

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF LAND MANAGEMENT

OCD Artesia

FORM APPROVED  
OMB NO. 1004-0137  
Expires: January 31, 2018**SUNDRY NOTICES AND REPORTS ON WELLS**  
*Do not use this form for proposals to drill or to re-enter an abandoned well. Use form 3160-3 (APD) for such proposals.*5. Lease Serial No.  
NMNM118108

6. If Indian, Allottee or Tribe Name

**SUBMIT IN TRIPLICATE - Other instructions on page 2**

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

1. Type of Well

☐ Oil Well ☒ Gas Well ☐ Other8. Well Name and No.  
HH SO 8 P2 13H2. Name of Operator  
CHEVRON USA INCORPORATEDContact: DORIAN K FUENTES  
E-Mail: DJVO@CHEVRON.COM9. API Well No.  
30-015-43933-00-X13a. Address  
6301 DEAUVILLE BLVD  
MIDLAND, TX 797063b. Phone No. (include area code)  
Ph: 432-687-763110. Field and Pool or Exploratory Area  
WILDCAT

4. Location of Well (Footage, Sec., T., R., M., or Survey Description)

Sec 17 T26S R27E NWNW 305FNL 960FWL

11. County or Parish, State

EDDY COUNTY, NM

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

TYPE OF SUBMISSION	TYPE OF ACTION			
<input checked="" type="checkbox"/> Notice of Intent	<input type="checkbox"/> Acidize	<input type="checkbox"/> Deepen	<input type="checkbox"/> Production (Start/Resume)	<input type="checkbox"/> Water Shut-Off
<input type="checkbox"/> Subsequent Report	<input type="checkbox"/> Alter Casing	<input type="checkbox"/> Hydraulic Fracturing	<input type="checkbox"/> Reclamation	<input type="checkbox"/> Well Integrity
<input type="checkbox"/> Final Abandonment Notice	<input type="checkbox"/> Casing Repair	<input type="checkbox"/> New Construction	<input type="checkbox"/> Recomplete	<input checked="" type="checkbox"/> Other
	<input type="checkbox"/> Change Plans	<input type="checkbox"/> Plug and Abandon	<input type="checkbox"/> Temporarily Abandon	Change to Original A
	<input type="checkbox"/> Convert to Injection	<input type="checkbox"/> Plug Back	<input type="checkbox"/> Water Disposal	PD

13. Describe Proposed or Completed Operation: Clearly state all pertinent details, including estimated starting date of any proposed work and approximate duration thereof. If the proposal is to deepen directionally or recompleat horizontally, give subsurface locations and measured and true vertical depths of all pertinent markers and zones. Attach the Bond under which the work will be performed or provide the Bond No. on file with BLM/BIA. Required subsequent reports must be filed within 30 days following completion of the involved operations. If the operation results in a multiple completion or recompleat in a new interval, a Form 3160-4 must be filed once testing has been completed. Final Abandonment Notices must be filed only after all requirements, including reclamation, have been completed and the operator has determined that the site is ready for final inspection.

CHEVRON RESPECTFULLY REQUEST TO RUN 7 5/8" CONTINGENCY LINER DUE TO LOWER THAN EXPECTED FIT OF 13.8 PPG EMW AT 9 5/8" INTERMEDIATE SHOE INSTEAD OF EXPECTED 15.0 PPG EMW.

PLEASE REFER TO THE ATTACHED DOCUMENTS.

SHOULD QUESTIONS ARISE PLEASE CONTACT MARKQUALE FIELDS @ 281-844-9091

NM OIL CONSERVATION  
ARTESIA DISTRICT

OCT 20 2017

SEE ATTACHED FOR  
CONDITIONS OF APPROVAL

Accepted for record - NMOCD

RECEIVED

14. I hereby certify that the foregoing is true and correct.

Electronic Submission #390823 verified by the BLM Well Information System

For CHEVRON USA INCORPORATED, sent to the Carlsbad

Committed to AFMSS for processing by ZOTA STEVENS on 10/05/2017 (18ZS0009SE)

Name (Printed/Typed) DORIAN K FUENTES

Title REGULATORY SPECIALIST

Signature (Electronic Submission)

Date 10/04/2017

**THIS SPACE FOR FEDERAL OR STATE OFFICE USE**

Approved By ZOTA STEVENS

Title PETROLEUM ENGINEER

Date 10/05/2017

Conditions of approval, if any, are attached. Approval of this notice does not warrant or certify that the applicant holds legal or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations thereon.

Office Carlsbad

Title 18 U.S.C. Section 1001 and Title 43 U.S.C. Section 1212, make it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

(Instructions on page 2)

**\*\* BLM REVISED \*\* BLM REVISED \*\* BLM REVISED \*\* BLM REVISED \*\* BLM REVISED \*\***

FORMATION	SUB-SEA TVD	KBTVD
Castille		505
Lamar		2395
Bell		2310
Cherry		3208
Brushy		4450
Bone Spring/Avalon		6299
First Bone Spring Sand		6888
First Bone Spring Shale		6914
Second Bone Spring Sand		7621
Harkey Sand		8123
Third Bone Spring Sand		8617
Wolfcamp A		9342
Wolfcamp C		9754
Wolfcamp D		10000
Lateral TVD Wolfcamp D		10000

#### 4. CASING PROGRAM

Purpose	From	To	Hole Size	Csg Size	Weight
Surface	0'	450'	17-1/2"	13-3/8"	54.5 #
Intermediate	0'	9,015'	12-1/4"	9-5/8"	40.0 #
Intermediate Liner	8600'	10,200'	8-1/2"	7-5/8"	29.7 #
Production	0'	20,613'	6-3/4"	5-1/2"x5"	20# x 18#

