

NO-420

OIL AND GAS WELL
SUMMARY REPORT

API No. 45-195-20923-00-03 VDMR Well Rep. No. _____
DMQ File No. WS-204

Operator ANR PRODUCTION COMPANY
Farm PENN VIRGINIA
Co. Well No. 10180

County WISE Quadrangle NORTON-7 1/2'
Location (UTM) N4,087,530;E346,270 UTM Zone 17
(Lat. and Long.) _____

Field _____ Province APPALACHIAN PLATEAUS
Elev. (specify) 1773. KB 1762.71 GR TD 5390 Form. at TD CORNIFEROUS
INITIAL FLOW - NONE Age DEVONIAN

Date compl. or abandoned JUNE 16, 1986
Result GAS WELL

Gas Shows _____
Gas Pays _____

Main Production _____ Prod. Form. DEVONIAN, SUNBURY; BEREA, WEIR
FINAL FLOW- 235,000 CU. FT. Age DEVONIAN; MISSISSIPPIAN

Treatment: LOWER DEVONIAN-75 QUALITY FOAM FRAC, 42,500 POUNDS OF 20/40 SAND, 7500 POUNDS OF 10/20 SAND, 618,000 SCF OF N2. UPPER DEVONIAN, BEREA, SUNBURY-75 QUALITY FOAM FRAC, 42,500 POUNDS OF 20/40 SAND, 7500 POUNDS OF 10/20 SAND, 741,000 SCF OF N2. WEIR-75 QUALITY FOAM FRAC, 40,000 POUNDS OF 10/20 SAND, 671,000 SCF OF N2.
Initial Production _____

Oil shows _____
Water FW yes at 80' _____ at _____ at _____
SH _____ 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 X Neutron _____
Density X Sonic _____ Other _____

Stratigraphic Data Source

(E-Log) 790 c. l. e. m.

Formation	Top	Datum (Subsea)	Thickness	
Little Lime	3504	-1042	140	
Top Greenbrier	3644	-1182	440	
Base Greenbrier	4084	-1622	196	
Sunbury	4280	-1818	163	
Berea	4443	-1981	49	
Dev. Shale (Cleveland)	4492	-2030	66	
3. Peak	4558	-2096	150	
U. Huron	4608	-2146	56	
M. Huron	4664	-2202	246	
L. Huron	4910	-2448	154	
oleomangy	5064	-2602	203	
Remarks	Coniferous	5267	-2805	121
	TD	5388	-2926	

References

Released to Open File: Completion

Samples

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

ANR PROD. CO.
PENN VA.
10180
NORTON - 7 1/2'
EL.

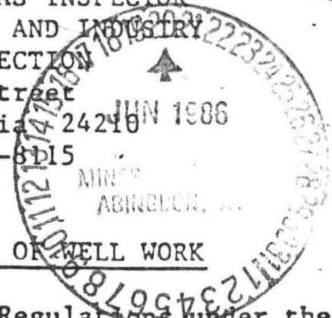
API Well No. 45 - 195 - 20923
State County Permit

Date: June 16, 19 86

Operator's
Well No. 10180

W.S. 204

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 Gas Act, the undersigned well operator reports completion of the type(s) of well work specified below on the referenced well in Richmond District Wise County, Virginia on 16 day, June Month, 19 86.

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 X / No /

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:

X Ninety days from the filing of this report,

OR

 Two years from , 19 , 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: ANR PRODUCTION COMPANY

By [Signature]
Its Manager, Drilling & Engineering

Address: 111 E. Capitol St., Suite 400
Jackson, MS 39201-2185

Telephone: (601) 961-6315

FORM 16
APPENDIX A,
SHEET 1, (OBVERSE)

API WELL NO. 45 - 195 - 20923
State County Permit
Date: June 16, 1986
Operator's Well
Name 10180

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

DRILLING CONTRACTOR Clint Hurt & Associates
ADDRESS P.O. Box 1973, Midland TX 79702
TELEPHONE _____

GEOLOGICAL TARGET FORMATION Devonian Shale, Weir

DEPTH OF COMPLETED WELL 5,390' FEET

DATE DRILLING COMMENCED 5-16-86

DATE DRILLING COMPLETED 6-3-86

DRILLING RIG: ROTARY X / CABLE TOOL _____ /

GEOLOGICAL DATA Depth Thickness
 Top Bottom

Fresh Water

+80

Salt water

Not Known

Name MINING IN AREA
 Yes No Mined Out

Coal Seams

None

Oil and Gas

Name

None

below:

