

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

OCD Artesia

FORM APPROVED
OMB NO. 1004-0135
Expires: July 31, 2010**SUNDRY NOTICES AND REPORTS ON WELLS**
*Do not use this form for proposals to drill or to re-enter an abandoned well. Use form 3160-3 (APD) for such proposals.***SUBMIT IN TRIPLICATE - Other instructions on reverse side.**

1. Type of Well ☒ Oil Well ☐ Gas Well ☐ Other		5. Lease Serial No. NMNM14124
2. Name of Operator CIMAREX ENERGY COMPANY		6. If Indian, Allottee or Tribe Name
Contact: PAULA BRUNSON E-Mail: pbrunson@cimarex.com		7. If Unit or CA/Agreement, Name and/or No.
3a. Address 600 N MARIENFELD STE 600 MIDLAND, TX 79701	3b. Phone No. (include area code) Ph: 432-571-7848	8. Well Name and No. MARQUARDT 1 FEDERAL 13
4. Location of Well (Footage, Sec., T., R., M., or Survey Description) Sec 1 T25S R26E 150FNL 1650FEL		9. API Well No. 30-015-37382
		10. Field and Pool, or Exploratory WILDCAT BONE SPRING <i>Cottonwood Draw B.S.</i>
		11. County or Parish, and State EDDY COUNTY, NM <i>C97494?</i>

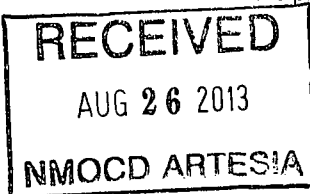
12. CHECK APPROPRIATE BOX(ES) TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA

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

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 shall 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 shall be filed once testing has been completed. Final Abandonment Notices shall be filed only after all requirements, including reclamation, have been completed, and the operator has determined that the site is ready for final inspection.)

Cimarex Energy respectfully requests a change to the approved APD for the Marquardt 1 Federal 13. The APD was approved on 11/5/09 and an extension was granted on 2/1/12. We would like to target the 2nd Bone Spring Ss instead of the Delaware. Please see attachments for the proposed changes.

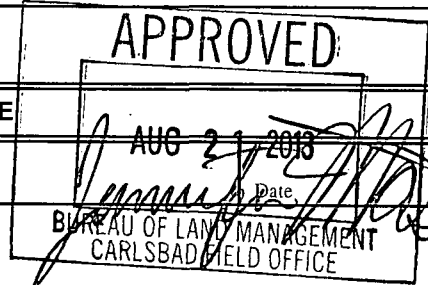
Accepted for record
NMOCD
Joc
8/28/2013



SEE ATTACHED FOR
CONDITIONS OF APPROVA

14. I hereby certify that the foregoing is true and correct. Electronic Submission #215564 verified by the BLM Well Information System For CIMAREX ENERGY COMPANY, sent to the Carlsbad Committed to AFMSS for processing by JOHNNY DICKERSON on 08/09/2013 ()	
Name (Printed/Typed) PAULA BRUNSON	Title REGULATORY ANALYST
Signature (Electronic Submission)	Date 08/01/2013
THIS SPACE FOR FEDERAL OR STATE OFFICE USE	
Approved By _____	Title _____
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.



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

PBT 8/21/13

Attachment to 3160-5
Marquardt 1 Federal 13
Cimarex Energy Co. of Colorado
UL: O, Sec 1-25S-26E
Eddy County, NM

Location:

UL: O – Sec 1-25S-26E

Eddy County, NM

SHL 150 FSL & 1650 FEL

BHL 330 FNL & 1850 FEL (changed from the approved BHL 330 FNL & 2080 FEL)

A revised C-102 is attached.

Proposed Drilling Depth:

11810' MD

7171' TVD

No Pilot Hole

Estimated Tops of Geological Markers:

Formation	Est. Top	Bearing
Top of Salt	1302	NA
Base of Salt	1771	NA
Delaware	1985	Hydrocarbons
Cherry Canyon	2989	NA
Brushy Canyon	3950	NA
Brushy Canyon Lower	5134	NA
Bone Spring	5478	NA
Bone Spring "A" Shale	5575	Hydrocarbons
Bone Spring "C" Shale	5852	NA
1st Bone Spring Ss	6398	NA
2nd Bone Spring Ss	6904	Hydrocarbons
2nd BS Ss Horz Target	7191	NA
3rd BS Limestone	7232	NA

Attachment to 3160-5
Marquardt 1 Federal 13
Cimarex Energy Co. of Colorado
UL: O, Sec 1-255-26E
Eddy County, NM

Casing Program:

Casing Depth From (ft)	Casing Setting Depth(ft) MD	Casing Setting Depth(ft) TVD	Open Hole Size (inches)	Casing Size (inches)	Casing Weight (lb/ft)	Casing Grade	Thread	Conditon	SI Surface Pressure & BHP (psig)	Mud Weight (ppg)	Collapse SF (1.125)	Burst SF (1.125)	Cumulative Air Weight (lbs)	Tension SF (1.6)
Surface														
0'	440'	440'	17 1/2	13 3/8	48	H-40	ST&C	New	198	8.4	3.85	8.7	21120	15.2
Intermediate														
0'	1965'	1965'	12 1/4	9 5/8	36	J-55	LT&C	New	884	9	2.20	4.0	70740	8.0
Production														
0'	6713'	6713'	8 3/4	5 1/2	17	P-110	LT&C	New	1649	8.4	2.55	6.5	121907	3.7
6713'	11810'	7171'	8 3/4	5 1/2	17	P-110	BT&C	New	3227	8.4	2.39	3.3	7786	70.1

Casing Design Criteria and Casing Loading Assumptions:

Surface, Intermediate and Production Casing:

- Tension: A 1.6 design factor without effects of buoyancy.
- Collapse: A 1.125 design factor with full internal evacuation.
- Burst: A 1.125 design with a surface pressure equal to the fracture gradient at setting depth less gas gradient to surface.

Attachment to 3160-5
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Cimarex Energy Co. of Colorado
UL: O, Sec 1-25S-26E
Eddy County, NM

Cementing Program:

<i>Surface</i>	Sacks	Yield (cuft/sx)	Weight (ppg)	Cubic Feet	Cement Blend
Lead	110	1.75	13.5	195	Class C + Bentonite + Calcium Chloride + LCM
Tail	200	1.34	14.8	261	Class C + LCM

TOC: 0' 49% Excess Centralizers per Onshore Order 2.III.B.1f

<i>Intermediate</i>	Sacks	Yield (cuft/sx)	Weight (ppg)	Cubic Feet	Cement Blend
Lead	430	1.88	12.9	802	35:65 (poz/C) + Salt + Bentonite + LCM + retarder
Tail	140	1.34	14.8	182	Class C + retarder + LCM

TOC: 0' 77% Excess

<i>Production</i>	Sacks	Yield (cuft/sx)	Weight (ppg)	Cubic Feet	Cement Blend
Lead	610	2.4	11.9	1464	35:65 (poz/H) + salt + Sodium Metasilicate + Bentonite + Fluid Loss + Dispersant + LCM + Retarder
Tail	1429	1.24	14.5	1771	50:50 (poz/H) + Bentonite + Salt + Fluid Loss + Dispersant + LCM + Retarder

Cement volumes will be adjusted depending on hole size.

TOC: 1465' 25% Excess Centralizers every 3rd joint through the curve or legal location hardline to provide adequate cement coverage every 100' unless hole conditions require greater spacing between centralizers.

Proposed Mud Circulating System:

Depth			Mud Wt	Visc	Fluid Loss	Type Mud
0'	to	440'	8.4	28	NC	FW Spud Mud
440'	to	1965'	9	30-32	NC	Brine water
1965'	to	11810'	8.4	30-32	NC	FW/Cut Brine

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

The Mud Monitoring System is an electronic Pason System satisfying requirements of Onshore Order 1.

Attachment to 3160-5
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Eddy County, NM

Drilling Plan:

Pilot Hole TD: NA

KOP: 6713

EOC: 7466

Set surface and intermediate casing strings. Drill production hole to KOP. Continue drilling lateral through the curve to TD. Run prod casing & cement.

A revised directional plan is attached.

Pressure Control Equipment: * See COA

See Exhibit A attached. A BOP consisting of two rams with blind rams and pipe rams, and one annular preventer. Below the surface casing, a 2M system will be used. Below the intermediate casing, a 3M system will be used. See attachments for BOP and choke manifold diagrams. An accumulator that meets the requirements in Onshore Order #2 for the pressure rating of the BOP stack. A Rotating head may be installed as needed. A kelly cock will be installed and maintained in operable condition and a drill string safety valve in the open position will be available on the rig floor.

BOP and associated equipment will be installed, used, maintained, and tested in a manner necessary to assure well control and shall be in place and operational prior to drilling the surface casing shoe. The Annular Preventer shall be functioned at least weekly. The pipe and blind rams will be operated each trip. No abnormal pressure or temperature is expected while drilling.

