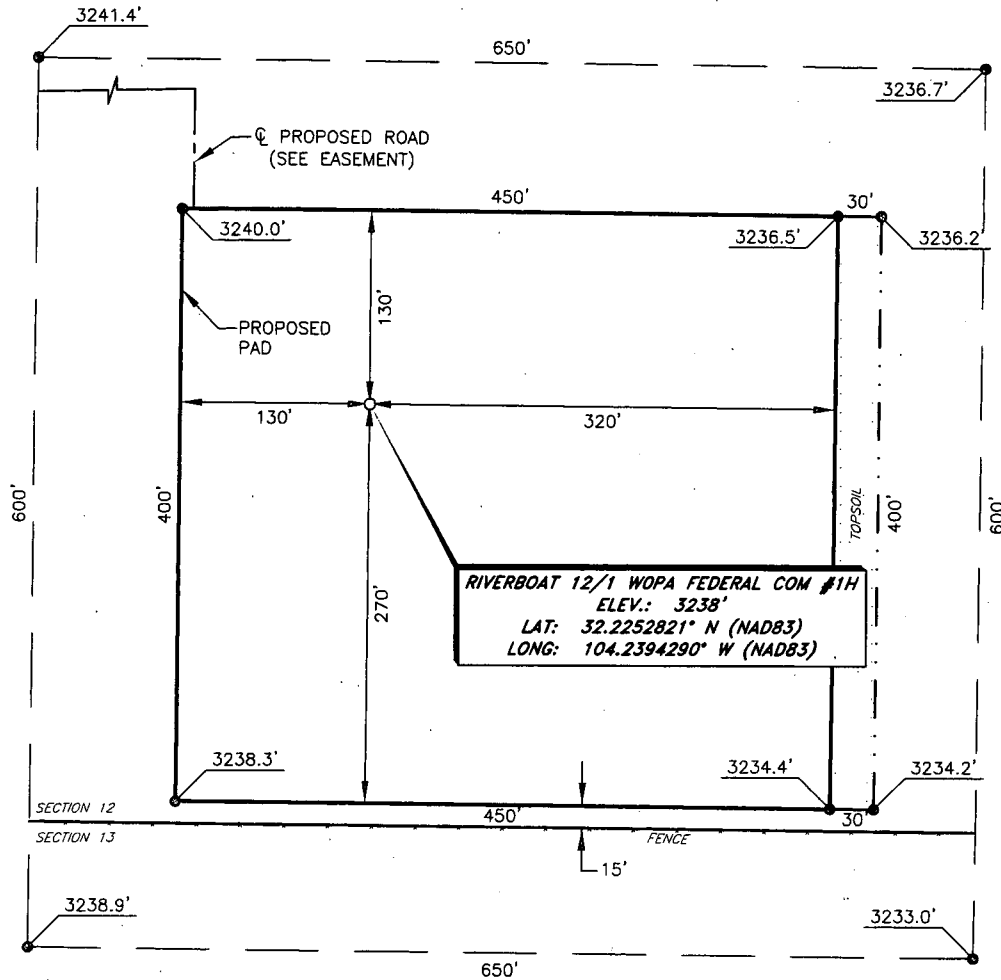
Title 18 U.S.C. Section 1001 and Title 43 U.S.C. Section 1212, make it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

(Instructions on page 2)

**** OPERATOR-SUBMITTED ** OPERATOR-SUBMITTED ** OPERATOR-SUBMITTED ****

RW 5-24-19

CIMAREX ENERGY COMPANY
RIVERBOAT 12/1 WOPA FEDERAL COM #1H
(285' FSL & 449' FEL)
SECTION 12, T24S, R26E
N. M. P. M., EDDY CO., NEW MEXICO



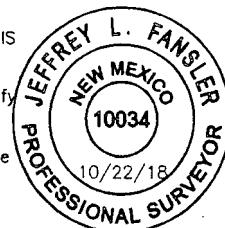
DIRECTIONS TO LOCATION

From the intersection of C.R. 396 (Black River Village Rd.) & C.R. 763 (Bounds Rd.)
go Northeast on C.R. 763 for approx. 1.3 miles;
Turn right onto lease road and go Southeast for approx. 0.8 miles;
Road curves, continue Northeast for approx. 0.1 miles;
Road curves, continue East for approx. 0.2 miles to proposed road;
Turn right onto proposed road and go East for approx. 0.6 miles;
Turn right and go South approx. 80 feet to proposed pad.

THIS IS NOT A BOUNDARY SURVEY, APPARENT PROPERTY CORNERS AND
PROPERTY LINES ARE SHOWN FOR INFORMATION ONLY, BOUNDARY DATA IS
SHOWN FROM A PREVIOUS SURVEY REFERENCED HEREON.

I, Jeffrey L. Fansler, a N. M. Professional Surveyor, hereby certify
that I prepared this plat from an actual survey made on the
ground under my direct supervision, said survey and plat meet
the Min. Stds. for Land Surveying in the State of N. M. and are
true and correct to the best of my knowledge and belief.

Jeffrey L. Fansler
Jeffrey L. Fansler NM PS 10034



SCALE: 1" = 100'
0 50' 100'

BEARINGS ARE GRID NAD 83
NM EAST
DISTANCES ARE HORIZ. GROUND.

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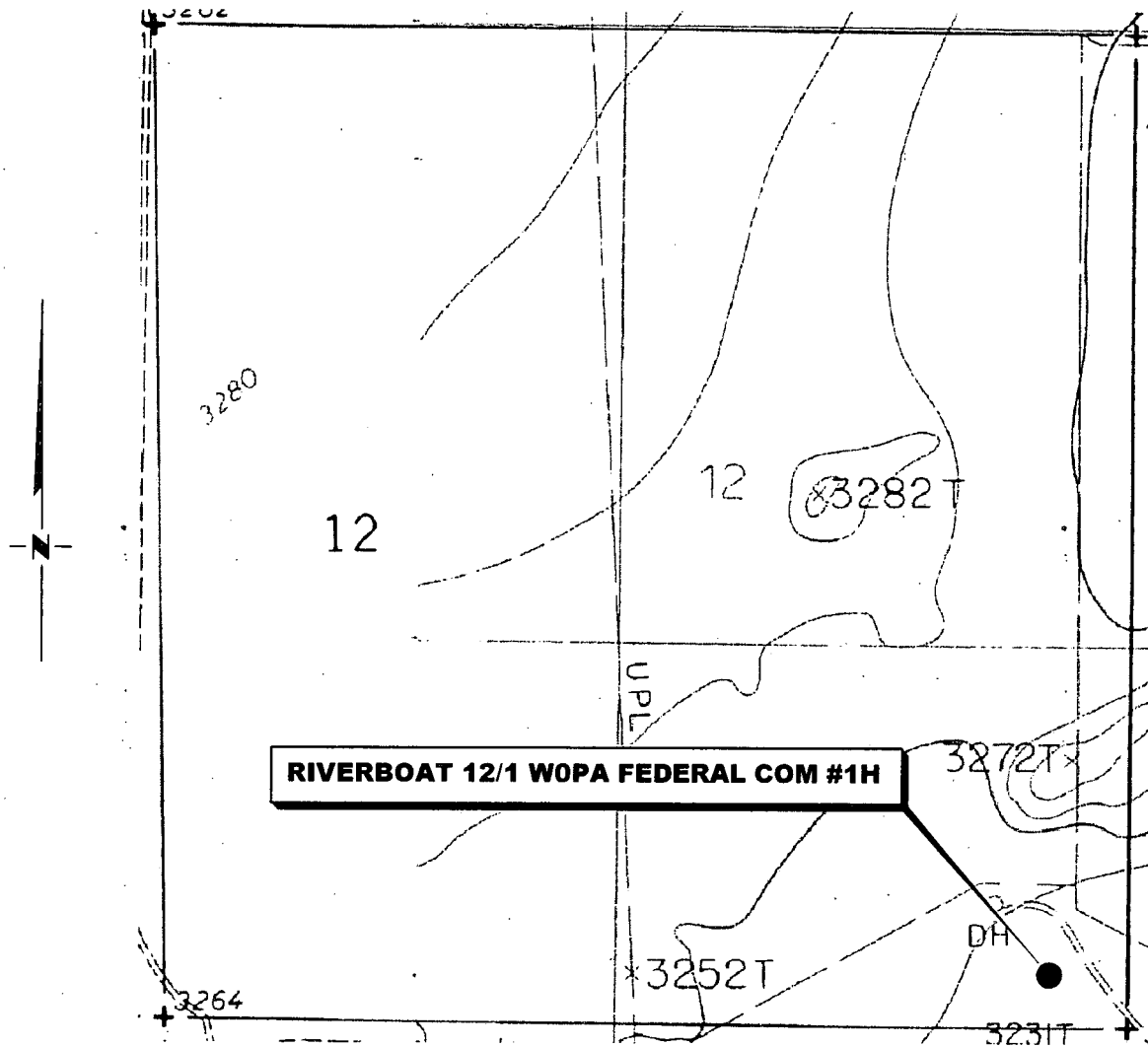
NO.	REVISION	DATE
JOB NO.:	LS18101186	
DWG. NO.:	4-18101186	

RRC

701 S. CECIL STREET, HOBBS, NM 88240 (575) 964-8200

SCALE: 1" = 100'
DATE: 10-19-2018
SURVEYED BY: AB/RU
DRAWN BY: Aiac
APPROVED BY: JLF
SHEET : 1 OF 1

LOCATION VERIFICATION MAP



*SECTION 12, TWP. 24 SOUTH, RGE. 26 EAST,
N. M. P. M., EDDY COUNTY, NEW MEXICO*

OPERATOR: Cimarex Energy Company
LEASE: Riverboat 12/1 WOPA Federal Com
WELL NO.: 1H
ELEVATION: 3238'

LOCATION: 285' FSL & 449' FEL
CONTOUR INTERVAL: 10'
USGS TOPO. SOURCE MAP:
Bond Draw, NM (P. E. 1985)

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NO.	REVISION	DATE
JOB NO.:	LS18101186	
DWG. NO.:	2-18101186	

