Form 3160-5
(February 2005)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

RECEIVED
AUG 18 2010
Farmington Field Office
Bureau of Land Management

FORM APPROVED
OMB No. 1004-0137
Expires: March 31, 2007

RCVD SEP 24'10
OIL CONS. DIV.
DIST. 3

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.

SUBMIT IN TRIPLICATE – *Other instructions on page 2.*

5. Lease Serial No.
NMSF 0078771

6. If Indian, Allottee or Tribe Name

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

1. Type of Well
☐ Oil Well ☒ Gas Well ☐ Other

8. Well Name and No.
Rosa Unit #634A

2. Name of Operator
Williams Production Company, LLC

9. API Well No.
30-039-30970

3a. Address
PO Box 640 Aztec, NM 87410

3b. Phone No. *(include area code)*
505-634-4208

10. Field and Pool or Exploratory Area
Basin Mancos

4. Location of Well *(Footage, Sec., T.,R.,M., or Survey Description)*
SURF: 1480' FNL & 700' FEL
BHL: 725' FNL & 20' FEL SEC 22 31N 6W

11. Country or Parish, State
Rio Arriba

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

TYPE OF SUBMISSION	TYPE OF ACTION			
☒ Notice of Intent	☐ Acidize	☐ Deepen	☐ Production (Start/Resume)	☐ Water Shut-Off
☐ Subsequent Report	☐ Alter Casing	☐ Fracture Treat	☐ Reclamation	☐ Well Integrity
☐ Final Abandonment Notice	☐ Casing Repair	☐ New Construction	☐ Recomplete	☒ Other change setting depth and casing design
	☐ Change Plans	☐ Plug and Abandon	☐ Temporarily Abandon	
	☐ Convert to Injection	☐ Plug Back	☐ 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 recomplete 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.)

CONFIDENTIAL

Williams Production wishes to modify it's drilling program on this well as per attached drilling program. Please note change in intermediate casing depth and change in production casing from a liner to a long string.

RECEIVED
SEP 15 2010
WPX

14. I hereby certify that the foregoing is true and correct.
Name *(Printed/Typed)*
Larry Higgins

Title Permits Supervisor

Signature Larry Higgins

Date 08/17/2010

THIS SPACE FOR FEDERAL OR STATE OFFICE USE

Approved by
Troy L. Salyers

Title PE

Date 9/14/2010

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 FFO

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)

NMOCD

Rosa Unit 634A
Drilling Program
Williams Production Co. LLC

WELL NAME:	Rosa Unit 634A
COUNTY, STATE:	Rio Arriba County, New Mexico
AFE #	WT24881-62299303
LOCATION – Surface:	1480' FNL & 700' FEL of Sec 22, T31N, R6W
TD at Bottom Hole:	725' FNL & 20' FEL Sec 23, T31N, R6W
API #:	30-039-30970
Surface Csg Size / Depth	13-3/8" at 500' MD
PROPOSED TD:	Hor. 13,130' MD/ 7,065' TVD at Incl. 90.96°, Azi.90.07°
ZONES OF INTEREST / OBJECTIVES:	Olive zone base 7,153' TVD/ 7,892' MD top 7,065' TVD/13,130' MD
GLE / RKB-ML:	6,258' GL ungraded KB – GL=18.5'
DHC /D&C / WI% TOTAL:	

Coordinates: **X_{SL}:** 2,837,072.21 E **Y_{SL}:** 2,142,906.76 N

Entry Point 7,151' TVD / 7,891' MD, 91.02° Incl. 90.07° Azm **X_{BHL}:** 2,837,788.80 E, **Y_{BHL}:** 2,143,731.59 N
TD/PBHL 7,058' TVD / 13,129' MD, 91.02° Incl. 90.07° Azm **X_{BHL}:** 2,843,026.01 E, **Y_{BHL}:** 2,143,746.91 N

Directions: **From Bloomfield, NM:** Travel East on US-64 for 37.5 miles, turn North onto NM-527 towards Sims Mesa Recreation Area, Drive 7.9 miles turn right on Rosa Road/County Road 362 (look for rig sign), Drive 11.5 miles look for rig sign and wildlife gate on left, Turn left on lease road, Rig is ~1 mile down lease road. **IF WILDLIFE GATE IS LOCKED CONTACT DALE BAKER AT (281)840-5800 ENSURE GATE CLOSES BEHIND ALL VEHICLES AVOID STOPPING ON FIRST 3 MILES OF ROSA ROAD**

Drilling Rig: Frontier Drilling Rig 7 **KB Elevation:** **6,276'**

Geology: ***Formation***

The referenced surface elevation is 6,258/' ungraded. KB to GL: 18.5'

Name		TVD	MD		Name		TVD	MD
Ojo Alamo		2,345	2,345		Menefee		5,350	5,367
Kirtland		2,445	2,445		Point Lookout		5,585	5,626
Fruitland		2,945	2,945		Mancos		5,880	5,952
Pictured Cliffs		3,120	3,120		Top of Black Zone		7,065	7,450
Lewis		3,401	3,401		Bottom of Black Zone		7,153	7,892
Cliff House		5,295	5,307		**TD**		**7,065**	**13,130**