#### **SF Calculations based on the following "Worst Case" casing design:**

**Surface Casing:** 450'

**Intermediate Casing:** 9015'

**Intermediate Liner :** 10,100'

**Production Casing:** 20613.13' MD/10,000' TVD (10,000' VS @ 89.7 c

Casing String	Min SF Burst	Min SF Collapse	Min :
Surface	1.82	5.11	
Intermediate	1.45	1.32	
Intermediate Liner	4.96	3.56	
Production	1.26	1.5	

<b>Burst Design</b>	Surf
Pressure Test- Surface, Int, Prod Csg P external: Water P internal: Test psi + next section heaviest mud in csg	X

Displace to Gas- Surf Csg P external: Water P internal: Dry Gas from Next Csg Point	X
Frac at Shoe, Gas to Surf- Int Csg P external: Water P internal: Dry Gas, 15 ppg Frac Gradient	
Stimulation (Frac) Pressures- Prod Csg P external: Water P internal: Max inj pressure w/ heaviest injected fluid	
Tubing leak- Prod Csg (packer at KOP) P external: Water P internal: Leak just below surf, 8.7 ppg packer fluid	
<b>Collapse Design</b>	
Full Evacuation P external: Water gradient in cement, mud above TOC P internal: none	X
Cementing- Surf, Int, Prod Csg P external: Wet cement P internal: water	X
<b>Tension Design</b>	
100k lb overpull	X

#### 5. CEMENTING PROGRAM

Slurry	Type	Cement Top	Cement Bottom	Weight
Tail	Class H	8,600'	10,200'	15.6

#### 6. MUD PROGRAM

From	To	Type	Weight	F. Visc	Filtrate
8,600'	10,200'	OBM	13-13.5	50 -70	5.0 - 10
10,200'	20,613'	OBM	13.0 - 13.6	50 -70	5.0 - 10

<b>MD</b>
20613.13'

<b>Grade</b>	<b>Thread</b>	<b>Condition</b>
K-55	STC	New
L-80	TXP	New
P-110	TSH513	New
P-110 x P-110IC	TXP x Wedge 521	New

deg inc)

<b>SF Tension</b>	<b>Min SF Tri-Axial</b>
3.97	2.31
1.78	1.84
2.96	2.27
2.43	1.35

<b>Int</b>	<b>Int Liner</b>	<b>Prod</b>
X	X	X

X	X	
		X
		X
X	X	X
X	X	X
X	X	X

Yield	%Excess	Sacks	Water
1.18	35	156	5.23

# PECOS DISTRICT

## DRILLING CONDITIONS OF APPROVAL

<b>OPERATOR'S NAME:</b>	<b>Chevron USA Inc.</b>
<b>LEASE NO.:</b>	<b>NMNM-118108</b>
<b>WELL NAME &amp; NO.:</b>	<b>HH SO 8 P2 13H</b>
<b>SURFACE HOLE FOOTAGE:</b>	<b>0305' FNL &amp; 0960' FWL</b>
<b>BOTTOM HOLE FOOTAGE:</b>	<b>0180' FNL &amp; 0330' FWL Sec. 05, T. 26 S., R 27 E.</b>
<b>LOCATION:</b>	<b>Section 17, T. 26 S., R 27 E., NMPM</b>
<b>COUNTY:</b>	<b>Eddy County, New Mexico</b>

COA

**All COAs still applied expect the following:**

H2S	<input type="radio"/> Yes	<input checked="" type="radio"/> No	
Potash	<input checked="" type="radio"/> None	<input type="radio"/> Secretary	<input type="radio"/> R-111-P
Cave Karst Potential	<input type="radio"/> Low	<input checked="" type="radio"/> Medium	<input type="radio"/> High
Variance	<input type="radio"/> None	<input checked="" type="radio"/> Flex Hose	<input type="radio"/> Other
Wellhead	<input type="radio"/> Conventional	<input checked="" type="radio"/> Multibowl	<input type="radio"/> Both
Other	<input type="checkbox"/> 4 String Area	<input type="checkbox"/> Capitan Reef	<input type="checkbox"/> WIPP

### A. Hydrogen Sulfide

Hydrogen Sulfide (H2S) monitors shall be installed prior to drilling out the surface shoe. If H2S is detected in concentrations greater than 100 ppm, the Hydrogen Sulfide area shall meet Onshore Order 6 requirements, which includes equipment and personnel/public protection items. If Hydrogen Sulfide is encountered, provide measured values and formations to the BLM.

### B. CASING

1. The **13-3/8** inch surface casing shall be set at approximately **450** feet (a minimum of 25 feet into the Rustler Anhydrite and above the salt) and cemented to the surface.
  - a. If cement does not circulate to the surface, the appropriate BLM office shall be notified and a temperature survey utilizing an electronic type temperature survey with surface log readout will be used or a cement bond log shall be run to verify the top of the cement. Temperature survey will be run a minimum of six hours after pumping cement and ideally between 8-10 hours after completing the cement job.
  - b. Wait on cement (WOC) time for a primary cement job will be a minimum of **8 hours** or 500 pounds compressive strength, whichever is greater. (This is to include the lead cement)

