

RECEIVED

JUL 27 1984

SAMPLE SUBMITTED FOR-

C.R.O.G.

CONTROLLED RESOURCES OIL AND GAS CORP  
PO BOX 386  
DUFFIELD VA 24244

WELL NAME & NO.- #102 SAMPLED 7-17-84  
WELL LOCATION- LEE CO VA LOWER URDUVICIAN LIMESTONE FORMATION

THIS ANALYSIS ONLY REFLECTS THE COMPONENTS OF THE  
SAMPLE RECEIVED BY COLUMBIA HYDROCARBON CORP.

COMPONENT	CONC. (MOLE%)
METHANE	85.07
ETHANE	5.67
PROPANE	2.36
I-BUTANE	.36
N-BUTANE	.62
I-PENTANE	.13
N-PENTANE	.16
HEXANES-PLUS	.22
NITROGEN	4.89
CO2	.51

GROSS BTU CONTENT= 1059  
(BTU/SCF, 60 F, 14.73 PSIA, SHT'D)

SPECIFIC GRAVITY= .6563

THIS ANALYSIS WAS RUN AT 14 . 37 O'CLOCK ON 7 / 23 / 84  
IT WAS PERFORMED BY ASTM D-1945 METHOD HI  
COLUMBIA HYDROCARBON CORP. LABORATORY  
PO BOX 575  
SOUTH SHORE KY 41175  
TELEPHONE 606-932-3111



-----Petricia C. Bauer-----  
LABORATORY TECHNICIAN

161

*LE-135*  
*ROSEHILL-7 1/2'*

Date: August 15, 19 84

Operator's Well No. 102



VIRGINIA OIL AND GAS CONSERVATION COMMISSION  
Virginia Oil and Gas Inspector  
Department of Labor and Industry  
Oil and Gas Section  
205 West Main Street  
Abingdon, Virginia 24210  
Phone 703-628-8115

NOTICE OF COMPLETION OF A JURISDICTIONAL WELL

Pursuant to Regulation 2.02 of the Regulations under the Virginia Oil and Gas Act, applicable to "each jurisdictional well completed or recompleted...in a pay zone deeper than 3,000 feet from the surface", the undersigned well operator hereby notifies the Commission of the completion of the referenced well, as completion is defined in Regulation 1.02(4), on March 21, 19 84, in White Shoals District, Lee County, Virginia, as follows:

The completion was to perform all those acts which resulted in the well being capable of producing oil or gas.

The well proved to be incapable of commercial production, and was plugged and abandoned.

The undersigned will also file with the Inspector a Report of Completion of Well Work (Form 18) within the time period provided in Regulation 4.06(a).

Other well operators, if any, who have an interest in the well have been mailed a copy of this Notice. The names and addresses of such other operators are typed below.

n/a

APPLICANT: PENN VIRGINIA RESOURCES CORPORATION

By *W. Kelly*  
Its Vice President-Exploration

Address: P.O. Box 386 Duffield, Virginia 24244

Telephone: 703-431-4131

API Well No. 45 - 105 - 20593  
State County Permit

Date: August 15, 19 84

Operator's  
Well No. 102

VIRGINIA OIL AND GAS CONSERVATION COMMISSION  
Department of Labor and Industry  
Oil and Gas Section  
205 W. Main Street  
Abingdon, Virginia 24210  
Phone 703 628-8115

INITIAL TESTS OF A JURISDICTIONAL WELL

Pursuant to Regulation 2.02(c) of the Regulations under the Virginia Oil and Gas Act, applicable to "each jurisdictional well completed or recompleted...in a pay zone deeper than 3,000 feet from the surface", the undersigned well operator hereby reports to the Commission the initial tests of the referenced well, which was completed on March 21, 19 84, in White Shoals District, Lee County, Virginia.

The results of (i) the initial indicated potential flow test and (ii) the initial gas/oil ratio test are set out on the reverse hereof.

Other well operators, if any, who have an interest in the well have been mailed a copy of this Form 15. The names and addresses of such other operators are typed below.

n/a

APPLICANT: PENN VIRGINIA RESOURCES CORPORATION

By   
Its Vice President-Exploration

Address: P.O. Box 386 Duffield, Virginia 24244

Telephone: 703-431-4131

API Well No. 45 - 105 - 20593  
State County PermitDate: August 15, 19 84Operator's  
Well No. \_\_\_\_\_

VIRGINIA OIL AND GAS INSPECTOR  
DEPARTMENT OF LABOR AND INDUSTRY  
OIL AND GAS SECTION  
205 W. Main Street  
Abingdon, Virginia 24210  
Phone 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 White Shoals District, Lee County, Virginia on the 21st day, March Month, 19 84.

WELL TYPE: Oil \_\_\_ / Gas x / Enhanced recovery \_\_\_ / Waste disposal \_\_\_ /  
If "Gas", Production x / Underground storage \_\_\_ /

Exempt by Code § 45.1-300.B.1 from general oil and gas conservation law: Yes \_\_\_ / No x /

WELL WORK: Drill x / Deepen \_\_\_ / Redrill \_\_\_ / Stimulate x /  
Plug off old formation \_\_\_ / Perforate new formation x /  
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 § 45.1-332:

\_\_\_ Ninety days from the filing of this report,

or

x Two years from March 21, 19 84, the date on which the referenced well was completed, the well being an exploratory well as defined in Code of Virginia § 45.1-288.21.

APPLICANT: Penn Virginia Resources Corporation

By   
Its Vice President - Exploration

Address: P.O. Box 386 Duffield, Virginia 24244

Telephone: 703-431-4131

Date: August 15, 19 84

Operator's  
Well No. 102

REPORT OF COMPLETION OF WELL WORK  
IF DRILLING, REDRILLING OR DEEPENING IS INVOLVED

DRILLING CONTRACTOR Falcon Drilling Corporation

Address: Charleston, West Virginia

Telephone: 304-343-0542

GEOLOGICAL TARGET FORMATION Knox

DEPTH OF COMPLETED WELL 5572 feet

DRILLING RIG Rotary x / Cable tool    /

GEOLOGICAL DATA	Depth		Thickness
	Top	Bottom	

Fresh water:	107'		
	126'		
	700'	1" stream	
<del>700'-785'</del>	785'	2" stream	
	5251'-5411'		

Coal seams:	Name	MINING IN AREA?		
		Yes	No	Mined Out
N/A				

Oil and gas:		Name
Oil:	3875'	Lower Ordovician ls.
	4260'	Lower Ordovician ls.
	4918'	Knox
Gas:	3597-3604'	Lower Ordovician ls.
	3895-3946'	Lower Ordovician ls.