Proposed Casing Program:

	Hole Size	***Casing***	***MD/TVD***	***TOC***
Conductor:	Pre-Set	20" , 94ppf,J55,Buttress, Rge 1-2	80'/80'	Surface
Surface:	17-1/2"	13-3/8",68ppf,J55, Buttress,8rd thrd,Rge 3	500'/500'	Surface
Intermediate:	*12-1/4"*	9-5/8",40ppf,HCP110, LT&C, 8rd thrd, Rge 3	6,152'/6,055'	Surface
Drlg. Liner:	*8-1/2"*	*7", 23ppf, N80, LT&C, 8rd thrd, Rge 3 Top*	4,800'/4,800' 7,891'/7,153'	TOL
Production	6-1/8"	4-1/2", 11.6 #/ft, HCP110,LT&C	13,130'/7,085'	~4000'

Coring: None Planned

Rosa Unit 634A
Drilling Program
Williams Production Co. LLC

Evaluation:	Mud Logging: 505-334-4088	K&C – 2 Man Unit from 500' – TD
	Weatherford XRD/SRA 720-497-8251	Ryan King – 2 man unit from top of Lewis(3,410' TVD/MD)–TD
	Electric Logging:	Company: Weatherford
		Intermediate: From 13-3/8" surface csg. shoe at 500' to 6,462' Log with a GR/Quad Combo
		Drilling Liner (thru the Curve): GR/Quad Combo- 7,891'MD(shoe of 7") to 6,152' MD (shoe of 9-5/8")
		Production: GR/HMI – Lateral section 13,129' MD (Toe of Lateral) to the 7,891' MD (Heel)

Major Service Providers:

Cement:	Halliburton
Drilling Fluids:	Baroid Drilling Fluids
Directional:	Weatherford
Logging:	Weatherford
Fuel:	Fraley's
Fresh Water:	SSS Trucking

Drilling Procedure:

1. After building location accommodate drilling rig, pre-set 20" conductor at 80' and drill 65' 16" rotating mouse holes as per rig lay out. Confirm location dimensions prior to mobilizing rig, in particular well center.

2. Mobilize and RU Frontier Drilling Company Rig #7. Install flowline as to minimize the need to reposition flowline after every casing string. Once rig is rigged up, perform pre-spud inspection with Williams/IADC pre-spud inspection form. ***Contact Virgil Lucero at BLM Farmington FO prior to spud to schedule BLM Rig Inspection***

    - Confirm conductor pipe is set vertical and rat/mouse holes are positioned correctly prior to mobilization.
    - Install riser system from Antelope Sales and Service on top of conductor prior to spud.
    - Install Stream-Flo HE BOP Quick Connect Adapter on bottom of BOP prior to spud.
    - Install Cameron Variable Diameter Pipe Rams in 13-5/8" BOP 5K prior to spud.
    - Ensure adequate freshwater supply prior to spud.
    - Review surface use agreement included with drilling program. Review same with Toolpushers and rig crews to ensure compliance with regard to trash pick up and lease road speed limits.
    - Record beginning and ending diesel readings for Rig tank and Camp tank in daily report. Monitor and document daily fuel usage in IADC and daily reports. Fuel is to be charged out on a daily basis. Diesel used in the mud should be tracked as a separate line item so that an accurate estimate of diesel usage for fuel and OBM can be made at the end of the well. All diesel fuel and lube supplies from Fraley Company (505-327-7474 – Sean - District Manager) Red Diesel – 2.60 $/gal, Clear diesel – 3.00 $/gal, Unleaded fuel -2.75 $/gal, all fuel tanks are from Fraley's at no charge.

- Inventory and visually inspect all tubulars and downhole tools on location. Record all dimensions, serial numbers, etc, of all downhole equipment. Maintain a file of all relative inspection reports.

- BHA inspection will be conducted every 300 hours or as needed.

- Gauge all BHA tools and stabilizers prior to and after running, record in IADC and daily reports.

- Advise the New Mexico OCD and BLM of spud within 24 hours of spud. Advise 24 hour prior to cementing all casing strings. All conversations are to be documented in the IADC reports as well as the daily reports. Include all pertinent information, including date, time, person contacted, details of the discussion/exception, etc. in the reports.

- Confirm KB elevation prior to spud and document same in the IADC and daily reports.

- Ensure a copy of the approved drilling permit are posted in doghouse prior to spud of the well.

- All drill pipe tallies, casing tallies, and BHAs are the responsibility of the drilling supervisor. Confirm drill pipe tallies prior to TD.

- It is the drilling supervisor's responsibility to check and confirm calculations with regard to rig operations including cement volumes, pressure tests, etc.