- c. Wait on cement (WOC) time for a remedial job will be a minimum of 4 hours after bringing cement to surface or 500 pounds compressive strength, whichever is greater.
  - d. If cement falls back, remedial cementing will be done prior to drilling out that string.
2. The minimum required fill of cement behind the **9-5/8** inch intermediate casing is: Operator has proposed a DV tool, the depth may be adjusted as long as the cement is changed proportionally. The DV tool may be cancelled if cement circulates to surface on the first stage.
- a. First stage to DV tool: Cement to circulate. If cement does not circulate off the DV tool, contact the appropriate BLM office before proceeding with second stage cement job.
    - Second stage above DV tool: Cement to surface. If cement does not circulate, contact the appropriate BLM office. **Additional cement maybe required. Excess cement calculates only 22%.**
  - ❖ In Medium Cave/Karst Areas if cement does not circulate to surface on the first two casing strings, the cement on the 3rd casing string must come to surface.
3. The minimum required fill of cement behind the **7-5/8** inch liner is:
- Cement should tie-back at least 100 feet into previous casing string. Operator shall provide method of verification. **Additional cement maybe required. Excess cement calculates only -41%.**
4. The minimum required fill of cement behind the **5-1/2 x 5** inch production casing is:
- Cement should tie-back 200' into the previous casing. Operator shall provide method of verification.

### C. PRESSURE CONTROL

1. Variance approved to use flex line from BOP to choke manifold. Manufacturer's specification to be readily available. No external damage to flex line. Flex line to be installed as straight as possible (no hard bends).
2. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the surface casing shoe shall be **3000 (3M)** psi.
3. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the **9-5/8** intermediate casing shoe shall be **5000 (5M)** psi.

## GENERAL REQUIREMENTS

The BLM is to be notified in advance for a representative to witness:

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

☒ Eddy County

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

1. Unless the production casing has been run and cemented or the well has been properly plugged, the drilling rig shall not be removed from over the hole without prior approval.
  - a. In the event the operator has proposed to drill multiple wells utilizing a skid/walking rig. Operator shall secure the wellbore on the current well, after installing and testing the wellhead, by installing a blind flange of like pressure rating to the wellhead and a pressure gauge that can be monitored while drilling is performed on the other well(s).
  - b. When the operator proposes to set surface casing with Spudder Rig
    - Notify the BLM when moving in and removing the Spudder Rig.
    - Notify the BLM when moving in the 2<sup>nd</sup> Rig. Rig to be moved in within 90 days of notification that Spudder Rig has left the location.
    - BOP/BOPE test to be conducted per Onshore Oil and Gas Order No. 2 as soon as 2nd Rig is rigged up on well.
2. Floor controls are required for 3M or Greater systems. These controls will be on the rig floor, unobstructed, readily accessible to the driller and will be operational at all times during drilling and/or completion activities. Rig floor is defined as the area immediately around the rotary table; the area immediately above the substructure on which the draw works are located, this does not include the dog house or stairway area.
3. The record of the drilling rate along with the GR/N well log run from TD to surface (horizontal well – vertical portion of hole) shall be submitted to the BLM office as well as all other logs run on the borehole 30 days from completion. If available, a digital copy of the logs is to be submitted in addition to the paper copies. The Rustler top and top and bottom of Salt are to be recorded on the Completion Report.



## A. CASING

1. Changes to the approved APD casing program need prior approval if the items substituted are of lesser grade or different casing size or are Non-API. The Operator can exchange the components of the proposal with that of superior strength (i.e. changing from J-55 to N-80, or from 36# to 40#). Changes to the approved cement program need prior approval if the altered cement plan has less volume or strength or if the changes are substantial (i.e. Multistage tool, ECP, etc.). The initial wellhead installed on the well will remain on the well with spools used as needed.
2. Wait on cement (WOC) for Potash Areas: After cementing but before commencing any tests, the casing string shall stand cemented under pressure until both of the following conditions have been met: 1) cement reaches a minimum compressive strength of 500 psi for all cement blends, 2) until cement has been in place at least 24 hours. WOC time will be recorded in the driller's log. The casing integrity test can be done (prior to the cement setting up) immediately after bumping the plug.
3. Wait on cement (WOC) for Water Basin: After cementing but before commencing any tests, the casing string shall stand cemented under pressure until both of the following conditions have been met: 1) cement reaches a minimum compressive strength of 500 psi at the shoe, 2) until cement has been in place at least 8 hours. WOC time will be recorded in the driller's log. See individual casing strings for details regarding lead cement slurry requirements. The casing integrity test can be done (prior to the cement setting up) immediately after bumping the plug.
4. Provide compressive strengths including hours to reach required 500 pounds compressive strength prior to cementing each casing string. Have well specific cement details onsite prior to pumping the cement for each casing string.
5. No pea gravel permitted for remedial or fall back remedial without prior authorization from the BLM engineer.
6. On that portion of any well approved for a 5M BOPE system or greater, a pressure integrity test of each casing shoe shall be performed. Formation at the shoe shall be tested to a minimum of the mud weight equivalent anticipated to control the formation pressure to the next casing depth or at total depth of the well. This test shall be performed before drilling more than 20 feet of new hole.
7. If hardband drill pipe is rotated inside casing, returns will be monitored for metal. If metal is found in samples, drill pipe will be pulled and rubber protectors which have a larger diameter than the tool joints of the drill pipe will be installed prior to continuing drilling operations.
8. Whenever a casing string is cemented in the R-111-P potash area, the NMOCD requirements shall be followed.

