API NO. 45 - 105 - 21123 NELL NAME 8709

VIRGINIA DIL AND GAS CONSERVATION BOARD Virginia Dil and Gas Inspector P. O. Box 1416 Abingdon, Virginia 24210 703 628-8115

6,10 ptk.

NOTICE OF COMPLETION OF A WELL UNDER ARTICLE 2

	N CCO CO	1
Pursuant to Regulation 2.02 of	the Regulations under the Virginia Oil and Gas Act, applicable to, "each jurisdictions well well a pay zone deeper than 3,000 feet from the surface", the undersigned well operator below notifies	200
completed or recompletedin	a pay zone deeper than 3,000 feet from the surface", the undersigned well operator hereby notifies	5
the Virginia Oil and Gas Conser	rvation Board of the completion of the referenced well, as completion is defined in Recoration	2
1.02(4), on November 2	23, 1987 in Jonesville Magisternia dict, Lee	f
County, Virginia as follows:	E0662071707CQ	
	6.05851630	
	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 16) 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:

AFFLICANT:	Penn Virginia Resources Corporation
EY:	William W. Kelly, Jr. William W. Kelly, Jr.
ITS:	Vice President - Exploration
ADDRESS:	P.O. Box 386, Duffield, VA 24244
TELEPHONE:	(703) 431–2831

AF1	NUMBER:	45		105	 2112	3
WELL	NAME:		8	709		

VIRGINIA OIL AND GAS CONSERVATION EDARD
Virginia Oil and Gas Inspector
P. O. Box 1416
Abingdon, Virginia 24210
703 628-8115

INITIAL TEST OF A WELL UNDER ARTICLE 2

completed the Virgin	o Regulation 2.02 (c) of the Regulations under the Virginia Oil and Gas Act, applicable to, "each jurisdictional well or recompletedin a pay zone deeper than 3,000 feet from the surface", the undersigned well operator hereby reports to ia Oil and Gas Conservation Board the initial tests of the referenced well, which was completed on 11-23-87 sville Magisterialtrict,
	•
	s of (i) the initial indicated potential flow test and (ii) the initial gas/oil ratio test are set out on the following
torm, ine	names and addresses of such other operators are listed below.
	·
APPLICANT	Penn Virginia Resources Corporation
_	1111/11/11
BY	William W. Kelly, Jr. Welledy
ITS	Vice President - Exploration
113	vice riesiucit Baptoración
ADDRESS	P.O. Box 386, Duffield, VA 24244

API NO.	45 - 105 -	21123	
WELL NAME	: 8709		
DATE 1	11-23-87		

Virginia Dil and Gas Inspector F. 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 Jonesville Magisteria District Lee County, Virginia on 23rd day, November month, 19 87.
WELL TYPE: 0:1 / Gas X / Enhanced Recovery / Waste Disposal / If Gas-Production x / Underground Storage / Exempt by Code Section 45.1-300.B.1. from general 0:1 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 SECTION 45.1-332
Ninety days from the filing of this report
DR .
X Two years from 11-23-87 , 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.
AFFLICANT Penn Virginia Resources Corporation
William W. Kelly, Jr. All Melly
Vice President - Exploration
ADDRESS P.O. Box 386, Duffield, VA 24244
TELEPHONE (703) 431-2831

