HOBBS OD			MIN SURF
- · · ·	-alleli -		SUNF
Form 3160-3 (March 2012) AUG 1 6 2018	Callela Field OCD Field He interior Management TO DRILL OR REENTER	FORM APP OMB No. 10 Expires Octobe	ROVED 04-0137
REGENCED STA BUREAU OF LAND	HE INTERIOR MANAGEMENT	NMNM092199	â
APPLICATION FOR PERMIT	TO DRILL OR REENTER	6. If Indian, Allotee or T	ribe Name
la. Type of work: DRILL RE	ENTER	7 If Unit or CA Agreeme	Turney
Ib. Type of Well: Oil Well Gas Well Other	Single Zone Multiple Zone		
2. Name of Operator CAZA OPERATING LLC	9099)	9. APT Well-No. 30-025-4	5096
3a. Address 200 N. Loraine Street, Suite 1550 Midland	3b. Phone No. (include area code)           (432)682-7424	10. Field and Pool, or Explo WOLFCAMP	pratory 97965
<ol> <li>Location of Well (Report location clearly und in accordance w At surface NENW / 130 FNL / 2130 FWL / LAT 32.2 At proposed prod. zone SESW / 330 FNL / 2275 FWL</li> </ol>	282496 / LONG -103.49373	11. Sec., T. R. M. or Blk.ar SEC 29 / T23S / R34E	-
<ol> <li>Distance in miles and direction from nearest town or post office</li> <li>18.5 miles</li> </ol>	<del></del>	12. County or Parish LEA	13. State NM
15. Distance from proposed* location to nearest 130 feet property or lease line, ft. (Also to nearest drig. unit line, if any)	16. No. of acres in lease 17. Sp 560 160	pacing Unit dedicated to this well	
<ol> <li>Distance from proposed location* to nearest well, drilling, completed, 50 feet applied for, on this lease, ft.</li> </ol>		LM/BIA Bond No. on file D: NMB000471	
21. Elevations (Show whether DF, KDB, RT, GL, etc.) 3539 feet	22 Approximate date work will start* 02/15/2017	23. Estimated duration 30 days	·
	24. Attachments		
<ol> <li>Fhe following, completed in accordance with the requirements of y</li> <li>Well plat certified by a registered surveyor.</li> <li>A Drilling Plan.</li> <li>A Surface Use Plan (if the location is on National Forest Sy SUPO must be filed with the appropriate Forest Service Office</li> </ol>	4. Bond to cover the oper ltem 20 above). 5. Operator certification	to this form: rations unless covered by an exis c information and/or plans as may	C X
25. Signature (Electronic-Submission)	Name (Printed/Typed) Tony B Sam / Ph: (432)682-74	124 Dat	e 0/26/2016
itle VP Operations			
Approved by (Signature) (Electronic Submission)	Name (Printed/Typed) Cody Layton / Ph: (575)234-59	Dat 059 08	e 3/04/2018
itle Assistant Field Manager Lands & Minerals	Office HOBBS		
Application approval does not warrant or certify that the applicar conduct operations thereon. Conditions of approval, if any, are attached.	1	e subject lease which would entitl	e the applicant to
Fitle 18 U.S.C. Section 1001 and Title 43 U.S.C. Section 1212, make States any false, fictitious or fraudulent statements or representation	it a crime for any person knowingly and willfully ons as to any matter within its jurisdiction.	to make to any department or ag	ency of the United
(Continued on page 2)		*(Instruc	tions on page 2)

GCP Rec 08/16/18

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VZ 08/16/18

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ITH CONDITIONS APPRO APPROVED . Approval Date: 08/04/2018

### INSTRUCTIONS

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GENERAL: This form is designed for submitting proposals to perform certain well operations, as indicated on Federal and Indian lands and leases for action by appropriate Federal agencies, pursuant to applicable Federal laws and regulations. Any necessary special instructions concerning the use of this form and the number of copies to be submitted, particularly with regard to local, area, or regional procedures and practices, either are shown below or will be issued by, or may be obtained from local Federal offices.

ITEM 1: If the proposal is to redrill to the same reservoir at a different subsurface location or to a new reservoir, use this form with appropriate notations. Consult applicable Federal regulations concerning subsequent work proposals or reports on the well.

ITEM 4: Locations on Federal or Indian land should be described in accordance with Federal requirements. Consult local Federal offices for specific instructions.

ITEM 14: Needed only when location of well cannot readily be found by road from the land or lease description. A plat, or plats, separate or on the reverse side, showing the roads to, and the surveyed location of, the well, and any other required information, should be furnished when required by Federal agency offices.

ITEMS 15 AND 18: If well is to be, or has been directionally drilled, give distances for subsurface location of hole in any present or objective productive zone.

ITEM 22: Consult applicable Federal regulations, or appropriate officials, concerning approval of the proposal before operations are started.

# The Privacy Act of 1974 and regulation in 43 CFR 2:48(d) provide that you be furnished the following information in connection with information required by this application.

NOTICES

AUTHORITY: 30 U.S.C. 181 et seq., 25 U.S.C. 396; 43 CFR 3160

PRINCIPAL PURPOSES: The information will be used to: (1) process and evaluate your application for a permit to drill a new oil, gas, or service well or to reenter a plugged and abandoned well; and (2) document, for administrative use, information for the management, disposal and use of National Resource Lands and resources including (a) analyzing your proposal to discover and extract the Federal or Indian resources encountered; (b) reviewing procedures and equipment and the projected impact on the land involved; and (c) evaluating the effects of the proposed operation on the surface and subsurface water and other environmental impacts. ROUTINE USE: Information from the record and/or the record will be transferred to appropriate Federal, State, and local or foreign agencies, when relevant to civil, criminal or regulatory investigations or prosecution, in connection with congressional inquiries and for regulatory responsibilities.

EFFECT OF NOT PROVIDING INFORMATION: Filing of this application and disclosure of the information is mandatory only if you elect to initiate a drilling or reentry operation on an oil and gas lease.

The Paperwork Reduction Act of 1995 requires us to inform you that:

The BLM collects this information to allow evaluation of the technical, safety, and environmental factors involved with drilling for oil and/or gas on Federal and Indian oil and gas leases. This information will be used to analyze and approve applications. Response to this request is mandatory only if the operator elects to initiate drilling or reentry operations on an oil and gas lease. The BLM would like you to know that you do not have to respond to this or any other Federal agency-sponsored information collection unless it displays a currently valid OMB control number.

BURDEN HOURS STATEMENT: Public reporting burden for this form is estimated to average 8 hours per response, including the time for reviewing instructions, gathering and maintaining data, and completing and reviewing the form. Direct comments regarding the burden estimate or any other aspect of this form to U.S. Department of the Interior, Bureau of Land Management (1004-0137), Bureau Information Collection Clearance Officer (WO-630), 1849 C Street, N.W., Mail Stop 401 LS, Washington, D.C. 20240.

(Continued on page 3)

(Form 3160-3, page 2)

Approval Date: 08/04/2018

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## **Additional Operator Remarks**

## Location of Well

SHL: NENW / 130 FNL / 2130 FWL / TWSP: 23S / RANGE: 34E / SECTION: 29 / LAT: 32.282496 / LONG: -103.49373 (TVD: 0 feet, MD: 0 feet)
 PPP: NENW / 351 FNL / 2017 FWL / TWSP: 23S / RANGE: 34E / SECTION: 29 / LAT: 32.281912 / LONG: -103.493369 (TVD: 11485 feet, MD: 11562 feet)
 BHL: SESW / 330 FNL / 2275 FWL / TWSP: 23S / RANGE: 34E / SECTION: 29 / LAT: 32.269251 / LONG: -103.493239 (TVD: 11647 feet, MD: 16200 feet)

## **BLM Point of Contact**

Name: Sipra Dahal Title: Legal Instruments Examiner Phone: 5752345983 Email: sdahal@blm.gov

### **Review and Appeal Rights**

A person contesting a decision shall request a State Director review. This request must be filed within 20 working days of receipt of the Notice with the appropriate State Director (see 43 CFR 3165.3). The State Director review decision may be appealed to the Interior Board of Land Appeals, 801 North Quincy Street, Suite 300, Arlington, VA 22203 (see 43 CFR 3165.4). Contact the above listed Bureau of Land Management office for further information.

<b>WAFMSS</b>	: `	App	lication Data F	Repor
U.S. Department of the Interior BUREAU OF LAND MANAGEMENT				8/07/201
APD ID: 10400005035		Submission Date: 09/2	26/2016	hasi dar
Operator Name: CAZA OPERATING LLC				ຣູ້າເ <b>ຕີ ຣູຟດີ (0</b> 5
Well Name: COPPERLINE WEST 29 FEE	DERAL	Well Number: 5H	Show	Final Tex
Well Type: OIL WELL		Well Work Type: Drill		
Section 1 - General				
APD ID: 10400005035	Tie to previo	ous NOS?	Submission Date	09/26/20
BLM Office: HOBBS	User: Tony B	Sam	Title: VP Operations	
Federal/Indian APD: FED	Is the first le	ase penetrated for proc	luction Federal or Indian	? FED
ease number: NMNM092199	Lease Acres	: 560		
Surface access agreement in place?	Allotted?	Reservat	ion:	
Variantine and the second	di çîsteyetî	din grandati		n na san an an Na sana Na sana
Nersemani mereken				
Agreement name:	ters ters to the source of the δ	y y standard an	and and the second s	<u> </u>
Keep application confidential? YES				
Permitting Agent? YES	APD Operato	or: CAZA OPERATING L	LC	
Operator letter of designation:				
		•		
Operator Info				
Operator Organization Name: CAZA OPI	ERATING LLC			
Operator Address: 200 N. Loraine Street	, Suite 1550	7: 70	704	
Operator PO Box:	. ·	<b>Zip</b> : 79	//01	
Operator City: Midland Stat	e: TX			
<b>Operator Phone:</b> (432)682-7424				
Operator Internet Address:				
Section 2 - Well Inform	nation			
Vell in Master Development Plan? NO		ter Development Plan n	ame:	
Vell in Master SUPO? NO		ster SUPO name:		
<b>Vell in Master Drilling Plan?</b> NO		ster Drilling Plan name:		
	ERAL We	II Number: 5H	Well API Number:	
<b>Well Name:</b> COPPERLINE WEST 29 FED				

## 

U.S. Department of the Interior BUREAU OF LAND MANAGEMENT

Submission Date: 09/26/2016

KIRS HENDES

08/07/2018

SUPO Data Report

1.0

Row(s) Exist? YES

Show Final Text

APD ID: 10400005035 Operator Name: CAZA OPERATING LLC Well Name: COPPERLINE WEST 29 FEDERAL Well Type: OIL WELL

Well Work Type: Drill

Well Number: 5H

## Section 1 - Existing Roads

Will existing roads be used? YES

#### Existing Road Map:

0355 Well Site Plan\_08-30-2016.pdf

Existing Road Purpose: ACCESS

ROW ID(s)

ID:

Do the existing roads need to be improved? NO

Existing Road Improvement Description:

**Existing Road Improvement Attachment:** 

Section 2 - New or Reconstructed Access Roads

Will new roads be needed? NO

## Section 3 - Location of Existing Wells

Existing Wells Map? YES

Attach Well map:

5H One Mile Circles\_09-06-2016.jpg

Well Name: COPPERLINE WEST 29 FEDERAL

#### Well Number: 5H

Multiple Well Pad Name:

**COPPERLINE WEST 29** 

FEDERAL Number of Legs:

**Describe other minerals:** 

Is the proposed well in a Helium production area? N Use Existing Well Pad? YES Type of Well Pad: MULTIPLE WELL Well Class: HORIZONTAL

Well Work Type: Drill

Well Type: OIL WELL

**Describe Well Type:** 

Well sub-Type: APPRAISAL

**Describe sub-type:** 

Distance to town: 18.5 Miles

Distance to nearest well: 50 FT

Reservoir well spacing assigned acres Measurement: 160 Acres

Well plat: Copperline\_West\_29\_Federal\_5H\_C\_102\_signed\_20180428074513.pdf

Well work start Date: 02/15/2017

## **Section 3 - Well Location Table**

Survey Type: RECTANGULAR

**Describe Survey Type:** 

Datum: NAD83

Vertical Datum: NAVD88

Duration: 30 DAYS

Survey number: 16.11.0355

	NS-Foot	NS Indicator	EW-Foot	EW Indicator	Twsp	Range	Section	Aliquot/Lot/Tract	Latitude	Longitude	County	State	Meridian	Lease Type	Lease Number	Elevation	MD	TVD
SHL Leg #1	130	FNL	213 0	FWL	23S	34E	29	Aliquot NENW	32.28249 6	- 103.4937 3	LEA	NEW MEXI CO	NEW MEXI CO	F	FEE	353 9	0	0
KOP Leg #1	130	FNL	213 0	FWL	23S	34E	29	Aliquot NENW	32.28249 6	- 103.4937 3	LEA		NEW MEXI CO	F	FEE	- 747 1	110 10	110 10
PPP Leg #1	351	FNL	201 7	FWL	23S	34E	29	Aliquot NENW	32.28191 2	- 103.4933 69	LEA		NEW MEXI CO	F	FEE	- <sup>·</sup> 794 6	115 62	114 85

New surface disturbance? Y

Number: 3H

Distance to lease line: 130 FT

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# AFMSS

U.S. Department of the Interior BUREAU OF LAND MANAGEMENT

## Drilling Plan Data Report

08/07/2018

APD ID: 10400005035

Well Type: OIL WELL

**Operator Name: CAZA OPERATING LLC** 

Well Name: COPPERLINE WEST 29 FEDERAL

Well Number: 5H

Submission Date: 09/26/2016

Show Final Text

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Well Work Type: Drill

## Section 1 - Geologic Formations

Formation		: .	True Vertical	Measured	· .:;		Producing
ID .	Formation Name	Elevation	Depth	Depth	Lithologies	Mineral Resources	Formation
1	RUSTLER	3562	1005	1005		NONE	No
2	TOP SALT	2334	1205	1205	SALT	NONE	No
3	BASE OF SALT	844	2695	2695	· .	NONE	No
4	DELAWARE	-1566	5105	5105		NONE	No
5	CHERRY CANYON	-2238	5800	5800		NONE	No
6	BRUSHY CANYON	-3538	7100	7100		NONE	No
7	BONE SPRING 1ST	-6183	9745	9745	SANDSTONE	NONE	No
8	BONE SPRING 2ND	-7188	10750	10750	SANDSTONE	NONE	No
9	BONE SPRING 3RD	-7688	11250	11257.5	SANDSTONE	NONE	No
10	WOLFCAMP	-7923	11485	11562.5		NONE	Yes

## Section 2 - Blowout Prevention

Pressure Rating (PSI): 5M

Rating Depth: 15000

Equipment: Rotating head with a rating of 500psi will be used. A remote kill line and gas buster will be used.

