

HOBBS OCD

NOV 07 2013

Form 3160-3
(April 2004)

OCD Hobbs

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

RECEIVED

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

APPLICATION FOR PERMIT TO DRILL OR REENTER

1a. Type of Work: ☒ DRILL ☐ REENTER		5. Lease Serial No. NMNM84729	
1b. Type of Well: ☒ Oil Well ☐ Gas Well ☐ Other ☒ Single Zone ☐ Multiple Zone		6. If Indian, Allottee or Tribe Name	
2. Name of Operator Cimarex Energy Co. of Colorado		7. If Unit or CA Agreement, Name and No.	
3a. Address 600 N. Marienfeld St. Ste. 600 Midland Tx 79701		8. Lease Name and Well No. Cuervo Federal No. 21H	
3b. Phone No. (include area code) 432-571-7800		9. API Well No. 30-025-41495	
4. Location of Well (Report location clearly and in accordance with any State requirements. *) At Surface 330 FNL & 2310 FEL (B)		10. Field and Pool, or Exploratory Diamondtail; Bone Spring (17644) KZ	
At proposed prod. Zone 330 FSL & 2310 FEL (O) Horizontal Bone Spring test		11. Sec., T. R. M. or Blk. and Survey or Area 14-235-32E	
14. Distance in miles and direction from nearest town or post office* 15.7 miles SW of Eunice		12. County or Parish Lea	
15. Distance from proposed* location to nearest property or lease line, ft. (Also to nearest drig. unit line if any) 330'		13. State NM	
16. No of acres in lease 640 acres		17. Spacing Unit dedicated to this well 160 acres	
18. Distance from proposed location* to nearest well, drilling, completed, applied for, on this lease, ft. Horizontal 170' from pre engaged well. 1935' to #20H		20. BLM/BIA Bond No. on File NM2575; NMB000835	
21. Elevations (Show whether DF, KDB, RT, GL, etc.) 3733' GR		22. Approximate date work will start* 01.01.13	
		23. Estimated duration 25-30 days	

24. Attachments

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

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

25. Signature 	Name (Printed/Typed) Tracie J Cherry	Date 09.11.12
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Title Sr. Regulatory Analyst		
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Approved By (Signature) /s/ STEPHEN J. CAFFEY	Name (Printed/Typed) STEPHEN J. CAFFEY	Date NOV - 5 2013
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Title FIELD MANAGER	Office CARLSBAD FIELD OFFICE	Date 11/05/13
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Application approval does not warrant or certify that the applicant holds legal or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations thereon.

Conditions of approval, if any, are attached.

APPROVAL FOR TWO YEARS

Title 18 U.S.S. 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)

Approval Subject to General Requirements
& Special Stipulations Attached

SEE ATTACHED FOR
CONDITIONS OF APPROVAL

Carlsbad Controlled Water Basin

NOV 14 2013

Application to Drill
Cuervo Federal No. 21H
 Cimarex Energy Co. of Colorado
 Unit B, Section 14
 T23S-R32E, Lea County, NM

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

- 1 Location: SHL 330 FNL & 2310 FEL
 BHL 330 FSL & 2310 FEL

- 2 Elevation above sea level: 3733' GR

- 3 Geologic name of surface formation: Quaternary Alluvium Deposits

- 4 Drilling tools and associated equipment: Conventional rotary drilling rig using fluid as a circulating medium for solids removal.

- 5 Proposed drilling depth: MD 15509 TVD 11035

- 6 Estimated tops of geological markers:

Water depth per OSE	550'	
Rustler	1220'	
Top of Salt	1380'	
Castile	3565'	
Base of Salt	4700'	
Delaware Sands	5000'	Oil
Cherry Canyon	5969'	
Brushy Canyon	7000'	
Bone Spring	8770'	Oil
FBSS	9930'	
SBSS	10600'	
3rd BS Carbonate	11100'	

- 7 Possible mineral bearing formation:
 See above

8 Proposed Mud Circulating System:

Depth	Mud Wt	Visc	Fluid Loss	Type Mud
0' to 1335'	8.4 - 8.6	28	NC	FW
1335' to 4900'	10.0	30-32	NC	Brine
4900' to 10700'	8.4-9.0	28-29	NC	FW and brine, use hi-vis sweeps to keep hole clean
10700' to 15509'	8.5-9.5	27-45	NC	2% KCL

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.

Proposed drilling Plan

After setting surface and intermediate casing, drill 7-7/8 or 8-3/4" hole to 10700'. Kick off curve at 10700' and drill 7-7/8 or 8-3/4" lateral to TD @ 15509' MD, 11035 TVD. Run 5 1/2" 17# P-110 BTC from 10700'-15509' and 5-1/2" 17# P-110 LTC from 0'-10700' and cement.

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 T23S-R32E, Lea County, NM

9 Casing & Cementing Program:

String	Hole Size	Depth		Casing OD		Weight	Collar	Grade
<i>Surface</i>	17 1/2"	0'	to 1335'	New	13 3/8"	48#	STC	H-40
<i>Intermediate</i>	12 1/4"	0'	to 4900'	New	9 5/8"	40#	LTC	N-80
<i>Production</i>	7 7/8" or 8 3/4"	0'	to 10700'	New	5 1/2"	17#	LTC	P-110
<i>Production</i>	7 7/8" or 8 3/4"	10700'	to 15509'	New	5 1/2"	17#	BTC	P-110

Surface Lead: 848 sx Class C + Bentonite + Calcium Chloride + LCM – mw 13.5 ppg yield 1.75
 Tail: 173 Class C + LCM – mw 14.8 ppg yield 1.34
 Excess 85% TOC Surface Centralizers per *Onshore Order* 2.III.B.1.f

Intermediate Lead: 1084 sx 35:65 (poz/C) + Salt + Bentonite + LCM + retarder – mw 12.9 ppg yield 1.88
 Tail: 286 sx Class C + retarder + LCM – mw 14.8 ppg yield 1.32
 Excess 60% TOC Surface

Production Lead: 575 sx 35:65 (poz/H) + salt + Sodium Metasilicate + Bentonite + Fluid Loss + Dispersant + LCM + Retarder - MW 11.9 ppg yield 2.4
 Tail: 927 sx 50:50 (poz/H) + Bentonite + Salt + Fluid Loss + Dispersant + LCM + Retarder – MW 14.5 ppg yield / *24*
 Excess 25% TOC 3600' 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.

See COA

Cement volumes will be adjusted depending on hole size.

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

11 Pressure control Equipment:

Exhibit "E". A 13 3/4" 5000 PSI working pressure B.O.P. consisting of one set of blind rams and one set of pipe rams and a 5000# annular type preventer. A choke manifold and 120 gallon accumulator with floor and remote operating stations and auxiliary power system. Rotating head below 4900'. 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. Mud gas separator will be available if drilling in H2S areas.

BOP unit will be hydraulically operated. BOP will be function tested and operated at least once a day while drilling and the blind rams will be operated when out of hole during trips. No abnormal pressure or temperature is expected while drilling.

Before drilling out of the surface casing BOPs will be tested to 250 psi low and 3000 psi high by an independent service company. Hydril will be tested to 250 psi low and 1500 psi high. Before drilling out of the intermediate casing BOPs will be tested to 250 psi low and 5000 psi high. Hydril will be tested to 250 psi low and 2500 high.

Cimarex Energy Co. of Colorado requests a variance to drill this well using a co-flex line between the BOP and choke manifold.

See COA

Certification for proposed co-flex hose is 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.

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Cuervo Federal No. 21H
Cimarex Energy Co. of Colorado
Unit B, Section 14
T23S-R32E, Lea County, NM

12 Testing, Logging and Coring Program:

- A. Mud logging program: 2 man unit from 4900 to TD
- B. Electric logging program: CNL / LDT / CAL / GR, DLL / CAL / GR Surface to TD
- C. No DSTs or cores are planned at this time.

13 Potential Hazards:

50X 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 **4900 psi** Estimated BHT **130°**

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

Drilling expected to take 30-35 days

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

15 Other Facets of Operations:

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

Bone Spring pay will be perforated and stimulated.

