

Carlsbad Field Office OCD Artesia

14-527

Form 3160-3
(March 2012)

**NM OIL CONSERVATION
ARTESIA DISTRICT**

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

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

JUN 1 2015

APPLICATION FOR PERMIT TO DRILL OR REENTER RECEIVED

5. Lease Serial No.
SHLABHL: NMNM117116

6. If Indian, Allottee or Tribe Name

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

8. Lease Name and Well No.
Cabrera 34 Federal #4H

1a. Type of Work DRILL REENTER

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

2. Name of Operator
Cimarex Energy Co.

9. API Well No.
30-015-43173

3a. Address
202 S. Cheyenne Ave., Ste 1000, Tulsa, OK 74103

3b. Phone No. (include area code)
918-585-1100

10. Field and Pool, or Exploratory
Wildcat Wolfcamp <98140>

4. Location of Well (Report location clearly and in accordance with any State requirements. *)
At Surface 1110 FSL & 210 FEL
At proposed prod. Zone 1070 FSL & 660 FWL

11. Sec., T. R. M. or Blk. and Survey and Area
34, 26S, 27E

14. Distance in miles and direction from nearest town or post office*
Whites City NM is 17 miles northwest of location

**UNORTHODOX
LOCATION**

12. County or Parish
Eddy

13. State
NM

15. Distance from proposed* location to nearest property or lease line, ft. (Also to nearest drig. unit line if any)
210

16. No of acres in lease
NMNM117116=1364.69 acres

17. Spacing Unit dedicated to this well
~~255.07~~
254.96

18. Distance from proposed* location to nearest well, drilling, completed, applied for, on this lease, ft.
40' to the #3H

19. Proposed Depth
Pilot Hole TD: N/A
13,831 MD 9,727 TVD

20. BLM/BIA Bond No. on File
NM2575; NMB000835

21. Elevations (Show whether DF, KDB, RT, GL, etc.)
^{2271 GR}
3237 per plat

22. Approximate date work will start*
4/17/14

23. Estimated duration
35 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:

- | | |
|---|---|
| <p>1. Well plat certified by a registered surveyor</p> <p>2. A Drilling Plan</p> <p>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).</p> | <p>4. Bond to cover the operations unless covered by an existing bond on file (see Item 20 above).</p> <p>5. Operator Certification</p> <p>6. Such other site specific information and/or plans as may be required by the authorized officer.</p> |
|---|---|

25. Signature 
Title
Regulatory Compliance

Name (Printed/Typed)
Terri Stathem

Date
2/17/14

Approved By (Signature) **Steve Caffey**
Title
FIELD MANAGER

Name (Printed/Typed)
Office **CARLSBAD FIELD OFFICE**

Date
MAY 21 2015

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.

ADD 6/3/2015

(Continued on page 2)

*(Instructions on page 2)

Carlsbad Controlled Water Basin

**Approval Subject to General Requirements
& Special Stipulations Attached**

**SEE ATTACHED FOR
CONDITIONS OF APPROVAL**

DISTRICT I
1625 N. French Dr., Hobbs, NM 88240
Phone (575) 393-6161 Fax: (575) 393-0720

DISTRICT II
811 S. First St., Artesia, NM 88210
Phone: (505) 748-1283 Fax: (505) 748-9720

DISTRICT III
1000 Rio Brazos Rd., Aztec, NM 87410
Phone: (505) 394-6178 Fax: (505) 394-6170

DISTRICT IV
1220 S. St. Francis Dr., Santa Fe, NM 87505
Phone: (505) 476-3480 Fax: (505) 476-3482

JUN 1 2015 Submit one copy to appropriate District Office

OIL CONSERVATION DIVISION
1220 South St. Francis Dr.
Santa Fe, New Mexico 87505

RECEIVED

WELL LOCATION AND ACREAGE DEDICATION PLAT

AMENDED REPORT

API Number 30015- 43173	Pool Code 98190	Pool Name WC-015 S262734P Wildcat Wolfeamp WC (Gas)
Property Code 40432	Property Name CABRERA 34 FEDERAL	
OGRID No. 215099	Operator Name GIMAREX ENERGY CO.	Well Number 4H Elevation 3237'

Surface Location

UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
A	34	26 S	27 E		1110	SOUTH	210	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
D	34	26 S	27 E		1070	SOUTH	660	WEST	EDDY

Dedicated Acres 255.07	Joint or Infill 294.96	Consolidation Code	Order No.
----------------------------------	----------------------------------	--------------------	-----------

NO ALLOWABLE WILL BE ASSIGNED TO THIS COMPLETION UNTIL ALL INTERESTS HAVE BEEN CONSOLIDATED OR A NON-STANDARD UNIT HAS BEEN APPROVED BY THE DIVISION

OPERATOR CERTIFICATION

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

Signature: *[Signature]* Date: **4/18/2014**

Printed Name: **Terr Stathem**
Email Address: **tstathem@cimarex.com**

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.

Date Surveyed: **April 25, 2014**
Signature: *[Signature]*
Professional Surveyor

Certificate No: **Gary L. Jones 7977**

BASIN SURVEYS 29251



CABRERA 34 FEDERAL #4H
 Located 1110' FSL and 210' FEL
 Section 34, Township 26 South, Range 27 East,
 N.M.P.M., Eddy County, New Mexico.



P.O. Box 1786
 1120 N. West County Rd.
 Hobbs, New Mexico 88241
 (575) 393-7316 - Office
 (575) 392-2206 - Fax
 basinsurveys.com

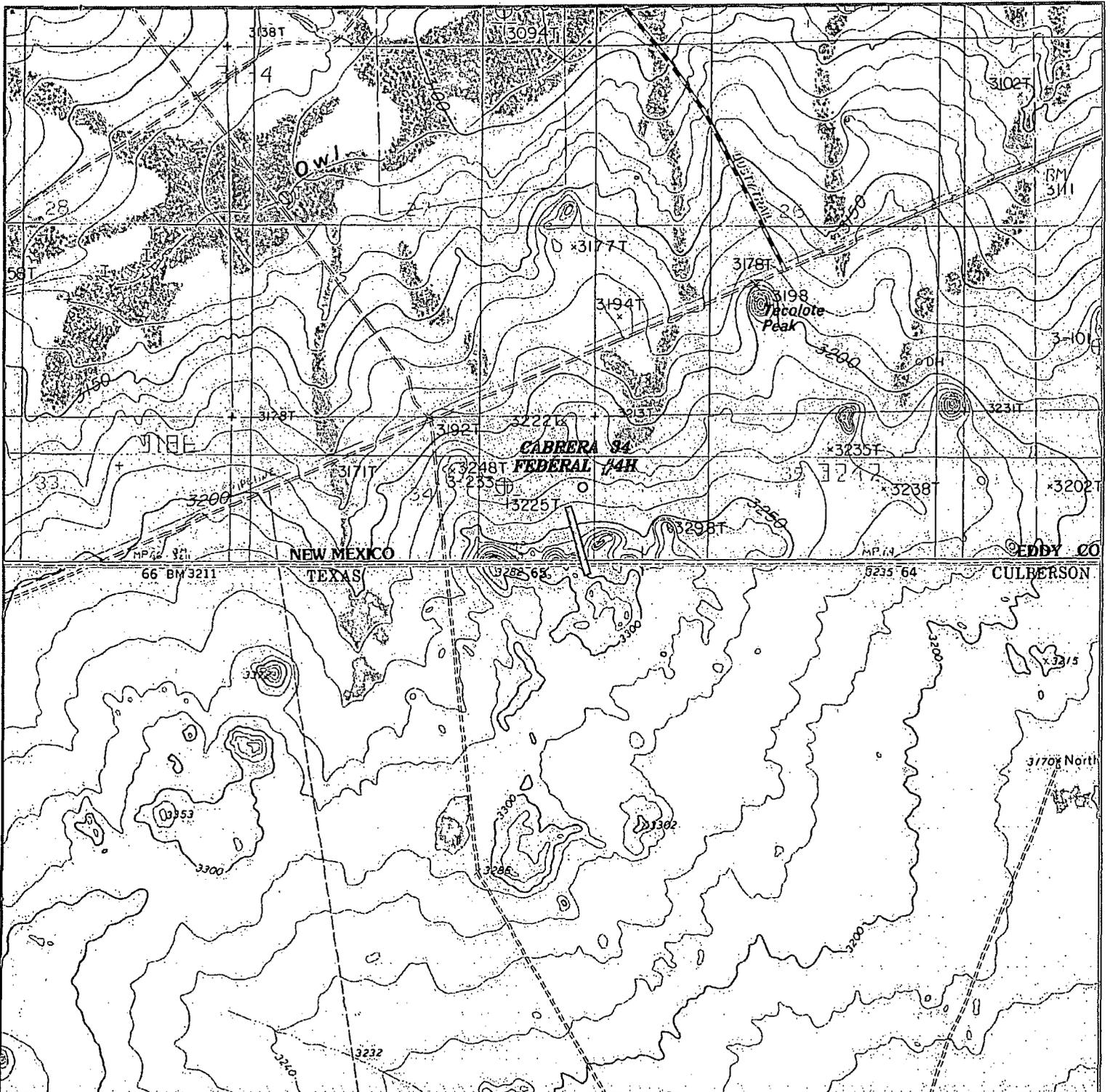
W.O. Number: 29251-29442

Survey Date: 10-09-2013

Scale: 1" = 2 Miles

Date: 10-16-2013

**CIMAREX
 ENERGY CO.**



CABRERA 34 FEDERAL #4H
 Located 1110' FSL and 210' FEL
 Section 34, Township 26 South, Range 27 East,
 N.M.P.M., Eddy County, New Mexico.

basin
surveys
 focused on excellence
 in the oilfield

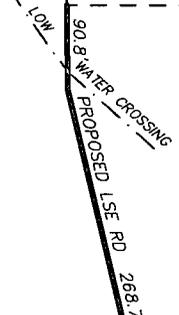
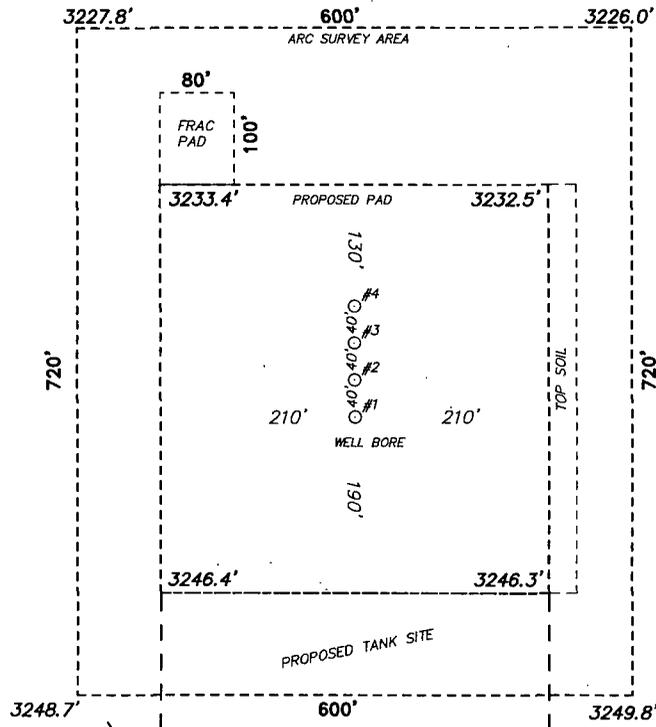
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 1120 N. West County Rd.
 Hobbs, New Mexico 88241
 (575) 393-7316 - Office
 (575) 392-2206 - Fax
 basin-surveys.com

W.O. Number: 29251-29442
Survey Date: 10-09-2013
Scale: 1" = 2000'
Date: 10-16-2013

CIMAREX
ENERGY CO.

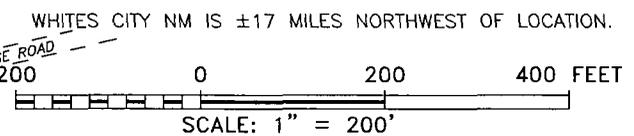
Exhibit C

SECTION 34, TOWNSHIP 26 SOUTH, RANGE 27 EAST, N.M.P.M.,
 EDDY COUNTY, NEW MEXICO.



CIMAREX ENERGY CO.
 CABRERA 34 FEDERAL #4H
 ELEV. - 3237'

Lat - N 32°00'11.00"
 Long - W 104°10'11.64"
 NMSPCE- N 364889.9
 E 591997.8
 (NAD-83)



Directions to Location:

FROM HIGHWAY 285 AND WHITES CITY GO WEST 3.1 MILES TURN SOUTH AND GO 4.5 MILES THEN GO WEST 3.2 MILES TO PROPOSED ROAD.

BASIN SURVEYS P.O. BOX 1786 - HOBBS, NEW MEXICO

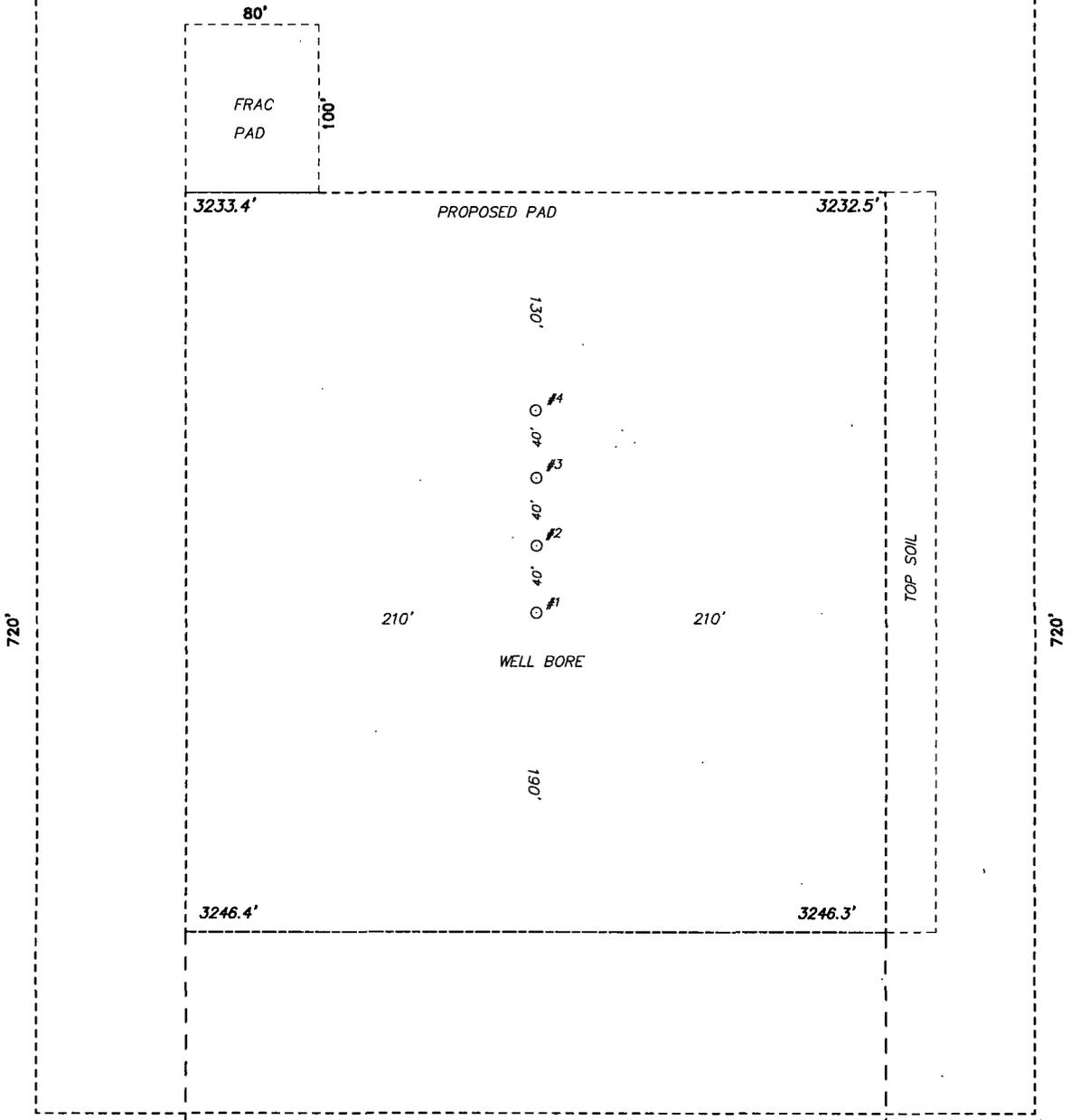
W.O. Number: 29251 Drawn By: J. GOAD

Date: 8-29-2013 Disk: JG - 29249-2950-2951

CIMAREX ENERGY CO.	
REF: CABRERA 34 FEDERAL #4H	
THE CABRERA 34 FEDERAL #4H LOCATED 1110' FROM THE SOUTH LINE AND 210' FROM THE EAST LINE OF SECTION 34, TOWNSHIP 26 SOUTH, RANGE 27 EAST, N.M.P.M., EDDY COUNTY, NEW MEXICO.	
Survey Date: 8-23-2013	Sheet 1 of 1 Sheets

**SECTION 34, TOWNSHIP 26 SOUTH, RANGE 27 EAST, N.M.P.M.,
EDDY COUNTY, NEW MEXICO.**

3227.8' 600' 3226.0'
ARC SURVEY AREA



720' 3248.7' 600' 100 0 100 3249.8' 200 FEET
SCALE: 1" = 100'

CIMAREX ENERGY CO.

