

RECEIVED

Form 3160-5
(February 2005)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

APR 07 2011

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

Farmington Field Office
Bureau of Land Management
Serial No.
NMNM 23044

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.

1. Type of Well		6. If Indian, Allottee or Tribe Name
☐ Oil Well ☒ Gas Well ☐ Other		7. If Unit of CA/Agreement, Name and/or No.
2. Name of Operator Williams Production Company, LLC		8. Well Name and No. Schalk 32 #1A
3a. Address PO Box 640 Aztec, NM 87410	3b. Phone No. (include area code) 505-634-4208	9. API Well No. 30-039-30915
4. Location of Well (Footage, Sec., T., R., M., or Survey Description) 1965' FNL & 660' FWL, section 32, T31N, R4W		10. Field and Pool or Exploratory Area Basin Fruitland Coal
		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 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 recompleat horizontally, give subsurface locations and measured and true vertical depths of all pertinent markers and zones. Attach the Bond under which the work will be performed or provide the Bond No. on file with BLM/BIA. Required subsequent reports must be filed within 30 days following completion of the involved operations. If the operation results in a multiple completion or recompleat in a new interval, a Form 3160-4 must be filed once testing has been completed. Final Abandonment Notices must be filed only after all requirements, including reclamation, have been completed and the operator has determined that the site is ready for final inspection.)

Williams Production wishes to change this well from a vertical cavitated completion to a horizontal completion. A revised C-102, drirectional plan and operation plan are attached. A special project area has been applied for with the NMOC.

BLM'S APPROVAL OR ACCEPTANCE OF THIS ACTION DOES NOT RELIEVE THE LESSEE AND OPERATOR FROM OBTAINING ANY OTHER AUTHORIZATION REQUIRED FOR OPERATIONS ON FEDERAL AND INDIAN LANDS

CONDITIONS OF APPROVAL
Adhere to previously issued stipulations.

14. I hereby certify that the foregoing is true and correct. Name (Printed/Typed) Larry Higgins		Title Permit Supervisor
Signature <i>Larry Higgins</i>		Date 4-7-11
THIS SPACE FOR FEDERAL OR STATE OFFICE USE		
Approved by <i>Troy L. Salvors</i>	Title PE	Date 4/12/2011
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)

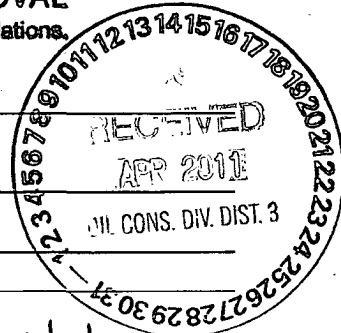
NMOC

Hold C104
for Directional Survey
and "As Drilled" plat

Simultaneous Dedication Allowed

AV

Hold C104
for Directional Survey
and "As Drilled" plat
Simultaneous Dedication Allowed



RECEIVED

District I
1625 N. French Dr., Hobbs, NM 88240

District II
1301 W. Grand Avenue, Artesia, NM 88210

District III
1000 Rio Brazos Rd., Aztec, NM 87410

District IV
1220 S. St. Francis Dr., Santa Fe, NM 87505

State of New Mexico
Energy, Minerals & Natural Resources Department

OIL CONSERVATION DIVISION
1220 South St. Francis Dr., Santa Fe, NM 87505
Bureau of Land Management

Form C-102
Revised October 12, 2005
Instructions on back
Submit to Appropriate District Office
State Lease - 4 Copies
Fee Lease - 3 Copies

☐ AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

*API Number 30-039-30915		*Pool Code 71629	*Pool Name BASIN FRUITLAND COAL
*Property Code	*Property Name SCHALK 32		*Well Number 1A
*GRID No. 120782	*Operator Name WILLIAMS PRODUCTION COMPANY		*Elevation 6978'

