

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

INTERVAL SHEET

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Date rec'd: Date Processed: 5-30-90

Well Repository No.: W- 7220

Sample Interval: from 400 to: 4000

PROPERTY: Jewell Davis LE-163  
 well # 8828

Number of samples: 360

COMPANY: Penn. VA. Resources

Total Depth: 5065

COUNTY: LEE

Oil or Gas:  Water:  Exploratory:

From-To	From-To	From-To	From-To	From-To
400 - 410	750 - 760	1100 - 1110	1450 - 1460	1800 - 1810
410 - 420	760 - 770	1110 - 1120	1460 - 1470	1810 - 1820
420 - 430	770 - 780	1120 - 1130	1470 - 1480	1820 - 1830
430 - 440	780 - 790	1130 - 1140	1480 - 1490	1830 - 1840
440 - 450	790 - 800	1140 - 1150	1490 - 1500	1840 - 1850
450 - 460	800 - 810 NO SAMPLE	1150 - 1160	1500 - 1510	1850 - 1860
460 - 470 NO SAMPLE	810 - 820 NO SAMPLE	1160 - 1170	1510 - 1520	1860 - 1870
470 - 480	820 - 830 NO SAMPLE	1170 - 1180	1520 - 1530	1870 - 1880
480 - 490	830 - 840	1180 - 1190	1530 - 1540	1880 - 1890
490 - 500	840 - 850	1190 - 1200	1540 - 1550	1890 - 1900
500 - 510	850 - 860	1200 - 1210	1550 - 1560	1900 - 1910
510 - 520	860 - 870	1210 - 1220	1560 - 1570	1910 - 1920
520 - 530	870 - 880	1220 - 1230	1570 - 1580	1920 - 1930
530 - 540	880 - 890	1230 - 1240	1580 - 1590	1930 - 1940
540 - 550	890 - 900	1240 - 1250	1590 - 1600	1940 - 1950
550 - 560	900 - 910	1250 - 1260	1600 - 1610	1950 - 1960
560 - 570	910 - 920	1260 - 1270	1610 - 1620	1960 - 1970
570 - 580	920 - 930 NO SAMPLE	1270 - 1280	1620 - 1630	1970 - 1980
580 - 590	930 - 940	1280 - 1290	1630 - 1640	1980 - 1990
590 - 600	940 - 950	1290 - 1300	1640 - 1650	1990 - 2000
600 - 610	950 - 960	1300 - 1310	1650 - 1660	2000 - 2010
610 - 620	960 - 970	1310 - 1320	1660 - 1670	2010 - 2020
620 - 630	970 - 980	1320 - 1330	1670 - 1680	2020 - 2030
630 - 640	980 - 990	1330 - 1340	1680 - 1690	2030 - 2040
640 - 650	990 - 1000	1340 - 1350	1690 - 1700	2040 - 2050
650 - 660	1000 - 1010	1350 - 1360	1700 - 1710	2050 - 2060
660 - 670	1010 - 1020	1360 - 1370	1710 - 1720	2060 - 2070
670 - 680	1020 - 1030	1370 - 1380	1720 - 1730	2070 - 2080
680 - 690	1030 - 1040	1380 - 1390	1730 - 1740	2080 - 2090
690 - 700	1040 - 1050	1390 - 1400	1740 - 1750	2090 - 2100
700 - 710	1050 - 1060	1400 - 1410	1750 - 1760	2100 - 2110
710 - 720	1060 - 1070	1410 - 1420	1760 - 1770	2110 - 2120
720 - 730	1070 - 1080	1420 - 1430	1770 - 1780	2120 - 2130
730 - 740	1080 - 1090	1430 - 1440	1780 - 1790	2130 - 2140
740 - 750	1090 - 1100	1440 - 1450	1790 - 1800	2140 - 2150

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INTERVAL SHEET  
 Continued

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Well Repository No.: W- 7220