Well	11 Name	8709	
File	Number	LE-156	

COMPLETION REPORT

WELL TYPE: Oil () Gas Production (\mathbf{X})	Gas-Underground	Storage () Enhanced Recovery () Waste Disposal ()
LOCATION		* ******
COUNTYLee	1	DISTRICTJonesville_Magisterial
SURFACE ELEVATION1807.20'	_ (QUALMANGLE Ben Hur
LATITUDE 1160 '\$ 36° 45	<u>' 00 " </u>	ONGITUDE 620 'S 83° 02 ' 30 "
DRILLING DATA		
DATE DRILLING COMMENCED 9-29-87 DATE DRILLING COMPLETED 10-17-87 DATE WELL COMPLETED 11-23-87 TOTAL DEFTH OF COMPLETED WELL 5110 *	F	RILLING CONTRACTOR Ray Resources DDRESS 600 Commerce Square, Charleston, WV 2530 ELEPHONE NUMBER 304-344-8393 ELEPHONE X ROTARY CARLE TOOL
GEOLOGICAL DATA		
FRESH WATER AT (1) No record FEET SALT WATER AT (1) N/A FEET	GPM: (2) GPM: (2)	FEET GPM GPM
COAL SEAMS: NAME N/A	<u>BOTTOM</u>	MINING IN AREA . THICKNESS YES NO MINED OUT
OIL AND GAS SHOWS: ' FORMATION TOP BOTTOM Trenton 2180' 2196'	THICKNESS 16"	IPF (MCFD/ECPD) FRESSURE HOURS TESTED Show Gas Not guaged
Eggleston 3000' 3015'		Show 0il & Gas Not guaged
Stones River 4186' 4196' Knox 4604' 4612'	8'	Show Gas Not guaged Show Gas Not guaged
STIMULATION RECORD ZONE (1) Knox X-link water frac 30. Breakd FERFORATED 4602 TO 4612 FORMATION EROKE DOWN AT 3200 INITIAL SHUT IN PRESSURE 3400	lown with 20 NO. OF PERFOR	ALATED WITH 42,000# 20/50 Sand, 626 bb1. 000 gallons 28% HCl. ATIONS 20 PERFORATION SIZE38 GE INJECTED RATE15 liquid
STIMULATION RECORD		
ZONE (2) Stones River	_	
PERFORATEDTO		
FORMATION GROKE DOWN AT		DE INJECTED RATE
FINAL PRODUCTION: () NATURAL () AFTER STI 800 MCFD ZONE (1) Knox 21	HOURS TESTED 4	ROCK PRESSURE HOURS TESTED 900 psi 72
ZONE (1) Knox 21 ZONE (2) Stones River 5 119	HOURS TESTED 4 8	ROCK PRESSURE HOURS TESTED

Form 16, Appendix A, Sh	æt 2			hell Hame	8709		
CASING AND TUBING	SIZE	TOP BOTTON	LENGTK	PERFORATIONS FEET TO FEET	FACKERS OR BR		
CONDUCTOR	20" 13 3/8"	0' 60' 0'	60'				
<u>CASING</u> Circulated and Cemented to Surface	9 5/8"	0' 1260'	1260'			· · · · · ·	
WATER PROTECTION (Casing Set According to Section 45.1-334)	Same as	above					
COAL PROTECTION (Casing Set According to Section 45.1-334)	N/A			/coal /cial	20.1.1		
OTHER CASING AND Tubing Left In Well	45"	0' 4681'	4681	4602'-4612' 4185'-4195' 2999'-3009'	20 holes 22 holes 22 holes	NC-1 Bri	. left at 4320 dge Plug left ily at 4000'
LINERS Remaining in well	N/A						,
OTHER used and not left	N/A			71			
Is the well underlain byYes	No			'es, was coal protectio	on string set to	Red Shales?	
Open hole cast				40' dumped 4	sacks of	Calcaal	
on top of it.				, o , umpeu ,	Jacks VI		
DRILLER'S LOG	ion U. Vol	l., I.,					
Compiled byWill:	iam W. Kel	ry, Jr.					
Geological Formation	General	Color	Dept		rknoss	Posseke	

Form 46, Appendix A Sheet 3 Well Name 8709
Samples and Cuttings
Will X Will not be available for examination by a member of the Virginia Division of Mineral Resources Will X Will not be furnished to the Virginia Division of Mineral Resources upon request Will Will not X require sacks to be furnished by the Virginia Division of Mineral Resources
Electric Logs and Surveys:
Type of Electric Log(s) Ran: GR-LDT-SNP, DIL, Temperature, Audio, Noise, Cement Bond Log Sonic Seismogram
Did log disclose vertical location of a coal seam? Yes NoX
Was log made at request of coal owner according to Section 45.1-333.B.1 of the Virginia Code? · Yes No _X
Note: If a coal seam was located, the part of the survey from the surface through the coal is attached in accordance with Section 45.1-333.8.3 of the Virginia Code
Deviation Surveys:
Deviation surveys were were not X 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 Feet/Degree Deviated Depth Feet/Degree Deviated Depth Feet/Degree Deviated of Survey From True Vertical of Survey From True Vertical of Survey From True Vertical
N/A
A continuous survey was was not X 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:
he operator requests that information herein and log(s) be kept confidential (after COMPLETION DATE of the well) for a period of
Ninety (90) days X two (2) years, if the we'll is evaluatory