## Requesting Variance? YES

Variance request: Variance is requested for the use of a coflex hose for the choke line to from the BOP to the choke manifold. A variance is requested to use 1502(15,000psi working pressure) hammer unions downstream of the Choke Manifold used to connect the mud/gas separator and panic line. See choke manifold diagram.

**Testing Procedure:** Minimum Working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the 13-3/8 inch 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. The appropriate BLM office shall be notified a minimum of 4 hours in advance for a representative to witness the tests. 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

Well Name: COPPERLINE WEST 29 FEDERAL

Well Number: 5H

cut-off is eight hours after bumping the pug. BOP/BOPE testing can begin after cut-off or once cement reaches 500PSI 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). The tests shall be done by an independent service company utilizing a test plug not a cup or J-packer. The operator also has the option of utilizing an independent tester to test without a plug (i.e. against the casing) pursuant to Onshore Order 2 with the pressure not to exceed 70% of the burst rating for the casing. Any test against the casing must meet the WOC time for water basin (18 hours) or potash (24 hours) or 500 pounds compressive strength, whichever is greater prior to initiating the test (see casing segment as lead cement may be critical item). a. The results of the test shall be reported to the appropriate BLM office. b. 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. c. 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.

#### **Choke Diagram Attachment:**

Choke Schematic\_08-29-2016.docx

#### **BOP Diagram Attachment:**

Copperline\_West\_29\_Fed\_5H\_BOP\_Schematic\_20180428064819.pdf

Copperline\_West\_29\_Fed\_6H\_Coflex\_Hose\_Cert\_20180503133601.pdf

## Section 3 - Casing

Casing ID	String Type	Hole Size	Csg Size	Condition	Standard	Tapered String	Top Set MD	Bottom Set MD	Top Set TVD	Bottom Set TVD	Top Set MSL	Bottom Set MSL	Calculated casing length MD	Grade	Weight	Joint Type	Collapse SF	Burst SF	Joint SF Type	Joint SF	Body SF Type	Body SF
	CONDUCT OR	26	20.0	NEW	API	N	0	120	0	120	3539	3419	120	H-40	94	STC						
2	SURFACE	17.5	13.375	NEW	API	N	0	1055	0	1055	3539	-2484	1055	J-55	54.5	STC	2.32	1.64	DRY	8.94	DRY	14.8 4
	INTERMED	12.2 5	9.625	NEW	API	N	0	5055	0	5055	3539	-1516	5055	L-80	40	LTC	1.47	1.23	DRY	12.7 4	DRY	13.9 5
	PRODUCTI ON	8.75	5.5	NEW	API	N	0	16200	0	11646	3539	- 12661	16200	P- 110	20	BUTT	2.13	2.4	DRY	2.99	DRY	2.87

#### **Casing Attachments**

Well Name: COPPERLINE WEST 29 FEDERAL

Well Number: 5H

Casing ID: 1	String Type: CONDUCTOR	
Inspection Document:		
Spec Document:		
Tapered String Spec:		
Casing Design Assum	ptions and Worksheet(s):	
Casing ID: 2	String Type: SURFACE	
Inspection Document:		
• • • • • • • • • • • • • • • • • • • •		
Spec Document:		
Tapered String Spec:		
Casing Design Assum	ptions and Worksheet(s):	
Copperline_West	_29_Fed_5H_Casing_and_Cement_Design_20180428070017.pdf	
	· · · · · · · · · · · · · · · · · · ·	
Casing ID: 3	String Type: INTERMEDIATE	
Inspection Document:		
•		
Spec Document:		
opeo Decamenti		
Tapered String Spec:		
Tapered String Spec: Casing Design Assum	ptions and Worksheet(s): _29_Fed_5H_Casing_and_Cement_Design_20180428070037.pdf	

Weil Name: COPPERLINE WEST 29 FEDERAL

Well Number: 5H

#### **Casing Attachments**

Casing ID: 4

String Type: PRODUCTION

Inspection Document:

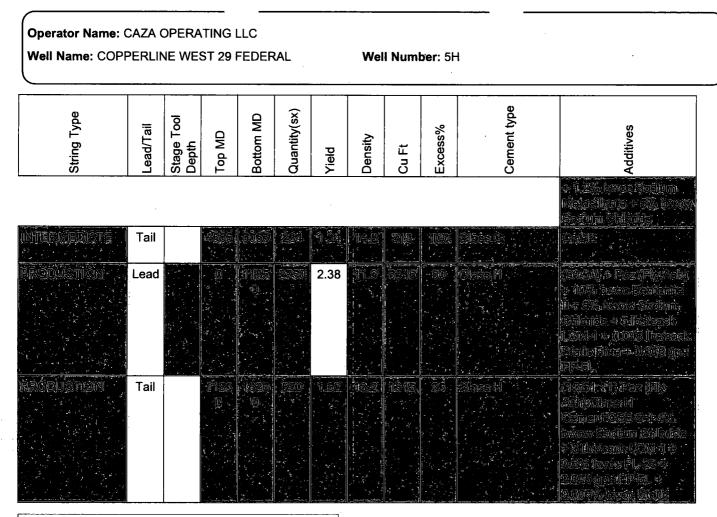
Spec Document:

**Tapered String Spec:** 

### Casing Design Assumptions and Worksheet(s):

Copperline\_West\_29\_Fed\_5H\_Casing\_and\_Cement\_Design\_20180428070046.pdf

Section	4 - Ce	emen	t								
String Type	Lead/Tail	Stage Tool Depth	Top MD	Bottom MD	Quantity(sx)	Yield	Density	Cu Ft	Excess%	Cement type	Additives
ANDUSINGR	Lead		۲	1846		1.93	125	1710		(dimerC 64612	4 4%, hores Baltanno II 1226 brios Galeino Chlustes C.C.S. Dodaci Colle Pate - 0.00578 Loros State Phys 12006 das Phys. L
newski star					-			and state.	1. A. S. M.		
	Lead		Ō,	765	¥223	1.93	18,8				249 Prot Calabri Chlada- 025 Baras Calo Raka - 0.0075 Dvor Stale Rice - 1006 cas PP-11.
NULINE VACAR	Tail		756	10.55	166	1.84	94.5	229	Ţ.ŪŘ		1.5% byge Seletan Kiloniste (* 1965 Bostenek Steinstfreger 9.965 gas FP 19.
	Lead					2.13		1240			(65255) - Por (Ay Ash) + 49, burg Bargatte II + 52, burg MPA 0283, burg AL-52 - 5 Barack Calls T - 9, 12 Barack Galo Field Auss - <u>COM</u> ens FP-01



## Section 5 - Circulating Medium

Mud System Type: Closed

Will an air or gas system be Used? NO

Description of the equipment for the circulating system in accordance with Onshore Order #2:

Diagram of the equipment for the circulating system in accordance with Onshore Order #2:

**Describe what will be on location to control well or mitigate other conditions:** Sufficient mud will be on location to control any abnormal conditions encountered. Such as but not limited to a kick, lost circulation and hole sloughing.

**Describe the mud monitoring system utilized:** A Pason PVT system will be rigged up prior to spudding the well. A volume monitoring system that measures, calculates, and displays readings from the mud system on the rig to alert the rig crew of impending gas kicks and lost circulation issues. Components a) PVT Pit Bull monitor: Acts as the heart of the system, containing all the controls, switches, and alarms. Typically, it is mounted near the driller's console. b) Junction box: Provides a safe, convenient place for making the wiring connections. c) Mud probes: Measure the volume of drilling fluid in each individual tank. d) Flow sensor: Measures the relative amount of mud flowing in the return line.

## Circulating Medium Table

#### Well Name: COPPERLINE WEST 29 FEDERAL

Well Number: 5H

Top Depth	Bottom Depth	Mud Type	Min Weight (Ibs/gal)	Max Weight (Ibs/gal)	Density (lbs/cu ft)	Gel Strength (lbs/100 sqft)	На	Viscosity (CP)	Salinity (ppm)	Filtration (cc)	Additional Characteristics
1055	5055	SALT SATURATED	9.8	10	75	0.1	9.5	2	150000	0	
5055	1620 0	SALT SATURATED	8.6	9.1	71	0.4	9.5	6	125000	18	
0	1055	SPUD MUD	8.4	8.9	66	0.12	9.5	10	0	0	

## Section 6 - Test, Logging, Coring

List of production tests including testing procedures, equipment and safety measures:

no production tests

List of open and cased hole logs run in the well:

DS,MWD,MUDLOG

Coring operation description for the well:

no coring

## **Section 7 - Pressure**

Anticipated Bottom Hole Pressure: 3500

Anticipated Surface Pressure: 937.65

Anticipated Bottom Hole Temperature(F): 162

Anticipated abnormal pressures, temperatures, or potential geologic hazards? NO

Describe:

Contingency Plans geoharzards description:

Contingency Plans geohazards attachment:

Hydrogen Sulfide drilling operations plan required? NO

Hydrogen sulfide drilling operations plan:

Well Name: COPPERLINE WEST 29 FEDERAL

Well Number: 5H

## Section 8 - Other Information

#### Proposed horizontal/directional/multi-lateral plan submission:

160803 Copperline West 29 Federal 5H Directional Plan\_08-30-2016.pdf

#### Other proposed operations facets description:

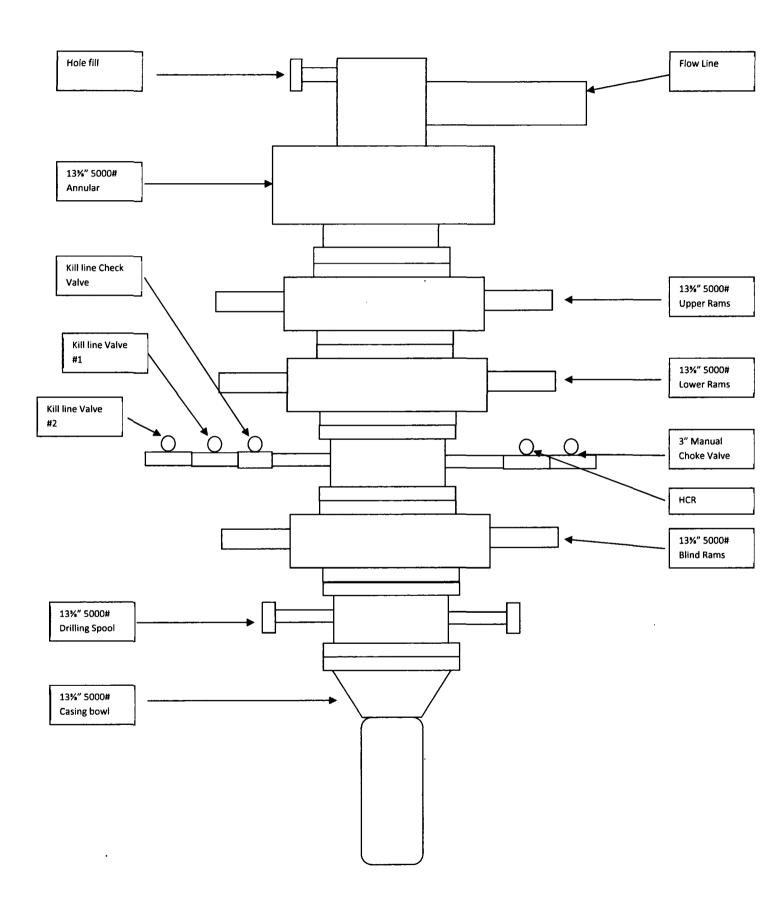
H2S Plan Informatiste casing is computed of a hyper of cycing. 9,665° J25 407 and 0,625 HCL20 447 This to Gre reason in the casing table for boring 2 Informations caringe. Gas Galina Plan