## B. PRESSURE CONTROL

1. All blowout preventer (BOP) and related equipment (BOPE) shall comply with well control requirements as described in Onshore Oil and Gas Order No. 2 and API RP 53.
2. If a variance is approved for a flexible hose to be installed from the BOP to the choke manifold, the following requirements apply: The flex line must meet the requirements of API 16C. Check condition of flexible line from BOP to choke manifold, replace if exterior is damaged or if line fails test. Line to be as straight as possible with no hard bends and is to be anchored according to Manufacturer's requirements. The flexible hose can be exchanged with a hose of equal size and equal or greater pressure rating. Anchor requirements, specification sheet and hydrostatic pressure test certification matching the hose in service, to be onsite for review. These documents shall be posted in the company man's trailer and on the rig floor.
3. 5M or higher 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.
4. If the operator has proposed a multi-bowl wellhead assembly in the APD. The following requirements must be met:
  - a. Wellhead shall be installed by manufacturer's representatives, submit documentation with subsequent sundry.
  - b. If the welding is performed by a third party, the manufacturer's representative shall monitor the temperature to verify that it does not exceed the maximum temperature of the seal.
  - c. Manufacturer representative shall install the test plug for the initial BOP test.
  - d. If the cement does not circulate and one inch operations would have been possible with a standard wellhead, the well head shall be cut off, cementing operations performed and another wellhead installed.
  - e. Whenever any seal subject to test pressure is broken, all the tests in OOGO2.III.A.2.i must be followed.
5. The appropriate BLM office shall be notified a minimum of 4 hours in advance for a representative to witness the tests.
  - a. In a water basin, for all casing strings utilizing slips, these are to be set as soon as the crew and rig are ready and any fallback cement remediation has been done. The casing cut-off and BOP installation can be initiated four hours after installing the slips, which will be approximately six hours after bumping the plug. For those casing strings not using slips, the minimum wait time before cut-off is eight hours after bumping the plug. BOP/BOPE testing can begin

after cut-off or once cement reaches 500 psi compressive strength (including lead when specified), whichever is greater. However, if the float does not hold, cut-off cannot be initiated until cement reaches 500 psi compressive strength (including lead when specified).

- b. In potash areas, 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. For all casing strings, casing cut-off and BOP installation can be initiated at twelve hours after bumping the plug. However, **no tests** shall commence until the cement has had a minimum of 24 hours setup time, except the casing pressure test can be initiated immediately after bumping the plug (only applies to single stage cement jobs).
- c. The tests shall be done by an independent service company utilizing a test plug. The results of the test shall be reported to the appropriate BLM office.
- d. The test shall be run on a 5000 psi chart for a 2-3M BOP/BOP, on a 10000 psi chart for a 5M BOP/BOPE and on a 15000 psi chart for a 10M BOP/BOPE. If a linear chart is used, it shall be a one hour chart. A circular chart shall have a maximum 2 hour clock. If a twelve hour or twenty-four hour chart is used, tester shall make a notation that it is run with a two hour clock.
- e. All tests are required to be recorded on a calibrated test chart. A copy of the BOP/BOPE test chart and a copy of independent service company test will be submitted to the appropriate BLM office.
- f. The BOP/BOPE test shall include a low pressure test from 250 to 300 psi. The test will be held for a minimum of 10 minutes. This test shall be performed prior to the test at full stack pressure.
- g. BOP/BOPE must be tested by an independent service company within 500 feet of the top of the Wolfcamp formation if the time between the setting of the intermediate casing and reaching this depth exceeds 20 days. This test does not exclude the test prior to drilling out the casing shoe as per Onshore Order No. 2.

### C. DRILLING MUD

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

#### **D. WASTE MATERIAL AND FLUIDS**

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

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

**ZS 100517**

Medium Cave Karst: two casing strings, both to circulate cement to surface.

13 3/8 Segment	surface csg in a #/ft	Grade	17 1/2 inch hole. Coupling	Joint	Design Factors		SURFACE	
"A"	54.50	K 55	ST&C	22.30	Collapse	Burst	Length	Weight
"B"								
w/8.4#/g mud, 30min Sfc Csg Test psig: 1,500				Tail Cmt	does	circ to sfc.	Totals:	
							450	24,525

**Comparison of Proposed to Minimum Required Cement Volumes**

Hole Size	Annular Volume	1 Stage Cmt Sx	1 Stage CuFt Cmt	Min Cu Ft	1 Stage % Excess	Drilling Mud Wt	Calc MASP	Req'd BOPE	Min Dist Hole-Cplg
17 1/2	0.6946	356	473	367	29	8.70	2466	3M	1.56

Burst Frac Gradient(s) for Segment(s) A, B = , b All &gt; 0.70, OK.

9 5/8 Segment	casing inside the #/ft	Grade	13 3/8	Coupling	Joint	Design Factors		INTERMEDIATE	
"A"	40.00	L 80		TXP	2.54	Collapse	Burst	Length	Weight
"B"									
w/8.4#/g mud, 30min Sfc Csg Test psig:							Totals:	9,015	360,600
The cement volume(s) are intended to achieve a top of				0	ft from surface or a			450	overlap.
Hole Size	Annular Volume	1 Stage Cmt Sx	1 Stage CuFt Cmt	Min Cu Ft	1 Stage % Excess	Drilling Mud Wt	Calc MASP	Req'd BOPE	Min Dist Hole-Cplg
12 1/4	0.3132	look	0	2864		9.50	4765	5M	0.81
D V Tool(s):				2100			sum of sx	Σ CuFt	Σ % excess
t by stage %				91	22		2361	5004	75

Class 'H' tail cmt yld &gt; 1.20

MASP is within 10% of 5000psig, need

Burst Frac Gradient(s) for Segment(s): A, B, C, D = 0.64, b, c, d &lt; 0.70 a Problem!!