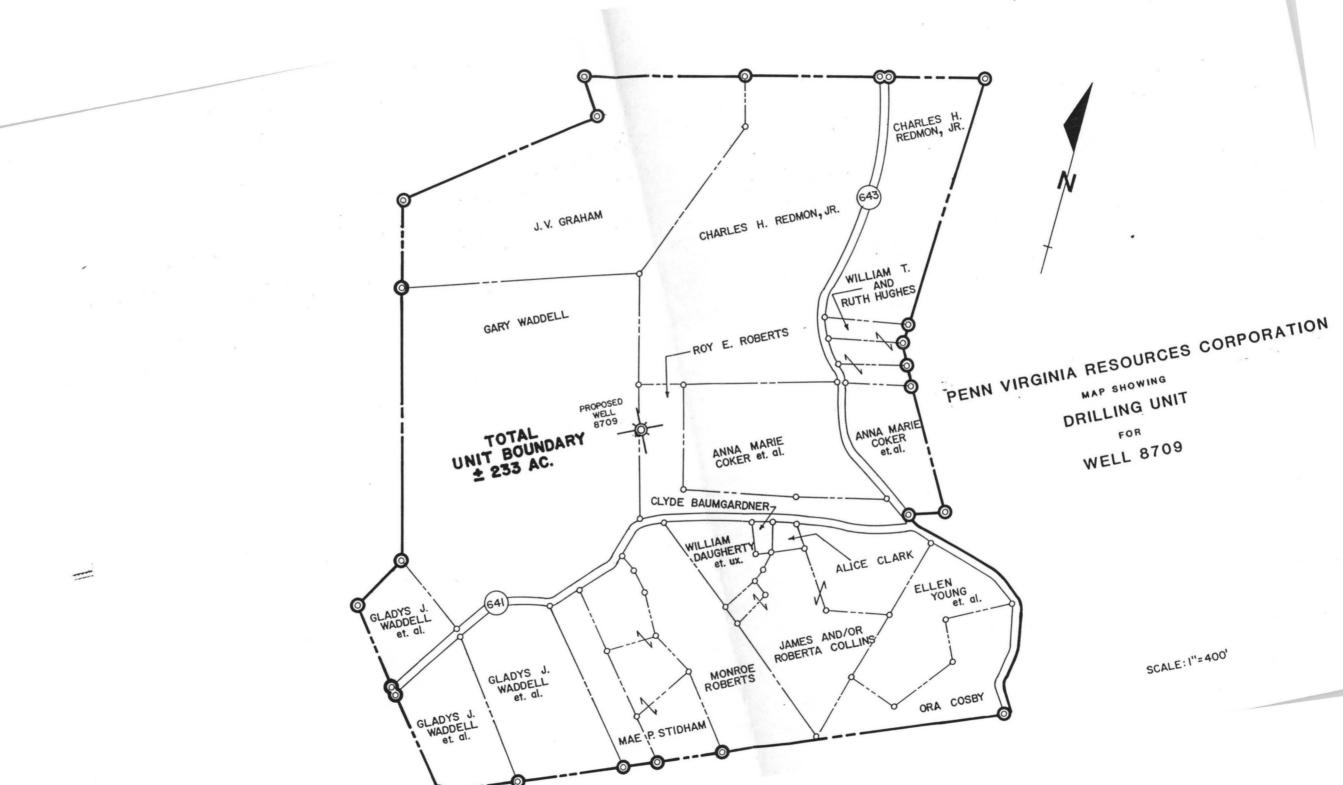
COMPLETION PROCEDURE

11-10-87	Stones River:	Perforated 4185'-4195'. 22 holes. Set NC-1 Bridge Plug at 4320'. Breakdown with 48 bbls 28% HCl. Breakdown 3000 psi, ISIP 2800 psi. Swab and cleanup - Gas guaged 119 Mcfd with show of oil.
11-12-87		Acidize with 15,000 gallons gelled acid with gel pads, foamed with 912,000 Scf Nitrogen. Average treatment pressure 4025 psi, Average rate 8.3 BPM, ISIP 3700 psi, 15 minute SIP 3414 psi. Results after cleanup 119 Mcfd 5 BOPD.
11-20-87	Stones River: (Eggleston)	Perforated 2999'-3009'. 22 holes. Set NC-1 Bridge Plug at 4000'. Acidize with 6000 gallons 15% HCl foamed to 50 Q with 247,000 Scf Nitrogen. Breakdown 3200 psi, ATP 2600 psi, Average rate 10 BPM.
11-23-87		Final openflow after cleanup 44 Mcfd, 1 BOPD Shut in.

