

API NO. 45 - 051 - 21149  
WELL NAME: Columbia Natural Resources (21613)  
DATE 2-20-91

01-426

Virginia Oil and Gas Inspector  
P. O. Box 1416  
Abingdon, VA 24210  
703 628-8115

REPORT OF COMPLETION OF WELL WORK

Pursuant to Regulation 4.06 of the Regulations under the Virginia Oil and Gas Act, the undersigned well operator reports completion of the type(s) of well work specified below on the referenced well in Rock Lick District Dickenson County, Virginia on 13th day, December month, 19 90.

WELL TYPE: Oil \_\_\_ / Gas X / Enhanced Recovery \_\_\_ / Waste Disposal \_\_\_ / If Gas-Production X / Underground Storage \_\_\_ / Exempt by Code Section 45.1-300.B.1. from general Oil and Gas Conservation Law yes \_\_\_ / no \_\_\_ /  
WELL WORK: Drill X / Deepen \_\_\_ / Redrill \_\_\_ / Stimulate X / Plug Off Old Formation \_\_\_ / Perforate New Formation \_\_\_ / Plug \_\_\_ / Replug \_\_\_ / Other physical change in well (specify) \_\_\_\_\_

The well work was done as shown in the Appendix(es) applicable to the type(s) of well work involved.

CONFIDENTIALITY STATUS UNDER CODE OF VIRGINIA SECTION 45.1-332

X Ninety days from the filing of this report

OR

Two years from \_\_\_\_\_, the date on which the referenced well was completed, the well being an exploratory well as defined in Code of Virginia, Section 45.1-288.21.

APPLICANT Columbia Natural Resources

BY *Joseph L. Campbell*

ITS Vice-President

ADDRESS P. O. Box 6070; Charleston, WV 25362-0070

TELEPHONE (304) 353-5000



COMPLETION REPORT

WELL TYPE: Oil ( ) Gas Production (X) Gas-Underground Storage ( ) Enhanced Recovery ( ) Waste Disposal ( )

LOCATION

COUNTY Dickenson DISTRICT Rock Lick  
SURFACE ELEVATION 1841.35 QUADRANGLE Haysi  
LATITUDE 6000 'S 37 15 ' 00 " LONGITUDE 4200 'S 82 15 ' 00 "

DRILLING DATA

DATE DRILLING COMMENCED 11-1-90 DRILLING CONTRACTOR Great Western Drilling Inc.  
DATE DRILLING COMPLETED 11-12-90 ADDRESS 600 Commerce Sq.; Charleston, WV 25301  
DATE WELL COMPLETED 12-13-90 TELEPHONE NUMBER 304/344-8393  
TOTAL DEPTH OF COMPLETED WELL 5722' RIG TYPE X ROTARY \_\_\_\_\_ CABLE TOOL \_\_\_\_\_

GEOLOGICAL DATA

FRESH WATER AT (1) 284 FEET < .5 GPM: (2) 339 FEET < .5 GPM  
SALT WATER AT (1) \_\_\_\_\_ FEET \_\_\_\_\_ GPM: (2) \_\_\_\_\_ FEET \_\_\_\_\_ GPM

COAL BEAMS:

NAME	TOP	BOTTOM	THICKNESS	MINING IN AREA		MINED OUT
				YES	NO	
N/A	135	137	2'		X	
N/A	337	339	2'		X	
N/A	448	454	6'		X	

OIL AND GAS SHOWS:

FORMATION	TOP	BOTTOM	THICKNESS	IPF (MCFD/BOPD)	PRESSURE	HOURS TESTED
No Shows						

STIMULATION RECORD

ZONE (1) Shale FORMATION STIMULATED WITH 2,000,000 scf Nitrogen  
PERFORATED 5414 TO 5617 NO. OF PERFORATIONS 18 PERFORATION SIZE .39  
FORMATION BROKE DOWN AT 3544 PSIG AVERAGE INJECTED RATE 75,980 scfm BPP  
INITIAL SHUT IN PRESSURE 2187 PSIG 15 MINUTE SHUT IN PRESSURE 1729 PSIG