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

X Applicant's own drilling experience in the area
X Information supplied by the coal operator in the area
____ Information already in possession of the Inspector
____ As follows _____

CASING AND TUBING PROGRAM

PRELIMINARY INFORMATION

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

PROGRAM DETAILS

Size	Top	Bottom	Length	Perforated	
				From	To
<u>Conductor</u>					
<u>Casing circulated and cemented in to the surface:</u>					
13-3/8"	Surface	82'	82'		
10-7/8"	Surface	355'	355'		
7"	Surface	3734'	3734'		
<u>Coal protection casing set under the special rule of Code of Virginia § 45.1-334.1</u>					
7"	Surface	3734'	3734'		
<u>Other casing and tubing left in the well:</u>					
4-1/2"	Surface	5308'	5308'		

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

None

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

None

<u>Packers or bridge plugs:</u>	<u>Kind</u>	<u>Size</u>	<u>Set At</u>
None			

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

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 ___ / require sacks to be furnished by the Survey.

- DRILLER'S LOG

Compiled by Roswell K. Barranco

<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>		
Pennsylvania	Wise & Norton	Sandstone		0	910	910	
	Lee	Sandstone & Shale		910	2522	1612	
Mississippian	Bluestone	Sandstone & Shale		2522	2696	174	
	Ravenclyff	Sandstone		2696	2806	110	
	Hinton	Sandstone & Shale		2806	3266	460	
	Maxton	Sandstone		3101	3266	165	
	Bluefield	Sandstone, Shale & Limestone		3266	3504	238	
	Greenbrier (Big Lime)	Limestone		3504	4084	580	
	Injun	Sandstone & Shale		4084	4086	2	
	Weir	Siltstone		4086	4280	194	
	Sunbury	Shale		4280	4444	164	
	Berea	Siltstone		4444	4493	49	
Devonian	Devonian Shale	Shale		4493	5266	773	
	Decollement			4954	5970	116	
Silurian	Corniferous	Limestone		5266	5390	124	

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 N/A MC
Gravity and grade: N/A

DISCOVERY OF GAS OR INDICATIONS THEREOF

Indicated potential flow before stimulation N/A MC
Rock pressure: Not Measurable psig N/A hour test

RECORD OF STIMULATION

Full description of stimulation:

Zone 1: Lower Devonian Formation
75 Quality Foam Frac; 42,500#s 20/40, 7,500#s 10/20
618,000 SCF of N₂
Perforated 4800' - 5168' # Perfs. 67 Perf. Size .375
Breakdown 2795 psig. Avg. Injection 4218 psig.
Avg. I.R. 86.1 BPM Init. S.I.P. 2717 psig 15 Min. S.I.P. 1685 psig

Zone 2: Upper Devonian, Berea, Sunbury Formation
75 Quality Foam Frac; 42,500#s 20/40, 7,500#s 10/20
741,000 SCF of N₂
Perforated 4406' - 4658' # Perfs. 65 Perf. Size .375
Breakdown 3119 psig. Avg. Injection 4025 psig.
Avg. I.R. 73.2 BPM Init. S.I.P. 2142 psig 15 Min. S.I.P. 1817 psig

Zone 3: Weir Formation
75 Quality Foam Frac, 40,000#s 10/20
671,000 SCF of N₂
Perforated 4140' - 4262' # Perfs. 66 Perf. Size .375
Breakdown 3141 psig. Avg. Injection 3972 psig.
Avg. I.R. 79.1 BPM Init. S.I.P. 1896 psig 15 Min. S.I.P. 1657 psig

Final production () natural (x) after stimulation

	BOD	MCFD	Hours Tested	Rock Pressure	Hours Tested
Zone 1: <u>Lower Devonian</u>					
Zone 2: <u>Upper Devonian, Berea, Sunbury</u>					
Zone 3: <u>Weir</u>					

