

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF LAND MANAGEMENT

**APPLICATION FOR PERMIT TO DRILL OR REENTER**

**OCD - HOBBS**  
**04/06/2020**  
**RECEIVED**

FORM APPROVED  
OMB No. 1004-0137  
Expires: January 31, 2018

1a. Type of work: <input type="checkbox"/> DRILL <input type="checkbox"/> REENTER			5. Lease Serial No.
1b. Type of Well: <input type="checkbox"/> Oil Well <input type="checkbox"/> Gas Well <input type="checkbox"/> Other			6. If Indian, Allottee or Tribe Name
1c. Type of Completion: <input type="checkbox"/> Hydraulic Fracturing <input type="checkbox"/> Single Zone <input type="checkbox"/> Multiple Zone			7. If Unit or CA Agreement, Name and No.
2. Name of Operator			8. Lease Name and Well No.
3a. Address			9. API Well No. <b>326211</b>
3b. Phone No. (include area code)			10. Field and Pool, or Exploratory
4. Location of Well (Report location clearly and in accordance with any State requirements. *)			11. Sec., T. R. M. or Blk. and Survey or Area
At surface			
At proposed prod. zone			
14. Distance in miles and direction from nearest town or post office*			12. County or Parish
			13. State
15. Distance from proposed* location to nearest property or lease line, ft. (Also to nearest drig. unit line, if any)	16. No of acres in lease	17. Spacing Unit dedicated to this well	
18. Distance from proposed location* to nearest well, drilling, completed, applied for, on this lease, ft.	19. Proposed Depth	20. BLM/BIA Bond No. in file	
21. Elevations (Show whether DF, KDB, RT, GL, etc.)	22. Approximate date work will start*	23. Estimated duration	
24. Attachments			

The following, completed in accordance with the requirements of Onshore Oil and Gas Order No. 1, and the Hydraulic Fracturing rule per 43 CFR 3162.3-3 (as applicable)

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

25. Signature	Name (Printed/Typed)	Date
Title		
Approved by (Signature)	Name (Printed/Typed)	Date
Title		
Office		

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

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.

**GCP Rec 04/06/2020**

**APPROVED WITH CONDITIONS**  
**Approval Date: 04/03/2020**

**KZ**  
**04/12/2020**

**REQUIRES NSL**

\*(Instructions on page 2)

**NSL**

(Continued on page 2)



APD ID: 10400043079

Submission Date: 06/24/2019

Highlighted data  
reflects the most  
recent changes

Operator Name: CENTENNIAL RESOURCE PRODUCTION LLC

Well Name: PAC-MAN 36 FED COM

Well Number: 502H

[Show Final Text](#)

Well Type: OIL WELL

Well Work Type: Drill

## Section 1 - General

APD ID: 10400043079

Tie to previous NOS?

Submission Date: 06/24/2019

BLM Office: CARLSBAD

User: Kanicia Schlichting

Title: Sr. Regulatory Analyst

Federal/Indian APD: FED

Is the first lease penetrated for production Federal or Indian? FED

Lease number: NMNM127446

Lease Acres: 320.44

Surface access agreement in place?

Allotted?

Reservation:

Agreement in place? NO

Federal or Indian agreement:

Agreement number:

Agreement name:

Keep application confidential? YES

Permitting Agent? NO

APD Operator: CENTENNIAL RESOURCE PRODUCTION LLC

Operator letter of designation:

## Operator Info

Operator Organization Name: CENTENNIAL RESOURCE PRODUCTION LLC

Operator Address: 1001 17th Street, Suite 1800

Zip: 80202

Operator PO Box:

Operator City: Denver

State: CO

Operator Phone: (720)499-1400

Operator Internet Address:

## Section 2 - Well Information

Well in Master Development Plan? NO

Master Development Plan name:

Well in Master SUPO? NO

Master SUPO name:

Well in Master Drilling Plan? NO

Master Drilling Plan name:

Well Name: PAC-MAN 36 FED COM

Well Number: 502H

Well API Number:

Field/Pool or Exploratory? Field and Pool

Field Name: 2ND BONE  
SPRING

Pool Name: OJO CHISO;  
BONESPRING,S

Is the proposed well in an area containing other mineral resources? NONE

**Operator Name:** CENTENNIAL RESOURCE PRODUCTION LLC

**Well Name:** PAC-MAN 36 FED COM

**Well Number:** 502H

**Is the proposed well in an area containing other mineral resources?** NONE

**Is the proposed well in a Helium production area?** N

**Use Existing Well Pad?** NO

**New surface disturbance?**

**Type of Well Pad:** MULTIPLE WELL

**Multiple Well Pad Name:** PAC-MAN SOUTHERN PAD

**Number:** 301H

**Well Class:** HORIZONTAL

**Number of Legs:** 1

**Well Work Type:** Drill

**Well Type:** OIL WELL

**Describe Well Type:**

**Well sub-Type:** INFILL

**Describe sub-type:**

**Distance to town:** 34.4 Miles

**Distance to nearest well:** 30 FT

**Distance to lease line:** 300 FT

**Reservoir well spacing assigned acres Measurement:** 320.14 Acres

**Well plat:** PAC\_MAN\_36\_FED\_COM\_502H\_\_C\_102\_\_Antelope\_Ridge\_\_20190624085424.pdf

PAC\_MAN\_36\_FED\_COM\_502H\_\_C\_102\_\_Ojo\_Chiso\_\_20190624085424.pdf

Pac\_Man\_36\_Fed\_Com\_502H\_Lease\_Plat\_20190624093208.pdf

**Well work start Date:** 08/01/2020

**Duration:** 30 DAYS

### Section 3 - Well Location Table

**Survey Type:** RECTANGULAR

**Describe Survey Type:**

**Datum:** NAD83

**Vertical Datum:** NAVD88

**Survey number:** 23782

**Reference Datum:**

Wellbore	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	Will this well produce from this lease?
SHL Leg #1	300	FNL	124 4	FW L	23S	34E	1	Aliquot NWN W	32.34008 3	- 103.4282 91	LEA	NEW MEXI CO	NEW MEXI CO	S	STATE	338 6	0	0	
KOP Leg #1	300	FNL	124 4	FW L	23S	34E	1	Aliquot NWN W	32.34008 3	- 103.4282 91	LEA	NEW MEXI CO	NEW MEXI CO	F	NMNM 127446	- 654 1	993 2	992 7	

**Operator Name:** CENTENNIAL RESOURCE PRODUCTION LLC

**Well Name:** PAC-MAN 36 FED COM

**Well Number:** 502H

Wellbore	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	Will this well produce from this lease?
PPP Leg #1-1	100	FNL	1244	FWL	23S	34E	1	Aliquot NWN W	32.340632	- 103.428291	LEA	NEW MEXICO	NEW MEXICO	F	NMNM 127446	- 7114	10832	10500	
EXIT Leg #1	100	FSL	1244	FWL	23S	34E	12	Aliquot SWS W	32.312145	- 103.428281	LEA	NEW MEXICO	NEW MEXICO	F	FEE	- 7114	20626	10500	
BHL Leg #1	100	FSL	1244	FWL	23S	34E	12	Aliquot SWS W	32.312145	- 103.428281	LEA	NEW MEXICO	NEW MEXICO	F	FEE	- 7114	20626	10500	

APD ID: 10400043079

Submission Date: 06/24/2019

Highlighted data  
reflects the most  
recent changes

Operator Name: CENTENNIAL RESOURCE PRODUCTION LLC

Well Name: PAC-MAN 36 FED COM

Well Number: 502H

[Show Final Text](#)

Well Type: OIL WELL

Well Work Type: Drill

## Section 1 - Geologic Formations

Formation ID	Formation Name	Elevation	True Vertical Depth	Measured Depth	Lithologies	Mineral Resources	Producing Formation
484902	RUSTLER	3386	1761	1761	SANDSTONE	NONE	N
484903	CAPITAN REEF	-1063	4449	4449	OTHER : Carbonate	USEABLE WATER	N
484904	BELL CANYON	-2064	5450	5450	SANDSTONE	NATURAL GAS, OIL	N
484905	CHERRY CANYON	-2557	5943	5943	SANDSTONE	CO2, NATURAL GAS	N
484906	BRUSHY CANYON	-3758	7144	7144	SANDSTONE	NATURAL GAS, OIL	N
484907	BONE SPRING LIME	-5144	8530	8530	OTHER : Carbonate	NATURAL GAS, OIL	N
484908	AVALON SAND	-5345	8731	8731	SHALE	CO2, NATURAL GAS, OIL	N
484909	FIRST BONE SPRING SAND	-6295	9681	9681	SANDSTONE	NATURAL GAS, OIL	N
484910	BONE SPRING 2ND	-6480	9866	9866	OTHER, SHALE : Carbonate	NATURAL GAS, OIL	Y
615503	BONE SPRING 3RD	-6811	10197	10197	SHALE	NATURAL GAS, OIL	N

## Section 2 - Blowout Prevention

Pressure Rating (PSI): 5M

Rating Depth: 9720

**Equipment:** The BOP and related equipment will meet or exceed the requirements of a 5M-psi system as set forth in On Shore Order No. 2. See attached BOP Schematic. A. Casinghead: 13 5/8" – 5,000 psi SOW x 13" – 5,000 psi WP Intermediate Spool: 13" – 5,000 psi WP x 11" – 5,000 psi WP Tubinghead: 11" – 5,000 psi WP x 7 1/16" – 15,000 psi WP B. Minimum Specified Pressure Control Equipment • Annular preventer • One Pipe ram, One blind ram • Drilling spool, or blowout preventer with 2 side outlets. Choke side will be a 3-inch minimum diameter, kill line shall be at least 2-inch diameter • 3 inch diameter choke line • 2 – 3 inch choke line valves • 2 inch kill line • 2 chokes with 1 remotely controlled from rig floor (see Figure 2) • 2 – 2 inch kill line valves and a check valve • Upper kelly cock valve with handle available • When the expected pressures approach working pressure of the system, 1 remote kill line tested to stack pressure (which shall run to the outer edge of the substructure and be unobstructed) • Lower kelly cock valve with handle available • Safety valve(s) and subs to fit all drill string connections in use • Inside BOP or float sub available • Pressure gauge on choke manifold • All BOPE connections subjected to well pressure shall be flanged, welded, or clamped • Fill-up line above the uppermost preventer. C. Auxiliary Equipment • Audio and visual mud monitoring equipment shall be placed to detect volume changes indicating loss or gain of circulating fluid volume. (OOS 1, III.C.2) • Gas Buster will be used below intermediate casing setting

**Operator Name:** CENTENNIAL RESOURCE PRODUCTION LLC

**Well Name:** PAC-MAN 36 FED COM

**Well Number:** 502H

depth. • Upper and lower kelly cocks with handles, safety valve and subs to fit all drill string connections and a pressure gauge installed on choke manifold.

**Requesting Variance?** YES

**Variance request:** Centennial Resource Production, LLC hereby requests to use a flex hose on the choke manifold for this well. Please see attached Multi-bowl procedure.

**Testing Procedure:** "The BOP test shall be performed before drilling out of the surface casing shoe and will occur at a minimum: a. when initially installed b. whenever any seal subject to test pressure is broken c. following related repairs d. at 30 day intervals e. checked daily as to mechanical operating conditions. The ram type preventer(s) will be tested using a test plug to 250 psi (low) and 5,000 psi (high) (casinghead WP) with a test plug upon its installation onto the 13" surface casing. If a test plug is not used, the ram type preventer(s) shall be tested to 70% of the minimum internal yield pressure of the casing. The annular type preventer(s) shall be tested to 50% of its working pressure. Pressure will be maintained for at least 10 minutes or until provisions of the test are met, whichever is longer. • A Sundry Notice (Form 3160 5), along with a copy of the BOP test report, shall be submitted to the local BLM office within 5 working days following the test. • If the bleed line is connected into the buffer tank (header), all BOP equipment including the buffer tank and associated valves will be rated at the required BOP pressure. • The BLM office will be provided with a minimum of four (4) hours' notice of BOP testing to allow witnessing. The BOP Configuration, choke manifold layout, and accumulator system, will be in compliance with Onshore Order 2 for a 5,000 psi system. A remote accumulator will be used. Pressures, capacities, and specific placement and use of the manual and/or hydraulic controls, accumulator controls, bleed lines, etc., will be identified at the time of the BLM 'witnessed BOP test. Any remote controls will be capable of both opening and closing all preventers and shall be readily accessible".