- Maintain a rental tool log of all tools delivered to location. Ensure daily totals match the figures reported in PA. Include delivery dates, condition, damage if any, etc.

- All wellhead equipment (Stream-Flo HE) is to be measured prior to spud and all cut-off heights are to be discussed with drilling engineer prior to running surface casing as to minimize/eliminate the need to reposition the BOP stack/flowline after each casing string.

- Record liquid mud and tangible equipment movements on IADC and daily reports. On equipment moved between wells or third party yards, ensure the proper paperwork is completed (William's – MT forms).

- All accidents are to be reported as soon as practical to drilling supervisor and Ronnie Shorter (Williams EH&S) and detailed in the daily reports as well on the Williams accident form. A copy of the contractor's incident investigation report should also be included with Williams accident form.

- Pipe rams are to be function tested weekly (if not otherwise tested during well control drills) and prior to all trips. Blind rams are to be functioned after all trips. All function tests are to be documented in daily reports.

- BOP and associated well control equipment are to be inspected prior to nipple up. Ensure bottles are properly charged and all equipment is in working condition.

- BOP pressure tests are to be conducted after the BOPs have been installed, after each casing string or anytime a pressure seal has been broken and/or every 30 days.

- Well control drills are to be conducted as necessary to ensure crews are familiar with shut-in procedures. Once crews are familiar with the proper well control procedures, drills may be conducted once per week per crew. All drills and shut-in times are to be documented in IADC and daily reports.

- Ensure familiarity of Stream-Flo HE Wellhead Installation Procedures. Ensure all crew members are instructed as to exactly how wellhead will be installed. This includes the welder for proper cut-off heights and weldless base plate installation. A detailed procedure for this operation is included in with this program.

- Slow pump rates are to be recorded and documented on the daily reports daily or when the mud weight has changed more the 0.3 ppg.

- All trips are to be conducted using pump strokes and trip sheet to monitor for proper fill-up and displacement.

- The following reports are to be sent every morning by 06:00 hrs:

    - WellEZ Daily Drilling Report
    - Mud Logs/Show Reports
    - BHA, Casing Tallies etc as they become available
    - Directional Survey Reports
    - Mud Reports

- The following items need to be recorded daily in the PA morning reports.

    - Daily fuel consumption/cumulative use
    - Topic of Tailgate safety meeting for both crews
    - Accidents/Injuries if any are reported
    - Crew status (crews full, etc)
    - Repair time for an event/Cumulative Repair time
    - Rotating hours and cumulative hour on BHA & Jars, etc.

- The attached drilling program is intended to act as a guide and is NOT a substitute for common sense.

SURFACE HOLE: 13-1/2" Hole , 9-5/8" Casing

3. Prepare to spud well by picking up the following BHA:

    - 17-1/2" Milled Tooth jetted with 3x18 nozzles
    - 8" OD Float sub w/float installed
    - 3 - 8" Drill Collar
    - X-over Sub
    - 6-1/2" Drill Collars as needed to reach 500'

Spud well. Drill ahead using, surveying well every 200' below conductor and at interval TD

Interval Mud Properties:

Interval *(Feet)*	**Mud Weight** *(ppg)*	**Funnel Vis.** *(sec/qt)*	**Plastic Vis.** *(cp)*	**Yield Point** *(lb/100ft^2)*	**Fluid Loss** *(ml/30 min)*	**HTHP Fluid Loss** *(ml/30 min)*	**Total Solids** *(%)*
0 - 500'	8.4 - 8.7	As needed	N/A	N/A	N/A	N/A	< 3

- Spud well with 8.3 ppg fresh water.

- Control seepage losses with the addition of drilling paper and other LCM as needed.

- Use PHPA polymer as needed for sweeps
- Use high viscosity sweeps containing freshwater gel to clean hole as required. Frequency will be dictated by holes conditions and previous results of sweeps pumped.
- Spot high viscosity/weighted pills on bottom prior running casing as needed.

Continue drilling ahead with the above mud properties to the planned TD/Casing Point. Planned surface casing point is 500' MD.

- Casing tally should be completed prior to TD, adjust TD of this hole section accordingly to allow for casing collar to be at floor level during cement job.

4. Upon reaching TD, circulate and sweep hole clean. Wiper trip will be at the discretion of well site supervisor and New Tech Drilling Superintendent. Spot a high viscosity pill on bottom (as necessary), drop survey and strap out of the hole, confirm pipe figures and joint count.

5. Hold pre-job safety meeting regarding casing running equipment, discuss shoe and collar locations as well as centralizer placement with rig and casing crews. RU PU/LD machine. RU casing running equipment and run casing as follows:

- 13-3/8" Buttress Cement Nose Guide Shoe (Baker Lock on threads)
- 1 jt – 13-3/8" 68#, J-55 Buttress (Baker Lock Connections)
- 13-3/8" 68#, J-55 Buttress Float Collar (Baker Lock Connections)
- 13-3/8" 68#, J-55 Buttress LTC Casing to surface.

