

LONGITUDE 81° 20' 30"
81° 22' 30"

9100

FILE NO. Bk 73 P 67
 DRAWING NO. _____
 SCALE 1" = 1000'
 MINIMUM DEGREE OF ACCURACY 1-200
 PROVEN SOURCE OF ELEVATION USGS Top Knob 1049' S.W. of Loc. E. 1975'

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 ISSUED AND PRESCRIBED BY THE DEPARTMENT OF MINES.

(SIGNED) C. S. Valley Jr.
 R.P.E. _____ O.L.S. 92

PLACE SEAL HERE

(+) DENOTES LOCATION OF WELL ON UNITED STATES TOPOGRAPHIC MAPS

FORM IV-6
(8-78)



DATE NOV 14, 1982
 OPERATOR'S WELL NO. WI-016
 API WELL NO. _____
47 - 107 - 1237
 STATE COUNTY PERMIT

STATE OF WEST VIRGINIA
 DEPARTMENT OF MINES
 OIL AND GAS DIVISION

WELL TYPE: OIL ___ GAS X LIQUID INJECTION ___ WASTE DISPOSAL ___
 (IF "GAS,") PRODUCTION X STORAGE ___ DEEP ___ SHALLOW X
 LOCATION: ELEVATION 880.55 WATERSHED RIGHT FORK KITES RUN
 DISTRICT CLAY COUNTY WOOD
 QUADRANGLE KANAWHA 7.5' Elizabeth 15' Nc
 SURFACE OWNER WESTVACO ACREAGE 268.80
 OIL & GAS ROYALTY OWNER GLEN W ROBERTS ESTATE LEASE ACREAGE 291
 LEASE NO. 1892
 PROPOSED WORK: DRILL X CONVERT ___ DRILL DEEPER ___ REDRILL ___ FRACTURE OR STIMULATE ___ PLUG OFF OLD FORMATION ___ PERFORATE NEW FORMATION ___ OTHER PHYSICAL CHANGE IN WELL (SPECIFY) _____

PLUG AND ABANDON ___ CLEAN OUT AND REPLUG ___
 TARGET FORMATION MARCELLUS ESTIMATED DEPTH 5500'
 WELL OPERATOR BOW VALLEY PETRO. DESIGNATED AGENT W.E. STOVER
 ADDRESS 600 COMMERCE SQUARE ADDRESS BOX 235
CHARLESTON WVA 25301 CULLODEN WVA 25510

DEC 6 1982

RECEIVED

DEC 22 1983

OIL & GAS DIVISION
DEPT. OF MINES



State of West Virginia
Department of Mines
Oil and Gas Division

Date December 16, 1983
Operator's
Well No. WI016
Farm Roberts
API No. 47 - 107 - 1237
107-1237

WELL OPERATOR'S REPORT
OF
DRILLING, FRACTURING AND/OR STIMULATING, OR PHYSICAL CHANGE

WELL TYPE: Oil / Gas X / Liquid Injection / Waste Disposal /
(If "Gas," Production X / Underground Storage / Deep / Shallow X /)

LOCATION: Elevation: 880.55 Watershed Right Fork Kites Run
District: Clay County Wood Quadrangle Kanawha

COMPANY Bow Valley Petroleum, Inc.
ADDRESS 600 Commerce Sq. Charleston, WV.
DESIGNATED AGENT Robert Long
ADDRESS Box 235 Culloden, WV.
SURFACE OWNER Westvaco
ADDRESS Parkersburg, WV.
MINERAL RIGHTS OWNER Glen W. Roberts Estate
ADDRESS Box 92 Elizabeth, West Virginia
OIL AND GAS INSPECTOR FOR THIS WORK Deo Mace
ADDRESS Sandridge, WV.
PERMIT ISSUED November 30, 1982

| Casing & Tubing Size | Used in Drilling | Left in Well | Cement fill up Cu. ft. |
|----------------------|------------------|--------------|------------------------|
| 20-16 Cond. | | | |
| 13-10" | 39.70 | 39.70 | 15sks |
| 9 5/8 | 258.50 | 258.50 | to surface |
| 8 5/8 | | | |
| 7 | 2046.30 | 2046.30 | 125sks |
| 5 1/2 | | | |
| 4 1/2 | 5209 | 5209 | 270sks |
| 3 | | | |
| 2 | | 4981.79 | |
| Liners used | | | |