The data on depth of strata is based on the source(s) checked below:

- Applicant's own drilling experience in the area
- Information supplied by the coal operator in the area
- Information already in the possession of the Inspector
- As follows: Drillers Logs
- Wireline Logs

## OTHER GENERAL INFORMATION

An electric log survey was \_\_\_ / was not x / conducted pursuant to Code of Virginia § 45.1-333.B.2, at the coal owner's or operator's request.

An electric log survey was x / was not \_\_\_ / run for other purposes. This survey did \_\_\_ / did not x / disclose the vertical location of a coal seam.

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

Deviation surveys were \_\_\_ / were not x / required under Code of Virginia § 45.1-333.C "to the bottom of the lowest published coal seam depth".

Note: If deviation surveys were required, the survey results are attached.

A continuous survey was \_\_\_ / was not x / required under Code of Virginia § 45.1-333.C.

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

CHANGES IN THE PERMITTED WELL WORK

The well operator did \_\_\_ / did not x / make any change(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.

N/A

CASING AND TUBING PROGRAM

PRELIMINARY INFORMATION

Is the subject well underlaid by the red shales? Yes \_\_\_ / No x /  
If "Yes", was a coal protection string set to the red shales? Yes \_\_\_ / No x /

PROGRAM DETAILS

Size	Top	Bottom	Length	Perforated	
				From	To
<u>Conductor</u>					
13-3/8"	0'	39'	39'	cemented to surface with 26	
<u>Casing circulated and cemented in to the surface:</u>					
8-5/8"	0'	1039'	1039'	cemented with 340 sks.	

Coal protection casing set under the special rule of Code of Virginia § 45.1-334.B:

N/A

Other casing and tubing left in the well:

4 1/2"	0'	5485'	5485'	3597'-3604'	8 holes
				3895'-3946'	15 holes
				4282'-4296'	8 holes
				4477'-5259'	85 holes
				5372'-5411'	8 holes

(see perforation log for details)

Liners left in well, under Code of Virginia § 45.1-336 or otherwise:

N/A

Other casing used in drilling but not left in the well:

N/A

Packers or bridge plugs:

	Kind	Size	Set At
Bridge Plug	Permanent	3.71 O.D.	5240'
Bridge Plug	Permanent	3.71 O.D.	4012'
Bridge Plug	Frac Retainer	3.71 O.D.	3680' (Knocked out after

REMARKS (SHUT DOWN DEPTHS, DATES; FISHING JOB DEPTHS, DATES; CAVING; ETC.) treat

SAMPLES AND CUTTINGS

will x / will not \_\_\_ / be available for examination by a member of the Virginia Geological Survey;  
will x / will not \_\_\_ / be furnished the Virginia Geological Survey upon request;  
will \_\_\_ / will not x / require sacks to be furnished by the Survey.

DRILLER'S LOG

Compiled by William W. Kelly, Jr.

<u>Geologic Age</u>	<u>Formation</u>	<u>General Lithology</u>	<u>Color</u>	<u>Depth (feet)</u>		<u>Thickness</u>	<u>Remarks</u>
				<u>Top</u>	<u>Bottom</u>		
Cambro - Ordovician		Dolomite	Tan	0'	1050'	1050'	Overthrust
	Pine Mt. Fault Zone	Variable		1050'	1057'	7'	
Devonian	Chattanooga	Shale	Dk. Gray	1057'	1074'	17'	
Silurian	Hancock	Dolomite	Tan	1074'	1185'	111'	
	Clinton	Shale	Dk. Gray- Green/Maroon	1185'	1528'	343'	
	Clinch Hagan	Sandstone Shale	White Dk. Gray	1528' 1634'	1634' 1681'	106' 47'	
Ordovician (Upper)	Sequatchie	Calcareous Siltstone	Green/Red	1681'	1971'	290'	
	Reedsville	Shale & Limestone	Dk.-Med. Gray	1971'	2330'	359'	
Ordovician (Middle)	Trenton	Limestone	Med. Gray- Tan	2330'	2888'	558'	
	Eggleston	Limestone	Tan	2888'	3025'	137'	
	Moccasin	Limestone	Med. Gray	3025'	3290'	265'	
	Lowville	Limestone	Med. Gray	3290'	3872'	582'	Gas Pay 3597'-360'
Ordovician (Lower)	Lenoir	Limestone	Med. Gray	3872'	4004'	132'	Gas Pay 3895'-391' Oil Show @ 3875'
	Mosheim	Limestone	Med. Gray	4004'	4124'	120'	
	Murfreesboro	Limestone	Med. Gray- Tan	4124'	4268'	144'	Oil Show @ 4260'
	Knox Group	Dolomite	Tan	4268'	5572' (T.D.)	1304'	Oil Show @ 4918'

(Complete on supplemental sheets as necessary.)



Date August 15, 19 84

Operator's Well No. 102

APPENDIX TO REPORT OF COMPLETION OF WELL WORK  
ON A WELL DRILLED IN SEARCH OF OIL OR GAS

DISCOVERY OF OIL OR INDICATIONS THEREOF

Indicated potential flow before stimulation Show BOD  
Gravity and grade not analyzed

DISCOVERY OF GAS OR INDICATIONS THEREOF

Indicated potential flow before stimulation show MCFD  
Rock pressure: not guaged psig \_\_\_\_\_ hour test

RECORD OF STIMULATION

Full description of stimulation:

Zone 1: \_\_\_\_\_ Formation: (See Attached)

Breakdown \_\_\_\_\_ psig; Avg. Injection \_\_\_\_\_ psig; Avg. Injection Rate \_\_\_\_\_ BPM;  
ISIP \_\_\_\_\_ psig; 15-Min. Shut-In \_\_\_\_\_ psig.

