



COLEMAN PETROLEUM ENGINEERING COMPANY

PHONE EXPRESS 3-3813

611 GRIMES

P. O. BOX 1829

HOBBS, NEW MEXICO

DECEMBER 26, 1969

MOBIL OIL CORPORATION
P. O. Box 633
MIDLAND, TEXAS

RE: NORTH VACUUM TOWER GAS
BRIDGES STATE, No. 130
4-POINT BACK PRESSURE TEST
& GAS SAMPLE & ANALYSIS

GENTLEMEN:

IN COMPLIANCE WITH YOUR INSTRUCTIONS, A 4-POINT BACK PRESSURE TEST WAS CONDUCTED, AND THE ABSOLUTE OPEN FLOW POTENTIAL WAS CALCULATED TO BE 3500 MCF/D. THE AVERAGE GAS PRODUCTION WAS RECORDED AS 1107.0 MCF/D WITH 33.78 BO/D, AND A RESULTING GOR OF 32771 CF GAS/BO. THE AVERAGE GAS PRODUCTION FOR THE 24 HOURS PRODUCTION TEST WAS RECORDED AS 1573.3 MCF/D WITH 132.30 BO/D AND A RESULTING GOR OF 11665 CF GAS/BO.

THE SAMPLE TAKEN DURING TEST YIELDED COMPONENT PERCENTAGES AS FOLLOWS:

| | |
|------------------|-------|
| CARBON DIOXIDE | 0.48 |
| NITROGEN | 0.83 |
| OXYGEN | 0.00 |
| HYDROGEN SULFIDE | 0.00 |
| METHANE | 85.02 |
| ETHANE | 8.19 |
| PROPANE | 3.54 |
| ISO-BUTANE | 0.50 |
| NORMAL BUTANE | 0.93 |
| ISO-PENTANE | 0.19 |
| NORMAL PENTANE | 0.16 |
| HEXANES PLUS | 0.16 |

TOTAL 100.00

| | |
|------------------------|--------|
| CALCULATED SP. G. | 0.6676 |
| CALCULATED BTU SAT DRY | 1163 |
| CALCULATED BTU SAT WET | 1143 |

*Analysis
Original
in Midland
Central File
Copy*

VERY TRULY YOURS

COLEMAN PETROLEUM ENG. CO.