From-To	From-To	From-To	From-To	From-To
2150-2160	2550-2560	2950-2960	3350-3360	3750-3760
2160-2170	2560-2570	2960-2970	3360-3370	3760-3770
2170-2180	2570-2580	2970-2980	3370-3380	3770-3780
2180-2190	2580-2590	2980-2990	3380-3390	3780-3790
2190-2200	2590-2600	2990-3000	3390-3400	3790-3800
2200-2210	2600-2610	3000-3010	3400-3410	3800-3810
2210-2220	2610-2620	3010-3020	3410-3420	3810-3820
2220-2230	2620-2630	3020-3030	3420-3430	3820-3830
2230-2240	2630-2640	3030-3040	3430-3440	3830-3840
2240-2250	2640-2650	3040-3050	3440-3450	3840-3850
2250-2260	2650-2660	3050-3060	3450-3460	3850-3860
2260-2270	2660-2670	3060-3070	3460-3470	3860-3870
2270-2280	2670-2680	3070-3080	3470-3480	3870-3880
2280-2290	2680-2690	3080-3090	3480-3490	3880-3890
2290-2300	2690-2700	3090-3100	3490-3500	3890-3900
2300-2310	2700-2710	3100-3110	3500-3510	3900-3910
2310-2320	2710-2720	3110-3120	3510-3520	3910-3920
2320-2330	2720-2730	3120-3130	3520-3530	3920-3930
2330-2340	2730-2740	3130-3140	3530-3540	3930-3940
2340-2350	2740-2750	3140-3150	3540-3550	3940-3950
2350-2360	2750-2760	3150-3160	3550-3560	3950-3960
2360-2370	2760-2770	3160-3170	3560-3570	3960-3970
2370-2380	2770-2780	3170-3180	3570-3580	3970-3980
2380-2390	2780-2790	3180-3190	3580-3590	3980-3990
2390-2400	2790-2800	3190-3200	3590-3600	3990-4000
2400-2410	2800-2810	3200-3210	3600-3610	-
2410-2420	2810-2820	3210-3220	3610-3620	-
2420-2430	2820-2830	3220-3230	3620-3630	-
2430-2440	2830-2840	3230-3240	3630-3640	-
2440-2450	2840-2850	3240-3250	3640-3650	-
2450-2460	2850-2860	3250-3260	3650-3660	-
2460-2470	2860-2870	3260-3270	3660-3670	-
2470-2480	2870-2880	3270-3280	3670-3680	-
2480-2490	2880-2890	3280-3290	3680-3690	-
2490-2500	2890-2900	3290-3300	3690-3700	-
2500-2510	2900-2910	3300-3310	3700-3710	-
2510-2520	2910-2920	3310-3320	3710-3720	-
2520-2530	2920-2930	3320-3330	3720-3730	-
2530-2540	2930-2940	3330-3340	3730-3740	-
2540-2550	2940-2950	3340-3350	3740-3750	-



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

Date: 9-28, 19 88

Operator's  
Well No. 8828

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     / updated X /

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

Well operator PENN VIRGINIA RESOURCES CORPORATION

Address P. O. BOX 386, DUFFIELD, VA 24244  
Farm JEWELL DAVIS ET. AL.  
Tract                      Acres 187.00 Lease No. 45-1594  
Elevation 1744.51'  
Quadrangle ROSE HILL  
County LEE District ROSE HILL  
Registered Engineer X Registration No. 13613  
Certified Land Surveyor                      Cert. No.                       
File No.                      Drawing No.                       
Date 7-29-88 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.