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



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. John Jones</i>	Approved: <i>Kevin [Signature]</i>	



Midwest Hose
& Specialty, Inc.

Internal Hydrostatic Test Graph

March 3, 2011

Customer: Houston

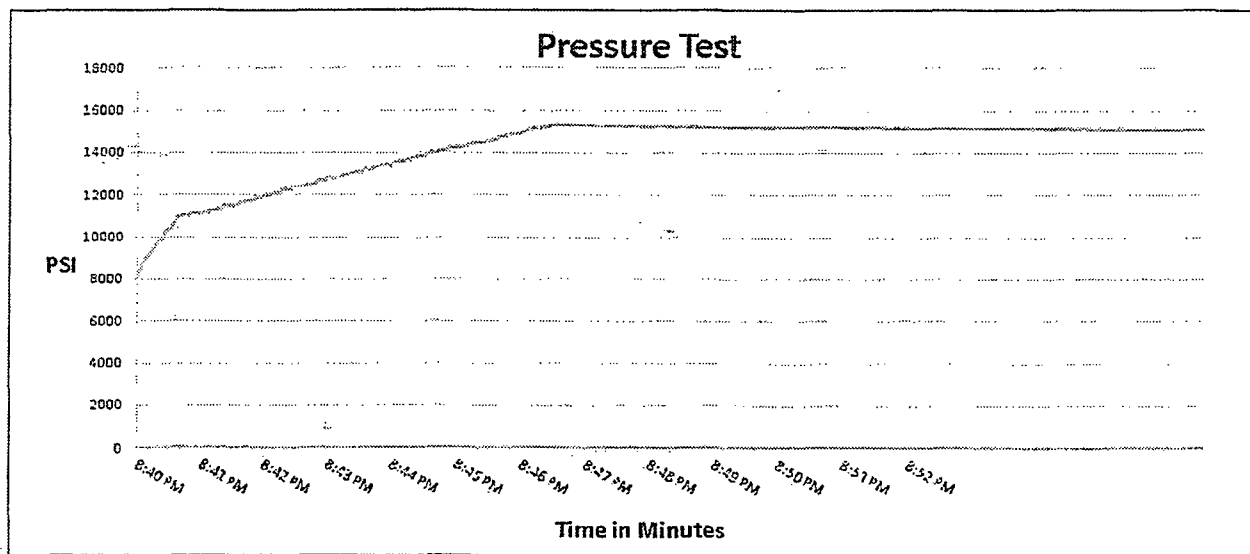
Pick Ticket #: 94260

Hose Specifications

<u>Hose Type</u>	<u>Length</u>
C & K	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>
4 1/16 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: Zac McConnell

Approved By: Kim Thomas

[Signature]

[Signature]



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

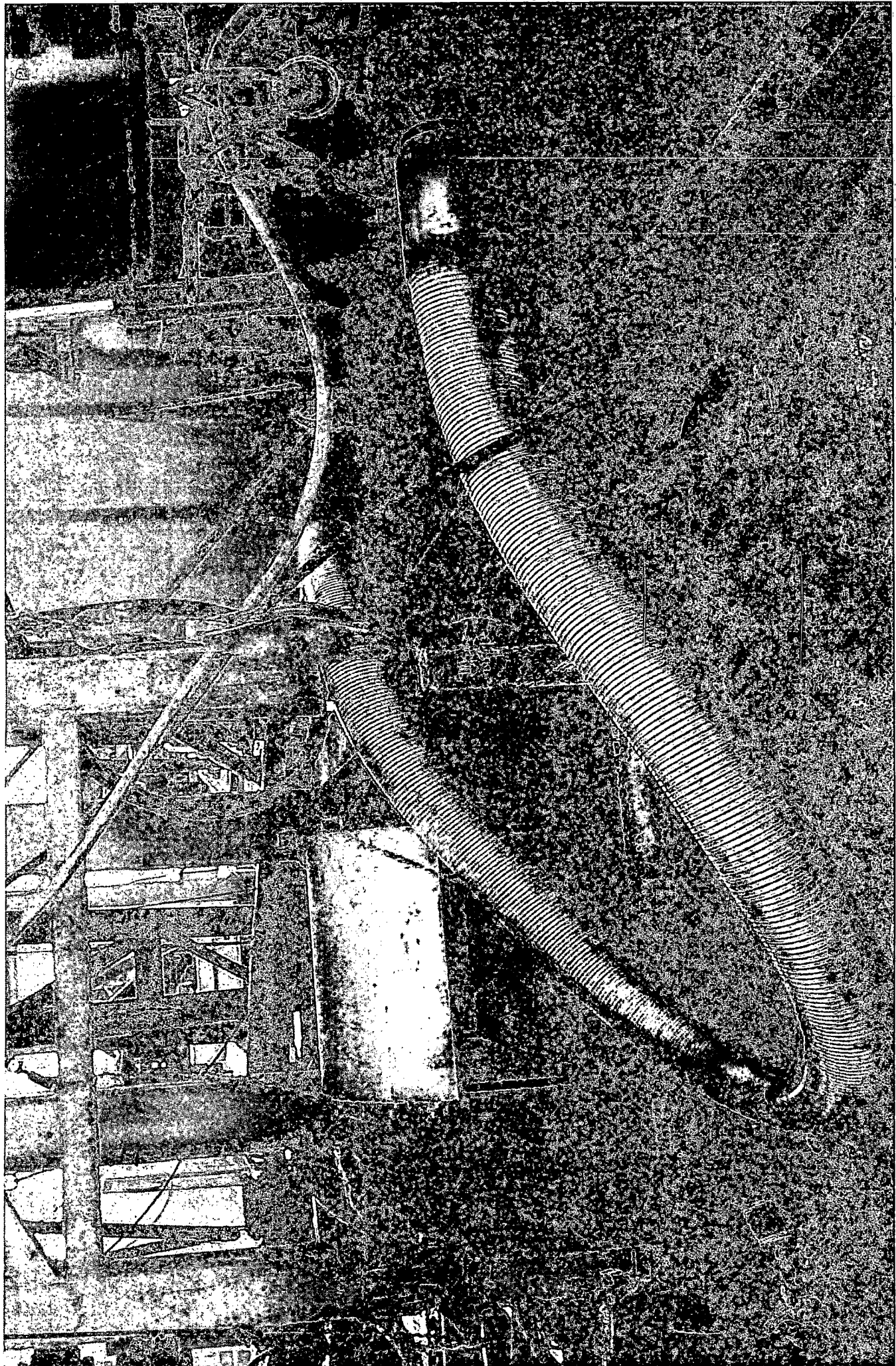
Comments:

Approved:

James H. Hester

Date:

3/8/2011





Cimarex Energy Co. of Colorado

Location: Lea County, NM
Field: (Cuervo) Sec 14, T23S, R32E
Facility: Cuervo Fed No. 21

Slot: No. 21 SHL
Well: No. 21
Wellbore: No. 21 PWB



Well Profile Data

Design Comment	MD (ft)	Inc (°)	Az (°)	TVD (ft)	Local N (ft)	Local E (ft)	DLS (°/100ft)	VS (ft)
Tie On	0.00	0.000	179.597	0.00	0.00	0.00	0.00	0.00
Est KOP	10700.00	0.000	179.597	10700.00	0.00	0.00	0.00	0.00
EOC	11226.22	90.000	179.597	11035.00	-334.99	2.36	17.10	335.00
No. 21 PBHL	15509.02	90.000	179.597	11035.00	-4617.69	32.49	0.00	4617.80

Plot reference wellpath is Prelim. 2

True vertical depths are referenced to Rig on No. 21 (RT)

Measured depths are referenced to Rig on No. 21 (RT)

Rig on No. 21 (RT) to Mean Sea Level: 3733 feet

Mean Sea Level to Mud line (At Slot: No. 21 SHL): -3733 feet

Coordinates are in feet referenced to Slot

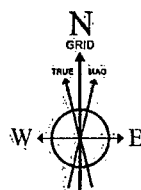
Grid System: NAD83 / TM New Mexico SP, Eastern Zone (3001), US feet