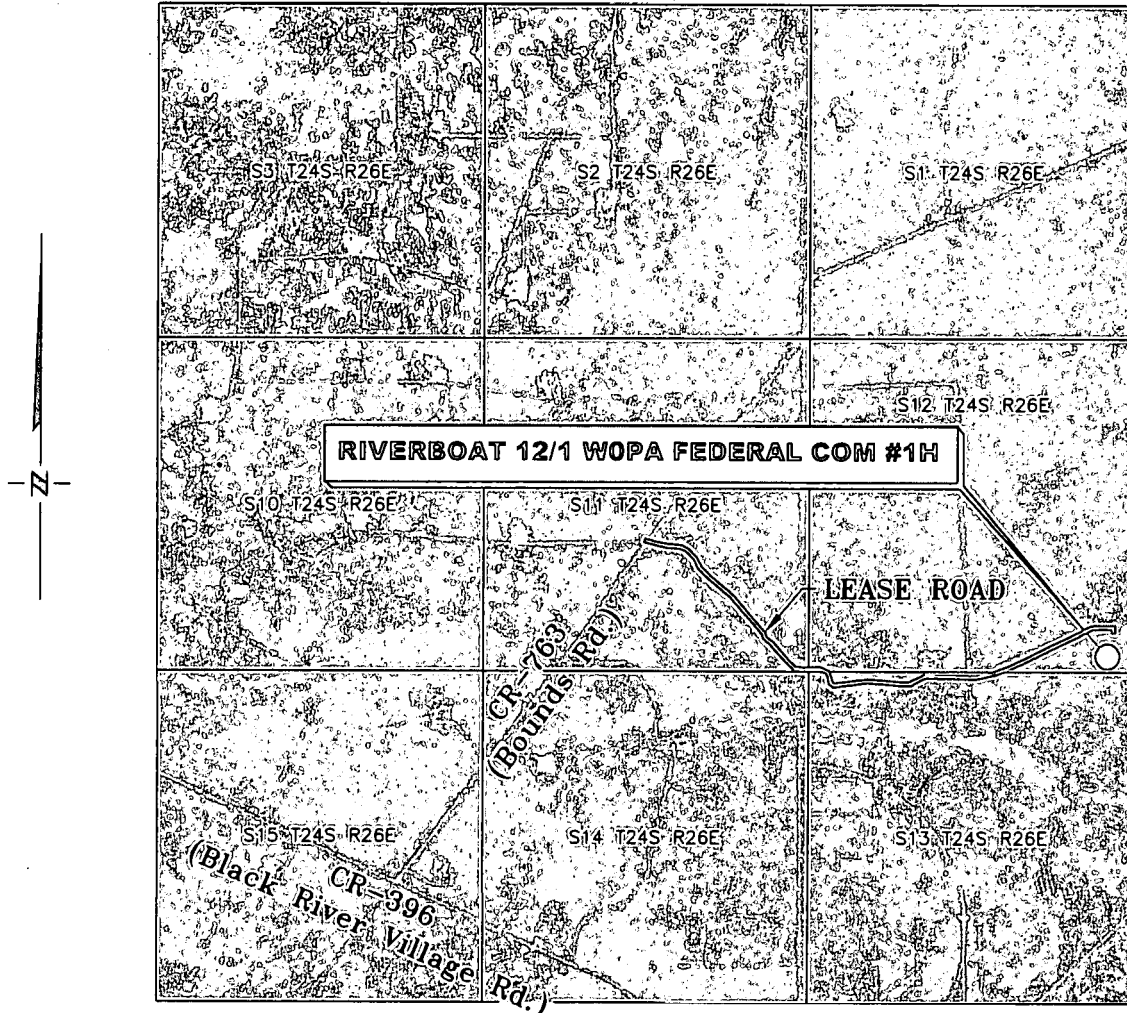
RRC

701 S. CECIL STREET, HOBBS, NM 88240 (575) 964-8200

SCALE: 1" = 1000'
DATE: 10-19-2018
SURVEYED BY: AB/RU
DRAWN BY: AiAC
APPROVED BY: JLF
SHEET: 1 OF 1

VICINITY MAP

NOT TO SCALE



SECTION 12, TWP. 24 SOUTH, RGE. 26 EAST,
N. M. P. M., EDDY COUNTY, NEW MEXICO

OPERATOR: Cimarex Energy Company
LEASE: Riverboat 12/1 WOPA Federal Com
WELL NO.: 1H

LOCATION: 285' FSL & 449' FEL
ELEVATION: 3238'

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NO.	REVISION	DATE
JOB NO.:	LS18101186	
DWG. NO.:	3-18101186	

RRC

701 S. CECIL STREET, HOBBS, NM 88240 (575) 964-8200

SCALE:	N. T. S.
DATE:	10-19-2018
SURVEYED BY:	AB/RU
DRAWN BY:	AiAC
APPROVED BY:	JLF
SHEET:	1 OF 1

1. Geological Formations

TVD of target 8,843

Pilot Hole TD N/A

MD at TD 18,544

Deepest expected fresh water

Formation	Depth (TVD) from KB	Water/Mineral Bearing/Target Zone	Hazards
Salado	1030	N/A	
Castille	1660	N/A	
Bell Canyon	2000	Hydrocarbons	
Cherry Canyon	2874	Hydrocarbons	
Brushy Canyon	3792	Hydrocarbons	
Bone Spring	5372	Hydrocarbons	
1st Bone Spring SS	6386	Hydrocarbons	
2nd Bone Spring SS	6918	Hydrocarbons	
3rd Bone Spring Carb	7054	Hydrocarbons	
Top Harkey SS	7801	Hydrocarbons	
3rd Bone Spring SS	8306	Hydrocarbons	
Wolfcamp	8666	Hydrocarbons	
Wolfcamp Y SS	8752	Hydrocarbons	

2. Casing Program

Hole Size	Casing Depth From	Casing Depth To	Setting Depth TVD	Casing Size	Weight (lb/ft)	Grade	Conn.	SF Collapse	SF Burst	SF Tension
17 1/2	0	425	425	13-3/8"	48.00	H-40/J-55 Hybrid	ST&C	3.76	8.80	15.78
12 1/4	0	1980	1980	9-5/8"	36.00	J-55	LT&C	1.92	3.35	6.36
8 3/4	0	8263	8263	7"	26.00	L-80	LT&C	1.40	1.87	2.25
8 3/4	8263	8888	8724	7"	26.00	N-80	BT&C	1.33	1.77	50.39
6	8263	18544	18544	4-1/2"	11.60	P-110	BT&C	1.57	2.22	54.55
BLM Minimum Safety Factor								1.125	1	1.6 Dry 1.8 Wet

TVD was used on all calculations.

All casing strings will be tested in accordance with Onshore Oil and Gas Order #2 III.B.1.h

Cimarex Energy Co., Riverboat 12/1 WOPA Fed Com 1H

	Y or N
Is casing new? If used, attach certification as required in Onshore Order #1	Y
Does casing meet API specifications? If no, attach casing specification sheet.	Y
Is premium or uncommon casing planned? If yes attach casing specification sheet.	N
Does the above casing design meet or exceed BLM's minimum standards? If not provide justification (loading assumptions, casing design criteria).	Y
Will the intermediate pipe be kept at a minimum 1/3 fluid filled to avoid approaching the collapse pressure rating of the casing?	Y
Is well located within Capitan Reef?	N
If yes, does production casing cement tie back a minimum of 50' above the Reef?	N
Is well within the designated 4 string boundary.	N
Is well located in SOPA but not in R-111-P?	N
If yes, are the first 2 strings cemented to surface and 3rd string cement tied back 500' into previous casing?	N
Is well located in R-111-P and SOPA?	N
If yes, are the first three strings cemented to surface?	N
Is 2nd string set 100' to 600' below the base of salt?	N
Is well located in high Cave/Karst?	N
If yes, are there two strings cemented to surface?	N
(For 2 string wells) If yes, is there a contingency casing if lost circulation occurs?	N
Is well located in critical Cave/Karst?	N
If yes, are there three strings cemented to surface?	N
Is AC Report included?	N

3. Cementing Program

Casing	# Sk	Wt. lb/gal	Yld ft ³ /sack	H ₂ O gal/sk	500# Comp. Strength (hours)	Slurry Description
Surface	98	14.80	1.34	6.32	9.5	Lead: Class C + LCM
	195	14.80	1.34	6.32	9.5	Tail: Class C + LCM
Intermediate	375	12.90	1.88	9.65	12	Lead: 35:65 (Poz:C) + Salt + Bentonite
	116	14.80	1.34	6.32	9.5	Tail: Class C + LCM
Production	334	10.30	3.64	22.18		Lead: Tuned Light + LCM
	80	14.20	1.30	5.86	14:30	Tail: 50:50 (Poz:H) + Salt + Bentonite + Fluid Loss + Dispersant + SMS
Completion System	702	14.20	1.30	5.86	14:30	Tail: 50:50 (Poz:H) + Salt + Bentonite + Fluid Loss + Dispersant + SMS

Casing String	TOC	% Excess
Surface	0	32
Intermediate	0	50
Production	1780	24
Completion System	8888	10

4. Pressure Control Equipment

A variance is requested for the use of a diverter on the surface casing. See attached for schematic.					
BOP installed and tested before drilling which hole?	Size	Min. Required WP	Type		Tested To
12 1/4	13 5/8	2M	Annular	X	50% of working pressure
			Blind Ram		2M
			Pipe Ram	X	
			Double Ram	X	
			Other		
8 3/4	13 5/8	3M	Annular	X	50% of working pressure
			Blind Ram		3M
			Pipe Ram	X	
			Double Ram	X	
			Other		
6	13 5/8	5M	Annular	X	50% of working pressure
			Blind Ram		5M
			Pipe Ram	X	
			Double Ram	X	
			Other		

BOP/BOPE will be tested by an independent service company to 250 psi low and the high pressure indicated above per Onshore Order 2 requirements. The System may be upgraded to a higher pressure but still tested to the working pressure listed in the table above. If the system is upgraded all the components installed will be functional and tested.

Pipe rams will be operationally checked each 24 hour period. Blind rams will be operationally checked on each trip out of the hole. These checks will be noted on the daily tour sheets. Other accessories to the BOP equipment will include a Kelly cock and floor safety valve (inside BOP) and choke lines and choke manifold. See attached schematics.

X	Formation integrity test will be performed per Onshore Order #2. On Exploratory wells or on that portion of any well approved for a 5M BOPE system or greater, a pressure integrity test of each casing shoe shall be performed. Will be tested in accordance with Onshore Oil and Gas Order #2 III.B.1.i.				
X	A variance is requested for the use of a flexible choke line from the BOP to Choke Manifold. See attached for specs and hydrostatic test chart.				
N	Are anchors required by manufacturer?				

5. Mud Program

Depth	Type	Weight (ppg)	Viscosity	Water Loss
0' to 425'	FW Spud Mud	8.40 - 8.90	30-32	N/C
425' to 1980'	Brine Water	9.70 - 10.20	30-32	N/C
1980' to 8888'	FW/Cut Brine	8.50 - 9.00	30-32	N/C
9252' to 18544'	OBM	10.00 - 10.50	50-70	N/C

Sufficient mud materials to maintain mud properties and meet minimum lost circulation and weight increase requirements will be kept on location at all times.

What will be used to monitor the loss or gain of fluid?	PVT/Pason/Visual Monitoring
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6. Logging and Testing Procedures

Logging, Coring and Testing	
X	Will run GR/CNL from TD to surface (horizontal well – vertical portion of hole). Stated logs run will be in the Completion Report and submitted to the BLM.
	No logs are planned based on well control or offset log information.
	Drill stem test?
	Coring?

Additional Logs Planned	Interval
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7. Drilling Conditions

Condition	
BH Pressure at deepest TVD	4828 psi
Abnormal Temperature	No

Hydrogen Sulfide (H₂S) monitors will be installed prior to drilling out the surface shoe. If H₂S is detected in concentrations greater than 100 ppm, the operator will comply with the provisions of Onshore Oil and Gas Order #6. If Hydrogen Sulfide is encountered, measured values and formations will be provided to the BLM.

X	H ₂ S is present
X	H ₂ S plan is attached

8. Other Facets of Operation**9. Wellhead**

A multi-bowl wellhead system will be utilized.

After running the 13-3/8" surface casing, a 13 5/8" BOP/BOPE system with a minimum working pressure of 5000 psi will be installed on the wellhead system and will be pressure tested to 250 psi low followed by a 5000 psi test. Annular will be tested to 50% of working pressure. The pressure test will be repeated at least every 30 days, as per Onshore Order No. 2.

The multi-bowl wellhead will be installed by vendor's representative. A copy of the installation instructions has been sent to the BLM field office.

The wellhead will be installed by a third-party welder while being monitored by the wellhead vendor representative.

All BOP equipment will be tested utilizing a conventional test plug. Not a cup or J-packer type.

A solid steel body pack-off will be utilized after running and cementing the intermediate casing. After installation the pack-off and lower flange will be pressure tested to 5000 psi.

A solid steel body pack-off will be utilized after running and cementing the production casing. After installation the pack-off and lower flange will be pressure tested to 5000 psi.

The surface casing string will be tested as per Onshore Order No. 2 to at least 0.22 psi/ft or 1500 psi, whichever is greater.

The casing string utilizing steel body pack-off will be tested to 70% of casing burst.

If well conditions dictate conventional slips will be set and BOPE will be tested to appropriate pressures based on permitted pressure requirements.