DRILLING COMMENCED
DRILLING COMPLETED December 15, 1982
IF APPLICABLE: PLUGGING OF DRY HOLE ON CONTINUOUS PROGRESSION FROM DRILLING OR REWORKING. VERBAL PERMISSION OBTAINED ON

GEOLOGICAL TARGET FORMATION Devonian Shale Depth feet
Depth of completed well 5237' feet Rotary X / Cable Tools
Water strata depth: Fresh 130 feet; Salt feet
Coal seam depths: N/A Is coal being mined in the area? No

OPEN FLOW DATA
Producing formation Devonian Shale Pay zone depth 2348'-5011' feet
Gas: Initial open flow Mcf/d Oil: Initial open flow Bbl/d
Final open flow 231 Mcf/d Final open flow Bbl/d
Time of open flow between initial and final tests 72 hours
Static rock pressure 575 psig (surface measurement) after 24 hours shut in
(If applicable due to multiple completion--)
Second producing formation Pay zone depth feet
Gas: Initial open flow Mcf/d Oil: Initial open flow Bbl/d
Final open flow Mcf/d Oil: Final open flow Bbl/d
Time of open flow between initial and final tests hours
Static rock pressure psig (surface measurement) after hours shut in

DETAILS OF PERFORATED INTERVALS, FRACTURING OR STIMULATING, PHYSICAL CHANGE, ETC.

1st Stage (N₂ Frac) Perforation Interval ^{up Dev. Interval} ~~3149'-5011'~~ (24 holes), 800 gal HCl @ 15%
Max.Pressure=3350#, Min.Pressure=2350#, N₂ Injection Rate=50,000 sft.³/min, ISIP-2020#, Partial Ballout.

2nd Stage (N₂ Frac) Perforation Interval ^{Berea up Dev.} 2349'-2726' (18 holes). 1250 gal HCl @ 15%,
N₂ Injected=1,260,000. Max.Pressure=3000#, Min.Pressure=2150#. N₂ Injection Rate=10,000 sft.³/min. Partial Ballout

WELL LOG

| FORMATION | COLOR | HARD OR SOFT | TOP FEET | BOTTOM FEET | REMARKS Including indication of all fresh and salt water, coal, oil and gas |
|--------------|-------|--------------|----------|-------------|--|
| Top Soil | | | 0 | 10 | |
| Sand & Shale | | | 10 | 38 | |
| Shale | | | 38 | 50 | |
| Sand & Shale | | | 50 | 89 | |
| Red Rock | | | 89 | 100 | |
| Sand & Shale | | | 100 | 160 | H ₂ O @ 130' |
| Sand | | | 160 | 220 | |
| Red Rock | | | 220 | 230 | Electric Log Tops |
| Sand & Shale | | | 230 | 288 | K.B. 891.55 |
| Sand | | | 288 | 300 | Elev.880.55 |
| Sand & Shale | | | 300 | 337 | |
| Sand | | | 337 | 380 | Gr.Lime 1746'-1900' |
| Sand & Shale | | | 380 | 596 | Injun 1900'-1966' |
| Sand | | | 596 | 664 | Sunbury Shale 2300'-2354 |
| Sand & Shale | | | 664 | 800 | Berea Sand 2354'-2357' |
| Shale | | | 800 | 870 | Dev.Shale 2357'-5237' |
| Sand & Shale | | | 870 | 1670 | |
| Sand | | | 1670 | 1700 | |
| Shale | | | 1700 | 1717 | |
| Sand & Shale | | | 1717 | 1739 | |
| Sand | | | 1739 | 1965 | |
| Sand & Shale | | | 1965 | 2580 | |
| Shale | | | 2580 | 5220 T.D. | |
| | | | | 5237 T.D. | 5237 T.D. |
| | | | | | 5237 |
| | | | | | 2357 |
| | | | | | 2880 |
| | | | | | 0 non - 5148 - E log |
| | | | | | Dev. 881 |

(Attach separate sheets as necessary)

Bow Valley Petroleum, Inc.

Well Operator

By: Maurice Combs

Date: 12/19/83

Note: Regulation 2.02(i) provides as follows:
"The term 'log' or 'well log' shall mean a systematic detailed geological record of all formations, including ..., encountered in the drilling of a well."