Casing Specifications:

13-3/8" 68#, J-55 Buttress

Collapse:	1,950 psi
Burst:	3,450 psi
Tension:	675,000 lbs
Make-up:	6,750 Ft-lb

Estimated Cost: **$ 42.30/ft (Includes inspection)**

All casing is to be drifted prior to running. Threads are to be visually inspected by drilling supervisor for dirt/sand and should be cleaned as necessary.

Centralizers are to be placed as follows:

- 1 standard bowspring centralizer every other joint beginning with shoe joint (approx. 13 - 17-1/2"x13 3/8" bow type centralizer placed over casing collar area.)

- ***Notify BLM Casing/Cement hotline and New Mexico Oil Conservation District 24 hrs prior to running and cementing casing.***
- *Have casing swage on location*

Be prepared to wash casing to bottom as necessary with rig pumps. Circulate a minimum 1-1/2 times the casing annular volume with rig pumps prior to cementing well.

6. Make up landing joint, Stream-Flo HE wellhead, and running tool on final joint of casing as instructed by Antelope Sales and Service technician. Land out baseplate on conductor.

7. RU Halliburton. Hold safety/procedure meeting regarding cement job. Pressure test lines to 2M# and cement surface casing with the following:

10 bbls	Freshwater
255 sks	Halliburton VariCem + 0.25 #/sk Poly-e-Flake + 1% Cal-Seal 60 mixed @ 12.7 ppg and 9.13 gps mix water with a yield of 1.78 ft^3/sk.
150 sks	Premium Plus (Type III) + 0.25 #/sk Poly-e-Flake + 0.3% Versaset + 2% Econolite + 6% Salt mixed @ 13.5 ppg and 9.26 gps mix water with a yield of 1.77 ft^3/sk.

The above volumes are based on 100% excess on lead cement and 0% excess on the tail.

Release top plug and displace with fresh water using the Halliburton pumps. Monitor and note cement returns in daily reports. Bump plug with 500 psi over final circulating pressure. Do not over-displace more than ½ the volume of the shoe joint. Release pressure and ensure floats are holding. RD cementing equipment from rig floor.

8. RD cementing equipment and breakout and RD riser system. Wash off wellhead and associated equipment to remove remaining cement. Begin WOC.

9. Off critical path operations while WOC:
   - Back out Stream-Flo HE running tool and landing joint from wellhead
   - Connect BOP to wellhead with Stream-Flo HE quick connect
   - NU BOP and related equipment
   - Pressure test BOP and related equipment as follows:
     - 250 psi (low) for 5 minutes
     - 2,500 psi (high) for 10 minutes
     - Utilize BOP testing unit with recording chart and appropriate test plug
     - ***Notify BLM Farmington FO and NMOCD of BOP pressure test 24 hours prior to testing***
   - Mix fresh water based Baroid EZ-MUD system in pits to specifications per Baroid fluid engineer on location.

10. After completion of BOP pressure testing or WOC for 12 hours ***WHICHEVER IS GREATER*** pressure test surface casing to 600 psi for 30 minutes prior to tripping in to drill out. Utilize BOP testing unit with recording chart.

INTERMEDIATE HOLE: 12-1/4" Hole , 9-5/8" Casing

11. PU the following Weatherford Directional BHA and TIH to drill float equipment:

    - 12-1/4" Smith MDi716PX PDC Bit - 7x16's
    - 1- 8" 7/8 lobe 2.5 Stage Mud Motor bend at 2.12°
    - Float Sub
    - Double pin sub
    - MWD Tool Carrier w/Directional only MWD
    - Emitter Sub
    - 2 x 8" - Monel Collar
    - 3 x 8" rig Drill Collars
    - 15- 6-1/2" drill collars as needed to tag plug

TIH and tag cement, note cement top in daily reports.

12. Displace fresh water in 13-3/8" casing with WBM.

13. Cautiously continue drilling ahead until DC's have cleared casing shoe and WBM mud has been treated and conditioned. Drill ahead taking surveys every 100' with MWD. ***DO NOT ALLOW WELLBORE TO DRIFT MORE THAN 15' TOWARDS PLANNED WELLPATH OF ROSA UNIT 634B***

    Use all solids control equipment to remove cuttings from mud. Place water based mud cuttings in cuttings pit on location.

    Drill with at least 700 gpm using both pumps

    Bit selections are to be based on offset well performance, rock strength analysis as well as dull grades from previous bit runs. Discuss potential bit selections with Drilling Engineers prior to running bit.