#### Other proposed operations facets attachment:

160803 Copperline West 29 Federal 5H Directional Plot\_08-30-2016.pdf Copperline\_West\_29\_Fed\_5H\_H2S\_plan\_20180428074932.pdf

Copperline\_West\_29\_Fed\_5H\_Gas\_Capture\_Plan\_20180503132436.pdf

#### Other Variance attachment:



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## COPPER STATE RUBBER VISUAL INSPECTION / HYDROSTATIC TEST REPORT CHOKE & KILL HOSE 10,000 P.S.I. W/P X 15,000 P.S.I. T/P SPEC: 090-1915 HS H2S SUITABLE

SHOP ORDER NO.:16454	SIZE: <u>4"</u> 1.D.
SERIAL NO.: 22199	LENGTH FT IN.
CONNECTIONS: <u>4-1/16"</u> HT-X18	10,000 PSI API FLANGES 840
VISUAL INSPE	CTION
(A) END CAPS / SLEEVE RECESS: (B) EXTERIOR / COVER / BRANDING:	ОК ОК
(C) INTERIOR TUBE:	OK
HYDROSTATIC	TEST
5 MIN. @ 10,000 PSI	
2 MIN. @ 0 PSI51'	OAL
3 MIN. @ 15,000 PSI	
WITNESSED BY: DATE November 20, 2006 FORM QA-21- REV-2 3-22-00	 

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	NICE MICH CONTRACTOR
	Anna Seate Bullion June 2019 1111 11 11 1111
	Copper State Rubber. Inc. Phoenix, Arizona
1771 (MUM) (MUM)	DATE
EXCELLENCE -	No mono
E A SAUTES	4" A"
a statistica a statis	50'
	TYPE OF ENDS 4-1/16" 10,000 PSI API FLANGES
	TYPE OF HOSE 15,000 PSI TEST
	CHOKE & KILL

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#### In a Lesser Prairie-Chicken section.

13 3/8	surface	csg in a	17 1/2	inch hole.	D	esign Facto	<u>rs</u>	SUR	FACE
Segment	#/ft	Gra	ade	Coupling	Joint	Collapse	Burst	Length	Weight
"A"	54.50	J	55	ST&C	8.94	2.32	0.95	1,055	57,498
"B"	and a second second		· · · · · · · ·					0	0
w/8.4#/g r	nud, 30min Sfo	Csg Test psig:	1,451	Tail Cmt	does not	circ to sfc.	Totals:	1,055	57,498
Comparison of	f Proposed t	o Minimum F	Required Ce	ement Volume	<u>s</u>				
Hole	Annular	1 Stage	1 Stage	Min	1 Stage	Drilling	Calc	Req'd	Min Dist
Size	Volume	Cmt Sx	CuFt Cmt	Cu Ft	% Excess	Mud Wt	MASP	BOPE	Hole-Cplg
17 1/2	0.6946	981	1795	806	123	8.90	1660	2M	1.56
				::::::	i				
Burst Frac Grad	lient(s) for Se	gment(s) A, I	B = 2.59, b	All > 0.70,	بر ویکر بر میں بر س	· · · · · · · · · · · · · · · · · · ·			
9 5/8	casing in	a series of the second se	13 3/8			Design Fac			<b>NEDIATE</b>
Segment	#/ft	Gra		Coupling	Joint	Collapse	Burst	Length	Weight
"A"	40.00		55	LT&C	2.35	1.27	0.75	3,900	156,000
"B"	40.00	HCL		LT&C	12.74	1.47	1.09	1,642	65,680
w/8.4#/g n	nud, 30min Sfo	Csg Test psig:	1,063				Totals:	5,542	221,680
Hole Size	Annular Volume	1 Stage Cmt Sx	1 Stage CuFt Cmt	ieve a top of Min Cu Ft	0 1 Stage % Excess	ft from su Drilling Mud Wt	Calc MASP	1055 Req'd BOPE	Hole-Cpl
Hole Size 12 1/4	Annular Volume 0.3132	1 Stage Cmt Sx 1735	1 Stage CuFt Cmt 3696	Min	1 Stage	Drilling	Calc MASP 2821	Req'd BOPE 3M	Min Dist Hole-Cpl 0.81
Hole Size 12 1/4 Setting	Annular Volume 0.3132 g Depths for	1 Stage Cmt Sx 1735	1 Stage CuFt Cmt	Min Cu Ft	1 Stage % Excess	Drilling Mud Wt	Calc MASP 2821 sum of sx	Req'd           BOPE           3Μ           Σ CuFt	Min Dist Hole-Cpl 0.81
Hole Size 12 1/4 Setting excess cmt	Annular Volume 0.3132 g Depths for by stage % :	1 Stage Cmt Sx 1735 D V Tool(s):	1 Stage CuFt Cmt 3696 4000	Min Cu Ft	1 Stage % Excess	Drilling Mud Wt	Calc MASP 2821	Req'd BOPE 3M	Min Dist Hole-Cpl 0.81 Σ%exces
Hole Size 12 1/4 Setting excess cmt class 'C' tail cm	Annular Volume 0.3132 g Depths for by stage % : t yld > 1.35	1 Stage Cmt Sx 1735 D V Tool(s): 192	1 Stage CuFt Cmt 3696 4000 -100	Min Cu Ft 1807	1 Stage % Excess	Drilling Mud Wt	Calc MASP 2821 sum of sx	Req'd           BOPE           3Μ           Σ CuFt	Min Dist Hole-Cpl 0.81 Σ%excess
Hole Size 12 1/4 Setting excess cmt class 'C' tail cm urst Frac Grad	Annular Volume 0.3132 g Depths for by stage % : t yld > 1.35 lient(s) for Se	1 Stage Cmt Sx 1735 D V Tool(s): 192 gment(s): A,	1 Stage CuFt Cmt 3696 4000 -100 B, C, D = 1.0	Min Cu Ft 1807	1 Stage % Excess 105	Drilling Mud Wt 10.00	Calc MASP 2821 sum of sx 770	Req'd           BOPE           3M           Σ CuFt           1464	Min Dist Hole-Cpl 0.81 Σ%excess -19
Hole Size 12 1/4 Setting excess cmt Class 'C' tail cm Surst Frac Grad 5 1/2	Annular Volume 0.3132 g Depths for by stage % : t yld > 1.35 lient(s) for Se casing in:	1 Stage Cmt Sx 1735 D V Tool(s): 192 gment(s): A, side the	1 Stage CuFt Cmt 3696 4000 -100 B, C, D = 1.0 9 5/8	Min Cu Ft 1807	1 Stage % Excess 105 > 0.70, OK	Drilling Mud Wt 10.00 Design Fac	Calc MASP 2821 sum of sx 770	Req'd BOPE 3M Σ CuFt 1464	Min Dist Hole-Cpl 0.81 Σ%excess -19
Hole Size 12 1/4 Setting excess cmt Class 'C' tail cm Burst Frac Grad 5 1/2 Segment	Annular Volume 0.3132 g Depths for by stage % : t yld > 1.35 lient(s) for Se casing in: #/ft	1 Stage Cmt Sx 1735 D V Tool(s): 192 gment(s): A, side the Gra	1 Stage CuFt Cmt 3696 4000 -100 B, C, D = 1.0 9 5/8 ide	Min Cu Ft 1807	1 Stage % Excess 105 > 0.70, OK Body	Drilling Mud Wt 10.00 <u>Design Fac</u> Collapse	Caic MASP 2821 <u>sum of sx</u> 770	Req'd BOPE 3M Σ CuFt 1464 RODUCTIO	Min Dist Hole-Cpl 0.81 Σ%excess -19 N Weight
Hole Size 12 1/4 Setting excess cmt class 'C' tail cm burst Frac Grad 5 1/2 Segment "A"	Annular Volume 0.3132 g Depths for by stage % : t yld > 1.35 lient(s) for Se casing in: #/ft 20.00	1 Stage Cmt Sx 1735 D V Tool(s): 192 gment(s): A, side the Gra P	1 Stage CuFt Cmt 3696 4000 -100 B, C, D = 1.0 9 5/8 ide 110	Min Cu Ft 1807 1, b, c, d All <b>Coupling</b> BUTT	1 Stage % Excess 105 > 0.70, ОК Воdy 2.87	Drilling Mud Wt 10.00 <u>Design Fac</u> Collapse 2.13	Calc MASP 2821 <u>sum of sx</u> 770 <u>ctors</u> P <u>Burst</u> 2.4	Req'd           BOPE           3M           Σ CuFt           1464           RODUCTIOI           Length           11,010	Min Dist Hole-Cpl 0.81 Σ%excess -19 N Weight 220,200
Hole Size 12 1/4 Setting excess cmt class 'C' tail cm urst Frac Grad 5 1/2 Segment "A" "B"	Annular Volume 0.3132 g Depths for by stage % : t yld > 1.35 lient(s) for Se casing in: #/ft 20.00 20.00	1 Stage Cmt Sx 1735 D V Tool(s): 192 gment(s): A, side the Gra P P	1 Stage CuFt Cmt 3696 4000 -100 B, C, D = 1.0 9 5/8 110 110	Min Cu Ft 1807	1 Stage % Excess 105 > 0.70, OK Body	Drilling Mud Wt 10.00 <u>Design Fac</u> Collapse	Calc MASP 2821 <u>sum of sx</u> 770 Ctors P Burst 2.4 2.4 2.4	Req'd           BOPE           3M           Σ CuFt           1464           RODUCTION           Length           11,010           5,190	Min Dist Hole-Cpl 0.81 Σ%excess -19 N Weight 220,200 103,800
Hole Size 12 1/4 Setting excess cmt Class 'C' tail cm Surst Frac Grad 5 1/2 Segment "A" "B" w/8.4#/g n	Annular Volume 0.3132 g Depths for by stage % : t yld > 1.35 lient(s) for Se casing in: #/ft 20.00 20.00 nud, 30min Sfc	1 Stage Cmt Sx 1735 D V Tool(s): 192 gment(s): A, side the Gra P Csg Test psig:	1 Stage CuFt Cmt 3696 4000 -100 B, C, D = 1.0 9 5/8 100 110 2,422	Min Cu Ft 1807 1, b, c, d All <b>Coupling</b> BUTT <b>BUTT</b>	1 Stage % Excess 105 > 0.70, OK Body 2.87 9.39	Drilling Mud Wt 10.00 Design Fac Collapse 2.13 1.91	Calc MASP 2821 <u>sum of sx</u> 770 ctors Burst 2.4 2.4 2.4 Totals:	Req'd           BOPE           3M           Σ CuFt           1464           RODUCTION           Length           11,010           5,190           16,200	Min Dist Hole-Cpl 0.81 Σ%excess -19 N Weight 220,200 103,800 324,000