Final production if gas zones are comingled: 235 MC

3 hours tested: _____ psig. _____ hours tes

DEVIATION SURVEY

Well #10180

Results

Depth From	Depth To	Survey
0'	150'	1/4 ^o
0'	300'	1/2 ^o
0'	550'	1/2 ^o
0'	800'	1/2 ^o
0'	1070'	1/4 ^o
0'	1325'	1/4 ^o
0'	1530'	3/4 ^o
0'	1750'	1 ^o
0'	2000'	1 ^o
0'	2250'	1 ^o
0'	2500'	1-1/4 ^o
0'	2750'	1-1/2 ^o
0'	3000'	1-1/2 ^o
0'	3250'	1-1/2 ^o
0'	3500'	1-1/2 ^o
0'	3750'	1-1/2 ^o
0'	4000'	1-3/4 ^o
0'	4250'	1-3/4 ^o
0'	4500'	1-3/4 ^o
0'	4750'	1-3/4 ^o
0'	5000'	2 ^o
0'	5250'	2 ^o
0'	5390'	1-3/4 ^o

WS-204

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

Date: 8-23, 19 85

Operator's Well No. 10,180

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 /

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

Well operator ANR PRODUCTION COMPANY

Address JACKSON, MISSISSIPPI
Farm PENN VIRGINIA RESOURCES CORPORATION
Tract 170 Acres 3736 Lease No.
Elevation 1762.71'
Quadrangle NORTON
County WISE District RICHMOND
Registered Engineer X Registration No. 11439
Certified Land Surveyor Cert. No.
File No. Drawing No.
Date 8-23-85 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.

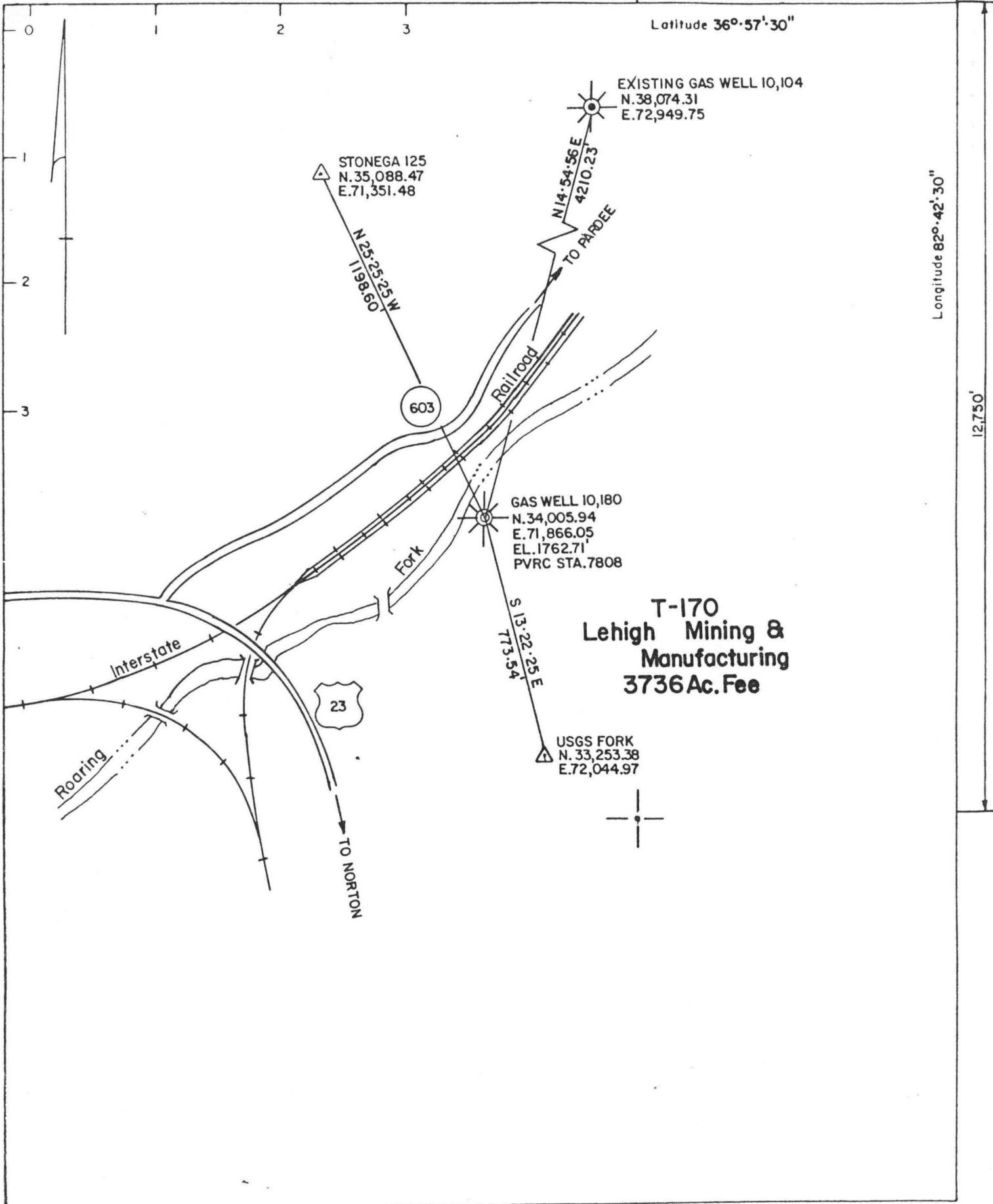
Jack Bembach
Registered Engineer or Certified Land Surveyor in Charge

