

HOBBSD

14-631

JAN 20 2015

Form 3160-3
(March 2012)UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

RECEIVED

OCD Hobbs

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

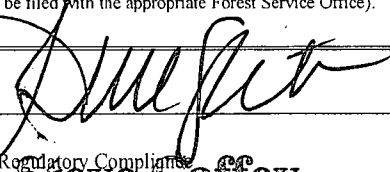
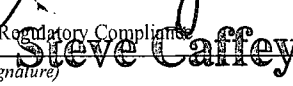
APPLICATION FOR PERMIT TO DRILL OR REENTER

1a. Type of Work ☒ DRILL ☐ REENTER		7. If Unit or CA Agreement, Name and No.
1b. Type of Well ☒ Oil Well ☐ Gas Well ☐ Other ☒ Single Zone ☐ Multiple Zone		8. Lease Name and Well No. (314104) Cascade 28 Federal #1H
2. Name of Operator Cimarex Energy Co.		9. API Well No. 30-025-42369
3a. Address 202 S. Cheyenne Ave., Ste 1000, Tulsa, OK 74103	3b. Phone No. (include area code) 918-585-1100	Field and Pool or Extension Red Hills Upper Bone Spring / Wildcat Shale (9700)
4. Location of Well (Report location clearly and in accordance with any State requirements. *) At Surface 330 FNL & 1310 FWL At proposed prod. Zone 330 FSL & 440 FWL Bone Spring		11. Sec., T. R. M. or Blk. and Survey and Area 28, 25S, 33E
14. Distance in miles and direction from nearest town or post office* Jal, NM is 23 miles to the east of location		12. County or Parish Lea
15. Distance from proposed* location to nearest property or lease line, ft. (Also to nearest drig. unit line if any) 330		13. State NM
16. No of acres in lease NMNMN 043562=640.00 acres	17. Spacing Unit dedicated to this well 160.00	
18. Distance from proposed* location to nearest well, drilling, completed, applied for, on this lease, ft. 20' to the #2H	19. Proposed Depth Pilot Hole TD: N/A 14,353 MD 9,875 TVD	20. BLM/BIA Bond No. on File NM2575; NMB000835
21. Elevations (Show whether DF, KDB, RT, GL, etc.) 3385 GR	22. Approximate date work will start* 7/14/14	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:

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

25. Signature 	Name (Printed/Typed) Terri Stathem	Date 3/19/14
Title Regulatory Compliance		
Approved By (Signature) 	Name (Printed/Typed) Office CARLSBAD FIELD OFFICE	Date JAN 12 2015
Title FIELD MANAGER		

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.

(Continued on page 2)

Carlsbad Controlled Water Basin

Approval Subject to General Requirements
& Special Stipulations Attached

SEE ATTACHED FOR
CONDITIONS OF APPROVAL
JAN 21 2015

Application to Drill
Cascade 28 Federal #1H
 Cimarex Energy Co.
 UL: D, Sec. 28, 25S, 33E
 Lea Co., NM

HOBBSOCD

JAN 20 2015

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

1. **Location:** SHL 330 FNL & 1310 FWL
 BHL 330 FSL & 440 FWL
2. **Elevation Above Sea Level:** 3,385' 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:** 14,353 MD 9,875 TVD Pilot Hole TD: N/A
6. **Estimated Tops of Geological Markers:**

Formation	Est Top	Bearing
Rustler	995'	N/A
Salt	1140'	N/A
Castille	3380'	N/A
Lamar	4900'	N/A
Bell Canyon	4945'	N/A
Cherry Canyon	6190'	N/A
Brushy Canyon	7485'	N/A
Bone Spring	9045'	Hydrocarbons
U. Aalon (Lenoard)	9080'	Hydrocarbons
L. Avalon	9680'	Hydrocarbons

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

7A. **OSE Ground Water Estimated Depth:** 150'

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 Bouyed Weight (lbs)	Bouyant Tension SF (1.8)
Surface	0	1045	1045	17 1/2	13-3/8"	48.00	H-40	ST&C	New	478	8.8	1.55		3.62	50,160	43,421	7.42
Intermediate	0	4920	4920	12 1/4	9-5/8"	56.00	J-55	LT&C	New	2583	10.1		1.17	1.36	177,120	149,808	3.02
Production	0	9454	9398	8 3/4	5-1/2"	17.00	L-80	LT&C	New	4496	9.2	1.40		1.72	166,923	143,477	2.36
Production	9398	14353	9875	8 3/4	5-1/2"	17.00	L-80	BT&C	New	4724	9.2	1.33		1.64	7,157	6,152	64.53

Per operator 1-9-15 CRW

Note: Operator may drill a 8-1/2" OH from end of curve to TD of the well. This is to reduce the need to ream the conventionally drilled curve to run a RSS assembly into the lateral.

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 Lea Co., NM

8A. Casing Design and Casing Loading Assumptions:

Surface	Tension	A 1.8 design factor with effects of buoyancy: 8.80 ppg.
	Collapse	A 1.125 design factor with full internal evacuation and a collapse force equal to a 8.80 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: 10.10 ppg.
	Collapse	A 1.125 design factor evacuated 1/3 TVD of next casing string with a collapse force equal to a 10.10 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: 9.20 ppg.
	Collapse	A 1.125 design factor with full internal evacuation of next casing string with a collapse force equal to a 9.20 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.

9. Cementing Program:

Casing Type	Type	Sacks	Yield	Weight	Cubic Feet	Cement Blend
Surface	Lead	498	1.75	13.50		871 Class C + Bentonite + Calcium Chloride + LCM, 8.829 gps water
	Tail	136	1.34	14.80		181 Class C + LCM, 6.320 gps water
	TOC: 0		45% Excess			Centralizers per Onshore Order 2.III.B.1f
Intermediate	Lead	897	1.88	12.90		1686 35:65 (Poz:C) + Salt + Bentonite + LCM + Retarder, 9.650 gps water
	Tail	288	1.34	14.80		385 Class C + Retarder + LCM, 6.320 gps water
	TOC: 0		44% Excess			
Production	Lead	553	2.40	11.90		1325 35:65 (poz:H) + Salt + Sodium Metasilicate + Bentonite + Fluid Loss + Dispersant + LCM + Retarder, 13.800 gps water
	Tail	1211	1.24	14.50		1501 50:50(Poz:H) + Bentonite + Salt + Fluid Loss + Dispersant + LCM + Retarder, 5.550 gps water
	TOC: 4720		16% 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.

Cement volumes will be adjusted depending on hole size

9a. Proposed Drilling Plan:

Pilot Hole TD: No Pilot KOP: 9,454' EOC: 10,203'

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

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. 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.

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.

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.

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11. Proposed Mud Circulating System:

Depth	Mud Weight	Visc	Fluid Loss	Type Mud
0' to 1045'	8.30 - 8.80	28	NC	FW Spud Mud
1045' to 4920'	9.60 - 10.10	30-32	NC	Brine Water
4920' to 14369'	8.70 - 9.20	30-32	NC	FW/Cut Brine

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

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

12. Testing, Logging and Coring Program:

- A. Mud logging program: 2 man unit from 4920 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:

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: 4444 psi

Estimated BHT: 159°

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.

15. Other Facets of Operations:

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

Bone Spring pay will be perforated and stimulated.