10 Surface Location

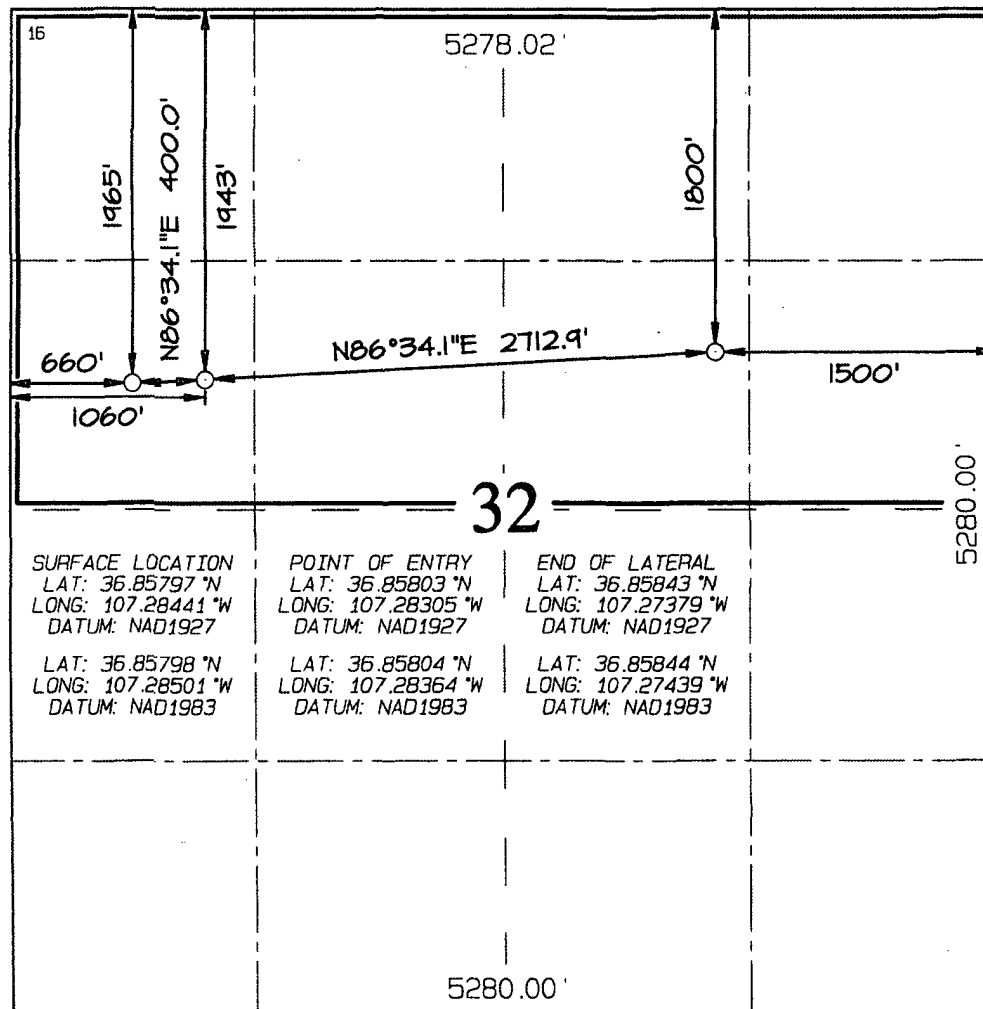
UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
E	32	31N	4W		1965	NORTH	660	WEST	RIO ARriba

11 Bottom Hole Location If Different From Surface

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
G	32	31N	4W		1800	NORTH	1500	EAST	RIO ARriba

12 Dedicated Acres 320.0 Acres - (N/2)	13 Joint or Infill	14 Consolidation Code	15 Order No.
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NO ALLOWABLE WILL BE ASSIGNED TO THIS COMPLETION UNTIL ALL INTERESTS HAVE BEEN CONSOLIDATED OR A NON-STANDARD UNIT HAS BEEN APPROVED BY THE DIVISION





WILLIAMS PRODUCTION COMPANY

Operations Plan

(Note: This procedure will be adjusted on site based upon actual conditions)

DATE: 4/6/2011

WELLNAME: Schalk 32 #1A

FIELD: Basin Fruitland Coal

SH DH LOCATION: SWNW Sec. 32-T31N-4W
Rio Arriba, NM

SURFACE: USFS

ELEVATION: 6,978' GR

MINERALS: BLM

TOTAL DEPTH: 6,772'

LEASE # NMNM-23044

I. GEOLOGY: Surface formation - San Jose

A. FORMATION TOPS: (KB)

NAME		TVD	MD		NAME		TVD	MD
San Jose		Surface	Surface		Top Target Coal		3,782	3,892
Nacimiento		1,942	1,942		Bottom Target Coal		3,792	
Ojo Alamo		3,172	3,172		Base Coal		3,807	
Kirtland		3,287	3,287		Picture Cliffs		3,807	
Fruitland		3,667	3,679		Lewis		4,132	
Top Coal		3,782	3,892		TD		3,782	6,772

- **NOTE:** Well will be vertically drilled to 100' into Lewis with core across coal interval, logged through the Lewis, 7" csg will be run with shoe 100' into Lewis. Cased hole whipstock will be set at KOP (300' above top of target coal). Well will be geosteered in lateral. ✓
- B. LOGGING PROGRAM:** HRI/Temp/SDL/DSN from pilot hole TD to surface csg. MWD Gamma Ray in curve and lateral.
- C. CORING PROGRAM:** Whole core will be taken across expected coal interval in Fruitland Formation. ✓
- D. NATURAL GAUGES:** Gauge any noticeable increases in gas flow. Record all gauges in Tour book and on morning reports.
- E. MUD LOGGING PROGRAM:** Mud logger will be on location from 500' above Ojo Alamo to TD of intermediate casing. Then from mill out of intermediate casing to TD.