Cimarex Riverboat 12-1 W0PA Fed Com 1H Rev0 CVS 24Oct18 Proposal

Geodetic Report

(Non-Def Plan)



Report Date: October 24, 2018 - 04:51 PM
Client: Cimarex
Field: NM Eddy County (NAD 83)
Structure / Slot: Cimarex Riverboat 12-1 W0PA Fed Com 1H / Cimarex Riverboat 12-1 W0PA Fed Com 1H
Well: Cimarex Riverboat 12-1 W0PA Fed Com 1H
Borehole: Original Borehole
UWI / API#: Unknown / Unknown
Survey Name: Cimarex Riverboat 12-1 W0PA Fed Com 1H Rev0 CVS 24Oct18
Survey Date: October 24, 2018
Tort / AHD / DDI / ERD Ratio: 89.568° / 10005.629 ft / 6.274 / 1.131
Coordinate Reference System: NAD83 New Mexico State Plane, Eastern Zone, US Feet
Location Lat / Long: N 32° 13' 31.01543", W 104° 14' 21.94474"
Location Grid NE YIX: N 445704.100 RUS, E 570375.300 RUS
CRS Grid Convergence Angle: 0.0501°
Grid Scale Factor: 0.99991006
Version / Patch: 2.10.740.0

Survey / DLS Computation: Minimum Curvature / Lubinski
Vertical Section Azimuth: 0.451° (Grid North)
Vertical Section Origin: 0.000 ft, 0.000 ft
TVD Reference Datum: RKB
TVD Reference Elevation: 3258.000 ft above MSL
Seabed / Ground Elevation: 3238.000 ft above MSL
Magnetic Declination: 7.346°
Total Gravity Field Strength: 998.4518mgn (9.80665 Based)
Gravity Model: GARM
Total Magnetic Field Strength: 47894.833 nT
Magnetic Dip Angle: 59.919°
Declination Date: October 24, 2018
Magnetic Declination Model: HDGM 2018
North Reference: Grid North
Grid Convergence Used: 0.0501°
Total Corr Mag North->Grid North: 7.2980°
Local Coord Referenced To: Well Head

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	Northing (RUS)	Easting (RUS)	Latitude (N/S ° ' ")	Longitude (E/W ° ' ")
SHL [285' FSL, 449' FEL]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	N/A	445704.10	570375.30	N 32 13 31.02	W 104 14 21.94
	100.00	0.00	0.45	100.00	0.00	0.00	0.00	0.00	445704.10	570375.30	N 32 13 31.02	W 104 14 21.94
	200.00	0.00	0.45	200.00	0.00	0.00	0.00	0.00	445704.10	570375.30	N 32 13 31.02	W 104 14 21.94
	300.00	0.00	0.45	300.00	0.00	0.00	0.00	0.00	445704.10	570375.30	N 32 13 31.02	W 104 14 21.94
	400.00	0.00	0.45	400.00	0.00	0.00	0.00	0.00	445704.10	570375.30	N 32 13 31.02	W 104 14 21.94
	500.00	0.00	0.45	500.00	0.00	0.00	0.00	0.00	445704.10	570375.30	N 32 13 31.02	W 104 14 21.94
	600.00	0.00	0.45	600.00	0.00	0.00	0.00	0.00	445704.10	570375.30	N 32 13 31.02	W 104 14 21.94
	700.00	0.00	0.45	700.00	0.00	0.00	0.00	0.00	445704.10	570375.30	N 32 13 31.02	W 104 14 21.94
	800.00	0.00	0.45	800.00	0.00	0.00	0.00	0.00	445704.10	570375.30	N 32 13 31.02	W 104 14 21.94
	900.00	0.00	0.45	900.00	0.00	0.00	0.00	0.00	445704.10	570375.30	N 32 13 31.02	W 104 14 21.94
	1000.00	0.00	0.45	1000.00	0.00	0.00	0.00	0.00	445704.10	570375.30	N 32 13 31.02	W 104 14 21.94
Salado (Top Salt)	1030.00	0.00	0.45	1030.00	0.00	0.00	0.00	0.00	445704.10	570375.30	N 32 13 31.02	W 104 14 21.94
	1100.00	0.00	0.45	1100.00	0.00	0.00	0.00	0.00	445704.10	570375.30	N 32 13 31.02	W 104 14 21.94
	1200.00	0.00	0.45	1200.00	0.00	0.00	0.00	0.00	445704.10	570375.30	N 32 13 31.02	W 104 14 21.94
	1300.00	0.00	0.45	1300.00	0.00	0.00	0.00	0.00	445704.10	570375.30	N 32 13 31.02	W 104 14 21.94
	1400.00	0.00	0.45	1400.00	0.00	0.00	0.00	0.00	445704.10	570375.30	N 32 13 31.02	W 104 14 21.94
	1500.00	0.00	0.45	1500.00	0.00	0.00	0.00	0.00	445704.10	570375.30	N 32 13 31.02	W 104 14 21.94
	1600.00	0.00	0.45	1600.00	0.00	0.00	0.00	0.00	445704.10	570375.30	N 32 13 31.02	W 104 14 21.94
Castile (Base Salt)	1660.00	0.00	0.45	1660.00	0.00	0.00	0.00	0.00	445704.10	570375.30	N 32 13 31.02	W 104 14 21.94
	1700.00	0.00	0.45	1700.00	0.00	0.00	0.00	0.00	445704.10	570375.30	N 32 13 31.02	W 104 14 21.94
	1800.00	0.00	0.45	1800.00	0.00	0.00	0.00	0.00	445704.10	570375.30	N 32 13 31.02	W 104 14 21.94
	1900.00	0.00	0.45	1900.00	0.00	0.00	0.00	0.00	445704.10	570375.30	N 32 13 31.02	W 104 14 21.94
Bell Canyon (Top Delaware)	2000.00	0.00	0.45	2000.00	0.00	0.00	0.00	0.00	445704.10	570375.30	N 32 13 31.02	W 104 14 21.94
	2100.00	0.00	0.45	2100.00	0.00	0.00	0.00	0.00	445704.10	570375.30	N 32 13 31.02	W 104 14 21.94
	2200.00	0.00	0.45	2200.00	0.00	0.00	0.00	0.00	445704.10	570375.30	N 32 13 31.02	W 104 14 21.94
	2300.00	0.00	0.45	2300.00	0.00	0.00	0.00	0.00	445704.10	570375.30	N 32 13 31.02	W 104 14 21.94
	2400.00	0.00	0.45	2400.00	0.00	0.00	0.00	0.00	445704.10	570375.30	N 32 13 31.02	W 104 14 21.94
	2500.00	0.00	0.45	2500.00	0.00	0.00	0.00	0.00	445704.10	570375.30	N 32 13 31.02	W 104 14 21.94
	2600.00	0.00	0.45	2600.00	0.00	0.00	0.00	0.00	445704.10	570375.30	N 32 13 31.02	W 104 14 21.94
	2700.00	0.00	0.45	2700.00	0.00	0.00	0.00	0.00	445704.10	570375.30	N 32 13 31.02	W 104 14 21.94
	2800.00	0.00	0.45	2800.00	0.00	0.00	0.00	0.00	445704.10	570375.30	N 32 13 31.02	W 104 14 21.94
Cherry Canyon	2874.00	0.00	0.45	2874.00	0.00	0.00	0.00	0.00	445704.10	570375.30	N 32 13 31.02	W 104 14 21.94
	2900.00	0.00	0.45	2900.00	0.00	0.00	0.00	0.00	445704.10	570375.30	N 32 13 31.02	W 104 14 21.94
	3000.00	0.00	0.45	3000.00	0.00	0.00	0.00	0.00	445704.10	570375.30	N 32 13 31.02	W 104 14 21.94
	3100.00	0.00	0.45	3100.00	0.00	0.00	0.00	0.00	445704.10	570375.30	N 32 13 31.02	W 104 14 21.94
	3200.00	0.00	0.45	3200.00	0.00	0.00	0.00	0.00	445704.10	570375.30	N 32 13 31.02	W 104 14 21.94
	3300.00	0.00	0.45	3300.00	0.00	0.00	0.00	0.00	445704.10	570375.30	N 32 13 31.02	W 104 14 21.94
	3400.00	0.00	0.45	3400.00	0.00	0.00	0.00	0.00	445704.10	570375.30	N 32 13 31.02	W 104 14 21.94
	3500.00	0.00	0.45	3500.00	0.00	0.00	0.00	0.00	445704.10	570375.30	N 32 13 31.02	W 104 14 21.94
	3600.00	0.00	0.45	3600.00	0.00	0.00	0.00	0.00	445704.10	570375.30	N 32 13 31.02	W 104 14 21.94
	3700.00	0.00	0.45	3700.00	0.00	0.00	0.00	0.00	445704.10	570375.30	N 32 13 31.02	W 104 14 21.94
Brushy Canyon	3792.00	0.00	0.45	3792.00	0.00	0.00	0.00	0.00	445704.10	570375.30	N 32 13 31.02	W 104 14 21.94
	3800.00	0.00	0.45	3800.00	0.00	0.00	0.00	0.00	445704.10	570375.30	N 32 13 31.02	W 104 14 21.94
	3900.00	0.00	0.45	3900.00	0.00	0.00	0.00	0.00	445704.10	570375.30	N 32 13 31.02	W 104 14 21.94
	4000.00	0.00	0.45	4000.00	0.00	0.00	0.00	0.00	445704.10	570375.30	N 32 13 31.02	W 104 14 21.94
	4100.00	0.00	0.45	4100.00	0.00	0.00	0.00	0.00	445704.10	570375.30	N 32 13 31.02	W 104 14 21.94
	4200.00	0.00	0.45	4200.00	0.00	0.00	0.00	0.00	445704.10	570375.30	N 32 13 31.02	W 104 14 21.94
	4300.00	0.00	0.45	4300.00	0.00	0.00	0.00	0.00	445704.10	570375.30	N 32 13 31.02	W 104 14 21.94
	4400.00	0.00	0.45	4400.00	0.00	0.00	0.00	0.00	445704.10	570375.30	N 32 13 31.02	W 104 14 21.94
	4500.00	0.00	0.45	4500.00	0.00	0.00	0.00	0.00	445704.10	570375.30	N 32 13 31.02	W 104 14 21.94
	4600.00	0.00	0.45	4600.00	0.00	0.00	0.00	0.00	445704.10	570375.30	N 32 13 31.02	W 104 14 21.94
	4700.00	0.00	0.45	4700.00	0.00	0.00	0.00	0.00	445704.10	570375.30	N 32 13 31.02	W 104 14 21.94
	4800.00	0.00	0.45	4800.00	0.00	0.00	0.00	0.00	445704.10	570375.30	N 32 13 31.02	W 104 14 21.94
	4900.00	0.00	0.45	4900.00	0.00	0.00	0.00	0.00	445704.10	570375.30	N 32 13 31.02	W 104 14 21.94
	5000.00	0.00	0.45	5000.00	0.00	0.00	0.00	0.00	445704.10	570375.30	N 32 13 31.02	W 104 14 21.94
	5100.00	0.00	0.45	5100.00	0.00	0.00	0.00	0.00	445704.10	570375.30	N 32 13 31.02	W 104 14 21.94
	5200.00	0.00	0.45	5200.00	0.00	0.00	0.00	0.00	445704.10	570375.30	N 32 13 31.02	W 104 14 21.94
	5300.00	0.00	0.45	5300.00	0.00	0.00	0.00	0.00	445704.10	570375.30	N 32 13 31.02	W 104 14 21.94
Top Bone Spring	5372.00	0.00	0.45	5372.00	0.00	0.00	0.00	0.00	445704.10	570375.30	N 32 13 31.02	W 104 14 21.94
	5400.00	0.00	0.45	5400.00	0.00	0.00	0.00	0.00	445704.10	570375.30	N 32 13 31.02	W 104 14 21.94

