

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

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 Other

8. Well Name and No.
HH SO 17 20 FED 001 2H

2. Name of Operator
CHEVRON USA INCORPORATED
Contact: LAURA BECERRA
E-Mail: LBECERRA@CHEVRON.COM

9. API Well No.
30-015-45101-00-X1

3a. Address
6301 DEAUVILLE BLVD
MIDLAND, TX 79706

3b. Phone No. (include area code)
Ph: 432-687-7665

10. Field and Pool or Exploratory Area
PURPLE SAGE-WOLFCAMP (GAS)

4. Location of Well (Footage, Sec., T., R., M., or Survey Description)
Sec 8 T26S R27E SESW 305FSL 1873FWL
32.050606 N Lat, 104.214859 W Lon

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 APD
	<input type="checkbox"/> Convert to Injection	<input type="checkbox"/> Plug Back	<input type="checkbox"/> Water Disposal	

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 recomplate 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 recompletion 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 requests to change the TVD, ranging from 98862-99772. With the update to the TVD target the well design was updated and the subsurface design, intermediate cement placement design, mud weight ranges, and updating to the URS multibowl wellhead.

Please see attached drilling plan and directional survey.

Carlsbad Field Office
OCD Artesia

RECEIVED

SEP 06 2018

DISTRICT II-ARTESIA O.C.D.

GC 9-7-18
Accepted for record - NMOCD

SEE ATTACHED FOR
CONDITIONS OF APPROVAL

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

Electronic Submission #429853 verified by the BLM Well Information System
For CHEVRON USA INCORPORATED, sent to the Carlsbad
Committed to AFMSS for processing by PRISCILLA PEREZ on 08/08/2018 (18PP2412SE)

Name (Printed/Typed) LAURA BECERRA	Title PERMITTING SPECIALIST
Signature (Electronic Submission)	Date 08/02/2018

THIS SPACE FOR FEDERAL OR STATE OFFICE USE

Approved By ZQIA STEVENS Title PETROLEUM ENGINEER Date 08/17/2018

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 ****

1. FORMATION TOPS

The estimated tops of important geologic markers are as follows:

FORMATION	SUB-SEA TVD	KBTVD	MD
Castille		614	
Lamar		2046	
Bell		2097	
Cherry		2910	
Brushy		4006	
Bone Spring/Avalon		5666	
First Bone Spring Sand		6588	
First Bone Spring Shale		6604	
Second Bone Spring Sand		7904	
Harkey Sand		7916	
Third Bone Spring Sand		8418	
Wolfcamp A		8790	
Wolfcamp D		9691	
Lateral TVD Wolfcamp D		9896	

2. ESTIMATED DEPTH OF WATER, OIL, GAS & OTHER MINERAL BEARING FORMATIONS

The estimated depths at which the top and bottom of the anticipated water, oil, gas, or other mineral bearing formations are expected to be encountered are as follows:

Substance	Formation	Depth
Deepest Expected Base of Fresh Water		450
Water	Castille	614
Water	Cherry Canyon	2910
Oil/Gas	Brushy Canyon	4006
Oil/Gas	Bone Spring Limestone	5666
Oil/Gas	First Bone Spring Shale	6604
Oil/Gas	Second Bone Spring Sand	7904
Oil/Gas	Harkey Sand	7916
Oil/Gas	Wolfcamp A	8790
Oil/Gas	Wolfcamp D	9691

All shows of fresh water and minerals will be reported and protected.

3. BOP EQUIPMENT

Will have a minimum of a 5000 psi rig stack (see proposed schematic) for drill out below surface casing. Stack will be tested as specified in the attached testing requirements. Chevron requests a variance to use a CoFlex hose with a metal protective covering that will be utilized between the BOP and Choke manifold. Please refer to the testing and specification documents.

Chevron requests a variance to use a FMC Technologies UHS Multibowl wellhead, which will be run through the rig floor on surface casing. BOPE will be nipped up and tested after cementing surface casing. Subsequent tests will be performed as needed, not to exceed 30 days. The field report from FMC Technologies and BOP test information will be provided in a subsequent report at the end of the well. Please see the attached wellhead schematic. An installation manual has been placed on file with the BLM office and remains unchanged from previous submittal.