Joe A. Coleman
JOE A. COLEMAN

NEW MEXICO OIL CONSERVATION COMMISSION
MULTIPOINT AND ONE POINT BACK PRESSURE TEST FOR GAS WELL

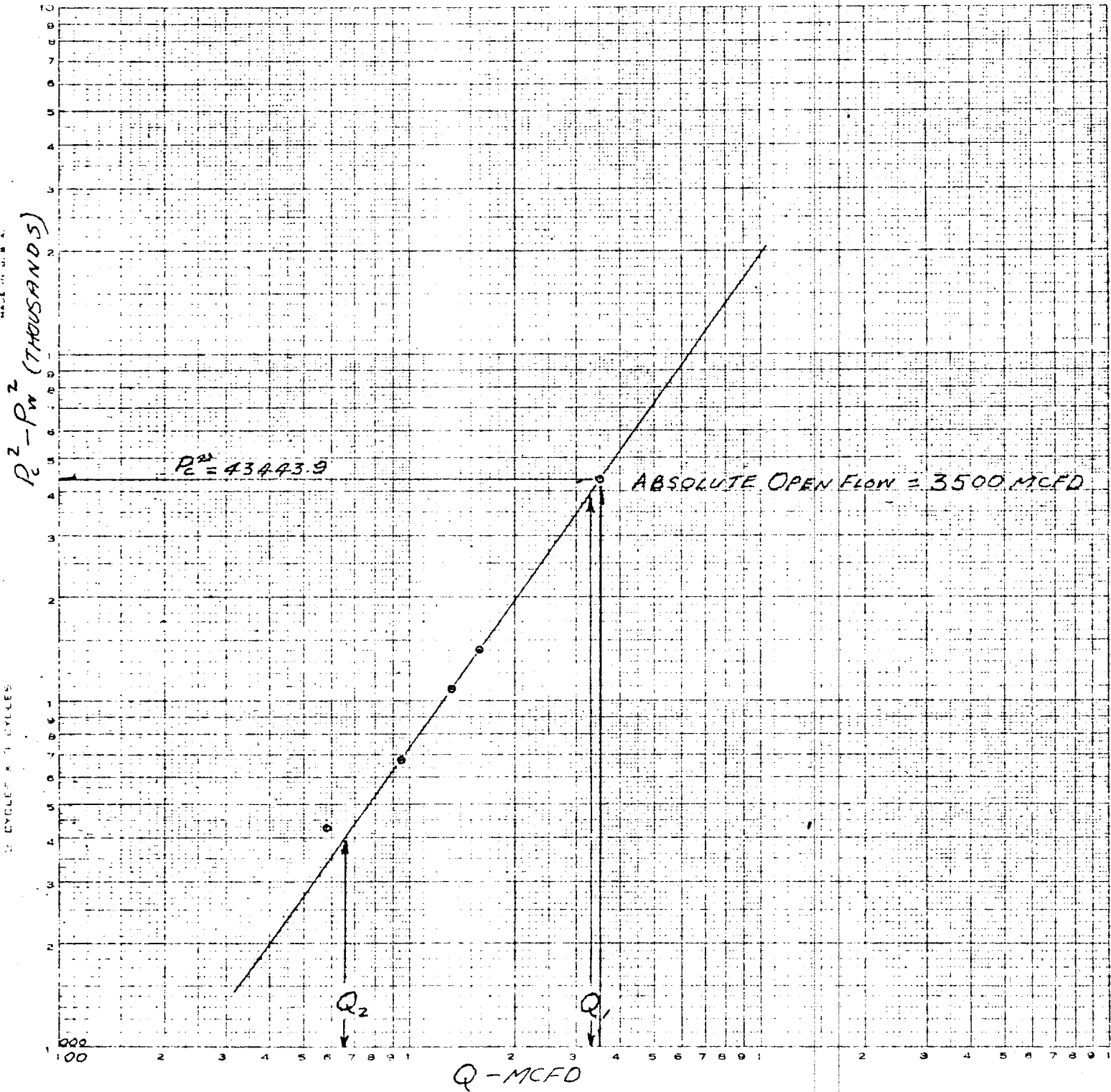
Form C-122
Revised 9-1-65

| Type Test <input type="checkbox"/> Initial <input type="checkbox"/> Annual <input type="checkbox"/> Special | | | | Test Date 12-19-69 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|-----------------------------|-------------------------------------|-----------------------------|---|---|--|----------------------|----------|-----------------------------|-----------------------------|-----------------------------|---|---|--|---|---|--------|--------|--------|-------|---------------------------------------|-----------|---|--------|--------|--------|------|-------|--------------------------------|-------|--------|--------|---------|-----|------|-------|--------------------------------|--------|---------|---------|------|-----|------|-------|-------------------|--------------|--|---|--|--|--|--|----------------------|-------|--|
| Company MORROW OIL CORPORATION | | | Connection NONE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Pool NORTH VACUUM | | Formation MORROW GAS | | Unit 320 AC. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Completion Date 12-12-69 | | Total Depth 12612' | Plug Back TD 12612' | Elevation 4053' GL | Farm or Lease Name BRIDGES STATE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Csg. Size 7" | Wt. 25 | d 6.275 | Set At 12199' | Perforations: OPEN HOLE From 12199' To 12612' | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Tbg. Size 2 3/8" | Wt. 4.7 | d 1.995 | Set At 12215' | Perforations: From OPEN ENDED | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Type Well - Single - Bradenhead - G.G. or G.O. Multiple SINGLE | | | Packer Set At 12148' | | County LEA | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Producing Thru TUBING | | Reservoir Temp. °F 176° @ 12100' | Mean Annual Temp. °F 60 | Baro. Press. - P _g 13.2 | State NEW MEXICO | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| L 12106' | H - | G _g 0.662 | % CO ₂ 0.48 | % N ₂ 0.83 | % H ₂ S 0.00 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | Prover - | Meter Run X | Taps F | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| FLOW DATA | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| NO. | Prover Line Size | X | Orifice Size | Press. p.s.i.g. | Diff. hw | Temp. °F | TUBING DATA | | CASING DATA | | Duration of Flow | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | Press. p.s.i.g. | Temp. °F | Press. p.s.i.g. | Temp. °F | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SI | | | | | | | 1570 | | | | 120 HRS | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1. | 1 | 8/64 | 1.250 | 610 | 6 | 80 | 4105 | 71 | PACKER | - | 2.0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2. | 1 | 8/64 | 1.250 | 610 | 16 | 80 | 3905 | 72 | - | - | 1.0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3. | 1 | 10/64 | 1.250 | 610 | 31 | 80 | 3610 | 72 | - | - | 1.0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4. | 1 | 12/64 | 1.250 | 610 | 44 | 75 | 3380 | 70 | - | - | 1.0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| RATE OF FLOW CALCULATIONS | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| NO. | Coefficient (24 Hour) | $\sqrt{h_w P_m}$ | Pressure P _m | Flow Temp. Factor Ft. | Gravity Factor F _g | Super Compress. Factor, F _{pv} | Rate of Flow Q, Mcfd | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | 7.469 | 61.14 | 623.2 | 0.9813 | 1.224 | 1.058 | 560.4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | 7.469 | 99.85 | 623.2 | 0.9813 | 1.224 | 1.058 | 947.8 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | 7.469 | 139.00 | 623.2 | 0.9813 | 1.224 | 1.058 | 1319.3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | 7.469 | 165.59 | 623.2 | 0.9859 | 1.224 | 1.059 | 1580.6 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <table border="0" style="width:100%;"> <tr> <td>NO.</td> <td>P_r</td> <td>Temp. °R</td> <td>T_r</td> <td>Z</td> <td>Gas Liquid Hydrocarbon Ratio</td> <td colspan="2">32771 Mcf/bbl.</td> </tr> <tr> <td>1</td> <td>0.93</td> <td>510</td> <td>1.44</td> <td>0.894</td> <td>A.P.I. Gravity of Liquid Hydrocarbons</td> <td colspan="2">50.2 Deg.</td> </tr> <tr> <td>2</td> <td>0.93</td> <td>510</td> <td>1.44</td> <td>0.894</td> <td>Specific Gravity Separator Gas</td> <td colspan="2">0.668</td> </tr> <tr> <td>3</td> <td>0.93</td> <td>510</td> <td>1.41</td> <td>0.894</td> <td>Specific Gravity Flowing Fluid</td> <td colspan="2">XXXXXX</td> </tr> <tr> <td>4</td> <td>0.93</td> <td>535</td> <td>1.43</td> <td>0.891</td> <td>Critical Pressure</td> <td colspan="2">673 P.S.I.A.</td> </tr> <tr> <td>5</td> <td></td> <td></td> <td></td> <td></td> <td>Critical Temperature</td> <td colspan="2">374 R</td> </tr> </table> | | | | | | | | NO. | P _r | Temp. °R | T _r | Z | Gas Liquid Hydrocarbon Ratio | 32771 Mcf/bbl. | | 1 | 0.93 | 510 | 1.44 | 0.894 | A.P.I. Gravity of Liquid Hydrocarbons | 50.2 Deg. | | 2 | 0.93 | 510 | 1.44 | 0.894 | Specific Gravity Separator Gas | 0.668 | | 3 | 0.93 | 510 | 1.41 | 0.894 | Specific Gravity Flowing Fluid | XXXXXX | | 4 | 0.93 | 535 | 1.43 | 0.891 | Critical Pressure | 673 P.S.I.A. | | 5 | | | | | Critical Temperature | 374 R | |