ALT. COLLASPE SF IS GOOD.

Tail cmt

7 5/8 Segment	Liner w/top @ #/ft	Grade	8600	Coupling	Joint	Design Factors		LINER	
"A"	29.70	P 110		TXP	16.22	Collapse	Burst	Length	Weight
"B"	29.70	P 110		TXP	2.36	1.60	1.84	836	24,829
w/8.4#/g mud, 30min Sfc Csg Test psig: 2,060							Totals:	1,600	47,520
A would be:				11.87	1.09	if it were a vertical wellbore.			
No Pilot Hole Planned				MTD	Max VTD	Csg VD	Curve KOP	Dogleg <sup>a</sup>	Severity <sup>a</sup>
				10200	9900	9900	9364	84	-1
The cement volume(s) are intended to achieve a top of				7015	ft from surface or a			2000	overlap.
Hole Size	Annular Volume	1 Stage Cmt Sx	1 Stage CuFt Cmt	Min Cu Ft	1 Stage % Excess	Drilling Mud Wt	Calc MASP	Req'd BOPE	Min Dist Hole-Cplg
8 1/2	0.0770	156	184	312	-41	13.50	4865	5M	0.44

MASP is within 10% of 5000psig, need exrta equip?

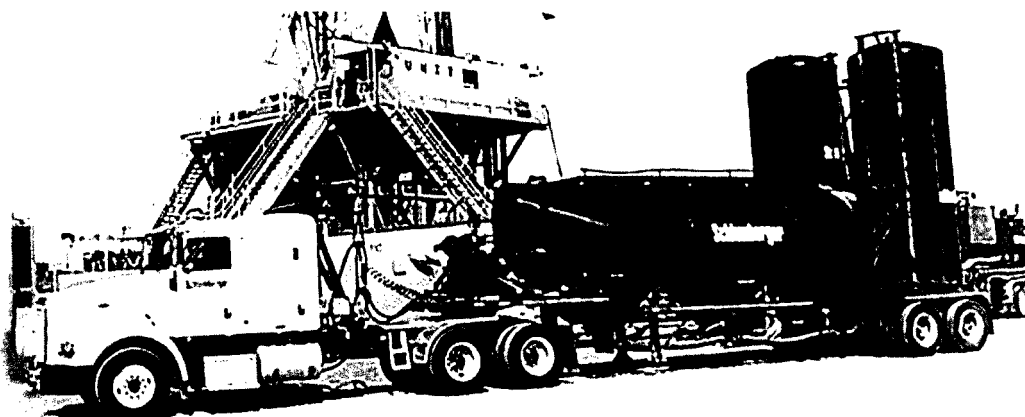
CURVE SF IS TOO CONSERVATIVE. COLLAPSE SF IS GOOD.

Tail cmt

5 1/2 Segment	casing inside the #/ft	Grade	7 5/8	Coupling	Joint	Design Factors		PRODUCTION	
"A"	20.00	P 110		BUTT	3.67	Collapse	Burst	Length	Weight
"B"	18.00	P 110		BUTT	5.80	1.94	1.97	11,249	202,482
w/8.4#/g mud, 30min Sfc Csg Test psig: 2,060							Totals:	20,613	389,762
B segment Design Factors would be:				37.39	2.1	if it were a vertical wellbore.			
No Pilot Hole Planned				MTD	Max VTD	Csg VD	Curve KOP	Dogleg <sup>a</sup>	Severity <sup>a</sup>
				20613	10000	10000	9364	90	10
The cement volume(s) are intended to achieve a top of				0	ft from surface or a			10200	overlap.
Hole Size	Annular Volume	1 Stage Cmt Sx	1 Stage CuFt Cmt	Min Cu Ft	1 Stage % Excess	Drilling Mud Wt	Calc MASP	Req'd BOPE	Min Dist Hole-Cplg
6 3/4	0.0835	4017	4825	1821	165	13.60			0.70

MASP is within 10% of 5000psig, need exrta equip?

## 7 5/8 in Liner



<b>Company</b>	CHEVRON CORP
<b>Well Name</b>	HH SO 8 P2 13H
<b>Date</b>	9/30/2017
<b>Surface Location</b>	Patterson 815
<b>Proposal Number</b>	2 – Revised depths
<b>Prepared For</b>	Roderick Milligan/Mark Fields
<b>Primary Contact</b>	Jenny Clements / +1 432 212 2307
<b>Alternative Contacts</b>	James Jesudas / +1 281 765 5061
<b>Service From District</b>	Hobbs
<b>District Phone</b>	575-393-6186
<b>Objective</b>	To safely set casing as per company rep requests.
<b>PPP ID:</b>	64090

Schlumberger submits this document with the benefit of its judgment, experience, and good oilfield practices. This information is provided in accordance with generally accepted industry practice, relying on facts or information provided by others, limitations, computer models, measurements, assumptions and inferences that are not infallible. Calculations are estimates based on provided information. All proposals, recommendations, or predictions are opinions only. NO WARRANTY IS GIVEN CONCERNING ACCURACY OR COMPLETENESS OF DATA, INFORMATION PRESENTED, EFFECTIVENESS OF MATERIAL, PRODUCTS OR SUPPLIES, RECOMMENDATIONS MADE, OR RESULTS OF THE SERVICES RENDERED. Freedom from infringement of any intellectual property rights of Schlumberger or others is not inferred and no intellectual property rights are granted hereby.