**Choke Diagram Attachment:**

HP650\_10M\_Choke\_Manifold\_20190618110856.pdf

**BOP Diagram Attachment:**

HP650\_BOP\_Schematic\_CoFlex\_Choke\_5K\_2019\_1\_29\_20190618110909.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
1	CONDUCTOR	26	20.0	NEW	API	N	0	120	0	120	3386	3266	120	H-40	94	OTHER - WELD						
2	SURFACE	17.5	13.375	NEW	API	N	0	1800	0	1800	3386	1586	1800	J-55	54.5	OTHER - BTC	1.27	3.07	DRY	8.7	DRY	8.7
3	INTERMEDIATE	12.25	9.625	NEW	API	N	0	5300	0	5300	3386	-1914	5300	J-55	40	LT&C	1.32	1.43	DRY	2.45	BUOY	2.97
4	PRODUCTION	8.75	5.5	NEW	API	N	0	9932	0	9927	3386	-6541	9932	P-110	20	OTHER - TMK UP DQX	2.27	2.58	DRY	3.23	DRY	3.23
5	PRODUCTION	8.5	5.5	NEW	API	N	9932	20626	9927	10500	-6541	-7114	10694	P-110	20	OTHER - TMK UP DQX	2.14	2.44	DRY	55.93	DRY	55.93

**Operator Name:** CENTENNIAL RESOURCE PRODUCTION LLC

**Well Name:** PAC-MAN 36 FED COM

**Well Number:** 502H

### Casing Attachments

---

**Casing ID:** 1      **String Type:** CONDUCTOR

**Inspection Document:**

**Spec Document:**

**Tapered String Spec:**

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

CASING\_ASSUMPTIONS\_WORKSHEET\_20181217132208.pdf

---

**Casing ID:** 2      **String Type:** SURFACE

**Inspection Document:**

**Spec Document:**

**Tapered String Spec:**

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

CASING\_ASSUMPTIONS\_WORKSHEET\_20190618111636.pdf

---

**Casing ID:** 3      **String Type:** INTERMEDIATE

**Inspection Document:**

**Spec Document:**

**Tapered String Spec:**

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

CASING\_ASSUMPTIONS\_WORKSHEET\_20181217132216.pdf

---

**Operator Name:** CENTENNIAL RESOURCE PRODUCTION LLC

**Well Name:** PAC-MAN 36 FED COM

**Well Number:** 502H

#### Casing Attachments

**Casing ID:** 4      **String Type:** PRODUCTION

**Inspection Document:**

**Spec Document:**

**Tapered String Spec:**

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

CASING\_ASSUMPTIONS\_WORKSHEET\_20181217132222.pdf

Technical\_Data\_Sheet\_TMK\_UP\_DQX\_5.5\_x\_20\_P110\_CY\_20190618111548.pdf

**Casing ID:** 5      **String Type:** PRODUCTION

**Inspection Document:**

**Spec Document:**

**Tapered String Spec:**

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

CASING\_ASSUMPTIONS\_WORKSHEET\_20181217132228.pdf

Technical\_Data\_Sheet\_TMK\_UP\_DQX\_5.5\_x\_20\_P110\_CY\_20190618111539.pdf

#### Section 4 - Cement

String Type	Lead/Tail	Stage Tool Depth	Top MD	Bottom MD	Quantity(sx)	Yield	Density	Cu Ft	Excess%	Cement type	Additives
PRODUCTION	Lead		0	0	0	0	0	0	0	TXI Lightweight	Salt 8.98#/sk, STE 6.00%, Citric acid 0.20%, CSA-1000 0.23%, C47B 0.10%, C-503P 0.30%
PRODUCTION	Tail		0								none



**Operator Name:** CENTENNIAL RESOURCE PRODUCTION LLC

**Well Name:** PAC-MAN 36 FED COM

**Well Number:** 502H

String Type	Lead/Tail	Stage Tool Depth	Top MD	Bottom MD	Quantity(sx)	Yield	Density	Cu Ft	Excess%	Cement type	Additives
CONDUCTOR	Lead		0	120	121	1.49	12.9	181		Grout	Bentonite 4% BWOC, Cellophane #/sx, CaCl <sub>2</sub> 2% BWOC.

SURFACE	Lead		0	1300	1038	1.74	13.5	1806	100	Class C Premium	Premium Gel Bentonite 4%, C-45 Econolite 0.25%, Phenoseal 0.25#/sk, CaCl 1%, Defoamer C-41P 0.75%
SURFACE	Tail		1300	1800	518	1.34	14.8	695	100	Class C Premium	C-45 Econolite 0.10%, CaCl 1.0%
INTERMEDIATE	Lead		0	4800	1157	3.44	10.7	3981	150	TXI Lightweight	Salt 1.77/sk, C-45 Econolite 2.25%, STE 6.00%, Citric Acid 0.18%, C-19 0.10%, CSA-1000 0.20%, C-530P 0.30%, CTB-15 LCM 7#/sk, Gyp Seal 8#/sk
INTERMEDIATE	Tail		4800	5300	141	1.33	14.8	188	20	Class C Premium	C-45 Econolite 0.10%, Citric acid 0.05%, C503P 0.25%
PRODUCTION	Lead		0	9932	973	3.41	10.6	3318	30	TXI Lightweight	Salt 8.98#/sk, STE 6.00%, Citric acid 0.20%, CSA-1000 0.23%, C47B 0.10%, C-503P 0.30%
PRODUCTION	Tail		9932	20626	2469	1.24	14.2	3062	25	50:25:25 Class H: Poz: CPO18	Citric acid 0.03%, CSA-1000 0.05%, C47B 0.25%, C-503P 0.30%

**Operator Name:** CENTENNIAL RESOURCE PRODUCTION LLC

**Well Name:** PAC-MAN 36 FED COM

**Well Number:** 502H

## 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 quantities of mud materials will be on the well site at all times for the purpose of assuring well control and maintaining wellbore integrity. Surface interval will employ fresh water mud. The intermediate hole will utilize a diesel emulsified brine fluid to inhibit salt washout and prevent severe fluid losses. The production hole will employ oil base fluid to inhibit formation reactivity and of the appropriate density to maintain well control.

**Describe the mud monitoring system utilized:** Centrifuge separation system. Open tank monitoring with EDR will be used for drilling fluids and return volumes. Open tank monitoring will be used for cement and cuttings return volumes. Mud properties will be monitored at least every 24 hours using industry accepted mud check practices.

## Circulating Medium Table

Top Depth	Bottom Depth	Mud Type	Min Weight (lbs/gal)	Max Weight (lbs/gal)	Density (lbs/cu ft)	Gel Strength (lbs/100 sqft)	PH	Viscosity (CP)	Salinity (ppm)	Filtration (cc)	Additional Characteristics
0	2062 6	OTHER : Brine/OBM	8.8	9.5							
0	1800	WATER-BASED MUD	8.6	9.5							
1800	5300	OTHER : Brine	9.8	10							

## Section 6 - Test, Logging, Coring

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

Will utilize MWD/LWD (Gamma ray logging) from intermediate hole to TD of the well.

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

OTH

**Other log type(s):**

Gama Ray

**Coring operation description for the well:**

n/a

**Operator Name:** CENTENNIAL RESOURCE PRODUCTION LLC

**Well Name:** PAC-MAN 36 FED COM

**Well Number:** 502H

## Section 7 - Pressure

**Anticipated Bottom Hole Pressure:** 5187

**Anticipated Surface Pressure:** 2877

**Anticipated Bottom Hole Temperature(F):** 170

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

**Describe:**

**Contingency Plans geohazards description:**

**Contingency Plans geohazards attachment:**

**Hydrogen Sulfide drilling operations plan required?** YES

**Hydrogen sulfide drilling operations plan:**

Pac\_Man\_36\_Fed\_Com\_501\_502\_503\_H2S\_Plan\_20190624083034.pdf

## Section 8 - Other Information

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

PAC\_MAN\_36\_FED\_COM\_502H\_PLAN\_20190624091335.pdf

**Other proposed operations facets description:**

Centennial Resource Development – New Mexico Multi-Well Pad Drilling

Bone Springs Formations

- o 13-3/8" Surface Casing - CRD intends to preset 13-3/8" casing to a depth approved in the APD. Surface Holes will be batch set by a Spudder rig. Appropriate notifications will be made prior to spudding the well, running and cementing casing and prior to skidding to the rig to the next well on pad.
- o Intermediate and Production Casing – For all subsequent Intermediate and Production Casing Strings, the well will be drilled below 13-3/8" to it's intended final TD. Batch drilling will not be executed for casing strings below the 13-3/8". Appropriate notifications will be made prior Testing BOPE, and prior to running/cementing all casing strings.

Gas Capture Plan attached.

OCD is considering this a preapproved DHC. We are staying in the same field just two state pools.

**Other proposed operations facets attachment:**

Pac\_Man\_36\_Fed\_Com\_301H\_Gas\_Capture\_Plan\_20181219152148.pdf

CDEV\_Multi\_Bowl\_Procedure\_Pac\_Man\_36\_Fed\_Com\_502H\_20191212172849.pdf

CRD\_Batch\_Setting\_Procedures\_20191212172911.pdf

**Other Variance attachment:**

Flex\_Hose\_Specs\_20181219152357.pdf

## CASING ASSUMPTIONS WORKSHEET:

### Centralizer Program:

Surface:        - 3 welded bow spring centralizers, one on each of the bottom 3 joints, plus one on the shoe joint (4 minimum)  
                     - No Cement baskets will be run

Production:    - 1 welded bow spring centralizer on a stop ring 6' above float shoe  
                     - 1 centralizer every other joint to the top of the tail cement  
                     - 1 centralizer every 4 joints to 500' below the top of the lead cement  
                     - The actual number and placement of centralizers will be determined from hole deviation and potential production zones. Centralizers will be run for maximum practical standoff and through all potential productive zones.

- All casing strings below the conductor shall be tested, prior to drilling out the casing shoe, to 0.22 psi/ft of casing string length or 1500 psi, whichever is greater, but not to exceed 70% of the internal yield pressure of the casing. If pressure declines more than 10 percent in 30 minutes, corrective action will be taken.

No freshly hard banded pipe will be rotated in the surface casing

- CENTENNIAL RESOURCE DEVELOPMENT will not employ an air-drill rig for the surface casing. The casing shoe will be tested by drilling 5'-10' out from under the shoe and pressure testing to the maximum expected mud weight equivalent as shown in the mud program listed in the drilling plan.

## CASING ASSUMPTIONS WORKSHEET:

### Centralizer Program:

Surface:        - 3 welded bow spring centralizers, one on each of the bottom 3 joints, plus one on the shoe joint (4 minimum)  
                     - No Cement baskets will be run

Production:    - 1 welded bow spring centralizer on a stop ring 6' above float shoe  
                     - 1 centralizer every other joint to the top of the tail cement  
                     - 1 centralizer every 4 joints to 500' below the top of the lead cement  
                     - The actual number and placement of centralizers will be determined from hole deviation and potential production zones. Centralizers will be run for maximum practical standoff and through all potential productive zones.

- All casing strings below the conductor shall be tested, prior to drilling out the casing shoe, to 0.22 psi/ft of casing string length or 1500 psi, whichever is greater, but not to exceed 70% of the internal yield pressure of the casing. If pressure declines more than 10 percent in 30 minutes, corrective action will be taken.

No freshly hard banded pipe will be rotated in the surface casing

- CENTENNIAL RESOURCE DEVELOPMENT will not employ an air-drill rig for the surface casing. The casing shoe will be tested by drilling 5'-10' out from under the shoe and pressure testing to the maximum expected mud weight equivalent as shown in the mud program listed in the drilling plan.

## CASING ASSUMPTIONS WORKSHEET:

### Centralizer Program:

Surface:        - 3 welded bow spring centralizers, one on each of the bottom 3 joints, plus one on the shoe joint (4 minimum)  
                     - No Cement baskets will be run

Production:    - 1 welded bow spring centralizer on a stop ring 6' above float shoe  
                     - 1 centralizer every other joint to the top of the tail cement  
                     - 1 centralizer every 4 joints to 500' below the top of the lead cement  
                     - The actual number and placement of centralizers will be determined from hole deviation and potential production zones. Centralizers will be run for maximum practical standoff and through all potential productive zones.

- All casing strings below the conductor shall be tested, prior to drilling out the casing shoe, to 0.22 psi/ft of casing string length or 1500 psi, whichever is greater, but not to exceed 70% of the internal yield pressure of the casing. If pressure declines more than 10 percent in 30 minutes, corrective action will be taken.

No freshly hard banded pipe will be rotated in the surface casing

- CENTENNIAL RESOURCE DEVELOPMENT will not employ an air-drill rig for the surface casing. The casing shoe will be tested by drilling 5'-10' out from under the shoe and pressure testing to the maximum expected mud weight equivalent as shown in the mud program listed in the drilling plan.