* See COA
BOPS will be tested by an independent service company. The ram preventers, choke manifold, and safety valves will be tested as follows: On the surface casing, pressure tests will be made to 250 psi low and 2000 psi high. On the intermediate casing, pressure tests will be made to 250 psi low and 3000 psi high.

The Annular Preventer will be tested to 250 psi low and 1000 psi high on the surface casing, and 250 low and 1500 high on the intermediate casing.

See COA
Cimarex Energy Co. of Colorado requests a variance to drill this well using a co-flex line between the BOP and choke manifold. Certification for proposed co-flex hose is attached (please see Exhibit B, B-1, B-2, B-3 attached). The hose is not required by the manufacturer to be anchored. In the event the specific hose is not available, one of equal or higher rating will be used.

Attachment to 3160-5
Marquardt 1 Federal 13
Cimarex Energy Co. of Colorado
UL: O, Sec 1-25S-26E
Eddy County, NM

See COA
Potential Hazards:

No abnormal pressures or temperatures are expected. In accordance with Onshore Order 6, Cimarex does not anticipate that there will be enough H₂S from the surface to the Bone Spring formations to meet the BLM's minimum requirements for the submission of an "H₂S Drilling Operation Plan" or "Public Protection Plan" for the drilling and completion of this well. Since we have an H₂S Safety package on all wells, attached is an "H₂S Drilling Operations Plan." Adequate flare lines will be installed off the mud / gas separator where gas may be flared safely. All personnel will be familiar with all aspects of safe operation of equipment being used.

Estimated BHP: 3226.95 psi

Estimated BHT: 138 deg

Other:

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

Bone Spring pay will be perforated and stimulated.

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

DISTRICT I
1025 N. French Dr., Hobbs, NM 88240

DISTRICT II
1501 W. Grand Avenue, Artesia, NM 88210

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

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

State of New Mexico
Energy, Minerals and Natural Resources Department

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 30-015-37382	Pool Code 97494	Pool Name Cottonwood Dam Wildcat Bone Spring
Property Code	Property Name MARQUARDT "1" FEDERAL	Well Number 13
OGRID No. 162683	Operator Name CIMAREX ENERGY CO. OF COLORADO	Elevation 3272'

Surface Location

UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
0	1	25 S	26 E		150	SOUTH	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
B	1	25 S	26 E		330	NORTH	1850	EAST	EDDY

Dedicated Acres	Joint or Infill	Consolidation Code	Order No.
160.09			

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

BOTTOM HOLE LOCATION Lot - N 32°09'55.55" Long - W 104°14'38.37" NMSPC- N 423929.7 E 586982.5 (NAD-83)	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 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. <i>Paula Brunson</i> 7/31/2013 Signature Date Paula Brunson Printed Name pbrunson@cimarex.com
SURFACE LOCATION Lot - N 32°09'07.86" Long - W 104°14'35.94" NMSPC- N 419110.9 E 569195.3 (NAD-83)	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. 7/31/2013 Date Surveyed <i>[Signature]</i> Signature of Professional Surveyor 7977 Certificate No. Cory L. Jones BASIN SURVEYS

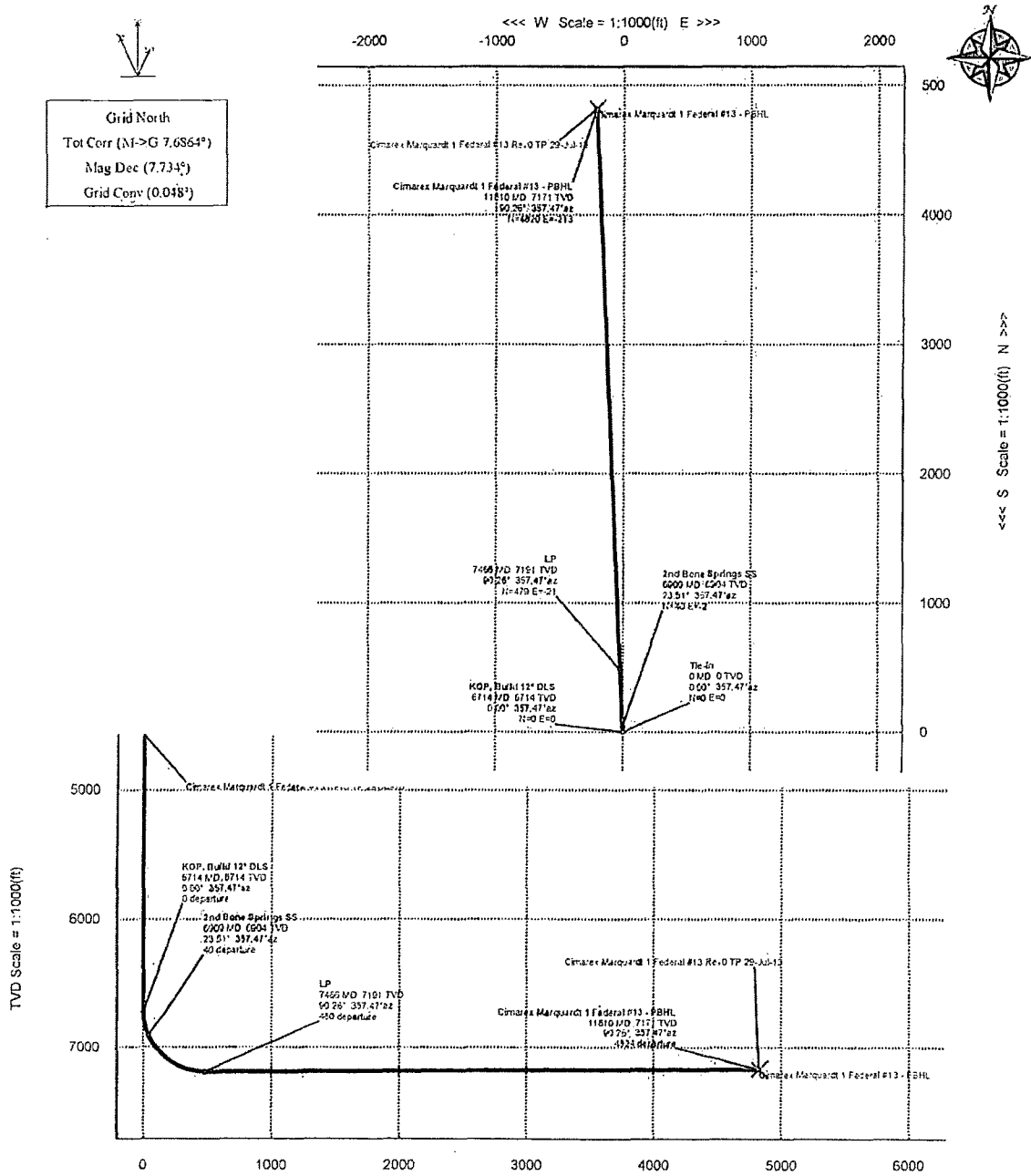


Cimarex Energy

PATHFINDER
A Schlumberger Company

WELL	FIELD	STRUCTURE
Marquardt 1 Federal #13	NM Eddy County (NAD 83)	Cimarex Marquardt 1 Federal #

Version: 2011	MD: 22.821	DW: 23	DATE: 07/26/2013	Current Location: N 22 8 7156 E 11214 21 811	NAD 83 North Arrow: 11214 21 811	MD: 22.821	MD: 22.821	MD: 22.821	MD: 22.821
MD: 22.821	MD: 22.821	MD: 22.821	MD: 22.821	MD: 22.821	MD: 22.821	MD: 22.821	MD: 22.821	MD: 22.821	MD: 22.821



Cimarex Marquardt 1 Federal #13 Rev0 TP 29-Jul-13 Proposal Report

(Def Plan)

Report Date: July 29, 2013 - 12:50 PM
Client: Cimarex Energy
Field: NM Eddy County (NAD 83)
Structure / Slot: Cimarex Marquardt 1 Federal #13 / Marquardt 1 Federal #13
Well: Marquardt 1 Federal #13
Borehole: Original Borehole
UWI / API#: Unknown / Unknown
Survey Name: Cimarex Marquardt 1 Federal #13 Rev0 TP 29-Jul-13
Survey Date: July 29, 2013
Tort / AHD / DDI / ERD Ratio: 90.268 * / 4824.385 ft / 5.854 / 0.671
Coordinate Reference System: NAD83 New Mexico State Plane, Eastern Zone, US Feet
Location Lat / Long: N 32° 9' 7.85624", W 104° 14' 35.94128"
Location Grid N/E Y/X: N 419110.900 ftUS, E 569195.300 ftUS
CRS Grid Convergence Angle: 0.0479 *
Grid Scale Factor: 0.99990998