North Reference: Grid north

Scale: True distance

Depths are in feet

Created by: gentbry on 1/30/2012



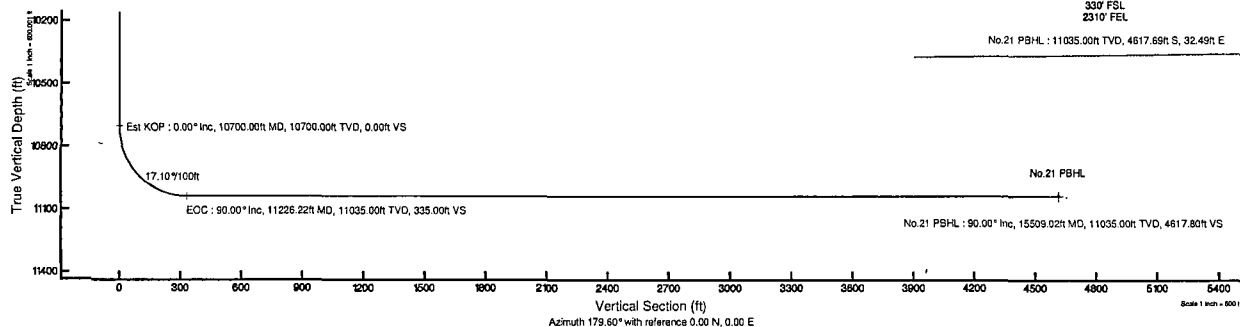
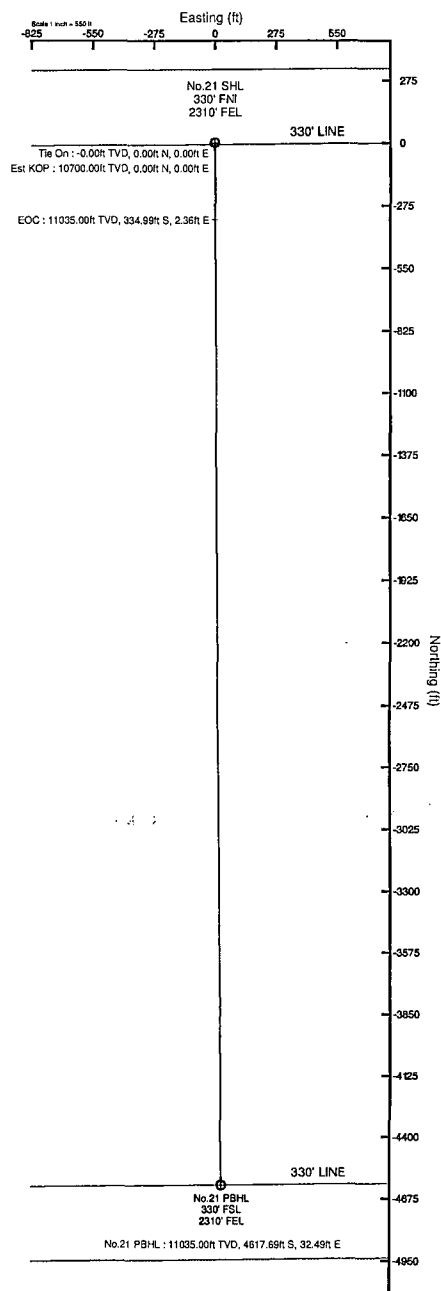
BGGM (1945.0 to 2013.0) Dip: 60.21° Field: 48613.9 nT
Magnetic North is 7.63 degrees East of True North (at 1/4/2012)

Grid North is 0.37 degrees East of True North

To correct azimuth from True to Grid subtract 0.37 degrees

To correct azimuth from Magnetic to Grid add 7.27 degrees

For example: if the Magnetic North Azimuth = 90 degs, then the Grid North Azimuth = $90 + 7.27 = 97.27$





Planned Wellpath Report

Prelim_2
Page 1 of 6



REFERENCE WELLPATH IDENTIFICATION			
Operator	Cimarex Energy Co. of Colorado	Slot	No.21 SHL
Area	Lea County, NM	Well	No.21
Field	(Cuervo) Sec 14,T23S,R32E	Wellbore	No.21 PWB
Facility	Cuervo Fed No.21		

REPORT SETUP INFORMATION			
Projection System	NAD83 / TM New Mexico SP, Eastern Zone (3001), US feet	Software System	WellArchitect® 3.0.0
North Reference	Grid	User	Gentbry
Scale	0.999961	Report Generated	1/30/2012 at 10:22:28 AM
Convergence at slot	0.37° East	Database/Source file	WA Midland/No.21_PWB.xml

WELLPATH LOCATION						
	Local coordinates		Grid coordinates		Geographic coordinates	
	North[ft]	East[ft]	Easting[US ft]	Northing[US ft]	Latitude	Longitude
Slot Location	0.00	0.00	754189.10	477587.10	32°18'39.885"N	103°38'39.695"W
Facility Reference Pt			754189.10	477587.10	32°18'39.885"N	103°38'39.695"W
Field Reference Pt			751577.10	474590.70	32°18'10.401"N	103°39'10.352"W

WELLPATH DATUM			
Calculation method	Minimum curvature	Rig on No.21 (RT) to Facility Vertical Datum	0.00ft
Horizontal Reference Pt	Slot	Rig on No.21 (RT) to Mean Sea Level	3733.00ft
Vertical Reference Pt	Rig on No.21 (RT)	Rig on No.21 (RT) to Mud Line at Slot (No.21 SHL)	0.00ft
MD Reference Pt	Rig on No.21 (RT)	Section Origin	N 0.00, E 0.00 ft
Field Vertical Reference	Mean Sea Level	Section Azimuth	179.60°



Planned Wellpath Report

Prelim_2
Page 2 of 6



REFERENCE WELLPATH IDENTIFICATION			
Operator	Cimarex Energy Co. of Colorado	Slot	No.21 SHL
Area	Lea County, NM	Well	No.21
Field	(Cuervo) Sec 14,T23S,R32E	Wellbore	No.21 PWB
Facility	Cuervo Fed No.21		