WELL 8709

Geological		General		Depth		
Age	Formation	Lithology	Color	Top Bottom	Thickness	Remarks
Cambrian	Overthrust	Dolomite	Tan-gray	0'- 635'	635'	
Silurian	Hancock	Dolomite	Gray	635'- 735'	100	
Silurian	Clinton	Shale (Gray-green	735'-1010'	275'	
Silurian	Clinch	Sandstone	White	1010'-1290'	280'	
Silurian	Hagan	Shale	Gray	1290'-1326'	36'	
Ordovician	Sequatchie Si	lty Limesto	one Red-gray	1326'-1726'	400	
Ordovician	Reedsville	Lime/Shale	Gray	1726'-2180'	454	
Ordovician	Trenton	Limestone	Gray-brown	2180'-2912'	732'	
Ordovician	Eggleston	Limestone	Tan	2912'-3070'	158'	
Ordovician	Stones River	Limestone	Gray	3070'-4432'	1362	
Ordovician	Knox	Limestone	Tan	4432'-5110'	678 '	

٠,	, Form 16, Appendix A Sheet 3	Hell Name 8709		
	Samples and Cuttings			
	Will X Will not be available for examination to the Will X Will not be furnished to the Virginia I Will Will will require sacks to be furnished	Division of Mineral Resourc	es upon request	
	Electric Logs and Surveys:			•
	Type of Electric Log(s) Ran: GR-LDT-SNP, DIL, Tempo Sonic Seismogram	erature, Audio,	Noise, Ceme	ent Bond Log,
	Did log disclose vertical location of a coal seam? Yes	No X		
	Was log made at request of coal owner according to Section 45.1-33	33.B.1 of the Virginia Code	? · Yes	No X
	Note: If a coal seam was located, the part of the survey from the Section 45.1-333.B.3 of the Virginia Code	surface through the coal i	is attached in acc	ordance with
	Deviation Surveys:			
	Deviation surveys were were not X required und lowest published coal seam depth."	er Section 45.1–333.C of th	ne Virginia Code "	to the bottom of the
	Note: If a deviation survey(s) was/were required, the survey resu	lts are as follows:		
		et/Degree Deviated rom True Vertical	Depth I	Feet/Degree Deviated From True Vertical
	N/A			
	A continuous survey was was not X required, und	der Section 45.1–333.C of t	he Virginia Code.	
1	Note: If a continuous survey was required, the survey results are	attached.		
!	Changes in the Permitted Well Work:			
	The well operator did did not X make any change Inspector or Assistant Inspector under Regulation 4.03 of the Regul insuring successful completion of the well work.			
ì	NOTE: The nature and purpose of each such change, if any, is set o	ut below or on additional s	heets if such are	required.
	*			
Ğ	Confidentiality Status:			
(Confidentiality status under Section 45.1-332 of the Virginia Code:	***		
I	The operator requests that information herein and log(s) be kept con	nfidential (after <u>COMPLETIO</u>	N DATE of the wel!	l) for a period of
-	Ninety (90) days X Evec (2) years, if the we'l is exploratory			



VIRGINIA DIVISION OF MINERAL RESOURCES Box 3667, Charlottesville, VA 22903

INTERVAL SHEET

Page / of 3

Well Repository No.: W- 7203

Date rec'd:

Date Processed:

Sample Interval: from 300 to: 4300'

PROPERTY: Roy E. Roberts LE-156 Number of samples: 383

COMPANY: PENN- VIRGINIA - RESOURCES Total Depth: 5110'