## CASING ASSUMPTIONS WORKSHEET:

### Centralizer Program:

Surface:        - 3 welded bow spring centralizers, one on each of the bottom 3 joints, plus one on the shoe joint (4 minimum)  
                     - No Cement baskets will be run

Production:    - 1 welded bow spring centralizer on a stop ring 6' above float shoe  
                     - 1 centralizer every other joint to the top of the tail cement  
                     - 1 centralizer every 4 joints to 500' below the top of the lead cement  
                     - The actual number and placement of centralizers will be determined from hole deviation and potential production zones. Centralizers will be run for maximum practical standoff and through all potential productive zones.

- All casing strings below the conductor shall be tested, prior to drilling out the casing shoe, to 0.22 psi/ft of casing string length or 1500 psi, whichever is greater, but not to exceed 70% of the internal yield pressure of the casing. If pressure declines more than 10 percent in 30 minutes, corrective action will be taken.

No freshly hard banded pipe will be rotated in the surface casing

- CENTENNIAL RESOURCE DEVELOPMENT will not employ an air-drill rig for the surface casing. The casing shoe will be tested by drilling 5'-10' out from under the shoe and pressure testing to the maximum expected mud weight equivalent as shown in the mud program listed in the drilling plan.

## CASING ASSUMPTIONS WORKSHEET:

### Centralizer Program:

Surface:        - 3 welded bow spring centralizers, one on each of the bottom 3 joints, plus one on the shoe joint (4 minimum)  
                     - No Cement baskets will be run

Production:    - 1 welded bow spring centralizer on a stop ring 6' above float shoe  
                     - 1 centralizer every other joint to the top of the tail cement  
                     - 1 centralizer every 4 joints to 500' below the top of the lead cement  
                     - The actual number and placement of centralizers will be determined from hole deviation and potential production zones. Centralizers will be run for maximum practical standoff and through all potential productive zones.

- All casing strings below the conductor shall be tested, prior to drilling out the casing shoe, to 0.22 psi/ft of casing string length or 1500 psi, whichever is greater, but not to exceed 70% of the internal yield pressure of the casing. If pressure declines more than 10 percent in 30 minutes, corrective action will be taken.

No freshly hard banded pipe will be rotated in the surface casing

- CENTENNIAL RESOURCE DEVELOPMENT will not employ an air-drill rig for the surface casing. The casing shoe will be tested by drilling 5'-10' out from under the shoe and pressure testing to the maximum expected mud weight equivalent as shown in the mud program listed in the drilling plan.





## **HYDROGEN SULFIDE CONTINGENCY PLAN**

**Pac-Man 36 Fed Com 501H, 502H and 503H**

**Section 36**

**T 22S R 34E**

**Lea County, NM**

**Initial Date: 12/17/18**

**Revision Date:**

# **Table of Contents**

Page 3: Introduction

Page 4: Directions to Location

Page 5: Safe Briefing Areas

Page 6: Drill Site Location Setup

Page 7: Toxicity of Various Gases

Page 10: H<sub>2</sub>S Required Equipment

Page 11: Determination of Radius of Exposure

Page 12: Emergency Contact List

## INTRODUCTION

This plan specifies precautionary measures, safety equipment, emergency procedures, responsibilities, duties, and the compliance status pertaining to the production operations of Hydrogen Sulfide producing wells on:

Centennial Resource Development, Inc.

This plan will be in full effect prior to and continuing with all drilling operations for all wells producing potential Hydrogen Sulfide on the

### **Pac-Man 36 Fed Com 501H, 502H, 503H**

This plan was developed in response to the potential hazards involved when producing formations that may contain Hydrogen Sulfide (H<sub>2</sub>S) It has been written in compliance with current New Mexico Oil Conservation Division Rule 118 and Bureau of Land Management 43 CFR 3160 Onshore Order No. 6.

### **All personnel shall receive proper H<sub>2</sub>S training in accordance with Onshore Order III.C.3.a**

This plan shall require the full cooperation and efforts of all individuals participating in the production of potential H<sub>2</sub>S wells.

Each individual is required to know their assigned responsibilities and duties in regard to normal production operations and emergency procedures.

Each person should thoroughly understand and be able to use all safety related equipment on the production facility.

Each person should become familiar with the location of all safety equipment and become involved in ensuring that all equipment is properly stored, easily accessible, and routinely maintained.

An ongoing training program will remain in effect with regular training, equipment inspections, and annual certifications for all personnel.

Centennial Resource Development, Inc. shall make every reasonable effort to provide all possible safeguards to protect all personnel, both on this location and in the immediate vicinity, from the harmful effects of H<sub>2</sub>S exposure, if a release to the atmosphere should occur.

## **DIRECTIONS TO LOCATION**

**Pac-Man Fed Com 501H, 502H, 503H**

**Section 36**

**T 22S R 34E**

**Lea County, NM**

BEGINNING AT THE INTERSECTION OF HIGHWAY 18 & HIGHWAY 128 FROM JAL, NEW MEXICO PROCEED IN A WESTERLY, THEN NORTHWESTERLY, THEN

WESTERLY DIRECTION ALONG HIGHWAY 128 APPROXIMATELY 20.6 MILES TO THE JUNCTION OF THIS ROAD AND DELAWARE BASIN ROAD TO THE NORTH; TURN RIGHT AND PROCEED IN A NORTHERLY, THEN EASTERLY DIRECTION APPROXIMATELY 12.2 MILES TO THE JUNCTION OF THIS ROAD AND COUNTY ROAD 32 TO THE NORTH; TURN LEFT AND PROCEED IN A NORTHERLY DIRECTION APPROXIMATELY 1.0 MILES TO THE JUNCTION OF THIS ROAD AND AN EXISTING ROAD TO THE EAST; TURN RIGHT AND PROCEED IN AN EASTERLY, THEN NORTHEASTERLY DIRECTION APPROXIMATELY 0.3 MILES TO THE EXISTING PRYOR STATE 1H & 4H WELL PAD; AND THE BEGINNING OF THE PROPOSED ACCESS FOR MORTAL KOMBAT 36 STATE COM #502H ACCESS ROAD TO THE SOUTHEAST; FOLLOW

ROAD FLAGS IN A SOUTHEASTERLY DIRECTION APPROXIMATELY 196' TO THE BEGINNING OF THE PROPOSED PAC-MAN 36 FED COM #601H-#603H ACCESS ROAD TO THE EAST; FOLLOW ROAD FLAGS IN AN EASTERLY DIRECTION APPROXIMATELY 339' TO THE BEGINNING OF THE PROPOSED ACCESS ROAD TO THE EAST; FOLLOW ROAD FLAGS IN AN EASTERLY, THEN

SOUTHERLY, THEN WESTERLY DIRECTION APPROXIMATELY 852' TO THE PROPOSED LOCATION.

TOTAL DISTANCE FROM JAL, NEW MEXICO TO THE PROPOSED WELL LOCATION IS APPROXIMATELY 34.4 MILES.

## **SAFE BRIEFING AREAS**

Two areas will be designated as “SAFE BRIEFING AREAS”.

### **The Primary Safe Briefing Area**

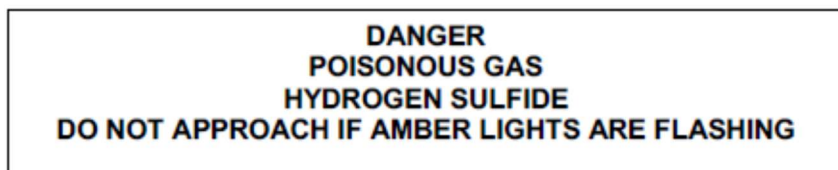
If the Primary Safe Briefing Area cannot be used due to wind conditions; the designated secondary safe briefing area will be used.

These two areas are so designated for accessibility reasons related to self-contained safe breathing air device locations, evacuation muster point utility, and for ease of overall communication, organizational support, as well as the all-important prevailing wind directions. Drawings of the facility denoting these locations are included on Page 15.

If H<sub>2</sub>S is detected in concentrations equal to or in excess of 15 PPM, all personnel not assigned emergency duties are to assemble in the appropriate “SAFE BRIEFING AREA” for instructions.

**Wind Direction Indicators:** A windsock, shall be positioned, allowing the wind direction to be observed from anywhere on the charted facility location.

**Warning-DANGER SIGNS for Approaching Traffic:** All signs shall also be illuminated under conditions of poor visibility.



An amber strobe light system will be activated for H<sub>2</sub>S concentrations of 10 PPM or greater and an audible alarm will sound when H<sub>2</sub>S exceeds 15 ppm, and. This condition will exist until the all clear is given.

## **DRILL SITE LOCATION:**

1. The drilling rig should be situated on location such that the prevailing winds blow across the rig toward the reserve pit or at right angles to a line from the rig to the reserve pit.
2. The entrance to the location should be designated so that it can be barricaded if Hydrogen Sulfide emergency conditions arise. An auxiliary exit (or entrance) should be available in case of a catastrophe; a shift in wind direction would not preclude escape from the location. Appropriate warning signs and flags should be placed at all location entrances.
3. Once H<sub>2</sub>S safety procedures are established on location, no beards or facial hair, which will interfere with face seal or mask, will be allowed on location.
4. A minimum of two BRIEFING AREAS will be established, no less than 250 feet from the wellhead and in such location that at least one area will be up-wind from the well at all times. Upon recognition of an emergency situation, all personnel should assemble at the designated briefing areas for instructions.
5. A safety equipment trailer will be station at one of the briefing areas.
6. Windsocks will be installed and wind streamers (6 to 8 feet above ground level) placed at the location entrance. Windsocks shall be illuminated for nighttime operations. Personnel should develop wind direction consciousness.
7. The mud-logging trailer will be located so as to minimize the danger from the gas that breaks out of the drilling fluid.
8. Shale shaker mud tanks will be located so as to minimize the danger from gas that breaks out of the drilling fluid.
9. Electric power plant(s) will be located as far from the well bore as practical so that it may be used under conditions where it otherwise would have to be shut down.
10. When approaching depth where Hydrogen Sulfide may be encountered, appropriate warning signs will be posted on all access roads to the location and at the foot of all stairways to the derrick floor.
11. Appropriate smoking areas will be designated, and smoking will be prohibited elsewhere.

The table below lists various poisonous gases and the concentrations at which they become dangerous.

### **TOXICITY OF VARIOUS GASES**

<b>TOXICITY OF GASES</b> (Taken from API RP-49 September 1974 – Re-issued August 1978)					
<b>Common Name</b>	<b>Chemical Formula</b>	<b>Gravity (Air = 1)</b>	<b>Threshold 1 Limit</b>	<b>Hazardous 2 Limit</b>	<b>Lethal 3 Limit</b>
Hydrogen Sulfide	H <sub>2</sub> S	1.18	10 ppm	250 ppm/1hr	600 ppm
Sulfur Dioxide	SO <sub>2</sub>	2.21	20 ppm	---	1000 ppm
Carbon Monoxide	CO	0.97	50 ppm	400 ppm/1hr	1000 ppm
Carbon Dioxide	CO <sub>2</sub>	1.52	5000 ppm	5%	10%
Methane	CH <sub>4</sub>	0.55	90000 ppm	Combustible Above 5% in Air	

1. Threshold concentration at which it is believed that all workers may repeatedly be exposed day after day, without adverse effect	2. Hazardous concentration that may cause death	3. Lethal concentration that will cause death with short-term exposure
-------------------------------------------------------------------------------------------------------------------------------------	-------------------------------------------------	------------------------------------------------------------------------

### **Properties of Gases**

The produced gas will probably be a mixture of Carbon Dioxide, Hydrogen Sulfide, and Methane.

#### **Carbon Dioxide**

Carbon Dioxide (CO<sub>2</sub>) is usually considered inert and is commonly used to extinguish fires.

It is heavier than air (1.52 times) and it will concentrate in low areas of still air.

Humans cannot breathe air containing more than 10% CO<sub>2</sub> without losing consciousness. Air containing 5% CO<sub>2</sub> will cause disorientation in a few minutes.

Continued exposures to CO<sub>2</sub> after being affected will cause convulsions, coma, and respiratory failure.

The threshold limit of CO<sub>2</sub> is 5000 ppm.

Short-term exposure to 50,000 PPM (5%) is reasonable. This gas is colorless and odorless and can be tolerated in relatively high concentrations.

## Hydrogen Sulfide

Hydrogen Sulfide (H<sub>2</sub>S) itself is a colorless, transparent gas and is flammable. It is heavier than air and, hence, may accumulate in low places.