...Original Borehole/Cimarex Riverboat 12-1 W0PA Fed Com 1H Rev0 CVS 24Oct18

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	Northing (ftUS)	Easting (ftUS)	Latitude (N/S ° ' '')	Longitude (E/W ° ' '')
	5500.00	0.00	0.45	5500.00	0.00	0.00	0.00	0.00	445704.10	570375.30	N 32 13 31.02	W 104 14 21.94
	5600.00	0.00	0.45	5600.00	0.00	0.00	0.00	0.00	445704.10	570375.30	N 32 13 31.02	W 104 14 21.94
	5700.00	0.00	0.45	5700.00	0.00	0.00	0.00	0.00	445704.10	570375.30	N 32 13 31.02	W 104 14 21.94
	5800.00	0.00	0.45	5800.00	0.00	0.00	0.00	0.00	445704.10	570375.30	N 32 13 31.02	W 104 14 21.94
	5900.00	0.00	0.45	5900.00	0.00	0.00	0.00	0.00	445704.10	570375.30	N 32 13 31.02	W 104 14 21.94
	6000.00	0.00	0.45	6000.00	0.00	0.00	0.00	0.00	445704.10	570375.30	N 32 13 31.02	W 104 14 21.94
	6100.00	0.00	0.45	6100.00	0.00	0.00	0.00	0.00	445704.10	570375.30	N 32 13 31.02	W 104 14 21.94
	6200.00	0.00	0.45	6200.00	0.00	0.00	0.00	0.00	445704.10	570375.30	N 32 13 31.02	W 104 14 21.94
	6300.00	0.00	0.45	6300.00	0.00	0.00	0.00	0.00	445704.10	570375.30	N 32 13 31.02	W 104 14 21.94
Top 1st BSPG SS	6386.00	0.00	0.45	6386.00	0.00	0.00	0.00	0.00	445704.10	570375.30	N 32 13 31.02	W 104 14 21.94
	6400.00	0.00	0.45	6400.00	0.00	0.00	0.00	0.00	445704.10	570375.30	N 32 13 31.02	W 104 14 21.94
	6500.00	0.00	0.45	6500.00	0.00	0.00	0.00	0.00	445704.10	570375.30	N 32 13 31.02	W 104 14 21.94
	6600.00	0.00	0.45	6600.00	0.00	0.00	0.00	0.00	445704.10	570375.30	N 32 13 31.02	W 104 14 21.94
	6700.00	0.00	0.45	6700.00	0.00	0.00	0.00	0.00	445704.10	570375.30	N 32 13 31.02	W 104 14 21.94
	6800.00	0.00	0.45	6800.00	0.00	0.00	0.00	0.00	445704.10	570375.30	N 32 13 31.02	W 104 14 21.94
	6900.00	0.00	0.45	6900.00	0.00	0.00	0.00	0.00	445704.10	570375.30	N 32 13 31.02	W 104 14 21.94
Top 2nd BSPG SS	6918.00	0.00	0.45	6918.00	0.00	0.00	0.00	0.00	445704.10	570375.30	N 32 13 31.02	W 104 14 21.94
	7000.00	0.00	0.45	7000.00	0.00	0.00	0.00	0.00	445704.10	570375.30	N 32 13 31.02	W 104 14 21.94
Top 3rd BSPG Carb	7054.00	0.00	0.45	7054.00	0.00	0.00	0.00	0.00	445704.10	570375.30	N 32 13 31.02	W 104 14 21.94
	7100.00	0.00	0.45	7100.00	0.00	0.00	0.00	0.00	445704.10	570375.30	N 32 13 31.02	W 104 14 21.94
	7200.00	0.00	0.45	7200.00	0.00	0.00	0.00	0.00	445704.10	570375.30	N 32 13 31.02	W 104 14 21.94
	7300.00	0.00	0.45	7300.00	0.00	0.00	0.00	0.00	445704.10	570375.30	N 32 13 31.02	W 104 14 21.94
	7400.00	0.00	0.45	7400.00	0.00	0.00	0.00	0.00	445704.10	570375.30	N 32 13 31.02	W 104 14 21.94
	7500.00	0.00	0.45	7500.00	0.00	0.00	0.00	0.00	445704.10	570375.30	N 32 13 31.02	W 104 14 21.94
	7600.00	0.00	0.45	7600.00	0.00	0.00	0.00	0.00	445704.10	570375.30	N 32 13 31.02	W 104 14 21.94
	7700.00	0.00	0.45	7700.00	0.00	0.00	0.00	0.00	445704.10	570375.30	N 32 13 31.02	W 104 14 21.94
	7800.00	0.00	0.45	7800.00	0.00	0.00	0.00	0.00	445704.10	570375.30	N 32 13 31.02	W 104 14 21.94
	7801.00	0.00	0.45	7801.00	0.00	0.00	0.00	0.00	445704.10	570375.30	N 32 13 31.02	W 104 14 21.94
	7900.00	0.00	0.45	7900.00	0.00	0.00	0.00	0.00	445704.10	570375.30	N 32 13 31.02	W 104 14 21.94
	8000.00	0.00	0.45	8000.00	0.00	0.00	0.00	0.00	445704.10	570375.30	N 32 13 31.02	W 104 14 21.94
Top Harkey SS												
	8100.00	0.00	0.45	8100.00	0.00	0.00	0.00	0.00	445704.10	570375.30	N 32 13 31.02	W 104 14 21.94
	8200.00	0.00	0.45	8200.00	0.00	0.00	0.00	0.00	445704.10	570375.30	N 32 13 31.02	W 104 14 21.94
	8263.04	0.00	0.45	8263.04	0.00	0.00	0.00	0.00	445704.10	570375.30	N 32 13 31.02	W 104 14 21.94
KOP - Build 12"1100'	8300.00	4.44	0.45	8299.96	1.43	1.43	0.01	12.00	445705.53	570375.31	N 32 13 31.03	W 104 14 21.94
Top 3rd BSPG SS	8306.06	5.16	0.45	8306.06	1.94	1.94	0.02	12.00	445706.04	570375.32	N 32 13 31.03	W 104 14 21.94
	8400.00	16.44	0.45	8398.13	19.51	19.51	0.15	12.00	445723.61	570375.45	N 32 13 31.21	W 104 14 21.94
	8500.00	28.44	0.45	8490.39	57.60	57.60	0.45	12.00	445761.70	570375.75	N 32 13 31.59	W 104 14 21.94
	8600.00	40.44	0.45	8572.72	114.05	114.04	0.90	12.00	445818.13	570376.20	N 32 13 32.14	W 104 14 21.93
	8700.00	52.44	0.45	8641.51	186.37	186.37	1.46	12.00	445890.45	570376.76	N 32 13 32.86	W 104 14 21.93
Top Wolfcamp	8742.71	57.56	0.45	8666.00	221.35	221.34	1.74	12.00	445925.42	570377.04	N 32 13 33.21	W 104 14 21.92
	8800.00	64.44	0.45	8693.76	271.42	271.42	2.13	12.00	445975.49	570377.43	N 32 13 33.70	W 104 14 21.92
Build 4"1100' DLS	8888.04	75.00	0.45	8724.24	353.89	353.88	2.78	12.00	446057.94	570378.08	N 32 13 34.52	W 104 14 21.91
	8900.00	75.48	0.45	8727.28	365.45	365.44	2.87	4.00	446069.51	570378.17	N 32 13 34.63	W 104 14 21.91
	9000.00	79.48	0.45	8749.96	463.05	463.04	3.84	4.00	446167.10	570378.94	N 32 13 35.60	W 104 14 21.90
Wolfcamp 'Y' SS	9017.21	80.17	0.45	8752.00	479.99	479.98	3.77	4.00	446184.03	570379.07	N 32 13 35.76	W 104 14 21.90
	9100.00	83.48	0.45	8763.77	561.93	561.91	4.41	4.00	446265.96	570379.71	N 32 13 36.58	W 104 14 21.89
	9200.00	87.48	0.45	8771.66	661.80	661.58	5.20	4.00	446365.62	570380.50	N 32 13 37.58	W 104 14 21.88
Wolfcamp 'Y' SS Tgt	9251.91	89.55	0.45	8773.00	713.49	713.46	5.61	4.00	446417.50	570380.91	N 32 13 38.08	W 104 14 21.87
Landing Point	9252.25	89.57	0.45	8773.00	713.83	713.81	5.61	4.00	446417.84	570380.91	N 32 13 38.08	W 104 14 21.87
	9300.00	89.57	0.45	8773.36	761.58	761.55	5.98	0.00	446465.58	570381.28	N 32 13 38.55	W 104 14 21.87
	9400.00	89.57	0.45	8774.12	861.57	861.55	6.77	0.00	446565.57	570382.07	N 32 13 39.54	W 104 14 21.86
	9500.00	89.57	0.45	8774.87	961.57	961.54	7.56	0.00	446665.55	570382.86	N 32 13 40.53	W 104 14 21.85
	9600.00	89.57	0.45	8775.62	1061.57	1061.54	8.34	0.00	446765.54	570383.64	N 32 13 41.52	W 104 14 21.84
	9700.00	89.57	0.45	8776.38	1161.57	1161.53	9.13	0.00	446865.52	570384.43	N 32 13 42.51	W 104 14 21.83
	9800.00	89.57	0.45	8777.13	1261.56	1261.52	9.92	0.00	446965.51	570385.22	N 32 13 43.50	W 104 14 21.82
	9900.00	89.57	0.45	8777.88	1361.56	1361.52	10.70	0.00	447065.49	570386.00	N 32 13 44.49	W 104 14 21.81
	10000.00	89.57	0.45	8778.64	1461.56	1461.51	11.49	0.00	447165.48	570386.79	N 32 13 45.48	W 104 14 21.80
	10100.00	89.57	0.45	8779.39	1561.55	1561.51	12.28	0.00	447265.46	570387.58	N 32 13 46.47	W 104 14 21.79
	10200.00	89.57	0.45	8780.14	1661.55	1661.50	13.06	0.00	447365.45	570388.36	N 32 13 47.46	W 104 14 21.78
	10300.00	89.57	0.45	8780.90	1761.55	1761.49	13.85	0.00	447465.43	570389.15	N 32 13 48.45	W 104 14 21.77
	10400.00	89.57	0.45	8781.65	1861.55	1861.49	14.64	0.00	447565.42	570389.94	N 32 13 49.43	W 104 14 21.76
	10500.00	89.57	0.45	8782.40	1961.54	1961.48	15.42	0.00	447665.40	570390.72	N 32 13 50.42	W 104 14 21.75
	10600.00	89.57	0.45	8783.16	2061.54	2061.48	16.21	0.00	447765.39	570391.51	N 32 13 51.41	W 104 14 21.74
	10700.00	89.57	0.45	8783.91	2161.54	2161.47	17.00	0.00	447865.37	570392.30	N 32 13 52.40	W 104 14 21.72
	10800.00	89.57	0.45	8784.66	2261.53	2261.47	17.78	0.00	447965.36	570393.08	N 32 13 53.39	W 104 14 21.71
	10900.00	89.57	0.45	8785.42	2361.53	2361.46	18.57	0.00	448065.34	570393.87	N 32 13 54.38	W 104 14 21.70
	11000.00	89.57	0.45	8786.17	2461.53	2461.45	19.36	0.00	448165.33	570394.66	N 32 13 55.37	W 104 14 21.69
	11100.00	89.57	0.45	8786.92	2561.53	2561.45	20.14	0.00	448265.31	570395.44	N 32 13 56.36	W 104 14 21.68
	11200.00	89.57	0.45	8787.68	2661.52	2661.44	20.93	0.00	448365.30	570396.23	N 32 13 57.35	W 104 14 21.67
	11300.00	89.57	0.45	8788.43	2761.52	2761.44	21.72	0.00	448465.28	570397.02	N 32 13 58.34	W 104 14 21.66
	11400.00	89.57	0.45	8789.18	2861.52	2861.43	22.50	0.00	448565.27	570397.80	N 32 13 59.33	W 104 14 21.65
	11500.00	89.57	0.45	8789.93	2961.52	2961.42	23.29	0.00	448665.25	570398.59	N 32 14 0.32	W 104 14 21.64
	11600.00	89.57	0.45	8790.69	3061.51	3061.42	24.08	0.00	448765.24	570399.38	N 32 14 1.31	W 104 14 21.63
	11700.00	89.57	0.45	8791.44	3161.51	3161.41	24.86	0.00	448865.22	570400.16	N 32 14 2.30	W 104 14 21.62
	11800.00	89.57	0.45	8792.19	3261.51	3261.41	25.65	0.00	448965.21	570400.95	N 32 14 3.29	W 104 14 21.61
	11900.00	89.57	0.45	8792.95	3361.50	3361.40	26.44	0.00	449065.19	570401.74	N 32 14 4.28	W 104 14 21.60
Base 'Y' SS	11906.88	89.57	0.45	8793.70	3368.38	3368.28	26.49	0.00	449072.07	570401.79	N 32 14 4.34	W 104 14 21.60
	12000.00	89.57	0.45	8793.70	3461.50	3461.39	27.22	0.00	449165.18	570402.52	N 32 14 5	