COUNTY: Lee Oil or Gas: Water: Exploratory: Well #8709

From-To	From-To	From-To	From-To	From-To
300 -10	651 -60	1010 - 20	1260-70	1610-20
10-20	60-70	20 -30	70 -80	20-30
20-30	70-50	30 -40	80 -90	30-40
30-40	80-90	40 -50	90-1300	40-50
40-50	90-700	50-60	1300 - 10	50-60
60.60	700-10	60 -70	10.20	60-70
60-70	10-20	70-80	20-30	70-80
70 = 80	20 =30	80-90	30-40	80-90
390-390	30 =40	90-1100	40-50	90=1700
390=400	40 =50	1/00=10	50 =60	1700=10
400 = 10	50 =60	10 = 20	60 = 70	10-20
10 = 20	60=70	20 = 30	70 -80	20=30
20 = 30	70 = 50	30=40	80 -80	30=40
30-40	80 .70	40=6U	90 =1400	40-50
40=50	90 = 800	50=60	1400 = 10	50 -60
50 60	800,10	60.70	10 -20	60-70
60.70	10 .20	70 - 80	20.30.	70-80
70-80	20.30	80-90	30 -40	80-90
80 -90	30-40	90-1100	40.50	90-1800
90-500	40-50	1100-1110	50 -60	1800-10 .
570-10	50.60	10 -20	60 -70	10-20
10-20	60.70	20 -30	70-80	20-30
20-30	70 -80	30-40	80-90	30=40
30 -40	80 -90	40.50	90 -1500	40 -50
40.50	90-900	50-60	1500-10	50 -60
50.60	900-10	60-70	10 .20	60 20
60.70	10 = 20	70 -80	20-30	70 -80
50 .80	20 -30	80 -90	30-40	80-1890
80 -90	30.40	90 -1200	40 =50	90-1900
90 - 600	50-60	1200-1210	50-60	1900-10
600-10	60-70	1210 - 20	60-70	10 -20
10-20	70-80	20 -30	70 -80	70 -30
20-30	80 -90	30 -40	80 - 90	30 = 40
30.40	90-1000	43-50	98 -1600	40 -50 50 -60
90.50	1600-10	50 -60	1600=10	30 -00

VIRGINIA DIVISION OF MINERAL RESOURCES Box 3667, Charlottesville, VA 22903

INTERVAL SHEET Continued

Page 2 of 3		W	ell Repository No.:	W-7203
From-To	From-To	From-To	From-To	From-To
1960-70	6°-70	2760-70	31% 80	3570-50
70-80	Po-80	70-80	80-90	80-90
80-90	80-90	80-90	90-3200	90-3600
90-2000	2390-2400	90-2800	3200-10	2600-10
2000-10	2400-10	2800-10	10-20	10-20
10-20	10 -20	10 - 20	20-30	20-30
20-30	20 -30	20 - 30	30-40	30-40
30-40	30 -40	30 - 40	40-50	40-50
40-50	40 -50	40 - 50	50-60	50-60
50-60	37 -60	50 - 60	60-70	60-70
60-70	60-70	60-70	70-80	70-80
70-80	70 - 80	70-80	80-90	80-90
80-90	80 - 90	80-90	90-3300	90-3700
90-2100	90 - 2500	90-2900	3300-10	3760-10
2100-10	2500-10	2900-10	10-20	10-20
10 -20	10 -20	10 - 20	20-30	20_30
20 -30	20 -30	20 - 30	30-40	30-40
30 -40	30 -40	30 - 40	40-50	40-50
40 -50	40 -50	40 - 50	50-60	50-60
50 -60	50 -60	50 - 60	60-70	60-70
60_70	60-70	60 _>0	70 -80	70-80
70_80	70-80	>0 _80	90 -90	80-90
80_90	80-90	80 _90	90 -3400	90-3800
90_2200	90-2600	90 _3000	3400-10	3800-10
2200-10	2600-10	3000 -/0	10 -20	10-20
10 _ 20	10-20	10 _ 20	20-30	20-30
20 _ 30	20-30	20 - 30	30-40	30-40
30 - 43	30-40	40 - 50	40-50	40-50
40 _ 50	40-50	50 - 60	50-60	50-60
50 - 60	50-60	60 - 70	60-70	60-70
60 -70	60-70	70-87	70-80	70-80
70 -80	70-80	80-90	80-90	80-90
80 -90	80-90	90-3/00	90-3500	90-3500
90 -230 0	90-2700	3/00-10	3500-10	3900-10
2300- 10	2700-10	/0-20	10-20	10-20
10 -20	10 - 20	20-30	70-30	20 -30
20 -30	20 - 30	30-40	30-40	30-40
30 -40	30 - 40	40-30	40-50	40-50
40 -50	40 - 50	50-60	50-60	50-60
50 -60	50 - 60	60-70	60-70	60-70