Although the slightest presence of H<sub>2</sub>S in the air is normally detectable by its characteristic “rotten egg” odor, it is dangerous to rely on the odor as a means of detecting excessive concentrations because the sense of smell is rapidly lost, allowing lethal concentrations to be accumulated without warning. The following table indicates the poisonous nature of Hydrogen Sulfide.

HYDROGEN SULFIDE TOXICITY			
Concentration			Effects
%H <sub>2</sub> S	PPM	GR/100 SCF 1	
0.001	10	0.65	Safe for 8 hours without respirator. Obvious and unpleasant odor.
0.002	20	1.30	Burning in eyes and irritation of respiratory tract after on hour.
0.01	100	6.48	Kills smell in 3 to 15 minutes; may sting eyes and throat.
0.02	200	12.96	Kills smell shortly; stings eyes and throat.
0.05	500	32.96	Dizziness; breathing ceases in a few minutes; need prompt artificial respiration.
0.07	700	45.92	Unconscious quickly; death will result if not rescued promptly
0.10	1000	64.80	DEATH!
Note: 1 grain per 100 cubic feet			

## Sulfur Dioxide

Sulfur Dioxide is a colorless, transparent gas and is non-flammable.

Sulfur Dioxide (SO<sub>2</sub>) is produced during the burning of H<sub>2</sub>S. Although SO<sub>2</sub> is heavier than air, it will be picked up by a breeze and carried downwind at elevated temperatures. Since Sulfur Dioxide is extremely irritating to the eyes and mucous membranes of the upper respiratory tract, it has exceptionally good warning powers in this respect. The following table indicates the toxic nature of the gas.



SULFUR DIOXIDE TOXICITY		
Concentration		Effects
%SO <sub>2</sub>	PPM	
0.0005	3 to 5	Pungent odor-normally a person can detect SO <sub>2</sub> in this range.
0.0012	12	Throat irritation, coughing, and constriction of the chest tearing and smarting of eyes.
0.15	150	So irritating that it can only be endured for a few minutes.
0.05	500	Causes a sense of suffocation, even with first breath.

## **H<sub>2</sub>S REQUIRED EQUIPMENT LIST**

### **RESPIRATORY SAFETY SYSTEMS**

- Working cascade system available on rig floor and pit system & 750' of air line hose
- Four (4) breathing air manifolds
- Four (4) 30-minute rescue packs
- Five (5) work/Escape units
- Five (5) escape units
- One (1) filler hose for the work/escape/rescue units

### **DETECTION AND ALARM SYSTEM**

- 4 channel H<sub>2</sub>S monitor
- 4 wireless H<sub>2</sub>S monitors
- H<sub>2</sub>S alarm system (Audible/Red strobe)
- Personal gas monitor for each person on location
- Gas sample tubes

### **WELL CONTROL EQUIPMENT**

- Flare line with remote ignitor and backup flare gun, placed 150' from wellhead
- Choke manifold with remotely operated choke
- Mud gas separator

### **VISUAL WARNING SYSTEMS**

- One color code condition sign will be placed at each entrance reflecting possible conditions at the site
- A colored condition flag will be on display, reflecting current condition at the site at the time
- At least 4 wind socks placed on location, visible at all angles and locations

### **MUD PROGRAM**

- Mud will contain sufficient weight and additives to control and minimize H<sub>2</sub>S

### **METALLURGY**

- All drill strings, casing, tubing, wellhead, BOP, spools, kill lines, choke manifold and lines, and valves shall be suitable for anticipated H<sub>2</sub>S volume and pressure

### **COMMUNICATION**

- Cell phones, intercoms, and satellite phones will be available on location

### **ADDITIONAL SAFETY RELATED ITEMS**

- Stretcher
- 2 OSHA full body harness
- 20# class ABC fire extinguisher

## DETERMINATION OF RADIUS OF EXPOSURE

**Potentially hazardous volume** means a volume of gas of such H<sub>2</sub>S concentration and flow rate that it may result in radius of exposure-calculated ambient concentrations of 100 ppm H<sub>2</sub>S at any occupied residence, school, church, park, school bus stop, place of business or other area where the public could reasonably be expected to frequent, or 500 ppm H<sub>2</sub>S at any Federal, State, County or municipal road or highway.

**Currently there are no residence located within the ROE**

**Radius of exposure** means the calculation resulting from using the Pasquill -Gifford derived equation, or by such other method(s) that may be approved by the authorized officer. Advanced Fire and Safety has provided the Pasquill-Gifford formula in excel format for simple calculations.

## NEW MEXICO OIL & GAS CONSERVATION DIVISION 118

**Pac-Man 36 Fed Com 501H, 502H, 503H**

H<sub>2</sub>S Concentration- **10** PPM (Block 13)

Maximum Escape Volume- **3000** MCF/Day (Block 13)

100 PPM Radius of Exposure (Block 15)- **11**  
(Formula=  $1.589 \times (B5/1000000) \times (B6 \times 1000) \times .6258$ )

500 PPM Radius of Exposure (Block 16)- **5**  
Formula=  $.4546 \times (B5/1000000) \times (B6 \times 1000) \times .6258$

## EMERGENCY CONTACT LIST

<b>911 is available in the area</b>			
NAME	POSITION	COMPANY	NUMBER
<b>Centennial Contacts</b>			
Jeremy Ray	Drilling Engineer	CDEV	303-263-7872
Ricky Mills/John Helm	Superintendent	CDEV	432-305-1068
Mike Ponder/Wayne Miller	Field Superintendent	CDEV	432-287-3003
Brett Thompson	Drilling Manager	CDEV	720-656-7027
Reggie Phillips	HSE Manager	CDEV	432-638-3380
H&P 650 Drilling Office	Drilling Supervisor	CDEV	432-538-3343
<b>Local Emergency Response</b>			
Fire Department			575-395-2511
Jal Community Hospital			505-395-2511
State Police			505-827-9000
Lea County Sheriff			575-396-3611
<b>Safety Contractor</b>			
Advanced Safety	Office	Advanced Safety	833-296-3913
Joe Gadway	Permian Supervisor	Advanced Safety	318-446-3716
Clint Hudson	Operations Manager	Advanced Safety	337-552-8330
<b>Well Control Company</b>			
Wild Well Control			866-404-9564
<b>Contractors</b>			
Tommy E Lee	Pump Trucks		432-813-7140
Paul Smith	Drilling Fluids	Momentum	307-258-6254
Compass Coordinators	Cement	Compass	432-561-5970

## **NEW MEXICO**

**LEA**

**PAC-MAN**

**PAC-MAN 36 FED COM 502H**

**PAC-MAN 36 FED COM 502H**

**Plan: PWP0**

## **Survey Report - Geographic**

**14 December, 2018**

<b>Company:</b>	NEW MEXICO	<b>Local Co-ordinate Reference:</b>	Well PAC-MAN 36 FED COM 502H
<b>Project:</b>	LEA	<b>TVD Reference:</b>	RKB=3382+25 @ 3407.0usft
<b>Site:</b>	PAC-MAN	<b>MD Reference:</b>	RKB=3382+25 @ 3407.0usft
<b>Well:</b>	PAC-MAN 36 FED COM 502H	<b>North Reference:</b>	True
<b>Wellbore:</b>	PAC-MAN 36 FED COM 502H	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	PWP0	<b>Database:</b>	Centennial EDM SQL Server

<b>Project</b>	LEA		
<b>Map System:</b>	Universal Transverse Mercator (US Survey Feet)	<b>System Datum:</b>	Mean Sea Level
<b>Geo Datum:</b>	North American Datum 1983		
<b>Map Zone:</b>	Zone 13N (108 W to 102 W)		

Site		PAC-MAN				
Site Position:		Northing:	0.00 usft	Latitude:	0° 0' 0.000 N	
From:	Map	Easting:	0.00 usft	Longitude:	109° 29' 19.478 W	
Position Uncertainty:		0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.00 °

Well	PAC-MAN 36 FED COM 502H					
Well Position	+N/-S	0.0 usft	Northing:	11,742,816.86 usft	Latitude:	32° 20' 24.298 N
	+E/-W	0.0 usft	Easting:	2,125,697.08 usft	Longitude:	103° 25' 41.846 W
Position Uncertainty		0.0 usft	Wellhead Elevation:	usft	Ground Level:	3,382.0 usft

Wellbore	PAC-MAN 36 FED COM 502H				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF200510	12/31/2009	7.69	60.37	48,879.20177943

Design	PWP0				
Audit Notes:					
Version:	Phase:	PROTOTYPE		Tie On Depth:	0.0
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)	
	0.0	0.0	0.0	179.98	

<b>Survey Tool Program</b>	<b>Date</b>	11/20/2018			
<b>From (usft)</b>	<b>To (usft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>	
0.0	20,626.3	PWP0 (PAC-MAN 36 FED COM 502H)	MWD+IFR1+MS	OWSG MWD + IFR1 + Multi-Station Correction	

<b>Planned Survey</b>										
<b>Measured Depth (usft)</b>	<b>Inclination (°)</b>	<b>Azimuth (°)</b>	<b>Vertical Depth (usft)</b>	<b>+N/-S (usft)</b>	<b>+E/-W (usft)</b>	<b>Map Northing (usft)</b>	<b>Map Easting (usft)</b>	<b>Latitude</b>	<b>Longitude</b>	
0.0	0.00	0.00	0.0	0.0	0.0	11,742,816.86	2,125,697.08	32° 20' 24.298 N	103° 25' 41.846 W	
100.0	0.00	0.00	100.0	0.0	0.0	11,742,816.86	2,125,697.08	32° 20' 24.298 N	103° 25' 41.846 W	
200.0	0.00	0.00	200.0	0.0	0.0	11,742,816.86	2,125,697.08	32° 20' 24.298 N	103° 25' 41.846 W	
300.0	0.00	0.00	300.0	0.0	0.0	11,742,816.86	2,125,697.08	32° 20' 24.298 N	103° 25' 41.846 W	
400.0	0.00	0.00	400.0	0.0	0.0	11,742,816.86	2,125,697.08	32° 20' 24.298 N	103° 25' 41.846 W	
500.0	0.00	0.00	500.0	0.0	0.0	11,742,816.86	2,125,697.08	32° 20' 24.298 N	103° 25' 41.846 W	
600.0	0.00	0.00	600.0	0.0	0.0	11,742,816.86	2,125,697.08	32° 20' 24.298 N	103° 25' 41.846 W	
700.0	0.00	0.00	700.0	0.0	0.0	11,742,816.86	2,125,697.08	32° 20' 24.298 N	103° 25' 41.846 W	
800.0	0.00	0.00	800.0	0.0	0.0	11,742,816.86	2,125,697.08	32° 20' 24.298 N	103° 25' 41.846 W	
900.0	0.00	0.00	900.0	0.0	0.0	11,742,816.86	2,125,697.08	32° 20' 24.298 N	103° 25' 41.846 W	
1,000.0	0.00	0.00	1,000.0	0.0	0.0	11,742,816.86	2,125,697.08	32° 20' 24.298 N	103° 25' 41.846 W	
1,100.0	0.00	0.00	1,100.0	0.0	0.0	11,742,816.86	2,125,697.08	32° 20' 24.298 N	103° 25' 41.846 W	

<b>Company:</b>	NEW MEXICO	<b>Local Co-ordinate Reference:</b>	Well PAC-MAN 36 FED COM 502H
<b>Project:</b>	LEA	<b>TVD Reference:</b>	RKB=3382+25 @ 3407.0usft
<b>Site:</b>	PAC-MAN	<b>MD Reference:</b>	RKB=3382+25 @ 3407.0usft
<b>Well:</b>	PAC-MAN 36 FED COM 502H	<b>North Reference:</b>	True
<b>Wellbore:</b>	PAC-MAN 36 FED COM 502H	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	PWP0	<b>Database:</b>	Centennial EDM SQL Server