Zone 2: \_\_\_\_\_ Formation: \_\_\_\_\_

Breakdown \_\_\_\_\_ psig; Avg. Injection \_\_\_\_\_ psig; Avg. Injection Rate \_\_\_\_\_ BPM;  
ISIP \_\_\_\_\_ psig; 15-Min. Shut-In \_\_\_\_\_ psig.

Zone 3: \_\_\_\_\_ Formation: \_\_\_\_\_

Breakdown \_\_\_\_\_ psig; Avg. Injection \_\_\_\_\_ psig; Avg. Injection Rate \_\_\_\_\_ BPM;  
ISIP \_\_\_\_\_ psig; 15-Min. Shut-In \_\_\_\_\_ psig.

Final production (check one) (X) after stimulation, ( ) natural.

	BOD	MCFD	Hours Tested	Rock pressure psig.	Hours Tested
Zone 1	<u>0</u>	_____	_____	_____	_____
Zone 2	_____	_____	_____	_____	_____
Zone 3	_____	_____	_____	_____	_____

Final production if gas zones are comingled: 103 MCFD.  
8 hours tested; 730 psig, 86 hours tested.

## COMPLETION SUMMARY - WELL NO. 102

- 12-23-83 Run 2-7/8" tubing, RTTS Packer and Retrievable Bridge Plug to 5430'. Set B.P. @ 5430', pull up hole and set RTTS @ 5358'. Treat perforations @ 5372'-74' 2 holes, 5393'-96' 4 holes, 5409'-11' 2 holes with 500 gallons 28% SGA Acid and 1500 gallons 15% SGA Acid. Breakdown 3400 psi, Average Treatment 2500 psi, A.I.R. 4.5 BPM, I.S.I.P. 1300 psi. RESULTS: No oil or gas seen after clean up, however, large flow of iron sulphide water filled hole to 1500' and would not swab down.
- Latched onto Retrievable Bridge Plug, but could not un-J. Kept pulling off plug on future attempts and could not retrieve. Shut down for rig repairs.
- 2-02-84 Circulate hole clean with Nitrogen, latch onto Bridge Plug and move up hole. Tried repeatedly to re-set but failed.
- 2-04-84 Pulled 2-7/8" tubing out of hole. Change-over nipple had stripped out of RTTS leaving it and Bridge Plug in hole.
- 2-07-84 to Attempted to fish out RTTS and Retrievable Bridge Plug  
2-12-84 but failed. Decided to abandon fish in hole.
- 2-12-84 Set 3.71 O.D. permanent bridge plug @ 5240' to shut off water from lower zone.
- 2-14-84 Run 2-7/8" tubing with RTTS and RBP. Set RBP @ 5214', pull up hole and set RTTS @ 5031'. Attempted to treat perforations at 5049'-59' 6 holes, 5111'-15' 3 holes, 5119'-23' 3 holes, 5174'-78' 3 holes. Pumped 500 gallons 28% Hcl, 1300 gallons 15% Hcl and 12,000 Scf N<sub>2</sub>. Had communication on annulus. Flushed acid out of hole. Presumed hole in tubing above RTTS.
- 2-15-84 Retrieve RBP and pull tools and tubing out of hole. Did have hole in tubing. Shut down waiting on new string of tubing.
- 2-21-84 Make up RTTS and RBP and run in hole on new string of 2-3/8" EUE tubing. Set RBP @ 5201'.
- 2-22-84 Pull up and set RTTS @ 4847'. Attempt to treat zone 4879'-5178' 31 holes. Start pumping acid with N<sub>2</sub> assist and had circulation on annulus. Shut down and move RTTS up hole to 4738'. Start pumping acid with N<sub>2</sub> assist again and had circulation on annulus behind tubing again. Shut down and flowed back. Evidently acid from the earlier job that failed because of a hole in the tubing set in the hole too long before the hole was flushed and damaged the cement behind the 4-1/2" casing. As a result, the perforations were connecting through channels in the cement behind the pipe and allowing circulation around the RTTS.
- 2-23-84 Retrieve RBP and pull tools and tubing out of hole. Release tools.
- 2-27-84 Attempted to swab hole dry and discovered that evidently acid had broken through into the lower zone and water was coming in the hole again. Cemented off lower perforations to 5006' and stopped water.

3-01-84 Run 2-3/8" EUE tubing in hole and set R-4 packer @ 4235'.

3-02-84 Did foamed acid treatment on entire Knox perforated interval - 4282'-4970' 74 holes. Treated with 4000 gallons 20% SGA, 3700 gallons 15% SGA, 485,000 Scf N2 and used 300# TLC-80 as a diverting agent. Breakdown 4200 psi, Average Treatment 4150 psi, A.I.R. 24 BPM foam, I.S.I.P. 2900 psi, 15 min. S.I.P. 2500 psi. After cleanup Knox showed small amount of salt water and no other results.

3-07-84 Set 3.71 O.D. permanent bridge plug in 4-1/2" casing @ 4012'. Perforate Lenoir limestone 3895'-3903' 9 holes, 3909'-12' 4 holes, 3945'-46' 2 holes.

3-08-84 Acidize Lenoir with 500 gallons 28% Hcl, 500 gallons 15% Hcl and 3500 gallons gelled Hcl. Dropped 15 perf. balls. Breakdown 800 psi, Average Treatment 1250 psi, A.I.R. 4.5 BPM, I.S.I.P. 1250 psi, 5 min. S.I.P. 1150 psi. After cleanup, gas gauging 84 Mcf.

3-12-84 Set 3.71 O.D. Frac retainer plug @ 3680' and perforate Lowville limestone 3597'-3604' 8 holes. Acidize with 2000 gallons 15% Hcl. Treated on vacuum, A.I.R. 4 BPM. After cleanup very little gas increase. Knock out retainer plug and commingle Lenoir and Lowville gas zones. Total gas gauging @ 103 Mcf.