REF: CABRERA 34 FEDERAL #4H

THE CABRERA 34 FEDERAL #4H LOCATED 1110'
FROM THE SOUTH LINE AND 210' FROM THE EAST LINE OF
SECTION 34, TOWNSHIP 26 SOUTH, RANGE 27 EAST,
N.M.P.M., EDDY COUNTY, NEW MEXICO.

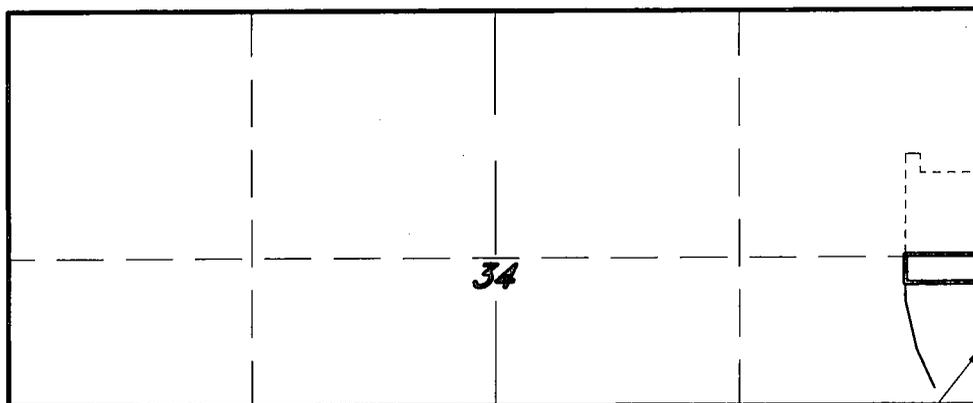
BASIN SURVEYS P.O. BOX 1786 - HOBBS, NEW MEXICO

W.O. Number: 29251-29442 | Drawn By: J. GOAD

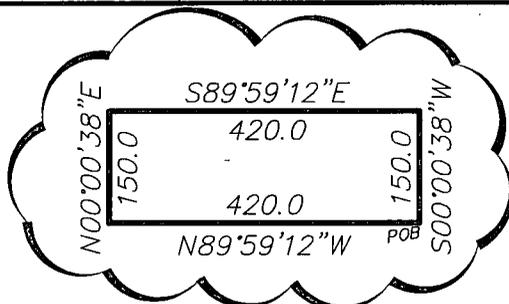
Date: 10-16-2013 | Disk: JG - 29249-2950-2951

Survey Date: 10-09-2013 | Sheet 1 of 1 Sheets

SECTION 34 TOWNSHIP 26 SOUTH, RANGE 27 EAST, N.M.P.M.,
 EDDY COUNTY, NEW MEXICO.



N00°11'45"W
 649.4

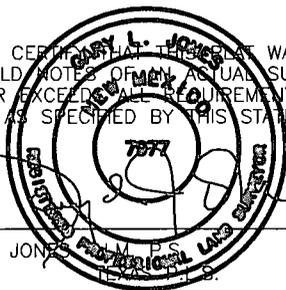


LEGAL DESCRIPTION

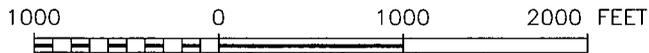
A TRACT OF LAND LOCATED IN SECTION 34, TOWNSHIP 26 SOUTH, RANGE 27 EAST, N.M.P.M., EDDY COUNTY, NEW MEXICO AND BEING MORE PARTICULARLY DESCRIBED, AS FOLLOWS:

BEGINNING AT A POINT WHICH LIES N.00°1'45"W., 649.4 FEET FROM THE SOUTHEAST CORNER OF SAID SECTION 34; THENCE N.89°59'12"W., 420.0 FEET; THENCE N.00°00'38"E., 150.0 FEET; THENCE S.89°59'12"E., 420.0 FEET; THENCE S.00°00'38"E., 150.0 FEET TO THE POINT OF BEGINNING. SAID TRACT OF LAND CONTAINS 1.45 ACRES, MORE OR LESS.

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED FROM FIELD NOTES OF AN ACTUAL SURVEY AND MEETS OR EXCEEDS ALL REQUIREMENTS FOR LAND SURVEYS AS SPECIFIED BY THIS STATE.



GARY L. JONES, P.L.S. No. 7977
 HOBBBS, N.M. No. 5074



CIMAREX ENERGY CO.

REF: PROPOSED BATTERY SITE

A TRACT OF LAND LAND IN
 SECTION 34, TOWNSHIP 26 SOUTH, RANGE 27 EAST,
 N.M.P.M., EDDY COUNTY, NEW MEXICO.

BASIN SURVEYS P.O. BOX 1786—HOBBS, NEW MEXICO

W.O. Number: 29249 Drawn By: J. GOAD

Date: 01-21-2014 Disk: JG - 29249-29250-29251

Survey Date: 01-19-2014 Sheet 1 of 1 Sheets

Application to Drill
Cabrera 34 Federal #4H
 Cimarex Energy Co.
 UL: A, Sec. 34, 26S, 27E
 Eddy Co., 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 1110 FSL & 210 FEL
 BHL 1070 FSL & 660 FWL
2. **Elevation Above Sea Level:** 3,241' 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:** 13,831 MD 9,727 TVD Pilot Hole TD: N/A
6. **Estimated Tops of Geological Markers:**

Formation	Est Top	Bearing
Rustler	50	N/A
Salado (Top Salt)	1552	N/A
Castille	2056	N/A
Bell Canyon (Top Delaware)	2228	N/A
Cherry Canyon	3230	N/A
Brushy Canyon	4392	N/A
Brushy Canyon Lower	5651	N/A
Bone Spring	5886	Hydrocarbons
Bone Spring "A" Shale	5985	Hydrocarbons
Bone Spring "C" Shale	6518	Hydrocarbons
1st Bone Spring Ss	6823	Hydrocarbons
2nd Bone Spring Ss	7293	Hydrocarbons
2nd BS Ss Lower	8116	Hydrocarbons
3rd Bone Spring Ss	8582	Hydrocarbons
Wolfcamp	8933	Hydrocarbons
Wolfcamp B	9580	Hydrocarbons
Wolfcamp C	9727	Hydrocarbons
Wolfcamp C Horz Target	9827	Hydrocarbons
Wolfcamp D	9867	Hydrocarbons
Wolfcamp E	10475	Hydrocarbons

7. **Possible Mineral Bearing Formation:** Shown above

7A. **OSE Ground Water Estimated Depth:** 100'

8. **Casing Program:**

Name	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	Condition	BHP (psig)	Anticipated Mud Weight (ppg)	Collapse SF at Full Evacuation(1.125)	Collapse SF at 1/3 Evacuation(1.125)	Burst SF (1.125)	Cumulative Air Weight	Cumulative Buoyed Weight (lbs)	Buoyant Tension SF (1.8)
Surface	0	400	400	17 1/2	13-3/8"	48.00	H-40	ST&C	New	183	8.8	4.04		9.45	19,200	16,620	19.37
Intermediate	0	1900	2100	12 1/4	9-5/8"	36.00	J-55	LT&C	New	988	10.0		2.04	3.56	68,400	57,957	7.82
Production	0	9345	9345	8 3/4	7"	32.00	L-80	LT&C	New	4373	9.0	1.97		2.07	311,264	268,495	2.50
Production	9345	10107	9727	8 3/4	7"	32.00	L-80	BT&C	New	4552	9.0	1.89		1.86	12,224	10,544	70.65
Completion System	9345	13831	9727	6	4-1/2"	11.60	P-110	BT&C	New	6069	12.0	1.25		1.76	52,037	42,504	8.63

Application to Drill
Cabrera 34 Federal #4H
 Cimarex Energy Co.
 UL: A, Sec. 34, 26S, 27E
 Eddy Co., NM

8A. Casing Design and Casing Loading Assumptions:

Surface	Tension	A 1.8 design factor with effects of buoyancy: 8.30 ppg.
	Collapse	A 1.125 design factor with full internal evacuation and a collapse force equal to a 8.30 ppg mud gradient.
	Burst	A 1.125 design with a surface pressure equal to the fracture gradient at setting depth less gas gradient to surface.
Intermediate	Tension	A 1.8 design factor with effects of buoyancy: 10.00 ppg.
	Collapse	A 1.125 design factor evacuated 1/3 TVD of next casing string with a collapse force equal to a 10.00 ppg mud gradient.
	Burst	A 1.125 design with a surface pressure equal to the fracture gradient at setting depth less gas gradient to surface.
Production and/or Production Completion System	Tension	A 1.8 design factor with effects of buoyancy: 9.00 ppg.
	Collapse	A 1.125 design factor with full internal evacuation of next casing string with a collapse force equal to a 9.00 ppg mud gradient.
	Burst	A 1.125 design with a surface pressure equal to the fracture gradient at setting depth less gas gradient to surface.

Note: The liner SFT is calculated for the worse case scenario of running in the hole. 4 1/2" completion system will be ran in the hole and cemented from the 4 1/2" shoe up to previous 7" casing shoe with a 10% OH Excess. A liner hanger with an isolation packer or HES versaset liner hanger will be set at the top of the 4 1/2" completion system close to the KOP. The length of liner overlap is to help with the fracture treatment efficiency during the pumping down of guns/plugs.

9. Cementing Program:

Casing Type	Type	Sacks	Yield	Weight	Cubic Feet	Cement Blend
Surface <i>See COA</i>	Lead	60	1.75	13.50	104	Class C + Bentonite + Calcium Chloride + LCM, 8.829 gps water
	Tail	195	1.34	14.80	260	Class C + LCM, 6.32 gps water
	TOC: 0		31% Excess			Centralizers per Onshore Order 2.III.B.1f
Intermediate <i>See COA</i>	Lead	347	1.88	12.90	652	35:65 (poz/C) + Salt + Bentonite + LCM + retarder, 9.65 gps water
	Tail	111	1.34	14.80	148	Class C + retarder + LCM, 6.32 gps water
	TOC: 0		44% Excess			
Production <i>See COA</i>	Lead	557	2.40	11.90	1335	35:65 (poz/H) + salt + Sodium Metasilicate + Bentonite + Fluid Loss + Dispersant + LCM + Retarder, 13.80 gps water
	Tail	169	1.24	14.50	209	50:50 (poz/H) + Bentonite + Salt + Fluid Loss + Dispersant + LCM + Retarder, 5.55 gps water
	TOC: 1700 <i>See COA</i>		23% Excess			No centralizers planned in the lateral section. 1 every jt from EOC to KOP. 1 every 4th joint from KOP to 500' inside previous casing.
Completion System <i>See COA</i>	Tail	284	1.24	14.50	351	50:50 (poz/H) + Bentonite + Salt + Fluid Loss + Dispersant + LCM + Retarder, 5.55 gps water
	TOC: 10107 Top of liner		10% Excess			No centralizers planned in the lateral section.

Cement volumes will be adjusted depending on hole size

9a. Proposed Drilling Plan:

Pilot Hole TD: No Pilot KOP: 9,345' EOC: 10,107'

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

Application to Drill
Cabrera 34 Federal #4H
 Cimarex Energy Co.
 UL: A, Sec. 34, 26S, 27E
 Eddy Co., NM

10. Pressure Control Equipment:

Exhibit "E-1". 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. Below the Production Casing, a 5M 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.

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. On the production casing, pressure tests will be made to 250 psi low and 5000 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, and 250 low and 2500 high on the production 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 F, F-1, F-2, F-3). 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.

See COA
11. Proposed Mud Circulating System:

Depth	Mud Weight	Visc	Fluid Loss	Type Mud
0' to 400'	8.30 - 8.80	28	NC	FW Spud Mud
400' to 1900' <i>2100'</i>	9.50 - 10.00	30-32	NC	Brine Water
1900' to 10107'	8.50 - 9.00	30-32	NC	FW/Cut Brine
10107' to 13831'	11.50 - 12.00	50-70	5-15	Oil Based Mud

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.

12. Testing, Logging and Coring Program:

- A. Mud logging program: 2 man unit from 1900 to TD
- B. Electric logging program: CNL / LDT / CAL / GR, DLL / GR -- Inter. Csg to TD
 CNL / GR -- Surf to Inter. Csg
- C. No DSTs or cores are planned at this time
- D. CBL w/ CCL from as far as gravity will let it fall to TOC

13. Potential Hazards: *See COA*

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: 4378 psi

Estimated BHT: 158°

14. Construction and Drilling:

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

Drilling expected to take: 35 days.

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

Application to Drill
Cabrera 34 Federal #4H
Cimarex Energy Co.
UL: A, Sec. 34, 26S, 27E
Eddy Co., NM

15. Other Facets of Operations:

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

Wolfcamp pay will be perforated and stimulated.

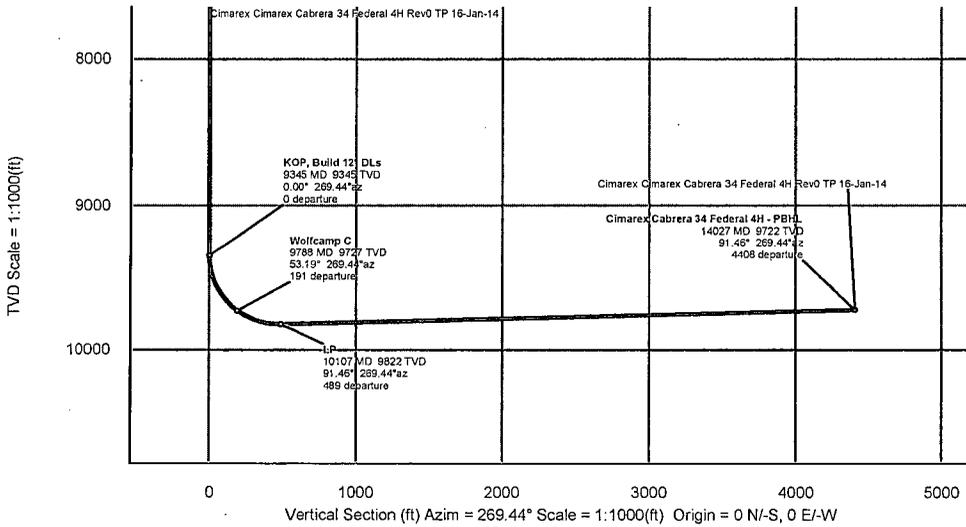
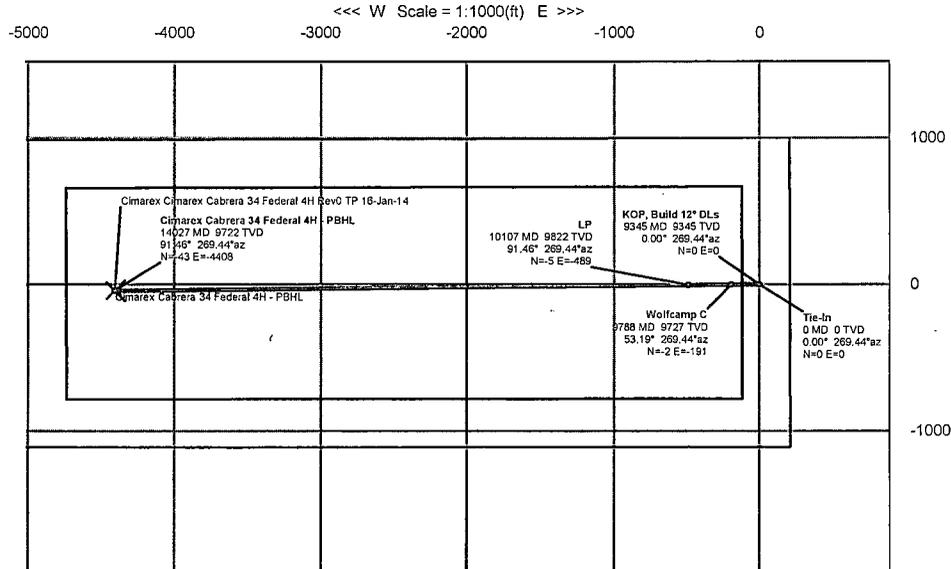
The proposed well will be tested and potential as **Gas**