WELLPATH DATA (161 stations) † = interpolated/extrapolated station												
MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	Latitude	Longitude	DLS [°/100ft]	Comments
0.00	0.000	179.597	0.00	0.00	0.00	0.00	754189.10	477587.10	32°18'39.885"N	103°38'39.695"W	0.00	Tie On
100.00†	0.000	179.597	100.00	0.00	0.00	0.00	754189.10	477587.10	32°18'39.885"N	103°38'39.695"W	0.00	
200.00†	0.000	179.597	200.00	0.00	0.00	0.00	754189.10	477587.10	32°18'39.885"N	103°38'39.695"W	0.00	
300.00†	0.000	179.597	300.00	0.00	0.00	0.00	754189.10	477587.10	32°18'39.885"N	103°38'39.695"W	0.00	
400.00†	0.000	179.597	400.00	0.00	0.00	0.00	754189.10	477587.10	32°18'39.885"N	103°38'39.695"W	0.00	
500.00†	0.000	179.597	500.00	0.00	0.00	0.00	754189.10	477587.10	32°18'39.885"N	103°38'39.695"W	0.00	
600.00†	0.000	179.597	600.00	0.00	0.00	0.00	754189.10	477587.10	32°18'39.885"N	103°38'39.695"W	0.00	
700.00†	0.000	179.597	700.00	0.00	0.00	0.00	754189.10	477587.10	32°18'39.885"N	103°38'39.695"W	0.00	
800.00†	0.000	179.597	800.00	0.00	0.00	0.00	754189.10	477587.10	32°18'39.885"N	103°38'39.695"W	0.00	
900.00†	0.000	179.597	900.00	0.00	0.00	0.00	754189.10	477587.10	32°18'39.885"N	103°38'39.695"W	0.00	
1000.00†	0.000	179.597	1000.00	0.00	0.00	0.00	754189.10	477587.10	32°18'39.885"N	103°38'39.695"W	0.00	
1100.00†	0.000	179.597	1100.00	0.00	0.00	0.00	754189.10	477587.10	32°18'39.885"N	103°38'39.695"W	0.00	
1200.00†	0.000	179.597	1200.00	0.00	0.00	0.00	754189.10	477587.10	32°18'39.885"N	103°38'39.695"W	0.00	
1300.00†	0.000	179.597	1300.00	0.00	0.00	0.00	754189.10	477587.10	32°18'39.885"N	103°38'39.695"W	0.00	
1400.00†	0.000	179.597	1400.00	0.00	0.00	0.00	754189.10	477587.10	32°18'39.885"N	103°38'39.695"W	0.00	
1500.00†	0.000	179.597	1500.00	0.00	0.00	0.00	754189.10	477587.10	32°18'39.885"N	103°38'39.695"W	0.00	
1600.00†	0.000	179.597	1600.00	0.00	0.00	0.00	754189.10	477587.10	32°18'39.885"N	103°38'39.695"W	0.00	
1700.00†	0.000	179.597	1700.00	0.00	0.00	0.00	754189.10	477587.10	32°18'39.885"N	103°38'39.695"W	0.00	
1800.00†	0.000	179.597	1800.00	0.00	0.00	0.00	754189.10	477587.10	32°18'39.885"N	103°38'39.695"W	0.00	
1900.00†	0.000	179.597	1900.00	0.00	0.00	0.00	754189.10	477587.10	32°18'39.885"N	103°38'39.695"W	0.00	
2000.00†	0.000	179.597	2000.00	0.00	0.00	0.00	754189.10	477587.10	32°18'39.885"N	103°38'39.695"W	0.00	
2100.00†	0.000	179.597	2100.00	0.00	0.00	0.00	754189.10	477587.10	32°18'39.885"N	103°38'39.695"W	0.00	
2200.00†	0.000	179.597	2200.00	0.00	0.00	0.00	754189.10	477587.10	32°18'39.885"N	103°38'39.695"W	0.00	
2300.00†	0.000	179.597	2300.00	0.00	0.00	0.00	754189.10	477587.10	32°18'39.885"N	103°38'39.695"W	0.00	
2400.00†	0.000	179.597	2400.00	0.00	0.00	0.00	754189.10	477587.10	32°18'39.885"N	103°38'39.695"W	0.00	
2500.00†	0.000	179.597	2500.00	0.00	0.00	0.00	754189.10	477587.10	32°18'39.885"N	103°38'39.695"W	0.00	
2600.00†	0.000	179.597	2600.00	0.00	0.00	0.00	754189.10	477587.10	32°18'39.885"N	103°38'39.695"W	0.00	
2700.00†	0.000	179.597	2700.00	0.00	0.00	0.00	754189.10	477587.10	32°18'39.885"N	103°38'39.695"W	0.00	
2800.00†	0.000	179.597	2800.00	0.00	0.00	0.00	754189.10	477587.10	32°18'39.885"N	103°38'39.695"W	0.00	
2900.00†	0.000	179.597	2900.00	0.00	0.00	0.00	754189.10	477587.10	32°18'39.885"N	103°38'39.695"W	0.00	
3000.00†	0.000	179.597	3000.00	0.00	0.00	0.00	754189.10	477587.10	32°18'39.885"N	103°38'39.695"W	0.00	
3100.00†	0.000	179.597	3100.00	0.00	0.00	0.00	754189.10	477587.10	32°18'39.885"N	103°38'39.695"W	0.00	
3200.00†	0.000	179.597	3200.00	0.00	0.00	0.00	754189.10	477587.10	32°18'39.885"N	103°38'39.695"W	0.00	
3300.00†	0.000	179.597	3300.00	0.00	0.00	0.00	754189.10	477587.10	32°18'39.885"N	103°38'39.695"W	0.00	
3400.00†	0.000	179.597	3400.00	0.00	0.00	0.00	754189.10	477587.10	32°18'39.885"N	103°38'39.695"W	0.00	
3500.00†	0.000	179.597	3500.00	0.00	0.00	0.00	754189.10	477587.10	32°18'39.885"N	103°38'39.695"W	0.00	
3600.00†	0.000	179.597	3600.00	0.00	0.00	0.00	754189.10	477587.10	32°18'39.885"N	103°38'39.695"W	0.00	
3700.00†	0.000	179.597	3700.00	0.00	0.00	0.00	754189.10	477587.10	32°18'39.885"N	103°38'39.695"W	0.00	
3800.00†	0.000	179.597	3800.00	0.00	0.00	0.00	754189.10	477587.10	32°18'39.885"N	103°38'39.695"W	0.00	
3900.00†	0.000	179.597	3900.00	0.00	0.00	0.00	754189.10	477587.10	32°18'39.885"N	103°38'39.695"W	0.00	
4000.00†	0.000	179.597	4000.00	0.00	0.00	0.00	754189.10	477587.10	32°18'39.885"N	103°38'39.695"W	0.00	
4100.00†	0.000	179.597	4100.00	0.00	0.00	0.00	754189.10	477587.10	32°18'39.885"N	103°38'39.695"W	0.00	
4200.00†	0.000	179.597	4200.00	0.00	0.00	0.00	754189.10	477587.10	32°18'39.885"N	103°38'39.695"W	0.00	
4300.00†	0.000	179.597	4300.00	0.00	0.00	0.00	754189.10	477587.10	32°18'39.885"N	103°38'39.695"W	0.00	
4400.00†	0.000	179.597	4400.00	0.00	0.00	0.00	754189.10	477587.10	32°18'39.885"N	103°38'39.695"W	0.00	



Planned Wellpath Report

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REFERENCE WELLPATH IDENTIFICATION

Operator	Cimarex Energy Co. of Colorado	Slot	No.21 SHL
Area	Lea County, NM	Well	No.21
Field	(Cuervo) Sec 14,T23S,R32E	Wellbore	No.21 PWB
Facility	Cuervo Fed No.21		