API Well No. 45 - 105 - 20593  
State County Permit

*LE-135*  
*ROSEHILL-7 1/2'*

Date: August 15, 19 84

Operator's Well No. 102



VIRGINIA OIL AND GAS CONSERVATION COMMISSION  
Virginia Oil and Gas Inspector  
Department of Labor and Industry  
Oil and Gas Section  
205 West Main Street  
Abingdon, Virginia 24210  
Phone 703-628-8115

NOTICE OF COMPLETION OF A JURISDICTIONAL WELL

Pursuant to Regulation 2.02 of the Regulations under the Virginia Oil and Gas Act, applicable to "each jurisdictional well completed or recompleted...in a pay zone deeper than 3,000 feet from the surface", the undersigned well operator hereby notifies the Commission of the completion of the referenced well, as completion is defined in Regulation 1.02(4), on March 21, 19 84, in White Shoals District, Lee County, Virginia, as follows:

- The completion was to perform all those acts which resulted in the well being capable of producing oil or gas.
- The well proved to be incapable of commercial production, and was plugged and abandoned.

The undersigned will also file with the Inspector a Report of Completion of Well Work (Form 18) within the time period provided in Regulation 4.06(a).

Other well operators, if any, who have an interest in the well have been mailed a copy of this Notice. The names and addresses of such other operators are typed below.

n/a

APPLICANT: PENN VIRGINIA RESOURCES CORPORATION

By *W. W. Kelly*  
Its Vice President-Exploration

Address: P.O. Box 386 Duffield, Virginia 24244

Telephone: 703-431-4131

API Well No. 45 - 105 - 20593  
State County PermitDate: August 15, 19 84Operator's  
Well No. 102

VIRGINIA OIL AND GAS CONSERVATION COMMISSION  
 Department of Labor and Industry  
 Oil and Gas Section  
 205 W. Main Street  
 Abingdon, Virginia 24210  
 Phone 703 628-8115

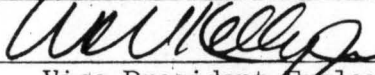
INITIAL TESTS OF A JURISDICTIONAL WELL

Pursuant to Regulation 2.02(c) of the Regulations under the Virginia Oil and Gas Act, applicable to "each jurisdictional well completed or recompleted...in a pay zone deeper than 3,000 feet from the surface", the undersigned well operator hereby reports to the Commission the initial tests of the referenced well, which was completed on March 21, 19 84, in White Shoals District, Lee County, Virginia.

The results of (i) the initial indicated potential flow test and (ii) the initial gas/oil ratio test are set out on the reverse hereof.

Other well operators, if any, who have an interest in the well have been mailed a copy of this Form 15. The names and addresses of such other operators are typed below.

n/a

APPLICANT: PENN VIRGINIA RESOURCES CORPORATIONBy   
Its Vice President, ExplorationAddress: P.O. Box 386 Duffield, Virginia 24244Telephone: 703-431-4131

API Well No. 45 - 105 - 20593  
State County PermitDate: August 15, 19 84Operator's  
Well No. \_\_\_\_\_

VIRGINIA OIL AND GAS INSPECTOR  
DEPARTMENT OF LABOR AND INDUSTRY  
OIL AND GAS SECTION  
205 W. Main Street  
Abingdon, Virginia 24210  
Phone 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 White Shoals District, Lee County, Virginia on the 21st day, March Month, 19 84.

WELL TYPE: Oil \_\_\_ / Gas x / Enhanced recovery \_\_\_ / Waste disposal \_\_\_ /  
If "Gas", Production x / Underground storage \_\_\_ /

Exempt by Code § 45.1-300.B.1 from general oil and gas conservation law: Yes \_\_\_ / No x /

WELL WORK: Drill x / Deepen \_\_\_ / Redrill \_\_\_ / Stimulate x /  
Plug off old formation \_\_\_ / Perforate new formation x /  
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 § 45.1-332:

\_\_\_ Ninety days from the filing of this report,

or

x Two years from March 21, 19 84, the date on which the referenced well was completed, the well being an exploratory well as defined in Code of Virginia § 45.1-288.21.

APPLICANT: Penn Virginia Resources Corporation

By   
Its Vice President - Exploration

Address: P.O. Box 386 Duffield, Virginia 24244

Telephone: 703-431-4131

Date: August 15, 19 84

Operator's  
Well No. 102

REPORT OF COMPLETION OF WELL WORK  
IF DRILLING, REDRILLING OR DEEPENING IS INVOLVED

DRILLING CONTRACTOR Falcon Drilling Corporation

Address: Charleston, West Virginia

Telephone: 304-343-0542

GEOLOGICAL TARGET FORMATION Knox

DEPTH OF COMPLETED WELL 5572 feet

DRILLING RIG Rotary x / Cable tool /

GEOLOGICAL DATA	Depth		Thickness
	Top	Bottom	

Fresh water:	107'		
	126'		
	700'	1" stream	
<del>Salt water</del>	785'	2" stream	
	5251'-5411'		

Coal seams: N/A

Name	MINING IN AREA?		
	Yes	No	Mined Out

		Name
Oil and gas: Oil:	3875'	Lower Ordovician ls.
	4260'	Lower Ordovician ls.
	4918'	Knox
Gas:	3597-3604'	Lower Ordovician ls.
	3895-3946'	Lower Ordovician ls.

The data on depth of strata is based on the source(s) checked below:

- Applicant's own drilling experience in the area
- Information supplied by the coal operator in the area
- Information already in the possession of the Inspector

As follows: Drillers Logs

Wireline Logs

OTHER GENERAL INFORMATION

An electric log survey was \_\_\_/ was not x/ conducted pursuant to Code of Virginia § 45.1-333.B.2, at the coal owner's or operator's request.

An electric log survey was x/ was not \_\_\_/ run for other purposes. This survey did \_\_\_/ did not x/ disclose the vertical location of a coal seam.

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

Deviation surveys were \_\_\_/ were not x/ required under Code of Virginia § 45.1-333.C "to the bottom of the lowest published coal seam depth".

Note: If deviation surveys were required, the survey results are attached.

A continuous survey was \_\_\_/ was not x/ required under Code of Virginia § 45.1-333.C.

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

CHANGES IN THE PERMITTED WELL WORK

The well operator did \_\_\_/ did not x/ make any change(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.