The proposed well will be tested and potentialized as **Oil**



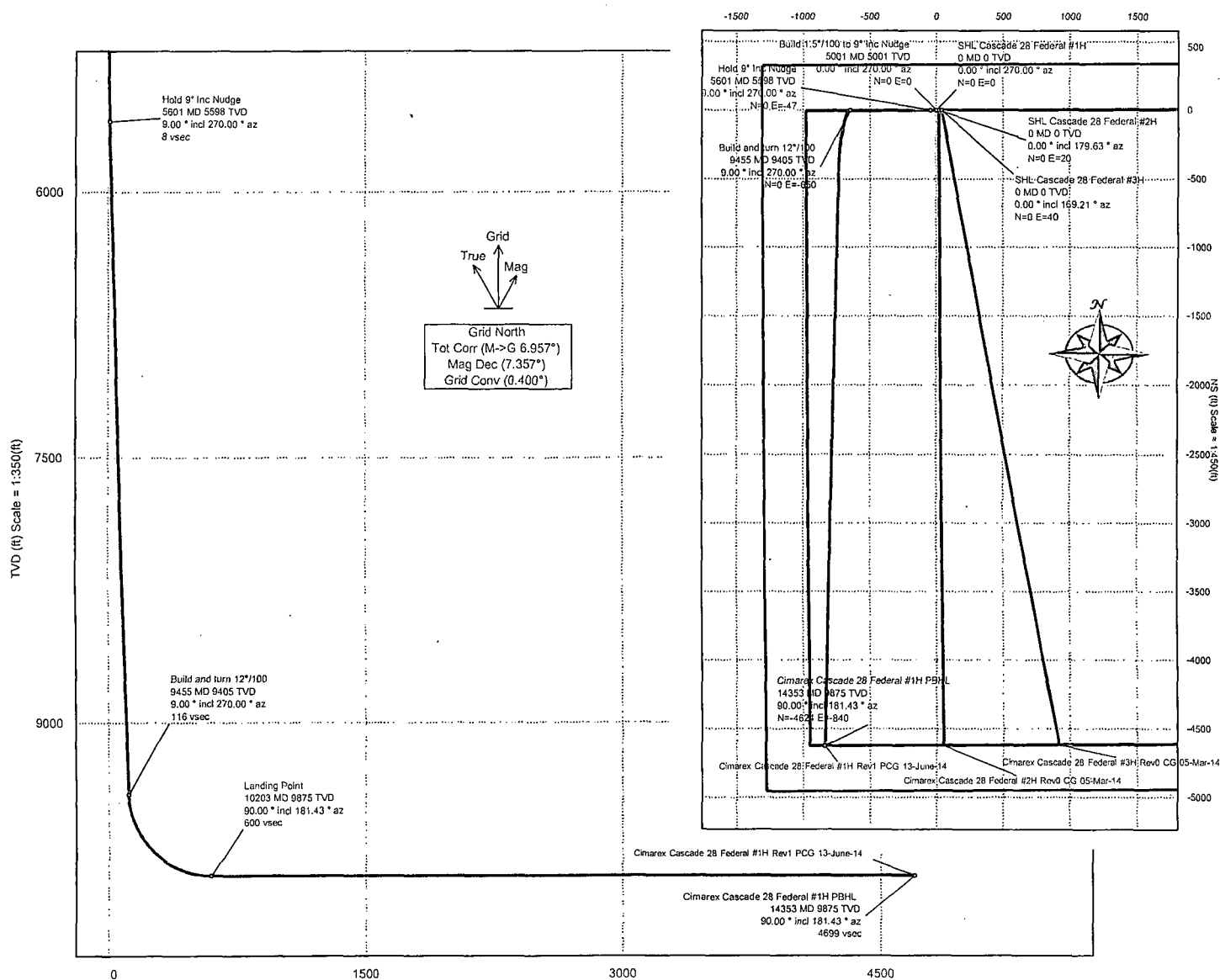
Cimarex

PATHFINDER
A Schlumberger Company

Borehole:	Well:	Field:	Structure:
Original Borehole	Cascade 28 Federal #1H	NM Lea County (NAD 83)	TBD

Gravity & Magnetic Parameters	Surface Location	Miscellaneous
Model: BGGM 2013 Dip: 59.994° Date: 05-Mar-2014	NAD83 New Mexico State Plane, Eastern Zone, US Feet	Slot: Cascade 28 Federal #1H TVD Ref: Ground Level (3385ft above MSL)
MagDec: 7.357° FS: 48253.728nT Gravity FS: 998.688mgn (9.80665 Based)	Lat: N 32 6 28.46 Northing: 403894ftUS Grid Conv: 0.3996°	Plan: Rev1 PCG 13-June-14
	Lon: W 103 34 53.54 Easting: 774114.6ftUS Scale Fact: 0.99997115	

EW (ft) Scale = 1:450(ft)



Vertical Section (ft) Azim = 190.297° Scale = 1:3500(ft) Origin = 0N/-S, 0E/-W

Critical Points								
Critical Point	MD	INCL	AZIM	TVD	VSEC	N(+)S(-)	E(+)W(-)	DLS
SHL Cascade 28 Federal #1H	0.00	0.00	270.00	0.00	0.00	0.00	0.00	
Build 1.5°/100 to 9° Inc Nudge	5000.52	0.00	270.00	5000.52	0.00	0.00	0.00	0.00
Hold 9° Inc Nudge	5600.52	9.00	270.00	5598.06	8.41	0.00	-47.03	1.50
Build and turn 12°/100	9454.99	9.00	270.00	9405.07	116.19	0.00	-650.00	0.00
Landing Point	10203.42	90.00	181.43	9875.00	589.60	-475.64	-736.34	12.00
Cimarex Cascade 28 Federal #1H PBHL	14352.62	90.00	181.43	9875.00	4699.23	-4623.54	-840.03	0.00

CONTROLLED		
Plan ref	Cimarex Cascade 28 Federal #1H Rev1 PCG 13-June-14	
Drawing ref		
Copy number	1 of 1	
Date	13-Jun-2014	
1	Originator	Craig Geaslen
2	DE Sign Off Authority	
3	D&M Line Manager	
4	Client	
Copy number for		



Cimarex Cascade 28 Federal #1H Rev1 PCG 13-June-14 Proposal Geodetic Report 100ft Interpolated (Non-Def Plan)



Report Date: June 13, 2014 - 02:37 PM
Client: Cimarex
Field: NM Lea County (NAD 83)
Structure / Slot: Cimarex Cascade 28 Federal #1H / Cimarex Cascade 28 Federal #1H
Well: Cimarex Cascade 28 Federal #1H
Borehole: Original Borehole
UWI / API#: Unknown / Unknown
Survey Name: Cimarex Cascade 28 Federal #1H Rev1 PCG 13-June-14
Survey Date: March 05, 2014
Tort / AHD / DDI / ERD Ratio: 98.780 ° / 5292.692 ft / 5.881 / 0.536
Coordinate Reference System: NAD83 New Mexico State Plane, Eastern Zone, US Feet
Location Lat / Long: N 32° 6' 28.45798", W 103° 34' 53.53756"
Location Grid N/E Y/X: N 403804.000 ftUS, E 774114.600 ftUS
CRS Grid Convergence Angle: 0.3996 °
Grid Scale Factor: 0.99997115
Version / Patch: 2.7.1043.0

Survey / DLS Computation: Minimum Curvature / Lubinski
Vertical Section Azimuth: 190.297 ° (Grid North)
Vertical Section Origin: 0.000 ft, 0.000 ft
TVD Reference Datum: Ground Level
TVD Reference Elevation: 3385.000 ft above MSL
Seabed / Ground Elevation: 3385.000 ft above MSL
Magnetic Declination: 7.357 °
Total Gravity Field Strength: 998.6876mgn (9.80665 Based)
Gravity Model: DOX
Total Magnetic Field Strength: 48253.728 nT
Magnetic Dip Angle: 59.994 °
Declination Date: March 05, 2014
Magnetic Declination Model: BGGM 2013
North Reference: Grid North
Grid Convergence Used: 0.3996 °
Total Corr Mag North->Grid North: 6.9571 °
Local Coord Referenced To: Structure Reference Point

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	Northing (ftUS)	Easting (ftUS)	Latitude (N/S ° ' ")	Longitude (E/W ° ' ")
SHL Cascade 28 Federal #1H	0.00	0.00	270.00	0.00	0.00	0.00	0.00	N/A	403804.00	774114.60	N 32 6 28.46 W 103 34 53.54	
	100.00	0.00	270.00	100.00	0.00	0.00	0.00	0.00	403804.00	774114.60	N 32 6 28.46 W 103 34 53.54	
	200.00	0.00	270.00	200.00	0.00	0.00	0.00	0.00	403804.00	774114.60	N 32 6 28.46 W 103 34 53.54	
	300.00	0.00	270.00	300.00	0.00	0.00	0.00	0.00	403804.00	774114.60	N 32 6 28.46 W 103 34 53.54	
	400.00	0.00	270.00	400.00	0.00	0.00	0.00	0.00	403804.00	774114.60	N 32 6 28.46 W 103 34 53.54	
	500.00	0.00	270.00	500.00	0.00	0.00	0.00	0.00	403804.00	774114.60	N 32 6 28.46 W 103 34 53.54	
	600.00	0.00	270.00	600.00	0.00	0.00	0.00	0.00	403804.00	774114.60	N 32 6 28.46 W 103 34 53.54	
	700.00	0.00	270.00	700.00	0.00	0.00	0.00	0.00	403804.00	774114.60	N 32 6 28.46 W 103 34 53.54	
	800.00	0.00	270.00	800.00	0.00	0.00	0.00	0.00	403804.00	774114.60	N 32 6 28.46 W 103 34 53.54	
	900.00	0.00	270.00	900.00	0.00	0.00	0.00	0.00	403804.00	774114.60	N 32 6 28.46 W 103 34 53.54	
	1000.00	0.00	270.00	1000.00	0.00	0.00	0.00	0.00	403804.00	774114.60	N 32 6 28.46 W 103 34 53.54	
	1100.00	0.00	270.00	1100.00	0.00	0.00	0.00	0.00	403804.00	774114.60	N 32 6 28.46 W 103 34 53.54	
	1200.00	0.00	270.00	1200.00	0.00	0.00	0.00	0.00	403804.00	774114.60	N 32 6 28.46 W 103 34 53.54	
	1300.00	0.00	270.00	1300.00	0.00	0.00	0.00	0.00	403804.00	774114.60	N 32 6 28.46 W 103 34 53.54	
	1400.00	0.00	270.00	1400.00	0.00	0.00	0.00	0.00	403804.00	774114.60	N 32 6 28.46 W 103 34 53.54	
	1500.00	0.00	270.00	1500.00	0.00	0.00	0.00	0.00	403804.00	774114.60	N 32 6 28.46 W 103 34 53.54	
	1600.00	0.00	270.00	1600.00	0.00	0.00	0.00	0.00	403804.00	774114.60	N 32 6 28.46 W 103 34 53.54	
	1700.00	0.00	270.00	1700.00	0.00	0.00	0.00	0.00	403804.00	774114.60	N 32 6 28.46 W 103 34 53.54	
	1800.00	0.00	270.00	1800.00	0.00	0.00	0.00	0.00	403804.00	774114.60	N 32 6 28.46 W 103 34 53.54	
	1900.00	0.00	270.00	1900.00	0.00	0.00	0.00	0.00	403804.00	774114.60	N 32 6 28.46 W 103 34 53.54	
	2000.00	0.00	270.00	2000.00	0.00	0.00	0.00	0.00	403804.00	774114.60	N 32 6 28.46 W 103 34 53.54	