STIMULATION RECORD

ZONE (2) Berea FORMATION STIMULATED WITH 543,000 scf nitrogen; 71,200# 20/40 sand; 786 foamed bbls sand laden fluid.  
PERFORATED 4618 TO 4670 NO. OF PERFORATIONS 15 PERFORATION SIZE .39  
FORMATION BROKE DOWN AT 1500 PSIG AVERAGE INJECTED RATE 48 BPP  
INITIAL SHUT IN PRESSURE 1700 PSIG 15 MINUTE SHUT IN PRESSURE 1200 PSIG

FINAL PRODUCTION: ( ) NATURAL (X) AFTER STIMULATION

ZONE	FORMATION	BOP	MCFD	HOURS TESTED	ROCK PRESSURE	HOURS TESTED
ZONE (1)	<u>Shale</u>		<u>189</u>	<u>96</u>	<u>575</u>	<u>96</u>
ZONE (2)	<u>Berea</u>		<u>260</u>	<u>72</u>	<u>650</u>	<u>96</u>
FINAL PRODUCTION IF GAS ZONES ARE COMINGLED _____ MCFD _____ HOURS TESTED _____ PSIG _____ HOURS TESTED						

CASING AND TUBING

	SIZE	TOP	BOTTOM	LENGTH	PERFORATIONS	PACKERS OR BRIDGE PLUGS		
					FEET TO FEET	KIND	SIZE	SET AT
<u>CONDUCTOR</u>	16"	0	42	28	-----			
<u>CASING</u> Circulated and Cemented to Surface	8 5/8"	0	2259	2245	----			
<u>WATER PROTECTION</u> (Casing Set According to Section 45.1-334)	8 5/8" Same as above							
<u>COAL PROTECTION</u> (Casing Set According to Section 45.1-334)	8 5/8" Same as above							
<u>OTHER CASING AND</u> Tubing Left In Well	4 1/2"	0	5755	5741	----			
	2 3/8"	0	5036	5022	2 x 4 Packer set at 4988'			
<u>LINERS</u> Remaining in well								
<u>OTHER</u> used and not left								

Is the well underlain by Red Shales  Yes \_\_\_\_\_ No, if Yes, was coal protection string set to Red Shales?  
 Yes \_\_\_\_\_ No

REMARKS: Shut down, fishing jobs, depths and dates, caving, etc.

DRILLER'S LOG

Compiled by \_\_\_\_\_

Geological Age	Formation	General Lithology	Color	Depth		Thickness	Remarks
				Top	Bottom		

(ATTACH DRILLER'S LOG IN THIS FORMAT)

Samples and Cuttings

Will  Will not  be available for examination by a member of the Virginia Division of Mineral Resources  
 Will  Will not  be furnished to the Virginia Division of Mineral Resources upon request  
 Will  Will not  require sacks to be furnished by the Virginia Division of Mineral Resources

Electric Logs and Surveys:

Type of Electric Log(s) Ran: Gamma Ray, Density, Sidewall Neutron, Dual Induction, Temperature

Did log disclose vertical location of a coal seam? Yes  No

Was log made at request of coal owner according to Section 45.1-333.B.1 of the Virginia Code? Yes  No

Note: If a coal seam was located, the part of the survey from the surface through the coal is attached in accordance with Section 45.1-333.B.3 of the Virginia Code

Deviation Surveys:

Deviation surveys were  were not  required under Section 45.1-333.C of the Virginia Code "to the bottom of the lowest published coal seam depth."

Note: If a deviation survey(s) was/were required, the survey results are as follows:

Depth of Survey	Feet/Degree Deviated From True Vertical	Depth of Survey	Feet/Degree Deviated From True Vertical	Depth of Survey	Feet/Degree Deviated From True Vertical
460	3/4	1675	1		
835	2 3/4	1875	1 1/4		
1050	2 3/4	2080	3		
1255	1 1/2				
1458	1 1/4				

A continuous survey was  was not  required, under Section 45.1-333.C of the Virginia Code.

Note: If a continuous survey was required, the survey results are attached.