Survey / DLS Computation: Minimum Curvature / Lubinski
Vertical Section Azimuth: 357.472 * (Grid North)
Vertical Section Origin: 0.000 ft, 0.000 ft
TVD Reference Datum: RKB
TVD Reference Elevation: 3297.000 ft above
Seabed / Ground Elevation: 3272.000 ft above
Magnetic Declination: 7.734 *
Total Field Strength: 48247.071 nT
Magnetic Dip Angle: 59.901 *
Declination Date: July 29, 2013
Magnetic Declination Model: BGGM 2012
North Reference: Grid North
Grid Convergence Used: 0.0479 *
Total Corr Mag North->Grid North: 7.6864 *
Local Coord Referenced To: Structure Reference Point

Comments	MD (ft)	Incl (°)	Azlm Grid (°)	TVD (ft)	VSEC (ft)	NS (ft)	EW (ft)	Northing (ftUS)	Easting (ftUS)	Latitude (N/S ° ' ")	Longitude (E/W ° ' ")	Closure (ft)	Closure Azimuth (°)	DLS (*/100ft)
Tie-In	0.00	0.00	357.47	0.00	0.00	0.00	0.00	419110.90	569195.30	N 32° 9' 7.86"	W 104 14 35.94	0.00	0.00	N/A
	100.00	0.00	357.47	100.00	0.00	0.00	0.00	419110.90	569195.30	N 32° 9' 7.86"	W 104 14 35.94	0.00	0.00	0.00
	200.00	0.00	357.47	200.00	0.00	0.00	0.00	419110.90	569195.30	N 32° 9' 7.86"	W 104 14 35.94	0.00	0.00	0.00
	300.00	0.00	357.47	300.00	0.00	0.00	0.00	419110.90	569195.30	N 32° 9' 7.86"	W 104 14 35.94	0.00	0.00	0.00
	400.00	0.00	357.47	400.00	0.00	0.00	0.00	419110.90	569195.30	N 32° 9' 7.86"	W 104 14 35.94	0.00	0.00	0.00
	500.00	0.00	357.47	500.00	0.00	0.00	0.00	419110.90	569195.30	N 32° 9' 7.86"	W 104 14 35.94	0.00	0.00	0.00
	600.00	0.00	357.47	600.00	0.00	0.00	0.00	419110.90	569195.30	N 32° 9' 7.86"	W 104 14 35.94	0.00	0.00	0.00
	700.00	0.00	357.47	700.00	0.00	0.00	0.00	419110.90	569195.30	N 32° 9' 7.86"	W 104 14 35.94	0.00	0.00	0.00
	800.00	0.00	357.47	800.00	0.00	0.00	0.00	419110.90	569195.30	N 32° 9' 7.86"	W 104 14 35.94	0.00	0.00	0.00
	900.00	0.00	357.47	900.00	0.00	0.00	0.00	419110.90	569195.30	N 32° 9' 7.86"	W 104 14 35.94	0.00	0.00	0.00
	1000.00	0.00	357.47	1000.00	0.00	0.00	0.00	419110.90	569195.30	N 32° 9' 7.86"	W 104 14 35.94	0.00	0.00	0.00
	1100.00	0.00	357.47	1100.00	0.00	0.00	0.00	419110.90	569195.30	N 32° 9' 7.86"	W 104 14 35.94	0.00	0.00	0.00
	1200.00	0.00	357.47	1200.00	0.00	0.00	0.00	419110.90	569195.30	N 32° 9' 7.86"	W 104 14 35.94	0.00	0.00	0.00
	1300.00	0.00	357.47	1300.00	0.00	0.00	0.00	419110.90	569195.30	N 32° 9' 7.86"	W 104 14 35.94	0.00	0.00	0.00
	1400.00	0.00	357.47	1400.00	0.00	0.00	0.00	419110.90	569195.30	N 32° 9' 7.86"	W 104 14 35.94	0.00	0.00	0.00
	1500.00	0.00	357.47	1500.00	0.00	0.00	0.00	419110.90	569195.30	N 32° 9' 7.86"	W 104 14 35.94	0.00	0.00	0.00
	1600.00	0.00	357.47	1600.00	0.00	0.00	0.00	419110.90	569195.30	N 32° 9' 7.86"	W 104 14 35.94	0.00	0.00	0.00
	1700.00	0.00	357.47	1700.00	0.00	0.00	0.00	419110.90	569195.30	N 32° 9' 7.86"	W 104 14 35.94	0.00	0.00	0.00
	1800.00	0.00	357.47	1800.00	0.00	0.00	0.00	419110.90	569195.30	N 32° 9' 7.86"	W 104 14 35.94	0.00	0.00	0.00
	1900.00	0.00	357.47	1900.00	0.00	0.00	0.00	419110.90	569195.30	N 32° 9' 7.86"	W 104 14 35.94	0.00	0.00	0.00
	2000.00	0.00	357.47	2000.00	0.00	0.00	0.00	419110.90	569195.30	N 32° 9' 7.86"	W 104 14 35.94	0.00	0.00	0.00
	2100.00	0.00	357.47	2100.00	0.00	0.00	0.00	419110.90	569195.30	N 32° 9' 7.86"	W 104 14 35.94	0.00	0.00	0.00
	2200.00	0.00	357.47	2200.00	0.00	0.00	0.00	419110.90	569195.30	N 32° 9' 7.86"	W 104 14 35.94	0.00	0.00	0.00
	2300.00	0.00	357.47	2300.00	0.00	0.00	0.00	419110.90	569195.30	N 32° 9' 7.86"	W 104 14 35.94	0.00	0.00	0.00
	2400.00	0.00	357.47	2400.00	0.00	0.00	0.00	419110.90	569195.30	N 32° 9' 7.86"	W 104 14 35.94	0.00	0.00	0.00
	2500.00	0.00	357.47	2500.00	0.00	0.00	0.00	419110.90	569195.30	N 32° 9' 7.86"	W 104 14 35.94	0.00	0.00	0.00
	2600.00	0.00	357.47	2600.00	0.00	0.00	0.00	419110.90	569195.30	N 32° 9' 7.86"	W 104 14 35.94	0.00	0.00	0.00
	2700.00	0.00	357.47	2700.00	0.00	0.00	0.00	419110.90	569195.30	N 32° 9' 7.86"	W 104 14 35.94	0.00	0.00	0.00
	2800.00	0.00	357.47	2800.00	0.00	0.00	0.00	419110.90	569195.30	N 32° 9' 7.86"	W 104 14 35.94	0.00	0.00	0.00
	2900.00	0.00	357.47	2900.00	0.00	0.00	0.00	419110.90	569195.30	N 32° 9' 7.86"	W 104 14 35.94	0.00	0.00	0.00
	3000.00	0.00	357.47	3000.00	0.00	0.00	0.00	419110.90	569195.30	N 32° 9' 7.86"	W 104 14 35.94	0.00	0.00	0.00