WELL Cabrera 34 Federal 4H	FIELD NM Eddy County (NAD 83)	STRUCTURE Cimarex Cabrera 34 Federal 4H
Magnetic Parameters Model: BGM 2013 Dip: 59.795° Mag Dec: 7.641°	Date: January 18, 2014 FB: 48133.4NT	Surface Location Lat: N 32 0 11.006 Lon: W 104 10 11.615
NADES3 New Mexico State Plane, Eastern Zone, US Feet Northing: 354489.90 NUS Easting: 591997.80 RUS Grid Cont: 0.087° Scale Fact: 0.99991203	Measurements Site: Cabrera 34 Federal 4H Plan: Cimarex Cimarex Cabrera 34 Fed 4H Rev0 TP 16 Jan 14 TVD Ref: Ground Level (3237.7 above)	



Grid North
Tot Corr (M->G 7.5540°)
Mag Dec (7.641°)
Grid Conv (0.087°)



Critical Points

Critical Point	MD	INCL	AZIM	TVD	VSEC	N(+)/S(-)	E(+)/W(-)	DLS
Tie-In	0.00	0.00	269.44	0.00	0.00	0.00	0.00	
KOP, Build 12° DLs	9345.00	0.00	269.44	9345.00	0.00	0.00	0.00	0.00
Wolfcamp C	9787.92	53.19	269.44	9727.00	191.23	-1.87	-191.22	12.01
LP	10106.67	91.46	269.44	9822.00	489.31	-4.78	-489.29	12.01
Wolfcamp C	13831.05	91.46	269.44	9727.00	4212.48	-41.19	-4212.28	0.00

Cimarex
Cabrera 34



Cimarex Cabrera 34 Federal 4H Rev0 TP 16-Jan-14 Proposal Report (Non-Def Plan)

Report Date: January 16, 2014 - 01:04 PM Client: NM Eddy County (NAD 83) Field: Cimarex Cabrera 34 Federal 4H / Cabrera 34 Federal 4H Structure / Slot: Cabrera 34 Federal 4H Well: Original Borehole Borehole: Unknown / Unknown UWI / API#: Cimarex Cimarex Cabrera 34 Federal 4H Rev0 TP 16-Jan-14 Survey Name: January 16, 2014 Tort / AHD / DDI / ERD Ratio: 91.463° / 4408.207 ft / 5.760 / 0.449 Coordinate Reference System: NAD83 New Mexico State Plane, Eastern Zone, US Feet Location Lat / Long: N 32° 0' 11.0558", W 104° 10' 11.64502" Location Grid N/E Y/X: N 364889.900 RUS, E 591997.800 RUS CRS Grid Convergence Angle: 0.0866° Grid Scale Factor: 0.99991203	Survey / DLS Computation: Minimum Curvature / Lubinski Vertical Section Azimuth: 269.440° (Grid North) Vertical Section Origin: 0.000 ft, 0.000 ft TVD Reference Datum: Ground Level TVD Reference Elevation: 3237.000 ft above Seabed / Ground Elevation: 3237.000 ft above Magnetic Declination: 7.841° Total Field Strength: 48133.441 nT Magnetic Dip Angle: 59.795° Declination Date: January 16, 2014 Magnetic Declination Model: BGM 2013 North Reference: Grid North Grid Convergence Used: 0.0866° Total Corr Mag North->Grid North: 7.5540° Local Coord Referenced To: Structure Reference Point	
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Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	VSEC (ft)	NS (ft)	EW (ft)	Northing (RUS)	Easting (RUS)	Latitude (N/S ° ' ")	Longitude (E/W ° ' ")	Closure (ft)	Closure Azimuth (°)	DLS (*/100ft)
Tie-in	0.00	0.00	269.44	0.00	0.00	0.00	0.00	364889.90	591997.80	N 32 0 11.01	W 104 10 11.65	0.00	0.00	N/A
	100.00	0.00	269.44	100.00	0.00	0.00	0.00	364889.90	591997.80	N 32 0 11.01	W 104 10 11.65	0.00	0.00	0.00
	200.00	0.00	269.44	200.00	0.00	0.00	0.00	364889.90	591997.80	N 32 0 11.01	W 104 10 11.65	0.00	0.00	0.00
	300.00	0.00	269.44	300.00	0.00	0.00	0.00	364889.90	591997.80	N 32 0 11.01	W 104 10 11.65	0.00	0.00	0.00
	400.00	0.00	269.44	400.00	0.00	0.00	0.00	364889.90	591997.80	N 32 0 11.01	W 104 10 11.65	0.00	0.00	0.00
	500.00	0.00	269.44	500.00	0.00	0.00	0.00	364889.90	591997.80	N 32 0 11.01	W 104 10 11.65	0.00	0.00	0.00
	600.00	0.00	269.44	600.00	0.00	0.00	0.00	364889.90	591997.80	N 32 0 11.01	W 104 10 11.65	0.00	0.00	0.00
	700.00	0.00	269.44	700.00	0.00	0.00	0.00	364889.90	591997.80	N 32 0 11.01	W 104 10 11.65	0.00	0.00	0.00
	800.00	0.00	269.44	800.00	0.00	0.00	0.00	364889.90	591997.80	N 32 0 11.01	W 104 10 11.65	0.00	0.00	0.00
	900.00	0.00	269.44	900.00	0.00	0.00	0.00	364889.90	591997.80	N 32 0 11.01	W 104 10 11.65	0.00	0.00	0.00
	1000.00	0.00	269.44	1000.00	0.00	0.00	0.00	364889.90	591997.80	N 32 0 11.01	W 104 10 11.65	0.00	0.00	0.00
	1100.00	0.00	269.44	1100.00	0.00	0.00	0.00	364889.90	591997.80	N 32 0 11.01	W 104 10 11.65	0.00	0.00	0.00
	1200.00	0.00	269.44	1200.00	0.00	0.00	0.00	364889.90	591997.80	N 32 0 11.01	W 104 10 11.65	0.00	0.00	0.00
	1300.00	0.00	269.44	1300.00	0.00	0.00	0.00	364889.90	591997.80	N 32 0 11.01	W 104 10 11.65	0.00	0.00	0.00
	1400.00	0.00	269.44	1400.00	0.00	0.00	0.00	364889.90	591997.80	N 32 0 11.01	W 104 10 11.65	0.00	0.00	0.00
	1500.00	0.00	269.44	1500.00	0.00	0.00	0.00	364889.90	591997.80	N 32 0 11.01	W 104 10 11.65	0.00	0.00	0.00
	1600.00	0.00	269.44	1600.00	0.00	0.00	0.00	364889.90	591997.80	N 32 0 11.01	W 104 10 11.65	0.00	0.00	0.00
	1700.00	0.00	269.44	1700.00	0.00	0.00	0.00	364889.90	591997.80	N 32 0 11.01	W 104 10 11.65	0.00	0.00	0.00
	1800.00	0.00	269.44	1800.00	0.00	0.00	0.00	364889.90	591997.80	N 32 0 11.01	W 104 10 11.65	0.00	0.00	0.00
	1900.00	0.00	269.44	1900.00	0.00	0.00	0.00	364889.90	591997.80	N 32 0 11.01	W 104 10 11.65	0.00	0.00	0.00
	2000.00	0.00	269.44	2000.00	0.00	0.00	0.00	364889.90	591997.80	N 32 0 11.01	W 104 10 11.65	0.00	0.00	0.00
	2100.00	0.00	269.44	2100.00	0.00	0.00	0.00	364889.90	591997.80	N 32 0 11.01	W 104 10 11.65	0.00	0.00	0.00
	2200.00	0.00	269.44	2200.00	0.00	0.00	0.00	364889.90	591997.80	N 32 0 11.01	W 104 10 11.65	0.00	0.00	0.00
	2300.00	0.00	269.44	2300.00	0.00	0.00	0.00	364889.90	591997.80	N 32 0 11.01	W 104 10 11.65	0.00	0.00	0.00
	2400.00	0.00	269.44	2400.00	0.00	0.00	0.00	364889.90	591997.80	N 32 0 11.01	W 104 10 11.65	0.00	0.00	0.00
	2500.00	0.00	269.44	2500.00	0.00	0.00	0.00	364889.90	591997.80	N 32 0 11.01	W 104 10 11.65	0.00	0.00	0.00
	2600.00	0.00	269.44	2600.00	0.00	0.00	0.00	364889.90	591997.80	N 32 0 11.01	W 104 10 11.65	0.00	0.00	0.00
	2700.00	0.00	269.44	2700.00	0.00	0.00	0.00	364889.90	591997.80	N 32 0 11.01	W 104 10 11.65	0.00	0.00	0.00
	2800.00	0.00	269.44	2800.00	0.00	0.00	0.00	364889.90	591997.80	N 32 0 11.01	W 104 10 11.65	0.00	0.00	0.00
	2900.00	0.00	269.44	2900.00	0.00	0.00	0.00	364889.90	591997.80	N 32 0 11.01	W 104 10 11.65	0.00	0.00	0.00
	3000.00	0.00	269.44	3000.00	0.00	0.00	0.00	364889.90	591997.80	N 32 0 11.01	W 104 10 11.65	0.00	0.00	0.00
	3100.00	0.00	269.44	3100.00	0.00	0.00	0.00	364889.90	591997.80	N 32 0 11.01	W 104 10 11.65	0.00	0.00	0.00
	3200.00	0.00	269.44	3200.00	0.00	0.00	0.00	364889.90	591997.80	N 32 0 11.01	W 104 10 11.65	0.00	0.00	0.00
	3300.00	0.00	269.44	3300.00	0.00	0.00	0.00	364889.90	591997.80	N 32 0 11.01	W 104 10 11.65	0.00	0.00	0.00
	3400.00	0.00	269.44	3400.00	0.00	0.00	0.00	364889.90	591997.80	N 32 0 11.01	W 104 10 11.65	0.00	0.00	0.00
	3500.00	0.00	269.44	3500.00	0.00	0.00	0.00	364889.90	591997.80	N 32 0 11.01	W 104 10 11.65	0.00	0.00	0.00
	3600.00	0.00	269.44	3600.00	0.00	0.00	0.00	364889.90	591997.80	N 32 0 11.01	W 104 10 11.65	0.00	0.00	0.00
	3700.00	0.00	269.44	3700.00	0.00	0.00	0.00	364889.90	591997.80	N 32 0 11.01	W 104 10 11.65	0.00	0.00	0.00
	3800.00	0.00	269.44	3800.00	0.00	0.00	0.00	364889.90	591997.80	N 32 0 11.01	W 104 10 11.65	0.00	0.00	0.00
	3900.00	0.00	269.44	3900.00	0.00	0.00	0.00	364889.90	591997.80	N 32 0 11.01	W 104 10 11.65	0.00	0.00	0.00
	4000.00	0.00	269.44	4000.00	0.00	0.00	0.00	364889.90	591997.80	N 32 0 11.01	W 104 10 11.65	0.00	0.00	0.00
	4100.00	0.00	269.44	4100.00	0.00	0.00	0.00	364889.90	591997.80	N 32 0 11.01	W 104 10 11.65	0.00	0.00	0.00
	4200.00	0.00	269.44	4200.00	0.00	0.00	0.00	364889.90	591997.80	N 32 0 11.01	W 104 10 11.65	0.00	0.00	0.00
	4300.00	0.00	269.44	4300.00	0.00	0.00	0.00	364889.90	591997.80	N 32 0 11.01	W 104 10 11.65	0.00	0.00	0.00
	4400.00	0.00	269.44	4400.00	0.00	0.00	0.00	364889.90	591997.80	N 32 0 11.01	W 104 10 11.65	0.00	0.00	0.00
	4500.00	0.00	269.44	4500.00	0.00	0.00	0.00	364889.90	591997.80	N 32 0 11.01	W 104 10 11.65	0.00	0.00	0.00
	4600.00	0.00	269.44	4600.00	0.00	0.00	0.00	364889.90	591997.80	N 32 0 11.01	W 104 10 11.65	0.00	0.00	0.00
	4700.00	0.00	269.44	4700.00	0.00	0.00	0.00	364889.90	591997.80	N 32 0 11.01	W 104 10 11.65	0.00	0.00	0.00
	4800.00	0.00	269.44	4800.00	0.00	0.00	0.00	364889.90	591997.80	N 32 0 11.01	W 104 10 11.65	0.00	0.00	0.00
	4900.00	0.00	269.44	4900.00	0.00	0.00	0.00	364889.90	591997.80	N 32 0 11.01	W 104 10 11.65	0.00	0.00	0.00
	5000.00	0.00	269.44	5000.00	0.00	0.00	0.00	364889.90	591997.80	N 32 0 11.01	W 104 10 11.65	0.00	0.00	0.00
	5100.00	0.00	269.44	5100.00	0.00	0.00	0.00	364889.90	591997.80	N 32 0 11.01	W 104 10 11.65	0.00	0.00	0.00
	5200.00	0.00	269.44	5200.00	0.00	0.00	0.00	364889.90	591997.80	N 32 0 11.01	W 104 10 11.65	0.00	0.00	0.00
	5300.00	0.00	269.44	5300.00	0.00	0.00	0.00	364889.90	591997.80	N 32 0 11.01	W 104 10 11.65	0.00	0.00	0.00
	5400.00	0.00	269.44	5400.00	0.00	0.00	0.00	364889.90	591997.80	N 32 0 11.01	W 104 10 11.65	0.00	0.00	0.00
	5500.00	0.00	269.44	5500.00	0.00	0.00	0.00	364889.90	591997.80	N 32 0 11.01	W 104 10 11.65	0.00	0.00	0.00
	5600.00	0.00	269.44	5600.00	0.00	0.00	0.00	364889.90	591997.80	N 32 0 11.01	W 104 10 11.65	0.00	0.00	0.00
	5700.00	0.00	269.44	5700.00	0.00	0.00	0.00	364889.90	591997.80	N 32 0 11.01	W 104 10 11.65	0.00	0.00	0.00
	5800.00	0.00	269.44	5800.00	0.00	0.00	0.00	364889.90	591997.80	N 32 0 11.01	W 104 10 11.65	0.00	0.00	0.00
	5900.00	0.00	269.44	5900.00	0.00	0.00	0.00	364889.90	591997.80	N 32 0 11.01	W 104 10 11.65	0.00	0.00	0.00
	6000.00	0.00	269.44	6000.00	0.00	0.00	0.00	364889.90	591997.80	N 32 0 11.01	W 104 10 11.65	0.00	0.00	0.00
	6100.00	0.00	269.44	6100.00	0.00	0.00	0.00	364889.90	591997.80	N 32 0 11.01	W 104 10 11.65	0.00	0.00	0.00
	6200.00	0.00	269.44	6200.00	0.00	0.00	0.00	364889.90	591997.80	N 32 0 11.01	W 104 10 11.65	0.00	0.00	0.00
	6300.00	0.00	269.44	6300.00	0.00	0.00	0.00	364889.90	591997.80	N 32 0 11.01	W 104 10 11.65	0.00	0.00	0.00
	6400.00	0.00	269.44	6400.00	0.00	0.00	0.00	364889.90	591997.80	N 32 0 11.01	W 104 10 11.65	0.00	0.00	0.00
	6500.00	0.00	269.44	6500.00	0.00	0.00	0.00	364889.90	591997.80	N 32 0 11.01	W 104 10 11.65	0.00	0.00	0.00
	6600.00	0.00	269.44	6600.00										