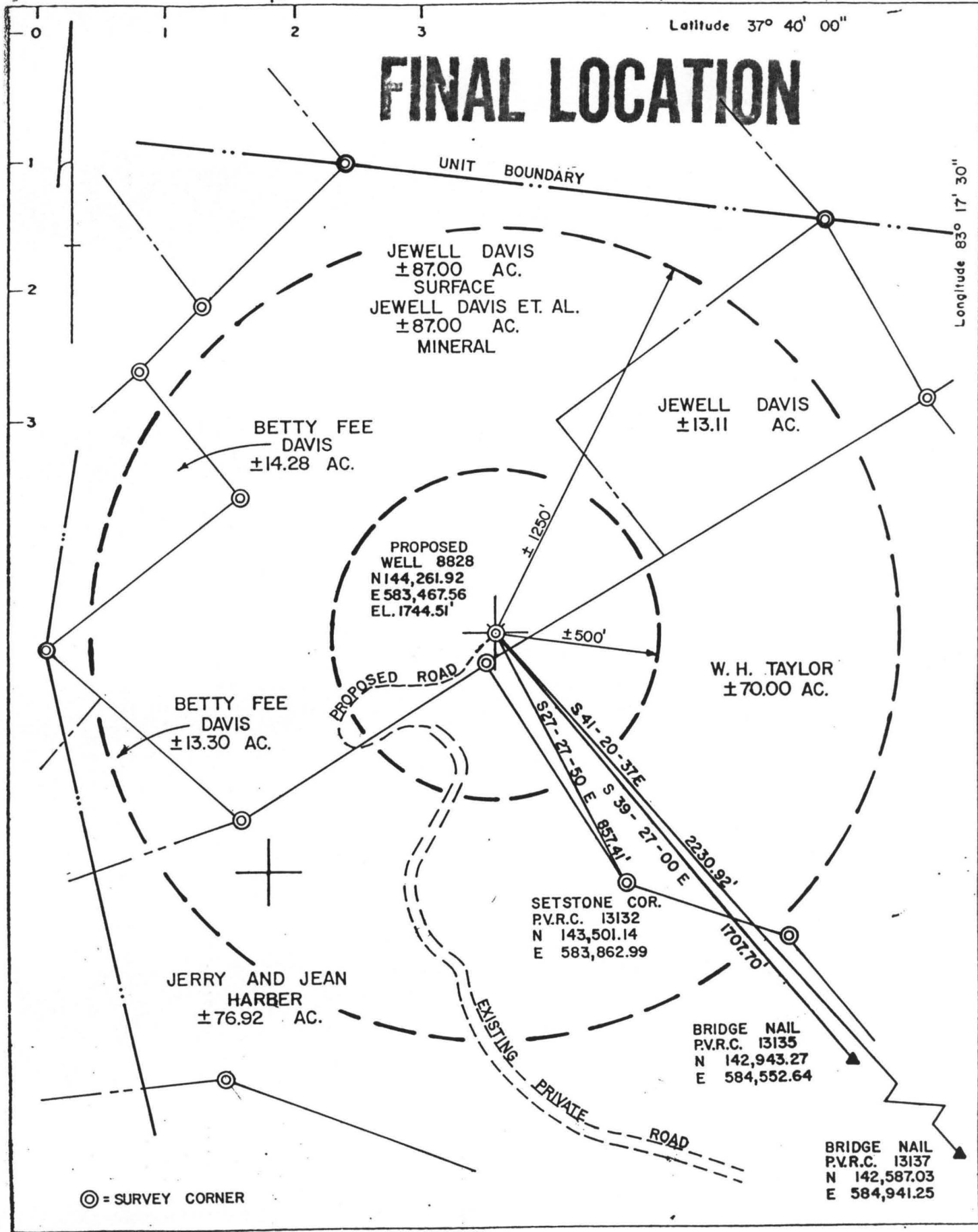
J. B. Powers  
Registered Engineer or Certified Land Surveyor  
in Charge

10,950'

Latitude 37° 40' 00"

Longitude 83° 17' 30"

# FINAL LOCATION



⊙ = SURVEY CORNER

API NO. 45 - 105 - 21193  
 WELL NAME: 8828  
 DATE March 7, 1989

LE-163

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 Rose Hill District  
Lee County, Virginia on 7th day, March month, 19 89.

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 X /  
 Plug X / 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

OR

X Two years from March 7, 1989, the date on which the referenced well was completed, the well being an exploratory well as defined in Code of Virginia, Section 45.1-286.21.

APPLICANT Penn Virginia Resources Corporation

BY William M. Ryan *W. M. Ryan*

ITS Senior Geologist

ADDRESS P.O. Box 386, Duffield, VA 24244

TELEPHONE (703) 431-2831

COMPLETION REPORT

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

LOCATION

COUNTY Lee

DISTRICT Rose Hill

SURFACE ELEVATION 1744.51'

QUADRANGLE Rose Hill

LATITUDE 13,300 'S 37° 40'

LONGITUDE 10,950'S 83° 17' 30"

DRILLING DATA

DATE DRILLING COMMENCED 9/28/88

DRILLING CONTRACTOR Ray Resources Division - Great Western

DATE DRILLING COMPLETED 12/23/88

ADDRESS P.O. Box 909, Poca, WV 25159

DATE WELL COMPLETED 2/3/89

TELEPHONE NUMBER (304) 755-8383

TOTAL DEPTH OF COMPLETED WELL 5064'

RIG TYPE X ROTARY \_\_\_\_\_ CABLE TOOL \_\_\_\_\_

GEOLOGICAL DATA

FRESH WATER AT (1) 90 FEET \_\_\_\_\_ GPM: (2) 182 FEET \_\_\_\_\_ GPM  
SALT WATER AT (1) \_\_\_\_\_ FEET \_\_\_\_\_ GPM: (2) \_\_\_\_\_ FEET \_\_\_\_\_ GPM