II. DRILLING

- A. MUD PROGRAM:** Clear water with benex to 7" casing point. Convert to a LSND mud to log and run pipe. Treat for lost circulation as necessary. Obtain 100% returns prior to cementing. Notify Engineering of any mud losses. If coal is detected before 3,782', **DO NOT** drill deeper until Engineering and Geology are contacted.

B. **DRILLING FLUID:** Horizontal section will be drilled with produced water. ✓

C. **BOP TESTING:** While drill pipe is in use, the pipe rams and the blind rams will be function tested once each trip. The anticipated reservoir is expected to be less than 1300 psi, so the BOPE will be tested to **250 psi (Low) for 5 minutes** and **1500 psi (High) for 10 minutes**. Utilize a BOPE Testing Unit with a recording chart and appropriate test plug for testing. The drum brakes will be inspected and tested each tour. **All tests and inspections will be recorded in the tour book as to time and results.**

III. **MATERIALS**

A. **CASING PROGRAM:**

<u>CASING TYPE</u>	<u>HOLE SIZE</u>	<u>DEPTH (MD)</u>	<u>CASING SIZE</u>	<u>WT. & GRADE</u>
Surface	12-1/4"	+/- 300'	9-5/8"	36# K-55
Intermediate	8-3/4"	+/- 4,232'	7"	20# K-55
Prod. Liner	6-1/4"	+/- 3,485' - 6,768'	4-1/2"	10.5# K-55

Note: Intermediate casing is set 100' into Lewis Shale in the pilot hole. Production liner is 4-1/2" 10.5# Pre-perforated K-55 and the liner will be set with liner hanger 5-10' outside of the window.

B. **FLOAT EQUIPMENT:**

1. **SURFACE CASING:** 9-5/8" notched regular pattern guide shoe. Run (1) standard centralizer on each of the bottom (4) joints of Surface Casing.
2. **INTERMEDIATE CASING:** 7" cement nose guide shoe with a self-fill insert float. Place float collar one joint above the shoe. Install (1) Turbulent centralizer on each of the bottom (3) joints and one standard centralizer every (3) joints to 2,500 ft. Run (1) Turbulent centralizer at 2,700 ft., 2,500 ft., 2,300ft., 2,000ft., 1,500 ft., and 1,000 ft. (**NTL-FRA 90-1**).
3. **PRODUCTION LINER / CASING:** No centralization

C. **CEMENTING:**

(Note: Volumes may be adjusted onsite due to actual conditions)

1. **SURFACE:** Slurry: 290sx (521 cu.ft.) of "Type III" + 2% Cal-Seal 60 + ¼ # of poly-e-flake/sk + 0.3% Versaset + 2% Econolite + 6% Salt (Yield = 1.796 cu.ft./sk, Weight = 13.5 #/gal.). The 100% excess should circulate cement to the surface. WOC 12 hours. Test csg to 1500psi. **30 minutes**
2. **INTERMEDIATE:** Lead - 550 sx (1498 cu.ft.) of "EXTENDACEM" + 5 #/sk pheno-seal + 5% Cal-Seal 60 (Yield = 2.723 cu.ft./sk, Weight = 11.5 #/gal.). Tail - 100 sx (117.8cu.ft.) of Premium cement + 0.125 #/sk Poly-E-Flake, (Yield = 1.178 cu.ft./sk, Weight = 15.6#/gal.). Total volume = 1615 cu.ft. Bump Plug to 1,500 psi. Notify engineering if cement is not circulated to surface
3. **PRODUCTION LINER:** Open hole completion. No cement. ✓

IV. **COMPLETION**

A. **PRESSURE TEST**

1. Pressure test 7" casing to 3300# for 15 minutes. **Minimum 1500 psi / 30 min**

B. STIMULATION

1. No stimulation

C. RUNNING TUBING

1. Fruitland Coal: Run 2-7/8", 6.5#, J-55, EUE tubing with a SN on top of bottom joint. Land tubing approximately 50' above PBTD of 7" casing.

Brian Alleman
Drilling Engineer II



Williams Production

Rio Arriba County

Schalk 32

#1A

ST01

Plan: Plan #3 ✓

Pathfinder X & Y Planning Report

05 April, 2011

PATHFINDER

A Schlumberger Company



Pathfinder

Pathfinder X & Y Planning Report



A Schlumberger Company

Company: Williams Production
Project: Rio Arriba County
Site: Schalk 32
Well: #1A
Wellbore: ST01
Design: Plan #3

Local Co-ordinate Reference:
TVD Reference:
MD Reference:
North Reference:
Survey Calculation Method:
Database:

Well #1A
RKB-12' @ 6990.00usft (Aztec 781)
RKB-12' @ 6990.00usft (Aztec 781)
True
Minimum Curvature
EDM 5000.1 Single User Db

Project: Rio Arriba County

Map System: US State Plane 1927 (Exact solution)
Geo Datum: NAD 1927 (NADCON CONUS)
Map Zone: New Mexico Central 3002

System Datum:

Mean Sea Level

Site: Schalk 32

Site Position:
From: Lat/Long
Position Uncertainty: 0.00 usft

Northings: 2,133,165.994 usft
Eastings: 197,376.032 usft
Slot Radius: 13-3/16 "
Latitude: 36° 51' 28.692 N
Longitude: 107° 17' 3.876 W
Grid Convergence: -0.62°

Well: #1A

Well Position
+N/-S 0.00 usft
+E/-W 0.00 usft
Position Uncertainty 0.00 usft

Northings: 2,133,165.994 usft
Eastings: 197,376.032 usft
Wellhead Elevation: usft
Latitude: 36° 51' 28.692 N
Longitude: 107° 17' 3.876 W
Ground Level: 6,978.00 usft

Wellbore: ST01

Magnetics
Model Name
Sample Date
IGRF200510 04/01/11

Declination (°) 9.71
Dip Angle (°) 63.68
Field Strength (nT) 50,917

Design: Plan #3

Audit Notes:

Version: Phase: PLAN

Depth From (TVD) (usft) 0.00
Tie On Depth: 0.00

Vertical Section:
From (usft) To (usft) Survey (Wellbore)
0.00 6,772.11 Plan #3 (ST01)

+N/-S (usft) 0.00
+E/-W (usft) 0.00
Direction (°) 86.91

Survey Tool Program Date 04/05/11

From (usft) To (usft) Survey (Wellbore) Description
0.00 6,772.11 Plan #3 (ST01) MWD MWD - Standard



Pathfinder
Pathfinder X & Y Planning Report



Company: Williams Production
Project: Rio Arriba County
Site: Schalk 32
Well: #1A
Wellbore: ST01
Design: Plan #3

Local Co-ordinate Reference:
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RKB-12' @ 6990.00usft (Aztec 781)
RKB-12' @ 6990.00usft (Aztec 781)
True
Minimum Curvature
EDM 5000.1 Single User Db

Planned Survey

MD (usft)	Inc (°)	Azi (°)	TVD (usft)	TVDSS (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	D Leg (°/100usft)	Northing (usft)	Easting (usft)
0.00	0.00	0.00	0.00	6,990.00	0.00	0.00	0.00	0.00	2,133,165.99	197,376.03
100.00	0.00	0.00	100.00	6,890.00	0.00	0.00	0.00	0.00	2,133,165.99	197,376.03
200.00	0.00	0.00	200.00	6,790.00	0.00	0.00	0.00	0.00	2,133,165.99	197,376.03
300.00	0.00	0.00	300.00	6,690.00	0.00	0.00	0.00	0.00	2,133,165.99	197,376.03
400.00	0.00	0.00	400.00	6,590.00	0.00	0.00	0.00	0.00	2,133,165.99	197,376.03
500.00	0.00	0.00	500.00	6,490.00	0.00	0.00	0.00	0.00	2,133,165.99	197,376.03
600.00	0.00	0.00	600.00	6,390.00	0.00	0.00	0.00	0.00	2,133,165.99	197,376.03
700.00	0.00	0.00	700.00	6,290.00	0.00	0.00	0.00	0.00	2,133,165.99	197,376.03
800.00	0.00	0.00	800.00	6,190.00	0.00	0.00	0.00	0.00	2,133,165.99	197,376.03
900.00	0.00	0.00	900.00	6,090.00	0.00	0.00	0.00	0.00	2,133,165.99	197,376.03
1,000.00	0.00	0.00	1,000.00	5,990.00	0.00	0.00	0.00	0.00	2,133,165.99	197,376.03
1,100.00	0.00	0.00	1,100.00	5,890.00	0.00	0.00	0.00	0.00	2,133,165.99	197,376.03
1,200.00	0.00	0.00	1,200.00	5,790.00	0.00	0.00	0.00	0.00	2,133,165.99	197,376.03
1,300.00	0.00	0.00	1,300.00	5,690.00	0.00	0.00	0.00	0.00	2,133,165.99	197,376.03
1,400.00	0.00	0.00	1,400.00	5,590.00	0.00	0.00	0.00	0.00	2,133,165.99	197,376.03
1,500.00	0.00	0.00	1,500.00	5,490.00	0.00	0.00	0.00	0.00	2,133,165.99	197,376.03
1,600.00	0.00	0.00	1,600.00	5,390.00	0.00	0.00	0.00	0.00	2,133,165.99	197,376.03
1,700.00	0.00	0.00	1,700.00	5,290.00	0.00	0.00	0.00	0.00	2,133,165.99	197,376.03
1,800.00	0.00	0.00	1,800.00	5,190.00	0.00	0.00	0.00	0.00	2,133,165.99	197,376.03
1,900.00	0.00	0.00	1,900.00	5,090.00	0.00	0.00	0.00	0.00	2,133,165.99	197,376.03
1,942.00	0.00	0.00	1,942.00	5,048.00	0.00	0.00	0.00	0.00	2,133,165.99	197,376.03
Nacimiento										
2,000.00	0.00	0.00	2,000.00	4,990.00	0.00	0.00	0.00	0.00	2,133,165.99	197,376.03
2,100.00	0.00	0.00	2,100.00	4,890.00	0.00	0.00	0.00	0.00	2,133,165.99	197,376.03
2,200.00	0.00	0.00	2,200.00	4,790.00	0.00	0.00	0.00	0.00	2,133,165.99	197,376.03
2,300.00	0.00	0.00	2,300.00	4,690.00	0.00	0.00	0.00	0.00	2,133,165.99	197,376.03
2,400.00	0.00	0.00	2,400.00	4,590.00	0.00	0.00	0.00	0.00	2,133,165.99	197,376.03