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	Northing (ftUS)	Easting (ftUS)	Latitude (N/S ° ' ")	Longitude (E/W ° ' ")
	2100.00	0.00	270.00	2100.00	0.00	0.00	0.00	0.00	403804.00	774114.60	N 32 6 28.46	W 103 34 53.54
	2200.00	0.00	270.00	2200.00	0.00	0.00	0.00	0.00	403804.00	774114.60	N 32 6 28.46	W 103 34 53.54
	2300.00	0.00	270.00	2300.00	0.00	0.00	0.00	0.00	403804.00	774114.60	N 32 6 28.46	W 103 34 53.54
	2400.00	0.00	270.00	2400.00	0.00	0.00	0.00	0.00	403804.00	774114.60	N 32 6 28.46	W 103 34 53.54
	2500.00	0.00	270.00	2500.00	0.00	0.00	0.00	0.00	403804.00	774114.60	N 32 6 28.46	W 103 34 53.54
	2600.00	0.00	270.00	2600.00	0.00	0.00	0.00	0.00	403804.00	774114.60	N 32 6 28.46	W 103 34 53.54
	2700.00	0.00	270.00	2700.00	0.00	0.00	0.00	0.00	403804.00	774114.60	N 32 6 28.46	W 103 34 53.54
	2800.00	0.00	270.00	2800.00	0.00	0.00	0.00	0.00	403804.00	774114.60	N 32 6 28.46	W 103 34 53.54
	2900.00	0.00	270.00	2900.00	0.00	0.00	0.00	0.00	403804.00	774114.60	N 32 6 28.46	W 103 34 53.54
	3000.00	0.00	270.00	3000.00	0.00	0.00	0.00	0.00	403804.00	774114.60	N 32 6 28.46	W 103 34 53.54
	3100.00	0.00	270.00	3100.00	0.00	0.00	0.00	0.00	403804.00	774114.60	N 32 6 28.46	W 103 34 53.54
	3200.00	0.00	270.00	3200.00	0.00	0.00	0.00	0.00	403804.00	774114.60	N 32 6 28.46	W 103 34 53.54
	3300.00	0.00	270.00	3300.00	0.00	0.00	0.00	0.00	403804.00	774114.60	N 32 6 28.46	W 103 34 53.54
	3400.00	0.00	270.00	3400.00	0.00	0.00	0.00	0.00	403804.00	774114.60	N 32 6 28.46	W 103 34 53.54
	3500.00	0.00	270.00	3500.00	0.00	0.00	0.00	0.00	403804.00	774114.60	N 32 6 28.46	W 103 34 53.54
	3600.00	0.00	270.00	3600.00	0.00	0.00	0.00	0.00	403804.00	774114.60	N 32 6 28.46	W 103 34 53.54
	3700.00	0.00	270.00	3700.00	0.00	0.00	0.00	0.00	403804.00	774114.60	N 32 6 28.46	W 103 34 53.54
	3800.00	0.00	270.00	3800.00	0.00	0.00	0.00	0.00	403804.00	774114.60	N 32 6 28.46	W 103 34 53.54
	3900.00	0.00	270.00	3900.00	0.00	0.00	0.00	0.00	403804.00	774114.60	N 32 6 28.46	W 103 34 53.54
	4000.00	0.00	270.00	4000.00	0.00	0.00	0.00	0.00	403804.00	774114.60	N 32 6 28.46	W 103 34 53.54
	4100.00	0.00	270.00	4100.00	0.00	0.00	0.00	0.00	403804.00	774114.60	N 32 6 28.46	W 103 34 53.54
	4200.00	0.00	270.00	4200.00	0.00	0.00	0.00	0.00	403804.00	774114.60	N 32 6 28.46	W 103 34 53.54
	4300.00	0.00	270.00	4300.00	0.00	0.00	0.00	0.00	403804.00	774114.60	N 32 6 28.46	W 103 34 53.54
	4400.00	0.00	270.00	4400.00	0.00	0.00	0.00	0.00	403804.00	774114.60	N 32 6 28.46	W 103 34 53.54
	4500.00	0.00	270.00	4500.00	0.00	0.00	0.00	0.00	403804.00	774114.60	N 32 6 28.46	W 103 34 53.54
	4600.00	0.00	270.00	4600.00	0.00	0.00	0.00	0.00	403804.00	774114.60	N 32 6 28.46	W 103 34 53.54
	4700.00	0.00	270.00	4700.00	0.00	0.00	0.00	0.00	403804.00	774114.60	N 32 6 28.46	W 103 34 53.54
	4800.00	0.00	270.00	4800.00	0.00	0.00	0.00	0.00	403804.00	774114.60	N 32 6 28.46	W 103 34 53.54
	4900.00	0.00	270.00	4900.00	0.00	0.00	0.00	0.00	403804.00	774114.60	N 32 6 28.46	W 103 34 53.54
	5000.00	0.00	270.00	5000.00	0.00	0.00	0.00	0.00	403804.00	774114.60	N 32 6 28.46	W 103 34 53.54
Build 1.5°/100 to 9° Inc Nudge	5000.52	0.00	270.00	5000.52	0.00	0.00	0.00	0.00	403804.00	774114.60	N 32 6 28.46	W 103 34 53.54
	5100.00	1.49	270.00	5099.99	0.23	0.00	-1.30	1.50	403804.00	774113.30	N 32 6 28.46	W 103 34 53.55
	5200.00	2.99	270.00	5199.91	0.93	0.00	-5.21	1.50	403804.00	774109.39	N 32 6 28.46	W 103 34 53.60
	5300.00	4.49	270.00	5299.69	2.10	0.00	-11.73	1.50	403804.00	774102.87	N 32 6 28.46	W 103 34 53.67
	5400.00	5.99	270.00	5399.27	3.73	0.00	-20.87	1.50	403804.00	774093.73	N 32 6 28.46	W 103 34 53.78
	5500.00	7.49	270.00	5498.58	5.83	0.00	-32.61	1.50	403804.00	774081.99	N 32 6 28.46	W 103 34 53.92
	5600.00	8.99	270.00	5597.54	8.39	0.00	-46.95	1.50	403804.00	774067.66	N 32 6 28.46	W 103 34 54.08
Hold 9° Inc Nudge	5600.52	9.00	270.00	5598.06	8.41	0.00	-47.03	1.50	403804.00	774067.57	N 32 6 28.46	W 103 34 54.08
	5700.00	9.00	270.00	5696.31	11.19	0.00	-62.59	0.00	403804.00	774052.01	N 32 6 28.46	W 103 34 54.27
	5800.00	9.00	270.00	5795.08	13.98	0.00	-78.23	0.00	403804.00	774036.37	N 32 6 28.46	W 103 34 54.45
	5900.00	9.00	270.00	5893.85	16.78	0.00	-93.88	0.00	403804.00	774020.73	N 32 6 28.46	W 103 34 54.63
	6000.00	9.00	270.00	5992.62	19.58	0.00	-109.52	0.00	403804.00	774005.08	N 32 6 28.47	W 103 34 54.81
	6100.00	9.00	270.00	6091.39	22.37	0.00	-125.16	0.00	403804.00	773989.44	N 32 6 28.47	W 103 34 54.99
	6200.00	9.00	270.00	6190.16	25.17	0.00	-140.81	0.00	403804.00	773973.80	N 32 6 28.47	W 103 34 55.17
	6300.00	9.00	270.00	6288.92	27.97	0.00	-156.45	0.00	403804.00	773958.15	N 32 6 28.47	W 103 34 55.36
	6400.00	9.00	270.00	6387.69	30.76	0.00	-172.09	0.00	403804.00	773942.51	N 32 6 28.47	W 103 34 55.54