WELLPATH DATA (161 stations) . † = interpolated/extrapolated station

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	Latitude	Longitude	DLS [°/100ft]	Comments
4500.00†	0.000	179.597	4500.00	0.00	0.00	0.00	754189.10	477587.10	32°18'39.885"N	103°38'39.695"W	0.00	
4600.00†	0.000	179.597	4600.00	0.00	0.00	0.00	754189.10	477587.10	32°18'39.885"N	103°38'39.695"W	0.00	
4700.00†	0.000	179.597	4700.00	0.00	0.00	0.00	754189.10	477587.10	32°18'39.885"N	103°38'39.695"W	0.00	
4800.00†	0.000	179.597	4800.00	0.00	0.00	0.00	754189.10	477587.10	32°18'39.885"N	103°38'39.695"W	0.00	
4900.00†	0.000	179.597	4900.00	0.00	0.00	0.00	754189.10	477587.10	32°18'39.885"N	103°38'39.695"W	0.00	
5000.00†	0.000	179.597	5000.00	0.00	0.00	0.00	754189.10	477587.10	32°18'39.885"N	103°38'39.695"W	0.00	Delaware Sands
5100.00†	0.000	179.597	5100.00	0.00	0.00	0.00	754189.10	477587.10	32°18'39.885"N	103°38'39.695"W	0.00	
5200.00†	0.000	179.597	5200.00	0.00	0.00	0.00	754189.10	477587.10	32°18'39.885"N	103°38'39.695"W	0.00	
5300.00†	0.000	179.597	5300.00	0.00	0.00	0.00	754189.10	477587.10	32°18'39.885"N	103°38'39.695"W	0.00	
5400.00†	0.000	179.597	5400.00	0.00	0.00	0.00	754189.10	477587.10	32°18'39.885"N	103°38'39.695"W	0.00	
5500.00†	0.000	179.597	5500.00	0.00	0.00	0.00	754189.10	477587.10	32°18'39.885"N	103°38'39.695"W	0.00	
5600.00†	0.000	179.597	5600.00	0.00	0.00	0.00	754189.10	477587.10	32°18'39.885"N	103°38'39.695"W	0.00	
5700.00†	0.000	179.597	5700.00	0.00	0.00	0.00	754189.10	477587.10	32°18'39.885"N	103°38'39.695"W	0.00	
5800.00†	0.000	179.597	5800.00	0.00	0.00	0.00	754189.10	477587.10	32°18'39.885"N	103°38'39.695"W	0.00	
5900.00†	0.000	179.597	5900.00	0.00	0.00	0.00	754189.10	477587.10	32°18'39.885"N	103°38'39.695"W	0.00	
6000.00†	0.000	179.597	6000.00	0.00	0.00	0.00	754189.10	477587.10	32°18'39.885"N	103°38'39.695"W	0.00	
6100.00†	0.000	179.597	6100.00	0.00	0.00	0.00	754189.10	477587.10	32°18'39.885"N	103°38'39.695"W	0.00	
6200.00†	0.000	179.597	6200.00	0.00	0.00	0.00	754189.10	477587.10	32°18'39.885"N	103°38'39.695"W	0.00	
6300.00†	0.000	179.597	6300.00	0.00	0.00	0.00	754189.10	477587.10	32°18'39.885"N	103°38'39.695"W	0.00	
6400.00†	0.000	179.597	6400.00	0.00	0.00	0.00	754189.10	477587.10	32°18'39.885"N	103°38'39.695"W	0.00	
6500.00†	0.000	179.597	6500.00	0.00	0.00	0.00	754189.10	477587.10	32°18'39.885"N	103°38'39.695"W	0.00	
6600.00†	0.000	179.597	6600.00	0.00	0.00	0.00	754189.10	477587.10	32°18'39.885"N	103°38'39.695"W	0.00	
6700.00†	0.000	179.597	6700.00	0.00	0.00	0.00	754189.10	477587.10	32°18'39.885"N	103°38'39.695"W	0.00	
6800.00†	0.000	179.597	6800.00	0.00	0.00	0.00	754189.10	477587.10	32°18'39.885"N	103°38'39.695"W	0.00	
6900.00†	0.000	179.597	6900.00	0.00	0.00	0.00	754189.10	477587.10	32°18'39.885"N	103°38'39.695"W	0.00	
7000.00†	0.000	179.597	7000.00	0.00	0.00	0.00	754189.10	477587.10	32°18'39.885"N	103°38'39.695"W	0.00	
7100.00†	0.000	179.597	7100.00	0.00	0.00	0.00	754189.10	477587.10	32°18'39.885"N	103°38'39.695"W	0.00	
7200.00†	0.000	179.597	7200.00	0.00	0.00	0.00	754189.10	477587.10	32°18'39.885"N	103°38'39.695"W	0.00	
7300.00†	0.000	179.597	7300.00	0.00	0.00	0.00	754189.10	477587.10	32°18'39.885"N	103°38'39.695"W	0.00	
7400.00†	0.000	179.597	7400.00	0.00	0.00	0.00	754189.10	477587.10	32°18'39.885"N	103°38'39.695"W	0.00	
7500.00†	0.000	179.597	7500.00	0.00	0.00	0.00	754189.10	477587.10	32°18'39.885"N	103°38'39.695"W	0.00	
7600.00†	0.000	179.597	7600.00	0.00	0.00	0.00	754189.10	477587.10	32°18'39.885"N	103°38'39.695"W	0.00	
7700.00†	0.000	179.597	7700.00	0.00	0.00	0.00	754189.10	477587.10	32°18'39.885"N	103°38'39.695"W	0.00	
7800.00†	0.000	179.597	7800.00	0.00	0.00	0.00	754189.10	477587.10	32°18'39.885"N	103°38'39.695"W	0.00	
7900.00†	0.000	179.597	7900.00	0.00	0.00	0.00	754189.10	477587.10	32°18'39.885"N	103°38'39.695"W	0.00	
8000.00†	0.000	179.597	8000.00	0.00	0.00	0.00	754189.10	477587.10	32°18'39.885"N	103°38'39.695"W	0.00	
8100.00†	0.000	179.597	8100.00	0.00	0.00	0.00	754189.10	477587.10	32°18'39.885"N	103°38'39.695"W	0.00	
8200.00†	0.000	179.597	8200.00	0.00	0.00	0.00	754189.10	477587.10	32°18'39.885"N	103°38'39.695"W	0.00	
8300.00†	0.000	179.597	8300.00	0.00	0.00	0.00	754189.10	477587.10	32°18'39.885"N	103°38'39.695"W	0.00	
8400.00†	0.000	179.597	8400.00	0.00	0.00	0.00	754189.10	477587.10	32°18'39.885"N	103°38'39.695"W	0.00	
8500.00†	0.000	179.597	8500.00	0.00	0.00	0.00	754189.10	477587.10	32°18'39.885"N	103°38'39.695"W	0.00	
8600.00†	0.000	179.597	8600.00	0.00	0.00	0.00	754189.10	477587.10	32°18'39.885"N	103°38'39.695"W	0.00	
8700.00†	0.000	179.597	8700.00	0.00	0.00	0.00	754189.10	477587.10	32°18'39.885"N	103°38'39.695"W	0.00	
8770.00†	0.000	179.597	8770.00	0.00	0.00	0.00	754189.10	477587.10	32°18'39.885"N	103°38'39.695"W	0.00	Bone Spring
8800.00†	0.000	179.597	8800.00	0.00	0.00	0.00	754189.10	477587.10	32°18'39.885"N	103°38'39.695"W	0.00	



Planned Wellpath Report

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REFERENCE WELLPATH IDENTIFICATION

Operator	Cimarex Energy Co. of Colorado	Slot	No.21 SHL
Area	Lea County, NM	Well	No.21
Field	(Cuervo) Sec 14,T23S,R32E	Wellbore	No.21 PWB
Facility	Cuervo Fed No.21		