Pathfinder

Pathfinder X & Y Planning Report



A Schlumberger Company

Company: Williams Production
Project: Rio Arriba County
Site: Schalk 32
Well: #1A
Wellbore: ST01
Design: Plan #3

Local Co-ordinate Reference:
TVD Reference:
MD Reference:
North Reference:
Survey Calculation Method:
Database:

Well #1A
RKB-12' @ 6990.00usft (Aztec 781)
RKB-12' @ 6990.00usft (Aztec 781)
True
Minimum Curvature
EDM 5000.1 Single User Db

Planned Survey

MD (usft)	Inc (°)	Azi (°)	TVD (usft)	TVDSS (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	D Leg (°/100usft)	Northing (usft)	Easting (usft)
2,500.00	0.00	0.00	2,500.00	4,490.00	0.00	0.00	0.00	0.00	2,133,165.99	197,376.03
2,600.00	0.00	0.00	2,600.00	4,390.00	0.00	0.00	0.00	0.00	2,133,165.99	197,376.03
2,700.00	0.00	0.00	2,700.00	4,290.00	0.00	0.00	0.00	0.00	2,133,165.99	197,376.03
2,800.00	0.00	0.00	2,800.00	4,190.00	0.00	0.00	0.00	0.00	2,133,165.99	197,376.03
2,900.00	0.00	0.00	2,900.00	4,090.00	0.00	0.00	0.00	0.00	2,133,165.99	197,376.03
3,000.00	0.00	0.00	3,000.00	3,990.00	0.00	0.00	0.00	0.00	2,133,165.99	197,376.03
3,100.00	0.00	0.00	3,100.00	3,890.00	0.00	0.00	0.00	0.00	2,133,165.99	197,376.03
3,172.00	0.00	0.00	3,172.00	3,818.00	0.00	0.00	0.00	0.00	2,133,165.99	197,376.03
Ojo Alamo										
3,200.00	0.00	0.00	3,200.00	3,790.00	0.00	0.00	0.00	0.00	2,133,165.99	197,376.03
3,287.00	0.00	0.00	3,287.00	3,703.00	0.00	0.00	0.00	0.00	2,133,165.99	197,376.03
Kirtland										
3,300.00	0.00	0.00	3,300.00	3,690.00	0.00	0.00	0.00	0.00	2,133,165.99	197,376.03
3,400.00	0.00	0.00	3,400.00	3,590.00	0.00	0.00	0.00	0.00	2,133,165.99	197,376.03
3,488.50	0.00	0.00	3,488.50	3,501.50	0.00	0.00	0.00	0.00	2,133,165.99	197,376.03
KOP-3488.50°MD,0.00°INC,0.00°AZI,3488.50°TVD										
3,500.00	2.19	86.91	3,500.00	3,490.00	0.01	0.22	0.22	19.00	2,133,166.00	197,376.25
3,525.00	6.94	86.91	3,524.91	3,465.09	0.12	2.20	2.21	19.00	2,133,166.09	197,378.24
3,550.00	11.69	86.91	3,549.57	3,440.43	0.34	6.24	6.25	19.00	2,133,166.26	197,382.28
3,575.00	16.44	86.91	3,573.82	3,416.18	0.66	12.31	12.32	19.00	2,133,166.52	197,388.34
3,600.00	21.19	86.91	3,597.48	3,392.52	1.10	20.35	20.38	19.00	2,133,166.87	197,396.40
3,625.00	25.94	86.91	3,620.38	3,369.62	1.64	30.33	30.38	19.00	2,133,167.30	197,406.38
3,650.00	30.69	86.91	3,642.39	3,347.61	2.28	42.17	42.23	19.00	2,133,167.81	197,418.22
3,675.00	35.44	86.91	3,663.33	3,326.67	3.01	55.78	55.87	19.00	2,133,168.40	197,431.85
3,679.53	36.30	86.91	3,667.00	3,323.00	3.15	58.43	58.52	19.00	2,133,168.52	197,434.50
Fruitland										
3,700.00	40.19	86.91	3,683.08	3,306.92	3.84	71.09	71.19	19.00	2,133,169.06	197,447.16
3,725.00	44.94	86.91	3,701.48	3,288.52	4.75	87.97	88.10	19.00	2,133,169.79	197,464.05