Changes in the Permitted Well Work:

The well operator did  did not  make any changes(s) in the permitted well work, verbally approved by the Inspector or Assistant Inspector under Regulation 4.03 of the Regulations under the Virginia Oil and Gas Act, for the purpose of insuring successful completion of the well work.

NOTE: The nature and purpose of each such change, if any, is set out below or on additional sheets if such are required.

Confidentiality Status:

Confidentiality status under Section 45.1-332 of the Virginia Code:

The operator requests that information herein and log(s) be kept confidential (after COMPLETION DATE of the well) for a period of

Ninety (90) days  
 two (2) years, if the well is exploratory

Well # 21613

API # 45-051-21149

## DRILLER'S LOG

Compiled By: E. Rothman

Geological Age	Formation	General Lithology	Depth		Thickness	Remarks		
			Top	Bottom				
Pennsylvanian	Lee	Sandstone	0	130	130			
		Shale	130	135	5			
		Coal	135	137	2			
		Sandstone	137	190	53			
		Shale	190	235	45			
		Sandstone	235	265	30			
		Shale	265	400	135	(Damp @ 284')		
		Sandstone & Shale	400	448	48	(Water @ 339')		
		Coal	448	454	6			
		Sandstone & Shale	454	545	91			
		Sandstone	545	570	25			
		Sandstone & Shale	570	800	230			
		Sandstone	800	925	125			
		Coal	925	929	4			
		Sandstone & Shale	929	1290	361			
		Mississippian	Pocahontas/ Salt Sand	Sandstone	1290	1515	225	
				Shale	1515	1610	95	
			Salt Sand	Sandstone	1610	1780	170	
				Sandstone & Shale	1780	1855	75	
			Salt Sand	Sandstone	1855	2135	280	
Hinton	Shale		2135	2685	550			
Maxon	Sandstone		2685	2750	65			
	Sandstone & Shale		2750	2975	225			
Maxon	Sandstone		2975	3040	65			
	Sandstone & Shale		3040	3420	380			
Devonian	Greenbrier/ Big Lime		Limestone & Shale	3420	4010	590		
	Weir		Sandstone & Shale	4010	4150	140		
		Shale	4150	4600	450			
	Berea	Sandstone	4600	4680	80			
		Shale	4680	5420	740			
	Lower Huron	Shale	5420	5620	200			
		Shale	5620	5763	143			

5763 DTD

(FOR OFFICE USE ONLY: API Well No. 45 - -  
State County Permit

Date: REVISED  
NOV. 6, 1987

Operator's  
Well No. 21613 DI-426

VIRGINIA OIL AND GAS INSPECTOR  
DEPARTMENT OF LABOR AND INDUSTRY  
DIVISION OF MINES  
219 Wood Avenue  
Big Stone Gap, Virginia 24219-1799  
Phone 703-523-0335

WELL PLAT

+ Denotes location of well on United States Topographic Maps, scale 1 to 24,000. Latitude and longitude lines are represented by border lines as shown.

This plat is new x / updated X /

This plat is x / is not    / based on a mine coordinate system established for the areas of the well location.

Well operator COLUMBIA NATURAL RESOURCES INC.

Address PO BOX 1273 CHARLESTON WY 25325  
Farm PINE MOUNTAIN OIL AND GAS CO  
Tract            Acres 28.810.83 Lease No. 64340  
Elevation 1957.40'  
Quadrangle HAYSI  
County DICKENSON District NEW SAND LICK  
Registered Engineer x Registration No. 13910  
Certified Land Surveyor            Cert. No.             
File No. 3K110 P 63 Drawing No.             
Date REVISED 11/6/87 Scale 1" = 1000'

Certification of Well Plat

I, the undersigned, hereby certify that this plat is correct to the best of my knowledge and belief, and shows all the information required by law and the regulations of the Virginia Well Review Board.