4. CASING PROGRAM

Purpose	From	To	Hole Size	Csg Size	Weight	Grade	Thread	Condition
Surface	0'	450'	17-1/2"	13-3/8"	54.5 #	J-55	STC	New
Intermediate	0'	8,850'	12-1/4"	9-5/8"	43.5#	L-80	LTC	New
Production	0'	20,276'	8-1/2"	5-1/2"	20.0 #	P-110	TXP	New

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

Surface Casing: 450'
 Intermediate Casing: 8,850'
 Production Casing: 20276 MD/9,886' TVD (10,000' vs @ 90 deg inc)

Casing String	Min SF Burst	Min SF Collapse	Min SF Tension	Min SF Tri-Axial
Surface	1.41	5.09	3.56	1.54
Intermediate	1.2	1.74	1.81	1.29
Production	1.11	1.56	2.38	1.21

Min SF is the smallest of a group of safety factors that include the following considerations:

	Surf	Int	Prod
Burst Design			
Pressure Test- Surface, Int, Prod Csg P external: Water P internal: Test psi + next section heaviest mud in csg	X	X	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		X	
Stimulation (Frac) Pressures- Prod Csg P external: Water P internal: Max inj pressure w/ heaviest injected fluid			X
Tubing leak- Prod Csg (packer at KOP) P external: Water P internal: Leak just below surf, 8.7 ppg packer fluid			X
Collapse Design			
Full Evacuation P external: Water gradient in cement, mud above TOC P internal: none	X	X	X
Cementing- Surf, Int, Prod Csg P external: Wet cement P internal: water	X	X	X
Tension Design			
100k lb overpull	X	X	X

5. CEMENTING PROGRAM

Slurry	Type	Cement Top	Cement Bottom	Weight	Yield	%Excess	Sacks	Water
Surface				(ppg)	(sx/cu ft)	Open Hole		gal/sk
Tail	Class C	0'	450'	14.8	1.34	50	348	6.40
Intermediate								
Stage 2 Lead	50:50 Poz: Class C + Antifoam, Extender, Salt, Retarder	0'	1,900'	11.9	2.56	50	250	14.66
Stage 2 Tail	Class C + Antifoam, Retarder, Viscosifier	1,900'	2,100'	14.8	1.33	0	47	6.38
DV TOOL		2,100'						
Stage 1 Lead	50:50 Poz: Class C + Extender, Antifoam, Retarder, Salt, Viscosifier	2,100'	8,015'	11.9	2.56	10	788	14.66
Stage 1 Tail	Class C + Retarder, Extender, Dispersant	8,015'	8,850'	14.8	1.33	10	214	6.38
Production								
Lead	50:50 Poz: Class C + Extender, Antifoam, Dispersant, Retarder	5,353'	19,276'	15.6	1.18	10	3040	5.14
Tail	Class H + Viscosifier, Antifoam, Dispersant, Fluid Loss, Retarder, Expanding Agent	19,276'	20,276'	16	1.9	10	121	7.44

1. Final cement volumes will be determined by caliper. Also, due to the surface location not being staked, the cement volumes will be submitted with the APD. The production string will vary with respect to the lateral length drilled.
2. Surface casing shall have at least one centralizer installed on each of the bottom three joints starting with the shoe joint.
3. Production casing will have one horizontal type centralizer on every joint for the first 1000' from TD, then every other joint to EOB, and then every third joint to KOP. Bowspring type centralizers will be run from KOP to intermediate casing.

ONSHORE ORDER NO. 1
 Chevron
 HayHurst SO 17 20 Fed 001 2H
 Eddy County, NM

CONFIDENTIAL – TIGHT HOLE
 DRILLING PLAN
 4

PAGE:

6. MUD PROGRAM

From	To	Type	Weight	F. Vis	Filtrate
0'	450'	Spud Mud	8.3 - 8.7	32 - 34	NC - NC
450'	8,850'	OBM	8.8-9.5	50 -70	5.0 - 10
8,850'	20,270'	OBM	9-14.4	50 -70	5.0 - 10

A closed system will be utilized consisting of above ground steel tanks. All wastes accumulated during drilling operations will be contained in a portable trash cage and removed from location and deposited in an approved sanitary landfill. Sanitary wastes will be contained in a chemical porta-toilet and then hauled to an approved sanitary landfill.

All fluids and cuttings will be disposed of in accordance with New Mexico Oil Conservation Division rules and regulations.

A mud test shall be performed every 24 hours after mudding up to determine, as applicable: density, viscosity, gel strength, filtration, and pH.