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	VSEC (ft)	NS (ft)	EW (ft)	Northing (ftUS)	Easting (ftUS)	Latitude (N/S ° ' '')	Longitude (E/W ° ' '')	Closure (ft)	Closure Azimuth (°)	DLS ("/100ft)
	3100.00	0.00	357.47	3100.00	0.00	0.00	0.00	419110.90	569195.30	N 32 9 7.86	W 104 14 35.94	0.00	0.00	0.00
	3200.00	0.00	357.47	3200.00	0.00	0.00	0.00	419110.90	569195.30	N 32 9 7.86	W 104 14 35.94	0.00	0.00	0.00
	3300.00	0.00	357.47	3300.00	0.00	0.00	0.00	419110.90	569195.30	N 32 9 7.86	W 104 14 35.94	0.00	0.00	0.00
	3400.00	0.00	357.47	3400.00	0.00	0.00	0.00	419110.90	569195.30	N 32 9 7.86	W 104 14 35.94	0.00	0.00	0.00
	3500.00	0.00	357.47	3500.00	0.00	0.00	0.00	419110.90	569195.30	N 32 9 7.86	W 104 14 35.94	0.00	0.00	0.00
	3600.00	0.00	357.47	3600.00	0.00	0.00	0.00	419110.90	569195.30	N 32 9 7.86	W 104 14 35.94	0.00	0.00	0.00
	3700.00	0.00	357.47	3700.00	0.00	0.00	0.00	419110.90	569195.30	N 32 9 7.86	W 104 14 35.94	0.00	0.00	0.00
	3800.00	0.00	357.47	3800.00	0.00	0.00	0.00	419110.90	569195.30	N 32 9 7.86	W 104 14 35.94	0.00	0.00	0.00
	3900.00	0.00	357.47	3900.00	0.00	0.00	0.00	419110.90	569195.30	N 32 9 7.86	W 104 14 35.94	0.00	0.00	0.00
	4000.00	0.00	357.47	4000.00	0.00	0.00	0.00	419110.90	569195.30	N 32 9 7.86	W 104 14 35.94	0.00	0.00	0.00
	4100.00	0.00	357.47	4100.00	0.00	0.00	0.00	419110.90	569195.30	N 32 9 7.86	W 104 14 35.94	0.00	0.00	0.00
	4200.00	0.00	357.47	4200.00	0.00	0.00	0.00	419110.90	569195.30	N 32 9 7.86	W 104 14 35.94	0.00	0.00	0.00
	4300.00	0.00	357.47	4300.00	0.00	0.00	0.00	419110.90	569195.30	N 32 9 7.86	W 104 14 35.94	0.00	0.00	0.00
	4400.00	0.00	357.47	4400.00	0.00	0.00	0.00	419110.90	569195.30	N 32 9 7.86	W 104 14 35.94	0.00	0.00	0.00
	4500.00	0.00	357.47	4500.00	0.00	0.00	0.00	419110.90	569195.30	N 32 9 7.86	W 104 14 35.94	0.00	0.00	0.00
	4600.00	0.00	357.47	4600.00	0.00	0.00	0.00	419110.90	569195.30	N 32 9 7.86	W 104 14 35.94	0.00	0.00	0.00
	4700.00	0.00	357.47	4700.00	0.00	0.00	0.00	419110.90	569195.30	N 32 9 7.86	W 104 14 35.94	0.00	0.00	0.00
	4800.00	0.00	357.47	4800.00	0.00	0.00	0.00	419110.90	569195.30	N 32 9 7.86	W 104 14 35.94	0.00	0.00	0.00
	4900.00	0.00	357.47	4900.00	0.00	0.00	0.00	419110.90	569195.30	N 32 9 7.86	W 104 14 35.94	0.00	0.00	0.00
	5000.00	0.00	357.47	5000.00	0.00	0.00	0.00	419110.90	569195.30	N 32 9 7.86	W 104 14 35.94	0.00	0.00	0.00
	5100.00	0.00	357.47	5100.00	0.00	0.00	0.00	419110.90	569195.30	N 32 9 7.86	W 104 14 35.94	0.00	0.00	0.00
	5200.00	0.00	357.47	5200.00	0.00	0.00	0.00	419110.90	569195.30	N 32 9 7.86	W 104 14 35.94	0.00	0.00	0.00
	5300.00	0.00	357.47	5300.00	0.00	0.00	0.00	419110.90	569195.30	N 32 9 7.86	W 104 14 35.94	0.00	0.00	0.00
	5400.00	0.00	357.47	5400.00	0.00	0.00	0.00	419110.90	569195.30	N 32 9 7.86	W 104 14 35.94	0.00	0.00	0.00
	5500.00	0.00	357.47	5500.00	0.00	0.00	0.00	419110.90	569195.30	N 32 9 7.86	W 104 14 35.94	0.00	0.00	0.00
	5600.00	0.00	357.47	5600.00	0.00	0.00	0.00	419110.90	569195.30	N 32 9 7.86	W 104 14 35.94	0.00	0.00	0.00
	5700.00	0.00	357.47	5700.00	0.00	0.00	0.00	419110.90	569195.30	N 32 9 7.86	W 104 14 35.94	0.00	0.00	0.00
	5800.00	0.00	357.47	5800.00	0.00	0.00	0.00	419110.90	569195.30	N 32 9 7.86	W 104 14 35.94	0.00	0.00	0.00
	5900.00	0.00	357.47	5900.00	0.00	0.00	0.00	419110.90	569195.30	N 32 9 7.86	W 104 14 35.94	0.00	0.00	0.00
	6000.00	0.00	357.47	6000.00	0.00	0.00	0.00	419110.90	569195.30	N 32 9 7.86	W 104 14 35.94	0.00	0.00	0.00
	6100.00	0.00	357.47	6100.00	0.00	0.00	0.00	419110.90	569195.30	N 32 9 7.86	W 104 14 35.94	0.00	0.00	0.00
	6200.00	0.00	357.47	6200.00	0.00	0.00	0.00	419110.90	569195.30	N 32 9 7.86	W 104 14 35.94	0.00	0.00	0.00
	6300.00	0.00	357.47	6300.00	0.00	0.00	0.00	419110.90	569195.30	N 32 9 7.86	W 104 14 35.94	0.00	0.00	0.00
	6400.00	0.00	357.47	6400.00	0.00	0.00	0.00	419110.90	569195.30	N 32 9 7.86	W 104 14 35.94	0.00	0.00	0.00
	6500.00	0.00	357.47	6500.00	0.00	0.00	0.00	419110.90	569195.30	N 32 9 7.86	W 104 14 35.94	0.00	0.00	0.00
	6600.00	0.00	357.47	6600.00	0.00	0.00	0.00	419110.90	569195.30	N 32 9 7.86	W 104 14 35.94	0.00	0.00	0.00
	6700.00	0.00	357.47	6700.00	0.00	0.00	0.00	419110.90	569195.30	N 32 9 7.86	W 104 14 35.94	0.00	0.00	0.00
KOP, Build 12" DLS	6713.50	0.00	357.47	6713.50	0.00	0.00	0.00	419110.90	569195.30	N 32 9 7.86	W 104 14 35.94	0.00	0.00	0.00
	6800.00	10.38	357.47	6799.53	7.81	7.81	-0.34	419118.70	569194.96	N 32 9 7.93	W 104 14 35.95	7.81	357.47	12.00
	6900.00	22.38	357.47	6895.29	35.96	35.93	-1.59	419146.82	569193.71	N 32 9 8.21	W 104 14 35.96	35.96	357.47	12.00
2nd Bone Springs SS	6909.45	23.51	357.47	6904.00	39.65	39.61	-1.75	419150.50	569193.55	N 32 9 8.25	W 104 14 35.96	39.65	357.47	12.00
	7000.00	34.38	357.47	6983.12	83.40	83.32	-3.68	419194.21	569191.62	N 32 9 8.68	W 104 14 35.98	83.40	357.47	12.00
	7100.00	46.38	357.47	7059.16	148.06	147.92	-6.54	419258.81	569188.76	N 32 9 9.32	W 104 14 36.02	148.06	357.47	12.00
	7200.00	58.38	357.47	7120.10	227.12	226.90	-10.03	419337.78	569185.28	N 32 9 10.10	W 104 14 36.06	227.12	357.47	12.00
	7300.00	70.37	357.47	7163.26	317.12	316.81	-14.00	419427.68	569181.30	N 32 9 10.99	W 104 14 36.10	317.12	357.47	12.00
	7400.00	82.37	357.47	7186.78	414.13	413.73	-18.28	419524.59	569177.02	N 32 9 11.95	W 104 14 36.15	414.13	357.47	12.00
	7465.76	90.26	357.47	7191.00	479.71	479.24	-21.18	419590.09	569174.13	N 32 9 12.60	W 104 14 36.18	479.71	357.47	12.00
LP	7500.00	90.26	357.47	7190.84	513.94	513.44	-22.69	419624.29	569172.62	N 32 9 12.94	W 104 14 36.20	513.94	357.47	0.00
	7600.00	90.26	357.47	7190.38	613.94	613.34	-27.10	419724.19	569168.20	N 32 9 13.93	W 104 14 36.25	613.94	357.47	0.00
	7700.00	90.26	357.47	7189.92	713.94	713.24	-31.51	419824.08	569163.79	N 32 9 14.91	W 104 14 36.30	713.94	357.47	0.00
	7800.00	90.26	357.47	7189.46	813.94	813.14	-35.93	419923.97	569159.37	N 32 9 15.90	W 104 14 36.35	813.94	357.47	0.00
	7900.00	90.26	357.47	7189.00	913.94	913.05	-40.34	420023.86	569154.96	N 32 9 16.89	W 104 14 36.40	913.94	357.47	0.00
	8000.00	90.26	357.47	7188.54	1013.94	1012.95	-44.76	420123.75	569150.55	N 32 9 17.88	W 104 14 36.45	1013.94	357.47	0.00
	8100.00	90.26	357.47	7188.08	1113.94	1112.85	-49.17	420223.65	569146.14	N 32 9 18.87	W 104 14 36.50	1113.94	357.47	0.00