Pathfinder
Pathfinder X & Y Planning Report



Company: Williams Production
Project: Rio Arriba County
Site: Schalk 32
Well: #1A
Wellbore: ST01
Design: Plan #3

Local Co-ordinate Reference:
TVD Reference:
MD Reference:
North Reference:
Survey Calculation Method:
Database:

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RKB-12' @ 6990.00usft (Aztec 781)
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Planned Survey

MD (usft)	Inc (°)	Azi (°)	TVD (usft)	TVDSS (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	D Leg (°/100usft)	Northing (usft)	Easting (usft)
3,750.00	49.69	86.91	3,718.43	3,271.57	5.74	106.32	106.47	19.00	2,133,170.58	197,482.40
3,775.00	54.45	86.91	3,733.79	3,256.21	6.80	126.00	126.18	19.00	2,133,171.43	197,502.10
3,800.00	59.20	86.91	3,747.47	3,242.53	7.93	146.89	147.10	19.00	2,133,172.33	197,523.00
3,825.00	63.95	86.91	3,759.36	3,230.64	9.11	168.83	169.08	19.00	2,133,173.28	197,544.96
3,850.00	68.70	86.91	3,769.40	3,220.60	10.35	191.69	191.97	19.00	2,133,174.27	197,567.82
3,875.00	73.45	86.91	3,777.51	3,212.49	11.62	215.30	215.61	19.00	2,133,175.28	197,591.44
3,892.49	76.77	86.91	3,782.00	3,208.00	12.53	232.17	232.51	19.00	2,133,176.01	197,608.32
Top Coal										
3,900.00	78.20	86.91	3,783.63	3,206.37	12.93	239.49	239.84	19.00	2,133,176.33	197,615.65
3,925.00	82.95	86.91	3,787.72	3,202.28	14.26	264.11	264.50	19.00	2,133,177.39	197,640.28
3,950.00	87.70	86.91	3,789.76	3,200.24	15.60	288.99	289.41	19.00	2,133,178.46	197,665.17
3,962.10	90.00	86.91	3,790.00	3,200.00	16.25	301.06	301.50	19.00	2,133,178.98	197,677.25
EOC-3962.10°MD,90.00°INC,86.91°AZI,3790.00°TVD										
4,000.00	90.00	86.91	3,790.00	3,200.00	18.30	338.91	339.40	0.00	2,133,180.62	197,715.12
4,100.00	90.00	86.91	3,790.00	3,200.00	23.69	438.77	439.40	0.00	2,133,184.93	197,815.03
4,200.00	90.00	86.91	3,790.00	3,200.00	29.08	538.62	539.40	0.00	2,133,189.23	197,914.94
4,300.00	90.00	86.91	3,790.00	3,200.00	34.47	638.48	639.40	0.00	2,133,193.54	198,014.84
4,400.00	90.00	86.91	3,790.00	3,200.00	39.86	738.33	739.40	0.00	2,133,197.85	198,114.75
4,500.00	90.00	86.91	3,790.00	3,200.00	45.25	838.18	839.40	0.00	2,133,202.16	198,214.66
4,600.00	90.00	86.91	3,790.00	3,200.00	50.64	938.04	939.40	0.00	2,133,206.47	198,314.56
4,700.00	90.00	86.91	3,790.00	3,200.00	56.03	1,037.89	1,039.40	0.00	2,133,210.78	198,414.47
4,800.00	90.00	86.91	3,790.00	3,200.00	61.42	1,137.75	1,139.40	0.00	2,133,215.09	198,514.38
4,900.00	90.00	86.91	3,790.00	3,200.00	66.81	1,237.60	1,239.40	0.00	2,133,219.40	198,614.29
5,000.00	90.00	86.91	3,790.00	3,200.00	72.20	1,337.46	1,339.40	0.00	2,133,223.70	198,714.19
5,100.00	90.00	86.91	3,790.00	3,200.00	77.59	1,437.31	1,439.40	0.00	2,133,228.01	198,814.10
5,200.00	90.00	86.91	3,790.00	3,200.00	82.98	1,537.17	1,539.40	0.00	2,133,232.32	198,914.01
5,300.00	90.00	86.91	3,790.00	3,200.00	88.37	1,637.02	1,639.40	0.00	2,133,236.63	199,013.91



Pathfinder
Pathfinder X & Y Planning Report



Company: Williams Production
Project: Rio Arriba County
Site: Schalk 32
Well: #1A
Wellbore: ST01
Design: Plan #3

Local Co-ordinate Reference:
TVD Reference: RKB-12' @ 6990.00usft (Aztec 781)
MD Reference: RKB-12' @ 6990.00usft (Aztec 781)
North Reference: True
Survey Calculation Method: Minimum Curvature
Database: EDM 5000.1 Single User Db