Hole Size 12 1/4 Setting excess cmt class 'C' tail cm surst Frac Grad 5 1/2 Segment "A" "B"	Annular Volume 0.3132 g Depths for by stage % : t yld > 1.35 lient(s) for Se casing in: #/ft 20.00 20.00 nud, 30min Sfc	1 Stage Cmt Sx 1735 D V Tool(s): 192 gment(s): A, side the Gra P P	<b>1 Stage</b> <b>CuFt Cmt</b> 3696 4000 -100 B, C, D = 1.0 <b>9 5/8</b> <b>10</b> <b>110</b> 2,422 Factors	Min Cu Ft 1807 1, b, c, d All <b>Coupling</b> BUTT <b>BUTT</b> would be:	1 Stage % Excess 105 > 0.70, OK Body 2.87 9.39 210.89	Drilling Mud Wt 10.00 Design Fac Collapse 2.13 1.91 2.10	Calc MASP 2821 <u>sum of sx</u> 770 <u>ctors</u> P Burst 2.4 2.4 2.4 Totals: if it were a	Req'd           BOPE           3M           Σ CuFt           1464           RODUCTION           Length           11,010           5,190           16,200           vertical we	Min Dist Hole-Cpl 0.81 Σ%excess -19 N Weight 220,200 103,800 324,000
Hole Size 12 1/4 Setting excess cmt Class 'C' tail cm Surst Frac Grad 5 1/2 Segment "A" "B" w/8.4#/g m B	Annular Volume 0.3132 g Depths for by stage % : t yld > 1.35 lient(s) for Se casing in: #/ft 20.00 20.00 nud, 30min Sfc	1 Stage Cmt Sx 1735 D V Tool(s): 192 gment(s): A, side the Gra P P Csg Test psig: nt Design	1 Stage CuFt Cmt 3696 4000 -100 B, C, D = 1.0 9 5/8 100 110 2,422 Factors MTD	Min Cu Ft 1807 1, b, c, d All Coupling BUTT BUTT BUTT would be: Max VTD	1 Stage % Excess 105 > 0.70, OK. > 0.70, OK. <b>Body</b> 2.87 9.39 210.89 Csg VD	Drilling Mud Wt 10.00 Design Fac Collapse 2.13 1.91 2.10 Curve KOP	Calc MASP 2821 <u>sum of sx</u> 770 <u>ctors</u> P Burst 2.4 2.4 2.4 2.4 if it were a Dogleg <sup>o</sup>	Req'd           BOPE           3M           Σ CuFt           1464           RODUCTION           Length           11,010           5,190           16,200           vertical we Severity°	Min Dist Hole-Cpl 0.81 Σ%excess -19 N Weight 220,200 103,800 324,000 Ilbore. MEOC
Hole Size 12 1/4 Setting excess cmt Class 'C' tail cm Burst Frac Grad 5 1/2 Segment "A" "B" w/8.4#/g n B No Pilc	Annular Volume 0.3132 g Depths for by stage % : t yld > 1.35 lient(s) for Se casing in: #/ft 20.00 20.00 nud, 30min Sfc Segme ot Hole Plar	1 Stage Cmt Sx 1735 D V Tool(s): 192 gment(s): A, side the Gra P P Csg Test psig: nt Design	1 Stage CuFt Cmt 3696 4000 -100 B, C, D = 1.0 9 5/8 100 110 2,422 Factors MTD 16200	Min Cu Ft 1807 1, b, c, d All Coupling BUTT BUTT BUTT would be: Max VTD 11162	1 Stage % Excess 105 > 0.70, OK > 0.70, OK 2.87 9.39 210.89 Csg VD 11162	Drilling Mud Wt 10.00 Design Fac Collapse 2.13 1.91 2.10 Curve KOP 11010	Calc MASP 2821 <u>sum of sx</u> 770 <u>ctors</u> P Burst 2.4 2.4 2.4 2.4 if it were a Dogleg° 90	Req'd           BOPE           3M           Σ CuFt           1464           RODUCTIOI           Length           11,010           5,190           16,200           vertical we           Severity°           9	Min Dist Hole-Cplg 0.81 Σ%excess -19 N Weight 220,200 103,800 324,000 Ilbore. MEOC 11961
Hole Size 12 1/4 Setting excess cmt Class 'C' tail cm burst Frac Grad 5 1/2 Segment "A" "B" w/8.4#/g m B No Pilc The ce	Annular Volume 0.3132 g Depths for by stage % : t yld > 1.35 lient(s) for Se casing in: #/ft 20.00 20.00 nud, 30min Sfc Segme ot Hole Plan	1 Stage Cmt Sx 1735 D V Tool(s): 192 gment(s): A, side the Gra P P Csg Test psig: nt Design nned e(s) are inter	<b>1 Stage</b> <b>CuFt Cmt</b> 3696 <b>4000</b> -100 <b>B</b> , C, D = 1.0 <b>9 5/8</b> <b>ide</b> 110 <b>110</b> <b>2,422</b> Factors MTD 16200 <b>ided to ach</b>	Min Cu Ft 1807 1, b, c, d All Coupling BUTT BUTT BUTT Would be: Max VTD 11162 ieve a top of	1 Stage % Excess 105 > 0.70, OK > 0.70, OK 2.87 9.39 210.89 Csg VD 11162 0	Drilling Mud Wt 10.00 Design Fac Collapse 2.13 1.91 2.10 Curve KOP 11010 ft from su	Calc MASP 2821 <u>sum of sx</u> 770 Ctors P Burst 2.4 2.4 2.4 2.4 Totals: if it were a Dogleg° 90 rface or a	Req'd           BOPE           3M           Σ CuFt           1464           RODUCTION           Length           11,010           5,190           16,200           vertical we           Severity°           9           5542	Min Dist Hole-Cpl 0.81 Σ%excess -19 N Weight 220,200 103,800 324,000 Ilbore. MEOC 11961 overlap.
Hole Size 12 1/4 Setting excess cmt class 'C' tail cm burst Frac Grad 5 1/2 Segment "A" "B" w/8.4#/g m B No Pilo The ce Hole	Annular Volume 0.3132 g Depths for by stage % : t yld > 1.35 lient(s) for Se casing in: #/ft 20.00 20.00 nud, 30min Sfc Segme ot Hole Plan ement volume Annular	1 Stage Cmt Sx 1735 D V Tool(s): 192 gment(s): A, side the Gra P Csg Test psig: nt Design nned e(s) are inter 1 Stage	1 Stage CuFt Cmt 3696 4000 -100 B, C, D = 1.0 9 5/8 de 110 2,422 Factors MTD 16200 ded to ach 1 Stage	Min Cu Ft 1807 1, b, c, d All Coupling BUTT BUTT Would be: Max VTD 11162 ieve a top of Min	1 Stage % Excess 105 > 0.70, OK Body 2.87 9.39 210.89 Csg VD 11162 0 1 Stage	Drilling Mud Wt 10.00 Design Fac Collapse 2.13 1.91 2.10 Curve KOP 11010 ft from su Drilling	Calc MASP 2821 <u>sum of sx</u> 770 Ctors P Burst 2.4 2.4 2.4 Totals: if it were a Dogleg <sup>o</sup> 90 rface or a Calc	Req'd           BOPE           3M           Σ CuFt           1464           RODUCTION           Length           11,010           5,190           16,200           vertical we Severity°           9           5542           Req'd	Min Dist Hole-Cpl 0.81 Σ%excess -19 N Weight 220,200 103,800 324,000 Ilbore. MEOC 11961 overlap. Min Dist
Hole Size 12 1/4 Setting excess cmt Class 'C' tail cm Surst Frac Grad 5 1/2 Segment "A" "B" w/8.4#/g n B No Pilc The ce Hole Size	Annular Volume 0.3132 g Depths for by stage % : t yld > 1.35 itent(s) for Se casing in: #/ft 20.00 20.00 nud, 30min Sfc Segme of Hole Plan ement volume	1 Stage Cmt Sx 1735 D V Tool(s): 192 gment(s): A, side the Gra P Csg Test psig: nt Design nned e(s) are inter 1 Stage Cmt Sx	1 Stage CuFt Cmt 3696 4000 -100 B, C, D = 1.0 9 5/8 de 110 2,422 Factors MTD 16200 ded to ach 1 Stage CuFt Cmt	Min Cu Ft 1807 1, b, c, d All Coupling BUTT BUTT BUTT Would be: Max VTD 11162 ieve a top of Min Cu Ft	1 Stage % Excess 105 > 0.70, OK. Body 2.87 9.39 210.89 Csg VD 11162 0 1 Stage % Excess	Drilling Mud Wt 10.00 Design Fac Collapse 2.13 1.91 2.10 Curve KOP 11010 ft from su Drilling Mud Wt	Calc MASP 2821 <u>sum of sx</u> 770 Ctors P Burst 2.4 2.4 2.4 2.4 Totals: if it were a Dogleg° 90 rface or a	Req'd           BOPE           3M           Σ CuFt           1464           RODUCTION           Length           11,010           5,190           16,200           vertical we           Severity°           9           5542	Min Dist Hole-Cplg 0.81 Σ%excess -19 <b>Weight</b> 220,200 <b>103,800</b> 324,000 Ilbore. MEOC 11961 overlap. Min Dist Hole-Cplg
Hole Size 12 1/4 Setting excess cmt class 'C' tail cm burst Frac Grad 5 1/2 Segment "A" "B" w/8.4#/g m B No Pilo The ce Hole	Annular Volume 0.3132 g Depths for by stage % : t yld > 1.35 itent(s) for Se Casing in: #/ft 20.00 20.00 nud, 30min Sfc Segme of Hole Plan ment volume Annular Volume 0.2526	1 Stage Cmt Sx 1735 D V Tool(s): 192 gment(s): A, side the Gra P Csg Test psig: nt Design nned e(s) are inter 1 Stage	1 Stage CuFt Cmt 3696 4000 -100 B, C, D = 1.0 9 5/8 de 110 2,422 Factors MTD 16200 ded to ach 1 Stage	Min Cu Ft 1807 1, b, c, d All Coupling BUTT BUTT Would be: Max VTD 11162 ieve a top of Min	1 Stage % Excess 105 > 0.70, OK Body 2.87 9.39 210.89 Csg VD 11162 0 1 Stage	Drilling Mud Wt 10.00 Design Fac Collapse 2.13 1.91 2.10 Curve KOP 11010 ft from su Drilling	Calc MASP 2821 <u>sum of sx</u> 770 Ctors P Burst 2.4 2.4 2.4 Totals: if it were a Dogleg <sup>o</sup> 90 rface or a Calc	Req'd           BOPE           3M           Σ CuFt           1464           RODUCTION           Length           11,010           5,190           16,200           vertical we Severity°           9           5542           Req'd	Min Dist Hole-Cplg 0.81 Σ%excess -19 N Weight 220,200 103,800 324,000 Ilbore. MEOC 11961