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	VSEC (ft)	NS (ft)	EW (ft)	Northing (ftUS)	Easting (ftUS)	Latitude (N/S ° ' ")	Longitude (E/W ° ' ")	Closure (ft)	Closure Azimuth (°)	DLS ("/100ft)
	8200.00	90.26	357.47	7187.62	1213.93	1212.75	-53.58	420323.54	569141.72	N 32 9 19.86	W 104 14 36.55	1213.93	357.47	0.00
	8300.00	90.26	357.47	7187.16	1313.93	1312.65	-57.99	420423.43	569137.31	N 32 9 20.85	W 104 14 36.60	1313.93	357.47	0.00
	8400.00	90.26	357.47	7186.70	1413.93	1412.55	-62.41	420523.32	569132.90	N 32 9 21.83	W 104 14 36.65	1413.93	357.47	0.00
	8500.00	90.26	357.47	7186.24	1513.93	1512.45	-66.82	420623.22	569128.49	N 32 9 22.82	W 104 14 36.70	1513.93	357.47	0.00
	8600.00	90.26	357.47	7185.78	1613.93	1612.36	-71.23	420723.11	569124.07	N 32 9 23.81	W 104 14 36.75	1613.93	357.47	0.00
	8700.00	90.26	357.47	7185.31	1713.93	1712.26	-75.64	420823.00	569119.66	N 32 9 24.80	W 104 14 36.80	1713.93	357.47	0.00
	8800.00	90.26	357.47	7184.85	1813.93	1812.16	-80.06	420922.89	569115.25	N 32 9 25.79	W 104 14 36.85	1813.93	357.47	0.00
	8900.00	90.26	357.47	7184.39	1913.93	1912.06	-84.47	421022.79	569110.84	N 32 9 26.78	W 104 14 36.91	1913.93	357.47	0.00
	9000.00	90.26	357.47	7183.93	2013.93	2011.95	-88.88	421122.68	569106.43	N 32 9 27.77	W 104 14 36.96	2013.93	357.47	0.00
	9100.00	90.26	357.47	7183.47	2113.92	2111.86	-93.29	421222.57	569102.02	N 32 9 28.75	W 104 14 37.01	2113.92	357.47	0.00
	9200.00	90.26	357.47	7183.01	2213.92	2211.77	-97.70	421322.46	569097.61	N 32 9 29.74	W 104 14 37.06	2213.92	357.47	0.00
	9300.00	90.26	357.47	7182.55	2313.92	2311.67	-102.11	421422.36	569093.19	N 32 9 30.73	W 104 14 37.11	2313.92	357.47	0.00
	9400.00	90.26	357.47	7182.09	2413.92	2411.57	-106.53	421522.25	569088.78	N 32 9 31.72	W 104 14 37.16	2413.92	357.47	0.00
	9500.00	90.26	357.47	7181.63	2513.92	2511.47	-110.94	421622.14	569084.37	N 32 9 32.71	W 104 14 37.21	2513.92	357.47	0.00
	9600.00	90.26	357.47	7181.17	2613.92	2611.37	-115.35	421722.03	569079.96	N 32 9 33.70	W 104 14 37.26	2613.92	357.47	0.00
	9700.00	90.26	357.47	7180.71	2713.92	2711.27	-119.76	421821.93	569075.55	N 32 9 34.69	W 104 14 37.31	2713.92	357.47	0.00
	9800.00	90.26	357.47	7180.25	2813.92	2811.18	-124.17	421921.82	569071.14	N 32 9 35.67	W 104 14 37.36	2813.92	357.47	0.00
	9900.00	90.26	357.47	7179.79	2913.92	2911.08	-128.58	422021.71	569066.73	N 32 9 36.66	W 104 14 37.41	2913.92	357.47	0.00
	10000.00	90.26	357.47	7179.33	3013.91	3010.98	-132.99	422121.60	569062.32	N 32 9 37.65	W 104 14 37.46	3013.91	357.47	0.00
	10100.00	90.26	357.47	7178.87	3113.91	3110.88	-137.40	422221.49	569057.91	N 32 9 38.64	W 104 14 37.51	3113.91	357.47	0.00
	10200.00	90.26	357.47	7178.41	3213.91	3210.78	-141.81	422321.39	569053.50	N 32 9 39.63	W 104 14 37.56	3213.91	357.47	0.00
	10300.00	90.26	357.47	7177.95	3313.91	3310.68	-146.22	422421.28	569049.10	N 32 9 40.62	W 104 14 37.61	3313.91	357.47	0.00
	10400.00	90.26	357.47	7177.49	3413.91	3410.59	-150.63	422521.17	569044.69	N 32 9 41.61	W 104 14 37.66	3413.91	357.47	0.00
	10500.00	90.26	357.47	7177.03	3513.91	3510.49	-155.04	422621.06	569040.28	N 32 9 42.59	W 104 14 37.71	3513.91	357.47	0.00
	10600.00	90.26	357.47	7176.57	3613.91	3610.39	-159.45	422720.96	569035.87	N 32 9 43.58	W 104 14 37.76	3613.91	357.47	0.00
	10700.00	90.26	357.47	7176.11	3713.91	3710.29	-163.86	422820.85	569031.46	N 32 9 44.57	W 104 14 37.81	3713.91	357.47	0.00
	10800.00	90.26	357.47	7175.65	3813.91	3810.19	-168.26	422920.74	569027.05	N 32 9 45.56	W 104 14 37.86	3813.91	357.47	0.00
	10900.00	90.26	357.47	7175.19	3913.91	3910.09	-172.67	423020.63	569022.64	N 32 9 46.55	W 104 14 37.91	3913.91	357.47	0.00
	11000.00	90.26	357.47	7174.73	4013.90	4010.00	-177.08	423120.53	569018.24	N 32 9 47.54	W 104 14 37.96	4013.90	357.47	0.00
	11100.00	90.26	357.47	7174.27	4113.90	4109.90	-181.49	423220.42	569013.83	N 32 9 48.53	W 104 14 38.01	4113.90	357.47	0.00
	11200.00	90.26	357.47	7173.81	4213.90	4209.80	-185.90	423320.31	569009.42	N 32 9 49.51	W 104 14 38.06	4213.90	357.47	0.00
	11300.00	90.26	357.47	7173.35	4313.90	4309.70	-190.31	423420.20	569005.01	N 32 9 50.50	W 104 14 38.11	4313.90	357.47	0.00
	11400.00	90.26	357.47	7172.89	4413.90	4409.60	-194.71	423520.10	569000.60	N 32 9 51.49	W 104 14 38.16	4413.90	357.47	0.00
	11500.00	90.26	357.47	7172.43	4513.90	4509.51	-199.12	423619.99	568996.20	N 32 9 52.48	W 104 14 38.21	4513.90	357.47	0.00
	11600.00	90.26	357.47	7171.97	4613.90	4609.41	-203.53	423719.88	568991.79	N 32 9 53.47	W 104 14 38.26	4613.90	357.47	0.00
	11700.00	90.26	357.47	7171.51	4713.90	4709.31	-207.94	423819.78	568987.38	N 32 9 54.46	W 104 14 38.31	4713.90	357.47	0.00
	11800.00	90.26	357.47	7171.05	4813.90	4809.21	-212.34	423919.67	568982.98	N 32 9 55.45	W 104 14 38.36	4813.90	357.47	0.00
Cimarex Marquardt 1 Federal #13 - PBHL	11810.49	90.26	357.47	7171.00	4824.38	4819.69	-212.81	423930.15	568982.51	N 32 9 55.55	W 104 14 38.37	4824.38	357.47	0.00

Survey Type: Dof Plan

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

Description	MD From (ft)	MD To (ft)	EOU Freq (ft)	Hole Size (in)	Casing Diameter (in)	Survey Tool Type	Borehole / Survey
	0.000	25.000	1/100.000	30.000	30.000	SLB_UNKNOWN-Depth Only	Original Borehole / Cimarex Marquardt 1 Federal #13 Rev0 TP
	25.000	11810.489	1/100.000	30.000	30.000	SLB_UNKNOWN	Original Borehole / Cimarex Marquardt 1 Federal #13 Rev0 TP