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	Northing (ftUS)	Easting (ftUS)	Latitude (N/S ° ' ")	Longitude (E/W ° ' ")
	6500.00	9.00	270.00	6486.46	33.56	0.00	-187.74	0.00	403804.00	773926.87	N 32 6 28.47	W 103 34 55.72
	6600.00	9.00	270.00	6585.23	36.36	0.00	-203.38	0.00	403804.00	773911.23	N 32 6 28.47	W 103 34 55.90
	6700.00	9.00	270.00	6684.00	39.15	0.00	-219.02	0.00	403804.00	773895.58	N 32 6 28.47	W 103 34 56.08
	6800.00	9.00	270.00	6782.77	41.95	0.00	-234.67	0.00	403804.00	773879.94	N 32 6 28.47	W 103 34 56.27
	6900.00	9.00	270.00	6881.54	44.75	0.00	-250.31	0.00	403804.00	773864.30	N 32 6 28.48	W 103 34 56.45
	7000.00	9.00	270.00	6980.31	47.54	0.00	-265.95	0.00	403804.00	773848.65	N 32 6 28.48	W 103 34 56.63
	7100.00	9.00	270.00	7079.07	50.34	0.00	-281.60	0.00	403804.00	773833.01	N 32 6 28.48	W 103 34 56.81
	7200.00	9.00	270.00	7177.84	53.13	0.00	-297.24	0.00	403804.00	773817.37	N 32 6 28.48	W 103 34 56.99
	7300.00	9.00	270.00	7276.61	55.93	0.00	-312.88	0.00	403804.00	773801.73	N 32 6 28.48	W 103 34 57.18
	7400.00	9.00	270.00	7375.38	58.73	0.00	-328.53	0.00	403804.00	773786.08	N 32 6 28.48	W 103 34 57.36
	7500.00	9.00	270.00	7474.15	61.52	0.00	-344.17	0.00	403804.00	773770.44	N 32 6 28.48	W 103 34 57.54
	7600.00	9.00	270.00	7572.92	64.32	0.00	-359.81	0.00	403804.00	773754.80	N 32 6 28.48	W 103 34 57.72
	7700.00	9.00	270.00	7671.69	67.12	0.00	-375.46	0.00	403804.00	773739.15	N 32 6 28.48	W 103 34 57.90
	7800.00	9.00	270.00	7770.46	69.91	0.00	-391.10	0.00	403804.00	773723.51	N 32 6 28.48	W 103 34 58.08
	7900.00	9.00	270.00	7869.23	72.71	0.00	-406.74	0.00	403804.00	773707.87	N 32 6 28.49	W 103 34 58.27
	8000.00	9.00	270.00	7967.99	75.51	0.00	-422.39	0.00	403804.00	773692.22	N 32 6 28.49	W 103 34 58.45
	8100.00	9.00	270.00	8066.76	78.30	0.00	-438.03	0.00	403804.00	773676.58	N 32 6 28.49	W 103 34 58.63
	8200.00	9.00	270.00	8165.53	81.10	0.00	-453.68	0.00	403804.00	773660.94	N 32 6 28.49	W 103 34 58.81
	8300.00	9.00	270.00	8264.30	83.89	0.00	-469.32	0.00	403804.00	773645.30	N 32 6 28.49	W 103 34 58.99
	8400.00	9.00	270.00	8363.07	86.69	0.00	-484.96	0.00	403804.00	773629.65	N 32 6 28.49	W 103 34 59.18
	8500.00	9.00	270.00	8461.84	89.49	0.00	-500.61	0.00	403804.00	773614.01	N 32 6 28.49	W 103 34 59.36
	8600.00	9.00	270.00	8560.61	92.28	0.00	-516.25	0.00	403804.00	773598.37	N 32 6 28.49	W 103 34 59.54
	8700.00	9.00	270.00	8659.38	95.08	0.00	-531.89	0.00	403804.00	773582.72	N 32 6 28.49	W 103 34 59.72
	8800.00	9.00	270.00	8758.14	97.88	0.00	-547.54	0.00	403804.00	773567.08	N 32 6 28.50	W 103 34 59.90
	8900.00	9.00	270.00	8856.91	100.67	0.00	-563.18	0.00	403804.00	773551.44	N 32 6 28.50	W 103 35 0.08
	9000.00	9.00	270.00	8955.68	103.47	0.00	-578.82	0.00	403804.00	773535.79	N 32 6 28.50	W 103 35 0.27
	9100.00	9.00	270.00	9054.45	106.27	0.00	-594.47	0.00	403804.00	773520.15	N 32 6 28.50	W 103 35 0.45
	9200.00	9.00	270.00	9153.22	109.06	0.00	-610.11	0.00	403804.00	773504.51	N 32 6 28.50	W 103 35 0.63
	9300.00	9.00	270.00	9251.99	111.86	0.00	-625.75	0.00	403804.00	773488.87	N 32 6 28.50	W 103 35 0.81
	9400.00	9.00	270.00	9350.76	114.65	0.00	-641.40	0.00	403804.00	773473.22	N 32 6 28.50	W 103 35 0.99
Build and turn 12°/100	9454.99	9.00	270.00	9405.07	116.19	0.00	-650.00	0.00	403804.00	773464.62	N 32 6 28.50	W 103 35 1.09
	9500.00	10.60	239.24	9449.45	119.54	-2.12	-657.08	12.00	403801.88	773457.54	N 32 6 28.48	W 103 35 1.18
	9600.00	19.72	207.65	9546.02	141.77	-21.84	-672.87	12.00	403782.16	773441.75	N 32 6 28.29	W 103 35 1.36
	9700.00	30.83	196.82	9636.35	183.48	-61.45	-688.17	12.00	403742.55	773426.45	N 32 6 27.90	W 103 35 1.54
	9800.00	42.40	191.42	9716.50	242.86	-119.24	-702.31	12.00	403684.76	773412.31	N 32 6 27.33	W 103 35 1.71
	9900.00	54.12	188.01	9782.98	317.32	-192.67	-714.68	12.00	403611.33	773399.95	N 32 6 26.60	W 103 35 1.86
	10000.00	65.92	185.49	9832.86	403.61	-278.54	-724.73	12.00	403525.46	773389.90	N 32 6 25.75	W 103 35 1.99
	10100.00	77.75	183.40	9863.99	497.95	-373.10	-732.02	12.00	403430.91	773382.60	N 32 6 24.82	W 103 35 2.08
	10200.00	89.60	181.50	9874.99	596.23	-472.22	-736.25	12.00	403331.79	773378.37	N 32 6 23.84	W 103 35 2.14
Landing Point	10203.42	90.00	181.43	9875.00	599.60	-475.64	-736.34	12.00	403328.38	773378.29	N 32 6 23.80	W 103 35 2.14
	10300.00	90.00	181.43	9875.00	695.03	-572.19	-738.75	0.00	403231.83	773375.87	N 32 6 22.85	W 103 35 2.17
	10400.00	90.00	181.43	9875.00	793.84	-672.16	-741.25	0.00	403131.86	773373.37	N 32 6 21.86	W 103 35 2.21
	10500.00	90.00	181.43	9875.00	892.65	-772.13	-743.76	0.00	403031.89	773370.87	N 32 6 20.87	W 103 35 2.25
	10600.00	90.00	181.43	9875.00	991.45	-872.10	-746.26	0.00	402931.93	773368.36	N 32 6 19.88	W 103 35 2.28
	10700.00	90.00	181.43	9875.00	1090.26	-972.07	-748.76	0.00	402831.96	773365.86	N 32 6 18.89	W 103 35 2.32
	10800.00	90.00	181.43	9875.00	1189.06	-1072.04	-751.26	0.00	402732.00	773363.36	N 32 6 17.90	W 103 35 2.36
	10900.00	90.00	181.43	9875.00	1287.87	-1172.00	-753.76	0.00	402632.03	773360.86	N 32 6 16.91	W 103 35 2.40