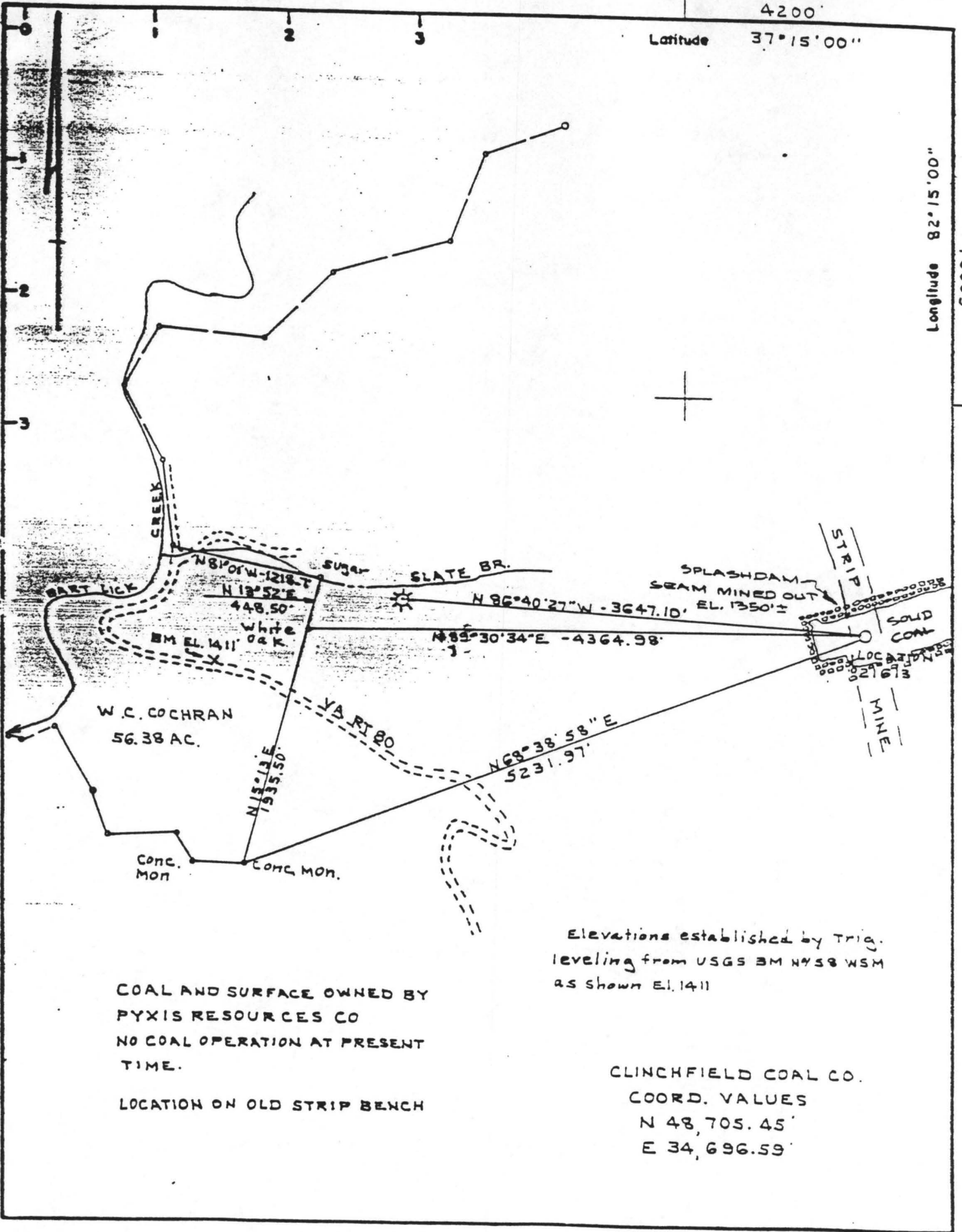
Michael J. Akers Jr.  
Registered Engineer or Certified Land Surveyor  
in Charge

4200'

Latitude 37°15'00"

Longitude 82°15'00"

6000'



W.C. COCHRAN  
56.38 AC.

COAL AND SURFACE OWNED BY  
PYXIS RESOURCES CO  
NO COAL OPERATION AT PRESENT  
TIME.

LOCATION ON OLD STRIP BENCH

Elevations established by Trig.  
leveling from USGS BM 4438 WSM  
as shown El. 1411

CLINCHFIELD COAL CO.

COORD. VALUES

N 48,705.45'

E 34,696.59'