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

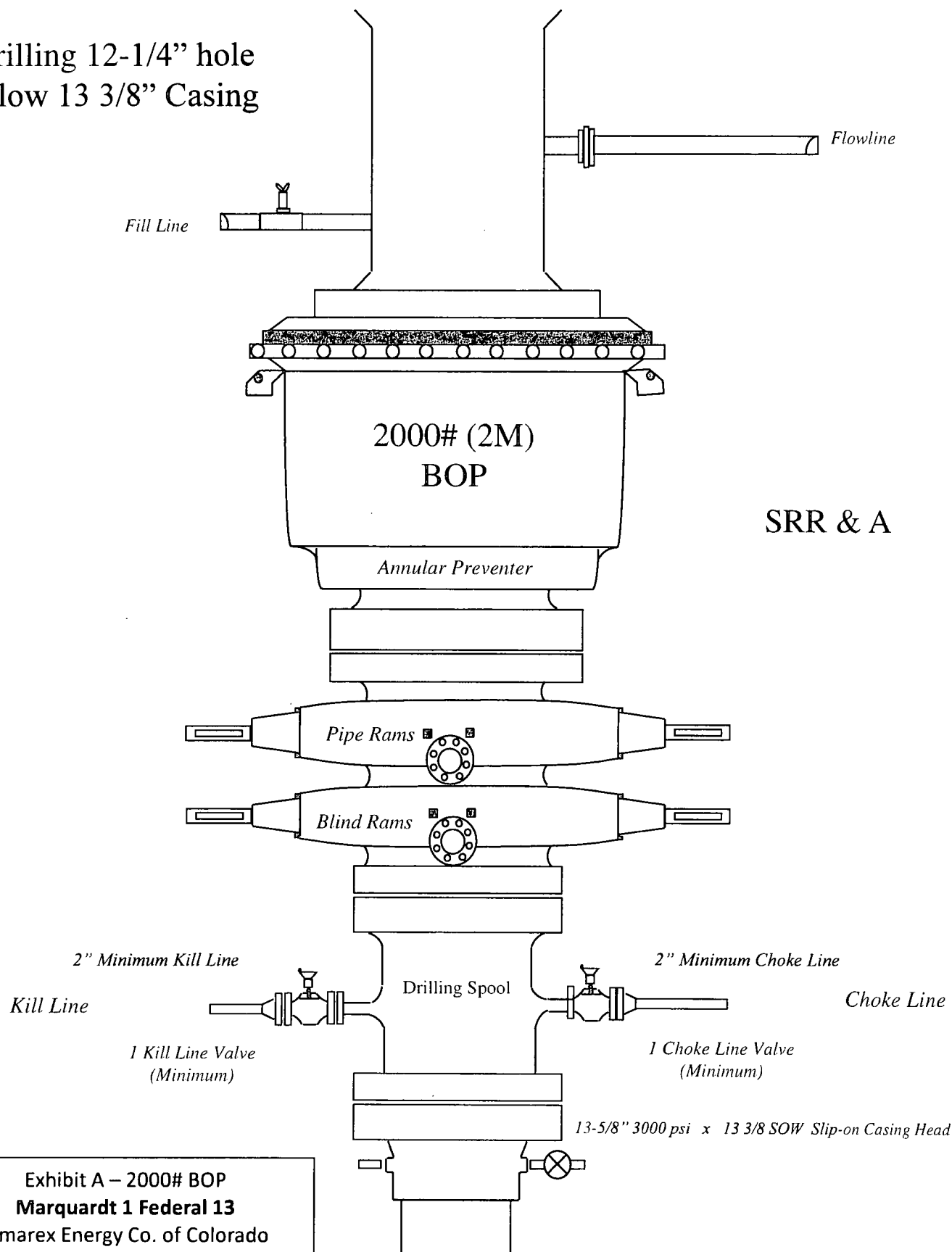
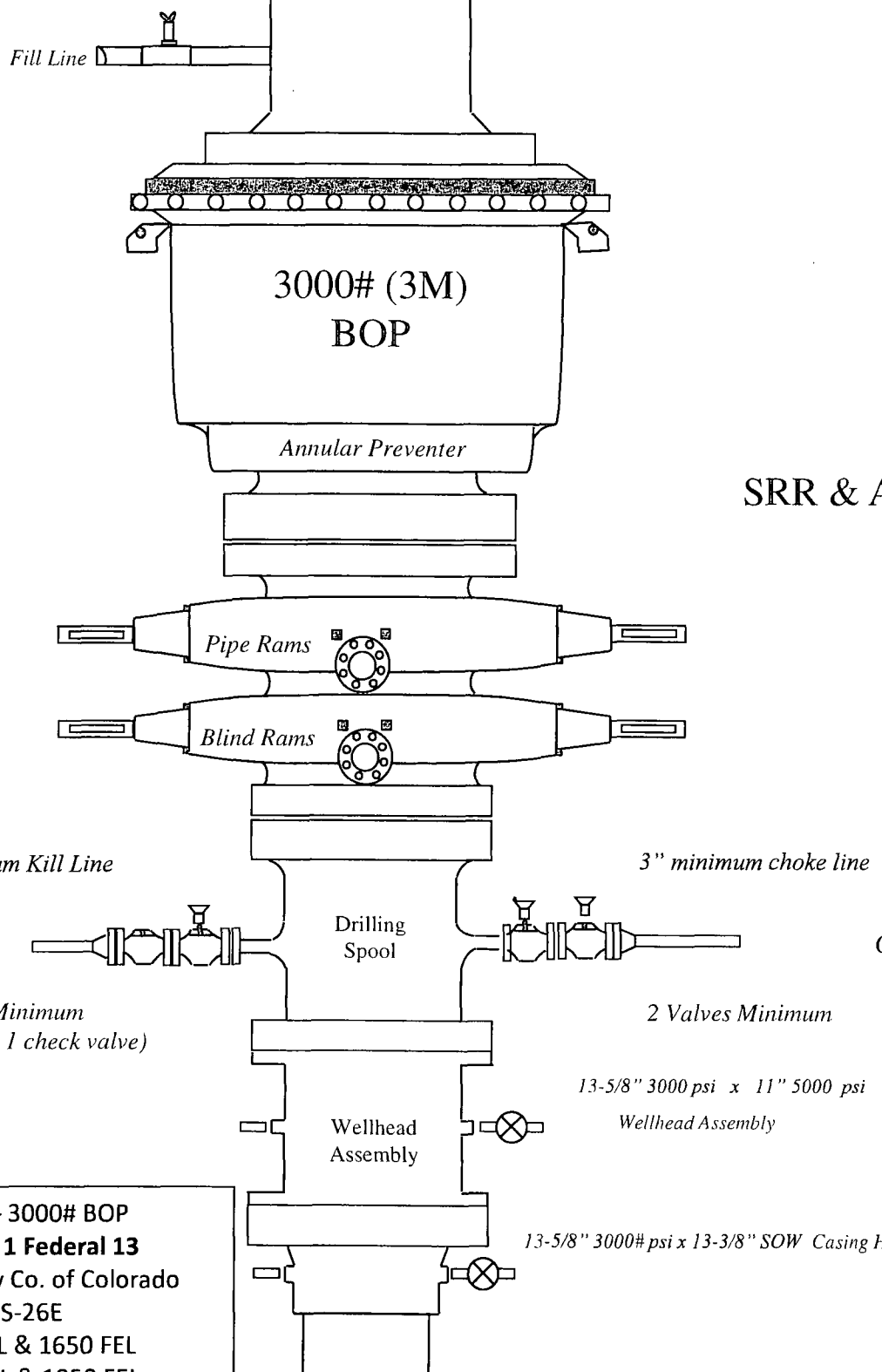


Exhibit A – 2000# BOP
Marquardt 1 Federal 13
Cimarex Energy Co. of Colorado
1-25S-26E
SHL 150 FSL & 1650 FEL
BHL 330 FNL & 1850 FEL
Eddy County, NM

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



SRR & A

Exhibit A – 3000# BOP
Marquardt 1 Federal 13
Cimarex Energy Co. of Colorado
1-25S-26E
SHL 150 FSL & 1650 FEL
BHL 330 FNL & 1850 FEL
Eddy County, NM