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In a Lesser	<b>Prairie-Chicken</b>	section.
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13 3/8	surface o	csg in a	17 1/2	inch hole.		esign Facto	<u>rs</u>	SURFACE		
Segment			ade	Coupling	Joint	Collapse	Burst	Length	Weight	
"A"	54.50	54.50 J 55		ST&C	8.94	2.32	0.95	1,055	57,498	
"B"							0	0		
w/8.4#/g	mud, 30min Sfc	Csg Test psig	1,451	Tail Cmt	does not	circ to sfc.	Totals:	1,055	57,498	
<u>Comparison c</u>	of Proposed to	<u>o Minimum</u>	Required Co	ement Volume	5					
Hole	e Annular 1 Stage 1 Stage		Min	1 Stage	Drilling	Calc	Req'd	Min Dist		
Size Volume		Cmt Sx	CuFt Cmt	Cu Ft	% Excess	Mud Wt	MASP	BOPE	Hole-Cplg	
17 1/2	0.6946	981	1795	806	123	8.90	1660	2M	1.56	
Burst Frac Grad	dient(s) for Ser	ement(s) A	B=259 b	All > 0.70,		:				
9 5/8	casing ins	side the	13 3/8			<b>Design Fa</b>	ctors	INTERN	<b>NEDIÁTE</b>	
Segment	#/ft		ade	Coupling	Joint	Collapse	Burst	Length	Weight	
"A"	40.00		55	LT&C	2,35	1.27	0.75	3,900	156,000	
"B"	40.00	HCL		LT&C	12.74	1.47	1.09	1,642	65,680	
w/8.4#/g	mud, 30min Sfc	Csg Test psig	1,063	• . •	- •		Totals:	5,542	221,680	
	ement volume	• •			0 1 Stage	ft from su		1055 Reg'd	overlap. Min Dist	
Hole	Annular	1 Stage	1 Stage	Min	1 Stage	Drilling	Calc	Req'd	Min Dist	
Hole Size	Annular Volume	1 Stage Cmt Sx	1 Stage CuFt Cmt	Min	•	Drilling Mud Wt	Calc MASP	Req'd BOPE	Min Dist	
Hole Size 12 1/4	Annular	1 Stage Cmt Sx 1735	1 Stage CuFt Cmt 3696	Min Cu Ft	1 Stage % Excess	Drilling	Calc	Req'd	Min Dist Hole-Cplo 0.81	
Hole Size 12 1/4 Settin	Annular Volume 0.3132	1 Stage Cmt Sx 1735	1 Stage CuFt Cmt 3696	Min Cu Ft	1 Stage % Excess	Drilling Mud Wt	Calc MASP 2821	Req'd BOPE 3M	Min Dist Hole-Cplo 0.81	
Hole Size 12 1/4 Settin excess cm	Annular Volume 0.3132 Ig Depths for t by stage % :	1 Stage Cmt Sx 1735 D V Tool(s):	1 Stage CuFt Cmt 3696 4000	Min Cu Ft	1 Stage % Excess	Drilling Mud Wt	Calc MASP 2821 sum of sx	Req'd           BOPE           3M           Σ CuFt	Min Dist Hole-Cplg 0.81 Σ%excess	
Hole Size 12 1/4 Settin excess cm Class 'C' tail cm	Annular Volume 0.3132 og Depths for t by stage % nt yld > 1.35	1 Stage Cmt Sx 1735 D V Tool(s) 192	1 Stage CuFt Cmt 3696 4000 -100	Min Cu Ft	1 Stage % Excess 105	Drilling Mud Wt	Calc MASP 2821 sum of sx	Req'd           BOPE           3M           Σ CuFt	Min Dist Hole-Cplg 0.81 Σ%excess	
Hole Size 12 1/4 Settin excess cm Class 'C' tail cm	Annular Volume 0.3132 og Depths for t by stage % : nt yld > 1.35 dient(s) for Ser	1 Stage Cmt Sx 1735 D V Tool(s): 192 gment(s): A	1 Stage CuFt Cmt 3696 4000 -100	Min Cu Ft 1807	1 Stage % Excess 105	Drilling Mud Wt	Calc MASP 2821 sum of sx 770	Req'd           BOPE           3M           Σ CuFt	Min Dist Hole-Cplg 0.81 Σ%excess -19	
Hole Size 12 1/4 Settin excess cm Class 'C' tail cm Burst Frac Grad 5 1/2	Annular Volume 0.3132 og Depths for t by stage % nt yld > 1.35	1 Stage Cmt Sx 1735 D V Tool(s): 192 gment(s): A side the	1 Stage CuFt Cmt 3696 4000 -100 , B, C, D = 1.0	Min Cu Ft 1807	1 Stage % Excess 105	Drilling Mud Wt 10.00	Calc MASP 2821 sum of sx 770	Req'd           BOPE           3M           Σ CuFt           1464	Min Dist Hole-Cplg 0.81 Σ%excess -19	
Hole Size 12 1/4 Settin excess cm Class 'C' tail cm Burst Frac Grad 5 1/2	Annular Volume 0.3132 Ing Depths for t by stage % Int yld > 1.35 dient(s) for Seg Casing ins	1 Stage Cmt Sx 1735 D V Tool(s): 192 gment(s): A side the Gr	1 Stage CuFt Cmt 3696 4000 -100 , B, C, D = 1.0 9 5/8	Min Cu Ft 1807 01, b, c, d All	1 Stage % Excess 105 > 0.70, OK.	Drilling Mud Wt 10.00 Design Fa	Calc MASP 2821 <u>sum of sx</u> 770	Req'd BOPE 3M Σ CuFt 1464	Min Dist Hole-Cplg 0.81 Σ%excess -19 N Weight 220,200	
Hole Size 12 1/4 Settin excess cm Class 'C' tail cm Burst Frac Grad 5 1/2 Segment	Annular Volume 0.3132 ng Depths for t by stage % nt yld > 1.35 dient(s) for Seg casing ins #/ft	1 Stage Cmt Sx 1735 D V Tool(s): 192 gment(s): A side the Gr	1 Stage CuFt Cmt 3696 4000 -100 , B, C, D = 1.0 9 5/8 ade	Min Cu Ft 1807 <sup>D1, b, c, d</sup> All <b>Coupling</b>	1 Stage % Excess 105 > 0.70, OK.	Drilling Mud Wt 10.00 <u>Design Fac</u> Collapse	Calc MASP 2821 <u>sum of sx</u> 770 <u>ctors</u> P Burst	Req'd BOPE 3M Σ CuFt 1464 RODUCTIO Length	Min Dist Hole-Cplo 0.81 Σ%excess -19 N Weight 220,200 103,800	
Hole Size 12 1/4 Settin excess cm Class 'C' tail cm Burst Frac Grad 5 1/2 Segment "A" <b>"B"</b>	Annular Volume 0.3132 ag Depths for t by stage % int yld > 1.35 dient(s) for Seg casing ins #/ft 20.00	1 Stage Cmt Sx 1735 D V Tool(s): 192 gment(s): A side the Gr P	1 Stage CuFt Cmt 3696 4000 -100 , B, C, D = 1.0 9 5/8 ade 110 110	Min Cu Ft 1807 <sup>01, b, c, d</sup> All <b>Coupling</b> BUTT	1 Stage % Excess 105 > 0.70, ОК. Воdy 2.87	Drilling Mud Wt 10.00 <u>Design Fa</u> Collapse 2.13	Calc MASP 2821 <u>sum of sx</u> 770 <u>ctors</u> P Burst 2.4	Req'd           BOPE           3M           Σ CuFt           1464           RODUCTIO           Length           11,010	Min Dist Hole-Cplo 0.81 Σ%excess -19 N Weight 220,200 103,800	
Hole Size 12 1/4 Settin excess cm Class 'C' tail cm Burst Frac Grad 5 1/2 Segment "A" <b>"B"</b>	Annular Volume 0.3132 Ing Depths for t by stage % int yld > 1.35 dient(s) for See casing ins #/ft 20.00 20.00 mud, 30min Sfc	1 Stage Cmt Sx 1735 D V Tool(s): 192 gment(s): A side the Gr P Csg Test psig	1 Stage CuFt Cmt 3696 4000 -100 , B, C, D = 1.0 9 5/8 ade 110 110 : 2,422	Min Cu Ft 1807 <sup>01, b, c, d</sup> All <b>Coupling</b> BUTT	1 Stage % Excess 105 > 0.70, ОК. Воdy 2.87	Drilling Mud Wt 10.00 Design Fac Collapse 2.13 1.91	Calc MASP 2821 <u>sum of sx</u> 770 Ctors P Burst 2.4 2.4	Req'd           BOPE           3M           Σ CuFt           1464           PRODUCTIO           Length           11,010           5,190           16,200	Min Dist Hole-Cpl 0.81 Σ%excess -19 N Weight 220,200 103,800 324,000	
Hole Size 12 1/4 Settin excess cm Class 'C' tail cm Burst Frac Grad 5 1/2 Segment "A" "B" w/8.4#/g B	Annular Volume 0.3132 ag Depths for t by stage % nt vld > 1.35 dient(s) for Seg casing ins #/ft 20.00 20.00 mud, 30min Sfc Segmen	1 Stage Cmt Sx 1735 D V Tool(s): 192 gment(s): A side the Gr P Csg Test psig nt Design	1 Stage CuFt Cmt 3696 4000 -100 , B, C, D = 1.0 9 5/8 ade 110 2,422 Factors MTD	Min Cu Ft 1807 D1, b, c, d All Coupling BUTT BUTT Would be: Max VTD	1 Stage % Excess 105 > 0.70, OK. Body 2.87 9.39 210.89 Csg VD	Drilling Mud Wt 10.00 Design Fac Collapse 2.13 1.91 2.10 Curve KOP	Calc MASP 2821 <u>sum of sx</u> 770 Ctors F Burst 2.4 2.4 2.4 Totals: if it were a Dogleg <sup>o</sup>	Req'd           BOPE           3M           Σ CuFt           1464           PRODUCTIO           Length           11,010           5,190           16,200	Min Dist Hole-Cpls 0.81 Σ%excess -19 N Weight 220,200 103,800 324,000 Ilbore. MEOC	
Hole Size 12 1/4 Settin excess cm Class 'C' tail cm Burst Frac Grad 5 1/2 Segment "A" "B" w/8.4#/g B No Pil	Annular Volume 0.3132 Ing Depths for t by stage % int yld > 1.35 dient(s) for Seg casing ins #/ft 20.00 20.00 mud, 30min Sfc Segmentot Hole Plan	1 Stage Cmt Sx 1735 D V Tool(s): 192 gment(s): A side the Gr P Csg Test psig nt Design	1 Stage CuFt Cmt 3696 4000 -100 , B, C, D = 1.0 9 5/8 ade 110 2,422 Factors MTD 16200	Min Cu Ft 1807 D1, b, c, d All Coupling BUTT BUTT Would be: Max VTD 11162	1 Stage % Excess 105 > 0.70, OK. Body 2.87 9.39 210.89	Drilling Mud Wt 10.00 Design Fac Collapse 2.13 1.91 2.10 Curve KOP 11010	Calc MASP 2821 <u>sum of sx</u> 770 <u>ctors</u> P Burst 2.4 2.4 2.4 Totals: if it were a Dogleg <sup>o</sup> 90	Req'd           BOPE           3M           Σ CuFt           1464           RODUCTIO           Length           11,010           5,190           16,200           vertical we severity°           9	Min Dist Hole-Cplg 0.81 Σ%excess -19 N Weight 220,200 103,800 324,000 illbore. MEOC 11961	
Hole Size 12 1/4 Settin excess cm Class 'C' tail cm Burst Frac Grad 5 1/2 Segment "A" "B" w/8.4#/g B No Pil The c	Annular Volume 0.3132 og Depths for t by stage % int yld > 1.35 dient(s) for Seg casing ins #/ft 20.00 20.00 mud, 30min Sfc Segmen ot Hole Plan ement volume	1 Stage Cmt Sx 1735 D V Tool(s): 192 gment(s): A side the Gr P Csg Test psig nt Design nned e(s) are inter	1 Stage CuFt Cmt 3696 4000 -100 , B, C, D = 1.0 9 5/8 ade 110 2,422 Factors MTD 16200 ended to ach	Min Cu Ft 1807 D1, b, c, d All D1, d A	1 Stage % Excess 105 > 0.70, OK. > 0.70, OK. Body 2.87 9.39 210.89 Csg VD 11162 0	Drilling Mud Wt 10.00 Design Fac Collapse 2.13 1.91 2.10 Curve KOP 11010 ft from su	Calc MASP 2821 <u>sum of sx</u> 770 Ctors P Burst 2.4 2.4 2.4 Totals: if it were a Dogleg <sup>o</sup> 90 urface or a	Req'd           BOPE           3M           Σ CuFt           1464           RODUCTIO           Length           11,010           5,190           16,200           vertical we           Severity°           9           5542	Min Dist Hole-Cpls 0.81 Σ%excess -19 N Weight 220,200 103,800 324,000 Ilbore. MEOC 11961 overlap.	
Hole Size 12 1/4 Settin excess cm Class 'C' tail cm Burst Frac Grad 5 1/2 Segment "A" "B" w/8.4#/g B No Pil The c Hole	Annular Volume 0.3132 Ing Depths for t by stage % int yld > 1.35 dient(s) for Seg casing ins #/ft 20.00 20.00 mud, 30min Sfc Segmen ot Hole Plar ement volume Annular	1 Stage Cmt Sx 1735 D V Tool(s): 192 gment(s): A side the Gr P Csg Test psig nt Design nned e(s) are inte 1 Stage	1 Stage CuFt Cmt 3696 4000 -100 , B, C, D = 1.0 9 5/8 ade 110 2,422 Factors MTD 16200 ended to ach 1 Stage	Min Cu Ft 1807 D1, b, c, d All D1, b, c, d All BUTT BUTT BUTT Would be: Max VTD 11162 iieve a top of Min	1 Stage % Excess 105 > 0.70, OK. Body 2.87 9.39 210.89 Csg VD 11162 0 1 Stage	Drilling Mud Wt 10.00 Design Fac Collapse 2.13 1.91 2.10 Curve KOP 11010 ft from su Drilling	Calc MASP 2821 <u>sum of sx</u> 770 Ctors P Burst 2.4 2.4 2.4 Totals: if it were a Dogleg <sup>o</sup> 90 Irface or a Calc	Req'd           BOPE           3M           Σ CuFt           1464           RODUCTIO           Length           11,010           5,190           16,200           vertical we severity°           9           5542           Req'd	Min Dist Hole-Cpl 0.81 Σ%excess -19 N Weight 220,200 324,000 324,000 Ilbore. MEOC 11961 overlap. Min Dist	
Hole Size 12 1/4 Settin excess cm Class 'C' tail cm Burst Frac Grad 5 1/2 Segment "A" "B" w/8.4#/g B No Pil The c Hole Size	Annular Volume 0.3132 Ing Depths for t by stage % int yld > 1.35 dient(s) for Seg casing ins #/ft 20.00 20.00 mud, 30min Sfc Segmen ot Hole Plan ement volume	1 Stage Cmt Sx 1735 D V Tool(s): 192 gment(s): A side the Gr P Csg Test psig nt Design nned e(s) are inte Csg Test psig	1 Stage CuFt Cmt 3696 4000 -100 , B, C, D = 1.0 9 5/8 ade 110 110 2,422 Factors MTD 16200 ended to ach 1 Stage CuFt Cmt	Min Cu Ft 1807 D1, b, c, d All D1, b, c, d All	1 Stage % Excess 105 > 0.70, OK. Body 2.87 9.39 210.89 Csg VD 11162 0 1 Stage % Excess	Drilling Mud Wt 10.00 Design Fac Collapse 2.13 1.91 2.10 Curve KOP 11010 ft from su Drilling Mud Wt	Calc MASP 2821 <u>sum of sx</u> 770 Ctors P Burst 2.4 2.4 2.4 Totals: if it were a Dogleg <sup>o</sup> 90 urface or a	Req'd           BOPE           3M           Σ CuFt           1464           RODUCTIO           Length           11,010           5,190           16,200           vertical we           Severity°           9           5542	Min Dist Hole-Cplg 0.81 Σ%excess -19 <b>Weight</b> 220,200 <b>103,800</b> 324,000 Ilbore. MEOC 11961 overlap. Min Dist Hole-Cplg	
Hole Size 12 1/4 Settin excess cm Class 'C' tail cm Burst Frac Grad 5 1/2 Segment "A" "B" w/8.4#/g B No Pil The c Hole Size 8 3/4	Annular Volume 0.3132 Ing Depths for t by stage % int yld > 1.35 dient(s) for Seg casing ins #/ft 20.00 20.00 mud, 30min Sfc Segmen ot Hole Plar ement volume Annular Volume 0.2526	1 Stage Cmt Sx 1735 D V Tool(s): 192 gment(s): A side the Gr P Csg Test psig nt Design nned e(s) are inte 1 Stage	1 Stage CuFt Cmt 3696 4000 -100 , B, C, D = 1.0 9 5/8 ade 110 2,422 Factors MTD 16200 ended to ach 1 Stage	Min Cu Ft 1807 D1, b, c, d All D1, b, c, d All	1 Stage % Excess 105 > 0.70, OK. Body 2.87 9.39 210.89 Csg VD 11162 0 1 Stage	Drilling Mud Wt 10.00 Design Fac Collapse 2.13 1.91 2.10 Curve KOP 11010 ft from su Drilling	Calc MASP 2821 <u>sum of sx</u> 770 Ctors P Burst 2.4 2.4 2.4 Totals: if it were a Dogleg <sup>o</sup> 90 Irface or a Calc	Req'd           BOPE           3M           Σ CuFt           1464           RODUCTIO           Length           11,010           5,190           16,200           vertical we severity°           9           5542           Req'd	Min Dist Hole-Cplg 0.81 Σ%excess -19 N Weight 220,200 103,800 324,000 Ilbore. MEOC 11961 overlap. Min Dist	
Hole Size 12 1/4 Settin excess cm Class 'C' tail cm Burst Frac Grad 5 1/2 Segment "A" "B" w/8.4#/g B No Pil The c Hole Size	Annular Volume 0.3132 Ing Depths for t by stage % int yld > 1.35 dient(s) for Seg casing ins #/ft 20.00 20.00 mud, 30min Sfc Segmen ot Hole Plar ement volume Annular Volume 0.2526	1 Stage Cmt Sx 1735 D V Tool(s): 192 gment(s): A side the Gr P Csg Test psig nt Design nned e(s) are inte Csg Test psig	1 Stage CuFt Cmt 3696 4000 -100 , B, C, D = 1.0 9 5/8 ade 110 110 2,422 Factors MTD 16200 ended to ach 1 Stage CuFt Cmt	Min Cu Ft 1807 D1, b, c, d All D1, b, c, d All	1 Stage % Excess 105 > 0.70, OK. Body 2.87 9.39 210.89 Csg VD 11162 0 1 Stage % Excess	Drilling Mud Wt 10.00 Design Fac Collapse 2.13 1.91 2.10 Curve KOP 11010 ft from su Drilling Mud Wt	Calc MASP 2821 <u>sum of sx</u> 770 Ctors P Burst 2.4 2.4 2.4 Totals: if it were a Dogleg <sup>o</sup> 90 Irface or a Calc	Req'd           BOPE           3M           Σ CuFt           1464           RODUCTIO           Length           11,010           5,190           16,200           vertical we severity°           9           5542           Req'd	Min Dist Hole-Cplg 0.81 Σ%excess -19 <b>Weight</b> 220,200 <b>103,800</b> 324,000 Ilbore. MEOC 11961 overlap. Min Dist Hole-Cplg	