5,125'

Latitude 36°-57'-30"

Longitude 82°-42'-30"

12,750'



STONEGA 125
 N. 35,088.47
 E. 71,351.48

N 25° 25' 25" W
 1198.60

603

EXISTING GAS WELL 10,104
 N. 38,074.31
 E. 72,949.75

N 14° 54' 56" E
 4210.23

GAS WELL 10,180
 N. 34,005.94
 E. 71,866.05
 EL. 1762.71
 PVRC STA. 7808

S 13° 22' 25" E
 773.54

USGS FORK
 N. 33,253.38
 E. 72,044.97

T-170
Lehigh Mining &
Manufacturing
3736 Ac. Fee

Interstate

Railroad

Fork

Roaring

23

TO NORTON

TO PARDEE

ANR PRODUCTION COMPANY

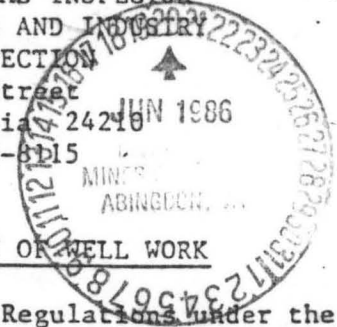
Date: June -16, 19 86

Operator's
Well No. 10180

WBS204

10180
NORTON-7 1/2'
EL.-1762.71

VIRGINIA OIL AND GAS INSPECTOR
DEPARTMENT OF LABOR AND INDUSTRY
OIL AND GAS SECTION
205 W. Main Street
Abingdon, Virginia 24210
Phone 703 628-6115



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 Richmond District, Wise County, Virginia on 16 day, June Month, 19 86.

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 X / No /

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:

X Ninety days from the filing of this report,

or

 Two years from , 19 , 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: ANR PRODUCTION COMPANY

By [Signature]
Its Manager, Drilling & Engineering

Address: 111 E. Capitol St., Suite 400
Jackson, MS 39201-2185

Telephone: (601) 961-6315

FORM 16
APPENDIX A,
SHEET 1, (OBVERSE)

API WELL NO. 45 - 195 - 20923
State County Permit
Date: June 16, 1986
Operator's Well
Name 10180

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

DRILLING CONTRACTOR Clint Hurt & Associates
ADDRESS P.O. Box 1973, Midland TX 79702
TELEPHONE _____

GEOLOGICAL TARGET FORMATION Devonian Shale, Weir

DEPTH OF COMPLETED WELL 5,390' FEET

DATE DRILLING COMMENCED 5-16-86

DATE DRILLING COMPLETED 6-3-86

DRILLING RIG: ROTARY X / CABLE TOOL _____ /

GEOLOGICAL DATA Depth Thickness
 Top Bottom

Fresh Water

+80

Salt water

Not Known

Name MINING IN AREA
 Yes No Mined Out

Coal Seams

None

Oil and Gas

None

Name

below:

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

X Applicant's own drilling experience in the area
X Information supplied by the coal operator in the area
_____ Information already in possession of the Inspector
_____ As follows _____

OTHER GENERAL INFORMATION

An electric log survey was / was not / 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 / was not / run for other purposes. This survey did / did not / 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 / 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 / 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 / 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.