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	Northing (ftUS)	Easting (ftUS)	Latitude (N/S ° ' ")	Longitude (E/W ° ' ")
	12500.00	89.57	0.45	8797.47	3961.49	3961.36	31.18	0.00	449665.10	570408.48	N 32 14 10.21	W 104 14 21.54
	12600.00	89.57	0.45	8798.22	4061.48	4061.36	31.94	0.00	449765.08	570407.24	N 32 14 11.20	W 104 14 21.53
	12700.00	89.57	0.45	8798.97	4161.48	4161.35	32.73	0.00	449865.07	570408.03	N 32 14 12.19	W 104 14 21.52
	12800.00	89.57	0.45	8799.73	4261.48	4261.35	33.52	0.00	449965.05	570408.81	N 32 14 13.18	W 104 14 21.51
	12900.00	89.57	0.45	8800.48	4361.48	4361.34	34.30	0.00	450065.04	570409.60	N 32 14 14.17	W 104 14 21.50
	13000.00	89.57	0.45	8801.23	4461.47	4461.33	35.09	0.00	450165.02	570410.39	N 32 14 15.16	W 104 14 21.49
	13100.00	89.57	0.45	8801.99	4561.47	4561.33	35.88	0.00	450265.01	570411.17	N 32 14 16.15	W 104 14 21.48
	13200.00	89.57	0.45	8802.74	4661.47	4661.32	36.66	0.00	450364.99	570411.96	N 32 14 17.14	W 104 14 21.47
	13300.00	89.57	0.45	8803.49	4761.46	4761.32	37.45	0.00	450464.98	570412.75	N 32 14 18.13	W 104 14 21.46
	13400.00	89.57	0.45	8804.25	4861.46	4861.31	38.24	0.00	450564.96	570413.53	N 32 14 19.12	W 104 14 21.45
	13500.00	89.57	0.45	8805.00	4961.46	4961.30	39.02	0.00	450664.95	570414.32	N 32 14 20.11	W 104 14 21.44
	13600.00	89.57	0.45	8805.75	5061.46	5061.30	39.81	0.00	450764.93	570415.11	N 32 14 21.10	W 104 14 21.43
	13700.00	89.57	0.45	8806.51	5161.45	5161.29	40.60	0.00	450864.92	570415.89	N 32 14 22.09	W 104 14 21.42
	13800.00	89.57	0.45	8807.26	5261.45	5261.29	41.38	0.00	450964.90	570416.68	N 32 14 23.08	W 104 14 21.41
	13900.00	89.57	0.45	8808.01	5361.45	5361.28	42.17	0.00	451064.89	570417.47	N 32 14 24.07	W 104 14 21.40
	14000.00	89.57	0.45	8808.77	5461.44	5461.28	42.96	0.00	451164.87	570418.25	N 32 14 25.06	W 104 14 21.39
	14100.00	89.57	0.45	8809.52	5561.44	5561.27	43.74	0.00	451264.86	570419.04	N 32 14 26.04	W 104 14 21.38
	14200.00	89.57	0.45	8810.27	5661.44	5661.26	44.53	0.00	451364.84	570419.83	N 32 14 27.03	W 104 14 21.37
	14300.00	89.57	0.45	8811.03	5761.44	5761.26	45.32	0.00	451464.83	570420.61	N 32 14 28.02	W 104 14 21.36
	14400.00	89.57	0.45	8811.78	5861.43	5861.25	46.10	0.00	451564.81	570421.40	N 32 14 29.01	W 104 14 21.35
	14500.00	89.57	0.45	8812.53	5961.43	5961.25	46.89	0.00	451664.80	570422.19	N 32 14 30.00	W 104 14 21.34
	14600.00	89.57	0.45	8813.29	6061.43	6061.24	47.68	0.00	451764.78	570422.97	N 32 14 30.99	W 104 14 21.33
	14700.00	89.57	0.45	8814.04	6161.42	6161.23	48.46	0.00	451864.77	570423.76	N 32 14 31.98	W 104 14 21.32
	14800.00	89.57	0.45	8814.79	6261.42	6261.23	49.25	0.00	451964.75	570424.55	N 32 14 32.97	W 104 14 21.31
	14900.00	89.57	0.45	8815.55	6361.42	6361.22	50.04	0.00	452064.74	570425.33	N 32 14 33.96	W 104 14 21.30
	15000.00	89.57	0.45	8816.30	6461.42	6461.22	50.82	0.00	452164.72	570426.12	N 32 14 34.95	W 104 14 21.29
	15100.00	89.57	0.45	8817.05	6561.41	6561.21	51.61	0.00	452264.71	570426.91	N 32 14 35.94	W 104 14 21.28
	15200.00	89.57	0.45	8817.81	6661.41	6661.20	52.40	0.00	452364.69	570427.69	N 32 14 36.93	W 104 14 21.27
	15300.00	89.57	0.45	8818.56	6761.41	6761.20	53.18	0.00	452464.68	570428.48	N 32 14 37.92	W 104 14 21.26
	15400.00	89.57	0.45	8819.31	6861.40	6861.19	53.97	0.00	452564.66	570429.27	N 32 14 38.91	W 104 14 21.25
	15500.00	89.57	0.45	8820.07	6961.40	6961.19	54.76	0.00	452664.65	570430.05	N 32 14 39.90	W 104 14 21.24
	15600.00	89.57	0.45	8820.82	7061.40	7061.18	55.55	0.00	452764.63	570430.84	N 32 14 40.89	W 104 14 21.23
	15700.00	89.57	0.45	8821.57	7161.40	7161.17	56.33	0.00	452864.62	570431.63	N 32 14 41.88	W 104 14 21.22
	15800.00	89.57	0.45	8822.33	7261.39	7261.17	57.12	0.00	452964.60	570432.41	N 32 14 42.87	W 104 14 21.21
	15900.00	89.57	0.45	8823.08	7361.39	7361.16	57.91	0.00	453064.59	570433.20	N 32 14 43.85	W 104 14 21.20
	16000.00	89.57	0.45	8823.83	7461.39	7461.16	58.69	0.00	453164.57	570433.99	N 32 14 44.84	W 104 14 21.19
	16100.00	89.57	0.45	8824.59	7561.38	7561.15	59.48	0.00	453264.56	570434.77	N 32 14 45.83	W 104 14 21.18
	16200.00	89.57	0.45	8825.34	7661.38	7661.14	60.27	0.00	453364.54	570435.56	N 32 14 46.82	W 104 14 21.17
	16300.00	89.57	0.45	8826.09	7761.38	7761.14	61.05	0.00	453464.53	570436.35	N 32 14 47.81	W 104 14 21.16
	16400.00	89.57	0.45	8826.85	7861.38	7861.13	61.84	0.00	453564.51	570437.13	N 32 14 48.80	W 104 14 21.15
	16500.00	89.57	0.45	8827.60	7961.37	7961.13	62.63	0.00	453664.49	570437.92	N 32 14 49.79	W 104 14 21.14
	16600.00	89.57	0.45	8828.35	8061.37	8061.12	63.41	0.00	453764.48	570438.71	N 32 14 50.78	W 104 14 21.13
	16700.00	89.57	0.45	8829.11	8161.37	8161.12	64.20	0.00	453864.46	570439.49	N 32 14 51.77	W 104 14 21.12
	16800.00	89.57	0.45	8829.86	8261.36	8261.11	64.99	0.00	453964.45	570440.28	N 32 14 52.76	W 104 14 21.11
	16900.00	89.57	0.45	8830.61	8361.36	8361.10	65.77	0.00	454064.43	570441.07	N 32 14 53.75	W 104 14 21.10
	17000.00	89.57	0.45	8831.37	8461.36	8461.10	66.56	0.00	454164.42	570441.85	N 32 14 54.74	W 104 14 21.09
	17100.00	89.57	0.45	8832.12	8561.36	8561.09	67.35	0.00	454264.40	570442.64	N 32 14 55.73	W 104 14 21.08
	17200.00	89.57	0.45	8832.87	8661.35	8661.09	68.13	0.00	454364.39	570443.43	N 32 14 56.72	W 104 14 21.07
	17300.00	89.57	0.45	8833.63	8761.35	8761.08	68.92	0.00	454464.37	570444.21	N 32 14 57.71	W 104 14 21.06
	17400.00	89.57	0.45	8834.38	8861.35	8861.07	69.71	0.00	454564.36	570445.00	N 32 14 58.70	W 104 14 21.05
	17500.00	89.57	0.45	8835.13	8961.34	8961.07	70.49	0.00	454664.34	570445.79	N 32 14 59.69	W 104 14 21.04
	17600.00	89.57	0.45	8835.88	9061.34	9061.06	71.28	0.00	454764.33	570446.57	N 32 15 00.68	W 104 14 21.03
	17700.00	89.57	0.45	8836.64	9161.34	9161.06	72.07	0.00	454864.31	570447.36	N 32 15 01.67	W 104 14 21.02
	17800.00	89.57	0.45	8837.39	9261.34	9261.05	72.85	0.00	454964.30	570448.15	N 32 15 02.66	W 104 14 21.01
	17900.00	89.57	0.45	8838.15	9361.33	9361.04	73.64	0.00	455064.28	570448.93	N 32 15 03.65	W 104 14 21.00
	18000.00	89.57	0.45	8838.90	9461.33	9461.04	74.43	0.00	455164.27	570449.72	N 32 15 04.64	W 104 14 20.99
	18100.00	89.57	0.45	8839.65	9561.33	9561.03	75.21	0.00	455264.25	570450.51	N 32 15 05.63	W 104 14 20.98
	18200.00	89.57	0.45	8840.41	9661.33	9661.03	76.00	0.00	455364.24	570451.29	N 32 15 06.62	W 104 14 20.97
	18300.00	89.57	0.45	8841.16	9761.32	9761.02	76.79	0.00	455464.22	570452.08	N 32 15 07.61	W 104 14 20.96
	18400.00	89.57	0.45	8841.91	9861.32	9861.01	77.57	0.00	455564.21	570452.86	N 32 15 08.60	W 104 14 20.95
	18500.00	89.57	0.45	8842.67	9961.32	9961.01	78.36	0.00	455664.19	570453.65	N 32 15 09.59	W 104 14 20.94

Cimarex
Riverboat 12-1
WOPA Fed Com
1H - PBHL (330'
FNL, 380' FEL)

Survey Type: Non-Def Plan

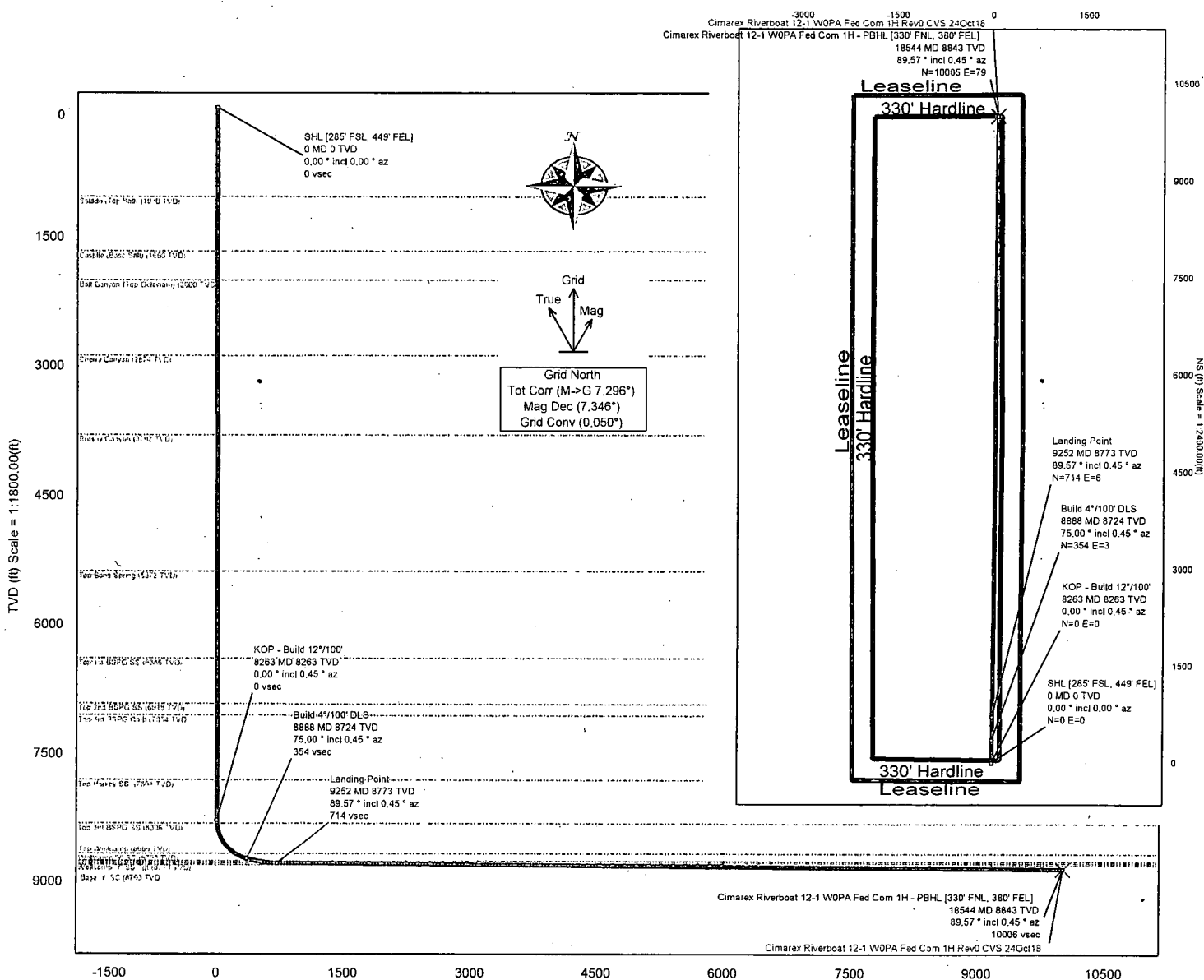
Survey Error Model: ISCWSA Rev 0 *** 3-D 95.000% Confidence 2.7955 sigma
Survey Program:

Description	Part	MD From (ft)	MD To (ft)	EOU Freq (ft)	Hole Size (in)	Casing Diameter (in)	Expected Max Inclination (deg)	Survey Tool Type	Borehole / Survey
	1	0.000	20.000	1/100.000	30.000	30.000		NAL_MWD_IFR1+MS-Depth Only	Original Borehole / Cimarex Riverboat 12-1 WOPA Fed Com 1H Rev0 CVS 24Oct18
	1	20.000	18544.314	1/100.000	30.000	30.000		NAL_MWD_IFR1+MS	Original Borehole / Cimarex Riverboat 12-1 WOPA Fed Com

Borehole:	Well:	Field:	Structure:
Original Borehole	Cimarex Riverboat 12-1 W0PA Fed Com 1H	NM Eddy County (NAD 83)	Cimarex Riverboat 12-1 W0PA Fed Com 1H

Gravity & Magnetic Parameters	Surface Location	Miscellaneous
Model: HDOM 2018 Dip: 59.919° Date: 24-Oct-2018	NAD83 New Mexico State Plane, Eastern Zone, US Feet	Cimarex
MagDec: 7.346° FS: 47894.833nT Gravity FS: 898.462mgm (9.80665 Based)	Lat: N 32 13 31.02 Northing: 446704.1NUS Grid Conv: 0.0591°	Slot: Riverboat 12-1
	Lon: W 104 14 21.84 Easting: 670376.3NUS Scale Fact: 0.98991006	TVD Ref: RKB(3258ft above MSL)
		W0PA Fed Com 1H
		Cimarex Riverboat 12-1 W0PA Fed Com 1H Rev0 CVS 24Oct18

EW (ft) Scale = 1:2400.00(ft)



Vertical Section (ft) Azim = 0.45° Scale = 1:1800.00(ft) Origin = 0N/-S, 0E/-W

Critical Points

Critical Point	MD	INCL	AZIM	TVD	VSEC	N(+)/S(-)	E(+)/W(-)	DLS
SHL (285' FSL, 449' FEL)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Salado (Top Salt)	1030.00	0.00	0.45	1030.00	0.00	0.00	0.00	0.00
Castille (Base Salt)	1660.00	0.00	0.45	1660.00	0.00	0.00	0.00	0.00
Bell Canyon (Top Delaware)	2000.00	0.00	0.45	2000.00	0.00	0.00	0.00	0.00
Cherry Canyon	2874.00	0.00	0.45	2874.00	0.00	0.00	0.00	0.00
Brushy Canyon	3792.00	0.00	0.45	3792.00	0.00	0.00	0.00	0.00
Top Bone Spring	5372.00	0.00	0.45	5372.00	0.00	0.00	0.00	0.00
Top 1st BSPG SS	6386.00	0.00	0.45	6386.00	0.00	0.00	0.00	0.00
Top 2nd BSPG SS	6918.00	0.00	0.45	6918.00	0.00	0.00	0.00	0.00
Top 3rd BSPG Carb	7054.00	0.00	0.45	7054.00	0.00	0.00	0.00	0.00
Top Harkey SS	7801.00	0.00	0.45	7801.00	0.00	0.00	0.00	0.00
KOP - Build 12'/100'	8263.04	0.00	0.45	8263.04	0.00	0.00	0.00	0.00
Top 3rd BSPG SS	8306.06	5.16	0.45	8306.00	1.94	1.94	0.02	12.00
Top Wolfcamp	8742.71	57.56	0.45	8666.00	221.35	221.34	1.74	12.00
Build 4'/100' DLS	8888.04	75.00	0.45	8724.24	353.89	353.88	2.78	12.00
Wolfcamp "Y" SS	9017.21	80.17	0.45	8752.00	479.99	479.98	3.77	4.00
Wolfcamp "Y" SS Tgt	9251.91	89.55	0.45	8773.00	713.49	713.46	5.61	4.00
Landing Point	9252.25	89.57	0.45	8773.00	713.83	713.81	5.61	4.00
Base "Y" SS	11906.88	89.57	0.45	8793.00	3368.38	3368.28	26.49	0.00
Cimarex Riverboat 12-1 W0PA Fed Com 1H - PBHL [330' FNL, 380' FEL]	18544.31	89.57	0.45	8843.00	10005.63	10005.32	78.71	0.00

Cimarex Riverboat 12-1 W0PA Fed Com 1H Rev0 CVS 24Oct18 Proposal Geodetic Report (Non-Def Plan)



Report Date:	October 24, 2018 - 04:51 PM	Survey / DLS Computation:	Minimum Curvature / Lubinski
Client:	Cimarex	Vertical Section Azimuth:	0.451 ° (Grid North)
Field:	NM Eddy County (NAD 83)	Vertical Section Origin:	0.000 ft, 0.000 ft
Structure / Slot:	Cimarex Riverboat 12-1 W0PA Fed Com 1H / Cimarex Riverboat 12-1 W0PA Fed Com 1H	TVD Reference Datum:	RKB
Well:	Cimarex Riverboat 12-1 W0PA Fed Com 1H	TVD Reference Elevation:	3258.000 ft above MSL
Borehole:	Original Borehole	Seabed / Ground Elevation:	3238.000 ft above MSL
UWI / API#:	Unknown / Unknown	Magnetic Declination:	7.346 °
Survey Name:	Cimarex Riverboat 12-1 W0PA Fed Com 1H Rev0 CVS 24Oct18	Total Gravity Field Strength:	998.4518mgm (9.80685 Based)
Survey Date:	October 24, 2018	Gravity Model:	GARM
Tort / AHD / DDI / ERD Ratio:	89.568 ° / 10005.629 ft / 6.274 / 1.131	Total Magnetic Field Strength:	47894.833 nT
Coordinate Reference System:	NAD83 New Mexico State Plane, Eastern Zone, US Feet	Magnetic Dip Angle:	59.919 °
Location Lat / Long:	N 32° 13' 31.01543", W 104° 14' 21.94474"	Declination Date:	October 24, 2018
Location Grid N/E Y/X:	N 445704.100 ftUS, E 570375.300 ftUS	Magnetic Declination Model:	HDGM 2018
CRS Grid Convergence Angle:	0.0501 °	North Reference:	Grid North
Grid Scale Factor:	0.99991006	Grid Convergence Used:	0.0501 °
Version / Patch:	2.10.740.0	Total Corr Mag North->Grid North:	7.2960 °
		Local Coord Referenced To:	Well Head

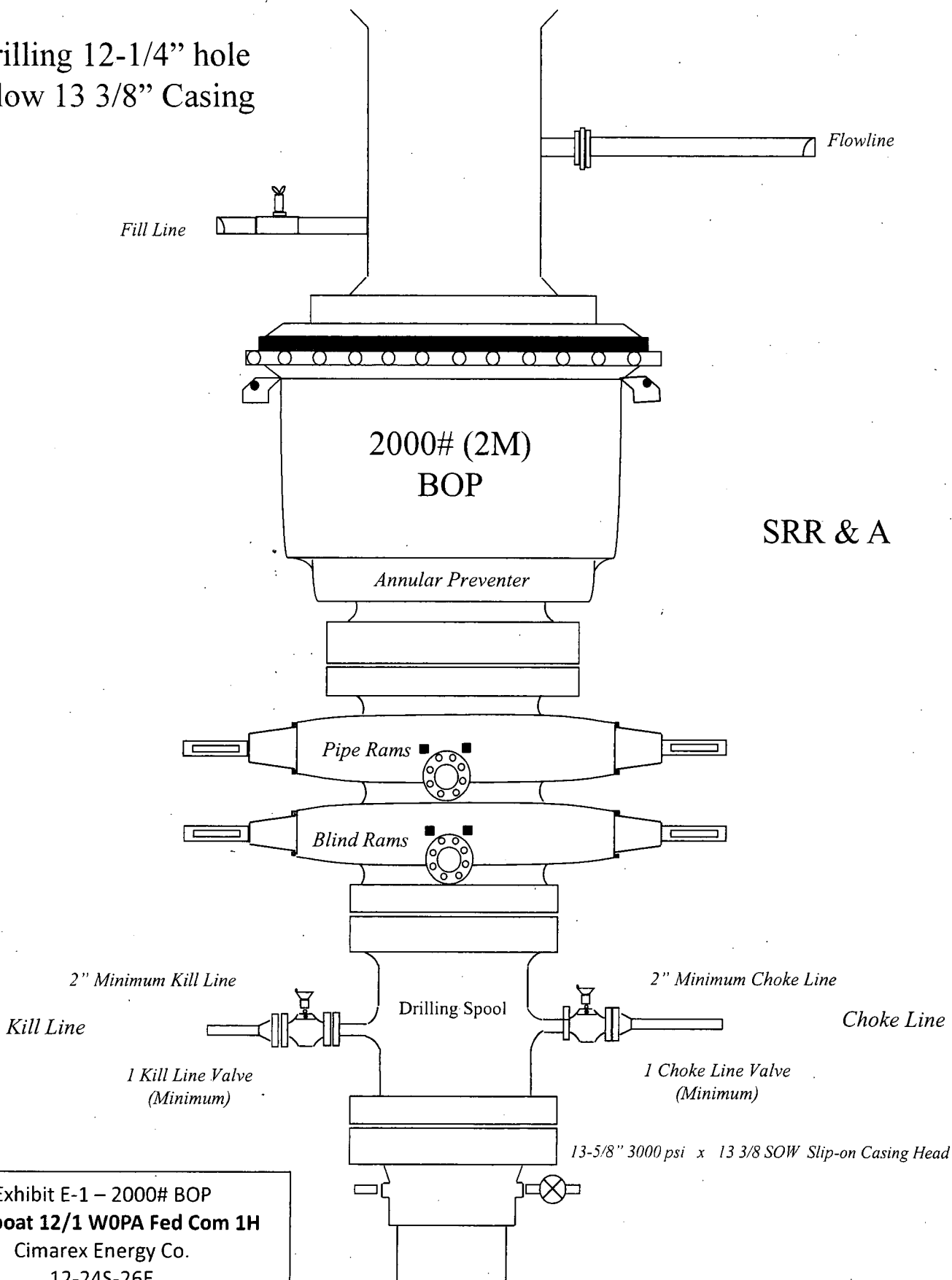
Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	Northing (ftUS)	Easting (ftUS)	Latitude (N/S ° ' ")	Longitude (E/W ° ' ")
SHL [285' FSL, 449' FEL]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	N/A	445704.10	570375.30	N 32 13 31.02	W 104 14 21.94
KOP - Build 12"/100'	8263.04	0.00	0.45	8263.04	0.00	0.00	0.00	0.00	445704.10	570375.30	N 32 13 31.02	W 104 14 21.94
Build 4"/100' DLS	8888.04	75.00	0.45	8724.24	353.89	353.88	2.78	12.00	446057.94	570378.08	N 32 13 34.52	W 104 14 21.91
Landing Point	9252.25	89.57	0.45	8773.00	713.83	713.81	5.61	4.00	446417.84	570380.91	N 32 13 38.08	W 104 14 21.87
Cimarex Riverboat 12-1 W0PA Fed Com 1H - PBHL [330' FNL, 380' FEL]	18544.31	89.57	0.45	8843.00	10005.63	10005.32	78.71	0.00	455708.50	570454.00	N 32 15 10.02	W 104 14 20.93