#### In a Lesser Prairie-Chicken section.

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13 3/8	surface o	csg in a 17 1/2	inch hole.	D	esign Facto	<u>rs</u>	SURFACE		
Segment #/ft		Grade	Coupling	Joint	Collapse	Burst	Length	Weight	
"A"	A" 54.50 J 55		ST&C	8.94	2.32	0.95	1,055	57,498	
"B"							0	0	
		Csg Test psig: 1,451	Tail Cmt	does not	circ to sfc.	Totals:	1,055	57,498	
comparison o	of Proposed to	o Minimum Required	Cement Volume	S					
Hole	Annular	1 Stage 1 Stage	Min	1 Stage	Drilling	Calc	Req'd	Min Dist	
Size	Volume	Cmt Sx CuFt Cm	nt i Cu Ft	% Excess	Mud Wt	MASP	BOPE	Hole-Cpl	
17 1/2	0.6946	<b>981</b> 1795	806	123	8.90	1660	2M	1.56	
	• •	· · ·		· · · · · · · · · · · · · · · · · · ·		:	:		
Burst Frac Grad	dient(s) for Se	gment(s) A, B = 2.59, b	All > 0.70,						
9 5/8	casing ins	and an		•	Design Fac		INTERN	MEDIÁTE	
Segment	#/ft	Grade	Coupling	Joint	Collapse	Burst	Length	Weight	
"A"	40.00	J 55	ĿT&C	2.35	1.27	0.75	3,900	156,000	
"B"	40.00	HCL 80	LT&C	12.74	1.47	1.09	1,642	65,680	
w/8.4#/g	mud, 30min Sfc	Csg Test psig: 1,063				Totals:	5,542	221,680	
Hole	Annular	e(s) are intended to ac 1 Stage 1 Stage	Min	0 1 Stage	ft from su Drilling	Calc	1055 Req'd	1	
Hole Size	Annular Volume	1 Stage 1 Stage Cmt Sx CuFt Cm	Min nt Cu Ft	1 Stage % Excess	Drilling Mud Wt	Calc MASP	Req'd BOPE	Min Dist Hole-Cpl	
Hole Size 12 1/4	Annular Volume 0.3132	1 Stage1 StageCmt SxCuFt Cm17353696	Min	1 Stage	Drilling	Calc MASP 2821	Req'd BOPE 3M	Min Dist Hole-Cpl 0.81	
Hole Size 12 1/4 Settin	Annular Volume	1 Stage1 StageCmt SxCuFt Cm17353696	Min nt Cu Ft	1 Stage % Excess	Drilling Mud Wt	Calc MASP	Req'd BOPE	Min Dist Hole-Cpl 0.81	
Hole Size 12 1/4 Settin excess cm	Annular Volume 0.3132 Ig Depths for I t by stage % :	1 Stage         1 Stage           Cmt Sx         CuFt Cm           1735         3696           D V Tool(s):         4000	Min nt Cu Ft	1 Stage % Excess	Drilling Mud Wt	Calc MASP 2821 sum of sx	Req'd BOPE 3M Σ CuFt	Min Dist Hole-Cpl 0.81 Σ%exces	
Hole Size 12 1/4 Settin excess cmt lass 'C' tail cm	Annular Volume 0.3132 g Depths for t by stage % : nt yld > 1.35	1 Stage         1 Stage           Cmt Sx         CuFt Cm           1735         3696           D V Tool(s):         4000	Min Cu Ft 1807	1 Stage % Excess	Drilling Mud Wt	Calc MASP 2821 sum of sx	Req'd BOPE 3M Σ CuFt	Min Dist Hole-Cpl 0.81 Σ%excess	
Hole Size 12 1/4 Settin excess cml lass 'C' tail cm surst Frac Grac	Annular Volume 0.3132 Ing Depths for t by stage % : ht yld > 1.35 dient(s) for Seg	1 Stage         1 Stage           Cmt Sx         CuFt Cm           1735         3696           D V Tool(s):         4000           192         -100           gment(s):         A, B, C, D = 1	Min Cu Ft 1807	1 Stage % Excess 105	Drilling Mud Wt 10.00	Calc MASP 2821 sum of sx 770	Req'd           BOPE           3M           Σ CuFt           1464	Min Dist Hole-Cpl 0.81 Σ%excess -19	
Hole Size 12 1/4 Settin excess cml class 'C' tail cm surst Frac Grac 5 1/2	Annular Volume 0.3132 Ig Depths for t by stage % : ht yld > 1.35 dient(s) for Seg casing ins	1 Stage         1 Stage           Cmt Sx         CuFt Cm           1735         3696           D V Tool(s):         4000           192         -100           gment(s):         A, B, C, D = 1           side the         9 5/8	Min cu Ft 1807	1 Stage % Excess 105 > 0.70, OK.	Drilling Mud Wt 10.00 Design Fac	Calc MASP 2821 sum of sx 770	Req'd           BOPE           3M           Σ CuFt           1464           RODUCTIO	Min Dist Hole-Cpl 0.81 Σ%excess -19	
Hole Size 12 1/4 Settin excess cm class 'C' tail cm surst Frac Grac 5 1/2 Segment	Annular Volume 0.3132 g Depths for t by stage % : int yld > 1.35 dient(s) for Seg casing ins #/ft	1 Stage         1 Stage           Cmt Sx         CuFt Cm           1735         3696           D V Tool(s):         4000           192         -100           gment(s):         A, B, C, D = 1           side the         9 5/8           Grade	Min Cu Ft 1807	1 Stage % Excess 105 > 0.70, OK. Body	Drilling Mud Wt 10.00 <u>Design Fac</u> Collapse	Calc MASP 2821 sum of sx 770 ctors P Burst	Req'd BOPE 3M Σ CuFt 1464 RODUCTIO Length	Min Dist Hole-Cpl 0.81 Σ%excess -19 N Weight	
Hole Size 12 1/4 Settin excess cmt class 'C' tail cm Burst Frac Grac 5 1/2 Segment "A"	Annular Volume 0.3132 gp Depths for t by stage % : nt yld > 1.35 dient(s) for Seg casing ins #/ft 20.00	1 Stage         1 Stage           Cmt Sx         CuFt Cm           1735         3696           D V Tool(s):         4000           192         -100           gment(s):         A, B, C, D = 1           side the         9 5/8           Grade         P 110	Min Cu Ft 1807	1 Stage % Excess 105 > 0.70, ОК. Воdy 2.87	Drilling Mud Wt 10.00 <u>Design Fac</u> Collapse 2.13	Calc MASP 2821 sum of sx 770 ctors P Burst 2.4	Req'd           BOPE           3M           Σ CuFt           1464           RODUCTIO           Length           11,010	Min Dist Hole-Cpl 0.81 Σ%excess -19 N Weight 220,200	
Hole Size 12 1/4 Settin excess cml class 'C' tail cm class 'C' tai	Annular Volume 0.3132 bg Depths for I t by stage % : nt yld > 1.35 dient(s) for Seg casing ins #/ft 20.00 20.00	1 Stage         1 Stage           Cmt Sx         CuFt Cm           1735         3696           D V Tool(s):         4000           192         -100           gment(s):         A, B, C, D = 1           side the         9 5/8           Grade         P 110           P 110         P 110	Min Cu Ft 1807	1 Stage % Excess 105 > 0.70, OK. Body	Drilling Mud Wt 10.00 <u>Design Fac</u> Collapse	Calc MASP 2821 <u>sum of sx</u> 770 Ctors Burst 2.4 2.4	Req'd           BOPE           3M           Σ CuFt           1464           RODUCTIO           Length           11,010           5,190	Min Dist Hole-Cpl 0.81 Σ%excess -19 N Weight 220,200 103,800	
Hole Size 12 1/4 Settin excess cml class 'C' tail cm class 'C' tai	Annular Volume 0.3132 19 Depths for t by stage % : 10 t yld > 1.35 dient(s) for Seg casing ins #/ft 20.00 20.00 mud, 30min Sfc	1 Stage         1 Stage           Cmt Sx         CuFt Cm           1735         3696           D V Tool(s):         4000           192         -100           gment(s):         A, B, C, D = 1           side the         9 5/8           Grade         P 110	Min Cu Ft 1807 .01, b, c, d All Coupling BUTT BUTT	1 Stage % Excess 105 > 0.70, ОК. Воdy 2.87	Drilling Mud Wt 10.00 Design Fac Collapse 2.13 1.91	Calc MASP 2821 sum of sx 770 ctors P Burst 2.4	Req'd           BOPE           3M           Σ CuFt           1464           RODUCTIO           Length           11,010           5,190           16,200	Min Dist Hole-Cpl 0.81 Σ%excess -19 N Weight 220,200 103,800 324,000	
Hole Size 12 1/4 Settin excess cmt lass 'C' tail cm burst Frac Grac 5 1/2 Segment "A" "B" w/8.4#/gr	Annular Volume 0.3132 gg Depths for t by stage % : nt yld > 1.35 dient(s) for Seg casing ins #/ft 20.00 20.00 mud, 30min Sfc Segmer	1 Stage         1 Stage           Cmt Sx         CuFt Cm           1735         3696           D V Tool(s):         4000           192         -100           gment(s):         A, B, C, D = 1           side the         9 5/8           Grade         P 110           P 110         P 110           Csg Test psig:         2,422           nt Design         Factors	Min Cu Ft 1807 .01, b, c, d All Coupling BUTT BUTT	1 Stage % Excess 105 > 0.70, OK Body 2.87 9.39	Drilling Mud Wt 10.00 Design Fac Collapse 2.13 1.91	Calc MASP 2821 <u>sum of sx</u> 770 Ctors Burst 2.4 2.4 2.4 Totals:	Req'd           BOPE           3M           Σ CuFt           1464           RODUCTIO           Length           11,010           5,190           16,200	Min Dist Hole-Cpl 0.81 Σ%excess -19 N Weight 220,200 103,800 324,000	
Hole Size 12 1/4 Settin excess cmt lass 'C' tail cm burst Frac Grac 5 1/2 Segment "A" "B" w/8.4#/gr	Annular Volume 0.3132 19 Depths for t by stage % : 10 t yld > 1.35 dient(s) for Seg casing ins #/ft 20.00 20.00 mud, 30min Sfc	1 Stage         1 Stage           Cmt Sx         CuFt Cm           1735         3696           D V Tool(s):         4000           192         -100           gment(s):         A, B, C, D = 1           side the         9 5/8           Grade         P 110           P 110         P 110           Csg Test psig:         2,422           nt Design         Factors	Min Cu Ft 1807	1 Stage % Excess 105 > 0.70, OK. > 0.70, OK. ■ 0.70 2.87 9.39 210.89	Drilling Mud Wt 10.00 Design Fac Collapse 2.13 1.91 2.10	Calc MASP 2821 <u>sum of sx</u> 770 Ctors P Burst 2.4 2.4 2.4 Totals: if it were a	Req'd           BOPE           3M           Σ CuFt           1464           RODUCTIO           Length           11,010           5,190           16,200           vertical we	Min Dist Hole-Cpl 0.81 Σ%exces -19 N Weight 220,200 103,800 324,000	
Hole Size 12 1/4 Settin excess cm lass 'C' tail cm burst Frac Grac 5 1/2 Segment "A" "B" w/8.4#/g m B No Pike	Annular Volume 0.3132 g Depths for t by stage % : at yld > 1.35 dient(s) for Seg casing ins #/ft 20.00 20.00 mud, 30min Sfc Segmen ot Hole Plan	1 Stage         1 Stage           Cmt Sx         CuFt Cm           1735         3696           D V Tool(s):         4000           192         -100           gment(s):         A, B, C, D = 1           side the         9 5/8           Grade         P 110           P 110         P 110           Csg Test psig:         2,422           nt Design         Factors           mrd         MTD	Min Cu Ft 1807 01, b, c, d All Coupling BUTT BUTT S would be: Max VTD 11162	1 Stage % Excess 105 > 0.70, OK. Body 2.87 9.39 210.89 Csg VD	Drilling Mud Wt 10.00 Design Fac Collapse 2.13 1.91 2.10 Curve KOP	Calc MASP 2821 <u>sum of sx</u> 770 Ctors P Burst 2.4 2.4 2.4 Totals: if it were a Dogleg <sup>o</sup> 90	Req'd           BOPE           3M           Σ CuFt           1464           RODUCTIO           Length           11,010           5,190           16,200           vertical we severity°	Min Dist Hole-Cpl 0.81 Σ%excess -19 N Weight 220,200 103,800 324,000 Ilbore. MEOC	
Hole Size 12 1/4 Settin excess cm lass 'C' tail cm burst Frac Grac 5 1/2 Segment "A" "B" w/8.4#/g m B No Pike	Annular Volume 0.3132 g Depths for t by stage % : at yld > 1.35 dient(s) for Seg casing ins #/ft 20.00 20.00 mud, 30min Sfc Segmen ot Hole Plan	1 Stage         1 Stage           Cmt Sx         CuFt Cm           1735         3696           D V Tool(s):         4000           192         -100           gment(s):         A, B, C, D = 1           side the         9 5/8           Grade         P 110           Csg Test psig:         2,422           nt         Design         Factors           amed         MTD           16200         16200	Min Cu Ft 1807	1 Stage % Excess 105 > 0.70, OK. > 0.70, OK. <b>Body</b> 2.87 9.39 210.89 Csg VD 11162	Drilling Mud Wt 10.00 Design Fac Collapse 2.13 1.91 2.10 Curve KOP 11010	Calc MASP 2821 <u>sum of sx</u> 770 Ctors P Burst 2.4 2.4 2.4 Totals: if it were a Dogleg <sup>o</sup> 90	Req'd           BOPE           3M           Σ CuFt           1464           RODUCTIO           Length           11,010           5,190           16,200           vertical we severity°           9	Min Dist Hole-Cpl 0.81 Σ%exces -19 N Weight 220,200 103,800 324,000 Ilbore. MEOC 11961 overlap.	
Hole Size 12 1/4 Settin excess cmt durst Frac Grac 5 1/2 Segment "A" "B" w/8.4#/gr B No Pike The ce	Annular Volume 0.3132 gp Depths for l t by stage % : int yld > 1.35 dient(s) for Seg casing ins #/ft 20.00 20.00 mud, 30min Sfc Segmen ot Hole Plan ement volume	1 Stage         1 Stage           Cmt Sx         CuFt Cm           1735         3696           D V Tool(s):         4000           192         -100           gment(s):         A, B, C, D = 1           side the         9 5/8           Grade         P 110           P 110         P 110           Csg Test psig:         2,422           nt         Design         Factors           aned         MTD           16200         e(s) are intended to action	Min Cu Ft 1807	1 Stage % Excess 105 > 0.70, OK. > 0.70, OK. <b>Body</b> 2.87 9.39 210.89 Csg ∨D 11162 0	Drilling Mud Wt 10.00 Design Fac Collapse 2.13 1.91 2.10 Curve KOP 11010 ft from su	Calc MASP 2821 <u>sum of sx</u> 770 Ctors P Burst 2.4 2.4 2.4 Totals: if it were a Dogleg <sup>o</sup> 90 rface or a	Req'd           BOPE           3M           Σ CuFt           1464           RODUCTIO           Length           11,010           5,190           16,200           vertical we           Severity°           9           5542	Min Dist Hole-Cpl 0.81 Σ%excess -19 N Weight 220,200 103,800 324,000 324,000 100re. MEOC 11961 overlap. Min Dist	
Hole Size 12 1/4 Settin excess cmt lass 'C' tail cm burst Frac Grac 5 1/2 Segment "A" "B" w/8.4#/gr B No Pike The ce Hole	Annular Volume 0.3132 gp Depths for l t by stage % : nt yld > 1.35 dient(s) for Seg casing ins #/ft 20.00 20.00 mud, 30min Sfc Segmen ot Hole Plan ement volume Annular	1 Stage         1 Stage           Cmt Sx         CuFt Cm           1735         3696           D V Tool(s):         4000           192         -100           gment(s):         A, B, C, D = 1           side the         9 5/8           Grade         P 110           P 110         Csg Test psig: 2,422           nt         Design           nned         16200           e(s) are intended to act         1 Stage	Min Cu Ft 1807	1 Stage % Excess 105 > 0.70, OK. 2.87 9.39 210.89 Csg VD 11162 0 1 Stage	Drilling Mud Wt 10.00 Design Fac Collapse 2.13 1.91 2.10 Curve KOP 11010 ft from su Drilling	Calc MASP 2821 <u>sum of sx</u> 770 Ctors P Burst 2.4 2.4 2.4 Cotals: if it were a Dogleg° 90 rface or a Calc	Req'd           BOPE           3M           Σ CuFt           1464           RODUCTIO           Length           11,010           5,190           16,200           vertical we severity°           9           5542           Req'd	Min Dist Hole-Cpl 0.81 Σ%excess -19 N Weight 220,200 103,800 324,000 324,000 Ilbore. MEOC 11961	
Hole Size 12 1/4 Settin excess cml lass 'C' tail cm urst Frac Grac 5 1/2 Segment "A" "B" w/8.4#/gr B No Pike The ce Hole Size	Annular Volume 0.3132 g Depths for I t by stage % : at yld > 1.35 dient(s) for Seg casing ins #/ft 20.00 20.00 mud, 30min Sfc Segmen ot Hole Plan ement volume Annular Volume 0.2526	1 Stage         1 Stage           Cmt Sx         CuFt Cm           1735         3696           D V Tool(s):         4000           192         -100           gment(s):         A, B, C, D = 1           side the         9 5/8           Grade         P 110           Csg Test psig:         2,422           nt Design         Factors           aned         MTD           16200         e(s) are intended to act           Stage         1 Stage           Cmt Sx         CuFt Cm	Min Cu Ft 1807 .01, b, c, d All Coupling BUTT BUTT S would be: Max VTD 11162 chieve a top of Min t Cu Ft	1 Stage % Excess 105 > 0.70, OK. > 0.70, OK. <b>Body</b> 2.87 9.39 210.89 Csg VD 11162 0 1 Stage % Excess	Drilling Mud Wt 10.00 Design Fac Collapse 2.13 1.91 2.10 Curve KOP 11010 ft from su Drilling Mud Wt	Calc MASP 2821 <u>sum of sx</u> 770 Ctors P Burst 2.4 2.4 2.4 Cotals: if it were a Dogleg° 90 rface or a Calc	Req'd           BOPE           3M           Σ CuFt           1464           RODUCTIO           Length           11,010           5,190           16,200           vertical we severity°           9           5542           Req'd	Min Dist Hole-Cpl 0.81 Σ%excess -19 N Weight 220,200 103,800 324,000 Ilbore. MEOC 11961 overlap. Min Dist Hole-Cpl	