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
1,200.0	0.00	0.00	1,200.0	0.0	0.0	11,742,816.86	2,125,697.08	32° 20' 24.298 N	103° 25' 41.846 W
1,300.0	0.00	0.00	1,300.0	0.0	0.0	11,742,816.86	2,125,697.08	32° 20' 24.298 N	103° 25' 41.846 W
1,400.0	0.00	0.00	1,400.0	0.0	0.0	11,742,816.86	2,125,697.08	32° 20' 24.298 N	103° 25' 41.846 W
1,500.0	0.00	0.00	1,500.0	0.0	0.0	11,742,816.86	2,125,697.08	32° 20' 24.298 N	103° 25' 41.846 W
1,600.0	0.00	0.00	1,600.0	0.0	0.0	11,742,816.86	2,125,697.08	32° 20' 24.298 N	103° 25' 41.846 W
1,700.0	0.00	0.00	1,700.0	0.0	0.0	11,742,816.86	2,125,697.08	32° 20' 24.298 N	103° 25' 41.846 W
1,800.0	0.00	0.00	1,800.0	0.0	0.0	11,742,816.86	2,125,697.08	32° 20' 24.298 N	103° 25' 41.846 W
1,900.0	0.00	0.00	1,900.0	0.0	0.0	11,742,816.86	2,125,697.08	32° 20' 24.298 N	103° 25' 41.846 W
2,000.0	0.00	0.00	2,000.0	0.0	0.0	11,742,816.86	2,125,697.08	32° 20' 24.298 N	103° 25' 41.846 W
2,100.0	0.00	0.00	2,100.0	0.0	0.0	11,742,816.86	2,125,697.08	32° 20' 24.298 N	103° 25' 41.846 W
2,200.0	0.00	0.00	2,200.0	0.0	0.0	11,742,816.86	2,125,697.08	32° 20' 24.298 N	103° 25' 41.846 W
2,300.0	0.00	0.00	2,300.0	0.0	0.0	11,742,816.86	2,125,697.08	32° 20' 24.298 N	103° 25' 41.846 W
2,400.0	0.00	0.00	2,400.0	0.0	0.0	11,742,816.86	2,125,697.08	32° 20' 24.298 N	103° 25' 41.846 W
2,500.0	0.00	0.00	2,500.0	0.0	0.0	11,742,816.86	2,125,697.08	32° 20' 24.298 N	103° 25' 41.846 W
2,600.0	0.00	0.00	2,600.0	0.0	0.0	11,742,816.86	2,125,697.08	32° 20' 24.298 N	103° 25' 41.846 W
2,700.0	0.00	0.00	2,700.0	0.0	0.0	11,742,816.86	2,125,697.08	32° 20' 24.298 N	103° 25' 41.846 W
2,800.0	0.00	0.00	2,800.0	0.0	0.0	11,742,816.86	2,125,697.08	32° 20' 24.298 N	103° 25' 41.846 W
2,900.0	0.00	0.00	2,900.0	0.0	0.0	11,742,816.86	2,125,697.08	32° 20' 24.298 N	103° 25' 41.846 W
3,000.0	0.00	0.00	3,000.0	0.0	0.0	11,742,816.86	2,125,697.08	32° 20' 24.298 N	103° 25' 41.846 W
3,100.0	0.00	0.00	3,100.0	0.0	0.0	11,742,816.86	2,125,697.08	32° 20' 24.298 N	103° 25' 41.846 W
3,200.0	0.00	0.00	3,200.0	0.0	0.0	11,742,816.86	2,125,697.08	32° 20' 24.298 N	103° 25' 41.846 W
3,300.0	0.00	0.00	3,300.0	0.0	0.0	11,742,816.86	2,125,697.08	32° 20' 24.298 N	103° 25' 41.846 W
3,400.0	0.00	0.00	3,400.0	0.0	0.0	11,742,816.86	2,125,697.08	32° 20' 24.298 N	103° 25' 41.846 W
3,500.0	0.00	0.00	3,500.0	0.0	0.0	11,742,816.86	2,125,697.08	32° 20' 24.298 N	103° 25' 41.846 W
3,600.0	0.00	0.00	3,600.0	0.0	0.0	11,742,816.86	2,125,697.08	32° 20' 24.298 N	103° 25' 41.846 W
3,700.0	0.00	0.00	3,700.0	0.0	0.0	11,742,816.86	2,125,697.08	32° 20' 24.298 N	103° 25' 41.846 W
3,800.0	0.00	0.00	3,800.0	0.0	0.0	11,742,816.86	2,125,697.08	32° 20' 24.298 N	103° 25' 41.846 W
3,900.0	0.00	0.00	3,900.0	0.0	0.0	11,742,816.86	2,125,697.08	32° 20' 24.298 N	103° 25' 41.846 W
4,000.0	0.00	0.00	4,000.0	0.0	0.0	11,742,816.86	2,125,697.08	32° 20' 24.298 N	103° 25' 41.846 W
4,100.0	1.00	0.00	4,100.0	0.9	0.0	11,742,817.74	2,125,697.06	32° 20' 24.306 N	103° 25' 41.846 W
4,200.0	2.00	0.00	4,200.0	3.5	0.0	11,742,820.35	2,125,697.03	32° 20' 24.332 N	103° 25' 41.846 W
4,300.0	3.00	0.00	4,299.9	7.9	0.0	11,742,824.71	2,125,696.96	32° 20' 24.375 N	103° 25' 41.846 W
4,400.0	3.00	0.00	4,399.7	13.1	0.0	11,742,829.95	2,125,696.89	32° 20' 24.427 N	103° 25' 41.846 W
4,500.0	3.00	0.00	4,499.6	18.3	0.0	11,742,835.18	2,125,696.81	32° 20' 24.479 N	103° 25' 41.846 W
4,600.0	3.00	0.00	4,599.5	23.6	0.0	11,742,840.41	2,125,696.73	32° 20' 24.531 N	103° 25' 41.846 W
4,700.0	3.00	0.00	4,699.3	28.8	0.0	11,742,845.65	2,125,696.65	32° 20' 24.582 N	103° 25' 41.846 W
4,800.0	3.00	0.00	4,799.2	34.0	0.0	11,742,850.88	2,125,696.58	32° 20' 24.634 N	103° 25' 41.846 W
4,900.0	3.00	0.00	4,899.0	39.3	0.0	11,742,856.11	2,125,696.50	32° 20' 24.686 N	103° 25' 41.846 W
5,000.0	3.00	0.00	4,998.9	44.5	0.0	11,742,861.35	2,125,696.42	32° 20' 24.738 N	103° 25' 41.846 W
5,100.0	3.00	0.00	5,098.8	49.7	0.0	11,742,866.58	2,125,696.35	32° 20' 24.790 N	103° 25' 41.846 W
5,200.0	3.00	0.00	5,198.6	55.0	0.0	11,742,871.81	2,125,696.27	32° 20' 24.841 N	103° 25' 41.846 W
5,300.0	3.00	0.00	5,298.5	60.2	0.0	11,742,877.04	2,125,696.19	32° 20' 24.893 N	103° 25' 41.846 W
5,400.0	3.00	0.00	5,398.4	65.4	0.0	11,742,882.28	2,125,696.12	32° 20' 24.945 N	103° 25' 41.846 W
5,500.0	3.00	0.00	5,498.2	70.7	0.0	11,742,887.51	2,125,696.04	32° 20' 24.997 N	103° 25' 41.846 W
5,600.0	3.00	0.00	5,598.1	75.9	0.0	11,742,892.74	2,125,695.96	32° 20' 25.049 N	103° 25' 41.846 W
5,700.0	3.00	0.00	5,697.9	81.1	0.0	11,742,897.98	2,125,695.89	32° 20' 25.100 N	103° 25' 41.846 W
5,800.0	3.00	0.00	5,797.8	86.4	0.0	11,742,903.21	2,125,695.81	32° 20' 25.152 N	103° 25' 41.846 W
5,900.0	3.00	0.00	5,897.7	91.6	0.0	11,742,908.44	2,125,695.73	32° 20' 25.204 N	103° 25' 41.846 W
6,000.0	3.00	0.00	5,997.5	96.8	0.0	11,742,913.68	2,125,695.66	32° 20' 25.256 N	103° 25' 41.846 W
6,100.0	3.00	0.00	6,097.4	102.1	0.0	11,742,918.91	2,125,695.58	32° 20' 25.308 N	103° 25' 41.846 W
6,200.0	3.00	0.00	6,197.3	107.3	0.0	11,742,924.14	2,125,695.50	32° 20' 25.359 N	103° 25' 41.846 W
6,300.0	3.00	0.00	6,297.1	112.5	0.0	11,742,929.37	2,125,695.43	32° 20' 25.411 N	103° 25' 41.846 W
6,400.0	3.00	0.00	6,397.0	117.8	0.0	11,742,934.61	2,125,695.35	32° 20' 25.463 N	103° 25' 41.846 W
6,500.0	3.00	0.00	6,496.8	123.0	0.0	11,742,939.84	2,125,695.27	32° 20' 25.515 N	103° 25' 41.846 W
6,600.0	3.00	0.00	6,596.7	128.2	0.0	11,742,945.07	2,125,695.20	32° 20' 25.567 N	103° 25' 41.846 W

<b>Company:</b>	NEW MEXICO	<b>Local Co-ordinate Reference:</b>	Well PAC-MAN 36 FED COM 502H
<b>Project:</b>	LEA	<b>TVD Reference:</b>	RKB=3382+25 @ 3407.0usft
<b>Site:</b>	PAC-MAN	<b>MD Reference:</b>	RKB=3382+25 @ 3407.0usft
<b>Well:</b>	PAC-MAN 36 FED COM 502H	<b>North Reference:</b>	True
<b>Wellbore:</b>	PAC-MAN 36 FED COM 502H	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	PWP0	<b>Database:</b>	Centennial EDM SQL Server