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	Northing (ftUS)	Easting (ftUS)	Latitude (N/S ° ' ")	Longitude (E/W ° ' ")
	11000.00	90.00	181.43	9875.00	1386.67	-1271.97	-756.26	0.00	402532.07	773358.36	N 32 6 15.92	W 103 35 2.43
	11100.00	90.00	181.43	9875.00	1485.48	-1371.94	-758.77	0.00	402432.10	773355.86	N 32 6 14.93	W 103 35 2.47
	11200.00	90.00	181.43	9875.00	1584.28	-1471.91	-761.27	0.00	402332.14	773353.36	N 32 6 13.95	W 103 35 2.51
	11300.00	90.00	181.43	9875.00	1683.09	-1571.88	-763.77	0.00	402232.17	773350.86	N 32 6 12.96	W 103 35 2.54
	11400.00	90.00	181.43	9875.00	1781.90	-1671.85	-766.27	0.00	402132.20	773348.36	N 32 6 11.97	W 103 35 2.58
	11500.00	90.00	181.43	9875.00	1880.70	-1771.82	-768.77	0.00	402032.24	773345.86	N 32 6 10.98	W 103 35 2.62
	11600.00	90.00	181.43	9875.00	1979.51	-1871.79	-771.27	0.00	401932.27	773343.35	N 32 6 9.99	W 103 35 2.66
	11700.00	90.00	181.43	9875.00	2078.31	-1971.75	-773.77	0.00	401832.31	773340.85	N 32 6 9.00	W 103 35 2.69
	11800.00	90.00	181.43	9875.00	2177.12	-2071.72	-776.27	0.00	401732.34	773338.35	N 32 6 8.01	W 103 35 2.73
	11900.00	90.00	181.43	9875.00	2275.92	-2171.69	-778.77	0.00	401632.38	773335.86	N 32 6 7.02	W 103 35 2.77
	12000.00	90.00	181.43	9875.00	2374.73	-2271.66	-781.27	0.00	401532.41	773333.36	N 32 6 6.03	W 103 35 2.80
	12100.00	90.00	181.43	9875.00	2473.53	-2371.63	-783.77	0.00	401432.44	773330.86	N 32 6 5.04	W 103 35 2.84
	12200.00	90.00	181.43	9875.00	2572.34	-2471.60	-786.27	0.00	401332.48	773328.36	N 32 6 4.06	W 103 35 2.88
	12300.00	90.00	181.43	9875.00	2671.14	-2571.57	-788.77	0.00	401232.51	773325.86	N 32 6 3.07	W 103 35 2.92
	12400.00	90.00	181.43	9875.00	2769.95	-2671.54	-791.27	0.00	401132.55	773323.36	N 32 6 2.08	W 103 35 2.95
	12500.00	90.00	181.43	9875.00	2868.76	-2771.50	-793.76	0.00	401032.58	773320.86	N 32 6 1.09	W 103 35 2.99
	12600.00	90.00	181.43	9875.00	2967.56	-2871.47	-796.26	0.00	400932.62	773318.36	N 32 6 0.10	W 103 35 3.03
	12700.00	90.00	181.43	9875.00	3066.37	-2971.44	-798.76	0.00	400832.65	773315.86	N 32 5 59.11	W 103 35 3.06
	12800.00	90.00	181.43	9875.00	3165.17	-3071.41	-801.26	0.00	400732.68	773313.37	N 32 5 58.12	W 103 35 3.10
	12900.00	90.00	181.43	9875.00	3263.98	-3171.38	-803.76	0.00	400632.72	773310.87	N 32 5 57.13	W 103 35 3.14
	13000.00	90.00	181.43	9875.00	3362.78	-3271.35	-806.26	0.00	400532.75	773308.37	N 32 5 56.14	W 103 35 3.18
	13100.00	90.00	181.43	9875.00	3461.59	-3371.32	-808.75	0.00	400432.79	773305.87	N 32 5 55.15	W 103 35 3.21
	13200.00	90.00	181.43	9875.00	3560.39	-3471.29	-811.25	0.00	400332.82	773303.37	N 32 5 54.17	W 103 35 3.25
	13300.00	90.00	181.43	9875.00	3659.20	-3571.25	-813.75	0.00	400232.86	773300.88	N 32 5 53.18	W 103 35 3.29
	13400.00	90.00	181.43	9875.00	3758.00	-3671.22	-816.25	0.00	400132.89	773298.38	N 32 5 52.19	W 103 35 3.32
	13500.00	90.00	181.43	9875.00	3856.81	-3771.19	-818.74	0.00	400032.92	773295.88	N 32 5 51.20	W 103 35 3.36
	13600.00	90.00	181.43	9875.00	3955.61	-3871.16	-821.24	0.00	399932.96	773293.39	N 32 5 50.21	W 103 35 3.40
	13700.00	90.00	181.43	9875.00	4054.42	-3971.13	-823.74	0.00	399832.99	773290.89	N 32 5 49.22	W 103 35 3.43
	13800.00	90.00	181.43	9875.00	4153.22	-4071.10	-826.23	0.00	399733.03	773288.39	N 32 5 48.23	W 103 35 3.47
	13900.00	90.00	181.43	9875.00	4252.03	-4171.07	-828.73	0.00	399633.06	773285.90	N 32 5 47.24	W 103 35 3.51
	14000.00	90.00	181.43	9875.00	4350.83	-4271.04	-831.23	0.00	399533.10	773283.40	N 32 5 46.25	W 103 35 3.55
	14100.00	90.00	181.43	9875.00	4449.64	-4371.01	-833.72	0.00	399433.13	773280.90	N 32 5 45.26	W 103 35 3.58
	14200.00	90.00	181.43	9875.00	4548.44	-4470.97	-836.22	0.00	399333.16	773278.41	N 32 5 44.27	W 103 35 3.62
	14300.00	90.00	181.43	9875.00	4647.25	-4570.94	-838.71	0.00	399233.20	773275.91	N 32 5 43.29	W 103 35 3.66
Cimarex Cascade 28 Federal #1H PBHL	14352.62	90.00	181.43	9875.00	4699.23	-4623.54	-840.03	0.00	399180.60	773274.60	N 32 5 42.77	W 103 35 3.68

Survey Type: Non-Def Plan

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

Description	Part	MD From (ft)	MD To (ft)	EOU Freq (ft)	Hole Size (in)	Casing Diameter (in)	Survey Tool Type	Borehole / Survey
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Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	Northing (ftUS)	Easting (ftUS)	Latitude (N/S ° ' ")	Longitude (E/W ° ' ")
		1	0.000	14352.616	1/100.000	30.000	30.000	SLB_UNKNOWN			Original Borehole / Cimarex Cascade 28 Federal #1H Rev1	



Cimarex Cascade 28 Federal #1H Rev1 PCG 13-June-14 Proposal Geodetic Report

(Non-Def Plan)



Report Date:	June 13, 2014 - 02:38 PM	Survey / DLS Computation:	Minimum Curvature / Lubinski
Client:	Cimarex	Vertical Section Azimuth:	190.297 ° (Grid North)
Field:	NM Lea County (NAD 83)	Vertical Section Origin:	0.000 ft, 0.000 ft
Structure / Slot:	Cimarex Cascade 28 Federal #1H / Cimarex Cascade 28 Federal #1H	TVD Reference Datum:	Ground Level
Well:	Cimarex Cascade 28 Federal #1H	TVD Reference Elevation:	3385.000 ft above MSL
Borehole:	Original Borehole	Seabed / Ground Elevation:	3385.000 ft above MSL
UWI / API#:	Unknown / Unknown	Magnetic Declination:	7.357 °
Survey Name:	Cimarex Cascade 28 Federal #1H Rev1 PCG 13-June-14	Total Gravity Field Strength:	998.6876mgn (9.80865 Based)
Survey Date:	March 05, 2014	Gravity Model:	DOX
Tort / AHD / DDI / ERD Ratio:	98.780 ° / 5292.692 ft / 5.881 / 0.536	Total Magnetic Field Strength:	48253.728 nT
Coordinate Reference System:	NAD83 New Mexico State Plane, Eastern Zone, US Feet	Magnetic Dip Angle:	59.994 °
Location Lat / Long:	N 32° 6' 28.45798", W 103° 34' 53.53756"	Declination Date:	March 05, 2014
Location Grid N/E Y/X:	N 403804.000 ftUS, E 774114.600 ftUS	Magnetic Declination Model:	BGGM 2013
CRS Grid Convergence Angle:	0.3996 °	North Reference:	Grid North
Grid Scale Factor:	0.99997115	Grid Convergence Used:	0.3996 °
Version / Patch:	2.7.1043.0	Total Corr Mag North->Grid North:	6.9571 °
		Local Coord Referenced To:	Structure Reference Point

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	Northing (ftUS)	Easting (ftUS)	Latitude (N/S ° ' ")	Longitude (E/W ° ' ")
SHL Cascade 28 Federal #1H	0.00	0.00	270.00	0.00	0.00	0.00	0.00	N/A	403804.00	774114.60	N 32 6 28.46	W 103 34 53.54
Build 1.5°/100 to 9° Inc Nudge	5000.52	0.00	270.00	5000.52	0.00	0.00	0.00	0.00	403804.00	774114.60	N 32 6 28.46	W 103 34 53.54
Hold 9° Inc Nudge	5600.52	9.00	270.00	5598.06	8.41	0.00	-47.03	1.50	403804.00	774067.57	N 32 6 28.46	W 103 34 54.08
Build and turn 12°/100	9454.99	9.00	270.00	9405.07	116.19	0.00	-650.00	0.00	403804.00	773464.62	N 32 6 28.50	W 103 35 1.09
Landing Point	10203.42	90.00	181.43	9875.00	599.60	-475.64	-736.34	12.00	403328.38	773378.29	N 32 6 23.80	W 103 35 2.14
Cimarex Cascade 28 Federal #1H PBHL	14352.62	90.00	181.43	9875.00	4699.23	-4623.54	-840.03	0.00	399180.60	773274.60	N 32 5 42.77	W 103 35 3.68