VIRGINIA DIVISION OF MINERAL RESOURCES Box 3667, Charlottesville, VA 22903

INTERVAL SHEET Continued

Page 3 of 3		Well	Repository No.:	W- 7203
From-To	From-To	From-To	From-To	From-To
3970-80 80-90	, -	-		-
00-90	-	-	- "	-
90-4000	-	-	-	-
4000-2010	-	-	-	-
10-20	7	-	-	-
20-30	-	_	_	_
30-40	_	_	_	_
40-50	_	_		_
50-60	_	_		_
60-70	_	_	_	_
70-80	-	-	-	-
80-90	-	-	_	-
90-4100	-	-	-	-
4/00-10	-	-	-	-
10-20	-	-	-	-
20-30	-	_	_	
30-40	-	-	-	-
90-50	-	_	_	_
50-60	-	-	-	-
60-70	-	-	-	-
70-80	-	_	_	-
80-90	-	_		-
90-2200	_	_	-	-
4200-10	-	_	-	_
10-20	-	-	_	_
20-30	_	_	-	_
30-40	-	-	_	_ '
40-50	-		-	-
50-60	-	-	-	
60-70	_	_	_	
70-88 80-90 90-4300	-		-	-
80-90		-	-	-
90-4300	-	-	-	-
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- <u>-</u>	_	-	-	-
-	-	-	-	, -
				-

AF1 NO. 45 - 105 - 21123 WELL NAME 8709

PENN VIRGINIA RESOURCES ROY E. ROBERTS 8709 BEN HUR-7/2 VIRGINIA DIL AND GAS CONSERVATION EDARD Virginia Dil and Gas Inspector P. O. Box 1416 Abingdon, Virginia 24210 703 628-8115

6,10 p. W.

NOTICE OF COMPLETION OF A WELL UNDER ARTICLE 2

2-26	W 10	
Fursuant to Regulation 2.02 of the Regulations under the Virginia Oil and Gas Act, a completed or recompletedin a pay zone deeper than 3,000 feet from the surface", th	policable to, "each jurisdictions well well	
completed or recompletedin a pay zone deeper than 3,000 feet from the surface", the	he undersigned well operator hereby notifies	
the Virginia Oil and Gas Conservation Board of the completion of the referenced well.	, as completion is defined in Reportation	
1.02(4), on November 23, 1987 in Jonesville Magi	istemialict, Lee	
County, Virginia as follows:	Enco	0
	859.30	5750

X The completion was to perform all those acts which resulted in the well being capable of producing oil er 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 16) 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:

APPLICANT:	Penn Virginia Resources Corporation	
BY:	William W. Kelly, Jr. William W. Kelly, Jr.	
ITS:	Vice President - Exploration	
ADDRESS: _	P.O. Box 386, Duffield, VA 24244	
TELEPHONE:	(703) 431–2831	

AFT NUMBER:	45 -	105	-	21123
WELL NAME:		3709		

VIRGINIA OIL AND GAS CONSERVATION EDARD Virginia Oil and Gas Inspector P. O. Box 1416 Abingdon, Virginia 24210 703 628-8115

INITIAL TEST OF A WELL UNDER ARTICLE 2

Fursuant to Regulation 2.02 (c) of the Regulations under the Virginia Oil and Gas Act, applicable to, "each jurisdictional completed or recompletedin a pay zone deeper than 3,000 feet from the surface", the undersigned well operator hereby of the Virginia Oil and Gas Conservation Board the initial tests of the referenced well, which was completed on $11-23$ -	eports to
in Jonesville Magisteria trict, 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 form. The names and addresses of such other operators are listed below.	ollowing
· ·	
AFFLICANT Penn Virginia Resources Corporation	
William W. Kelly, Jr. Welledge	
Vice President - Exploration	
ADDRESS P.O. Box 386, Duffield, VA 24244	
TELEPHOE (703) 431-2831	

MFI NO. 45 - 105 - 21123
WELL NAME: 8709
DATE 11-23-87

Virginia Dil and Gas Inspector F. D. Box 1416 Abingdon, VA 24210 703 628-8115

REPORT OF COMPLETION OF WELL WORK

Fursuant to Regulation 4.06 of the Regulations under the Virginia Dil and Gas Act, the undersigned well operator reports completion of the type(s) of well work specified below on the referenced well in Jonesville Magisteria District Lee County, Virginia on 23rd day, November senth, 19 87.
WELL TYPE: 0il/ Gas X _/ Enhanced Recovery/ Waste Disposal/ If Gas-Production _x _/ Underground Storage/
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
Ninety days from the filing of this report
DR .
X Two years from 11-23-87 , the date on which the referenced well was completed, the well being an exploratory well as defined in Code of Virginia, Section 45.1-208.21.
AFFLICANI Penn Virginia Resources Corporation
William W. Kelly, Jr. Millely
Wice President - Exploration
ADDRESS P.O. Box 386, Duffield, VA 24244
TELEPHONE _(703) 431-2831