Drilling Operations Choke Manifold 2M/3M Service

Exhibit A – Choke Manifold Diagram

Marquardt 1 Federal 13

Cimarex Energy Co. of Colorado

1-25S-26E

SHL 150 FSL & 1650 FEL

BHL 330 FNL & 1850 FEL

Eddy County, NM

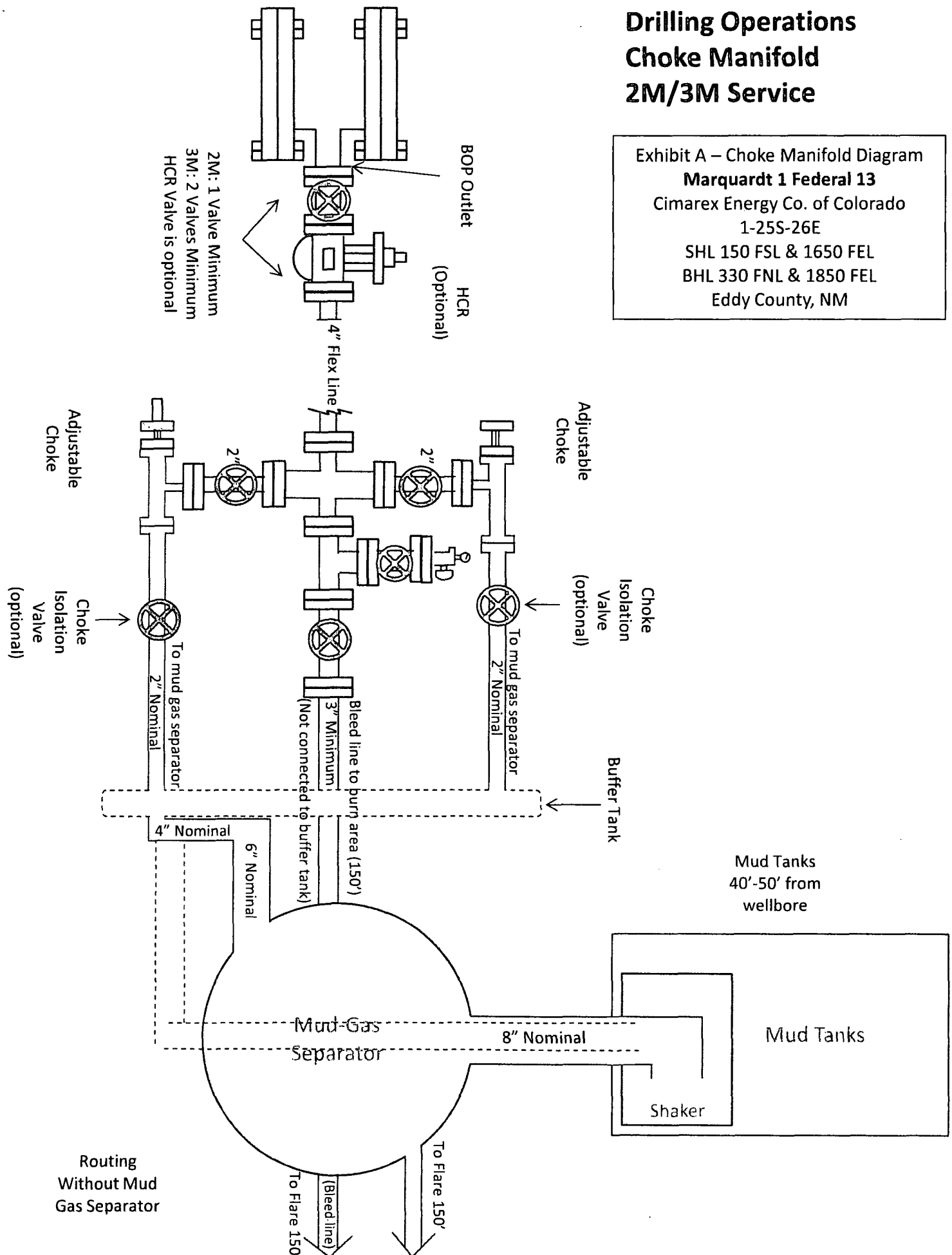


Exhibit B – Co-Flex Hose
Marquardt 1 Federal 13
Cimarex Energy Co. of Colorado
1-25S-26E
SHL 150 FSL & 1650 FEL
BHL 330 FNL & 1850 FEL
Eddy County, NM

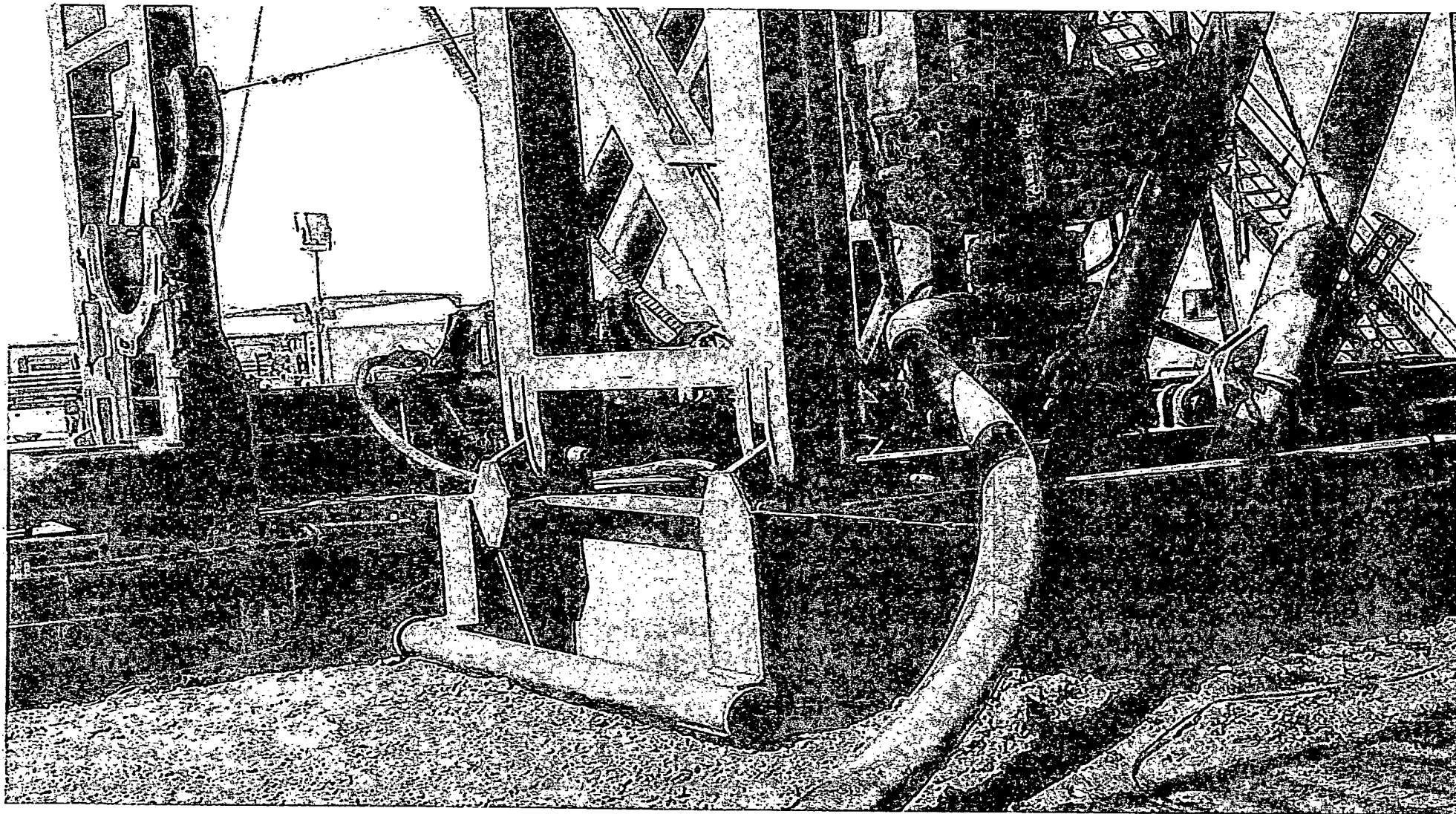


Exhibit B-1 – Co-Flex Hose Hydrostatic Test

Marquardt 1 Federal 13

Cimarex Energy Co. of Colorado

1-25S-26E

SHL 150 FSL & 1650 FEL

BHL 330 FNL & 1850 FEL

Eddy County, 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</i>	Approved: <i>[Signature]</i>	



Midwest Hose
& Specialty, Inc.

Internal Hydrostatic Test Graph

Customer: Houston

Pick Ticket #: 94260

Hose Specifications

Hose Type
C & K
L.D.
4"
Working Pressure
10000 PSI

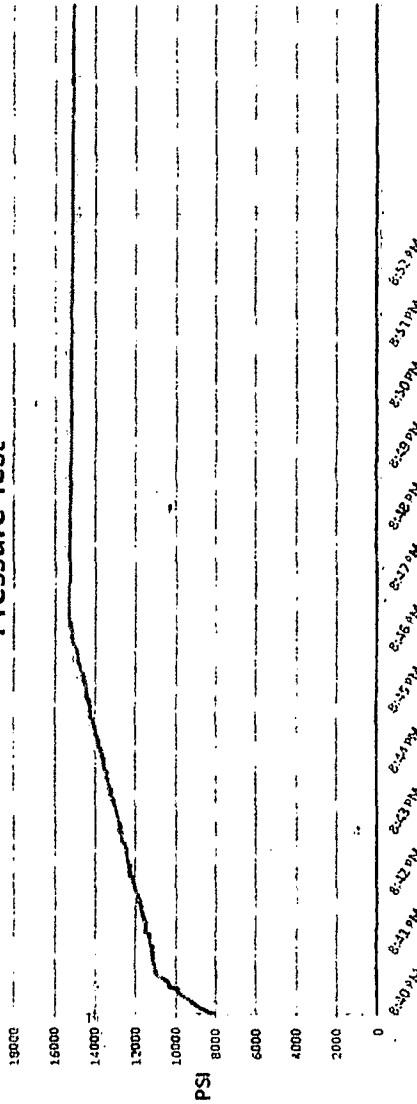
Length
45'
O.D.
6.09"
Burst Pressure
Standard Safety Multiplier Applied

Verification

Type of Fittings
4 1/16 JOK
Die Size
6.38"
Hose Serial #
5544

Coupling Method
Swage
Final O.D.
6.75"
Hose Assembly Serial #
79793

Pressure Test



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: Zac Mcconnell

Approved By: Kim Thomas

Certificate of Conformity

ODYD-271

3/8/2011

3/8/2011

Exhibit B -3- Co-Flex Hose
Marquardt 1 Federal 13
Cimarex Energy Co. of Colorado
1-25S-26E
SHL 150 FSL & 1650 FEL
BHL 330 FNL & 1850 FEL
Eddy County, NM