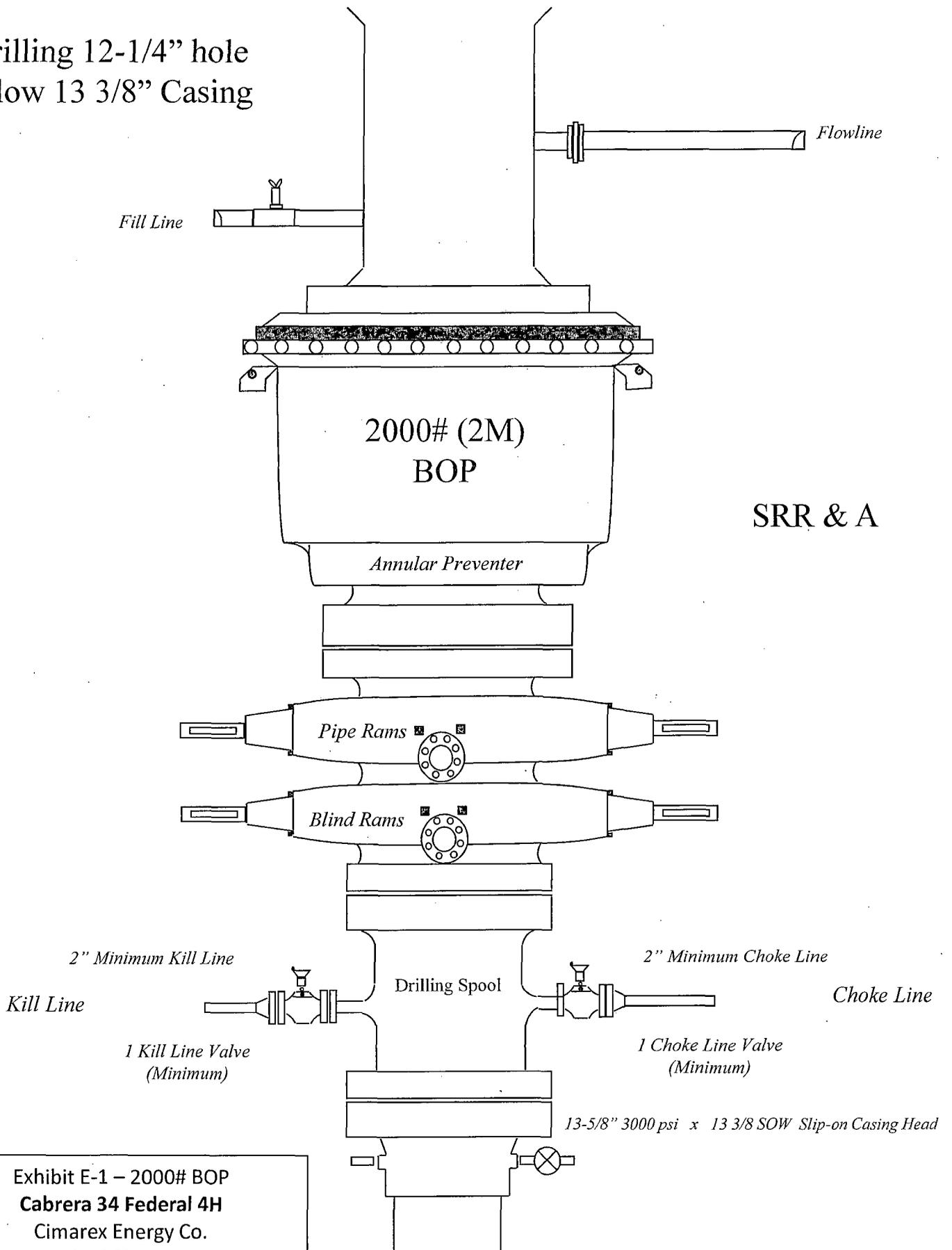
Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	VSEC (ft)	NS (ft)	EW (ft)	Northing (ftUS)	Easting (ftUS)	Latitude (N/S ° °')	Longitude (E/W ° °')	Closure (ft)	Closure Azimuth (°)	DLS (ft/100ft)
	8000.00	0.00	269.44	8000.00	0.00	0.00	0.00	364889.90	591997.80	N 32 0 11.01	W 104 10 11.65	0.00	0.00	0.00
	8100.00	0.00	269.44	8100.00	0.00	0.00	0.00	364889.90	591997.80	N 32 0 11.01	W 104 10 11.65	0.00	0.00	0.00
	8200.00	0.00	269.44	8200.00	0.00	0.00	0.00	364889.90	591997.80	N 32 0 11.01	W 104 10 11.65	0.00	0.00	0.00
	8300.00	0.00	269.44	8300.00	0.00	0.00	0.00	364889.90	591997.80	N 32 0 11.01	W 104 10 11.65	0.00	0.00	0.00
	8400.00	0.00	269.44	8400.00	0.00	0.00	0.00	364889.90	591997.80	N 32 0 11.01	W 104 10 11.65	0.00	0.00	0.00
	8500.00	0.00	269.44	8500.00	0.00	0.00	0.00	364889.90	591997.80	N 32 0 11.01	W 104 10 11.65	0.00	0.00	0.00
	8600.00	0.00	269.44	8600.00	0.00	0.00	0.00	364889.90	591997.80	N 32 0 11.01	W 104 10 11.65	0.00	0.00	0.00
	8700.00	0.00	269.44	8700.00	0.00	0.00	0.00	364889.90	591997.80	N 32 0 11.01	W 104 10 11.65	0.00	0.00	0.00
	8800.00	0.00	269.44	8800.00	0.00	0.00	0.00	364889.90	591997.80	N 32 0 11.01	W 104 10 11.65	0.00	0.00	0.00
	8900.00	0.00	269.44	8900.00	0.00	0.00	0.00	364889.90	591997.80	N 32 0 11.01	W 104 10 11.65	0.00	0.00	0.00
	9000.00	0.00	269.44	9000.00	0.00	0.00	0.00	364889.90	591997.80	N 32 0 11.01	W 104 10 11.65	0.00	0.00	0.00
	9100.00	0.00	269.44	9100.00	0.00	0.00	0.00	364889.90	591997.80	N 32 0 11.01	W 104 10 11.65	0.00	0.00	0.00
	9200.00	0.00	269.44	9200.00	0.00	0.00	0.00	364889.90	591997.80	N 32 0 11.01	W 104 10 11.65	0.00	0.00	0.00
	9300.00	0.00	269.44	9300.00	0.00	0.00	0.00	364889.90	591997.80	N 32 0 11.01	W 104 10 11.65	0.00	0.00	0.00
KOP, Build 12* DLs	9345.00	0.00	269.44	9345.00	0.00	0.00	0.00	364889.90	591997.80	N 32 0 11.01	W 104 10 11.65	0.00	0.00	0.00
	9400.00	6.60	269.44	9399.88	3.17	-0.03	-3.17	364889.87	591994.63	N 32 0 11.01	W 104 10 11.68	3.17	269.44	12.01
	9500.00	18.61	269.44	9497.29	24.95	-0.24	-24.95	364889.66	591972.85	N 32 0 11.00	W 104 10 11.93	24.95	269.44	12.01
	9600.00	30.62	269.44	9588.03	66.53	-0.65	-66.53	364889.25	591931.28	N 32 0 11.00	W 104 10 12.42	66.53	269.44	12.01
	9700.00	42.63	269.44	9668.14	126.08	-1.23	-126.07	364888.67	591871.74	N 32 0 11.00	W 104 10 13.11	126.08	269.44	12.01
Wolfcamp C	9787.92	53.19	269.44	9727.00	191.23	-1.87	-191.22	364888.03	591806.60	N 32 0 10.99	W 104 10 13.87	191.23	269.44	12.01
	9800.00	54.64	269.44	9734.11	200.99	-1.96	-200.98	364887.94	591796.84	N 32 0 10.99	W 104 10 13.98	200.99	269.44	12.01
	9900.00	66.64	269.44	9783.05	287.98	-2.81	-287.97	364887.09	591709.86	N 32 0 10.98	W 104 10 14.99	287.98	269.44	12.01
	10000.00	78.65	269.44	9812.83	383.26	-3.75	-383.24	364886.15	591614.59	N 32 0 10.97	W 104 10 16.10	383.26	269.44	12.01
	10100.00	90.66	269.44	9822.12	482.64	-4.72	-482.62	364885.18	591515.22	N 32 0 10.97	W 104 10 17.25	482.64	269.44	12.01
LP	10106.67	91.48	269.44	9822.00	489.31	-4.78	-489.29	364885.12	591508.56	N 32 0 10.97	W 104 10 17.33	489.31	269.44	12.01
	10200.00	91.48	269.44	9819.62	582.61	-5.69	-582.58	364884.21	591415.27	N 32 0 10.96	W 104 10 18.41	582.61	269.44	0.00
	10300.00	91.48	269.44	9817.07	682.58	-6.67	-682.55	364883.23	591315.32	N 32 0 10.95	W 104 10 19.57	682.58	269.44	0.00
	10400.00	91.46	269.44	9814.53	782.55	-7.65	-782.51	364882.25	591215.38	N 32 0 10.94	W 104 10 20.73	782.55	269.44	0.00
	10500.00	91.46	269.44	9811.98	882.51	-8.63	-882.47	364881.28	591115.41	N 32 0 10.93	W 104 10 21.89	882.51	269.44	0.00
	10600.00	91.46	269.44	9809.43	982.48	-9.60	-982.43	364880.30	591015.46	N 32 0 10.93	W 104 10 23.05	982.48	269.44	0.00
	10700.00	91.46	269.44	9806.88	1082.45	-10.58	-1082.40	364879.32	590915.50	N 32 0 10.92	W 104 10 24.21	1082.45	269.44	0.00
	10800.00	91.46	269.44	9804.33	1182.42	-11.56	-1182.36	364878.34	590815.55	N 32 0 10.91	W 104 10 25.38	1182.42	269.44	0.00
	10900.00	91.46	269.44	9801.78	1282.38	-12.53	-1282.32	364877.37	590715.59	N 32 0 10.90	W 104 10 26.54	1282.38	269.44	0.00
	11000.00	91.46	269.44	9799.23	1382.35	-13.51	-1382.28	364876.39	590615.64	N 32 0 10.89	W 104 10 27.70	1382.35	269.44	0.00
	11100.00	91.46	269.44	9796.68	1482.32	-14.49	-1482.25	364875.41	590515.69	N 32 0 10.88	W 104 10 28.86	1482.32	269.44	0.00
	11200.00	91.46	269.44	9794.13	1582.29	-15.47	-1582.21	364874.44	590415.73	N 32 0 10.88	W 104 10 30.02	1582.29	269.44	0.00
	11300.00	91.46	269.44	9791.58	1682.25	-16.44	-1682.17	364873.46	590315.78	N 32 0 10.87	W 104 10 31.18	1682.25	269.44	0.00
	11400.00	91.46	269.44	9789.03	1782.22	-17.42	-1782.14	364872.48	590215.83	N 32 0 10.86	W 104 10 32.34	1782.22	269.44	0.00
	11500.00	91.46	269.44	9786.48	1882.19	-18.40	-1882.10	364871.50	590115.87	N 32 0 10.85	W 104 10 33.50	1882.19	269.44	0.00
	11600.00	91.46	269.44	9783.93	1982.16	-19.38	-1982.06	364870.53	590015.92	N 32 0 10.84	W 104 10 34.66	1982.16	269.44	0.00
	11700.00	91.46	269.44	9781.38	2082.12	-20.35	-2082.02	364869.55	589915.96	N 32 0 10.83	W 104 10 35.82	2082.12	269.44	0.00
	11800.00	91.46	269.44	9778.83	2182.09	-21.33	-2181.99	364868.57	589816.01	N 32 0 10.83	W 104 10 36.98	2182.09	269.44	0.00
	11900.00	91.46	269.44	9776.28	2282.06	-22.31	-2281.95	364867.59	589716.06	N 32 0 10.82	W 104 10 38.14	2282.06	269.44	0.00
	12000.00	91.46	269.44	9773.73	2382.03	-23.29	-2381.91	364866.62	589616.10	N 32 0 10.81	W 104 10 39.31	2382.03	269.44	0.00
	12100.00	91.46	269.44	9771.18	2481.99	-24.26	-2481.97	364865.64	589516.15	N 32 0 10.80	W 104 10 40.47	2481.99	269.44	0.00
	12200.00	91.46	269.44	9768.63	2581.96	-25.24	-2581.94	364864.66	589416.20	N 32 0 10.79	W 104 10 41.63	2581.96	269.44	0.00
	12300.00	91.46	269.44	9766.08	2681.93	-26.22	-2681.90	364863.68	589316.24	N 32 0 10.79	W 104 10 42.79	2681.93	269.44	0.00
	12400.00	91.46	269.44	9763.53	2781.89	-27.20	-2781.76	364862.71	589216.29	N 32 0 10.78	W 104 10 43.95	2781.89	269.44	0.00
	12500.00	91.46	269.44	9760.98	2881.86	-28.17	-2881.72	364861.73	589116.33	N 32 0 10.77	W 104 10 45.11	2881.86	269.44	0.00
	12600.00	91.46	269.44	9758.42	2981.83	-29.15	-2981.69	364860.75	589016.38	N 32 0 10.76	W 104 10 46.27	2981.83	269.44	0.00
	12700.00	91.46	269.44	9755.87	3081.80	-30.13	-3081.65	364859.77	588916.43	N 32 0 10.75	W 104 10 47.43	3081.80	269.44	0.00
	12800.00	91.46	269.44	9753.32	3181.76	-31.11	-3181.61	364858.80	588816.47	N 32 0 10.74	W 104 10 48.59	3181.76	269.44	0.00
	12900.00	91.46	269.44	9750.77	3281.73	-32.08	-3281.58	364857.82	588716.52	N 32 0 10.74	W 104 10 49.75	3281.73	269.44	0.00
	13000.00	91.46	269.44	9748.22	3381.70	-33.05	-3381.54	364856.84	588616.57	N 32 0 10.73	W 104 10 50.91	3381.70	269.44	0.00
	13100.00	91.46	269.44	9745.66	3481.67	-34.04	-3481.50	364855.88	588516.61	N 32 0 10.72	W 104 10 52.08	3481.67	269.44	0.00
	13200.00	91.46	269.44	9743.11	3581.63	-35.02	-3581.46	364854.89	588416.66	N 32 0 10.71	W 104 10 53.24	3581.63	269.44	0.00
	13300.00	91.46	269.44	9740.56	3681.60	-36.00	-3681.43	364853.91	588316.71	N 32 0 10.70	W 104 10 54.40	3681.60	269.44	0.00
	13400.00	91.46	269.44	9738.01	3781.57	-36.97	-3781.39	364852.93	588216.75	N 32 0 10.69	W 104 10 55.56	3781.57	269.44	0.00
	13500.00	91.46	269.44	9735.45	3881.54	-37.95	-3881.35	364851.95	588116.80	N 32 0 10.69	W 104 10 56.72	3881.54	269.44	0.00
	13600.00	91.46	269.44	9732.90	3981.50	-38.93	-3981.31	364850.97	588016.84	N 32 0 10.68	W 104 10 57.88	3981.50	269.44	0.00
	13700.00	91.46	269.44	9730.35	4081.47	-39.91	-4081.28	364850.00	587916.89	N 32 0 10.67	W 104 10 59.04	4081.47	269.44	0.00
	13800.00	91.46	269.44	9727.79	4181.44	-40.89	-4181.24	364849.02	587816.94	N 32 0 10.66	W 104 10 60.20	4181.44	269.44	0.00
	13900.00	91.46	269.44	9725.24	4281.41	-41.86	-4281.20	364848.04	587716.98	N 32 0 10.65	W 104 10 61.36	4281.41	269.44	0.00
	14000.00	91.46	269.44	9722.69	4381.37	-42.84	-4381.16	364847.06	587617.03	N 32 0 10.64	W 104 10 62.52	4381.37	269.44	0.00
Cimarex Cabrera 34 Federal 4H - PBHL	14026.84	91.46	269.44	9722.00	4408.21	-43.10	-4408.00	364846.80	587580.20	N 32 0 10.64	W 104 10 62.83	4408.21	269.44	0.00

Survey Type: Non-Def 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	14026.843	1/100.000	30.000	30.000	SLB_MWD-POOR	Original Borehole / Cimarex Cabrera 34 Federal 4H

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



SRR & A

Exhibit E-1 – 2000# BOP
Cabrera 34 Federal 4H
 Cimarex Energy Co.
 34-26S-27E
 SHL 1110 FSL & 210 FEL
 BHL 1070 FSL & 660 FWL
 Eddy County, NM