Well	Name	8709	
File	Number	LE-156	

COMPLETION REPORT

WELL TYFE: Oil () Gas Froduction (X)	Gas-Undergroun	d Storage () Enhanced Recovery () Waste Disposal ()
LOCATION		** ** *****	
CENTY Lee		DISTRICT	storial
		_	steriar
SURFACE ELEVATION 1807.20		QUADRANGLE Ben Hur	
LATITUDE 1160 'S 36° 45	00"	LONGITUDE 620 'S 83°	02′30"
DRILLING DATA			
DATE DRILLING COMMENCED 9-29-87		DRILLING CONTRACTOR Ray Resou	rces
DATE DRILLING COMPLETED 10-17-87			are, Charleston, WV 2530
WHILE WELL LUTTLETEN 11-23-07		TELEPHONE NUMBER 304-344-8	
TOTAL DEPTH OF COMPLETED WELL 5110'		RIG TYFE X ROTARY	CARLE TOOL
GEOLOGICAL DATA			
FRESH WATER AT (1) No record FFFT	GPM: (2)	FFFT	C E M .
FRESH WATER AT (1) No record FEET	GPM: (2)	FEET	GP:M
COAL SEARS:		MIM	NING IN AREA .
NAME TOP	BOTTOM	THICKNESS YES	NO MINED OUT
N/A			
	mp /		
STI AND DAD CHOIR !		b.,	
DIL AND GAS SHOWS:	THENAUTO	the Meen theen) term	AIDE HOUSE TECTES
FORMATION TOP BOTTOM Trenton 2180' 2196'	THICKNESS 16'		SURE HOURS TESTED
Eggleston 3000' 3015'	15'		t guaged
Stones River 4186' 4196'	10'	Show Oil & Gas No Show Gas No	t guaged
Knox 4604' 4612'	8'		t guaged
1001 1012		Onew Out	- Augeu
STIMULATION RECORD			
		MULATED WITH 42,000# 20/50	Sand, 626 bb1.
X-link water frac 30. Break			
		ORATIONS 20 PERFORATIO	
		RAGE INJECTED RATE 15 liqui	
INITIAL SHUT IN PRESSURE 3400	PSIG	15 MINUTE SHUT IN PRESSURE	2356 FSI6
ATHE ATTOU SECOND		4.	
STIMULATION RECORD			
ONE (2) Stones River	_ FORMATION ST	MUATED WITH See Attached	
PERFORATEDTO	NO DE PERS	ORATIONS PERFORATION	N SIZE
FORMATION BROKE DOWN AT	PSIG AVE	RAGE INJECTED RATE	
INITIAL SHUT IN PRESSURE		MINUTE SHUT IN FRESSURE	
INAL PRODUCTION: () NATURAL () AFTER ST.	INULATION	12.	
EOD MCFD	HOURS TEST		HOURS_TESTED
(I) Knox 21	4	900 psi	72
ONE (2) Stones River 5 119	8	880 psi	48
INAL PRODUCTION IF GAS ZONES ARE COMINGLED		HOURS TESTED	PSIGHOURS TESTED
Zone (3) Stones River 1 44	6	230 psi	14

COMPLETION PROCEDURE

11-10-87	Stones River:	Perforated 4185'-4195'. 22 holes. Set NC-1 Bridge Plug at 4320'. Breakdown with 48 bbls 28% HCl. Breakdown 3000 psi, ISIP 2800 psi. Swab and cleanup - Gas guaged 119 Mcfd with show of oil.
11-12-87		Acidize with 15,000 gallons gelled acid with gel pads, foamed with 912,000 Scf Nitrogen. Average treatment pressure 4025 psi, Average rate 8.3 BPM, ISIP 3700 psi, 15 minute SIP 3414 psi. Results after cleanup 119 Mcfd 5 BOPD.
11-20-87	Stones River: (Eggleston)	Perforated 2999'-3009'. 22 holes. Set NC-1 Bridge Plug at 4000'. Acidize with 6000 gallons 15% HCl foamed to 50 Q with 247,000 Scf Nitrogen. Breakdown 3200 psi, ATP 2600 psi, Average rate 10 BPM.
11-23-87		Final openflow after cleanup 44 Mcfd, 1 BOPD Shut in.