N/A



CASING AND TUBING PROGRAM

PRELIMINARY INFORMATION

Is the subject well underlaid by the red shales? Yes \_\_\_ / No x /  
If "Yes", was a coal protection string set to the red shales? Yes \_\_\_ / No x /

PROGRAM DETAILS

Size	Top	Bottom	Length	Perforated	
				From	To
<u>Conductor</u>					
13-3/8"	0'	39'	39'	cemented to surface with 26	
<u>Casing circulated and cemented in to the surface:</u>					
8-5/8"	0'	1039'	1039'	cemented with 340 sks.	

Coal protection casing set under the special rule of Code of Virginia § 45.1-334.B:

N/A

<u>Other casing and tubing left in the well:</u>			
4 1/2"	0'	5485'	5485'
			3597'-3604' 8 holes
			3895'-3946' 15 holes
			4282'-4296' 8 holes
			4477'-5259' 85 holes
			5372'-5411' 8 holes

(see perforation log for details)

Liners left in well, under Code of Virginia § 45.1-336 or otherwise:

N/A

Other casing used in drilling but not left in the well:

N/A

<u>Packers or bridge plugs:</u>	<u>Kind</u>	<u>Size</u>	<u>Set At</u>
Bridge Plug	Permanent	3.71 O.D.	5240'
Bridge Plug	Permanent	3.71 O.D.	4012'
Bridge Plug	Frac Retainer	3.71 O.D.	3680' (Knocked out after

REMARKS (SHUT DOWN DEPTHS, DATES; FISHING JOB DEPTHS, DATES; CAVING; ETC.) treatm

SAMPLES AND CUTTINGS

will x / will not \_\_\_ / be available for examination by a member of the Virginia Geological Survey;  
will x / will not \_\_\_ / be furnished the Virginia Geological Survey upon request;  
will \_\_\_ / will not x / require sacks to be furnished by the Survey.

DRILLER'S LOG

Compiled by William W. Kelly, Jr.

<u>Geologic Age</u>	<u>Formation</u>	<u>General Lithology</u>	<u>Color</u>	<u>Depth (feet)</u>		<u>Thickness</u>	<u>Remarks</u>
				<u>Top</u>	<u>Bottom</u>		
Cambro - Ordovician		Dolomite	Tan	0'	1050'	1050'	Overthrust
	Pine Mt. Fault Zone	Variable		1050'	1057'	7'	
Devonian	Chattanooga	Shale	Dk.Gray	1057'	1074'	17'	
Silurian	Hancock	Dolomite	Tan	1074'	1185'	111'	
	Clinton	Shale	Dk.Gray- Green/Maroon	1185'	1528'	343'	
	Clinch Hagan	Sandstone Shale	White Dk.Gray	1528' 1634'	1634' 1681'	106' 47'	
Ordovician (Upper)	Sequatchie	Calcareous Siltstone	Green/Red	1681'	1971'	290'	
	Reedsville	Shale & Limestone	Dk.-Med. Gray	1971'	2330'	359'	
Ordovician (Middle)	Trenton	Limestone	Med.Gray- Tan	2330'	2888'	558'	
	Eggleston	Limestone	Tan	2888'	3025'	137'	
	Moccasin	Limestone	Med.Gray	3025'	3290'	265'	
	Lowville	Limestone	Med.Gray	3290'	3872'	582'	Gas Pay 3597'-3604'
Ordovician (Lower)	Lenoir	Limestone	Med.Gray	3872'	4004'	132'	Gas Pay 3895'-3912' Oil Show @ 3875'
	Mosheim	Limestone	Med.Gray	4004'	4124'	120'	
	Murfreesboro	Limestone	Med.Gray- Tan	4124'	4268'	144'	Oil Show @ 4260'
	Knox Group	Dolomite	Tan	4268'	5572'	1304'	Oil Show @ 4918' (T.D.)

(Complete on supplemental sheets as necessary.)

APPENDIX--TYPE D

Date August 15, 1984

Operator's Well No. 102

APPENDIX TO REPORT OF COMPLETION OF WELL WORK  
ON A WELL DRILLED IN SEARCH OF OIL OR GAS

DISCOVERY OF OIL OR INDICATIONS THEREOF

Indicated potential flow before stimulation Show BOD  
Gravity and grade not analyzed

DISCOVERY OF GAS OR INDICATIONS THEREOF

Indicated potential flow before stimulation show MCFD  
Rock pressure: not guaged psig \_\_\_\_\_ hour test

RECORD OF STIMULATION

Full description of stimulation:

Zone 1: \_\_\_\_\_ Formation: (See Attached)

Breakdown \_\_\_\_\_ psig; Avg. Injection \_\_\_\_\_ psig; Avg. Injection Rate \_\_\_\_\_ BPM;  
ISIP \_\_\_\_\_ psig; 15-Min. Shut-In \_\_\_\_\_ psig.

Zone 2: \_\_\_\_\_ Formation: \_\_\_\_\_

Breakdown \_\_\_\_\_ psig; Avg. Injection \_\_\_\_\_ psig; Avg. Injection Rate \_\_\_\_\_ BPM;  
ISIP \_\_\_\_\_ psig; 15-Min. Shut-In \_\_\_\_\_ psig.

Zone 3: \_\_\_\_\_ Formation: \_\_\_\_\_

Breakdown \_\_\_\_\_ psig; Avg. Injection \_\_\_\_\_ psig; Avg. Injection Rate \_\_\_\_\_ BPM;  
ISIP \_\_\_\_\_ psig; 15-Min. Shut-In \_\_\_\_\_ psig.

Final production (check one) (X) after stimulation, ( ) natural.

	BOD	MCFD	Hours Tested	Rock pressure psig.	Hours Tested
Zone 1	<u>0</u>	_____	_____	_____	_____
Zone 2	_____	_____	_____	_____	_____
Zone 3	_____	_____	_____	_____	_____

Final production if gas zones are comingled: 103 MCFD.  
8 hours tested; 730 psig, 86 hours tested.