    Interval Mud Properties:

Interval *(Feet)*	Mud Weight *(ppg)*	Funnel Vis. *(sec/qt)*	Plastic Vis. *(cp)*	Yield Point *(lb/100ft^2)*	Fluid Loss *(ml/30 min)*	HTHP Fluid Loss *(ml/30 min)*	LG Solids *(%)*
500' to 6,162'	8.5 – 9.0	60-70	7-15	25-35	<10	NA	<4

14. Drill to Kick Off Point of 4,900' MD/TVD. Pick up 6-1/2" drill collars until 15 have been picked up, switch to 4-1/2" HWDP until 18 jts have been picked up. Drill ahead picking up rig's 4-1/2" drill pipe. POOH for directional equipment

15. PU Weatherford directional tools. Preliminary BHA as follows:

    - 12-1/4" Smith GF20BVCPS TCI Rock Bit - 3-16's and 1-18 center jet
    - 1- 8" 7/8 lobe 2.5 stages Mud Motor bend motor as recommended by Weatherford directional team.
    - Float Sub
    - Double pin sub
    - MWD Tool Carrier w/Directional only MWD
    - Emitter Sub
    - 2 x Monel Collar
    - 3 x 8" rig Drill Collars
    - 15 x 6-1/2" Drill Collars
    - 54 jts 4-1/2" XH HWDP

16. Drill 12-1/4" curve according to directional plan with approximately 700 gpm ***DO NOT ALLOW DOGLEG SEVERITY TO EXCEED 10°/100***. TD intermediate hole 200' MD below top of Mancos Shale. Treat for lost circulation as necessary, use air injected at stand pipe if necessary. **CONTACT ENGINEERING IMMEDIATELY IF YOU ENCOUNTER LOST CIRCULATION**

17. Circulate and condition hole at TD, Short trip to surface shoe at discretion of drilling supervisor.

18. POOH, stand 4-1/2" XH drill pipe, and 4-1/2" XH HWDP in derrick. Lay down 8" drill collars, 6-1/2" drill collars and Weatherford directional tools.

19. Hold PJSM regarding wireline logging. RU Weatherford Logging Services log from TD to surface shoe with GR/Quad Combo. RD Weatherford Logging Services.

20. Hold pre-job safety meeting regarding casing running operations and equipment, discuss shoe and collar locations as well as centralizer placement with rig and casing crews. All casing running equipment is to be visually inspected for adequate capacity as well as condition. Review wellhead installation procedures with casing and rig crews. RU casing running equipment and run casing as follows:

- Float shoe (Baker Lock on threads)
- 2 jt – 9-5/8" 40# HCP-110 LT&C (Thread-Lok Connections)
- Float Collar (Thread-Lok Connections)
- 9-5/8" 40# HCP-110 LT&C to Surface

Make-up mandrel/landing joint to casing. Ensure all lock downs are backed out in wellhead and prepare to land casing.

Land out casing in wellhead with landing joint and running tool.

Use swage to fill 9-5/8" casing. No fillup tool required.

Casing Specifications:

	9-5/8" 40# HCP-110 LT&C
Collapse:	5,600 psi
Burst:	8,700 psi
Tension:	1,106,000 lbs
Make-up:	11,050 ft-lb

Estimated Cost: $38.95/ft

All casing is to be drifted to 8-1/2" prior to running. Threads are to be visually inspected by drilling supervisor for dirt/sand and should be cleaned as necessary.

Monitor make-up torque and check periodically as needed.

Centralizers are to be placed as follows:

- 1 – Bowspring centralizer on each shoe joint (2 centralizers
- 1 – Bowspring centralizer on every other joint from float collar to 5,000' MD (18 centralizers)
- 1 – Bowspring centralizer on every 3rd joint from 5,000' MD to surface (42 centralizers)
- Grand total centralizers 62 - 12-1/4" x 9-5/8" bow spring type centralizers.

- ***Notify BLM Casing/Cement hotline and New Mexico Oil Conservation District 24 hrs prior to running and cementing casing.***

Be prepared to wash casing to landing point (10-12' off bottom to assure mandrel will land in head) as necessary with rig pumps. Circulate a minimum of 2 casing annular volumes with rig pumps prior to cementing well.

WHILE RUNNING CASING TRANSFER WBM FROM PITS TO STORAGE TANKS, CLEAN TANKS AND TRANSFER BAROID OIL BASED MUD FROM STORAGE TANKS TO RIG MUD TANKS.

21. Land casing with mandrel in wellhead and test packoff prior to cementing.

22. Hold pre-job safety/procedure meeting prior to RU Halliburton cementing company. RU cementing company while circulating. Cement 9-5/8" casing as follows:

20 bbls	Freshwater
20 bbls	SUPER FLUSH 101
20 bbls	Freshwater
1275 sks Lead	Halliburton FILLSEAL + 0.2% Versaset + 0.1% HALAD-766 + 2% ZoneSeal 4000 mixed at 13 ppg with 6.76 gps mix water and a yield of 1.43 ft^3/sk. Use N_2 to foam cement slurry to 9 ppg
180 sks Lead	Halliburton FILLSEAL + 0.2% Versaset + 0.1% HALAD-766 + 2% ZoneSeal 4000 mixed at 13 ppg with 6.76 gps mix water and a yield of 1.43 ft^3/sk. Use N_2 to foam cement slurry to 9.5 ppg
210 sks Tail	Halliburton HALCEM + 0.2% Versaset + 0.1% HALAD-766 + 2% ZoneSeal 4000 mixed at 13 ppg with 6.76 gps mix water and a yield of 1.43 ft^3/sk. and CEMENT SLURRY WEIGHT OF 13 PPG **THIS SLURRY IS NOT FOAMED**

Please provide the following information to the Halliburton representative 48-72 hrs. before the job:

- Electronic copy of most recent deviation survey (Excel or ASCII format)
- Updated target depth (TVD & MD)
- Confirmation of formation temperature at TD

The above cement volumes are based on a TOC @ surface with 80% excess applied to open hole volumes. Actual volumes will be based on caliper log plus 10% excess.