Visual mud monitoring equipment shall be in place to detect volume changes indicating loss or gain of circulating fluid volume. When abnormal pressures are anticipated -- a pit volume totalizer (PVT), stroke counter, and flow sensor will be used to detect volume changes indicating loss or gain of circulating fluid volume.

A weighting agent and lost circulating material (LCM) will be onsite to mitigate pressure or lost circulation as hole conditions dictate.

7. TESTING, LOGGING, AND CORING

The anticipated type and amount of testing, logging, and coring are as follows:

- a. Drill stem tests are not planned.
- b. The logging program will be as follows:

TYPE	Logs	Interval	Timing	Vendor
Mudlogs	2 man mudlog	Int Csg to TD	Drillout of Int Csg	TBD
LWD	MWD Gamma	Int. and Prod. Hole	While Drilling	TBD

- c. Conventional whole core samples are not planned.
- d. A Directional Survey will be run.

8. ABNORMAL PRESSURES AND HYDROGEN SULFIDE

- a. There is a pressure ramp that will be seen in the Wolfcamp D formation expected. Estimated BHP is: 5228 psi
- b. Hydrogen sulfide gas is not anticipated. An H2S Contingency plan will be attached with this MPD in the event that H2S is encountered

**Chevron HH SO 17 20 Fed 001 No. 2H Rev0 cvs 14Jun18 Proposal
Geodetic Report
(Non-Def Plan)**



Report Date:	June 15, 2018 - 12:38 PM	Survey / DLS Computation:	Minimum Curvature / Lubinski
Client:	Chevron	Vertical Section Azimuth:	179.820 ° (Grid North)
Field:	NM Eddy County (NAD 27)	Vertical Section Origin:	0.000 ft, 0.000 ft
Structure / Slot:	Chevron HH SO 17 20 Fed 001 No. 2H / HH SO 17 20 Fed 001 No. 2H	TVD Reference Datum:	RKB = 28ft
Well:	HH SO 17 20 Fed 001 No. 2H	TVD Reference Elevation:	3285.000 ft above MSL
Borehole:	HH SO 17 20 Fed 001 No. 2H	Seabed / Ground Elevation:	3257.000 ft above MSL
UWI / API#:	Unknown / Unknown	Magnetic Declination:	7.332 °
Survey Name:	Chevron HH SO 17 20 Fed 001 No. 2H Rev0 cvs 14Jun18	Total Gravity Field Strength:	998.4301mgn (9.80665 Based)
Survey Date:	June 14, 2018	Gravity Model:	GARM
Tort / AHD / DDI / ERD Ratio:	101.859 ° / 10912.841 ft / 8.358 / 1.104	Total Magnetic Field Strength:	47872.871 nT
Coordinate Reference System:	NAD27 New Mexico State Plane, Eastern Zone, US Feet	Magnetic Dip Angle:	59.704 °
Location Lat / Long:	N 32° 3' 1.74814", W 104° 12' 51.72958"	Declination Date:	June 14, 2018
Location Grid N/E Y/X:	N 382112.000 ftUS, E 538858.000 ftUS	Magnetic Declination Model:	HdGM 2018
CRS Grid Convergence Angle:	0.0831 °	North Reference:	Grid North
Grid Scale Factor:	0.99991085	Grid Convergence Used:	0.0831 °
Version / Patch:	2.10.720.0	Total Corr Mag North->Grid North:	7.2893 °
		Local Coord Referenced To:	Well Head