COMPLETION SUMMARY - WELL NO. 102

- 12-23-83 Run 2-7/8" tubing, RTTS Packer and Retrievable Bridge Plug to 5430'. Set B.P. @ 5430', pull up hole and set RTTS @ 5358'. Treat perforations @ 5372'-74' 2 holes, 5393'-96' 4 holes, 5409'-11' 2 holes with 500 gallons 28% SGA Acid and 1500 gallons 15% SGA Acid. Breakdown 3400 psi, Average Treatment 2500 psi, A.I.R. 4.5 BPM, I.S.I.P. 1300 psi. RESULTS: No oil or gas seen after clean up, however, large flow of iron sulphide water filled hole to 1500' and would not swab down.
- Latched onto Retrievable Bridge Plug, but could not un-J. Kept pulling off plug on future attempts and could not retrieve. Shut down for rig repairs.
- 2-02-84 Circulate hole clean with Nitrogen, latch onto Bridge Plug and move up hole. Tried repeatedly to re-set but failed.
- 2-04-84 Pulled 2-7/8" tubing out of hole. Change-over nipple had stripped out of RTTS leaving it and Bridge Plug in hole.
- 2-07-84 to Attempted to fish out RTTS and Retrievable Bridge Plug  
2-12-84 but failed. Decided to abandon fish in hole.
- 2-12-84 Set 3.71 O.D. permanent bridge plug @ 5240' to shut off water from lower zone.
- 2-14-84 Run 2-7/8" tubing with RTTS and RBP. Set RBP @ 5214', pull up hole and set RTTS @ 5031'. Attempted to treat perforations at 5049'-59' 6 holes, 5111'-15' 3 holes, 5119'-23' 3 holes, 5174'-78' 3 holes. Pumped 500 gallons 28% Hcl, 1300 gallons 15% Hcl and 12,000 Scf N2. Had communication on annulus. Flushed acid out of hole. Presumed hole in tubing above RTTS.
- 2-15-84 Retrieve RBP and pull tools and tubing out of hole. Did have hole in tubing. Shut down waiting on new string of tubing.
- 2-21-84 Make up RTTS and RBP and run in hole on new string of 2-3/8" EUE tubing. Set RBP @ 5201'.
- 2-22-84 Pull up and set RTTS @ 4847'. Attempt to treat zone 4879'-5178' 31 holes. Start pumping acid with N2 assist and had circulation on annulus. Shut down and move RTTS up hole to 4738'. Start pumping acid with N2 assist again and had circulation on annulus behind tubing again. Shut down and flowed back. Evidently acid from the earlier job that failed because of a hole in the tubing set in the hole too long before the hole was flushed and damaged the cement behind the 4-1/2" casing. As a result, the perforations were connecting through channels in the cement behind the pipe and allowing circulation around the RTTS.
- 2-23-84 Retrieve RBP and pull tools and tubing out of hole. Release tools.
- 2-27-84 Attempted to swab hole dry and discovered that evidently acid had broken through into the lower zone and water was coming in the hole again. Cemented off lower perforations to 5006' and stopped water.

3-01-84 Run 2-3/8" EUE tubing in hole and set R-4 packer @ 4235'.

3-02-84 Did foamed acid treatment on entire Knox perforated interval - 4282'-4970' 74 holes. Treated with 4000 gallons 20% SGA, 3700 gallons 15% SGA, 485,000 Scf N<sub>2</sub> and used 300# TLC-80 as a diverting agent. Breakdown 4200 psi, Average Treatment 4150 psi, A.I.R. 24 BPM foam, I.S.I.P. 2900 psi, 15 min. S.I.P. 2500 psi. After cleanup Knox showed small amount of salt water and no other results.

3-07-84 Set 3.71 O.D. permanent bridge plug in 4-1/2" casing @ 4012'. Perforate Lenoir limestone 3895'-3903' 9 holes, 3909'-12' 4 holes, 3945'-46' 2 holes.

3-08-84 Acidize Lenoir with 500 gallons 28% Hcl, 500 gallons 15% Hcl and 3500 gallons gelled Hcl. Dropped 15 perf. balls. Breakdown 800 psi, Average Treatment 1250 psi, A.I.R. 4.5 BPM, I.S.I.P. 1250 psi, 5 min. S.I.P. 1150 psi. After cleanup, gas gauging 84 Mcf.

3-12-84 Set 3.71 O.D. Frac retainer plug @ 3680' and perforate Lowville limestone 3597'-3604' 8 holes. Acidize with 2000 gallons 15% Hcl. Treated on vacuum, A.I.R. 4 BPM. After cleanup very little gas increase. Knock out retainer plug and commingle Lenoir and Lowville gas zones. Total gas gauging @ 103 Mcf.

OK  
API No. 45-105-20593-00-03

VDMR Well

Rep. No. \_\_\_\_\_

DMQ File No. LF-135

Operator PENN VIRGINIA RESOURCES CORPORATION

Farm CHANCE AND MONTGOMERY COAL COMPANY

Co. Well No. 102

County LEE Quadrangle ROSE HILL - 7 1/2'

Location (UTM) N4,060,540; E296,070 UTM Zone 17

(Lat. and Long.) \_\_\_\_\_

Field ROSE HILL Province VALLEY AND RIDGE

Elev. (specify) 1664.5' GR TD 5572' Form. at TD KNOX

Age ORDOVICIAN

Date compl. or abandoned MARCH 21, 1984

Result GAS WELL

Gas Shows \_\_\_\_\_

Gas Pays 3597' TO 3604' 3895' TO 3912'

Main Production \_\_\_\_\_ Prod. Form. LENOIR: LOWVILLE

FINAL FLOW - 103,000 CU. FT.

Age ORDOVICIAN

Treatment: \_\_\_\_\_

Initial Production \_\_\_\_\_

Oil shows 4260'; 4918'; 3875'

Water FW YES at 107'; 126' at 700'; 785' at 5251' TO 5411'

SW \_\_\_\_\_ at \_\_\_\_\_ at \_\_\_\_\_ at \_\_\_\_\_

Coal \_\_\_\_\_

Plat \_\_\_\_\_ Plotted \_\_\_\_\_ Completion Report X

Drillers Log X Geologic Log \_\_\_\_\_

Samples \_\_\_\_\_ Interval Sheet \_\_\_\_\_

Sample Interval \_\_\_\_\_

Remarks \_\_\_\_\_

Geophysical Logs S.P. \_\_\_\_\_ Res \_\_\_\_\_ Gamma \_\_\_\_\_ Neutron \_\_\_\_\_

Density \_\_\_\_\_ Sonic \_\_\_\_\_ Other \_\_\_\_\_

Stratigraphic Data Source WILLIAM W. KELLY, JR.