Well #1A

Planned Survey

MD (usft)	Inc (°)	Azi (°)	TVD (usft)	TVDSS (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)	Northing (usft)	Easting (usft)
5,400.00	90.00	86.91	3,790.00	3,200.00	93.76	1,736.88	1,739.40	0.00	2,133,240.94	199,113.82
5,500.00	90.00	86.91	3,790.00	3,200.00	99.15	1,836.73	1,839.40	0.00	2,133,245.25	199,213.73
5,600.00	90.00	86.91	3,790.00	3,200.00	104.54	1,936.59	1,939.40	0.00	2,133,249.56	199,313.64
5,700.00	90.00	86.91	3,790.00	3,200.00	109.93	2,036.44	2,039.40	0.00	2,133,253.86	199,413.54
5,800.00	90.00	86.91	3,790.00	3,200.00	115.32	2,136.29	2,139.40	0.00	2,133,258.17	199,513.45
5,900.00	90.00	86.91	3,790.00	3,200.00	120.71	2,236.15	2,239.40	0.00	2,133,262.48	199,613.36
6,000.00	90.00	86.91	3,790.00	3,200.00	126.10	2,336.00	2,339.40	0.00	2,133,266.79	199,713.26
6,100.00	90.00	86.91	3,790.00	3,200.00	131.49	2,435.86	2,439.40	0.00	2,133,271.10	199,813.17
6,200.00	90.00	86.91	3,790.00	3,200.00	136.89	2,535.71	2,539.40	0.00	2,133,275.41	199,913.08
6,300.00	90.00	86.91	3,790.00	3,200.00	142.28	2,635.57	2,639.40	0.00	2,133,279.72	200,012.99
6,400.00	90.00	86.91	3,790.00	3,200.00	147.67	2,735.42	2,739.40	0.00	2,133,284.03	200,112.89
6,500.00	90.00	86.91	3,790.00	3,200.00	153.06	2,835.28	2,839.40	0.00	2,133,288.33	200,212.80
6,600.00	90.00	86.91	3,790.00	3,200.00	158.45	2,935.13	2,939.40	0.00	2,133,292.64	200,312.71
6,700.00	90.00	86.91	3,790.00	3,200.00	163.84	3,034.99	3,039.40	0.00	2,133,296.95	200,412.61
6,772.33	90.00	86.91	3,790.00	3,200.00	167.74	3,107.21	3,111.73	0.00	2,133,300.07	200,484.87

TD at 6772.33

Formations

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Direction (°)
3,172.00	3,172.00	Ojo Alamo		0.00	
3,287.00	3,287.00	Kirtland		0.00	
3,679.53	3,667.00	Fruitland		0.00	
3,892.49	3,782.00	Top Coal		0.00	
1,942.00	1,942.00	Nacimiento		0.00	



Pathfinder
Pathfinder X & Y Planning Report



Company: Williams Production
Project: Rio Arriba County
Site: Schalk 32
Well: #1A
Wellbore: ST01
Design: Plan #3

Local Co-ordinate Reference: Well #1A
TVD Reference: RKB-12' @ 6990.00usft (Aztec 781)
MD Reference: RKB-12' @ 6990.00usft (Aztec 781)
North Reference: True
Survey Calculation Method: Minimum Curvature
Database: EDM 5000.1 Single User Db

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	+E/-W (usft)	Comment
3,488.50	3,488.50	0.00	0.00	KOP-3488.50'MD,0.00°INC,0.00°AZI,3488.50'TVD
3,962.10	3,790.00	16.25	301.06	EOC-3962.10'MD,90.00°INC,86.91°AZI,3790.00'TVD
6,772.33	3,790.00	167.74	3,107.21	TD at 6772.33

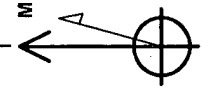
Checked By: _____

Approved By: _____

Date: _____



Project: Rio Arriba County
Site: Schalk 32
Well: #1A
Wellbore: ST01
Plan: Plan #3 (#1A/ST01)



Azimuths to True North
Magnetic North: 9.71°
Magnetic Field
Strength: 50916.9snT
Dip Angle: 63.68°
Date: 04/01/2011
Model: IGRF200510

PROJECT DETAILS: Rio Arriba County
Geodetic System: US State Plane 1927 (Exact solution)
Datum: NAD 1927 (NADCON CONUS)
Elevation: Clark 1966
Zone: New Mexico Central 3002
System Datum: Mean Sea Level
Local North: True