COAL SEAMS:

NAME	TOP	BOTTOM	THICKNESS	MINING IN AREA	
				YES	NO

OIL AND GAS SHOWS:

FORMATION	TOP	BOTTOM	THICKNESS	IFF (MCFD/BOPD)	PRESSURE	HOURS TESTED

STIMULATION RECORD

ZONE (1) Stones River FORMATION STIMULATED WITH 10,000 gallons 20% HCl and 461,000 ScfN<sub>2</sub> (60 Quality Foam Acid)  
PERFORATED 4318 TO 4328 NO. OF PERFORATIONS 20 PERFORATION SIZE .43  
FORMATION BROKE DOWN AT 900# PSIG AVERAGE INJECTED RATE 8 BBL/M Fluid Rate GPM  
INITIAL SHUT IN PRESSURE 1750# PSIG MINUTE SHUT IN PRESSURE 1624 PSIG

STIMULATION RECORD

ZONE (2) \_\_\_\_\_ FORMATION STIMULATED WITH \_\_\_\_\_  
PERFORATED \_\_\_\_\_ TO \_\_\_\_\_ NO. OF PERFORATIONS \_\_\_\_\_ PERFORATION SIZE \_\_\_\_\_  
FORMATION BROKE DOWN AT \_\_\_\_\_ PSIG AVERAGE INJECTED RATE \_\_\_\_\_ GPM  
INITIAL SHUT IN PRESSURE \_\_\_\_\_ PSIG MINUTE SHUT IN PRESSURE \_\_\_\_\_ PSIG

FINAL PRODUCTION: ( ) NATURAL (X) AFTER STIMULATION

ZONE	BOB	MCFD	HOURS TESTED	ROCK PRESSURE	HOURS TESTED
ZONE (1)	<u>26 Mcfd with a heavy show of oil and water</u>				
ZONE (2)					

FINAL PRODUCTION IF GAS ZONES ARE CONTINGLED \_\_\_\_\_ MCFD \_\_\_\_\_ HOURS TESTED \_\_\_\_\_ PSIG \_\_\_\_\_ HOURS TESTED

CASING AND TUBING

	SIZE	TOP	BOTTOM	LENGTH	PERFORATIONS FEET TO FEET	PACKERS OR BRIDGE PLUGS		
						KIND	SIZE	SET AT
<u>CONDUCTOR</u>	20"	0'	54'	54'				
<u>CASING</u> Circulated and Cemented to Surface	10 3/4"	0'	770'	770'				
<u>WATER PROTECTION</u> (Casing Set According to Section 45.1-334)	8 5/8"	0'	927'	927'				Cut & Pulled at 750'
<del>XXXX PROTECTION</del> <del>XXXXXX Casing Set According to</del> <del>XXXX Section 45.1-334</del>	7"	0'	2264'					Cut & Pulled at 977'
<u>OTHER CASING AND</u> Tubing Left In Well	4 1/2"	0'	4419'					Cut & Pulled at 3750'
<u>LINERS</u> Remaining in well								
<u>OTHER</u> used and not left								

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

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

Caves: 90'-93', 182'-186', 268'-289', ± 473', 803'-841', 855'-862'

DRILLER'S LOG

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

Geological Age	Formation	General Lithology	Color	Depth		Thickness	Remarks
				Top	Bottom		

(ATTACH DRILLER'S LOG IN THIS FORMAT)



<u>AGE</u>	<u>FORMATION</u>	<u>LITHOLOGY</u>	<u>COLOR</u>	<u>TOP</u>	<u>BOTTOM</u>	<u>THICKNESS</u>
Cambrian		Dolomite	Gray	0'	1600'	1600'
Silurian	Clinton	Shale	Red & Gray	1600'	1914'	314'
Silurian	Clinch	Sand	Gray & White	1914'	2046'	132'
Silurian	Hagan	Shale	Gray	2046'	2094'	48'
Ordovician	Sequatchie	Siltstone & Limestone	Gray	2094'	2348'	254'
Ordovician	Reedsville	Limestone & Shale	Gray	2348'	2710'	362'
Ordovician	Trenton	Limestone	Gray	2710'	3288'	578'
Ordovician	Eggleston	Limestone	Gray	3288'	3424'	136'
Ordovician	Stones River	Limestone	Gray	3424'	4657'	1233'
Ordovician	Knox	Dolomite	Gray	4657'	5064'	407'