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

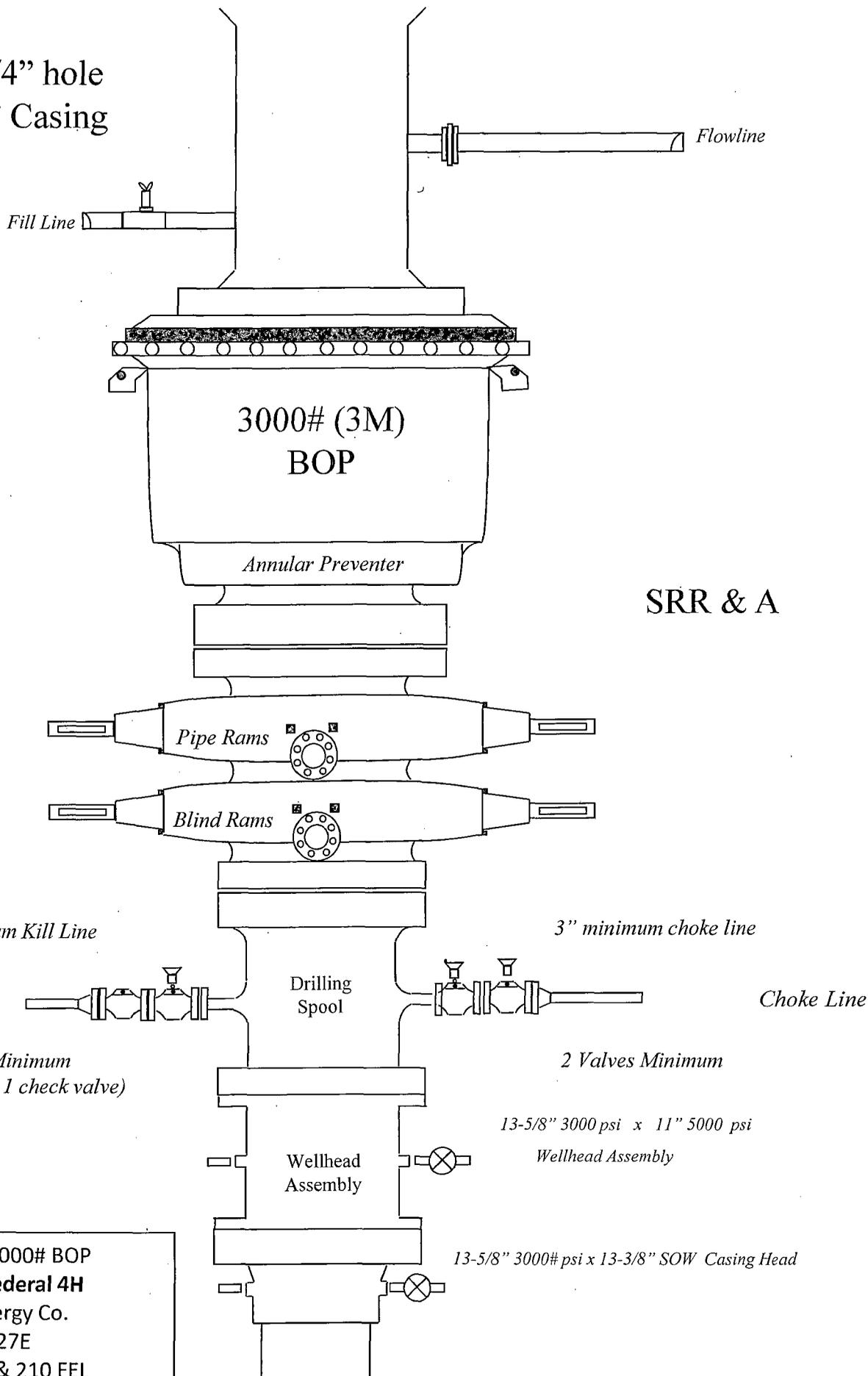


Exhibit E-1 – 3000# BOP
Cabrera 34 Federal 4H
Cimarex Energy Co.
34-26S-27E
SHL 1110 FSL & 210 FEL
BHL 1070 FSL & 660 FWL
Eddy County, NM

Drilling below 7" Casing

Fill Line

Flowline

5000# (5M)
BOP

Annular Preventer

SRR & A

Pipe Rams

Blind Rams

2" Minimum Kill Line

Kill Line

3" minimum choke line

Choke Line

Drilling Spool

2 Valves Minimum
(HCR Required)

2 Valves and a check valve

Wellhead Assembly

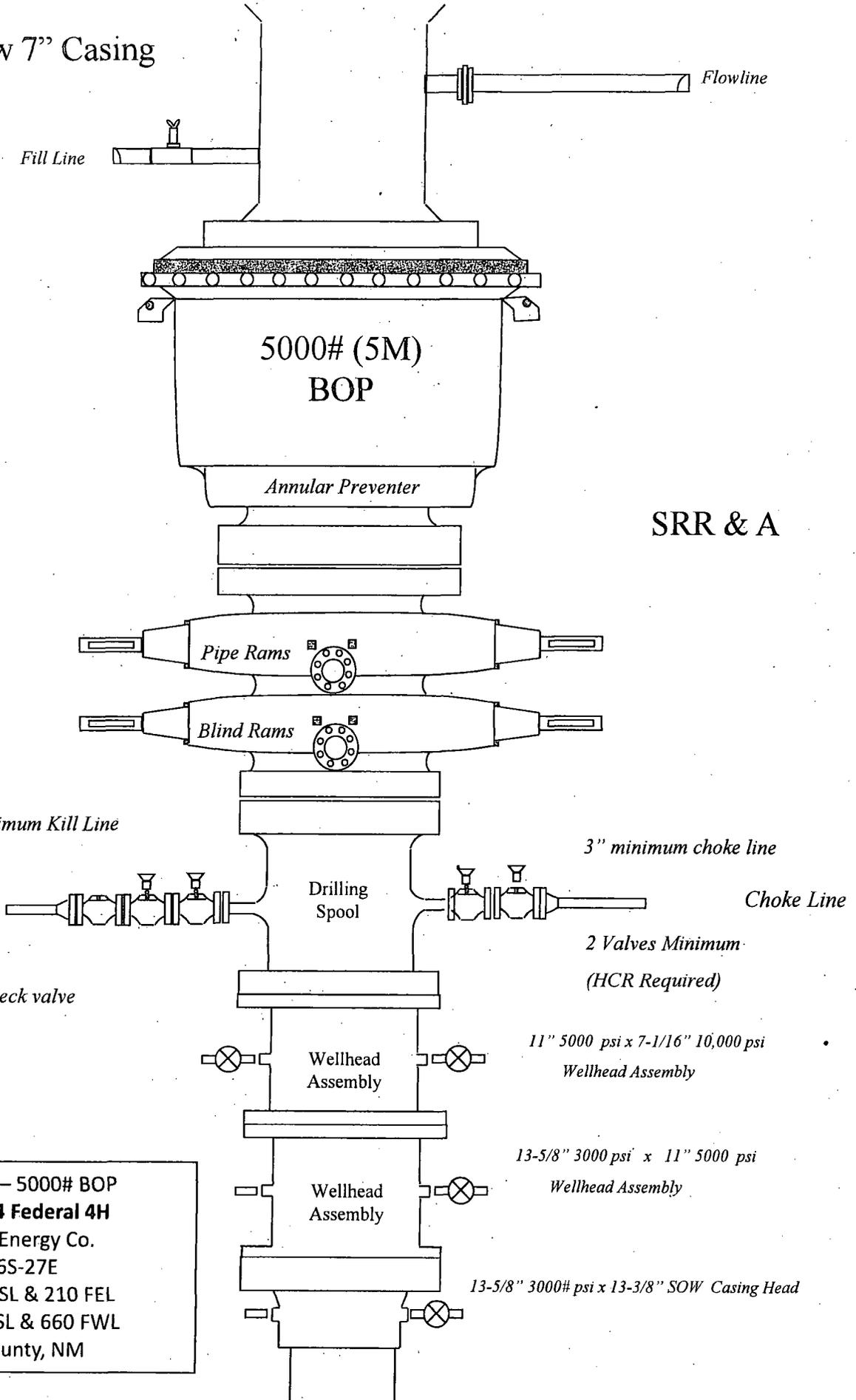
11" 5000 psi x 7-1/16" 10,000 psi
Wellhead Assembly

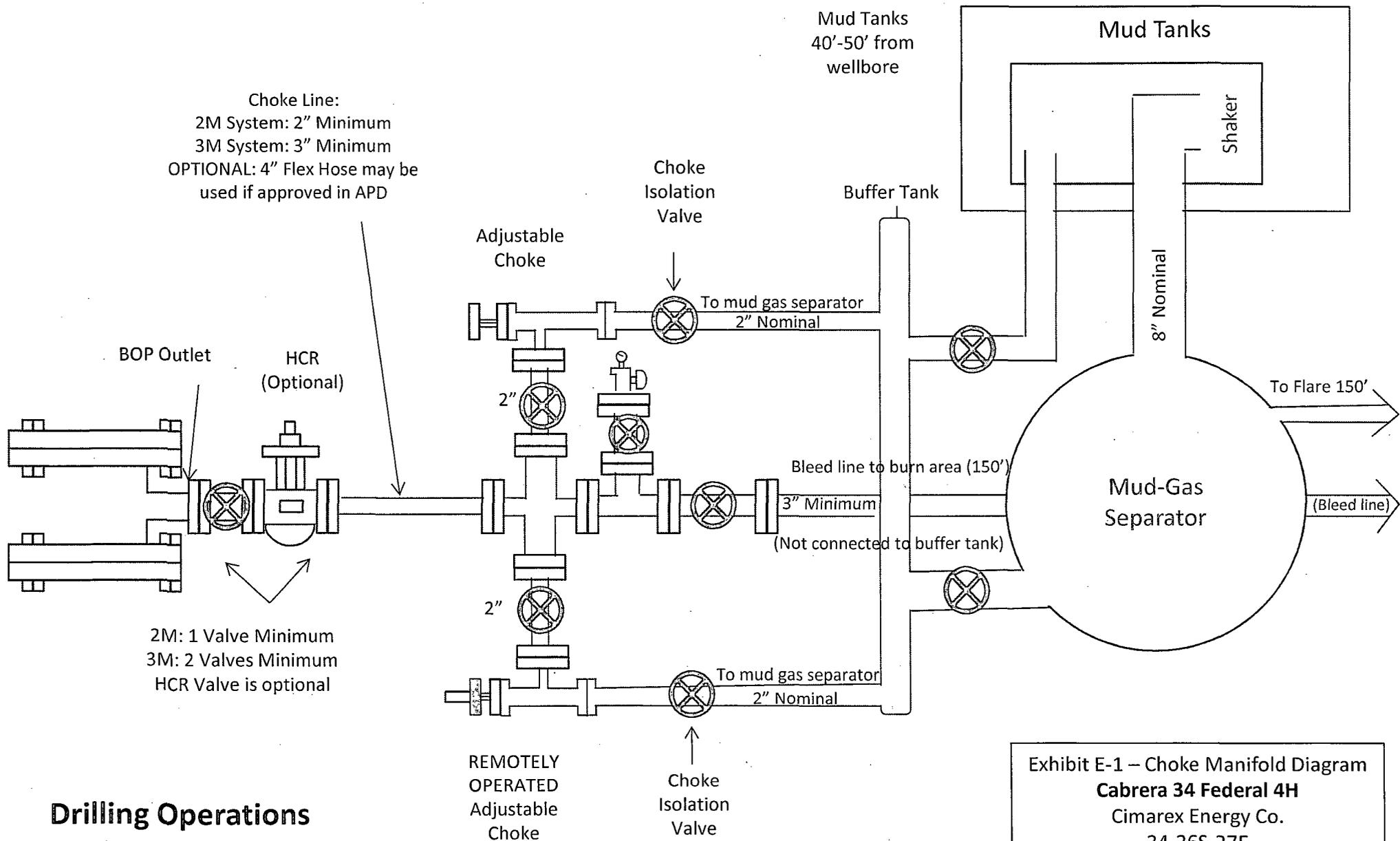
Wellhead Assembly

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
Cabrera 34 Federal 4H
Cimarex Energy Co.
34-26S-27E
SHL 1110 FSL & 210 FEL
BHL 1070 FSL & 660 FWL
Eddy County, NM





**Drilling Operations
 Choke Manifold
 2M/3M Service**

**Exhibit E-1 – Choke Manifold Diagram
 Cabrera 34 Federal 4H
 Cimarex Energy Co.
 34-26S-27E
 SHL 1110 FSL & 210 FEL
 BHL 1070 FSL & 660 FWL
 Eddy County, NM**

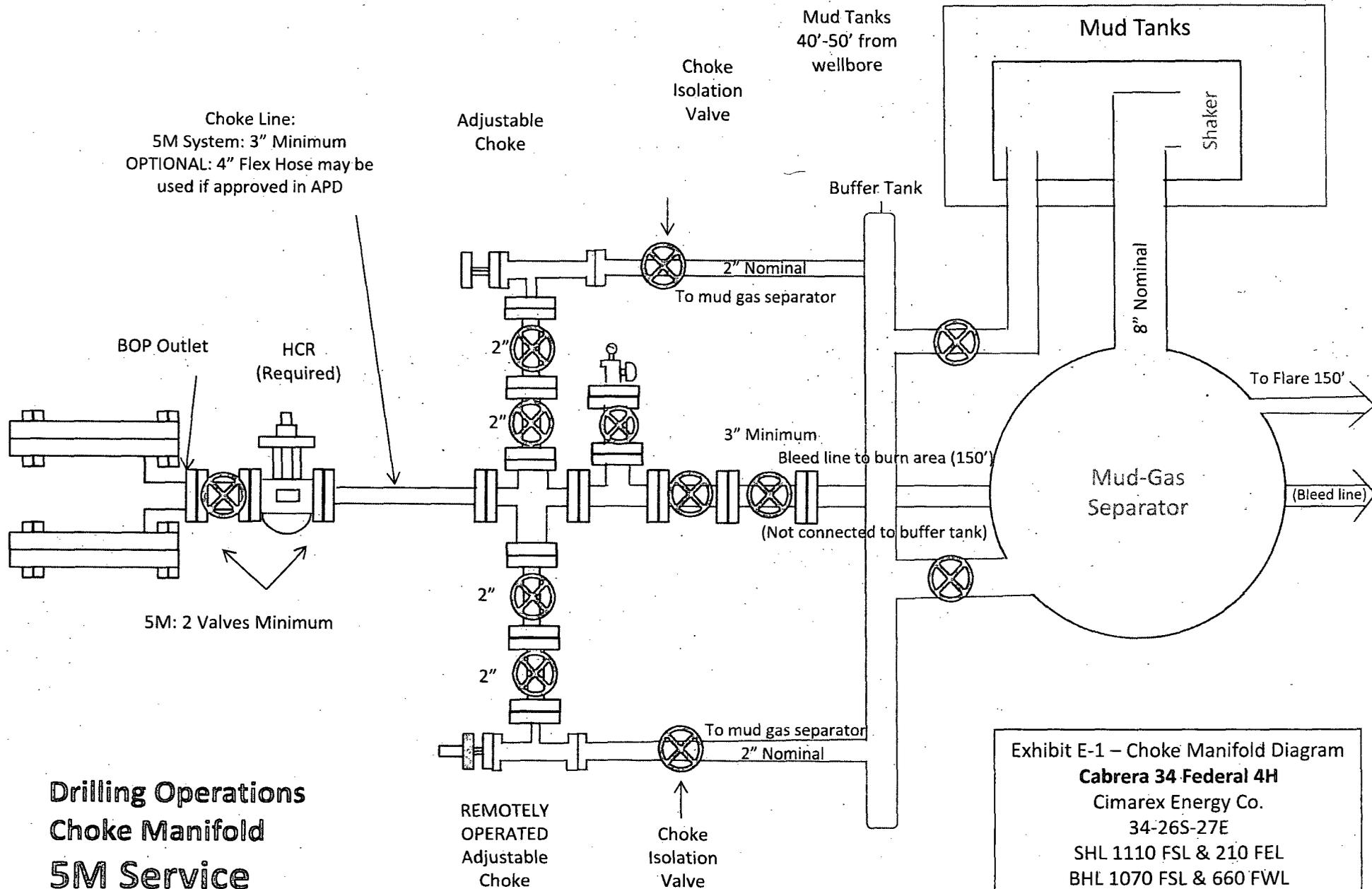


Exhibit E-1 – Choke Manifold Diagram
Cabrera 34 Federal 4H
 Cimarex Energy Co.
 34-26S-27E
 SHL 1110 FSL & 210 FEL
 BHL 1070 FSL & 660 FWL
 Eddy County, NM

Drilling Operations
Choke Manifold
5M Service

Exhibit F-1 – Co-Flex Hose Hydrostatic Test

Cabrera 34 Federal 4H
 Cimarex Energy Co.
 34-26S-27E
 SHL 1110 FSL & 210 FEL
 BHL 1070 FSL & 660 FWL
 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		
<i>Hose assembly pressure tested with water at ambient temperature.</i>		
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 Garcia</i>	Approved: <i>[Signature]</i>



Midwest Hose & Specialty, Inc.