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	Northing (ftUS)	Easting (ftUS)	Latitude (N/S ° ' ")	Longitude (E/W ° ' ")
Surface Location	0.00	0.00	0.00	0.00	0.00	0.00	0.00	N/A	382112.00	538858.00	N 32 3 1.75 W 104 12 51.73	
13-3/8" Casing Shoe	450.00	0.00	257.63	450.00	0.00	0.00	0.00	0.00	382112.00	538858.00	N 32 3 1.75 W 104 12 51.73	
Castile	503.00	0.00	257.63	503.00	0.00	0.00	0.00	0.00	382112.00	538858.00	N 32 3 1.75 W 104 12 51.73	
KOP, Build 1.5" DLS	550.00	0.00	257.63	550.00	0.00	0.00	0.00	0.00	382112.00	538858.00	N 32 3 1.75 W 104 12 51.73	
Begin 5.5" Inc	916.67	5.50	257.63	916.11	3.71	-3.77	-17.18	1.50	382108.23	538840.82	N 32 3 1.71 W 104 12 51.93	
Lamar LS	2033.71	5.50	257.63	2028.00	28.32	-28.71	-121.76	0.00	382085.30	538736.26	N 32 3 1.48 W 104 12 53.14	
Bell Canyon	2078.91	5.50	257.63	2073.00	27.24	-27.63	-125.99	0.00	382084.37	538732.02	N 32 3 1.47 W 104 12 53.19	
Cherry Canyon	2931.84	5.50	257.63	2922.00	44.50	-45.15	-205.84	0.00	382066.85	538652.18	N 32 3 1.30 W 104 12 54.12	
Drop 1.5" DLS	3576.70	5.50	257.63	3563.89	57.58	-58.39	-286.21	0.00	382053.61	538591.81	N 32 3 1.17 W 104 12 54.82	
Hold Vertical	3943.37	0.00	257.63	3930.00	61.27	-62.16	-283.39	1.50	382048.85	538574.84	N 32 3 1.13 W 104 12 55.02	
Brushy Canyon	4055.37	0.00	257.63	4042.00	61.27	-62.16	-283.39	0.00	382049.85	538574.84	N 32 3 1.13 W 104 12 55.02	
Bone Spring	5692.37	0.00	257.63	5649.00	61.27	-62.16	-283.39	0.00	382049.85	538574.84	N 32 3 1.13 W 104 12 55.02	
1st Bone Spring Sand	6577.37	0.00	257.63	6564.00	61.27	-62.16	-283.39	0.00	382049.85	538574.84	N 32 3 1.13 W 104 12 55.02	
2nd Bone Spring Sand	7255.37	0.00	257.63	7242.00	61.27	-62.16	-283.39	0.00	382049.85	538574.84	N 32 3 1.13 W 104 12 55.02	
3rd BS Carbonate	8203.37	0.00	257.63	8190.00	61.27	-62.16	-283.39	0.00	382049.85	538574.84	N 32 3 1.13 W 104 12 55.02	
Marker												
Top 3rd BS Carbonate	8313.37	0.00	257.63	8300.00	61.27	-62.16	-283.39	0.00	382049.85	538574.84	N 32 3 1.13 W 104 12 55.02	
3rd Bone Spring Sand	8418.37	0.00	257.63	8405.00	61.27	-62.16	-283.39	0.00	382049.85	538574.84	N 32 3 1.13 W 104 12 55.02	
Wolfcamp	8758.37	0.00	257.63	8745.00	61.27	-62.16	-283.39	0.00	382049.85	538574.84	N 32 3 1.13 W 104 12 55.02	
Wolfcamp B	9248.37	0.00	257.63	9235.00	61.27	-62.16	-283.39	0.00	382049.85	538574.84	N 32 3 1.13 W 104 12 55.02	
Build 10" DLS	9326.41	0.00	257.63	9313.00	61.27	-62.16	-283.39	0.00	382049.85	538574.84	N 32 3 1.13 W 104 12 55.02	
9-5/8" Casing Shoe	9413.71	8.73	179.16	9400.00	67.91	-68.80	-283.29	10.00	382043.21	538574.73	N 32 3 1.07 W 104 12 55.02	
Wolfcamp C	9527.47	20.11	179.16	9510.00	98.18	-97.07	-282.88	10.00	382014.94	538575.15	N 32 3 0.79 W 104 12 55.02	
Wolfcamp D	9650.36	32.39	179.16	9620.00	150.43	-151.31	-282.09	10.00	381980.70	538575.94	N 32 3 0.25 W 104 12 55.01	
Landing Point	10226.41	90.00	179.16	9886.00	834.19	-835.06	-275.03	10.00	381477.00	538583.00	N 32 2 55.46 W 104 12 54.93	
	10226.42	90.00	179.16	9886.00	834.19	-835.06	-275.03	0.00	381477.00	538583.00	N 32 2 55.46 W 104 12 54.93	
	10227.81	90.00	179.16	9886.00	835.58	-836.45	-275.00	0.02	381475.61	538583.02	N 32 2 55.45 W 104 12 54.93	
	15225.41	90.00	179.16	9886.00	5832.85	-5833.51	-202.02	0.00	378479.00	538656.00	N 32 2 6.00 W 104 12 54.15	
	18418.83	90.00	180.12	9886.00	8827.23	-8827.84	-182.08	0.03	373284.96	538675.94	N 32 1 34.39 W 104 12 53.98	
	20225.97	90.00	180.12	9886.00	10833.33	-10833.97	-185.91	0.00	371479.00	538672.11	N 32 1 16.52 W 104 12 54.02	
Last Take Point Chevron HH SO 17 20 Fed 001 No. 2H - PBHL	20275.97	90.00	180.12	9886.00	10863.34	-10863.98	-186.02	0.00	371429.00	538672.00	N 32 1 16.02 W 104 12 54.03	