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Well Name: COPPERLINE WEST 29 FEDERAL

Well Number: 5H

Existing Wells description:

## Section 4 - Location of Existing and/or Proposed Production Facilities

#### Submit or defer a Proposed Production Facilities plan? SUBMIT

**Production Facilities description:** There is an existing production facility that is used for the Copperline West 29 Fed 1H and 3H wells. This facility and containment will be used for the 5H. Tankage and a metered 3 phase separator will be added to the existing facility. The pad will have all 3 wells on it. **Production Facilities map:** 

Production Facility\_09-06-2016.docx

Section 5 - Location and Types of Water Sup	ply
Water Source Table	
Water source use type: INTERMEDIATE/PRODUCTION CASING, STIMULATION, SURFACE CASING Describe type:	Water source type: GW WELL
Source latitude:	Source longitude:
Source datum: NAD83	
Water source permit type: PRIVATE CONTRACT	
Source land ownership: FEDERAL	
Water source transport method: TRUCKING	
Source transportation land ownership: FEDERAL	
Water source volume (barrels): 140000	Source volume (acre-feet): 18.04503
Source volume (gal): 5880000	
Water source use type: INTERMEDIATE/PRODUCTION CASING, STIMULATION, SURFACE CASING Describe type:	Water source type: GW WELL
Source latitude:	Source longitude:
Source datum:	
Water source permit type:	
Source land ownership:	
Water source transport method: TRUCKING	
Source transportation land ownership:	
Water source volume (barrels): 150000	Source volume (acre-feet): 19.33396
Source volume (gal): 6300000	

Well Name: COPPERLINE WEST 29 FEDERAL

Well Number: 5H

#### Water source and transportation map:

water supply map\_09-22-2016.docx

POD\_09-22-2016.pdf

Water source comments: Water will be supplied by the surface tenant's water well, Limestone Livestock LLC. Bill Angell Limestone Livestock, LLC 76 Angell Road Lovington, NM 88260 575-369-6303 New water well? NO

New Water Well In	fo	
Well latitude:	Well Longitude:	Well datum:
Well target aquifer:		
Est. depth to top of aquifer(ft):	Est thickness o	of aquifer:
Aquifer comments:		
Aquifer documentation:		
Well depth (ft):	Well casing type:	
Well casing outside diameter (in.):	Well casing inside	e diameter (in.):
New water well casing?	Used casing sour	ce:
Drilling method:	Drill material:	
Grout material:	Grout depth:	
Casing length (ft.):	Casing top depth	(ft.):
Well Production type:	Completion Metho	od:
Water well additional information:		
State appropriation permit:		
Additional information attachment:		

## Section 6 - Construction Materials

Construction Materials description: Caliche from pit at T20S R34E Section 35

**Construction Materials source location attachment:** 

Copperline\_West\_29\_Fed\_5H\_Caliche\_Map\_20180428072517.pdf

## Section 7 - Methods for Handling Waste

Waste type: DRILLING Waste content description: Drill cuttings Amount of waste: 1163640 pounds Waste disposal frequency : Daily Safe containment description: roll off bins Safe containmant attachment:

Well Name: COPPERLINE WEST 29 FEDERAL

Well Number: 5H

Waste disposal type: HAUL TO COMMERCIAL Disposal location ownership: PRIVATE FACILITY Disposal type description:

Disposal location description: R360 commercial disposal facility

Waste type: DRILLING

Waste content description: Drill fluids

Amount of waste: 2500 barrels

Waste disposal frequency : Weekly

Safe containment description: rig mud tanks

Safe containmant attachment:

Waste disposal type: HAUL TO COMMERCIAL Disposal location ownership: PRIVATE FACILITY Disposal type description:

Disposal location description: Siana SWD

Reserve Pit

Reserve Pit being used? NO

Temporary disposal of produced water into reserve pit?

Reserve pit length (ft.) Reserve pit width (ft.)

Reserve pit depth (ft.) Reserve pit volume (cu. yd.)

Is at least 50% of the reserve pit in cut?

Reserve pit liner

Reserve pit liner specifications and installation description

**Cuttings Area** 

Cuttings Area being used? NO

Are you storing cuttings on location? NO

Description of cuttings location

Cuttings area length (ft.)

Cuttings area depth (ft.)

Cuttings area width (ft.)

Cuttings area volume (cu. yd.)

Is at least 50% of the cuttings area in cut?

WCuttings area liner

Cuttings area liner specifications and installation description

Well Name: COPPERLINE WEST 29 FEDERAL

Well Number: 5H

## Section 8 - Ancillary Facilities

Are you requesting any Ancillary Facilities?: NO Ancillary Facilities attachment:

Comments:

## Section 9 - Well Site Layout

Well Site Layout Diagram: 162611 location map\_11-26-2016.docx Comments:

## **Section 10 - Plans for Surface Reclamation**

Type of disturbance: New Surface Disturbance

Multiple Well Pad Name: COPPERLINE WEST 29 FEDERAL Multiple Well Pad Number: 3H

Recontouring attachment:

**Drainage/Erosion control construction:** Per BLM insturctions as identified during onsite **Drainage/Erosion control reclamation:** Per BLM insturctions as identified during onsite

Wellpad long term disturbance (acres): 0Wellpad short term disturbance (acres): 0.5Access road long term disturbance (acres): 0.03Access road short term disturbance (acres): 0.03Pipeline long term disturbance (acres): 0Pipeline short term disturbance (acres): 0Other long term disturbance (acres): 0Other short term disturbance (acres): 0Total long term disturbance: 0.03Total short term disturbance: 0.53

**Disturbance Comments:** Interim reclamation as identified during onsite.

Reconstruction method: Interim reclamation as identified during onsite.