Planned Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
6,700.0	3.00	0.00	6,696.6	133.5	0.0	11,742,950.31	2,125,695.12	32° 20' 25.618 N	103° 25' 41.846 W	
6,800.0	3.00	0.00	6,796.4	138.7	0.0	11,742,955.54	2,125,695.04	32° 20' 25.670 N	103° 25' 41.846 W	
6,900.0	3.00	0.00	6,896.3	143.9	0.0	11,742,960.77	2,125,694.97	32° 20' 25.722 N	103° 25' 41.846 W	
7,000.0	3.00	0.00	6,996.2	149.2	0.0	11,742,966.01	2,125,694.89	32° 20' 25.774 N	103° 25' 41.846 W	
7,100.0	3.00	0.00	7,096.0	154.4	0.0	11,742,971.24	2,125,694.81	32° 20' 25.826 N	103° 25' 41.846 W	
7,200.0	3.00	0.00	7,195.9	159.6	0.0	11,742,976.47	2,125,694.73	32° 20' 25.877 N	103° 25' 41.846 W	
7,300.0	3.00	0.00	7,295.8	164.9	0.0	11,742,981.70	2,125,694.66	32° 20' 25.929 N	103° 25' 41.846 W	
7,400.0	3.00	0.00	7,395.6	170.1	0.0	11,742,986.94	2,125,694.58	32° 20' 25.981 N	103° 25' 41.846 W	
7,500.0	3.00	0.00	7,495.5	175.3	0.0	11,742,992.17	2,125,694.50	32° 20' 26.033 N	103° 25' 41.846 W	
7,600.0	3.00	0.00	7,595.3	180.6	0.0	11,742,997.40	2,125,694.43	32° 20' 26.084 N	103° 25' 41.846 W	
7,700.0	3.00	0.00	7,695.2	185.8	0.0	11,743,002.64	2,125,694.35	32° 20' 26.136 N	103° 25' 41.846 W	
7,800.0	3.00	0.00	7,795.1	191.0	0.0	11,743,007.87	2,125,694.27	32° 20' 26.188 N	103° 25' 41.846 W	
7,900.0	3.00	0.00	7,894.9	196.3	0.0	11,743,013.10	2,125,694.20	32° 20' 26.240 N	103° 25' 41.846 W	
8,000.0	2.00	0.00	7,994.8	200.6	0.0	11,743,017.46	2,125,694.13	32° 20' 26.283 N	103° 25' 41.846 W	
8,100.0	1.00	0.00	8,094.8	203.2	0.0	11,743,020.08	2,125,694.09	32° 20' 26.309 N	103° 25' 41.846 W	
8,200.0	0.00	0.00	8,194.8	204.1	0.0	11,743,020.95	2,125,694.08	32° 20' 26.318 N	103° 25' 41.846 W	
8,300.0	0.00	0.00	8,294.8	204.1	0.0	11,743,020.95	2,125,694.08	32° 20' 26.318 N	103° 25' 41.846 W	
8,400.0	0.00	0.00	8,394.8	204.1	0.0	11,743,020.95	2,125,694.08	32° 20' 26.318 N	103° 25' 41.846 W	
8,500.0	0.00	0.00	8,494.8	204.1	0.0	11,743,020.95	2,125,694.08	32° 20' 26.318 N	103° 25' 41.846 W	
8,600.0	0.00	0.00	8,594.8	204.1	0.0	11,743,020.95	2,125,694.08	32° 20' 26.318 N	103° 25' 41.846 W	
8,700.0	0.00	0.00	8,694.8	204.1	0.0	11,743,020.95	2,125,694.08	32° 20' 26.318 N	103° 25' 41.846 W	
8,800.0	0.00	0.00	8,794.8	204.1	0.0	11,743,020.95	2,125,694.08	32° 20' 26.318 N	103° 25' 41.846 W	
8,900.0	0.00	0.00	8,894.8	204.1	0.0	11,743,020.95	2,125,694.08	32° 20' 26.318 N	103° 25' 41.846 W	
9,000.0	0.00	0.00	8,994.8	204.1	0.0	11,743,020.95	2,125,694.08	32° 20' 26.318 N	103° 25' 41.846 W	
9,100.0	0.00	0.00	9,094.8	204.1	0.0	11,743,020.95	2,125,694.08	32° 20' 26.318 N	103° 25' 41.846 W	
9,200.0	0.00	0.00	9,194.8	204.1	0.0	11,743,020.95	2,125,694.08	32° 20' 26.318 N	103° 25' 41.846 W	
9,300.0	0.00	0.00	9,294.8	204.1	0.0	11,743,020.95	2,125,694.08	32° 20' 26.318 N	103° 25' 41.846 W	
9,400.0	0.00	0.00	9,394.8	204.1	0.0	11,743,020.95	2,125,694.08	32° 20' 26.318 N	103° 25' 41.846 W	
9,500.0	0.00	0.00	9,494.8	204.1	0.0	11,743,020.95	2,125,694.08	32° 20' 26.318 N	103° 25' 41.846 W	
9,600.0	0.00	0.00	9,594.8	204.1	0.0	11,743,020.95	2,125,694.08	32° 20' 26.318 N	103° 25' 41.846 W	
9,700.0	0.00	0.00	9,694.8	204.1	0.0	11,743,020.95	2,125,694.08	32° 20' 26.318 N	103° 25' 41.846 W	
9,800.0	0.00	0.00	9,794.8	204.1	0.0	11,743,020.95	2,125,694.08	32° 20' 26.318 N	103° 25' 41.846 W	
9,900.0	0.00	0.00	9,894.8	204.1	0.0	11,743,020.95	2,125,694.08	32° 20' 26.318 N	103° 25' 41.846 W	
9,932.0	0.00	0.00	9,926.8	204.1	0.0	11,743,020.95	2,125,694.08	32° 20' 26.318 N	103° 25' 41.846 W	
10,000.0	6.80	180.77	9,994.6	200.1	-0.1	11,743,016.93	2,125,694.09	32° 20' 26.278 N	103° 25' 41.847 W	
10,100.0	16.79	180.77	10,092.4	179.7	-0.3	11,742,996.51	2,125,694.11	32° 20' 26.076 N	103° 25' 41.850 W	
10,200.0	26.79	180.77	10,185.1	142.6	-0.8	11,742,959.44	2,125,694.16	32° 20' 25.709 N	103° 25' 41.856 W	
10,300.0	36.78	180.77	10,270.0	90.0	-1.5	11,742,906.83	2,125,694.22	32° 20' 25.188 N	103° 25' 41.864 W	
10,400.0	46.78	180.77	10,344.5	23.5	-2.4	11,742,840.28	2,125,694.31	32° 20' 24.530 N	103° 25' 41.875 W	
10,500.0	56.78	180.77	10,406.3	-55.0	-3.5	11,742,761.82	2,125,694.40	32° 20' 23.753 N	103° 25' 41.887 W	
10,600.0	66.77	180.77	10,453.5	-143.0	-4.7	11,742,673.83	2,125,694.51	32° 20' 22.883 N	103° 25' 41.901 W	
10,700.0	76.77	180.77	10,484.8	-237.8	-5.9	11,742,578.97	2,125,694.63	32° 20' 21.944 N	103° 25' 41.916 W	
10,800.0	86.76	180.77	10,499.1	-336.7	-7.3	11,742,480.12	2,125,694.75	32° 20' 20.966 N	103° 25' 41.931 W	
10,832.4	90.00	180.77	10,500.0	-369.0	-7.7	11,742,447.75	2,125,694.79	32° 20' 20.645 N	103° 25' 41.936 W	
10,900.0	90.00	180.75	10,500.0	-436.6	-8.6	11,742,380.14	2,125,694.89	32° 20' 19.976 N	103° 25' 41.947 W	
11,000.0	90.00	180.72	10,500.0	-536.6	-9.9	11,742,280.14	2,125,695.07	32° 20' 18.987 N	103° 25' 41.962 W	
11,100.0	90.00	180.70	10,500.0	-636.6	-11.1	11,742,180.14	2,125,695.30	32° 20' 17.997 N	103° 25' 41.976 W	
11,200.0	90.00	180.67	10,500.0	-736.6	-12.3	11,742,080.14	2,125,695.57	32° 20' 17.008 N	103° 25' 41.990 W	
11,300.0	90.00	180.64	10,500.0	-836.6	-13.5	11,741,980.14	2,125,695.90	32° 20' 16.018 N	103° 25' 42.003 W	
11,400.0	90.00	180.61	10,500.0	-936.6	-14.6	11,741,880.14	2,125,696.27	32° 20' 15.029 N	103° 25' 42.016 W	
11,500.0	90.00	180.59	10,500.0	-1,036.6	-15.6	11,741,780.14	2,125,696.70	32° 20' 14.039 N	103° 25' 42.028 W	
11,600.0	90.00	180.56	10,500.0	-1,136.6	-16.6	11,741,680.14	2,125,697.17	32° 20' 13.050 N	103° 25' 42.040 W	
11,700.0	90.00	180.53	10,500.0	-1,236.6	-17.5	11,741,580.15	2,125,697.69	32° 20' 12.060 N	103° 25' 42.051 W	
11,800.0	90.00	180.50	10,500.0	-1,336.6	-18.4	11,741,480.15	2,125,698.25	32° 20' 11.070 N	103° 25' 42.061 W	
11,900.0	90.00	180.47	10,500.0	-1,436.6	-19.3	11,741,380.15	2,125,698.87	32° 20' 10.081 N	103° 25' 42.071 W	



<b>Company:</b>	NEW MEXICO	<b>Local Co-ordinate Reference:</b>	Well PAC-MAN 36 FED COM 502H
<b>Project:</b>	LEA	<b>TVD Reference:</b>	RKB=3382+25 @ 3407.0usft
<b>Site:</b>	PAC-MAN	<b>MD Reference:</b>	RKB=3382+25 @ 3407.0usft
<b>Well:</b>	PAC-MAN 36 FED COM 502H	<b>North Reference:</b>	True
<b>Wellbore:</b>	PAC-MAN 36 FED COM 502H	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	PWP0	<b>Database:</b>	Centennial EDM SQL Server

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
12,000.0	90.00	180.45	10,500.0	-1,536.6	-20.1	11,741,280.15	2,125,699.53	32° 20' 9.091 N	103° 25' 42.081 W
12,100.0	90.00	180.42	10,500.0	-1,636.6	-20.9	11,741,180.15	2,125,700.25	32° 20' 8.102 N	103° 25' 42.089 W
12,200.0	90.00	180.39	10,500.0	-1,736.6	-21.6	11,741,080.16	2,125,701.01	32° 20' 7.112 N	103° 25' 42.098 W
12,300.0	90.00	180.36	10,500.0	-1,836.6	-22.2	11,740,980.16	2,125,701.82	32° 20' 6.122 N	103° 25' 42.105 W
12,400.0	90.00	180.34	10,500.0	-1,936.6	-22.8	11,740,880.16	2,125,702.68	32° 20' 5.133 N	103° 25' 42.112 W
12,500.0	90.00	180.31	10,500.0	-2,036.6	-23.4	11,740,780.17	2,125,703.58	32° 20' 4.143 N	103° 25' 42.119 W
12,600.0	90.00	180.28	10,500.0	-2,136.6	-23.9	11,740,680.17	2,125,704.54	32° 20' 3.154 N	103° 25' 42.125 W
12,700.0	90.00	180.25	10,500.0	-2,236.6	-24.4	11,740,580.18	2,125,705.54	32° 20' 2.164 N	103° 25' 42.130 W
12,800.0	90.00	180.22	10,500.0	-2,336.6	-24.8	11,740,480.18	2,125,706.59	32° 20' 1.174 N	103° 25' 42.135 W
12,900.0	90.00	180.20	10,500.0	-2,436.6	-25.2	11,740,380.19	2,125,707.69	32° 20' 0.185 N	103° 25' 42.140 W
13,000.0	90.00	180.17	10,500.0	-2,536.6	-25.5	11,740,280.20	2,125,708.84	32° 19' 59.195 N	103° 25' 42.143 W
13,100.0	90.00	180.14	10,500.0	-2,636.6	-25.7	11,740,180.20	2,125,710.03	32° 19' 58.205 N	103° 25' 42.146 W
13,200.0	90.00	180.11	10,500.0	-2,736.6	-26.0	11,740,080.21	2,125,711.28	32° 19' 57.216 N	103° 25' 42.149 W
13,300.0	90.00	180.09	10,500.0	-2,836.6	-26.1	11,739,980.22	2,125,712.57	32° 19' 56.226 N	103° 25' 42.151 W
13,400.0	90.00	180.06	10,500.0	-2,936.6	-26.3	11,739,880.23	2,125,713.91	32° 19' 55.237 N	103° 25' 42.153 W
13,500.0	90.00	180.03	10,500.0	-3,036.6	-26.3	11,739,780.24	2,125,715.30	32° 19' 54.247 N	103° 25' 42.153 W
13,600.0	90.00	180.00	10,500.0	-3,136.6	-26.4	11,739,680.25	2,125,716.74	32° 19' 53.257 N	103° 25' 42.154 W
13,700.0	90.00	179.98	10,500.0	-3,236.6	-26.4	11,739,580.26	2,125,718.23	32° 19' 52.268 N	103° 25' 42.154 W
13,800.0	90.00	179.95	10,500.0	-3,336.6	-26.3	11,739,480.27	2,125,719.76	32° 19' 51.278 N	103° 25' 42.153 W
13,900.0	90.00	179.92	10,500.0	-3,436.6	-26.2	11,739,380.28	2,125,721.34	32° 19' 50.288 N	103° 25' 42.151 W
14,000.0	90.00	179.89	10,500.0	-3,536.6	-26.0	11,739,280.30	2,125,722.98	32° 19' 49.299 N	103° 25' 42.150 W
14,100.0	90.00	179.86	10,500.0	-3,636.6	-25.8	11,739,180.31	2,125,724.65	32° 19' 48.309 N	103° 25' 42.147 W
14,200.0	90.00	179.84	10,500.0	-3,736.6	-25.5	11,739,080.32	2,125,726.38	32° 19' 47.320 N	103° 25' 42.144 W
14,300.0	90.00	179.81	10,500.0	-3,836.6	-25.2	11,738,980.34	2,125,728.16	32° 19' 46.330 N	103° 25' 42.140 W
14,400.0	90.00	179.78	10,500.0	-3,936.6	-24.9	11,738,880.36	2,125,729.98	32° 19' 45.340 N	103° 25' 42.136 W
14,500.0	90.00	179.75	10,500.0	-4,036.6	-24.5	11,738,780.37	2,125,731.86	32° 19' 44.351 N	103° 25' 42.132 W
14,539.8	90.00	179.74	10,500.0	-4,076.4	-24.3	11,738,740.55	2,125,732.62	32° 19' 43.956 N	103° 25' 42.129 W
14,600.0	90.00	179.74	10,500.0	-4,136.6	-24.0	11,738,680.39	2,125,733.77	32° 19' 43.361 N	103° 25' 42.126 W
14,700.0	90.00	179.74	10,500.0	-4,236.6	-23.6	11,738,580.41	2,125,735.69	32° 19' 42.371 N	103° 25' 42.121 W
14,800.0	90.00	179.74	10,500.0	-4,336.6	-23.1	11,738,480.43	2,125,737.60	32° 19' 41.382 N	103° 25' 42.116 W
14,900.0	90.00	179.74	10,500.0	-4,436.6	-22.7	11,738,380.45	2,125,739.52	32° 19' 40.392 N	103° 25' 42.111 W
15,000.0	90.00	179.74	10,500.0	-4,536.6	-22.2	11,738,280.47	2,125,741.44	32° 19' 39.403 N	103° 25' 42.105 W
15,100.0	90.00	179.74	10,500.0	-4,636.6	-21.8	11,738,180.49	2,125,743.35	32° 19' 38.413 N	103° 25' 42.100 W
15,200.0	90.00	179.74	10,500.0	-4,736.6	-21.3	11,738,080.50	2,125,745.27	32° 19' 37.423 N	103° 25' 42.095 W
15,300.0	90.00	179.74	10,500.0	-4,836.6	-20.9	11,737,980.52	2,125,747.19	32° 19' 36.434 N	103° 25' 42.090 W
15,400.0	90.00	179.74	10,500.0	-4,936.6	-20.4	11,737,880.54	2,125,749.10	32° 19' 35.444 N	103° 25' 42.084 W
15,500.0	90.00	179.74	10,500.0	-5,036.6	-20.0	11,737,780.56	2,125,751.02	32° 19' 34.454 N	103° 25' 42.079 W
15,600.0	90.00	179.74	10,500.0	-5,136.6	-19.5	11,737,680.58	2,125,752.93	32° 19' 33.465 N	103° 25' 42.074 W
15,700.0	90.00	179.74	10,500.0	-5,236.6	-19.1	11,737,580.60	2,125,754.85	32° 19' 32.475 N	103° 25' 42.069 W
15,800.0	90.00	179.74	10,500.0	-5,336.5	-18.6	11,737,480.61	2,125,756.77	32° 19' 31.486 N	103° 25' 42.063 W
15,900.0	90.00	179.74	10,500.0	-5,436.5	-18.2	11,737,380.63	2,125,758.68	32° 19' 30.496 N	103° 25' 42.058 W
16,000.0	90.00	179.74	10,500.0	-5,536.5	-17.7	11,737,280.65	2,125,760.60	32° 19' 29.506 N	103° 25' 42.053 W
16,100.0	90.00	179.74	10,500.0	-5,636.5	-17.3	11,737,180.67	2,125,762.52	32° 19' 28.517 N	103° 25' 42.048 W
16,200.0	90.00	179.74	10,500.0	-5,736.5	-16.8	11,737,080.69	2,125,764.43	32° 19' 27.527 N	103° 25' 42.042 W
16,300.0	90.00	179.74	10,500.0	-5,836.5	-16.4	11,736,980.71	2,125,766.35	32° 19' 26.538 N	103° 25' 42.037 W
16,400.0	90.00	179.74	10,500.0	-5,936.5	-15.9	11,736,880.72	2,125,768.27	32° 19' 25.548 N	103° 25' 42.032 W
16,500.0	90.00	179.74	10,500.0	-6,036.5	-15.5	11,736,780.74	2,125,770.18	32° 19' 24.558 N	103° 25' 42.027 W
16,600.0	90.00	179.74	10,500.0	-6,136.5	-15.0	11,736,680.76	2,125,772.10	32° 19' 23.569 N	103° 25' 42.022 W
16,700.0	90.00	179.74	10,500.0	-6,236.5	-14.6	11,736,580.78	2,125,774.02	32° 19' 22.579 N	103° 25' 42.016 W
16,800.0	90.00	179.74	10,500.0	-6,336.5	-14.2	11,736,480.80	2,125,775.93	32° 19' 21.589 N	103° 25' 42.011 W
16,900.0	90.00	179.74	10,500.0	-6,436.5	-13.7	11,736,380.82	2,125,777.85	32° 19' 20.600 N	103° 25' 42.006 W
17,000.0	90.00	179.74	10,500.0	-6,536.5	-13.3	11,736,280.83	2,125,779.77	32° 19' 19.610 N	103° 25' 42.001 W
17,100.0	90.00	179.74	10,500.0	-6,636.5	-12.8	11,736,180.85	2,125,781.68	32° 19' 18.621 N	103° 25' 41.995 W
17,200.0	90.00	179.74	10,500.0	-6,736.5	-12.4	11,736,080.87	2,125,783.60	32° 19' 17.631 N	103° 25' 41.990 W
17,300.0	90.00	179.74	10,500.0	-6,836.5	-11.9	11,735,980.89	2,125,785.52	32° 19' 16.641 N	103° 25' 41.985 W