Use Antelope choke manifold (connected to 2" wellhead valve) to maintain back pressure and ensure proper foam expansion. Direct WBM returns to storage tanks. When cement returns are seen direct returns to slop tank and sugar treat the cement slurry to slop tank. Manifold slop tanks together so that returns can be distributed between them.

Release top plug and displace with oil based mud from storage tanks using the cement pumps. Monitor and note returns in daily reports. Bump plug with 500 psi over final circulating pressure. Do not over-displace more than ½ the volume of the shoe joint. Release pressure and ensure floats are holding. RD cementing equipment from rig floor. ***Immediately contact engineering if cement is not circulated to surface***

Note: Displace plug with oil based mud

23. WOC 12 hours. Operations while WOC:

- Transfer remaining water based mud from pits to storage tanks
- Clean remaining mud pits
- Transfer oil based mud from storage tanks to mud pits
- Move Weatherford 6-1/4" directional tools onto pipe racks
- Strap and caliper directional tools
- Back out landing joint
- Pick up remaining 4-1/2" XH HWDP and stand back in derrick
- Install and rig up ZECO cuttings dryer to solids control equipment
- Have lined rollaway dumpsters from Dawn Trucking placed near cuttings pit

24. Pressure test intermediate casing to 1,500 psi for 30 minutes. Utilize BOP testing unit with recorder chart.

CURVE: 8-1/2" Hole , 7" Liner

25. PU the following BHA and TIH to drill float equipment:

- 8-1/2" Smith GFI10GVCR TCI Rock Bit - 3-13's and 1-20 center jet
- 6-3/4" 7/8 lobe stage 3.0 Mud Motor bend as Weatherford directional team recommends
- Float Sub
- Double pin sub
- MWD Tool Carrier w/Directional only MWD
- Emitter Sub
- 2 x Monel Collar
- X/O Sub
- 258 jts 4" XT-39 DP
- X/O Sub
- 66 jts 4-1/2" XH HWDP

26. Drill ahead per directional plan using oil based mud to landing point. Land well at 7,151' TVD, 821.89' N/S, 719.95' E/W with 91.02° inclination and 90.07° azimuth. Make wiper trip to 9-5/8" shoe.

Drill with approximately 450 gpm on both pumps.

Use all solids control equipment to remove drilled solids from mud and minimize retained oil on cuttings. **Place all oil based mud cuttings in lined rollaway dumpsters. When dumpsters are full have them hauled to Envirotech for disposal. TEST ALL LOADS OF CUTTINGS USING BAROID CHLORIDE TITRATION TO ENSURE CUTTINGS ARE BELOW 1,000 PPM CHLORIDES. DILUTE WITH COARSE GRIND BENTONITE AS NECESSARY.**

Interval Mud Properties:

Interval *(Feet)*	**Mud Weight** *(ppg)*	**Funnel Vis.** *(sec/qt)*	**Plastic Vis.** *(cp)*	**Yield Point** *(lb/100ft^2)*	**Electric Stability**	**HTHP Fluid Loss** *(ml/30 min)*	**WPS** *(ppm)*
6,151' to 7,891'	11.6 – 12.5	60-70	15-25	8-15	>400	≤15	250k-300k

- Diesel based invert emulsion fluid system with Oil Water Ratio of 75:25

27. POOH standing back drill pipe. LD directional tools.

28. Hold PJSM regarding logging operations. RU Weatherford Logging Services. Log from TD to 9-5/8" csg shoe with Gamma Ray and Quad Combo memory tool. Rabbit drill pipe in derrick while tripping in, pull pipe in open hole at 30'/minute. RD Weatherford Logging Services

29. Make up 8-1/2" bit on slick BHA and trip in hole to TD. Circulate and condition well. POOH stand back drillpipe and HWDP in derrick

30. Hold pre-job safety meeting regarding casing running operations and equipment, discuss shoe and collar locations as well as marker joint and centralizer placement with rig and casing crews. All casing running equipment is to visually inspected adequate capacity as well as condition. RU casing running equipment and run casing as follows:

- Davis Lynch Casing Shoe (Baker Lock on threads)
- 2 jt – 7" 23# N-80 LT&C (Baker Lock Connections)
- Smith services Landing Collar (Thread-Lok Connections)

- Approximately 2,687' 7" 23# N-80 LT&C (bring above KOP)
- Smith 7" x 9-5/8" Pocket Slip Rotating Liner Hanger with 10' tieback receptacle and buttress box to LT&C pin crossover
- Smith rotating pocket slip liner hanger setting tool
- Drill pipe to surface

Casing Specifications:

	7" 23#, N-80 LT&C
Collapse:	3.830 psi
Burst:	6,340 psi
Tension:	532,000 lbs
Make-up:	4,420 ft-lb

Estimated Cost: $18.29/ft (includes inspection)

Threads are to be visually inspected by drilling supervisor for dirt/sand and should be cleaned as necessary.