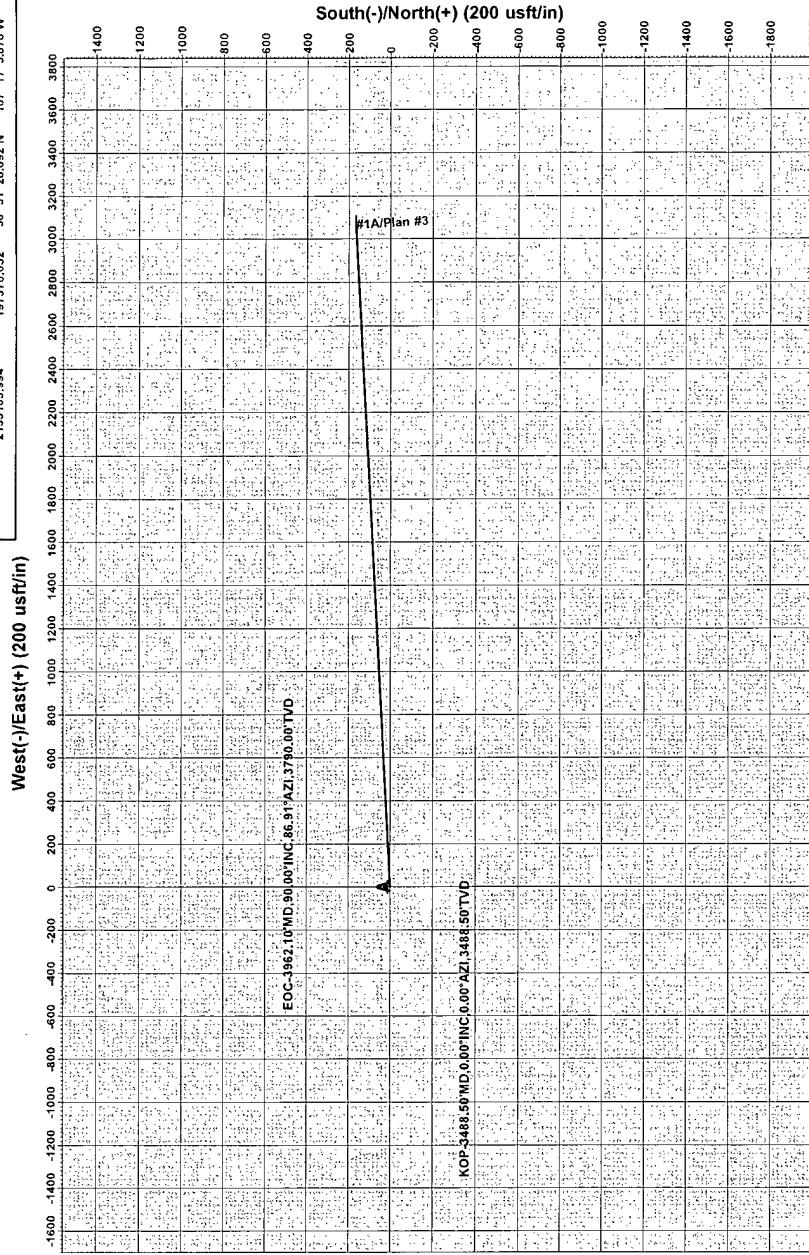
PATHFINDER
A Schlumberger Company

SECTION DETAILS									
Sec	MD	Inc	Azi	TVD	+NLS	+EAW	Diag	TFace	Vsect Target
23488.50	0.00	0.00	0.00	3488.50	0.00	0.00	0.00	0.00	0.00
33962.10	90.00	86.91	3790.00	86.91	301.06	19.00	86.91	301.50	0.00
48772.33	90.00	86.91	3790.00	157.74	3107.21	0.00	0.00	3111.73	BHL (Schalk32#1A)

WELL DETAILS: #1A

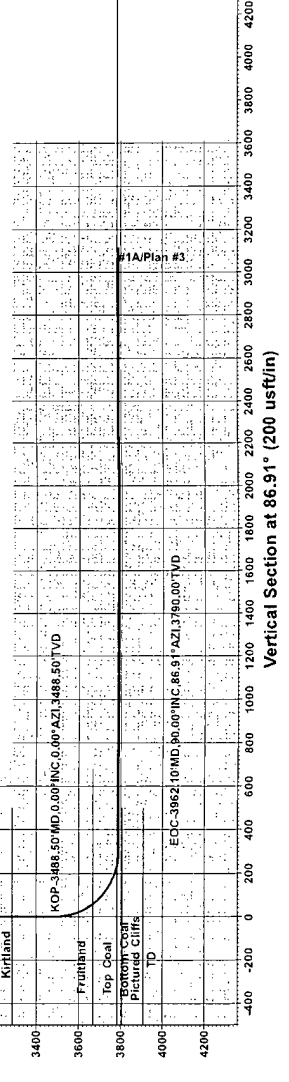
Ground Elevation: 6978.00
RMS Elevation: RKB-12 @ 6990.00usft (Aztec 781)
Rig Name: Aztec 781

Northing 2133165.994
Easting 197376.032
Latitude 36° 51' 28.692 N
Longitude 107° 17' 3.875 W



West(-)/East(+) (200 usft/in)

South(-)/North(+) (200 usft/in)



Vertical Section at 86.91° (200 usft/in)

LEGEND

◆ Plan #3

Plan: Plan #3 (#1A/ST01)

Created By: Nate Bingham Date: 14:33, April 05 2011