<b>Company:</b>	NEW MEXICO	<b>Local Co-ordinate Reference:</b>	Well PAC-MAN 36 FED COM 502H
<b>Project:</b>	LEA	<b>TVD Reference:</b>	RKB=3382+25 @ 3407.0usft
<b>Site:</b>	PAC-MAN	<b>MD Reference:</b>	RKB=3382+25 @ 3407.0usft
<b>Well:</b>	PAC-MAN 36 FED COM 502H	<b>North Reference:</b>	True
<b>Wellbore:</b>	PAC-MAN 36 FED COM 502H	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	PWP0	<b>Database:</b>	Centennial EDM SQL Server

Planned Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
17,400.0	90.00	179.74	10,500.0	-6,936.5	-11.5	11,735,880.91	2,125,787.43	32° 19' 15.652 N	103° 25' 41.980 W	
17,500.0	90.00	179.74	10,500.0	-7,036.5	-11.0	11,735,780.93	2,125,789.35	32° 19' 14.662 N	103° 25' 41.974 W	
17,600.0	90.00	179.74	10,500.0	-7,136.5	-10.6	11,735,680.94	2,125,791.26	32° 19' 13.672 N	103° 25' 41.969 W	
17,700.0	90.00	179.74	10,500.0	-7,236.5	-10.1	11,735,580.96	2,125,793.18	32° 19' 12.683 N	103° 25' 41.964 W	
17,800.0	90.00	179.74	10,500.0	-7,336.5	-9.7	11,735,480.98	2,125,795.10	32° 19' 11.693 N	103° 25' 41.959 W	
17,900.0	90.00	179.74	10,500.0	-7,436.5	-9.2	11,735,381.00	2,125,797.01	32° 19' 10.704 N	103° 25' 41.953 W	
18,000.0	90.00	179.74	10,500.0	-7,536.5	-8.8	11,735,281.02	2,125,798.93	32° 19' 9.714 N	103° 25' 41.948 W	
18,100.0	90.00	179.74	10,500.0	-7,636.5	-8.3	11,735,181.04	2,125,800.85	32° 19' 8.724 N	103° 25' 41.943 W	
18,200.0	90.00	179.74	10,500.0	-7,736.5	-7.9	11,735,081.05	2,125,802.76	32° 19' 7.735 N	103° 25' 41.938 W	
18,300.0	90.00	179.74	10,500.0	-7,836.5	-7.4	11,734,981.07	2,125,804.68	32° 19' 6.745 N	103° 25' 41.932 W	
18,400.0	90.00	179.74	10,500.0	-7,936.5	-7.0	11,734,881.09	2,125,806.60	32° 19' 5.755 N	103° 25' 41.927 W	
18,500.0	90.00	179.74	10,500.0	-8,036.5	-6.5	11,734,781.11	2,125,808.51	32° 19' 4.766 N	103° 25' 41.922 W	
18,600.0	90.00	179.74	10,500.0	-8,136.5	-6.1	11,734,681.13	2,125,810.43	32° 19' 3.776 N	103° 25' 41.917 W	
18,700.0	90.00	179.74	10,500.0	-8,236.5	-5.6	11,734,581.15	2,125,812.35	32° 19' 2.787 N	103° 25' 41.911 W	
18,800.0	90.00	179.74	10,500.0	-8,336.5	-5.2	11,734,481.16	2,125,814.26	32° 19' 1.797 N	103° 25' 41.906 W	
18,900.0	90.00	179.74	10,500.0	-8,436.5	-4.7	11,734,381.18	2,125,816.18	32° 19' 0.807 N	103° 25' 41.901 W	
19,000.0	90.00	179.74	10,500.0	-8,536.5	-4.3	11,734,281.20	2,125,818.10	32° 18' 59.818 N	103° 25' 41.896 W	
19,100.0	90.00	179.74	10,500.0	-8,636.5	-3.8	11,734,181.22	2,125,820.01	32° 18' 58.828 N	103° 25' 41.890 W	
19,200.0	90.00	179.74	10,500.0	-8,736.5	-3.4	11,734,081.24	2,125,821.93	32° 18' 57.839 N	103° 25' 41.885 W	
19,300.0	90.00	179.74	10,500.0	-8,836.5	-2.9	11,733,981.26	2,125,823.85	32° 18' 56.849 N	103° 25' 41.880 W	
19,400.0	90.00	179.74	10,500.0	-8,936.5	-2.5	11,733,881.27	2,125,825.76	32° 18' 55.859 N	103° 25' 41.875 W	
19,500.0	90.00	179.74	10,500.0	-9,036.5	-2.0	11,733,781.29	2,125,827.68	32° 18' 54.870 N	103° 25' 41.869 W	
19,600.0	90.00	179.74	10,500.0	-9,136.5	-1.6	11,733,681.31	2,125,829.59	32° 18' 53.880 N	103° 25' 41.864 W	
19,700.0	90.00	179.74	10,500.0	-9,236.5	-1.1	11,733,581.33	2,125,831.51	32° 18' 52.890 N	103° 25' 41.859 W	
19,800.0	90.00	179.74	10,500.0	-9,336.5	-0.7	11,733,481.35	2,125,833.43	32° 18' 51.901 N	103° 25' 41.854 W	
19,900.0	90.00	179.74	10,500.0	-9,436.5	-0.2	11,733,381.37	2,125,835.34	32° 18' 50.911 N	103° 25' 41.849 W	
20,000.0	90.00	179.74	10,500.0	-9,536.5	0.2	11,733,281.38	2,125,837.26	32° 18' 49.922 N	103° 25' 41.843 W	
20,100.0	90.00	179.74	10,500.0	-9,636.5	0.7	11,733,181.40	2,125,839.18	32° 18' 48.932 N	103° 25' 41.838 W	
20,200.0	90.00	179.74	10,500.0	-9,736.5	1.1	11,733,081.42	2,125,841.09	32° 18' 47.942 N	103° 25' 41.833 W	
20,300.0	90.00	179.74	10,500.0	-9,836.5	1.6	11,732,981.44	2,125,843.01	32° 18' 46.953 N	103° 25' 41.828 W	
20,400.0	90.00	179.74	10,500.0	-9,936.5	2.0	11,732,881.46	2,125,844.93	32° 18' 45.963 N	103° 25' 41.822 W	
20,500.0	90.00	179.74	10,500.0	-10,036.5	2.5	11,732,781.48	2,125,846.84	32° 18' 44.973 N	103° 25' 41.817 W	
20,600.0	90.00	179.74	10,500.0	-10,136.5	2.9	11,732,681.50	2,125,848.76	32° 18' 43.984 N	103° 25' 41.812 W	
20,626.5	90.00	179.74	10,500.0	-10,163.0	3.0	11,732,655.02	2,125,849.27	32° 18' 43.722 N	103° 25' 41.810 W	

Design Targets										
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude	
- hit/miss target										
- Shape										
LTP/BHL - PAC MAN 36	0.00	0.00	10,500.0	-10,163.0	3.0	11,732,655.02	2,125,849.27	32° 18' 43.722 N	103° 25' 41.810 W	
- plan hits target center										
- Point										
FTP - PAC MAN 36 FED	0.00	0.00	10,500.0	200.0	-0.2	11,743,016.80	2,125,693.90	32° 20' 26.277 N	103° 25' 41.849 W	
- plan misses target center by 235.1usft at 10398.3usft MD (10343.4 TVD, 24.7 N, -2.4 E)										
- Circle (radius 50.0)										

Checked By: \_\_\_\_\_ Approved By: \_\_\_\_\_ Date: \_\_\_\_\_

## Pac-Man 36 Fed Com 502H

### Centennial Drilling Plan for 3-Casing String Bone Springs Formation

#### 13-3/8" x 9-5/8" x 5-1/2" Casing Design

1. Drill 17-1/2" surface hole to Total Depth with Spudder Rig and perform wellbore cleanup cycles.
2. Run and land 13-3/8" casing to Depth.
3. Cement 13-3/8" casing – cement to surface.
4. Cut / Dress Conductor and 13-3/8" casing as needed, weld on Cameron Multi-bowl system with baseplate supported by 20" conductor.
5. Test Weld to 70% of 13-3/8" casing collapse. Place nightcap with Pressure Gauge on wellhead and test seals to 70% of Casing Collapse.
6. Bleed Pressure if necessary and remove nightcap. Nipple up and test BOPE with test plug per Onshore Order 2.
7. Test casing per COA WOC timing (.22 psi/ft or 1500 psi whichever is greater) - not to exceed 70% casing burst. Cement must have achieved 500psi compressive strength prior to test.
8. Install wear bushing then drill out 13-3/8" shoe-track plus 20' and conduct FIT to minimum of the MW equivalent anticipated to control the formation pressure to the next casing point.
9. Drill 12-1/4" Intermediate hole to 9-5/8" casing point. (Base Capitan Reef).
10. Remove wear bushing then run and land 9-5/8" Intermediate Casing with mandrel hanger in wellhead.
11. Cement 9-5/8 casing – cement to surface.
12. Washout stack then run wash tool in wellhead and wash hanger and pack-off setting area.
13. Install pack-off and test to 5000 psi for 15 minutes.
  - a. Test casing per COA WOC timing (.22 psi/ft or 1500 psi whichever is greater) - not to exceed 70% casing burst. Cement must have achieved 500psi compressive strength prior to test.
14. Install wear bushing then drill out 9-5/8" shoe-track plus 20' and conduct FIT to minimum MW equivalent to control the formation pressure to TD of well.
15. Drill 8-3/4" Vertical hole to KOP – Trip out for Curve BHA.
16. Drill 8-3/4" Curve, landing in production interval – Trip for Lateral BHA.
17. Drill 8-1/2" Lateral to Permitted BHL, perform cleanup cycles and trip out to run 5-1/2" Production Casing.
18. Remove wear bushing then run 5-1/2" production casing to TD landing casing mandrel in wellhead.
19. Cement 5-1/2" Production string to surface.
20. Run in with wash tool and wash wellhead area – install pack-off and test to 5000psi for 15 minutes.
21. Install BPV in 5-1/2" mandrel hanger – Nipple down BOPE and install nightcap.
22. Test nightcap void to 5000psi for 30 minutes.