**Topsoil redistribution:** Interim reclamation as identified during onsite.

Soil treatment: Interim reclamation as identified during onsite.

Existing Vegetation at the well pad: Sage brush and native grasses.

Existing Vegetation at the well pad attachment:

Existing Vegetation Community at the road: Sage brush and native grasses. Existing Vegetation Community at the road attachment:

Well Name: COPPERLINE WEST 29 FEDERAL

Well Number: 5H

Existing Vegetation Community at the pipeline: Sage brush and native grasses. Existing Vegetation Community at the pipeline attachment:

Existing Vegetation Community at other disturbances: Sage brush and native grasses. Existing Vegetation Community at other disturbances attachment:

Non native seed used? NO Non native seed description: Seedling transplant description: Will seedlings be transplanted for this project? NO

Seedling transplant description attachment:

Will seed be harvested for use in site reclamation? NO

Seed harvest description:

Seed harvest description attachment:

## **Seed Management**

## Seed Table

Seed name:

Seed type:

Source name:

Source phone:

Seed cultivar:

Seed use location:

PLS pounds per acre:

Seed source:

Source address:

Proposed seeding season:

Total pounds/Acre:

Seed reclamation attachment:

Seed Type

## **Operator Contact/Responsible Official Contact Info**

**Pounds/Acre** 

Seed Summary

First Name: Kevin

Phone: (432)556-8508

Last Name: Garrett

Email: kgarrett@cazapetro.com

Well Name: COPPERLINE WEST 29 FEDERAL

Well Number: 5H

Seedbed prep: Harrow Seed BMP: Per BLM instructions

Seed method: Broadcast followed by a drag chain

Existing invasive species? NO

Existing invasive species treatment description:

Existing invasive species treatment attachment:

Weed treatment plan description: Spray for cheat grass

Weed treatment plan attachment:

Monitoring plan description: Visual inspection in spring and late fall.

Monitoring plan attachment:

Success standards: 80% coverage by 2nd growing season of native species with less than 5% invasive species

Pit closure description: No pits to be used

Pit closure attachment:

### Section 11 - Surface Ownership

Disturbance type: WELL PAD Describe: Surface Owner: BUREAU OF LAND MANAGEMENT Other surface owner description: BIA Local Office: BOR Local Office: COE Local Office: DOD Local Office: NPS Local Office: State Local Office: Military Local Office: USFWS Local Office: USFWS Local Office: USFS Region:

**USFS Ranger District:** 

Well Number: 5H

## Section 12 - Other Information

Right of Way needed? NO ROW Type(s): Use APD as ROW?

**ROW Applications** 

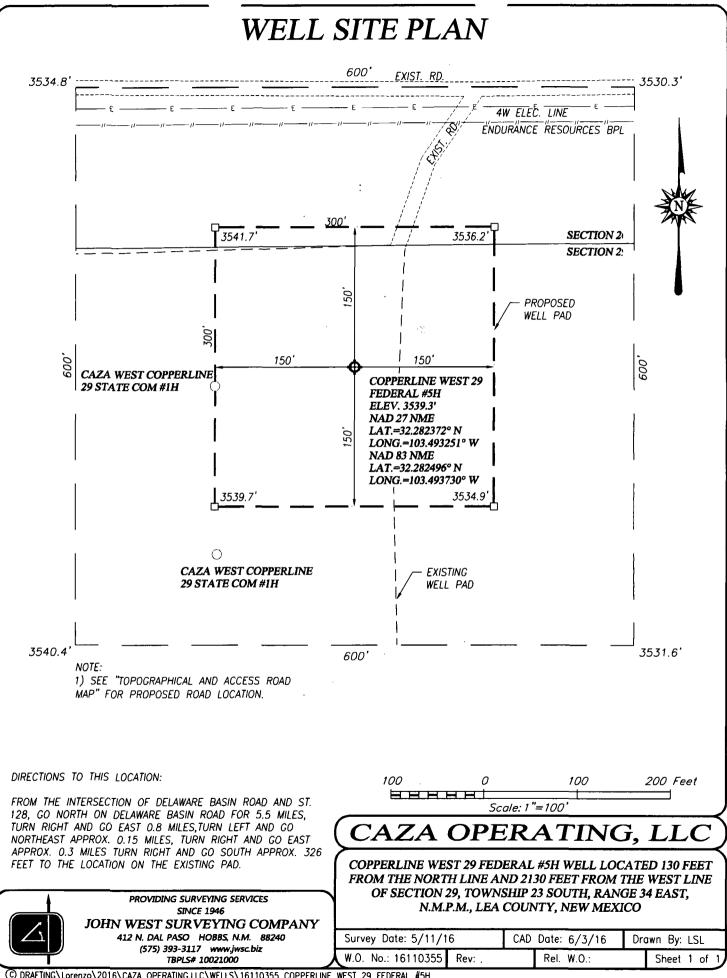
SUPO Additional Information:

Use a previously conducted onsite? YES

Previous Onsite information: Copperline West 29 Federal 3H

## Other SUPO Attachment

Copperline\_West\_29\_Fed\_5H\_Interim\_Reclamation\_Plat\_20180428074050.pdf

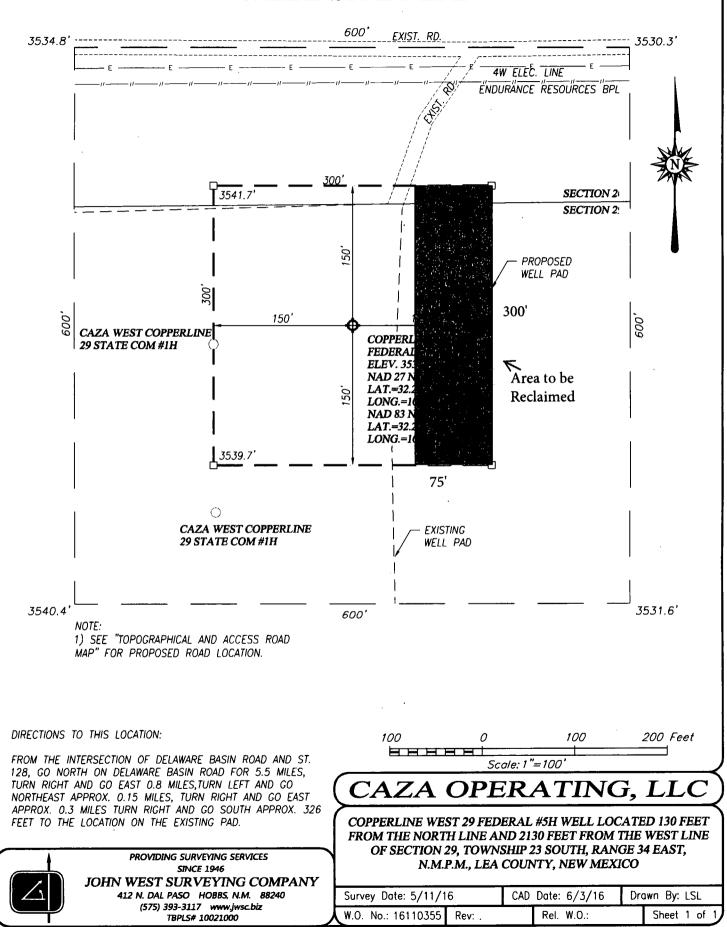


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C DRAFTING\Lorenzo\2016\CAZA OPERATING,LLC\WELLS\16110355 COPPERLINE WEST 29 FEDERAL #5H

# WELL SITE PLAN



C DRAFTING\Lorenzo\2016\CAZA OPERATING,LLC\WELLS\16110355 COPPERLINE WEST 29 FEDERAL #5H



U.S. Department of the Interior BUREAU OF LAND MANAGEMENT

## **Section 1 - General**

Would you like to address long-term produced water disposal? NO

## **Section 2 - Lined Pits**

Would you like to utilize Lined Pit PWD options? NO Produced Water Disposal (PWD) Location: PWD surface owner: Lined pit PWD on or off channel: Lined pit PWD discharge volume (bbl/day): Lined pit specifications: Pit liner description: Pit liner manufacturers information: Precipitated solids disposal: Decribe precipitated solids disposal: Precipitated solids disposal permit: Lined pit precipitated solids disposal schedule: Lined pit precipitated solids disposal schedule attachment: Lined pit reclamation description: Lined pit reclamation attachment: Leak detection system description: Leak detection system attachment: Lined pit Monitor description: Lined pit Monitor attachment: Lined pit: do you have a reclamation bond for the pit? Is the reclamation bond a rider under the BLM bond? Lined pit bond number: Lined pit bond amount: Additional bond information attachment:

PWD disturbance (acres):

PWD Data Report

08/07/2018

## Section 3 - Unlined Pits

#### Would you like to utilize Unlined Pit PWD options? NO

Produced Water Disposal (PWD) Location:

PWD surface owner:

Unlined pit PWD on or off channel:

Unlined pit PWD discharge volume (bbl/day):

Unlined pit specifications:

Precipitated solids disposal:

Decribe precipitated solids disposal:

Precipitated solids disposal permit:

Unlined pit precipitated solids disposal schedule:

Unlined pit precipitated solids disposal schedule attachment:

Unlined pit reclamation description:

Unlined pit reclamation attachment:

Unlined pit Monitor description:

Unlined pit Monitor attachment:

Do you propose to put the produced water to beneficial use?

Beneficial use user confirmation:

Estimated depth of the shallowest aquifer (feet):

Does the produced water have an annual average Total Dissolved Solids (TDS) concentration equal to or less than that of the existing water to be protected?

TDS lab results:

Geologic and hydrologic evidence:

State authorization:

**Unlined Produced Water Pit Estimated percolation:** 

Unlined pit: do you have a reclamation bond for the pit?

Is the reclamation bond a rider under the BLM bond?

Unlined pit bond number:

Unlined pit bond amount:

Additional bond information attachment:

#### **Section 4 - Injection**

Would you like to utilize Injection PWD options? NO

Produced Water Disposal (PWD) Location: PWD surface owner: Injection PWD discharge volume (bbl/day): Injection well mineral owner:

**PWD** disturbance (acres):

PWD disturbance (acres):

Injection well type: Injection well number: Assigned injection well API number? Injection well new surface disturbance (acres): Minerals protection information: Mineral protection attachment: Underground Injection Control (UIC) Permit? UIC Permit attachment:

## Section 5 - Surface Discharge

Would you like to utilize Surface Discharge PWD options? NO

Produced Water Disposal (PWD) Location:

PWD surface owner:

Surface discharge PWD discharge volume (bbl/day):

Surface Discharge NPDES Permit?

Surface Discharge NPDES Permit attachment:

Surface Discharge site facilities information:

Surface discharge site facilities map:

## Section 6 - Other

Would you like to utilize Other PWD options? NO

Produced Water Disposal (PWD) Location:

PWD surface owner:

Other PWD discharge volume (bbl/day):

Other PWD type description:

Other PWD type attachment:

Have other regulatory requirements been met?

Other regulatory requirements attachment:

PWD disturbance (acres):

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**PWD disturbance (acres):** 

Injection well API number:

Injection well name:



U.S. Department of the Interior BUREAU OF LAND MANAGEMENT

### **Bond Information**

Federal/Indian APD: FED

BLM Bond number: NMB000471

**BIA Bond number:** 

Do you have a reclamation bond? NO

Is the reclamation bond a rider under the BLM bond?

Bond Info Data Report

08/07/2018

Is the reclamation bond BLM or Forest Service?

**BLM reclamation bond number:** 

Forest Service reclamation bond number:

Forest Service reclamation bond attachment:

**Reclamation bond number:** 

**Reclamation bond amount:** 

**Reclamation bond rider amount:** 

Additional reclamation bond information attachment:



## Well Name: COPPERLINE WEST 29 FEDERAL

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	NS-Foot	NS Indicator	EW-Foot	EW Indicator	Twsp	Range	Section	Aliquot/Lot/Tract	Latitude	Longitude	County	State	Meridian	Lease Type	Lease Number	Elevation	MD	DVT
EXIT Leg #1	330	FSL	227 5	FWL	235	34E	29	Aliquot SESW	32.26925 1	- 103.4932 39	LEA	•	NEW MEXI CO	F	NMNM 092199	- 810- 8	162 00	116 47
BHL Leg #1	330	FNL	227 5	FWL	235	34E	29	Aliquot SESW	32.26925 1	- 103.4932 39	LEA	1	NEW MEXI CO	F	NMNM 092199	- 810 8	162 00	116 47

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