Internal Hydrostatic Test Graph

Customer: Houston

Pick Ticket #: 94260

Hose Specifications

Hose Type: C.S.K.
 I.D.: 4"
 Working Pressure: 10000 PSI

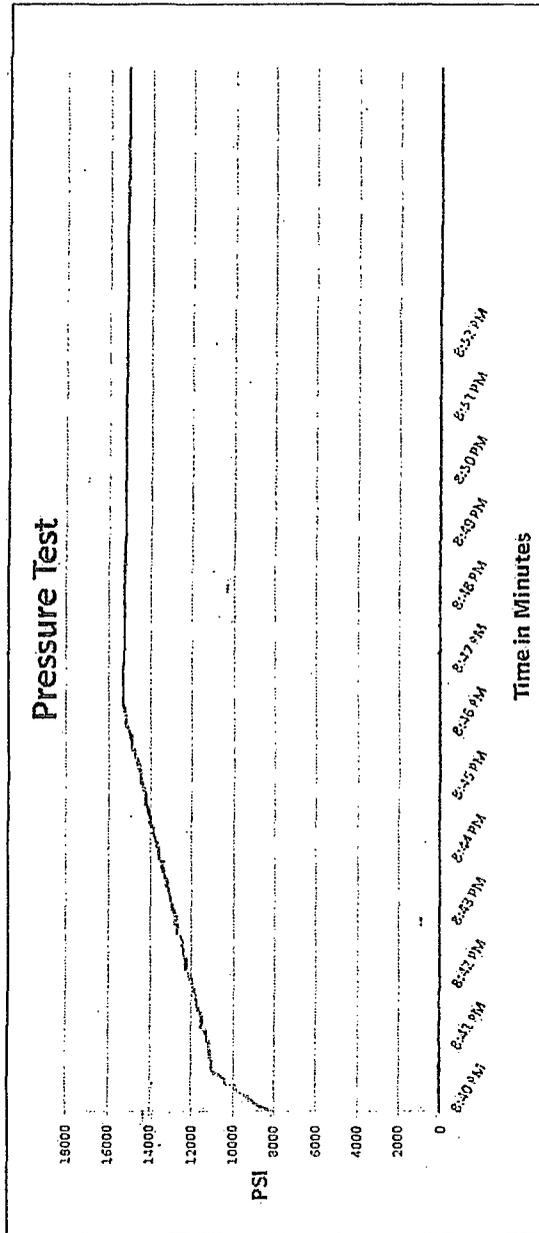
Length: 45'
 O.D.: 6.09"
 Burst Pressure: Standard Safety Multiplier Applies

Verification

Type of Fittings: 4 1/16 10K
 Die Size: 6.38"
 Hose Serial #: 5544

Coupling Method: Swage
 Final O.D.: 6.25"
 Hose Assembly Serial #: 79793

Exhibit F-1 – Co-Flex Hose Hydrostatic Test
 Cabrera 34 Federal 4H
 Cimarex Energy Co.
 34-26S-27E
 SHL 1110 FSL & 210 FEL
 BHL 1070 FSL & 660 FWL
 Eddy County, NM



Test Pressure: 15000 PSI
 Time Held at Test Pressure: 11 Minutes
 Actual Burst Pressure: 15483 PSI
 Peak Pressure: 15483 PSI

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

Tested By: Zac McConnell

Approved By: Kim Thomas

Zac McConnell

Kim Thomas

Exhibit F-2 – Co-Flex Hose
Cabrera 34 Federal 4H
Cimarex Energy Co.
34-26S-27E
SHL 1110 FSL & 210 FEL
BHL 1070 FSL & 660 FWL
Eddy County, NM



Midwest Hose & Specialty, Inc.

Certificate of Conformity

Customer: DEM	PO ODYD-271
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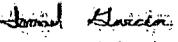
SPECIFICATIONS

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: 	Date: 3/8/2011
---	--------------------------



Midwest Hose
& Specialty, Inc.

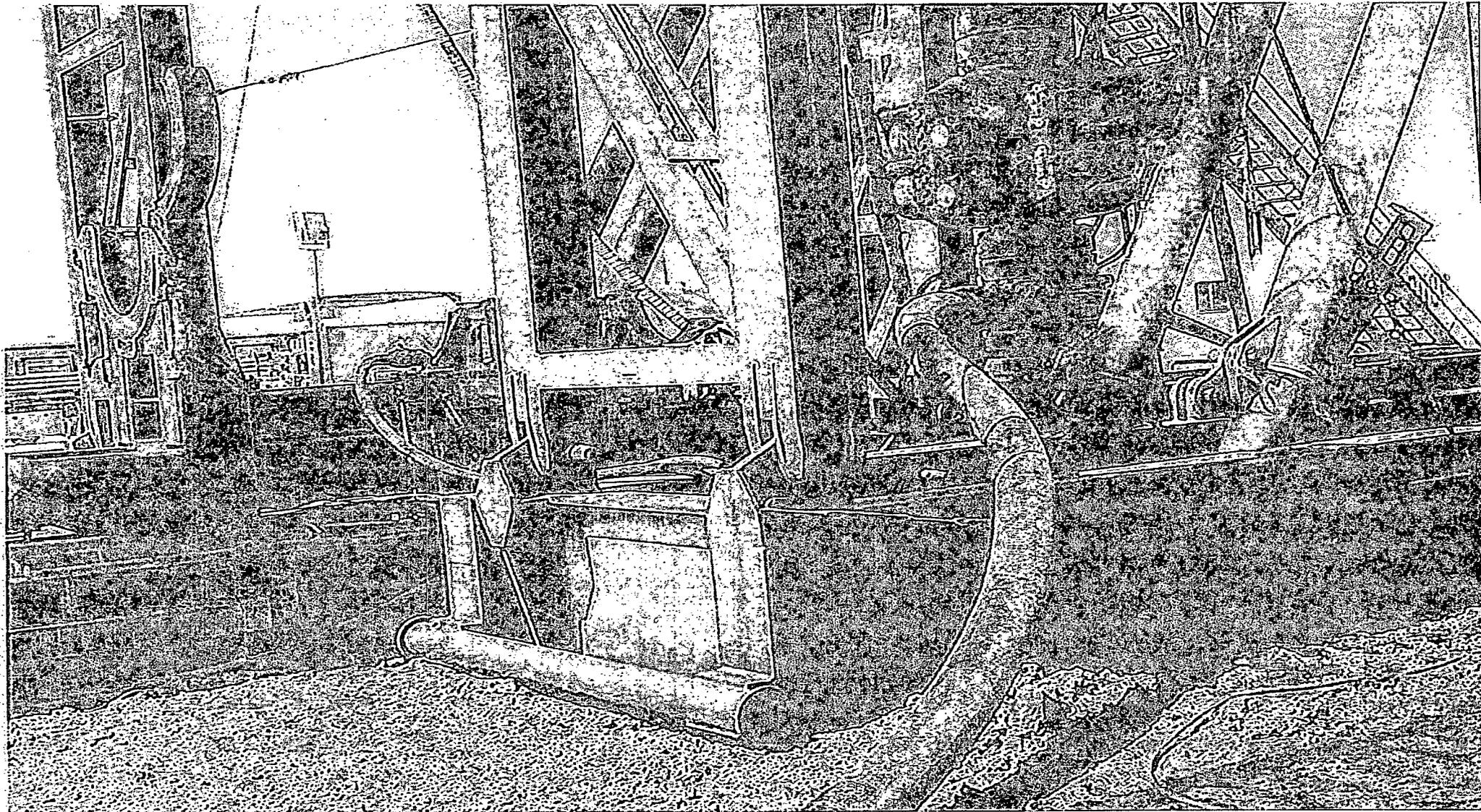
Exhibit F -3- Co-Flex Hose
Cabrera 34 Federal 4H
Cimarex Energy Co.
34-26S-27E
SHL 1110 FSL & 210 FEL
BHL 1070 FSL & 660 FWL
Eddy County, NM

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)

Exhibit F – Co-Flex Hose
Cabrera 34 Federal 4H
Cimarex Energy Co.
34-26S-27E
SHL 1110 FSL & 210 FEL
BHL 1070 FSL & 660 FWL
Eddy County, NM



- 1 All Company and Contract personnel admitted on location must be trained by a qualified H₂S safety instructor to the following:
 - A. Characteristics of H₂S
 - B. Physical effects and hazards
 - C. Principal and operation of H₂S detectors, warning system and briefing areas.
 - D. Evacuation procedure, routes and first aid.
 - E. Proper use of safety equipment & life support systems
 - F. Essential personnel meeting Medical Evaluation criteria will receive additional training on the proper use of 30 minute pressure demand air packs.

- 2 H₂S Detection and Alarm Systems:
 - A. H₂S sensors/detectors to be located on the drilling rig floor, in the base of the sub structure/cellar area, on the mud pits in the shale shaker area. Additional H₂S detectors may play placed as deemed necessary.
 - B. An audio alarm system will be installed on the derrick floor and in the top doghouse.

- 3 Windsock and/or wind streamers:
 - A. Windsock at mudpit area should be high enough to be visible.
 - B. Windsock on the rig floor and / or top doghouse should be high enough to be visible.

- 4 Condition Flags and Signs
 - A. Warning sign on access road to location.
 - B. Flags to be displayed on sign at entrance to location. Green flag indicates normal safe condition. Yellow flag indicates potential pressure and danger. Red flag indicates danger (H₂S present in dangerous concentration). Only H₂S trained and certified personnel admitted to location.

- 5 Well control equipment:
 - A. See exhibit "E-1"

- 6 Communication:
 - A. While working under masks chalkboards will be used for communication.
 - B. Hand signals will be used where chalk board is inappropriate.
 - C. Two way radio will be used to communicate off location in case of emergency help is required. In most cases cellular telephones will be available at most drilling foreman's trailer or living quarters.

- 7 Drillstem Testing:

No DSTs r cores are planned at this time.

- 8 Drilling contractor supervisor will be required to be familiar with the effects H₂S has on tubular goods and other mechanical equipment.

9

H₂S Contingency Plan
Cabrera 34 Federal 4H
Cimarex Energy Co.
UL: A, Sec. 34-26S-27E
Eddy Co., NM

Emergency Procedures

In the event of a release of gas containing H₂S, the first responder(s) must:

- « Isolate the area and prevent entry by other persons into the 100 ppm ROE.
- « Evacuate any public places encompassed by the 100 ppm ROE.
- « Be equipped with H₂S monitors and air packs in order to control the release.
- « Use the "buddy system" to ensure no injuries occur during the response.
- « Take precautions to avoid personal injury during this operation.
- « Contact operator and/or local officials to aid in operation. See list of phone numbers attached.
- « Have received training in the:
 - Detection of H₂S, and
 - Measures for protection against the gas,
 - Equipment used for protection and emergency response.

Ignition of Gas Source

Should control of the well be considered lost and ignition considered, take care to protect against exposure to Sulfur Dioxide (SO₂). Intentional ignition must be coordinated with the NMOCD and local officials. Additionally, the NM State Police may become involved. NM State Police shall be the Incident Command on scene of any major release. Take care to protect downwind whenever there is an ignition of the gas.

Characteristics of H₂S and SO₂

Please see attached International Chemical Safety Cards.

Contacting Authorities

Cimarex Energy Co. of Colorado's personnel must liaise with local and state agencies to ensure a proper response to a major release. Additionally, the OCD must be notified of the release as soon as possible but no later than 4 hours. Agencies will ask for information such as type and volume of release, wind direction, location of release, etc. Be prepared with all information available including directions to site. The following call list of essential and potential responders has been prepared for use during a release. Cimarex Energy Co. of Colorado's response must be in coordination with the State of New Mexico's "Hazardous Materials Emergency Response Plan" (HMER).

H₂S Contingency Plan Emergency Contacts

Cabrera 34 Federal 4H

Cimarex Energy Co.

UL: A, Sec. 34-26S-27E

Eddy Co., NM

Company Office

Cimarex Energy Co. of Colorado Co. Office and After-Hours Menu	800-969-4789
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Key Personnel

Name	Title	Office	Mobile
Larry Seigrist	Drilling Manager	432-620-1934	580-243-8485
Doug McQuitty	Drilling Superintendent	432-620-1933	806-640-2605
Scott Lucas	Drilling Superintendent	432-620-1989	432-894-5572
Roy Shirley	Construction Superintendent		432-634-2136

Artesia

Ambulance	911
State Police	575-746-2703
City Police	575-746-2703
Sheriff's Office	575-746-9888
Fire Department	575-746-2701
Local Emergency Planning Committee	575-746-2122
New Mexico Oil Conservation Division	575-748-1283

Carlsbad

Ambulance	911
State Police	575-885-3137
City Police	575-885-2111
Sheriff's Office	575-887-7551
Fire Department	575-887-3798
Local Emergency Planning Committee	575-887-6544
US Bureau of Land Management	575-887-6544

Santa Fe

New Mexico Emergency Response Commission (Santa Fe)	505-476-9600
New Mexico Emergency Response Commission (Santa Fe) 24 Hrs	505-827-9126
New Mexico State Emergency Operations Center	505-476-9635

National

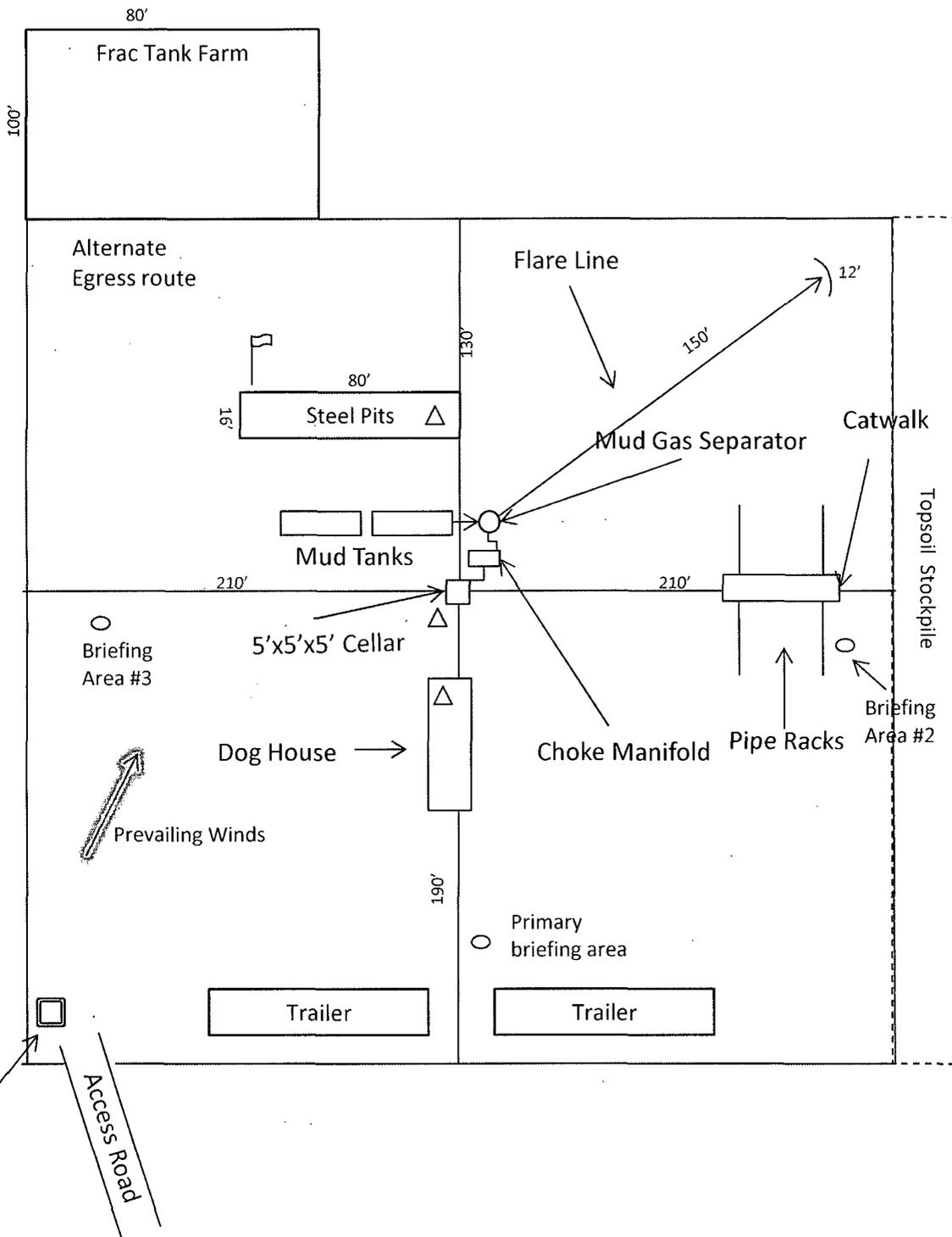
National Emergency Response Center (Washington, D.C.)	800-424-8802
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Medical

Flight for Life - 4000 24th St.; Lubbock, TX	806-743-9911
Aerocare - R3, Box 49F; Lubbock, TX	806-747-8923
Med Flight Air Amb - 2301 Yale Blvd S.E., #D3; Albuquerque, NM	505-842-4433
SB Air Med Service - 2505 Clark Carr Loop S.E.; Albuquerque, NM	505-842-4949

Other

Boots & Coots IWC	800-256-9688	or	281-931-8884
Cudd Pressure Control	432-699-0139	or	432-563-3356
Halliburton	575-746-2757		
B.J. Services	575-746-3569		



Condition Warning Sign (Driver Side)

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



Exhibit D – Rig Diagram
Cabrera 34 Federal 4H
 Cimarex Energy Co.
 34-26S-27E
 SHL 1110 FSL & 210 FEL
 BHL 1070 FSL & 660 FWL
 Eddy County, NM

100'

80'

100'
198'

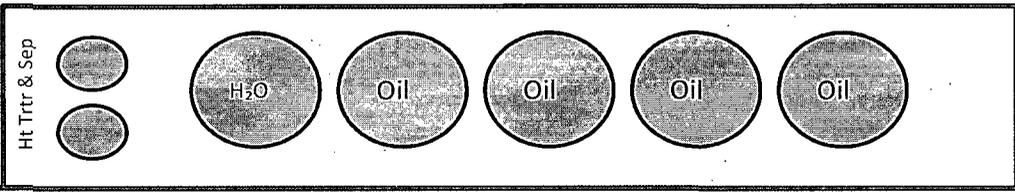
135'

135'

310' RS/16/14
198'

150'

Access Road



420'

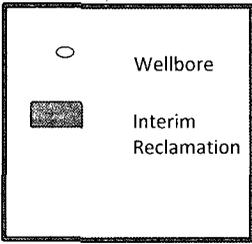


Exhibit D-1
 Interim Reclamation Diagram
Cabrera 34 Federal 4H
 Cimarex Energy Co.
 34-26S-27E
 SHL 1110 FSL & 210 FEL
 BHL 1070 FSL & 660 FWL
 Eddy County, NM

Surface Use Plan
Cabrera 34 Federal #4H
Cimarex Energy Co.
UL: A, Sec. 34, 26S, 27E
Eddy Co., NM

The following surface use plan of operations will be followed and carried out once the APD is approved. No other disturbance will be created other than what is submitted in this surface use plan without approval. If any other disturbance is needed after the APD is approved, a BLM approved sundry notice or right of way application will be submitted for approval prior to any new surface disturbance.