Survey Type: Non-Def Plan

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

Description	Part	MD From (ft)	MD To (ft)	EOU Freq (ft)	Hole Size (in)	Casing Diameter (in)	Survey Tool Type	Borehole / Survey
-------------	------	-----------------	---------------	------------------	-------------------	-------------------------	------------------	-------------------

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	Northing (ftUS)	Easting (ftUS)	Latitude (N/S ° ' ")	Longitude (E/W ° ' ")
		1	0.000	14352.616	1/100.000	30.000	30.000	SLB_UNKNOWN			Original Borehole / Cimarex Cascade 28 Federal #1H Rev1	



Cimarex Cascade 28 Federal #1H Rev1 PCG 13-June-14 Proposal Geodetic Report

(Non-Def Plan)



Report Date:	June 13, 2014 - 02:38 PM	Survey / DLS Computation:	Minimum Curvature / Lubinski
Client:	Cimarex	Vertical Section Azimuth:	190.297 ° (Grid North)
Field:	NM Lea County (NAD 83)	Vertical Section Origin:	0.000 ft, 0.000 ft
Structure / Slot:	Cimarex Cascade 28 Federal #1H / Cimarex Cascade 28 Federal #1H	TVD Reference Datum:	Ground Level
Well:	Cimarex Cascade 28 Federal #1H	TVD Reference Elevation:	3385.000 ft above MSL
Borehole:	Original Borehole	Seabed / Ground Elevation:	3385.000 ft above MSL
UWI / API#:	Unknown / Unknown	Magnetic Declination:	7.357 °
Survey Name:	Cimarex Cascade 28 Federal #1H Rev1 PCG 13-June-14	Total Gravity Field Strength:	998.6876mgn (9.80665 Based)
Survey Date:	March 05, 2014	Gravity Model:	DOX
Tort / AHD / DDI / ERD Ratio:	98.780 ° / 5292.692 ft / 5.881 / 0.536	Total Magnetic Field Strength:	48253.728 nT
Coordinate Reference System:	NAD83 New Mexico State Plane, Eastern Zone, US Feet	Magnetic Dip Angle:	59.994 °
Location Lat / Long:	N 32° 6' 28.45798", W 103° 34' 53.53756"	Declination Date:	March 05, 2014
Location Grid N/E Y/X:	N 403804.000 ftUS, E 774114.600 ftUS	Magnetic Declination Model:	BGGM 2013
CRS Grid Convergence Angle:	0.3996 °	North Reference:	Grid North
Grid Scale Factor:	0.99997115	Grid Convergence Used:	0.3996 °
Version / Patch:	2.7.1043.0	Total Corr Mag North->Grid North:	6.9571 °
		Local Coord Referenced To:	Structure Reference Point

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	Northing (ftUS)	Easting (ftUS)	Latitude (N/S ° ' ")	Longitude (E/W ° ' ")
SHL Cascade 28 Federal #1H	0.00	0.00	270.00	0.00	0.00	0.00	0.00	N/A	403804.00	774114.60	N 32 6 28.46	W 103 34 53.54
Build 1.5°/100 to 9° Inc Nudge	5000.52	0.00	270.00	5000.52	0.00	0.00	0.00	0.00	403804.00	774114.60	N 32 6 28.46	W 103 34 53.54
Hold 9° Inc Nudge	5600.52	9.00	270.00	5598.06	8.41	0.00	-47.03	1.50	403804.00	774067.57	N 32 6 28.46	W 103 34 54.08
Build and turn 12°/100	9454.99	9.00	270.00	9405.07	116.19	0.00	-650.00	0.00	403804.00	773464.62	N 32 6 28.50	W 103 35 1.09
Landing Point	10203.42	90.00	181.43	9875.00	599.60	-475.64	-736.34	12.00	403328.38	773378.29	N 32 6 23.80	W 103 35 2.14
Cimarex Cascade 28 Federal #1H PBHL	14352.62	90.00	181.43	9875.00	4699.23	-4623.54	-840.03	0.00	399180.60	773274.60	N 32 5 42.77	W 103 35 3.68

Survey Type: Non-Def Plan

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

Description	Part	MD From (ft)	MD To (ft)	EOU Freq (ft)	Hole Size (in)	Casing Diameter (in)	Survey Tool Type	Borehole / Survey
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Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	Northing (ftUS)	Easting (ftUS)	Latitude (N/S ° ' ")	Longitude (E/W ° ' ")
		1	0.000	14352.616	1/100.000	30.000	30.000	SLB_UNKNOWN			Original Borehole / Cimarex Cascade 28 Federal #1H Rev1	

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

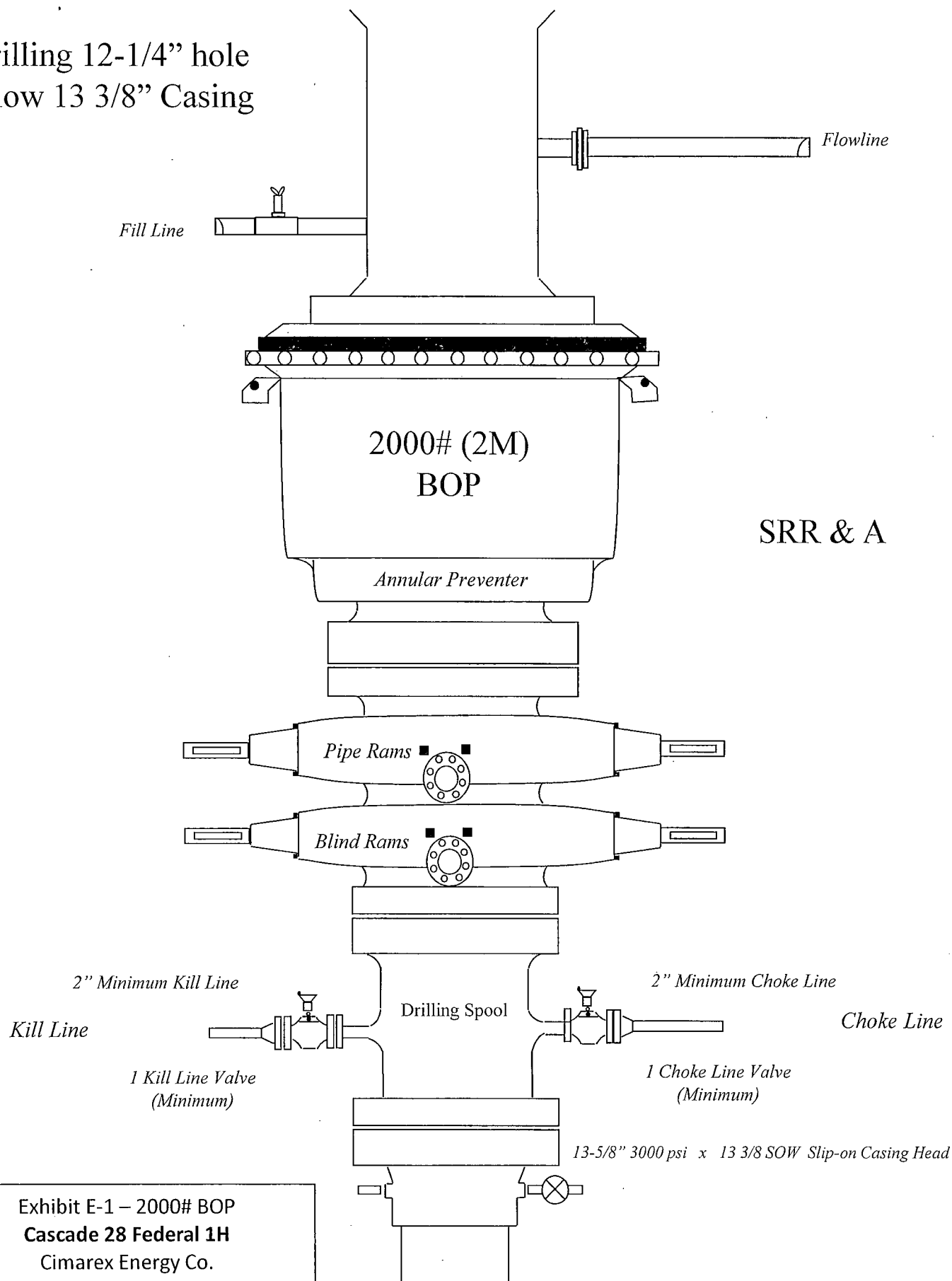


Exhibit E-1 – 2000# BOP

Cascade 28 Federal 1H

Cimarex Energy Co.