CASING AND TUBING PROGRAM

PRELIMINARY INFORMATION

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

PROGRAM DETAILS

<u>Conductor</u>	<u>Size</u>	<u>Top</u>	<u>Bottom</u>	<u>Length</u>	<u>Perforated</u>	
					<u>From</u>	<u>To</u>
<u>Casing circulated and cemented in to the surface:</u>						
	13-3/8"	Surface	82'	82'		
	10-7/8"	Surface	355'	355'		
	7"	Surface	3734'	3734'		
<u>Coal protection casing set under the special rule of Code of Virginia § 45.1-334.1</u>						
	7"	Surface	3734'	3734'		
<u>Other casing and tubing left in the well:</u>						
	4-1/2"	Surface	5308'	5308'		

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

None.

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

None

Packers or bridge plugs: Kind Size Set At

None

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

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 ___ / require sacks to be furnished by the Survey.

DRILLER'S LOG

Compiled by Roswell K. Barranco

<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>		
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ON A WELL DRILLED IN SEARCH OF OIL OR GAS

DISCOVERY OF OIL OR INDICATIONS THEREOF

Indicated potential flow before stimulation N/A MC
Gravity and grade: N/A

DISCOVERY OF GAS OR INDICATIONS THEREOF

Indicated potential flow before stimulation N/A MC
Rock pressure: Not Measurable psig N/A hour test

RECORD OF STIMULATION

Full description of stimulation:

Zone 1: Lower Devonian Formation
75 Quality Foam Frac; 42,500#s 20/40, 7,500#s 10/20
618,000 SCF of N₂
Perforated 4800' - 5168' # Perfs. 67 Perf. Size .375
Breakdown 2795 psig. Avg. Injection 4218 psig.
Avg. I.R. 86.1 BPM Init. S.I.P. 2717 psig 15 Min. S.I.P. 1685 psig

Zone 2: Upper Devonian, Berea, Sunbury Formation
75 Quality Foam Frac; 42,500#s 20/40, 7,500#s 10/20
741,000 SCF of N₂
Perforated 4406' - 4658' # Perfs. 65 Perf. Size .375
Breakdown 3119 psig. Avg. Injection 4025 psig.
Avg. I.R. 73.2 BPM Init. S.I.P. 2142 psig 15 Min. S.I.P. 1817 psig

Zone 3: Weir Formation
75 Quality Foam Frac, 40,000#s 10/20
671,000 SCF of N₂
Perforated 4140' - 4262' # Perfs. 66 Perf. Size .375
Breakdown 3141 psig. Avg. Injection 3972 psig.
Avg. I.R. 79.1 BPM Init. S.I.P. 1896 psig 15 Min. S.I.P. 1657 psig

Final production () natural (x) after stimulation

	BOD	MCFD	Hours Tested	Rock Pressure	Hours Tested
Zone 1: <u>Lower Devonian</u>					
Zone 2: <u>Upper Devonian, Berea, Sunbury</u>					
Zone 3: <u>Weir</u>					

Final production if gas zones are comingled: 235 MC

3 hours tested: _____ psig. _____ hours tes

DEVIATION SURVEY

Well #10180

Results

Depth From	Depth To	Survey
0'	150'	1/4 ^o
0'	300'	1/2 ^o
0'	550'	1/2 ^o
0'	800'	1/2 ^o
0'	1070'	1/4 ^o
0'	1325'	1/4 ^o
0'	1530'	3/4 ^o
0'	1750'	1 ^o
0'	2000'	1 ^o
0'	2250'	1 ^o
0'	2500'	1-1/4 ^o
0'	2750'	1-1/2 ^o
0'	3000'	1-1/2 ^o
0'	3250'	1-1/2 ^o
0'	3500'	1-1/2 ^o
0'	3750'	1-1/2 ^o
0'	4000'	1-3/4 ^o
0'	4250'	1-3/4 ^o
0'	4500'	1-3/4 ^o
0'	4750'	1-3/4 ^o
0'	5000'	2 ^o
0'	5250'	2 ^o
0'	5390'	1-3/4 ^o