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: LDT-SNP-GR, Audio/Temperature, Induction

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

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

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:

<u>Depth of Survey</u>	<u>Feet/Degree Deviated From True Vertical</u>	<u>Depth of Survey</u>	<u>Feet/Degree Deviated From True Vertical</u>	<u>Depth of Survey</u>	<u>Feet/Degree Deviated From True Vertical</u>
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____

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

PLUGGING AFFIDAVIT

STATE OF Virginia,  
COUNTY OF Scott, TO-WIT:  
Glenn E. Young AND William M. Ryan

being first duly sworn, depose and say that:

They are both experienced in the plugging of wells and participated in the plugging work which is the subject of this Affidavit on the referenced well.

THE PLUGGING WORK WAS FOR THE PURPOSE CHECKED BELOW:

- At the end of production or other use After drilling, re-drilling or deepening was unsuccessful, so that the well was plugged on the verbal permission of the Inspector or his designated representative under Code of Virginia Section 45.1-311.C.9.
- Partial plugging from the bottom of the hole to \_\_\_\_\_ feet below the surface, and continued operation by the well operator.
- Partial plugging from the bottom of the hole to \_\_\_\_\_ feet below the surface, for development as a water well under Section 45.1-350.
- Replug

THE MANNER OF PLUGGING OR REPLUGGING WHICH WAS COMMENCED ON 1/30/89 WAS IN THE MANNER PROVIDED BY LAW AS CHECKED BELOW

- 45.1-342 (Plugging a well that does not penetrate a coal seam)
- 45.1-343 (Plugging well penetrating coal seam without coal protection string provided in Section 45.1-344)
- 45.1-344 (Plugging wells with coal protection strings installed as provided in Section 45.1-344)
- 45.1-345 (Special plugging at the coal owner's request)
- 45.1-346 (Replugging a well previously plugged)

CHANGES IN THE PLUGGING AS PERMITTED

The well operator did \_\_\_\_\_ did not  make any change(s) in the plugging as specified in the well work permit, which changes were 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 plugging work.

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

PLUGGING DETAILS

INTERVAL (from bottom of Hole)		FORMATION(S)	TYPES OF MATERIALS USED				CASING SIZE	FILLED LINER
FROM	TO		PLUGGING	FILLING	BRIDGE	OPEN HOLE		

(ATTACH PLUGGING DETAILS IN THIS FORMAT)

Finally, if this affidavit concerns a well that was abandoned after plugging, deponents have verified that, in accordance with Section 45.1-347 of the Code of Virginia, a permanent marker of  concrete or \_\_\_\_\_ concrete and iron had been erected over the location.

Glenn Young  
First Signature

William M. Ryan  
Second Signature

Subscribed and sworn to before me a notary public, in and for the Scott County, Virginia State, this 7th day of March, 1989

Karen S. Waller My Commission Expires \_\_\_\_\_  
Notary Public My Commission Expires January 24, 1992  
Commissioned as Karen S. Kinder

<u>FROM</u>	<u>TO</u>	<u>FORMATION</u>	<u>PLUGGING MATERIAL</u>	<u>BRIDGE PLUGS</u>	<u>OPEN HOLE</u>	<u>CASING</u>
5064'	-4419'	Knox	Water		X	
4410'	-4338'	Stones River	Water			4½"
4338'	-4121'	Stones River	Cement			4½"
4121'	-2264'	Stones River Eggleston Trenton Reedsville Sequatchie	Gel		X	Top of 4½" at 3750'
2264'	- 977'	Sequatchie Hagan Shale Clinton Clinch Cambrian Dolomite	Gel			7"
977'	- 927'	Cambrian Dolomite	Cement		X	
927'	- 877'	Cambrian Dolomite	Cement			8 5/8" Top of 7" at 877'
877'	- 750'	Cambrian Dolomite	Gel			8 5/8" Top of 8 5/8" at 750'
750'				Brush Bridge		
750'	- 650'	Cambrian Dolomite	Cement			10 3/4"
650'	- 50'	Cambrian Dolomite	Gel			10 3/4"
50'	- 0'	Cambrian Dolomite	Cement			10 3/4"