CASING AND TUEING									
				PERFORATIONS		ERS OR BRIDG			
	20"		TOM LENGTH	FEET TO FEET	KIND	SIZE	SET AT		
CONDUCTOR	13 3/8"	0'	0' 60'						
CASING Circulated and									
Cemented to Surface	9 5/8"	0' 1260	0' 1260'						
WATER PROTECTION									
(Casing Set According to Section 45.1–334)	Same as	above							
COAL PROTECTION									
(Casing Set According	/ ·								
to Section 45.1-334)	N/A			4602'-46		holes	NC-1	B.P. left	at 4320
DTHER CASING AND	. 1	_ • / •		4185'-4		holes			
Tubing Left In Well	45"	0' 468	1' 4681'	2999'-30	009 22 1			Bridge Pl rarily at	
LINERS Remaining	N/A						сещро	iailly ac	4000
in well	N/A						·		
OTHER used and not	N7 / A				***				
left .	N/A								
								*	
Is the well underlain by F	red Shales	Yes	X No. 16	Yes. was coal o	rotection strin	a set to Re	d Shales?		
Yes				ice mas coar p	. 000000011 221 211	ig see to he			
, .					*,				
FEMARKS: Shut down, fishi	ng jobs, depths	and dates, c	aving, etc.		1	×			
Open hole cast	iron Brid	lge Plug	set at 47	740' . dumr	ned 4 sack	rs of C	21 0021	r	
		88		io , adm	red 4 bder	23 01 0	arsea		
on top of it.									
			THE WAY THE LAND			· ·			
DRILLER'S LOG									
Compiled byWilli	am W. Kel	ly, Jr.							
					Ý	i ,			
Contanient	C1		η	-46	,				
Geological Age Formation	General Litholog	y Colo		pth Bottom	Thickness	F	Remarks		

kell flame 8709

Form 16, Appendix A, Sheet 2

(ATTACH DRILLER'S LOG IN THIS FORMAT)

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WELL 8709

Geological		General		De	pth		
Age	Formation	Lithology	Color	Top	Bottom	Thickness	Remarks
Cambrian	Overthrust	Dolomite	Tan-gray	0'	- 635'	635'	
Silurian	Hancock	Dolomite	Gray	635	- 735 '	100	
Silurian	Clinton	Shale (Gray-green	735	-1010*	275	
Silurian	Clinch	Sandstone	White	1010	-1290°	280	
Silurian	Hagan	Shale	Gray	1290	-1326	36'	
Ordovician	Sequatchie Si	lty Limesto	one Red-gray	1326	-1726 °	400	
Ordovician	Reedsville	Lime/Shale	Gray	1726	-2180°	454	
Ordovician	Trenton	Limestone	Gray-brown	2180	-2912°	732'	
Ordovician	Eggleston	Limestone	Tan	2912	-3070°	158'	
Ordovician	Stones River	Limestone	Gray	3070	-4432	1362	
Ordovician	Knox	Limestone	Tan	4432	-5110 '	678'	

Fora 16, Appendi	x A Sheet 3		Hell Name 8709		
Samples and Cutt	ings				
Will X	Will not be furn	nished to the Virg	ation by a member of the Virgi pinia Division of Mineral Reso mished by the Virginia Divisio	ources upon reques	st
Electric Logs and	1 Surveys:				
Type of Electric	Log(s) Ran: GR-LDT-S		Cemperature, Audio	, Noise, C	ement Bond Log
Did log disclose	vertical location of a coa	al seam? Yes _			
das log made at r	equest of coal owner accor	ding to Section 4	5.1-333.B.1 of the Virginia C	ode? · Yes	No <u>X</u>
	seam was located, the part B.3 of the Virginia Code	of the survey fr	om the surface through the co	al is attached in	accordance with
Deviation Surveys	<u>:</u>				
	were were not coal seam depth."	Xrequir	ed under Section 45.1-333.C o	f the Virginia Co	ode "to the bottom of the
Hote: If a devia	tion survey(s) was/were re	quired, the surve	y 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
	N/A	Accessed to the second			-
continuous surv	ey was was not	Xrequire	ed, under Section 45.1-333.C	of the Virginia C	ode.
ote: If a conti	nuous survey was required,	the survey result	ts are attached.		
hanges in the Pe	rmitted Well Work:				
nspector or Assi		lation 4.03 of the	changes(s) in the permitted of Regulations under the Virgin		
OTE: The nature	and purpose of each such	change, if any, is	s set out below or on addition	nal sheets if suc	h are required.
		*			
onfidentiality S	tatus:				
onfidentiality s	tatus under Section 45.1-3	32 of the Virginia	a Code:		,
he operator requ	ests that information here	in and log(s).be i	kept confidential (after <u>COMF</u>)	LETION DATE of th	e well) for a period of
X	Ninety (90) days	se'l is explorator	у		