**Schlumberger**

## Executive Summary

Enclosed is our proposed commercial submission for Schlumberger intervention; and, for illustrative purposes, an estimate is also provided for the referenced well. This proposal includes well data, job design data, materials and resources requirements, and cost estimates. The purpose of our services is to perform Liner Treatment.

Schlumberger has a safety policy to which all Schlumberger personnel must adhere. A pre-job safety meeting will be held with customer representatives and other personnel on location to familiarize everyone with existing and anticipated hazards and safety procedures. We would appreciate close cooperation between the customer representative and the Schlumberger representative to ensure a safe operation.

The estimated total cost of our services is **\$20,763.88** per well. All costs are estimates only. Actual costs will be dependent on time, material and equipment used during treatment. Taxes are not included. All work will be subject to Schlumberger then-current General Terms and Conditions or to the terms and conditions of a Master Service Agreement if one is in effect between Schlumberger and Customer. This quote is valid for a period of thirty (30) days from the date submitted.

Thank you for considering Schlumberger.

Please do not hesitate to contact me with any questions or concerns.

Sincerely,

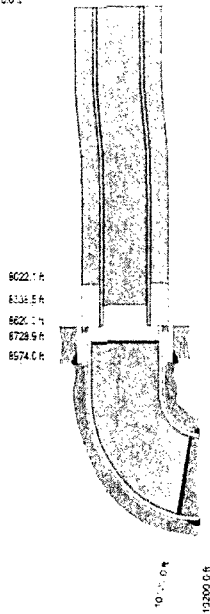
Jenny Clements  
DESC Engineer  
WClements@exchange.slb.com  
Office: +1 432 212 2307

# Well Data

## IMPORTANT

The well data shown on this page is based on information available when this treatment program was prepared. This data must be confirmed on location with the customer representative prior to the treatment. Any changes in the well design need to be reviewed for their impact on the treatment design.

MD  
CGG



## Well Data

Job Type:	Liner
Total Depth (Measured):	10,200.0 ft
TVD:	9,900.0 ft
BHST (Tubular Bottom Static Temperature):	169.5 degF
BHCT (Tubular Bottom Circulating Temperature):	147.0 degF
Drilling Fluid:	13.20 lb/gal

## Open Hole

Excess Type	OH Diameter	MD	Annular Excess	Equiv. OH Diameter	Annular Capacity
Annular	8.500 in	10,200.0 ft	35.0 %	8.786 in	0.019 bbl/ft

## Previous Casing

OD, in	Weight, lbm/ft	Grade	Inner Capacity, bbl/ft	Bottom Depth, ft	Casing Capacity, bbl/ft
9 5/8	43.5	L-80	0.074	8,974.0	0.07446

## Drill Pipe

OD, in	Weight, lbm/ft	Grade	Inner Capacity, bbl/ft	Bottom Depth, ft	Casing Capacity, bbl/ft
5	19.5	X95	0.018	8,620.0	0.01776

## Casing

OD, in	Weight, lbm/ft	Grade	Inner Capacity, bbl/ft	Bottom Depth, ft	Casing Capacity, bbl/ft
7 5/8	29.7	P-110	0.046	10,200.0	0.04592

## Annular Capacity (no excess)

9 5/8 in Previous CSG :: 7 5/8 in CSG:	0.018 bbl/ft
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## Fluid Placement

Fluid Name	Volume, bbl	Top of Fluid, ft	Annular Length, ft	Length, ft	Density, lb/gal
Mud	402.5	0.0	8,022.1	8,022.1	13.20
MUDPUSH Express	30.0	8,022.1	597.9	597.9	14.00
Tail Slurry	32.7	8,620.0	1,580.0	1,660.0	15.60
Mud	63.9	8,728.9	0.0	1,391.1	13.20
MUDPUSH Express	10.0	8,338.5	0.0	390.4	14.00
Mud	148.1	0.0	0.0	8,338.5	13.20

Total Liquid Volume: 687.2 bbl



## Fluid Systems

MudPUSH Express			
System		MudPUSH Express	
Density		14.00 lb/gal	
Total Volume		40.0 bbl	
Additives	Code	Description	Concentration
	B389	Viscosifier	0.70 lb/bbl of Spacer
	B553	Surfactant	1.00 gal/bbl of Spacer
	D206	Anti Foam	0.20 gal/bbl of Spacer
	D035	Weighting Agent	398.480 lb/bbl of Spacer

Tail Slurry (156 sacks, 94.0 lbm per sack of Blend)			
System		Class H	
Density		15.60 lb/gal	
Yield		1.18 ft <sup>3</sup> /sk	
Mix Water		5.23 gal/sk	
Mix Fluid		5.25 gal/sk	
Total Volume		32.7 bbl	
Additives	Code	Description	Concentration
	H	Cement	94.00 lb/sk BWOB
	D047	Anti Foam	0.02 gal/sk VBWOB
	D065	Dispersant	0.10 % BWOB
	D208	Viscosifier	0.03 % BWOB
	D255	Fluid loss	0.30 % BWOB
	D800	Retarder	0.10 % BWOB

Some of the chemicals specified in this program may have toxic properties. All personnel should be familiar with the inherent dangers and appropriate safeguards to prevent accidental injury. Use of these chemicals may be governed by certain laws and regulations and should only be used in accordance with such. Please refer to the MSDS for the recommended safety precautions and required minimum personal protective equipment.