Survey Type: Non-Def Plan

Survey Error Model: ISCWSA Rev 0 *** 3-D 95.000% Confidence 2.7955 sigma
Survey Program:

Description	Part	MD From (ft)	MD To (ft)	EQU Freq (ft)	Hole Size (in)	Casing Diameter (in)	Expected Max Inclination (deg)	Survey Tool Type	Borehole / Survey
	1	0.000	20.000	1/100.000	30.000	30.000		NAL_MWD_IFR1+MS-Depth Only	Original Borehole / Cimarex Riverboat 12-1 W0PA Fed Com 1H Rev0 CVS 24Oct18
	1	20.000	18544.314	1/100.000	30.000	30.000		NAL_MWD_IFR1+MS	Original Borehole / Cimarex Riverboat 12-1 W0PA Fed Com

Drilling 12-1/4" hole
below 13 3/8" Casing



SRR & A

Exhibit E-1 – 2000# BOP
Riverboat 12/1 WOPA Fed Com 1H
Cimarex Energy Co.
12-24S-26E
Eddy, NM

Drilling 8-3/4" hole
below 9 5/8" Casing

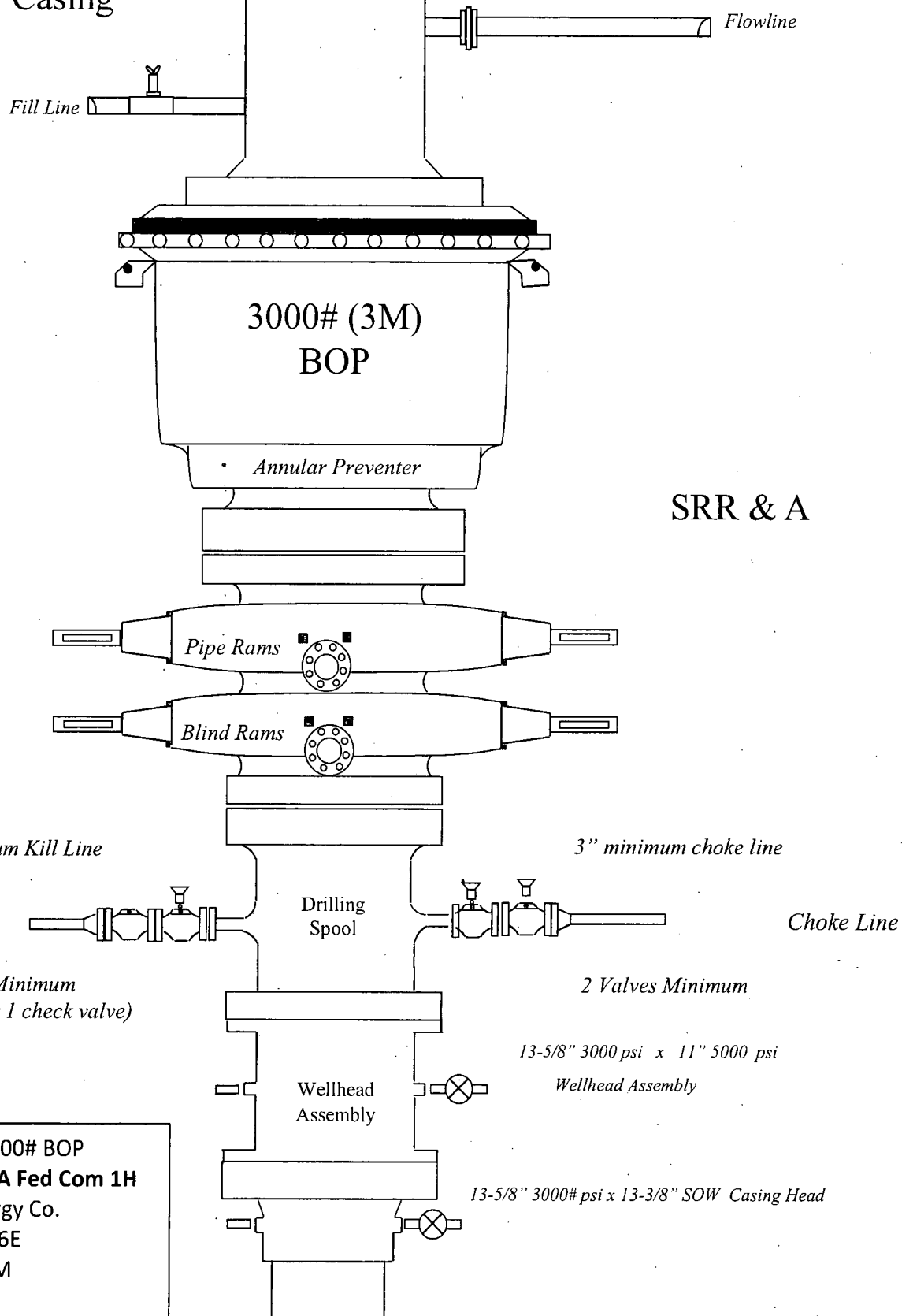


Exhibit E-1 – 3000# BOP
Riverboat 12/1 WOPA Fed Com 1H
Cimarex Energy Co.
12-24S-26E
Eddy, NM

Drilling 6" hole below 7"
Casing

Fill Line

Flowline

5000# (5M)
BOP

Annular Preventer

SRR & A

Pipe Rams

Blind Rams

2" Minimum Kill Line

Kill Line

Drilling
Spool

3" minimum choke line

Choke Line

2 Valves Minimum
(HCR Required)

2 Valves and a check valve

Wellhead
Assembly

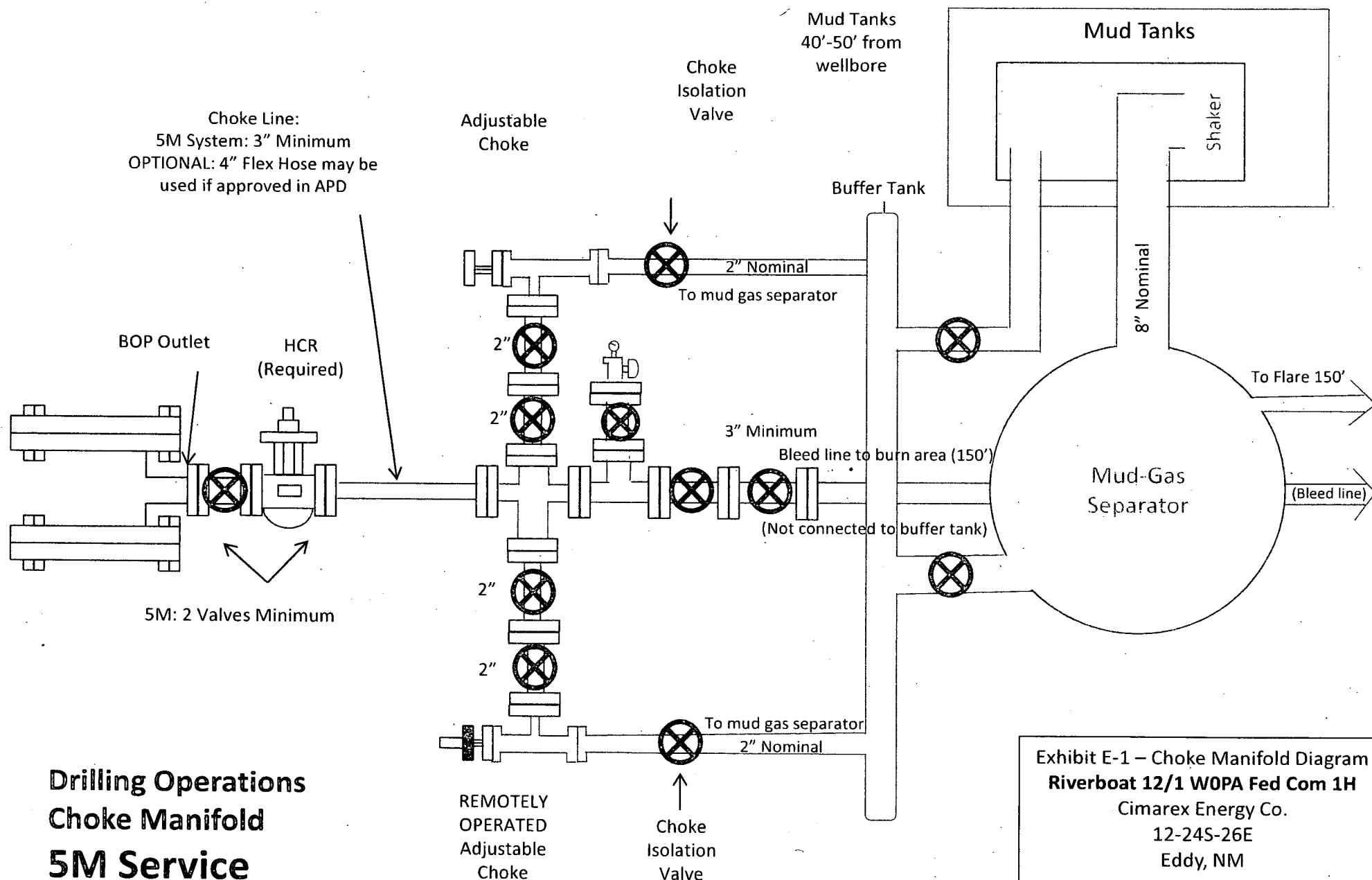
1 1/2" 5000 psi x 7-1/16" 10,000 psi
Wellhead Assembly

Wellhead
Assembly

13-5/8" 3000 psi x 11" 5000 psi
Wellhead Assembly

13-5/8" 3000#psi x 13-3/8" SOW Casing Head

Exhibit E-1 – 5000# BOP
Riverboat 12/1 WOPA Fed Com 1H
Cimarex Energy Co.
12-24S-26E
Eddy, NM



Drilling Operations
Choke Manifold
5M Service

Exhibit E-1 – Choke Manifold Diagram
Riverboat 12/1 WOPA Fed Com 1H
 Cimarex Energy Co.
 12-24S-26E
 Eddy, NM