<u>Formation</u>	<u>Top</u>	<u>Datum (Subsea)</u>	<u>Thickness</u>
<u>CAMBRO-ORDOVICIAN</u>	<u>0</u>	<u>+1664.5</u>	<u>1050</u>
<u>PINE MTN. FAULT</u>	<u>1050</u>	<u>+ 614.5</u>	<u>7</u>
<u>CHATTANOOGA</u>	<u>1057</u>	<u>+ 607.5</u>	<u>17</u>
<u>HANCOCK</u>	<u>1074</u>	<u>+ 590.5</u>	<u>111</u>
<u>CLINTON</u>	<u>1185</u>	<u>+ 479.5</u>	<u>343</u>
<u>CLINCH</u>	<u>1528</u>	<u>+ 136.5</u>	<u>106</u>
<u>HAGAN</u>	<u>1634</u>	<u>+ 30.5</u>	<u>47</u>
<u>SEQUATCHIE</u>	<u>1681</u>	<u>- 16.5</u>	<u>290</u>
<u>REEDSVILLE</u>	<u>1971</u>	<u>- 306.5</u>	<u>359</u>
<u>TRENTON</u>	<u>2330</u>	<u>- 665.5</u>	<u>558</u>
<u>EGGLESTON</u>	<u>2888</u>	<u>-1223.5</u>	<u>137</u>
<u>MOCCASIN</u>	<u>3025</u>	<u>-1360.5</u>	<u>265</u>
<u>Remark</u> <u>LOWVILLE</u>	<u>3290</u>	<u>-1625.5</u>	<u>582</u>
<u>LENOIR</u>	<u>3872</u>	<u>-2207.5</u>	<u>132</u>
<u>MOSHEIM</u>	<u>4004</u>	<u>-2339.5</u>	<u>120</u>
<u>MURFREESBORO</u>	<u>4124</u>	<u>-2459.5</u>	<u>144</u>
<u>KNOX</u>	<u>4268</u>	<u>-2603.5</u>	<u>1304</u>

References \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Released to Open File: Completion MARCH 21, 1986  
Samples NO

(Note: UTM measurements in meters, all others in feet)

OIL AND GAS WELL SUMMARY REPORT

API No.: 45-105-20593-00-03

VDMR Well Rep. No.

Div. Gas & Oil File No.: LE-135

Operator: PENN VIRGINIA RESOURCES CORPORATION

Farm: CHANCE AND MONTGOMERY COAL COMPANY

County: LEE

Co. Well No.: 102

Quadrangle: ROSE HILL - 7-1/2'

Location (UTM): N 4,060,540; E 296,070

UTM Zone: 17

Field: ROSE HILL

Province: VALLEY AND RIDGE

Elev. (specify): 1664.5' GR TD: 5572' Formation at TD: KNOX

Initial Gas Flow

Age: ORDOVICIAN

Date compl. or abandoned: MARCH 21, 1984

Result: GAS WELL

Gas Shows

Gas Pays: 3597' TO 3604' 3895' TO 3912'

Main Production

Producing Formation: LENOIR; LOWVILLE

Final Gas Flow: 103,000 CU. FT.

Age: ORDOVICIAN

Treatment:

Initial Oil Production:

Final Production:

Oil Shows: 4260'; 4918'; 3875'

Water FW: YES at: 107'; 126' at: 700'; 785' at: 5251' TO 5411'  
SW: at: at at

Coal

Plat

Plotted

Completion Report: X



Drillers Log: X

Geologic Log

Samples

Interval Sheet

Sample Interval

Geophysical Logs

S.P.

Res

Gamma:

Neutron

Density

Sonic

Other:

Stratigraphic Data Source: WILLIAM W. KELLY, JR.

<u>Formation</u>	<u>Top</u>	<u>Datum (Subsea)</u>	<u>Thickness</u>
CAMBRO-ORDOVICIAN	0	+1664.5	1050
PINE MTN. FAULT	1050	+ 614.5	7
CHATTANOOGA	1057	+ 607.5	17
HANCOCK	1074	+ 590.5	111
CLINTON	1185	+ 479.5	343
CLINCH	1528	+ 136.5	106
HAGAN	1634	+ 30.5	47
SEQUATCHIE	1681	- 16.5	290
REEDSVILLE	1971	- 306.5	359
TRENTON	2330	- 665.5	558
EGGLESTON	2888	-1223.5	137
MOCCASIN	3025	-1360.5	265
LOWVILLE	3290	-1625.5	582
LENOIR	3872	-2207.5	132
MOSHEIM	4004	-2339.5	120
MURFREESBORO	4124	-2459.5	144
KNOX	4268	-2603.5	1304

Remarks:

References:

Released to Open File: Completion: MARCH 21, 1986  
Samples: NO

(Note: UTM measurements in meters, all others in feet)

API No.: 45-105-20593-00-03

VDMR Well Rep. No.:

Div. Gas &amp; Oil File No.: LE-135

Operator: PENN VIRGINIA RESOURCES CORPORATION

Farm: CHANCE AND MONTGOMERY COAL COMPANY

County: LEE

Co. Well No.: 102

Quadrangle: ROSE HILL - 7-1/2'

Location (UTM): N 4,060,540; E 296,070

UTM Zone: 17

Field: ROSE HILL

Province: VALLEY AND RIDGE

Elev. (specify): 1664.5' GR TD: 5572'

Formation at TD: KNOX

Initial Gas Flow:

Age: ORDOVICIAN

Date compl. or abandoned: MARCH 21, 1984

Result: GAS WELL

Gas Shows:

Gas Pays: 3597' TO 3604' 3895' TO 3912'

Main Production

Producing Formation: LENOIR; LOWVILLE

Final Gas Flow: 103,000 CU. FT.

Age: ORDOVICIAN

Treatment:

Initial Oil Production:

Final Production:

Oil Shows: 4260'; 4918'; 3875'

Water: FW: YES at: 107'; 126' at: 700'; 785' at: 5251' TO 5411'  
SW: at: at at

Coal:

Plat

Plotted

Completion Report: X

*Correction  
Rose Hill*

Drillers Log: X

Geologic Log:

Samples:

Interval Sheet:

Sample Interval:

Geophysical Logs

S.P.