## Pumping Schedule - 7 5/8 in Liner

Fluid Placement						
Fluid	Flow Rate, bbl/min	Volume, bbl	Stage Time, min	Cumul Volume, bbl	Cumul Time, min	Comments
MUDPUSH Express	5.0	30.0	6.0	30.0	6.0	
Tail Slurry	6.0	32.7	5.5	62.7	11.5	
Pause	0.0	0.0	10.0	62.7	21.5	Shutdown, drop plug
Mud	5.0	63.9	12.8	126.6	34.2	
MUDPUSH Express	5.0	10.0	2.0	136.6	36.2	
Mud	6.0	70.0	11.7	206.6	47.9	
	3.0	20.0	6.7	226.6	54.6	Slow down across liner hanger
	6.0	48.1	8.0	274.7	62.6	
	2.0	10.0	5.0	284.7	67.6	Slow down to bump
Total Fluid Volume:				284.7		
Total Pump Time:					67.6	

## Procedures

Pre-job meeting to discuss rig up

Verify volumes calculation with company representative

Hold safety meeting

Pressure test

Pump 30 bbl MPE @ 14.0 ppg

Pump 32.7 bbl Tail Slurry @ 15.6 ppg

Drop plug

Displacement, placing 10 bbl MPE across liner hanger

Check returns

# Price Estimate

Primary Pricebook Code: BSPI

Equipment and Services						
Code	Standard Description	Quantity	Unit List Price	Total List Price \$	Discount Rate %	Discounted Price \$
102872105	Pumps by unit, depth charge 10001-10500 ft	1 EA	3,124.06	3,124.06	0.00	3,124.06
48019000	Cement Bulk Unit	20 HR	59.36	1,187.20	0.00	1,187.20
49100000	Cement Service Charge	371 CF	0.96	356.16	0.00	356.16
49102000	Cement Transport	1,531 MI	0.87	1,331.97	0.00	1,331.97
59200002	Equipment Mileage	200 MI	2.02	404.00	0.00	404.00
59200005	Car/PU Mileage	200 MI	1.19	238.00	0.00	238.00
59696008	Intermediate Casing Cement Surcharge	1 EA	6,000.00	6,000.00	0.00	6,000.00
59697004	Job Monitoring	1 JOB	301.90	301.90	0.00	301.90
Subtotals:			USD	12,943.29	USD	12,943.29

Materials						
Code	Standard Description	Quantity	Unit List Price	Total List Price \$	Discount Rate %	Discounted Price \$
B553	Surfactant B553	40 GA	34.85	1,394.00	0.00	1,394.00
B908	MUDPUSH* Express Water Based Spacer B908	40 BBL	69.85	2,794.00	0.00	2,794.00
D035-CF	LITEPOZ 3 Extender	216 CF	4.12	889.92	0.00	889.92
D047	Antifoam Agent	4 GA	28.41	113.64	0.00	113.64
D065	TIC Dispersant	15 LB	3.12	46.80	0.00	46.80
D206	D206, Antifoaming Agent	8 GA	41.76	334.08	0.00	334.08
D208	ScavengerPlus D208	5 LB	27.44	137.20	0.00	137.20
D255	Mid-Temperature FLAC D255	44 LB	13.29	584.76	0.00	584.76
D800	Retarder	15 LB	2.53	37.95	0.00	37.95
D909	Cement, Class H	156 CF	9.54	1,488.24	0.00	1,488.24
Subtotals:			USD	7,820.59	USD	7,820.59

Total List Price: USD 20,763.88  
Applied Discount: USD 0.00  
**Job Price Estimate: USD 20,763.88**

# General PRICING DETAILS – Chevron Corporation

This pricing agreement is valid to 30 days from the submitted date. These prices are estimates based on the current price structure, and the Chevron Corporation provided well design. Prices will vary somewhat with the actual job design parameters, materials, equipment, and time actually required during the execution of service.

The cement slurry data presented is from systems previously tested in Schlumberger Laboratories. Thickening time tests should be run when field mix water is available and final temperatures are known. Mud/Cement compatibility tests should be run when final mud systems are in use. These tests could cause quantity variations of the materials recommended, thereby affecting the price of the treatment.