Monitor make-up torque and check periodically as needed.

Centralizers are to be placed as follows:

- 46 – Solid body turbolizer style positioned every joint through KOP.

- ***Notify BLM Casing/Cement hotline and New Mexico Oil Conservation District 24 hrs prior to running and cementing casing.***

31. Hang liner per Smith procedure. Circulate a minimum 3 casing annualar volumes with rig pumps prior to cementing well.

32. Hold pre-job safety/procedure meeting prior to RU Halliburton cementing company. RU cementing company while circulating. Cement 7" liner as follows:

40 bbls	Tuned Spacer III with 0.1 gal/bbl SEM-7 + 0.1 gal/bbl Musol A. 12 ppg
395 sks	Halliburton HalCem premium cement + 0.4% Halad-9 + 0.4% Halad-413 + 0.3% D-AIR 3000 + 0.05% HR-5 + 2.5 #/sk Kol-Seal mixed at 13.50 ppg with 5.52 gps mix water and a yield of 1.30 ft^3/sack.

The above cement volumes are based on a TOC @ 4,900' with 30% excess applied to open hole volumes. Actual volumes will be based on caliper log plus 30% excess.

Release drill pipe dart and displace to liner wiper plug. Once sheared, continue displacement with oil based mud using the cement pumps. Monitor and note returns in daily reports. Bump plug with 500 psi over final circulating pressure. Do not over-displace more than ½ the volume of the shoe joint. Release pressure and ensure floats are holding.

Note: Displace plug with oil based mud

33. After bumping plug. Sting out of liner. Reverse circulate 2 drill pipe volumes. POOH with drill pipe and liner setting tool. Stand HWDP back in derrick and LDDP

34. WOC 12 hours. Operations while WOC:
- Move 4" XT-39 drillpipe and 4-1/2" XH HWDP onto pipe racks
- Strap and caliper same

- Pick up 4" XT-39 drillpipe and 4-1/2" XH HWDP
- Stand back in derrick such that pipe can be run in following order:
  - 4" XT-39 drillpipe
  - 4-1/2" XH HWDP
  - 6-1/2" Drill collars
- Move Weatherford 4-3/4" directional tools onto pipe racks
- Strap and caliper directional tools

35. Pressure test liner top to 1,500 psi for 30 minutes utilize BOP testing unit with recording chart.

PRODUCTION HOLE: 6-1/4" Hole , 4-1/2" Liner

36. PU the following BHA and TIH to drill float equipment:
    - 6-1/8" Smith Mi613PX PDC Bit - 6-15's
    - 4-3/4" 7/8 lobe 5 Stages Mud Motor 250 type rubber bend as per Weatherford Directional team
    - Float Sub
    - Double pin sub
    - MWD Tool Carrier w/Directional only MWD
    - Emitter Sub
    - 2 x Monel Flex Collar
    - 45 stands 4" XT-39 drillpipe
    - XT-39 to 4-1/2" XH Crossover
    - 24 stands 4-1/2" XH HWDP
37. TIH with 4-1/2" DP to drill out shoe

Interval Mud Properties:

Interval *(Feet)*	Mud Weight *(ppg)*	6 RPM	Plastic Vis. *(cp)*	Yield Point *(lb/100ft^2)*	Electric Stability	HTHP Fluid Loss *(ml/30 min)*	WPS *(ppm)*
7,891' to 13,130'	12.0 – 12.7	6-8	15-25	8-12	>800	≤10	250k-300k

- Diesel based invert emulsion fluid system with Oil Water Ratio of 80:20

38. After drilling out shoe, drill ahead according to directional plan to ~9,134' MD, ream every connection and sweep hole as necessary

    Drill with at least 250 gpm on one pump.