Res

Gamma:

Neutron:

Density:

Sonic

Other:

Stratigraphic Data Source: WILLIAM W. KELLY, JR.

<u>Formation</u>	<u>Top</u>	<u>Datum (Subsea)</u>	<u>Thickness</u>
CAMBRO-ORDOVICIAN	0	+1664.5	1050
PINE MTN. FAULT	1050	+ 614.5	7
CHATTANOOGA	1057	+ 607.5	17
HANCOCK	1074	+ 590.5	111
CLINTON	1185	+ 479.5	343
CLINCH	1528	+ 136.5	106
HAGAN	1634	+ 30.5	47
SEQUATCHIE	1681	- 16.5	290
REEDSVILLE	1971	- 306.5	359
TRENTON	2330	- 665.5	558
EGGLESTON	2888	-1223.5	137
MOCCASIN	3025	-1360.5	265
LOWVILLE	3290	-1625.5	582
LENOIR	3872	-2207.5	132
MOSHEIM	4004	-2339.5	120
MURFREESBORO	4124	-2459.5	144
KNOX	4268	-2603.5	1304

Remarks:

References:

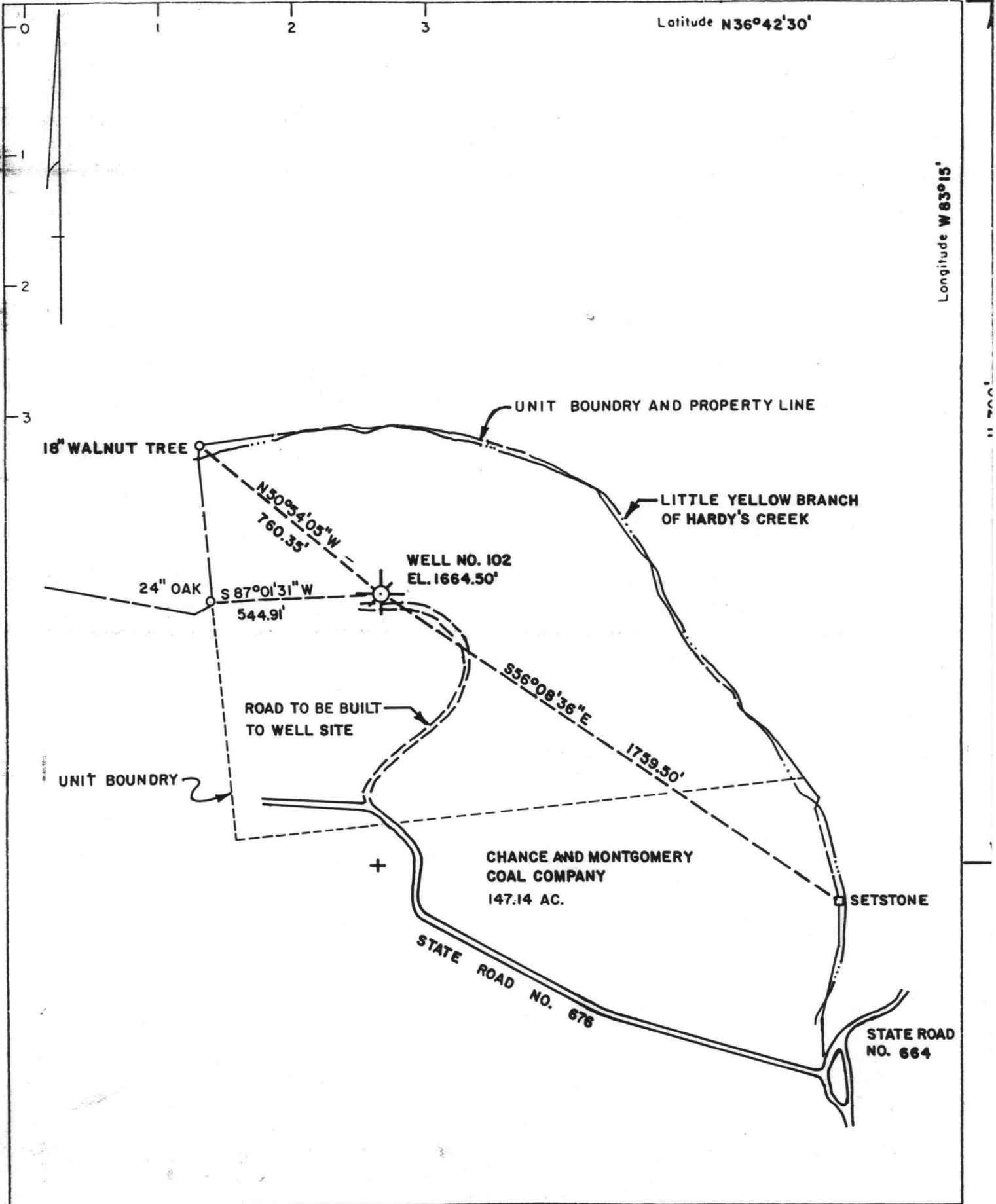
Release to Open File: Completion: MARCH 21, 1986  
Samples: NO

(Note: UTM measurements in meters, all others in feet)

9400'

Latitude N36°42'30"

Longitude W83°15'



LE-135

(FOR OFFICE USE ONLY: API Well No. 45 - 105 - 20593  
State County Permit

Date: 7/28, 19 83

Operator's Well No. 102

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

LE - 135

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     /

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

Well operator CONTROLLED RESOURCES OIL and GAS

Address P.O. BOX 43 DUFFIELD, VA.

Farm CHANCE AND MONTGOMERY COAL CO.

Tract            Acres 147.14 Lease No.           

Elevation 1664.50'

Quadrangle ROSE HILL

County LEE District WHITE SHOALS

Registered Engineer            Registration No.           

Certified Land Surveyor            Cert. No.           

File No.            Drawing No.           

Date 7/28/83 Scale 1"/400'

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.

*Jack G. [Signature]* #11439  
Registered Engineer or Certified Land Surveyor  
in Charge