Survey Type: Non-Def Plan

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

Description	Part	MD From (ft)	MD To (ft)	EOU Freq (ft)	Hole Size (in)	Casing Diameter (in)	Expected Max Inclination (deg)	Survey Tool Type	Borehole / Survey
	1	0.000	28.000	1/100.000	30.000	30.000		NAL_MWD_1.0_DEG-Depth Only	HH SO 17 20 Fed 001 No. 2H / Chevron HH SO 17 20 Fed 001 No. 2H Rev0 cvs 14Jun18
	1	28.000	20275.971	1/100.000	30.000	30.000		NAL_MWD_1.0_DEG	HH SO 17 20 Fed 001 No. 2H / Chevron HH SO 17 20 Fed 001

PECOS DISTRICT DRILLING CONDITIONS OF APPROVAL

OPERATOR'S NAME:	CHEVRON USA INCORPORATED
LEASE NO.:	NMNM118108
WELL NAME & NO.:	HH SO 17 20 FED 001 2H
SURFACE HOLE FOOTAGE:	305'S & 1873'W
BOTTOM HOLE FOOTAGE:	280'S & 1590'W
LOCATION:	SECTION 8, T26S, R37E
COUNTY:	EDDY

COA

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 type="radio"/> Medium	<input checked="" 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.

Operator shall filled 1/3rd of intermediate casing with fluid to maintain collapse safety factor.

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. **Additional cement maybe required. Excess calculates to 8%.**
 - b. Second stage above DV tool: Cement to surface. If cement does not circulate, contact the appropriate BLM office. **Additional cement maybe required. Excess calculates to 6%.**
- ❖ In High 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 5-1/2 inch production casing is:
 - Cement should tie-back at least 200 feet into previous casing string. 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 **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 2nd 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 Sec. 17.
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.

Waste Minimization Plan (WMP)

In the interest of resource development, submission of additional well gas capture development plan information is deferred but may be required by the BLM Authorized Officer at a later date.

ZS 081718

Medium

13 3/8 Segment	surface csg in a #/ft	17 1/2 Grade	inch hole. Coupling	Joint	Design Factors		SURFACE		
"A"	54.50	J 55	ST&C	20.96	Collapse	Burst	Length	Weight	
"B"					5.56	0.63	450	24,525	
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	348	466	367	27	8.70	2421	3M	1.56

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

9 5/8 Segment	casing inside the #/ft	13 3/8 Grade	Coupling	Joint	Design Factors		INTERMEDIATE		
"A"	43.50	L 80	LT&C	2.11	Collapse	Burst	Length	Weight	
"B"					0.87	0.86	8,850	384,975	
w/8.4#/g mud, 30min Sfc Csg Test psig:							Totals:	8,850	384,975

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	2812		9.50	5220	10M	0.81

D V Tool(s):		2100				sum of sx.	Σ CuFt	Σ% excess
t by stage % :	8	6				1307	3025	8

Class 'H' tail cmt yld > 1.20

MASP is within 10% of 5000psig, need

Burst Frac Gradient(s) for Segment(s): A, B, C, D = 0.72, b, c, d All > 0.70, OK.

ALT. COLLAPSE 0.87*1.5 = 1.31

5 1/2 Segment	casing inside the #/ft	9 5/8 Grade	Coupling	Joint	Design Factors		PRODUCTION		
"A"	20.00	P 110	TXP	3.24	Collapse	Burst	Length	Weight	
"B"	20.00	P 110	TXP	7.96	1.52	1.71	10,950	219,000	
w/8.4#/g mud, 30min Sfc Csg Test psig: 2,052							Totals:	20,276	405,520

B would be: 57.23 1.64 if it were a vertical wellbore.

No Pilot Hole Planned	MTD	Max VTD	Csg VD	Curve KOP	Dogleg°	Severity°	MEOC
	20276	9886	9886	9326	90	10	10226

The cement volume(s) are intended to achieve a top of 8650 ft from surface or a 200 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	0.2291	3161	3817	2673	43	14.40			1.20

Class 'H' tail cmt yld > 1.20