- Pricing is based on the WSV\_GEOREF\_USW\_2017\_USD\_CVX\_PERMIAN Pricebook (ID: BSP1)
- A minimum notice of 24 hours prior to job must be given to ensure quoted price.
- Services and Materials discounted at 0% (job discount) for (Primary Cementing Jobs)
- Services and Materials discount to be determined at time of request for non-Primary Cementing Jobs, eg Plugs, Squeezes
- Mileage is estimated @ 200 miles round trip. Actual Mileage will be charged.
- Heavy Vehicle Mileage charge (Roundtrip mileage per unit) applicable to Pump Units, Batchmixer and DOT units (F550) used for equipment delivery to wellsite. Line Item discounted @ 0%. Heavy Vehicle Mileage charge is applicable to Silo(s) and Silo Spotter.
- Fuel Surcharge charge applicable to each DOT Unit at wellsite during the job and F550 units for equipment delivery for the job. Fuel Surcharge is discounted @ 100% and is applicable to Silo(s), Silo Spotter and Cement Delivery to Silo.
- Surcharges will be applied for the following strings on a per job basis:
  - Surface Casing Cementing - \$3,000.00 per job @ 0% discount
  - Intermediate Casing/Drilling Liner Cementing - \$6,000.00 per job @ 0% discount
  - Remedial Cementing (Plugs, Squeezes, Pump Rentals) - \$5,000.00 per job @ 0% discount
- Offline Cement Charge is 1,500 per job @ 0% discount.
- Location hours are defined as the difference between Crew Arrival to Location or Time Requested to be on Location (whichever is later) and End of Pumping plus 1 hour.
- All base charges on Cement Bulk Units are \$59.36 per location hour, per unit with applicable job discount.
- For depths from 0ft to 9000ft, the additional hour/overtime charges for Equipment (Pump Unit, Cement Bulk Units, Batchmixer) and Personnel start after the first 6 (six) hours on location.
- For depths greater than 9000ft, the additional hour/overtime charges for Equipment (Pump Unit, Cement Bulk Units, Batchmixer) and Personnel start after the first 10 (ten) hours on location.
- For Multistage Cementing Jobs, the additional hour/overtime charges for Equipment (Pump Unit, Cement Bulk Units, Batchmixer) and Personnel start after the first 12 (twelve) hours on location, independent of the Casing Depth (MD).
- For Remedial Cementing (Plugs, Squeezes, Pump Rentals), the additional hour/overtime charges for Equipment (Pump Unit, Cement Bulk Units, Batchmixer) and Personnel start after the first 6 (six) hours on location, independent of Casing Depth (MD).
- Additional hours discounted at 0% for Equipment and 0% for Personnel.
- Overtime charges on Primary Cement Pump are \$640.50 per hour with applicable job discount.
- Overtime charges on Cement Bulk Units are \$121.10 per hour with applicable job discount.
- Overtime charges on Personnel are:
  - Service Supervisor or Field Engineer is \$39.33 per hour with applicable job discount.
  - Operator or Supervisor Technician is \$31.84 per hour with applicable job discount.
- If circulating equipment or cement head (9 5/8in and larger) is delivered prior to job, the circulating equipment charge and/or cement head charge line items will be applied to the Invoice with a 0% Discount respectively. In addition, Light Vehicle (F150) or F550 charges will apply dependent on the delivery mode to location. Heavy Vehicle, FS and FSI charge apply to the F550 and Light Vehicle mileage charge applies to F150.

- Based on Client Special Request, a 2nd Pump may be requested or based on cement volumes to be pumped, a 2nd Pump may also be suggested by Schlumberger. The 2nd pump will be charged as Standby Pump, \$7,000.00 with applicable job discount. Additional Hours on location for 2nd Pump Unit:
  - Overtime charges on Standby Cement Pump are \$1,120.00 per hour with applicable job discount.
- Mix Water/Displacement Fluid trailer may be used on cement jobs requiring large liquid additives for Batch mixing slurries.
- Top Out Pipe will be charged per foot used, with a 100ft minimum, no discount.
- 3rd party services requested by Client, that are billed to Schlumberger will be marked up by 40% of the 3rd party services invoice. The adjusted 3rd party service invoice charge will be included on the Schlumberger Job Invoice at 0% discount
  - For a cancelled job, the following charges will apply, in addition to a restocking fee. For an incomplete service, that is, the Crew, Equipment and Materials are mobilized to location and are released prior to completing the service, the following charges will be applied with a 20% discount

59220001	Applicable to each DOT vehicle, start/end time is the departure from/return to SLB Yard.
59220003	Applicable to each DOT vehicle mileage
59200005	Applicable to each Light Vehicle mileage
102476000	Applicable to Job Supervisor, start/end time is the departure from/return to SLB Yard.
102476001	Applicable to each EO, start/end time is the departure from/return to SLB Yard.

The following table is a Summary of the Items described above.

Code	FTL Description	Quantity		Unit List Price \$	Discount Rate	Discounted Price \$
59696009	Surface Casing Cement Surcharge	1	EA	3,000.00	0%	3,000.00
59696008	Intermediate Casing/Drilling Liner Cement Surcharge	1	EA	6,000.00	0%	6,000.00
59696010	Remedial Cement Surcharge	1	EA	5,000.00	0%	5,000.00
48015000	Pump, Cement Standby	1	EA	7,000.00	0%	7,000.00
48019000	Bulk Unit, Per Hr on location (per unit)	1	HR	59.36	0%	59.36
102171000	Bulk Unit, Per Hr on location Add Hr (per unit)	1	HR	121.10	0%	121.10
48020000	Pump, Cement Add Hr	1	HR	640.50	0%	640.50
48015200	Additional Pump on Location, Add Hr	1	HR	1,120.00	0%	1,120.00
102476000	Service Supervisor/Field Engineer, Add Hr	1	HR	39.33	0%	39.33
102476001	Per Equipment Operator/Service Technician, Add Hr	1	HR	31.84	0%	31.84
107136000	Derrick Charge, per job (applied if the cement head is greater than 10ft above the rig floor)	1	JOB	224.03	0%	224.03
58498000	Offline Cementing Charge	1	JOB	1,500.00	0%	1,500.00
107138100	Circulating Equipment before job	1	EA	591.12	0%	591.12
102875050	Batchmixer, 0-50 bbl	1	EA	306.52	0%	306.52

102876050	Batchmixer, 0-50 bbl Add Hr	1	HR	82.58	0%	82.58
48166000	Mix Water/Displacement Trailer	1	EA	275.49	0%	275.49
48166001	Mix Water/Displacement Trailer Add Hr	1	HR	60.04	0%	60.04
TP 110	Sugar (used based on Client Request)	1	LB	0.71	0%	0.71
107183000	Top Out Pipe (per ft, minimum 100ft)	1	FT	0.83	0%	0.83
D095	CemNET Lost Circulation Additive	1	LB	8.58	0%	8.58
B838	B838 CemNETplus conversion charge (Losseal)	1	BBL	62.71	0%	62.71