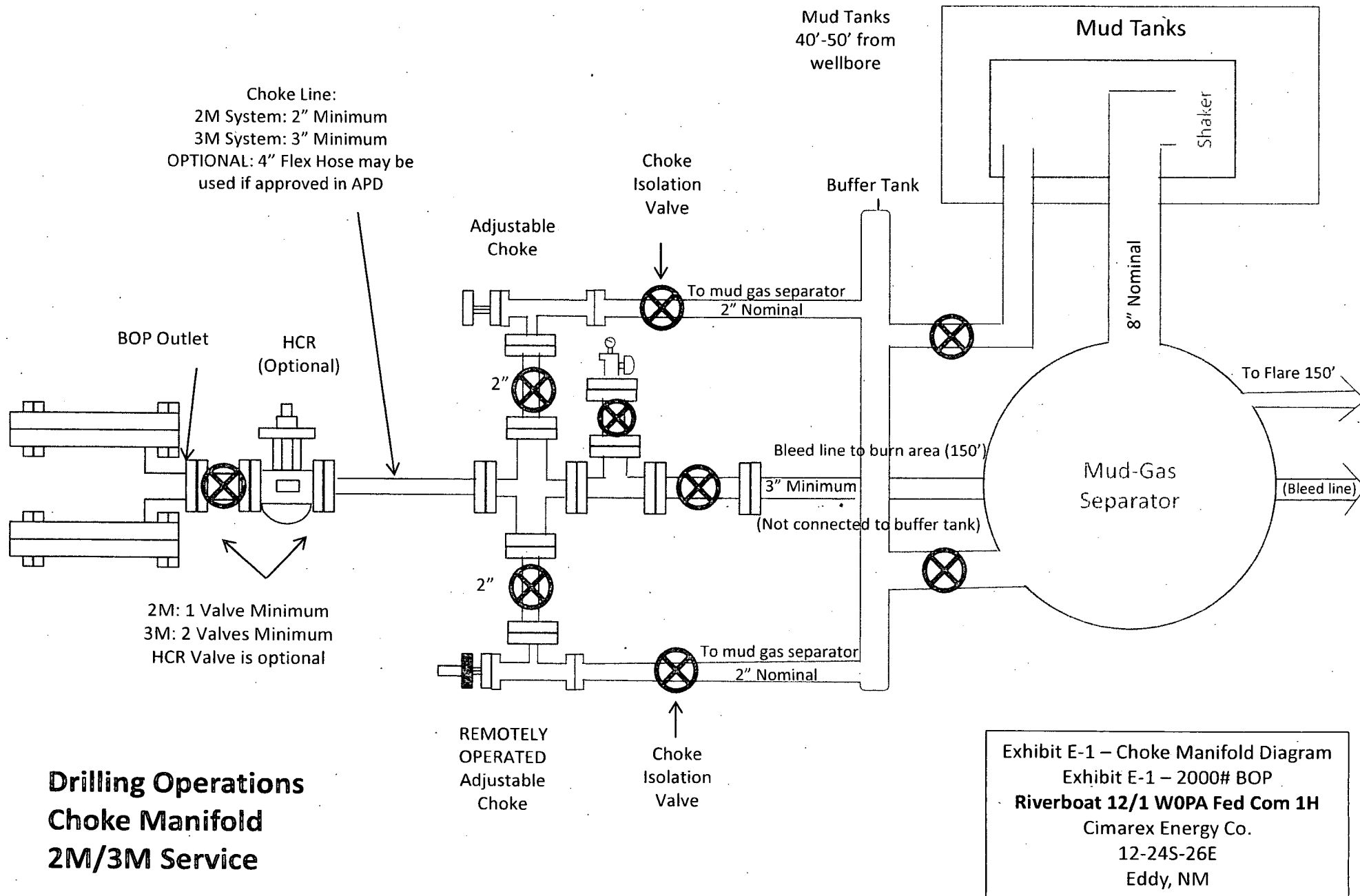


Exhibit F – Co-Flex Hose
Riverboat 12/1 WOPA Fed Com 1H
Cimarex Energy Co.
12-24S-26E
Eddy, NM

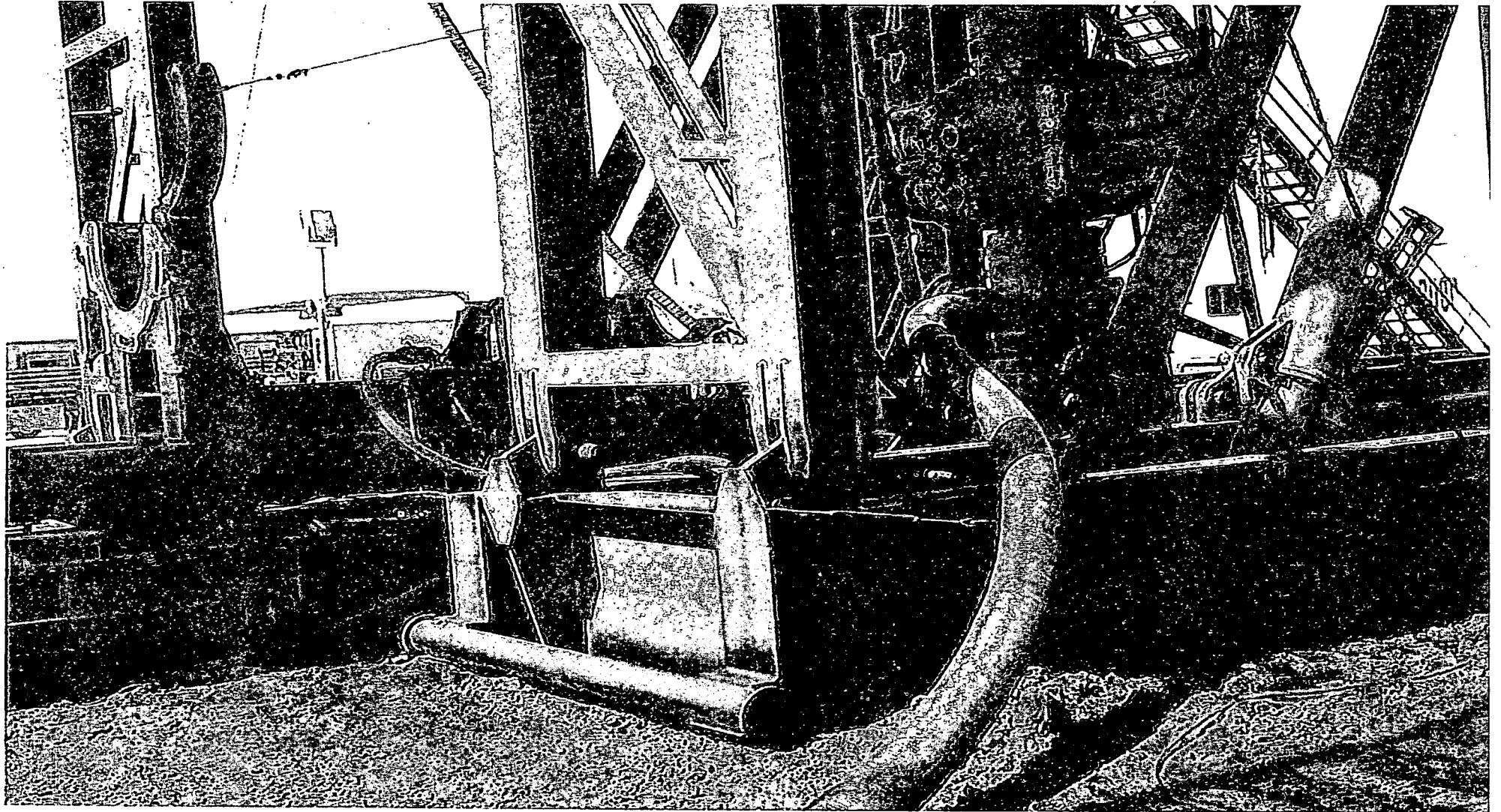


Exhibit F-1 - Co-Flex Hose Hydrostatic Test

Riverboat 12/1 WOPA Fed Com 1H

Cimarex Energy Co.

12-24S-26E

Eddy, NM



Midwest Hose & Specialty, Inc.

INTERNAL HYDROSTATIC TEST REPORT		
Customer: Oderco Inc		P.O. Number: odyd-271
HOSE SPECIFICATIONS		
Type: Stainless Steel Armor Choke & Kill Hose		Hose Length: 45'ft.
I.D. 4 INCHES	O.D. 9 INCHES	
WORKING PRESSURE 10,000 PSI	TEST PRESSURE 15,000 PSI	BURST PRESSURE 0 PSI
COUPLINGS		
Stem Part No. OKC OKC	Ferrule No. OKC OKC	
Type of Coupling: Swage-It		
PROCEDURE		
<u>Hose assembly pressure tested with water at ambient temperature.</u>		
TIME HELD AT TEST PRESSURE 15 MIN.	ACTUAL BURST PRESSURE: 0 PSI	
Hose Assembly Serial Number: 79793	Hose Serial Number: OKC	
Comments:		
Date: 3/8/2011	Tested: <i>A. Jaime Serna</i>	Approved: <i>Levi J. [Signature]</i>



Midwest Hose
& Specialty, Inc.

Internal Hydrostatic Test Graph

March 3, 2011

Customer: Houston

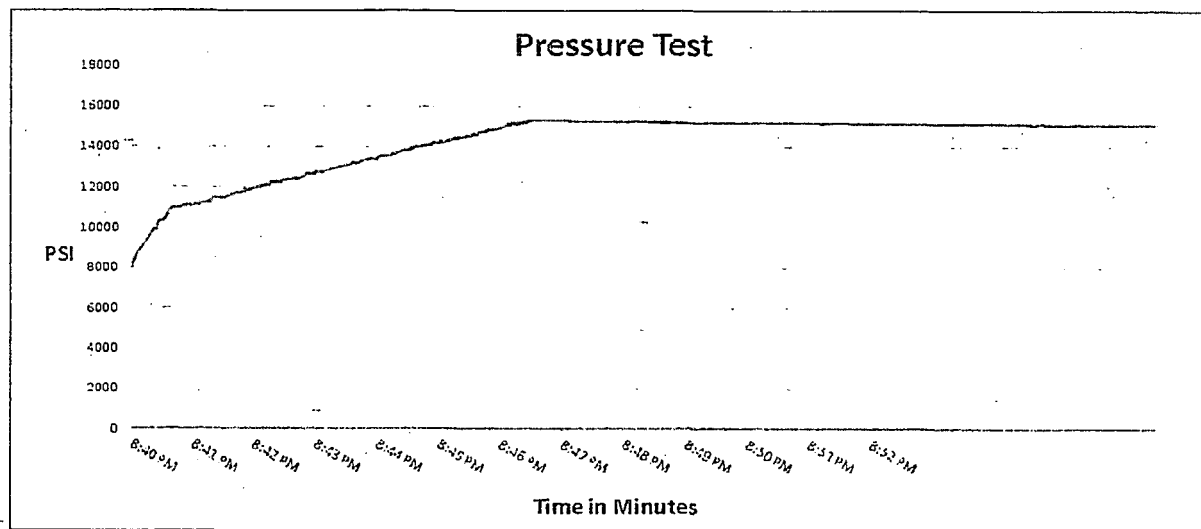
Pick Ticket #: 94260

Hose Specifications

<u>Hose Type</u>	<u>Length</u>
CSK	45'
<u>I.D.</u>	<u>O.D.</u>
4"	6.09"
<u>Working Pressure</u>	<u>Burst Pressure</u>
10000 PSI	Standard Safety Multiplier Applies

Verification

<u>Type of Fitting</u>	<u>Coupling Method</u>
41/16 10K	Swage
<u>Die Size</u>	<u>Final O.D.</u>
6.38"	6.25"
<u>Hose Serial #</u>	<u>Hose Assembly Serial #</u>
5544	79793



Test Pressure
15000 PSI

Time Held at Test Pressure
11 Minutes

Actual Burst Pressure

Peak Pressure
15483 PSI

Comments: Hose assembly pressure tested with water at ambient temperature.

Tested By: Zdc McConnell

Approved By: Kim Thomas

Exhibit F-1 - Co-Flex Hose Hydrostatic Test
Riverboat 12/1 WOPA Fed Com 1H
Cimarex Energy Co.
12-24S-26E
Eddy, NM

Exhibit F-2 - Co-Flex Hose
Riverboat 12/1 WOPA Fed Com 1H
Cimarex Energy Co.
12-24S-26E
Eddy, NM



Midwest Hose & Specialty, Inc.

Certificate of Conformity

Customer:

DEM

PO

ODYD-271

SPECIFICATIONS

Sales Order

79793

Dated:

3/8/2011

We hereby certify that the material supplied
for the referenced purchase order to be true
according to the requirements of the purchase
order and current industry standards.

Supplier:
Midwest Hose & Specialty, Inc.
10640 Tanner Road
Houston, Texas 77041

Comments:

Approved:

Joan Garcia

Date:

3/8/2011



Exhibit F -3- Co-Flex Hose
Riverboat 12/1 WOPA Fed Com 1H
Cimarex Energy Co.
12-24S-26E
Eddy, NM

Specification Sheet Choke & Kill Hose

The Midwest Hose & Specialty Choke & Kill hose is manufactured with only premium componets. The reinforcement cables, inner liner and cover are made of the highest quality material to handle the tough drilling applications of today's industry. The end connections are available with API flanges, API male threads, hubs, hammer unions or other special fittings upon request. Hose assembly is manufactured to API 7K. This assembly is wrapped with fire resistant vermiculite coated fiberglass insulation, rated at 2000 degrees with stainless steel armor cover.

Working Pressure:	5,000 or 10,000 psi working pressure
Test Pressure:	10,000 or 15,000 psi test pressure
Reinforcement:	Multiple steel cables
Cover:	Stainless Steel Armor
Inner Tube:	Petroleum resistant, Abrasion resistant
End Fitting:	API flanges, API male threads, threaded or butt weld hammer unions, unbolt and other special connections
Maximum Length:	110 Feet
ID:	2-1/2", 3", 3-1/2". 4"
Operating Temperature:	-22 deg F to +180 deg F (-30 deg C to +82 deg C)