# Centennial Resource Development New Mexico Multi-Well Pad Drilling Batch Setting Procedures

## ➤ Avalon and Bone Springs Formations

13-3/8" Surface Casing - CRD intends to preset 13-3/8" casing to a depth approved in the APD. 17-1/2" Surface Holes will be batch drilled by a Surface Preset rig. Appropriate notifications will be made prior to spudding the well, running and cementing casing and prior to skidding to the rig to the next well on pad.

1. Drill 17-1/2" Surface hole to Approved Depth with Surface Preset Rig and perform wellbore cleanup cycles. Trip out and rack back drilling BHA.
2. Run and land 13-3/8" 54.5# J55 BTC casing to depth approved in APD.
3. Cement 13-3/8" casing with cement to surface and floats holding.
4. Cut / Dress 20" Conductor and 13-3/8" casing as needed, weld on Cameron Multi-bowl system with baseplate supported by 20" conductor (see [Illustration 1-1 Below](#)). Weld performed per Cameron weld procedure.
5. Test Weld to 70% of 13-3/8" casing collapse or ~ 790psi.
6. Install nightcap with Pressure Gauge on wellhead. Nightcap is shown on final wellhead Stack up [Illustration #2-2 page 3](#).
7. Skid Rig to adjacent well to drill Surface hole.
8. Surface casing test will be performed by the Big Rig in order to allow ample time for Cement to develop 500psi compressive strength. Casing test to 0.22 psi/ft or 1500 psi whichever is greater - not to exceed 70% casing burst.

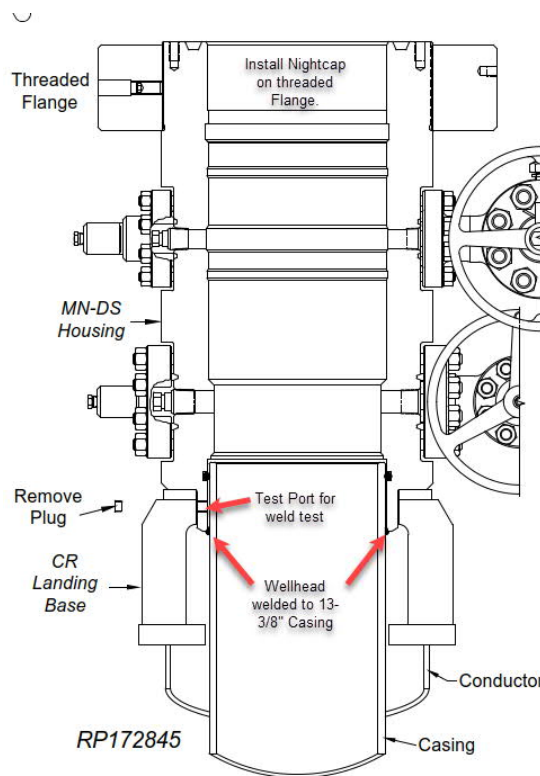


Illustration 1-1

- Intermediate and Production Casing – For all subsequent Intermediate and Production Casing Strings, the Big Rig will remove the nightcap and install and test BOPE. Prior to drill out the 13-3/8" Casing will be tested to 0.22psi/ft or 1500psi whichever is greater. The well will be drilled below 13-3/8" to its intended final TD in the Avalon or Bonesprings formations. Batch drilling will not be executed for casing strings below the 13-3/8". Appropriate notifications will be made prior Testing BOPE, and prior to running/cementing all casing strings. The

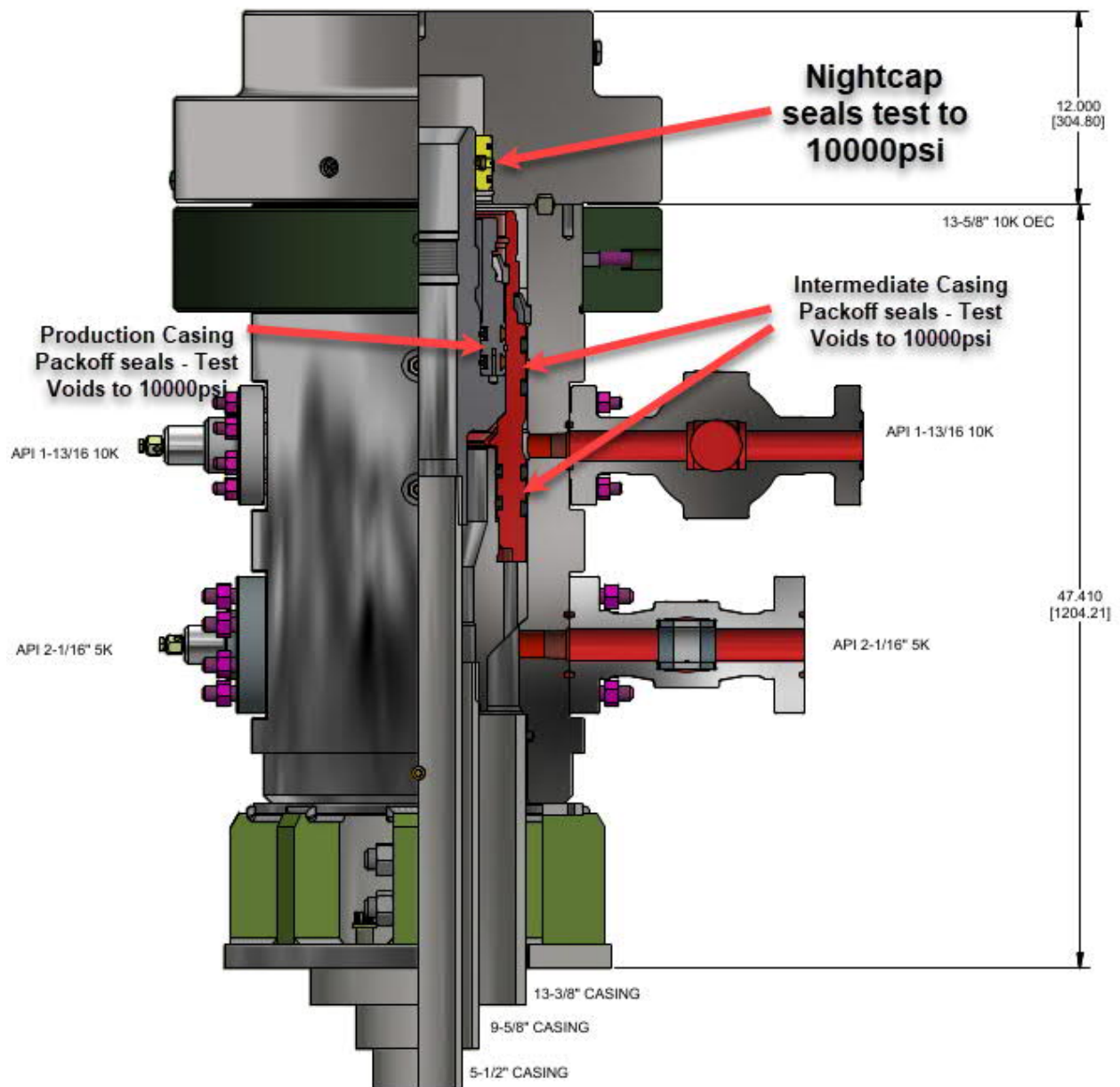
## ➤ Wolfcamp Formations

13-3/8" Surface Casing - CRD intends to preset 13-3/8" casing to a depth approved in the APD. Surface Holes will be batch set by a Surface Preset rig. Appropriate notifications will be made prior to spudding the well, running and cementing casing and prior to skidding to the rig to the next well on pad.

1. Drill 17-1/2" Surface hole to Approved Depth with Surface Preset Rig and perform wellbore cleanup cycles. Trip out and rack back drilling BHA.
2. Run and land 13-3/8" 54.5# J55 BTC casing to depth approved in APD.
3. Cement 13-3/8" casing with cement to surface and floats holding.
4. Cut / Dress 20" Conductor and 13-3/8" casing as needed, weld on Cameron Multi-bowl system with baseplate supported by 20" conductor (see [Illustration 1-1](#)). Weld performed per Cameron weld procedure.
5. Test Weld to 70% of 13-3/8" casing collapse or ~ 790psi.
6. Install nightcap with Pressure Gauge on wellhead. Nightcap is shown on final wellhead Stack up [Illustration #2-2 on page 3](#).
7. Subsequent casing test will be performed by the Big Rig in order to allow ample time for Cement to develop 500psi compressive strength. Casing test to 0.22 psi/ft or 1500 psi whichever is greater - not to exceed 70% casing burst.

Intermediate Casing – CRD intends to Batch set all intermediate casing strings to a depth approved in the APD, typically set 100' above KOP in the 3<sup>rd</sup> Bonesprings Carbonate. For the last intermediate section drilled on pad, the associated production interval will immediately follow. Appropriate notifications will be made prior Testing BOPE, and prior to running/cementing all casing strings.

1. Big Rig will remove the nightcap and install and test BOPE.
2. Test Surface casing per COA WOC timing (.22 psi/ft or 1500 psi whichever is greater) - not to exceed 70% casing burst. Cement must have achieved 500psi compressive strength prior to test.
3. Install wear bushing then drill out 13-3/8" shoe-track plus 20' and conduct FIT to minimum of the MW equivalent anticipated to control the formation pressure to the next casing point.
4. Drill Intermediate hole to approved casing point. Trip out of hole with BHA to run Casing.
5. Remove wear bushing then run and land Intermediate Casing with mandrel hanger in wellhead.
6. Cement casing to surface with floats holding.
7. Washout stack then run wash tool in wellhead and wash hanger and pack-off setting area.
8. Install pack-off and test void to 10000 psi for 15 minutes. Nightcap shown on final wellhead stack up [illustration 2-2 on page 3](#).
9. Test casing per COA WOC timing (.22 psi/ft or 1500 psi whichever is greater) - not to exceed 70% casing burst. Cement must have achieved 500psi compressive strength prior to test.
10. Install nightcap – skid rig to adjacent well to drill Intermediate hole.



WITH CAP

Illustration 2-2

Production Casing – CRD intends to Batch set all Production casings, except for the last intermediate hole. In this case the production interval will immediately follow the intermediate section on that well. Appropriate notifications will be made prior Testing BOPE, and prior to running/cementing all casing strings.

1. Big Rig will remove the nightcap and install and test BOPE.
2. Install wear bushing then drill Intermediate shoe-track plus 20' and conduct FIT to minimum MW equivalent to control the formation pressure to TD of well.
3. Drill Vertical hole to KOP – Trip out for Curve BHA.
4. Drill Curve, landing in production interval – Trip for Lateral BHA.

5. Drill Lateral / Production hole to Permitted BHL, perform cleanup cycles and trip out to run 5-1/2" Production Casing.
6. Remove wear bushing then run 5-1/2" production casing to TD landing casing mandrel in wellhead.
7. Cement 5-1/2" Production string to surface with floats holding.
8. Run in with wash tool and wash wellhead area – install pack-off and test void to 10000psi for 15 minutes.
9. Install BPV in 5-1/2" mandrel hanger – Nipple down BOPE and install nightcap.
10. Test nightcap void to 10000psi for 30 minutes per [illustration 2-2 page 3](#).
11. Skid rig to adjacent well on pad to drill production hole.