1. Existing Roads:

Area access roads and general road maps:

- Exhibit B: General Highway Map
- Exhibit C: USGS Topographic Map
- Exhibit C-1: Public Access Road Map
- Exhibit C-2: Existing and proposed access roads plat

The maximum width of the driving surface will be 14'. The road will be crowned and ditched with a 2% slope from the tip of the crown to the edge of the driving surface. The ditches will be 1' deep with 3:1 slopes. The driving surface will be made of 6" rolled and compacted caliche.

Existing access road route to the proposed project is depicted on the public access point map if applicable. Improvements to the driving surface will be done where necessary. No new surface disturbance will be done, unless otherwise noted in the New or Reconstructed Access Roads section of the surface use plan.

From HWY 285 and Whites City, go west 3.1 miles turn south and go 4.5 miles, then go west 3.2 miles to proposed road.

If existing roads are used, the operator will improve or maintain existing roads in a condition the same as or better than before the operations began. The operator will repair pot holes, etc. All existing structures on the entire access route such as cattleguards, other range improvement projects, culverts, etc. will be properly repaired or replaced if they are damaged or have deteriorated beyond practical use.

The operator will prevent and abate fugitive dust as needed, whether created by vehicular traffic, equipment operations, or other events. The operator will obtain written BLM approval prior to the application of surfactants, binding agents, or other dust suppression chemicals on the roadways.

2. New or Reconstructed Access Roads:

A new road will be constructed for this project.

Cimarex Energy plans to construct 978' of off-lease access road to service the well. The proposed access road does cross lease boundaries, a right of way grant will be submitted to and obtained from the BLM.

The maximum width of the driving surface will be 14'. The road will be crowned and ditched with a 2% slope from the tip of the crown to the edge of the driving surface. The ditches will be 1' deep with 3:1 slopes. The driving surface will be made of 6" rolled and compacted caliche.

Proposed and existing access road route to the proposed wellsite is depicted on Exhibit C-2. Improvements to the driving surface will be done where necessary. No new surface disturbance will be done without prior approval from the BLM.

The operator will prevent and abate fugitive dust as needed, whether created by vehicular traffic, equipment operations, or other events.

3. Planned Electric Line:

No new electric lines are planned.

4. Location of Existing Well in a One-Mile Radius -Exhibit A:

- Water Wells - None known
- Disposal Wells - None known
- Drilling Wells - None known
- Producing Wells - As shown on Exhibit A
- Abandoned Wells - As shown on Exhibit A

Surface Use Plan
Cabrera 34 Federal #4H
Cimarex Energy Co.
UL: A, Sec. 34, 26S, 27E
Eddy Co., NM

5. Location of Existing or Proposed Production Facilities:

If on completion this well is a producer, a tank battery will be used and the necessary production equipment will be installed at the wellsite. Exhibit D-1 illustrates the proposed facility/battery. Any changes to the facility will be submitted via sundry notice.

6. Location and Type of Water Supply:

Water will be purchased locally from a commercial source and trucked over the access roads.

7. Source of Construction Material:

If possible, native caliche will be obtained from the excavation of drill site. The primary way of obtaining caliche will be by "turning over" the location. This means caliche will be obtained from the actual well site. A caliche permit will be obtained from BLM prior to pushing up any caliche. 2400 cu yds is the max amount of caliche needed for pad and roads. Amount will vary for each pad. The procedure below has been approved by BLM personnel:

- The top 6 inches of topsoil is pushed off and stockpiled along the side of the location.
- An approximate 120' x 120' area is used within the proposed well site to remove caliche.
- Subsoil is removed and piled alongside the 120' by 120' area within the pad site.
- When caliche is found, material will be stockpiled within the pad site to build the location and road.
- Then subsoil is pushed back in the hole and caliche is spread accordingly across entire location and road.
- Once well is drilled, the stockpiled top soil will be used for interim reclamation and spread along areas where caliche is picked up and the location size is reduced. Neither caliche nor subsoil will be stockpiled outside of the well pad. Topsoil will be stockpiled along the edge of the pad as depicted in Exhibit D – Rig Layout Diagram.

In the event that no caliche is found onsite, caliche will be hauled in from a BLM-approved caliche pit.

8. Methods of Handling Waste

- Drilling fluids, produced oil, and water from the well during drilling and completion operations will be stored safely and disposed of properly in a NMOCD approved disposal facility.
- Garbage and trash produced during drilling and completion operations will be collected in a trash container and disposed of properly at a state approved disposal facility. All trash on and around well site will be collected for disposal.
- Human waste and grey water will be properly contained and disposed of properly at a state approved disposal site.
- After drilling and completion operations, trash, chemicals, salts, frac sand and other waste will be removed and disposed of properly at a state approved disposal site.
- The well will be drilled utilizing a closed loop system. Drill cuttings will be properly disposed of into steel tanks and taken to an NMOCD approved disposal facility.

9. Ancillary Facilities:

No camps or airstrips to be constructed.

10. Well Site Layout:

- Exhibit D: Rig Layout
- Exhibit D-2: Well Site layout plat
- Mud pits in the closed circulation system will be steel pits and the cuttings will be stored in steel containment pits.
- Cuttings will be stored in steel pits until they are hauled to a state-approved disposal facility.
- If the well is a producer, those areas of the location not essential to production facilities will be reclaimed and seeded per BLM requirements. Exhibit D-1: Interim Reclamation Diagram.

Surface Use Plan
Cabrera 34 Federal #4H
Cimarex Energy Co.
UL: A, Sec. 34, 26S, 27E
Eddy Co., NM

11. Plans for Restoration of Surface:

Rehabilitation of the location will start in a timely manner after all drilling operations cease. The type of reclamation will depend on whether the well is a producer or a dry hole.

In areas planned for interim and final reclamation, surfacing materials will be removed and returned to a mineral pit or recycled to repair or build roads and well pads.

Drainage systems, if any, will be reshaped to the original configuration with provisions made to alleviate erosion. These may need to be modified in certain circumstances to prevent inundation of the location's pad and surface facilities. After the area has been shaped and contoured, topsoil from the spoil pile will be placed over the disturbed area to the extent possible. Revegetation procedures will comply with BLM standards.

If the well is a dry hole, the pad and road area will be recountoured to match the existing terrain. Topsoil will be spread to the extent possible. Revegetation will comply with BLM standards.

Should the well be a producer, those areas of the location not essential to production facilities and operations will be reclaimed and seeded per BLM requirements. Exhibit D-1 illustrates the proposed Interim Reclamation.

12. Other Information:

- Topography consists of a sloping plane with loose tan sands. Vegetation is mainly yucca, mesquite and shin oak.
- The wellsite is on surface owned by Bureau of Land Management. The land is used mainly for farming, cattle ranching, recreational use, and oil and gas production.
- An archaeological survey will be conducted on the location and proposed roads and this report will be filed with the Bureau of Land Management.
- There are no known dwellings within 1½ miles of this location.

13. On Site Notes and Information:

Onsite Results: Jesse Rice w/ BLM on site August 21st. V-Door East. Top Soil East. Frac Pad at northwest corner (North). Interim reclamation North, East & West. Battery South (Additional 150' X 420' Pad). Access road from southwest corner, south, to Blair Road in Texas.

Operator Certification Statement

Cabrera 34 Federal #4H

Cimarex Energy Co.

UL: A, Sec. 34, 26S, 27E

Eddy Co., NM

Operator's Representative

Cimarex Energy Co. of Colorado

600 N. Marienfeld St., Ste. 600

Midland, TX 79701

Office Phone: (432) 571-7800

CERTIFICATION: I hereby certify that I, or someone under my direct supervision, have inspected the drill site and access route proposed herein; that I am familiar with the conditions which currently exist; that I have full knowledge of state and Federal laws applicable to this operation; that the statements made in this APD package are, to the best of my knowledge, true and correct; and that the work associated with the operations proposed herein will be performed in conformity with this APD package and the terms and conditions under which it is approved. I also certify that I, or the company I represent, am responsible for the operations conducted under this application. These statements are subject to the provisions of 18 U.S.C. 1001 for the filing of false statements.

Executed this 17 day of February, 2014

NAME: Gloria Garza
Gloria Garza

TITLE: Regulatory Compliance

ADDRESS: 202 S. Cheyenne Ave., Ste 1000, Tulsa, OK 74103

TELEPHONE: 918-585-1100

EMAIL: ggarza@cimarex.com

Field Representative: Same as above

JUN 1 2015

RECEIVED

**PECOS DISTRICT
CONDITIONS OF APPROVAL**

OPERATOR'S NAME:	Cimarex Energy Co.
LEASE NO.:	NMNM-117116
WELL NAME & NO.:	Cabrera 34 Federal 4H
SURFACE HOLE FOOTAGE:	1110' FSL & 0210' FEL
BOTTOM HOLE FOOTAGE:	1070' FSL & 0660' FWL
LOCATION:	Section 34, T. 26 S., R 27 E., NMPM
COUNTY:	Eddy County, New Mexico

TABLE OF CONTENTS

Standard Conditions of Approval (COA) apply to this APD. If any deviations to these standards exist or special COAs are required, the section with the deviation or requirement will be checked below.

- General Provisions**
- Permit Expiration**
- Archaeology, Paleontology, and Historical Sites**
- Noxious Weeds**
- Special Requirements**
 - Fence Requirements
- Construction**
 - Notification
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 - Closed Loop System
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- Road Section Diagram**
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 - Logging Requirements
 - Waste Material and Fluids
- Production (Post Drilling)**
 - Well Structures & Facilities
- Interim Reclamation**
- Final Abandonment & Reclamation**

I. GENERAL PROVISIONS

The approval of the Application For Permit To Drill (APD) is in compliance with all applicable laws and regulations: 43 Code of Federal Regulations 3160, the lease terms, Onshore Oil and Gas Orders, Notices To Lessees, New Mexico Oil Conservation Division (NMOCD) Rules, National Historical Preservation Act As Amended, and instructions and orders of the Authorized Officer. Any request for a variance shall be submitted to the Authorized Officer on Form 3160-5, Sundry Notices and Report on Wells.

II. PERMIT EXPIRATION

If the permit terminates prior to drilling and drilling cannot be commenced within 60 days after expiration, an operator is required to submit Form 3160-5, Sundry Notices and Reports on Wells, requesting surface reclamation requirements for any surface disturbance. However, if the operator will be able to initiate drilling within 60 days after the expiration of the permit, the operator must have set the conductor pipe in order to allow for an extension of 60 days beyond the expiration date of the APD. (Filing of a Sundry Notice is required for this 60 day extension.)

III. ARCHAEOLOGICAL, PALEONTOLOGY & HISTORICAL SITES

Any cultural and/or paleontological resource discovered by the operator or by any person working on the operator's behalf shall immediately report such findings to the Authorized Officer. The operator is fully accountable for the actions of their contractors and subcontractors. The operator shall suspend all operations in the immediate area of such discovery until written authorization to proceed is issued by the Authorized Officer. An evaluation of the discovery shall be made by the Authorized Officer to determine the appropriate actions that shall be required to prevent the loss of significant cultural or scientific values of the discovery. The operator shall be held responsible for the cost of the proper mitigation measures that the Authorized Officer assesses after consultation with the operator on the evaluation and decisions of the discovery. Any unauthorized collection or disturbance of cultural or paleontological resources may result in a shutdown order by the Authorized Officer.

IV. NOXIOUS WEEDS

The operator shall be held responsible if noxious weeds become established within the areas of operations. Weed control shall be required on the disturbed land where noxious weeds exist, which includes the roads, pads, associated pipeline corridor, and adjacent land affected by the establishment of weeds due to this action. The operator shall consult with the Authorized Officer for acceptable weed control methods, which include following EPA and BLM requirements and policies.

V. SPECIAL REQUIREMENT(S)

Cattleguards

An appropriately sized cattleguard **and gate** sufficient to carry out the project shall be installed and maintained at fence crossing. Any existing cattleguard on the access road shall be repaired or replaced if they are damaged or have deteriorated beyond practical use. The operator shall be responsible for the condition of the existing cattleguard that is in place and is utilized during lease operations. A gate shall be constructed on one side of the cattleguard and fastened securely to H-braces.

Fence Requirement

Where entry granted across a fence line, the fence must be braced and tied off on both sides of the passageway prior to cutting. **Cattle will be kept from crossing the fence while work is completed.** Once the work is completed, the fence will be restored to its prior condition, or better. The operator shall notify the private surface landowner or the grazing allotment holder prior to crossing any fence.

VI. CONSTRUCTION

A. NOTIFICATION

The BLM shall administer compliance and monitor construction of the access road and well pad. Notify the Carlsbad Field Office at (575) 234-5909 at least 3 working days prior to commencing construction of the access road and/or well pad.

When construction operations are being conducted on this well, the operator shall have the approved APD and Conditions of Approval (COA) on the well site and they shall be made available upon request by the Authorized Officer.

B. TOPSOIL

The operator shall strip the top portion of the soil (root zone) from the entire well pad area and stockpile the topsoil along the edge of the well pad as depicted in the APD. The root zone is typically six (6) inches in depth. All the stockpiled topsoil will be redistributed over the interim reclamation areas. Topsoil shall not be used for berming the pad or facilities. For final reclamation, the topsoil shall be spread over the entire pad area for seeding preparation.

Other subsoil (below six inches) stockpiles must be completely segregated from the topsoil stockpile. Large rocks or subsoil clods (not evident in the surrounding terrain) must be buried within the approved area for interim and final reclamation.

C. CLOSED LOOP SYSTEM

Tanks are required for drilling operations: No Pits.

The operator shall properly dispose of drilling contents at an authorized disposal site.

D. FEDERAL MINERAL MATERIALS PIT

Payment shall be made to the BLM prior to removal of any federal mineral materials. Call the Carlsbad Field Office at (575) 234-5972.

E. WELL PAD SURFACING

Surfacing of the well pad is not required.

If the operator elects to surface the well pad, the surfacing material may be required to be removed at the time of reclamation. The well pad shall be constructed in a manner which creates the smallest possible surface disturbance, consistent with safety and operational needs.

F. EXCLOSURE FENCING (CELLARS & PITS)

Exclosure Fencing

The operator will install and maintain exclosure fencing for all open well cellars to prevent access to public, livestock, and large forms of wildlife before and after drilling operations until the pit is free of fluids and the operator initiates backfilling. (For examples of exclosure fencing design, refer to BLM's Oil and Gas Gold Book, Exclosure Fence Illustrations, Figure 1, Page 18.)

G. ON LEASE ACCESS ROADS**Road Width**

The access road shall have a driving surface that creates the smallest possible surface disturbance and does not exceed fourteen (14) feet in width. The maximum width of surface disturbance, when constructing the access road, shall not exceed twenty-five (25) feet.

Surfacing

Surfacing material is not required on the new access road driving surface. If the operator elects to surface the new access road or pad, the surfacing material may be required to be removed at the time of reclamation.

Where possible, no improvements should be made on the unsurfaced access road other than to remove vegetation as necessary, road irregularities, safety issues, or to fill low areas that may sustain standing water.

The Authorized Officer reserves the right to require surfacing of any portion of the access road at any time deemed necessary. Surfacing may be required in the event the road deteriorates, erodes, road traffic increases, or it is determined to be beneficial for future field development. The surfacing depth and type of material will be determined at the time of notification.