28-25S-33E

SHL 330 FNL & 1310 FWL

BHL 330 FSL & 440 FWL

Lea County, NM

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

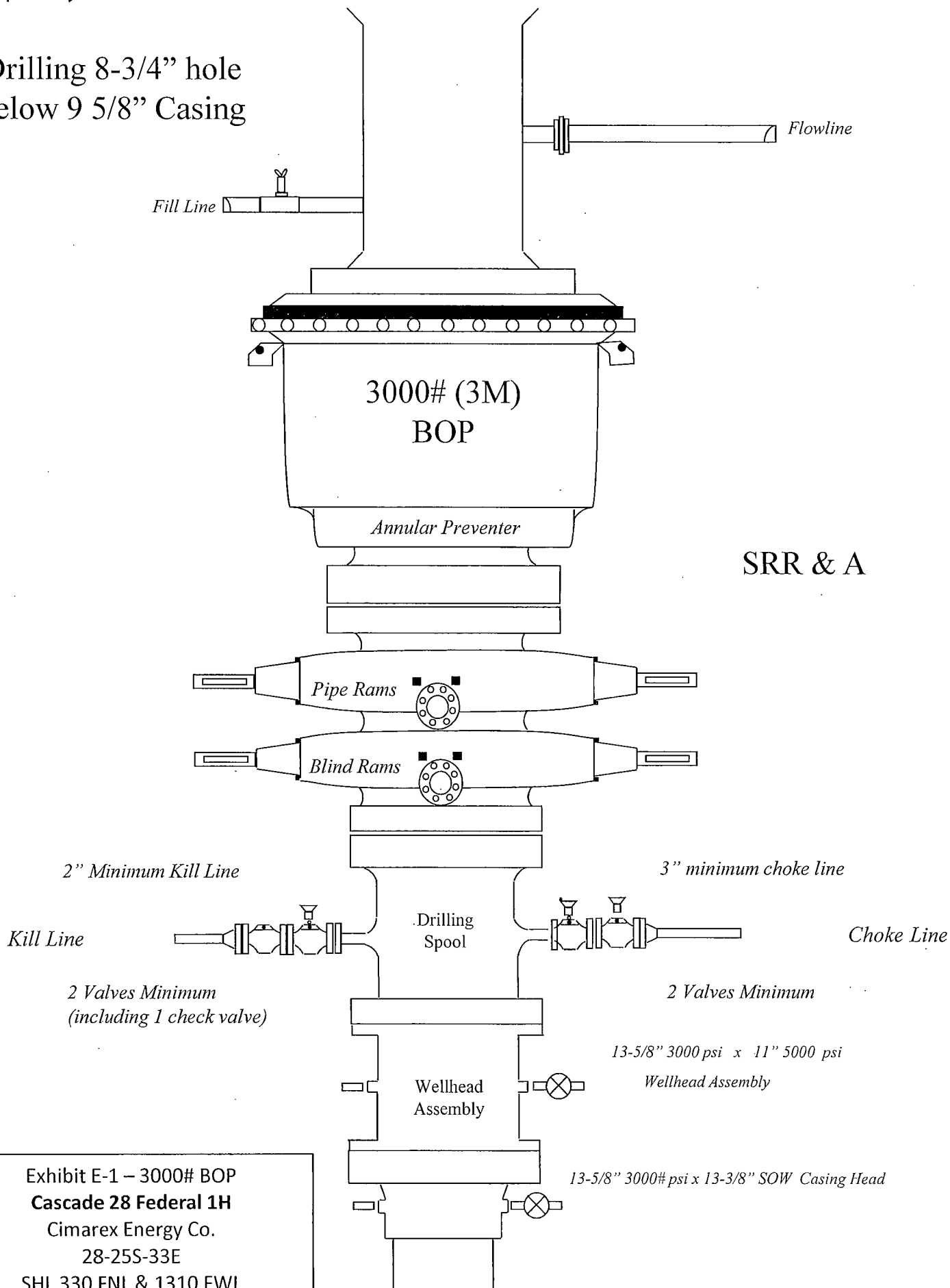
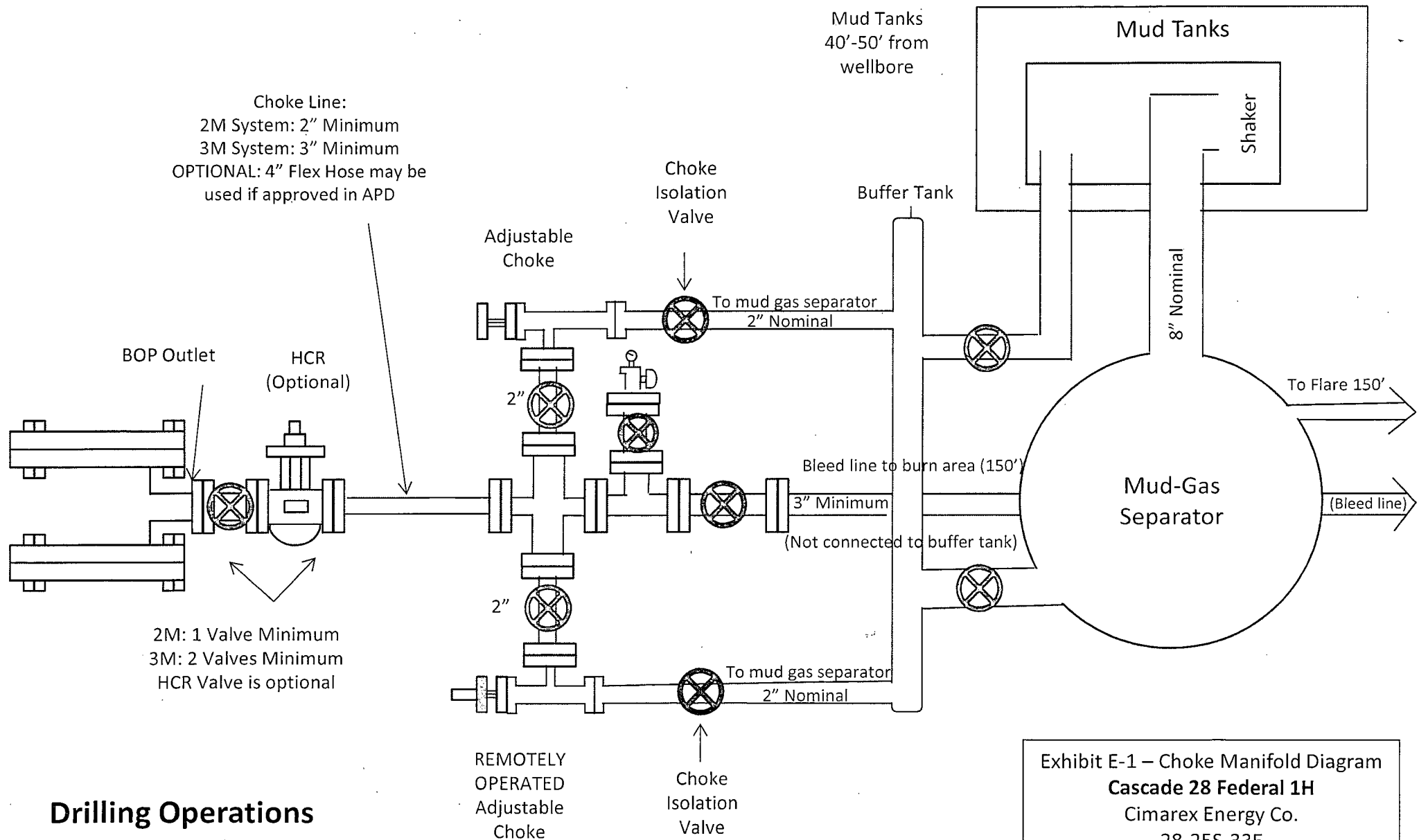


Exhibit E-1 – 3000# BOP
Cascade 28 Federal 1H
Cimarex Energy Co.
28-25S-33E
SHL 330 FNL & 1310 FWL
BHL 330 FSL & 440 FWL
Lea County, NM

Choke Line:
 2M System: 2" Minimum
 3M System: 3" Minimum
 OPTIONAL: 4" Flex Hose may be
 used if approved in APD



Drilling Operations Choke Manifold 2M/3M Service

Exhibit E-1 – Choke Manifold Diagram
Cascade 28 Federal 1H
 Cimarex Energy Co.
 28-25S-33E
 SHL 330 FNL & 1310 FWL
 BHL 330 FSL & 440 FWL
 Lea County, NM

Exhibit F-1 - Co-Flex Hose Hydrostatic Test

Cascade 28 Federal 1H

Cimarex Energy Co.

