

EXHIBIT 8

CARN1HRG.XLS

CASE 10970
NMOCD EXAMINER HEARING
MAY 12, 1994
MERRION OIL & GAS CORP.

CARNAHAN COM #1 MONTHLY GAS PRODUCTION ALLOCATION FORMULA

GENERAL METHODOLOGY

1. CALCULATE PICTURED CLIFFS (PC) RESERVES FROM VOLUMETRICS.
2. CALCULATE PC INITIAL MONTHLY PRODUCTION RATE BASED ON INITIAL FLOW TEST.
3. BASED ON OPERATING COSTS OF \$500/MO, CALCULATE PC ABANDONMENT RATE.
4. KNOWING INITIAL RATE, FINAL RATE, AND RESERVES, CALCULATE PC DECLINE RATE.
5. CAN NOW GENERATE PC PRODUCTION SCHEDULE FROM NOW TILL ABANDONMENT.
6. CALCULATE FRUITLAND COAL PRODUCTION RATE FOR EACH MONTH BY SUBTRACTING PC RATE FROM TOTAL RATE.

1. CALCULATE PC RESERVES FROM VOLUMETRICS

$$G_p = [7758 * O * h * A * (1 - S_w) / B_g] * \text{BTU Factor} * \text{Recovery Factor}$$

where:

G_p = Ultimate PC gas reserves in MMBTU.

7758 = Bbls/ac-ft conversion.

O = porosity = 18%.

h = Net pay = 30 feet.

A = Drainage area = 160 ac.

S_w = water saturation = 50%.

B_g = gas formation volume factor (RVB/Mcf) = $5.04 * z * T / P$.

z = gas deviation factor at reservoir conditions = 0.94.

T = Reservoir temperature = 100 F = 560 R.

P = reservoir pressure as measured during initial completion of PC.

BTU Factor = MMBTU/MCF from initial PC gas analysis.

Recover Factor 85%

THEREFORE:

$$G_p = [7758 * .18 * 30 * 160 * (1-.5) / \{5.04 * .94 * 560 / P\}] * \text{BTU Factor}$$

$$G_p \text{ (mmbtu)} = 1263 \text{ (mcf/psia)} * P \text{ (psia)} * \text{BTU Factor (mmbtu/mcf)} * 85\%$$

2. CALCULATE PC INITIAL MONTHLY PRODUCTION RATE

$$Q_{pc}(1) = Q_t(1) * \{Q_{pc}(\text{test}) / [Q_{pc}(\text{test}) + Q_{fc}(\text{test})]\}$$

and

$$Q_{pci}(\text{decline}) = Q_{pc}(1) * 30.4 / \text{Days Prod}(1)$$

where

$Q_{pc}(1)$ = first month PC production in mmbtu/mo.

$Q_t(1)$ = first month total production in mmbtu/mo.

$Q_{pc}(\text{test})$ = final PC flow test in mmbtu/day.

$Q_{fc}(\text{test})$ = final Fruitland Coal flow test in mmbtu/day.

Days Prod(1) = number of days the well was on in the first month.

$Q_{pci}(\text{decline})$ = initial monthly production rate to be used in forecasting future PC production .
Units are in MMBTU/MO.

3. CALCULATE PC ABANDONMENT RATE

$$Q_{pca} = \text{Op Cost} / \{\text{Price} * \text{NRI} * (1 - \text{Tax})\}$$

where

Q_{pca} = PC abandonment rate in mmbtu/mo.

Op Cost = monthly operating expense = \$500/mo.

Price = wellhead gas price = \$1.65/mmbtu.

NRI = average net revenue interest = 84%.

Tax = state & local severance and advalorem taxes = 9%.

THEREFORE

$$Q_{pca} = 500 / \{1.65 * .84 * (1 - .09)\}$$

$$Q_{pca} = 396 \text{ mmbtu/mo}$$

4. CALCULATE PC DECLINE RATE

$$D = \{Q_{pci}(\text{decline}) - Q_{pca}\} / G_p$$

where

D = nominal decline rate (fraction/mo)

$Q_{pci}(\text{decline})$ = initial monthly production rate in mmbtu/mo as calculated in Step 2.

Q_{pca} = PC abandonment rate in mmbtu/mo = 396 mmbtu/mo.

G_p = Ultimate PC gas reserves in MMBTU as calculated in step 1

5. CALCULATE PC PRODUCTION IN FUTURE MONTH "X"

$$Q_{pc}(x) = Q_{pci}(\text{decline}) * \exp \{-D * t(x)\}$$

where

$Q_{pc}(x)$ = PC production in mmbtu for month "x".

$Q_{pci}(\text{decline})$ = initial monthly production rate in mmbtu/mo as calculated in Step 2.

D = nominal decline rate (fraction/mo) as calculated in Step 4.

$t(x)$ = number of months from initial production to month "x".

6. CALCULATE FRUITLAND COAL RATE IN FUTURE MONTH "X"

$$Q_{fc}(x) = Q_t(x) - Q_{pc}(x)$$

where

$Q_{fc}(x)$ = Fruitland Coal production in mmbtu in month "x".

$Q_t(x)$ = total well production in mmbtu in month "x".

$Q_{pc}(x)$ = PC production in mmbtu for month "x" as calculated in Step 5.