WELLPATH DATA (161 stations) † = interpolated/extrapolated station

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	Latitude	Longitude	DLS [°/100ft]	Comments
8900.00†	0.000	179.597	8900.00	0.00	0.00	0.00	754189.10	477587.10	32°18'39.885"N	103°38'39.695"W	0.00	
9000.00†	0.000	179.597	9000.00	0.00	0.00	0.00	754189.10	477587.10	32°18'39.885"N	103°38'39.695"W	0.00	
9100.00†	0.000	179.597	9100.00	0.00	0.00	0.00	754189.10	477587.10	32°18'39.885"N	103°38'39.695"W	0.00	
9200.00†	0.000	179.597	9200.00	0.00	0.00	0.00	754189.10	477587.10	32°18'39.885"N	103°38'39.695"W	0.00	
9300.00†	0.000	179.597	9300.00	0.00	0.00	0.00	754189.10	477587.10	32°18'39.885"N	103°38'39.695"W	0.00	
9400.00†	0.000	179.597	9400.00	0.00	0.00	0.00	754189.10	477587.10	32°18'39.885"N	103°38'39.695"W	0.00	
9430.00†	0.000	179.597	9430.00	0.00	0.00	0.00	754189.10	477587.10	32°18'39.885"N	103°38'39.695"W	0.00	Upper Bone Spring Shale
9500.00†	0.000	179.597	9500.00	0.00	0.00	0.00	754189.10	477587.10	32°18'39.885"N	103°38'39.695"W	0.00	
9600.00†	0.000	179.597	9600.00	0.00	0.00	0.00	754189.10	477587.10	32°18'39.885"N	103°38'39.695"W	0.00	
9700.00†	0.000	179.597	9700.00	0.00	0.00	0.00	754189.10	477587.10	32°18'39.885"N	103°38'39.695"W	0.00	
9800.00†	0.000	179.597	9800.00	0.00	0.00	0.00	754189.10	477587.10	32°18'39.885"N	103°38'39.695"W	0.00	
9900.00†	0.000	179.597	9900.00	0.00	0.00	0.00	754189.10	477587.10	32°18'39.885"N	103°38'39.695"W	0.00	
9930.00†	0.000	179.597	9930.00	0.00	0.00	0.00	754189.10	477587.10	32°18'39.885"N	103°38'39.695"W	0.00	1st BSS
10000.00†	0.000	179.597	10000.00	0.00	0.00	0.00	754189.10	477587.10	32°18'39.885"N	103°38'39.695"W	0.00	
10100.00†	0.000	179.597	10100.00	0.00	0.00	0.00	754189.10	477587.10	32°18'39.885"N	103°38'39.695"W	0.00	
10200.00†	0.000	179.597	10200.00	0.00	0.00	0.00	754189.10	477587.10	32°18'39.885"N	103°38'39.695"W	0.00	
10300.00†	0.000	179.597	10300.00	0.00	0.00	0.00	754189.10	477587.10	32°18'39.885"N	103°38'39.695"W	0.00	
10400.00†	0.000	179.597	10400.00	0.00	0.00	0.00	754189.10	477587.10	32°18'39.885"N	103°38'39.695"W	0.00	
10500.00†	0.000	179.597	10500.00	0.00	0.00	0.00	754189.10	477587.10	32°18'39.885"N	103°38'39.695"W	0.00	
10600.00†	0.000	179.597	10600.00	0.00	0.00	0.00	754189.10	477587.10	32°18'39.885"N	103°38'39.695"W	0.00	2nd BSS
10700.00	0.000	179.597	10700.00	0.00	0.00	0.00	754189.10	477587.10	32°18'39.885"N	103°38'39.695"W	0.00	Est KOP
10800.00†	17.103	179.597	10798.52	14.81	-14.81	0.10	754189.20	477572.29	32°18'39.739"N	103°38'39.695"W	17.10	
10900.00†	34.206	179.597	10888.33	57.95	-57.95	0.41	754189.51	477529.15	32°18'39.312"N	103°38'39.694"W	17.10	
11000.00†	51.310	179.597	10961.48	125.59	-125.58	0.88	754189.93	477461.52	32°18'38.643"N	103°38'39.694"W	17.10	
11100.00†	68.413	179.597	11011.50	211.75	-211.74	1.49	754190.59	477375.37	32°18'37.790"N	103°38'39.693"W	17.10	
11200.00†	85.516	179.597	11033.97	308.81	-308.80	2.17	754191.27	477278.31	32°18'36.830"N	103°38'39.693"W	17.10	
11226.22	90.000	179.597	11035.00	335.00	-334.99	2.36	754191.46	477252.12	32°18'36.571"N	103°38'39.692"W	17.10	EOC
11300.00†	90.000	179.597	11035.00	408.78	-408.77	2.88	754191.98	477178.34	32°18'35.841"N	103°38'39.692"W	0.00	
11400.00†	90.000	179.597	11035.00	508.78	-508.77	3.58	754192.68	477078.35	32°18'34.851"N	103°38'39.691"W	0.00	
11500.00†	90.000	179.597	11035.00	608.78	-608.77	4.28	754193.38	476978.36	32°18'33.862"N	103°38'39.691"W	0.00	
11600.00†	90.000	179.597	11035.00	708.78	-708.77	4.99	754194.09	476878.36	32°18'32.872"N	103°38'39.690"W	0.00	
11700.00†	90.000	179.597	11035.00	808.78	-808.76	5.69	754194.79	476778.37	32°18'31.883"N	103°38'39.689"W	0.00	
11800.00†	90.000	179.597	11035.00	908.78	-908.76	6.39	754195.49	476678.38	32°18'30.893"N	103°38'39.688"W	0.00	
11900.00†	90.000	179.597	11035.00	1008.78	-1008.76	7.10	754196.20	476578.38	32°18'29.904"N	103°38'39.688"W	0.00	
12000.00†	90.000	179.597	11035.00	1108.78	-1108.76	7.80	754196.90	476478.39	32°18'28.914"N	103°38'39.687"W	0.00	
12100.00†	90.000	179.597	11035.00	1208.78	-1208.75	8.50	754197.60	476378.40	32°18'27.925"N	103°38'39.686"W	0.00	
12200.00†	90.000	179.597	11035.00	1308.78	-1308.75	9.21	754198.31	476278.40	32°18'26.935"N	103°38'39.686"W	0.00	
12300.00†	90.000	179.597	11035.00	1408.78	-1408.75	9.91	754199.01	476178.41	32°18'25.946"N	103°38'39.685"W	0.00	
12400.00†	90.000	179.597	11035.00	1508.78	-1508.75	10.61	754199.71	476078.42	32°18'24.956"N	103°38'39.684"W	0.00	
12500.00†	90.000	179.597	11035.00	1608.78	-1608.74	11.32	754200.42	475978.42	32°18'23.967"N	103°38'39.683"W	0.00	
12600.00†	90.000	179.597	11035.00	1708.78	-1708.74	12.02	754201.12	475878.43	32°18'22.977"N	103°38'39.683"W	0.00	
12700.00†	90.000	179.597	11035.00	1808.78	-1808.74	12.72	754201.82	475778.44	32°18'21.988"N	103°38'39.682"W	0.00	
12800.00†	90.000	179.597	11035.00	1908.78	-1908.74	13.43	754202.53	475678.45	32°18'20.998"N	103°38'39.681"W	0.00	
12900.00†	90.000	179.597	11035.00	2008.78	-2008.73	14.13	754203.23	475578.45	32°18'20.009"N	103°38'39.681"W	0.00	
13000.00†	90.000	179.597	11035.00	2108.78	-2108.73	14.83	754203.93	475478.46	32°18'19.019"N	103°38'39.680"W	0.00	



Planned Wellpath Report

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REFERENCE WELLPATH IDENTIFICATION			
Operator	Cimarex Energy Co. of Colorado	Slot	No.21 SHL
Area	Lea County, NM	Well	No.21
Field	(Cuervo) Sec 14,T23S,R32E	Wellbore	No.21 PWB
Facility	Cuervo Fed No.21		