Specification Sheet Choke & Kill Hose

The Midwest Hose & Specialty Choke & Kill hose is manufactured with only premium components. 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)

PECOS DISTRICT CONDITIONS OF APPROVAL

OPERATOR'S NAME:	Cimarex Energy Co. of Colorado
LEASE NO.:	NM-14124
WELL NAME & NO.:	Marquardt 1 Federal 13
SURFACE HOLE FOOTAGE:	0150' FSL & 1650' FEL
BOTTOM HOLE FOOTAGE	0330' FNL & 2080' FEL
LOCATION:	Section 1, T.25 S., R.26 E., NMPM
COUNTY:	Eddy County, New Mexico
API:	30-015-37382

The original COAs still stand with the following drilling modifications:

I. DRILLING

A. DRILLING OPERATIONS REQUIREMENTS

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

- a. Spudding well (minimum of 24 hours)
- b. Setting and/or Cementing of all casing strings (minimum of 4 hours)
- c. BOPE tests (minimum of 4 hours)

☒ **Eddy County**

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

1. A Hydrogen Sulfide (H₂S) Drilling Plan should be activated 500 feet prior to drilling into the **Delaware** formation. **As a result, the Hydrogen Sulfide area must meet Onshore Order 6 requirements, which includes equipment and personnel/public protection items. If Hydrogen Sulfide is encountered, provide measured values and formations to the BLM.**
2. Unless the production casing has been run and cemented or the well has been properly plugged, the drilling rig shall not be removed from over the hole without prior approval. **If the drilling rig is removed without approval – an Incident of Non-Compliance will be written and will be a “Major” violation.**

3. Floor controls are required for 3M or Greater systems. These controls will be on the rig floor, unobstructed, readily accessible to the driller and will be operational at all times during drilling and/or completion activities. Rig floor is defined as the area immediately around the rotary table; the area immediately above the substructure on which the draw works is located, this does not include the dog house or stairway area.
4. **The record of the drilling rate along with the GR/N well log run from TD to surface (horizontal well – vertical portion of hole) shall be submitted to the BLM office as well as all other logs run on the borehole 30 days from completion. If available, a digital copy of the logs is to be submitted in addition to the paper copies. The Rustler top and top and bottom of Salt are to be recorded on the Completion Report.**

B. CASING

Changes to the approved APD casing program need prior approval if the items substituted are of lesser grade or different casing size. The Operator can exchange the components of the proposal with that of superior strength (i.e. changing from J-55 to N-80, or from 36# to 40#). Changes to the approved cement program need prior approval if the altered cement plan has less volume or strength or if the changes are substantial (i.e. Multistage tool, ECP, etc.).

Wait on cement (WOC) time prior to drilling out for a primary cement job will be a minimum 18 hours for a water basin, 24 hours in the potash area, or 500 pounds compressive strength, whichever is greater for all casing strings. DURING THIS WOC TIME, NO DRILL PIPE, ETC. SHALL BE RUN IN THE HOLE. Provide compressive strengths including hours to reach required 500 pounds compressive strength prior to cementing each casing string. IF OPERATOR DOES NOT HAVE THE WELL SPECIFIC CEMENT DETAILS ONSITE PRIOR TO PUMPING THE CEMENT FOR EACH CASING STRING, THE WOC WILL BE 30 HOURS. See individual casing strings for details regarding lead cement slurry requirements.

No pea gravel permitted for remedial or fall back remedial without prior authorization from the BLM engineer.

Medium cave/karst.

Possible lost circulation in the Delaware.

1. The **13-3/8** inch surface casing shall be set at **approximately 440** feet and cemented to the surface.
 - a. If cement does not circulate to the surface, the appropriate BLM office shall be notified and a temperature survey utilizing an electronic type temperature survey with surface log readout will be used or a cement bond log shall be run to verify the top of the cement. Temperature survey will be run a minimum of six hours after pumping cement and ideally between 8-10 hours after completing the cement job.
 - b. **Wait on cement (WOC) time for a primary cement job is to include the lead cement slurry.**
 - c. Wait on cement (WOC) time for a remedial job will be a minimum of 4 hours after bringing cement to surface or 500 pounds compressive strength, whichever is greater.
 - d. If cement falls back, remedial cementing will be done prior to drilling out that string.
2. The minimum required fill of cement behind the **9-5/8** inch intermediate casing is:
☒ Cement to surface. If cement does not circulate see B.1.a, c-d above.
Wait on cement (WOC) time for a primary cement job is to include the lead cement slurry due to cave/karst concerns.
- If 75% or greater lost circulation occurs while drilling the intermediate casing hole, the cement on the production casing must come to surface.**
3. The minimum required fill of cement behind the **5-1/2** inch production casing is:
☒ Cement should tie-back at least 500 feet into previous casing string. Operator shall provide method of verification. **Excess calculates to 23% - Additional cement may be required.**
4. If hardband drill pipe is rotated inside casing, returns will be monitored for metal. If metal is found in samples, drill pipe will be pulled and rubber protectors which have a larger diameter than the tool joints of the drill pipe will be installed prior to continuing drilling operations.

C. PRESSURE CONTROL

1. All blowout preventer (BOP) and related equipment (BOPE) shall comply with well control requirements as described in Onshore Oil and Gas Order No. 2 and API RP 53 Sec. 17.

2. Variance approved to use flex line from BOP to choke manifold. Check condition of flexible line from BOP to choke manifold, replace if exterior is damaged or if line fails test. Line to be as straight as possible with no hard bends and is to be anchored according to Manufacturer's requirements. The flexible hose can be exchanged with a hose of equal size and equal or greater pressure rating. **Anchor requirements, specification sheet and hydrostatic pressure test certification matching the hose in service, to be onsite for review. These documents shall be posted in the company man's trailer and on the rig floor.** If the BLM inspector questions the straightness of the hose, a BLM engineer will be contacted and will review in the field or via picture supplied by inspector to determine if changes are required (operator shall expect delays if this occurs).
3. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the surface casing shoe shall be **2000 (2M)** psi.
 - a. **For surface casing only:** If the BOP/BOPE is to be tested against casing, the wait on cement (WOC) time for that casing is to be met (see WOC statement at start of casing section). Independent service company required.
4. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the **9-5/8** intermediate casing shoe shall be **3000 (3M)** psi.
5. The appropriate BLM office shall be notified a minimum of 4 hours in advance for a representative to witness the tests.
 - a. In a water basin, for all casing strings utilizing slips, these are to be set as soon as the crew and rig are ready and any fallback cement remediation has been done. The casing cut-off and BOP installation can be initiated four hours after installing the slips, which will be approximately six hours after bumping the plug. For those casing strings not using slips, the minimum wait time before cut-off is eight hours after bumping the plug. BOP/BOPE testing can begin after cut-off or once cement reaches 500 psi compressive strength (including lead when specified), whichever is greater. However, if the float does not hold, cut-off cannot be initiated until cement reaches 500 psi compressive strength (including lead when specified).
 - b. The tests shall be done by an independent service company utilizing a test plug **not a cup or J-packer**. The operator also has the option of utilizing an independent tester to test without a plug (i.e. against the casing) pursuant to Onshore Order 2 with the pressure not to exceed 70% of the burst rating for the casing. Any test against the casing must meet the WOC time for water basin (18 hours) or potash (24 hours) or 500 pounds compressive strength, whichever is greater, prior to initiating the test (see casing segment as lead cement may be critical item).

- c. The test shall be run on a 5000 psi chart for a 2-3M BOP/BOP, on a 10000 psi chart for a 5M BOP/BOPE and on a 15000 psi chart for a 10M BOP/BOPE. If a linear chart is used, it shall be a one hour chart. A circular chart shall have a maximum 2 hour clock.
- d. The results of the test shall be reported to the appropriate BLM office.
- e. All tests are required to be recorded on a calibrated test chart. **A copy of the BOP/BOPE test chart and a copy of independent service company test will be submitted to the appropriate BLM office.**
- f. The BOP/BOPE test shall include a low pressure test from 250 to 300 psi. The test will be held for a minimum of 10 minutes if test is done with a test plug and 30 minutes without a test plug. This test shall be performed prior to the test at full stack pressure.

D. DRILL STEM TEST

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

E. WASTE MATERIAL AND FLUIDS

All waste (i.e. drilling fluids, trash, salts, chemicals, sewage, gray water, etc.) created as a result of drilling operations and completion operations shall be safely contained and disposed of properly at a waste disposal facility. No waste material or fluid shall be disposed of on the well location or surrounding area.

Porto-johns and trash containers will be on-location during fracturing operations or any other crew-intensive operations.

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