28-25S-33E

SHL 330 FNL & 1310 FWL

BHL 330 FSL & 440 FWL

Lea County, NM



Midwest Hose & Specialty, Inc.

INTERNAL HYDROSTATIC TEST REPORT

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



Midwest Hose
& Specialty, Inc.

Internal Hydrostatic Test Graph

March 3, 2011

Customer: Houston

Pick Ticket #: 94260

Hose Specifications

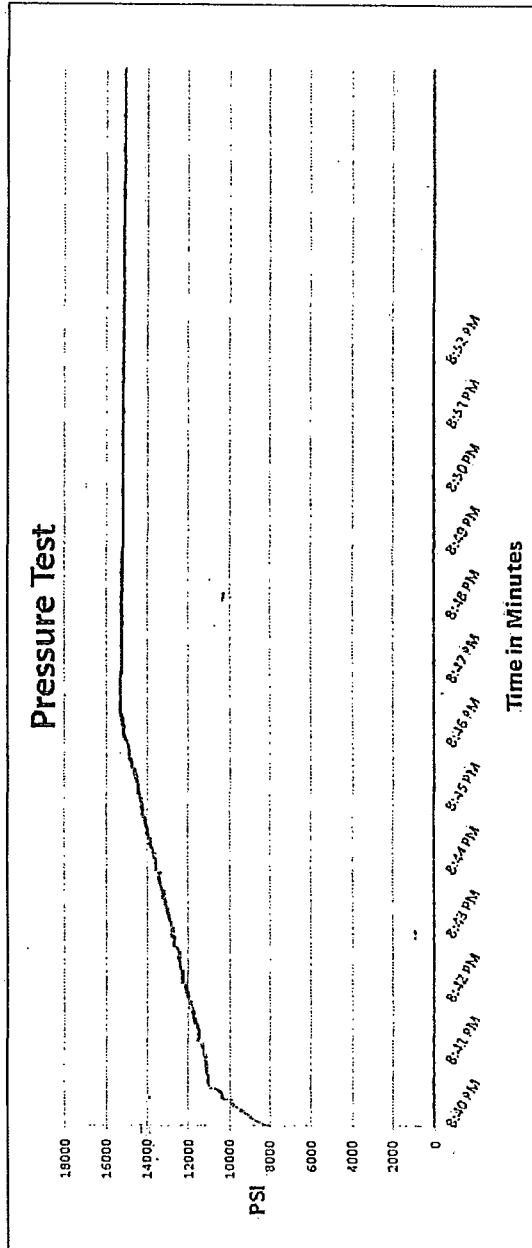
Hose Type
C&K
I.D.
4"
Working Pressure
10000 PSI

Length
45'
O.D.
6.09"

Verification

Type of Fittings
41/1610K
Die Size
6.38"
Hose Serial #
5544
Coupling Method
Swage
Final O.D.
6.25"
Hose Assembly Serial #
79793

Pressure Test



Test Pressure
15000 PSI

Time Held at Test Pressure
11 Minutes

Actual Burst Pressure

Peak Pressure
15483 PSI

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

Tested By: Zac McConnell

Approved By: Kim Thomas

[Signature]

[Signature]



Midwest Hose
& Specialty, Inc.

Exhibit F -3- Co-Flex Hose
Cascade 28 Federal 1H
Cimarex Energy Co.
28-25S-33E
SHL 330 FNL & 1310 FWL
BHL 330 FSL & 440 FWL
Lea 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-2 – Co-Flex Hose
Cascade 28 Federal 1H
Cimarex Energy Co.
28-25S-33E
SHL 330 FNL & 1310 FWL
BHL 330 FSL & 440 FWL
Lea County, NM



Midwest Hose & Specialty, Inc.

Certificate of Conformity

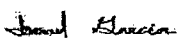
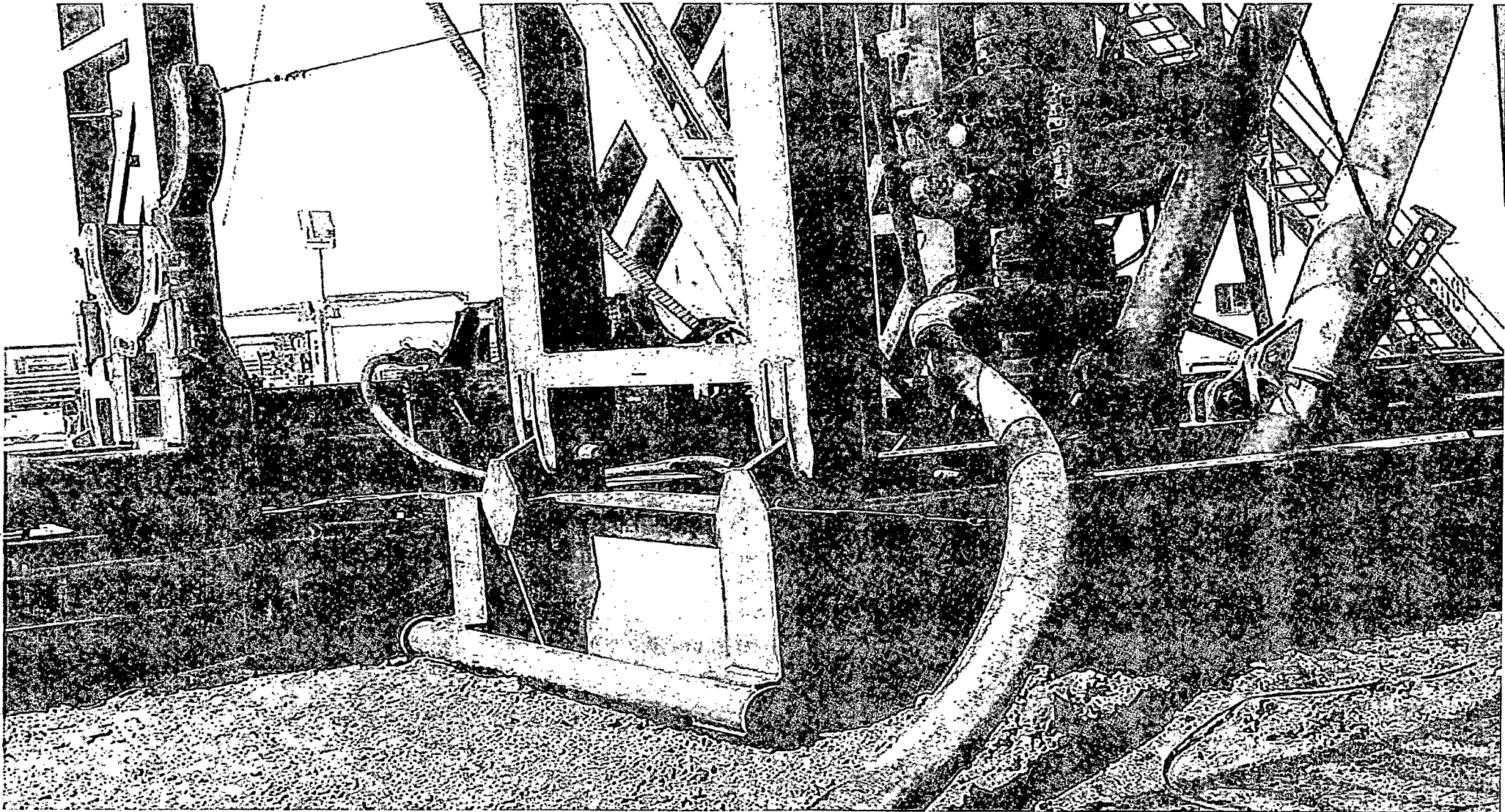
Customer:		PO
DEM		ODYD-271
SPECIFICATIONS		
Sales Order	Dated:	
79793	3/8/2011	
We hereby certify that the material supplied for the referenced purchase order to be true according to the requirements of the purchase order and current industry standards Supplier: Midwest Hose & Specialty, Inc. 10640 Tanner Road Houston, Texas 77041		
Comments:		
Approved:		Date:
		3/8/2011

Exhibit F – Co-Flex Hose
Cascade 28 Federal 1H
Cimarex Energy Co.
28-25S-33E
SHL 330 FNL & 1310 FWL
BHL 330 FSL & 440 FWL
Lea County, NM



Operator Certification Statement

Cascade 28 Federal #1H

Cimarex Energy Co.
UL: D, Sec. 28, 25S, 33E
Co., NM

HOBBSOCD

JAN 20 2015

RECEIVED

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 19 day of March, 2014

NAME: Aricka Easterling
Aricka Easterling

TITLE: Regulatory Compliance

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

TELEPHONE: 918-585-1100

EMAIL: AEasterling@cimarex.com

Field Representative: Same as above