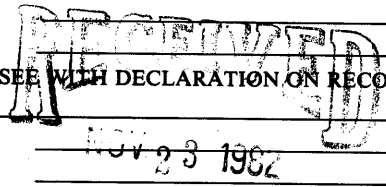
1) Date: November, 23, 19 82
2) Operator's Well No. WT 016
3) API Well No. 47 State 107 County _____ Permit _____

DRILLING CONTRACTOR:

STATE OF WEST VIRGINIA
DEPARTMENT OF MINES, OIL AND GAS DIVISION

OIL AND GAS WELL PERMIT APPLICATION

- 4) WELL TYPE: A Oil _____ / Gas _____
B (If "Gas", Production _____ / Underground storage _____ / Deep _____ / Shallow _____)
- 5) LOCATION: Elevation: _____ Watershed: _____
District: _____ County: _____ Quadrangle: _____
- 6) WELL OPERATOR _____ 11) DESIGNATED AGENT _____
Address _____ Address _____
- 7) OIL & GAS ROYALTY OWNER _____ 12) COAL OPERATOR _____
Address _____ Address _____
Acreage _____
- 8) SURFACE OWNER _____ 13) COAL OWNER(S) WITH DECLARATION ON RECORD:
Address _____ Name _____
Address _____ Name _____
- 9) FIELD SALE (IF MADE) TO: _____ 14) COAL LESSEE WITH DECLARATION ON RECORD:
Address _____ Name _____
Address _____
- 10) OIL & GAS INSPECTOR TO BE NOTIFIED
Name _____
Address _____
- 15) PROPOSED WORK: Drill _____ / Drill deeper _____ / Redrill _____ / Fracture or stimulate _____
Plug off old formation _____ / Perforate new formation _____
Other physical change in well (specify) _____
- 16) GEOLOGICAL TARGET FORMATION, _____
- 17) Estimated depth of completed well, _____ feet
- 18) Approximate water strata depths: Fresh, _____ feet; salt, _____ feet.
- 19) Approximate coal seam depths: _____ Is coal being mined in the area? Yes _____ / No _____



DEPT. OF MINES

20) CASING AND TUBING PROGRAM

| CASING OR TUBING TYPE | SPECIFICATIONS | | | | | FOOTAGE INTERVALS | | CEMENT FILL-UP OR SACKS (Cubic feet) | PACKERS |
|-----------------------|----------------|-------|----------------|-----|------|-------------------|--------------|--------------------------------------|---------------|
| | Size | Grade | Weight per ft. | New | Used | For drilling | Left in well | | |
| Conductor | | | | | | | | | Kinds |
| Fresh water | | | | | | | | | |
| Coal | | | | | | | | | Sizes |
| Intermediate | | | | | | | | | |
| Production | | | | | | | | | Depths set |
| Tubing | | | | | | | | | |
| Liners | | | | | | | | | Perforations: |
| | | | | | | | | | Top Bottom |

- 21) EXTRACTION RIGHTS
Check and provide one of the following:
 Included is the lease or leases or other continuing contract or contracts by which I hold the right to extract oil or gas.
 The requirement of Code 22-4-1-(c) (1) through (4). (See reverse side for specifics.)
- 22) ROYALTY PROVISIONS
Is the right to extract, produce or market the oil or gas based upon a lease or other continuing contract or contracts providing for flat well royalty or any similar provision for compensation to the owner of the oil or gas in place which is not inherently related to the volume of oil or gas so extracted, produced or marketed? Yes No
If the answer above is No, nothing additional is needed. If the answer is Yes, you may use Affidavit Form IV-60.
- 23) Required Copies (See reverse side.)
- 24) Copies of this Permit Application and the enclosed plat and reclamation plan have been mailed by registered mail or delivered by hand to the above named coal operator, coal owner(s), and coal lessee on or before the day of the mailing or delivery of this Permit Application to the Department of Mines at Charleston, West Virginia.

Notary: _____ Signed: _____
My Commission Expires _____ Its: _____

OFFICE USE ONLY
DRILLING PERMIT

Date

This permit covering the well operator and well location shown below is evidence of permission granted to drill in accordance with the pertinent legal requirements subject to the conditions contained herein and on the reverse hereof. Notification must be given to the District Oil and Gas Inspector. (Refer to No. 10) Prior to the construction of roads, locations and pits for any permitted work. In addition, the well operator or his contractor shall notify the proper district oil and gas inspector 24 hours before actual permitted work has commenced.)

Permit expires _____ unless drilling is commenced prior to that date and prosecuted with due diligence.
Bond: _____ Agent: _____ Plat: _____ Casing _____ Fee _____
Administrator, Office of Oil and Gas