WELLPATH DATA (161 stations) † = interpolated/extrapolated station												
MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	Latitude	Longitude	DLS [°/100ft]	Comments
13100.00†	90.000	179.597	11035.00	2208.78	-2208.73	15.54	754204.64	475378.46	32°18'18.030"N	103°38'39.679"W	0.00	
13200.00†	90.000	179.597	11035.00	2308.78	-2308.73	16.24	754205.34	475278.47	32°18'17.040"N	103°38'39.678"W	0.00	
13300.00†	90.000	179.597	11035.00	2408.78	-2408.72	16.94	754206.04	475178.48	32°18'16.051"N	103°38'39.678"W	0.00	
13400.00†	90.000	179.597	11035.00	2508.78	-2508.72	17.65	754206.75	475078.48	32°18'15.061"N	103°38'39.677"W	0.00	
13500.00†	90.000	179.597	11035.00	2608.78	-2608.72	18.35	754207.45	474978.49	32°18'14.072"N	103°38'39.676"W	0.00	
13600.00†	90.000	179.597	11035.00	2708.78	-2708.72	19.06	754208.16	474878.49	32°18'13.082"N	103°38'39.676"W	0.00	
13700.00†	90.000	179.597	11035.00	2808.78	-2808.71	19.76	754208.86	474778.50	32°18'12.093"N	103°38'39.675"W	0.00	
13800.00†	90.000	179.597	11035.00	2908.78	-2908.71	20.46	754209.56	474678.51	32°18'11.103"N	103°38'39.674"W	0.00	
13900.00†	90.000	179.597	11035.00	3008.78	-3008.71	21.17	754210.27	474578.51	32°18'10.114"N	103°38'39.673"W	0.00	
14000.00†	90.000	179.597	11035.00	3108.78	-3108.71	21.87	754210.97	474478.52	32°18'09.124"N	103°38'39.673"W	0.00	
14100.00†	90.000	179.597	11035.00	3208.78	-3208.70	22.57	754211.67	474378.53	32°18'08.135"N	103°38'39.672"W	0.00	
14200.00†	90.000	179.597	11035.00	3308.78	-3308.70	23.28	754212.38	474278.53	32°18'07.145"N	103°38'39.671"W	0.00	
14300.00†	90.000	179.597	11035.00	3408.78	-3408.70	23.98	754213.08	474178.54	32°18'06.156"N	103°38'39.671"W	0.00	
14400.00†	90.000	179.597	11035.00	3508.78	-3508.70	24.69	754213.78	474078.55	32°18'05.166"N	103°38'39.670"W	0.00	
14500.00†	90.000	179.597	11035.00	3608.78	-3608.69	25.39	754214.49	473978.55	32°18'04.177"N	103°38'39.669"W	0.00	
14600.00†	90.000	179.597	11035.00	3708.78	-3708.69	26.09	754215.19	473878.56	32°18'03.187"N	103°38'39.669"W	0.00	
14700.00†	90.000	179.597	11035.00	3808.78	-3808.69	26.80	754215.90	473778.57	32°18'02.198"N	103°38'39.668"W	0.00	
14800.00†	90.000	179.597	11035.00	3908.78	-3908.69	27.50	754216.60	473678.57	32°18'01.208"N	103°38'39.667"W	0.00	
14900.00†	90.000	179.597	11035.00	4008.78	-4008.68	28.20	754217.30	473578.58	32°18'00.219"N	103°38'39.666"W	0.00	
15000.00†	90.000	179.597	11035.00	4108.78	-4108.68	28.91	754218.01	473478.59	32°17'59.229"N	103°38'39.666"W	0.00	
15100.00†	90.000	179.597	11035.00	4208.78	-4208.68	29.61	754218.71	473378.59	32°17'58.240"N	103°38'39.665"W	0.00	
15200.00†	90.000	179.597	11035.00	4308.78	-4308.68	30.32	754219.41	473278.60	32°17'57.250"N	103°38'39.664"W	0.00	
15300.00†	90.000	179.597	11035.00	4408.78	-4408.67	31.02	754220.12	473178.61	32°17'56.260"N	103°38'39.664"W	0.00	
15400.00†	90.000	179.597	11035.00	4508.78	-4508.67	31.72	754220.82	473078.61	32°17'55.271"N	103°38'39.663"W	0.00	
15500.00†	90.000	179.597	11035.00	4608.78	-4608.67	32.43	754221.53	472978.62	32°17'54.281"N	103°38'39.662"W	0.00	
15509.02	90.000	179.597	11035.00 ¹	4617.80	-4617.69	32.49	754221.59	472969.60	32°17'54.192"N	103°38'39.662"W	0.00	No.21 PBHL



Planned Wellpath Report

Prelim_2

Page 6 of 6



REFERENCE WELLPATH IDENTIFICATION

Operator	Cimarex Energy Co. of Colorado	Slot	No.21 SHL
Area	Lea County, NM	Well	No.21
Field	(Cuervo) Sec 14,T23S,R32E	Wellbore	No.21 PWB
Facility	Cuervo Fed No.21		

TARGETS

Name	MD [ft]	TVD [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	Latitude	Longitude	Shape
1) No.21 PBHL	15509.02	11035.00	-4617.69	32.50	754221.60	472969.60	32°17'54.192"N	103°38'39.662"W	point

SURVEY PROGRAM - Ref Wellbore: No.21 PWB Ref Wellpath: Prelim_2

Start MD [ft]	End MD [ft]	Positional Uncertainty Model	Log Name/Comment	Wellbore
0.00	15509.02	NaviTrak (Standard)		No.21 PWB

SR & A

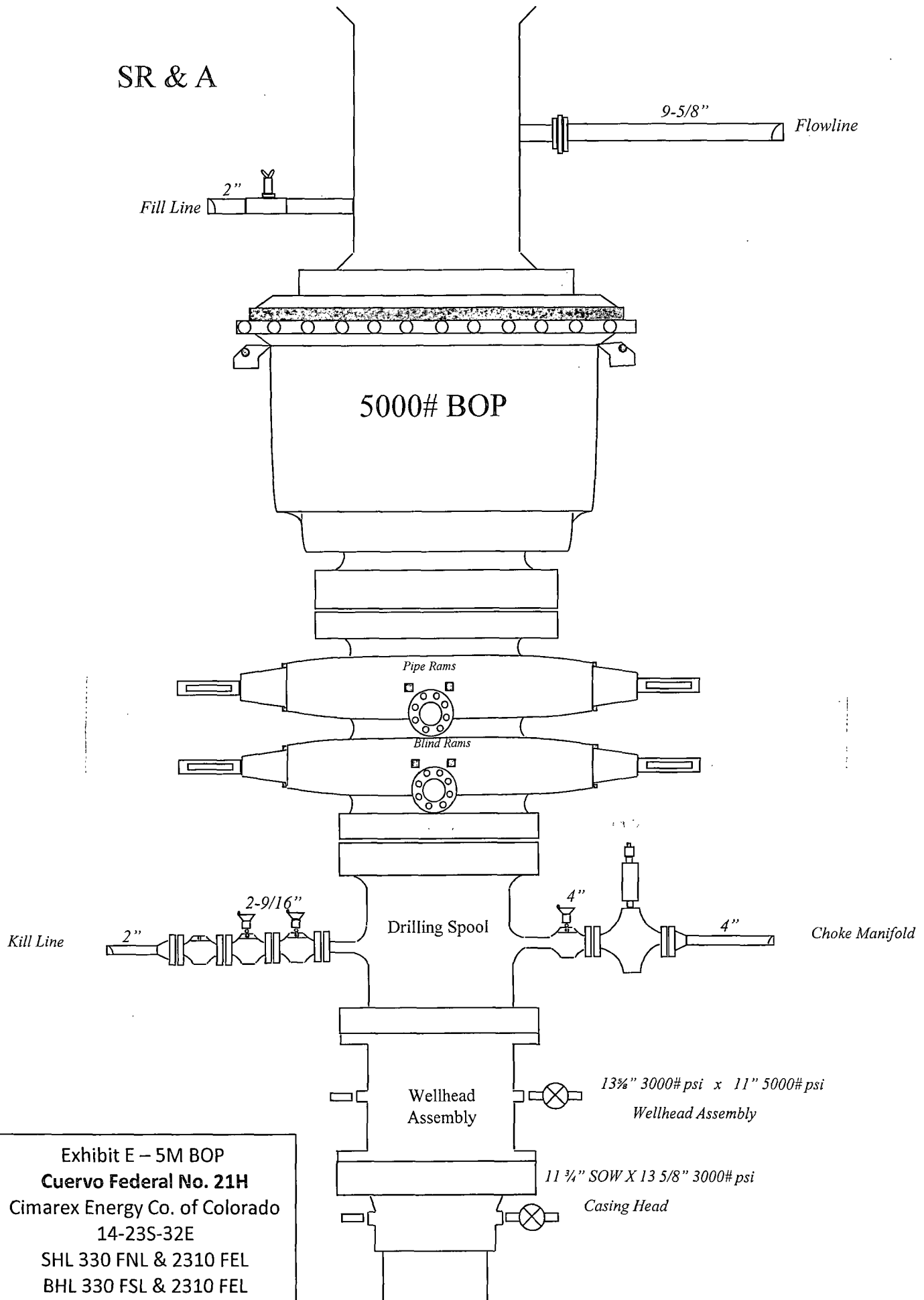
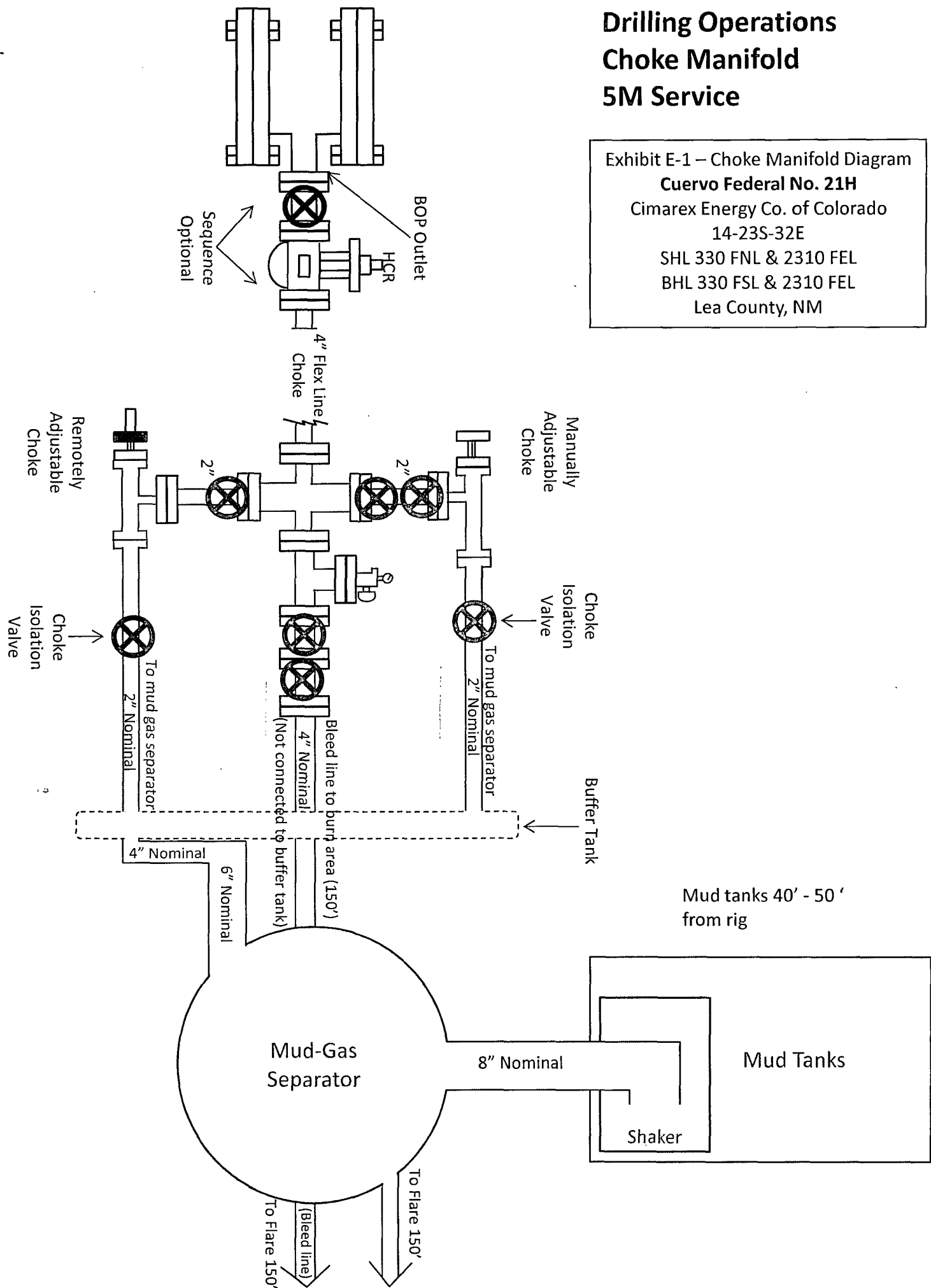