    Use all solids control equipment to remove drilled solids from mud and minimize retained oil on cuttings. **Place all oil based mud cuttings in lined rollaway dumpsters. When dumpsters are full have them hauled to Envirotech for disposal. TEST ALL LOADS OF CUTTINGS USING PROVIDED CHLORIDES TESTING KIT TO ENSURE CUTTINGS ARE BELOW 1,000 PPM CHLORIDES BEFORE LOADS LEAVE LOCATION. DILUTE WITH COARSE GRIND BENTONITE AS NECESSARY.**

39. POOH to bottom of 4-1/2" XH HWDP
40. Add 16 stands 4" XT-39 drillpipe below HWDP and place agitator/shock tool approx. 1200 to 2000' behind bit. Place left hand torque type safety joint directly below agitator.
41. TIH
42. Drill ahead according to directional plan to 10,574' MD, ream every connection and sweep hole as necessary

43. POOH to bottom of 4-1/2" XH HWDP
44. Add 28 stands of 3-1/2" IF HWDP below 4-1/2" XH HWDP
45. TIH
46. Drill ahead according to directional plan to **estimated TD of 13,129' MD/7,058 TVD (PBHL: -815.83' N/S, 5957.18' E/W, VS = 6,012' (82.20°))**, ream every connection and sweep hole as necessary
47. At TD sweep hole twice with high vis/weight (2 ppg above current mud weight)
48. Circulate minimum of 4 hours before POOH, short trip to 7" shoe at discretion of drilling supervisor
49. Hold PJSM regarding wireline operations. RU Weatherford Logging Services. Log from TD to 7" csg shoe with Gamma Ray and HMI imaging log on downhole tractors. RD Weatherford Logging Services
50. TIH to TD
51. Sweep hole with high vis/weight (2 ppg above current mud weight)
52. Circulate minimum of 4 hours before POOH, short trip to 7" shoe at discretion of drilling supervisor
53. POOH stand back 24 stands 4-1/2" XH HWDP and enough 4-1/2" XH drillpipe in derrick to set 4-1/2" liner hanger 100' above top of 7" liner (estimated at 4,800' MD)
54. Lay down remaining HWDP, drillpipe and directional tools
55. Hold pre-job safety meeting regarding casing running operations and equipment, discuss shoe and collar locations as well as marker joint and centralizer placement with rig and casing crews. All casing running equipment is to visually inspected adequate capacity as well as condition. RU casing running equipment and run casing as follows:

    - Davis Lynch Casing Shoe (Baker Lock on threads)
    - 1 jt – 4-1/2" 11.6# HCP-110 LT&C (Baker Lock Connections)
    - Smith services Landing Collar (Thread-Lok Connections)
    - 4-1/2" 11.6# HCP-110 LT&C

Casing Specifications:

	4-1/2" 11.6# HCP-110 LT&C
Collapse:	8,830 psi
Burst:	10,710 psi
Tension:	279,000 lbs
Make-up:	3,020 ft-lb

Estimated Cost: **$10.25/ft (includes inspection)**

Threads are to be visually inspected by drilling supervisor for dirt/sand and should be cleaned as necessary.

Monitor make-up torque and check periodically as needed.

Centralizers are to be placed as follows:

- 180 – Solid body turbolizer style positioned every joint through KOP.

- ***Notify BLM Casing/Cement hotline and New Mexico Oil Conservation District 24 hrs prior to running and cementing casing.***

56. Land 4-1/2" csg in wellhead with Antelope mandrel. Circulate a minimum 1-1/2 annular volumes with rig pumps prior to cementing well.

57. Hold pre-job safety/procedure meeting prior to RU Halliburton cementing company. RU cementing company while circulating. Cement 7" liner as follows:

20 bbls Diesel

20 bbls	Tuned Space III with 0.2 gal/bbl SEM-7 + 0.2 gal/bbl Musol A + 233.2 lb/bbl barite
180 bbl	12.7 ppg water based mud
20 bbls	Tuned Space III with 0.2 gal/bbl SEM-7 + 0.2 gal/bbl Musol A + 233.2 lb/bbl barite
410 sks	Halliburton FRACSEAL cement + 0.2% Versaset + 0.1% HALAD-766 + 1% ZoneSeal 4000 mixed at 13 ppg with 6.76 gps mix water and a yield of 1.43 ft^3/sk. Use N_2 to foam cement slurry to 10.8 ppg.
25 sks	Halliburton FRACCEM cement + 0.2% Versaset + 0.1% HALAD-766 + 1% ZoneSeal 4000 mixed at 13 ppg with 6.76 gps mix water and a yield of 1.43 ft^3/sk. **THIS SLURRY IS NOT FOAMED**

The above cement volumes are based on a TOC @ 3,800' with 30% excess applied to open hole volumes. Actual volumes will be based on caliper log plus 30% excess.

Use Halliburton choke manifold (connected to 2" wellhead valve) to maintain back pressure and ensure proper foam expansion. Direct OBM returns to storage tanks.

Release drill pipe dart and displace to liner wiper plug. Once sheared, continue displacement with fresh water using the cement pumps. Monitor and note returns in daily reports. Bump plug with 500 psi over final circulating pressure. Do not over-displace more than ½ the volume of the shoe track. Release pressure and ensure floats are holding.

Note: Displace plug with fresh water

58. Transfer remaining OBM in pits to storage tanks and clean pits.
59. Secure well. RD Frontier Rig #7 in preparation of moving to the Rosa Unit SWD 2.

Rosa Unit 634A
Drilling Program
Williams Production Co. LLC

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