Crowning

Crowning shall be done on the access road driving surface. The road crown shall have a grade of approximately 2% (i.e., a 1" crown on a 14' wide road). The road shall conform to Figure 1; cross section and plans for typical road construction.

Ditching

Ditching shall be required on both sides of the road.

Turnouts

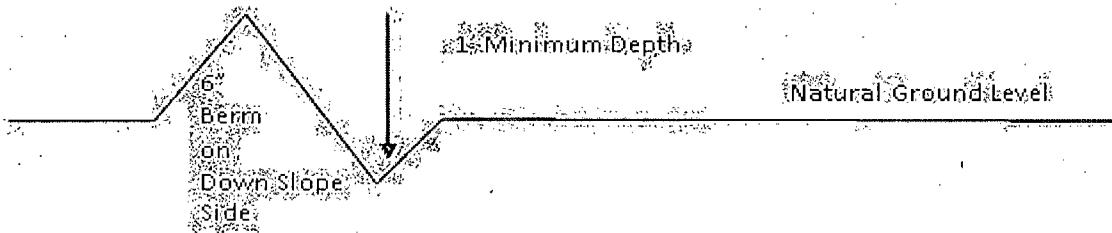
Vehicle turnouts shall be constructed on the road. Turnouts shall be intervisible with interval spacing distance less than 1000 feet. Turnouts shall conform to Figure 1; cross section and plans for typical road construction.

Drainage

Drainage control systems shall be constructed on the entire length of road (e.g. ditches, sidehill out-sloping and in-sloping, lead-off ditches, culvert installation, and low water crossings).

A typical lead-off ditch has a minimum depth of 1 foot below and a berm of 6 inches above natural ground level. The berm shall be on the down-slope side of the lead-off ditch.

Cross Section of a Typical Lead-off Ditch



All lead-off ditches shall be graded to drain water with a 1 percent minimum to 3 percent maximum ditch slope. The spacing interval are variable for lead-off ditches and shall be determined according to the formula for spacing intervals of lead-off ditches, but may be amended depending upon existing soil types and centerline road slope (in %);

Formula for Spacing Interval of Lead-off Ditches

Example - On a 4% road slope that is 400 feet long, the water flow shall drain water into a lead-off ditch. Spacing interval shall be determined by the following formula:

$$400 \text{ foot road with } 4\% \text{ road slope: } \frac{400' + 100'}{4\%} = 200' \text{ lead-off ditch interval}$$

Cattleguards

An appropriately sized cattleguard sufficient to carry out the project shall be installed and maintained at fence/road crossings. Any existing cattleguards on the access road route shall be repaired or replaced if they are damaged or have deteriorated beyond practical use. The operator shall be responsible for the condition of the existing cattleguards that are in place and are utilized during lease operations.

Fence Requirement

Where entry is granted across a fence line, the fence shall be braced and tied off on both sides of the passageway prior to cutting. The operator shall notify the private surface landowner or the grazing allotment holder prior to crossing any fences.

Public Access

Public access on this road shall not be restricted by the operator without specific written approval granted by the Authorized Officer.

Construction Steps

1. Salvage topsoil
2. Construct road

3. Redistribute topsoil
4. Revegetate slopes

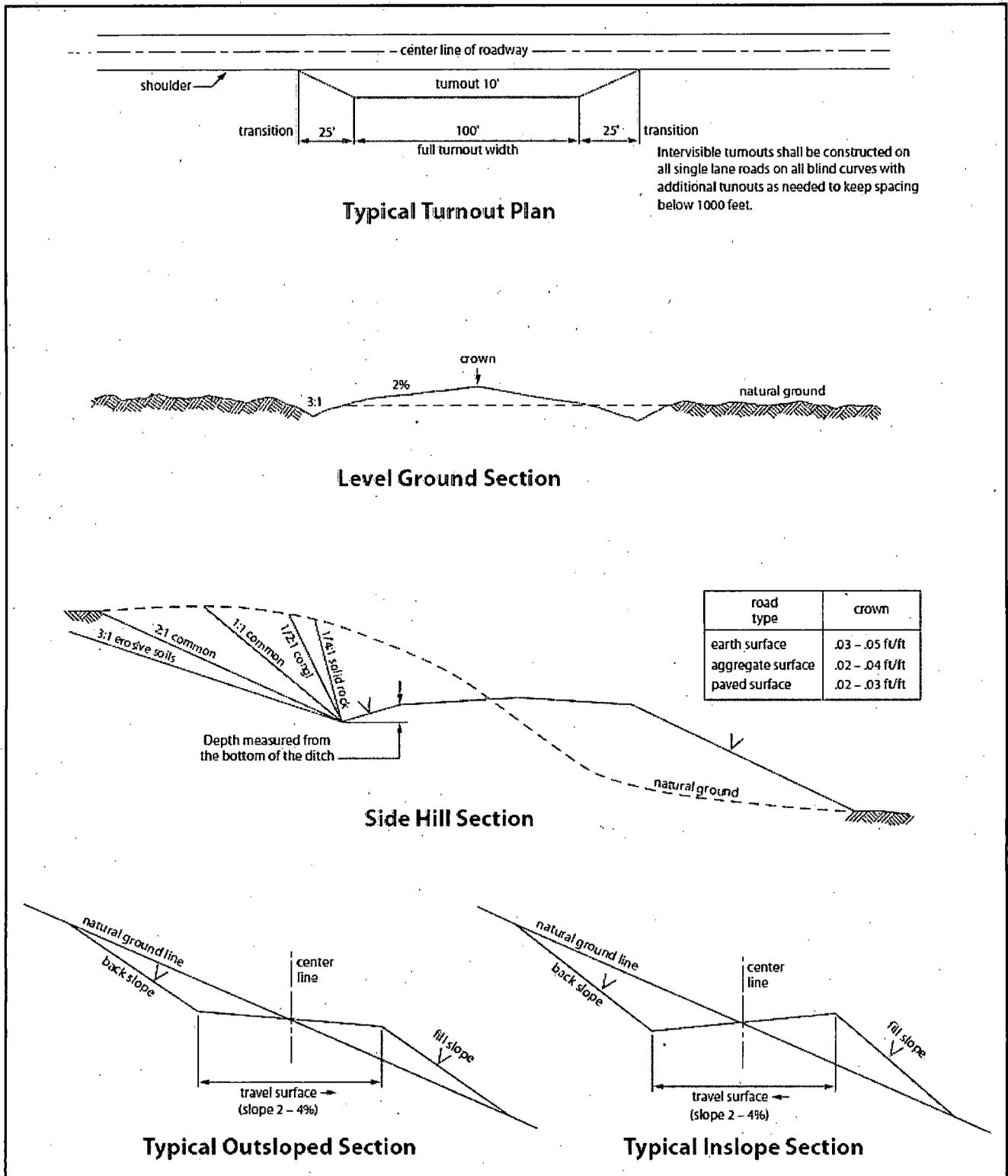


Figure 1. Cross-sections and plans for typical road sections representative of BLM resource or FS local and higher-class roads.

VII. DRILLING

A. DRILLING OPERATIONS REQUIREMENTS

The BLM is to be notified 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. **Although Hydrogen Sulfide has not been reported in the area, it is always a potential hazard. If Hydrogen Sulfide is encountered, report measured amounts 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 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 or are Non-API. 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.). The initial wellhead installed on the well will remain on the well with spools used as needed.

Centralizers required on surface casing per Onshore Order 2.III.B.1.f.

Wait on cement (WOC) for Water Basin:

After cementing but before commencing any tests, the casing string shall stand cemented under pressure until both of the following conditions have been met: 1) cement reaches a minimum compressive strength of 500 psi at the shoe, 2) until cement has been in place at least 8 hours. WOC time will be recorded in the driller's log. 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.

High Cave/Karst

Possibility of water flows in the Castile and Delaware.

Possibility of lost circulation in the Salado and Delaware.

Abnormal pressures may be encountered within the 3rd Bone Spring and Wolfcamp formations.

A MINIMUM OF TWO CASING STRINGS CEMENTED TO SURFACE IS REQUIRED IN HIGH CAVE/KARST AREAS. THE CEMENT MUST BE IN A SOLID SHEATH. THEREFORE, ONE INCH OPERATIONS ARE NOT SUFFICIENT TO PROTECT CAVE KARST RESOURCES. A CASING DESIGN THAT HAS A ONE INCH JOB PERFORMED DOES NOT COUNT AS A SOLID SHEATH. IF THE PRIMARY CEMENT JOB ON THE SURFACE CASING DOES NOT CIRCULATE, THEN THE NEXT TWO CASING STRINGS MUST BE CEMENTED TO SURFACE.

1. The 13-3/8 inch surface casing shall be set at approximately 400 feet and cemented to the surface. **If salt is encountered, set casing at least 25 feet above the salt. Excess calculates to 10% - Additional cement may be required.**
 - 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, which shall be set at approximately 2100 feet (**basal anhydrite of the Castile formation**), 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. Excess calculates to 14% - Additional cement may be required.**

Centralizers approved as written.

3. The minimum required fill of cement behind the 7 inch production casing is:
 - Cement should tie-back at least 200 feet into previous casing string. Operator shall provide method of verification. **Excess calculates to 24% - Additional cement may be required.**

Formation below the 7" shoe to be tested according to Onshore Order 2.III.B.1.i. Test to be done as a mud equivalency test using the mud weight necessary for the pore pressure of the formation below the shoe and the mud weight for the bottom of the hole. Report results to BLM office.

4. The minimum required fill of cement behind the 4-1/2 inch production Liner is:
 - Cement as proposed by operator. Operator shall provide method of verification. **Excess calculates to negative 11% - Additional cement will be required.**
5. 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 53.
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. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the 7 production casing shoe shall be **5000 (5M)** psi. **5M system requires an HCR valve, remote kill line and annular to match. The remote kill line is to be installed prior to testing the system and tested to stack pressure.**

6. 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 (8 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. If a twelve hour or twenty-four hour chart is used, tester shall make a notation that it is run with a two 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.
 - g. BOP/BOPE must be tested by an independent service company within 500 feet of the top of the **Wolfcamp** formation if the time between the setting of the intermediate casing and reaching this depth exceeds 20 days. This test does not exclude the test prior to drilling out the casing shoe as per Onshore Order No. 2.

D. DRILLING MUD

Mud system monitoring equipment, with derrick floor indicators and visual and audio alarms, shall be operating before drilling into the **Wolfcamp** formation, and shall be used until production casing is run and cemented.

E. DRILL STEM TEST

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

F. 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.

JAM 051315

VIII. PRODUCTION (POST DRILLING)

A. WELL STRUCTURES & FACILITIES

Placement of Production Facilities

Production facilities should be placed on the well pad to allow for maximum interim recontouring and revegetation of the well location.

Exclosure Netting (Open-top Tanks)

Immediately following active drilling or completion operations, the operator will take actions necessary to prevent wildlife and livestock access, including avian wildlife, to all open-topped tanks that contain or have the potential to contain salinity sufficient to cause harm to wildlife or livestock, hydrocarbons, or Resource Conservation and Recovery Act of 1976-exempt hazardous substances. At a minimum, the operator will net, screen, or cover open-topped tanks to exclude wildlife and livestock and prevent mortality. If the operator uses netting, the operator will cover and secure the open portion of the tank to prevent wildlife entry. The operator will net, screen, or cover the tanks until the operator removes the tanks from the location or the tanks no longer contain substances that could be harmful to wildlife or livestock. Use a maximum netting mesh size of 1 ½ inches. The netting must not be in contact with fluids and must not have holes or gaps.

Chemical and Fuel Secondary Containment and Exclosure Screening

The operator will prevent all hazardous, poisonous, flammable, and toxic substances from coming into contact with soil and water. At a minimum, the operator will install and maintain an impervious secondary containment system for any tank or barrel containing hazardous, poisonous, flammable, or toxic substances sufficient to contain the contents of the tank or barrel and any drips, leaks, and anticipated precipitation. The operator will dispose of fluids within the containment system that do not meet applicable state or U. S. Environmental Protection Agency livestock water standards in accordance with state law; the operator must not drain the fluids to the soil or ground. The operator will design, construct, and maintain all secondary containment systems to prevent wildlife and livestock exposure to harmful substances. At a minimum, the operator will install effective wildlife and livestock exclosure systems such as fencing, netting, expanded metal mesh, lids, and grate covers. Use a maximum netting mesh size of 1 ½ inches.

Open-Vent Exhaust Stack Exclosures

The operator will construct, modify, equip, and maintain all open-vent exhaust stacks on production equipment to prevent birds and bats from entering, and to discourage perching, roosting, and nesting. (*Recommended exclosure structures on open-vent exhaust stacks are in the shape of a cone.*) Production equipment includes, but may not be limited to, tanks, heater-treaters, separators, dehydrators, flare stacks, in-line units, and compressor mufflers.

Containment Structures

Proposed production facilities such as storage tanks and other vessels will have a secondary containment structure that is constructed to hold the capacity of 1.5 times the

largest tank, plus freeboard to account for precipitation, unless more stringent protective requirements are deemed necessary.

Painting Requirement

All above-ground structures including meter housing that are not subject to safety requirements shall be painted a flat non-reflective paint color, **Shale Green** from the BLM Standard Environmental Color Chart (CC-001: June 2008).

B. PIPELINES (Not applied for in APD)

C. ELECTRIC LINES (Not applied for in APD)

IX. INTERIM RECLAMATION

During the life of the development, all disturbed areas not needed for active support of production operations should undergo interim reclamation in order to minimize the environmental impacts of development on other resources and uses.

Within six (6) months of well completion, operators should work with BLM surface management specialists (Jim Amos: 575-234-5909) to devise the best strategies to reduce the size of the location. Interim reclamation should allow for remedial well operations, as well as safe and efficient removal of oil and gas.

During reclamation, the removal of caliche is important to increasing the success of revegetating the site. Removed caliche that is free of contaminants may be used for road repairs, fire walls or for building other roads and locations. In order to operate the well or complete workover operations, it may be necessary to drive, park and operate on restored interim vegetation within the previously disturbed area. Disturbing revegetated areas for production or workover operations will be allowed. If there is significant disturbance and loss of vegetation, the area will need to be revegetated. Communicate with the appropriate BLM office for any exceptions/exemptions if needed.

All disturbed areas after they have been satisfactorily prepared need to be reseeded with the seed mixture provided below.

Upon completion of interim reclamation, the operator shall submit a Sundry Notices and Reports on Wells, Subsequent Report of Reclamation (Form 3160-5).

X. FINAL ABANDONMENT & RECLAMATION

At final abandonment, well locations, production facilities, and access roads must undergo "final" reclamation so that the character and productivity of the land are restored.

Earthwork for final reclamation must be completed within six (6) months of well plugging. All pads, pits, facility locations and roads must be reclaimed to a satisfactory

revegetated, safe, and stable condition, unless an agreement is made with the landowner or BLM to keep the road and/or pad intact.

After all disturbed areas have been satisfactorily prepared, these areas need to be revegetated with the seed mixture provided below. Seeding should be accomplished by drilling on the contour whenever practical or by other approved methods. Seeding may need to be repeated until revegetation is successful, as determined by the BLM.

Operators shall contact a BLM surface protection specialist prior to surface abandonment operations for site specific objectives (Jim Amos: 575-234-5909).

Seed Mixture 1, for Loamy Sites

The holder shall seed all disturbed areas with the seed mixture listed below. The seed mixture shall be planted in the amounts specified in pounds of pure live seed (PLS)* per acre. There shall be no primary or secondary noxious weeds in the seed mixture. Seed will be tested and the viability testing of seed will be done in accordance with State law(s) and within nine (9) months prior to purchase. Commercial seed will be either certified or registered seed. The seed container will be tagged in accordance with State law(s) and available for inspection by the authorized officer.

Seed will be planted using a drill equipped with a depth regulator to ensure proper depth regulator to ensure proper depth of planting where drilling is possible. The seed mixture will be evenly and uniformly planted over the disturbed area (small/heavier seeds have a tendency to drop the bottom of the drill and are planted first). The holder shall take appropriate measures to ensure this does not occur. Where drilling is not possible, seed will be broadcast and the area shall be raked or chained to cover the seed. When broadcasting the seed, the pounds per acre are to be doubled. The seeding will be repeated until a satisfactory stand is established as determined by the authorized officer. Evaluation of growth will not be made before completion of at least one full growing season after seeding.

Species to be planted in pounds of pure live seed* per acre:

<u>Species</u>	<u>lb/acre</u>
Plains lovegrass (<i>Eragrostis intermedia</i>)	0.5
Sand dropseed (<i>Sporobolus cryptandrus</i>)	1.0
Sideoats grama (<i>Bouteloua curtipendula</i>)	5.0
Plains bristlegrass (<i>Setaria macrostachya</i>)	2.0

*Pounds of pure live seed:

Pounds of seed x percent purity x percent germination = pounds pure live seed