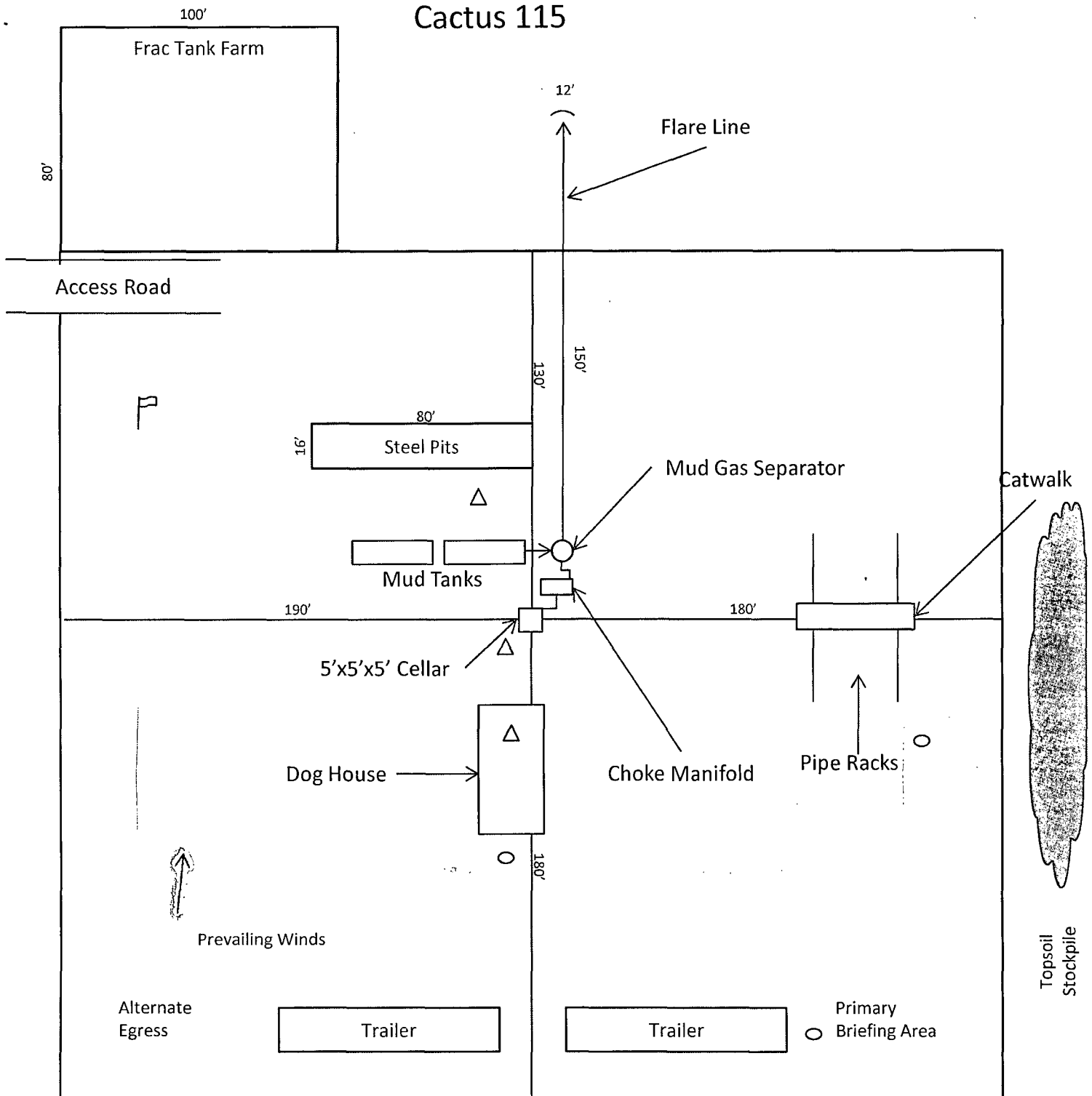
Exhibit E – 5M BOP
Cuervo Federal No. 21H
Cimarex Energy Co. of Colorado
14-23S-32E
SHL 330 FNL & 2310 FEL
BHL 330 FSL & 2310 FEL
Lea County, NM

Drilling Operations
Choke Manifold
5M Service

Exhibit E-1 – Choke Manifold Diagram
Cuervo Federal No. 21H
Cimarex Energy Co. of Colorado
14-23S-32E
SHL 330 FNL & 2310 FEL
BHL 330 FSL & 2310 FEL
Lea County, NM



Cactus 115



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

Exhibit D – Rig Diagram
Cuervo Federal No. 21H
 Cimarex Energy Co. of Colorado
 14-23S-32E
 SHL 330 FNL & 2310 FEL
 BHL 330 FSL & 2310 FEL
 Lea County, NM