| NO. | P _r | Temp. °R | T _r | Z | Gas Liquid Hydrocarbon Ratio | 32771 Mcf/bbl. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | 0.93 | 510 | 1.44 | 0.894 | A.P.I. Gravity of Liquid Hydrocarbons | 50.2 Deg. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | 0.93 | 510 | 1.44 | 0.894 | Specific Gravity Separator Gas | 0.668 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | 0.93 | 510 | 1.41 | 0.894 | Specific Gravity Flowing Fluid | XXXXXX | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | 0.93 | 535 | 1.43 | 0.891 | Critical Pressure | 673 P.S.I.A. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5 | | | | | Critical Temperature | 374 R | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <table border="0" style="width:100%;"> <tr> <td>NO.</td> <td>P_c²</td> <td>P_w²</td> <td>P_r²</td> <td>P_c² - P_w²</td> <td>(1) $\frac{P_c^2}{P_c^2 - P_w^2} = 3.103$</td> <td>(2) $\left[\frac{P_c^2}{P_c^2 - P_w^2} \right]^n = 2.238$</td> </tr> <tr> <td>1</td> <td>-</td> <td>3057.2</td> <td>3052.6</td> <td>1291.3</td> <td></td> <td></td> </tr> <tr> <td>2</td> <td>-</td> <td>3051.2</td> <td>3045.2</td> <td>1700.2</td> <td></td> <td></td> </tr> <tr> <td>3</td> <td>-</td> <td>3093.2</td> <td>3250.5</td> <td>10917.4</td> <td></td> <td></td> </tr> <tr> <td>4</td> <td>-</td> <td>5026.2</td> <td>10443.0</td> <td>11000.2</td> <td></td> <td></td> </tr> <tr> <td>5</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table> <p style="text-align:center;">AOF = Q $\left[\frac{P_c^2}{P_c^2 - P_w^2} \right]^n = 3521$</p> | | | | | | | | NO. | P _c ² | P _w ² | P _r ² | P _c ² - P _w ² | (1) $\frac{P_c^2}{P_c^2 - P_w^2} = 3.103$ | (2) $\left[\frac{P_c^2}{P_c^2 - P_w^2} \right]^n = 2.238$ | 1 | - | 3057.2 | 3052.6 | 1291.3 | | | 2 | - | 3051.2 | 3045.2 | 1700.2 | | | 3 | - | 3093.2 | 3250.5 | 10917.4 | | | 4 | - | 5026.2 | 10443.0 | 11000.2 | | | 5 | | | | | | | | | | | | |
| NO. | P _c ² | P _w ² | P _r ² | P _c ² - P _w ² | (1) $\frac{P_c^2}{P_c^2 - P_w^2} = 3.103$ | (2) $\left[\frac{P_c^2}{P_c^2 - P_w^2} \right]^n = 2.238$ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | - | 3057.2 | 3052.6 | 1291.3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | - | 3051.2 | 3045.2 | 1700.2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | - | 3093.2 | 3250.5 | 10917.4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | - | 5026.2 | 10443.0 | 11000.2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Absolute Open Flow | | | | Mcf/d @ 15.025 | | Angle of Slope @ 54° 31' | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | Slope, n 0.713 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Remarks: * THE WELL (-8353') 12406' USED FOR PRESSURE CALCULATIONS SURFACE EQUIPMENT PRESSURE TESTED TO 8300# | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Approved By Commission: | | Conducted By: | | Calculated By: | | Checked By: | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <i>[Signature]</i> | | COLEMAN, RETRO. ENG. | | JOE A. COLMAN | | JOE A. COLEMAN | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

COMPANY MOBIL OIL CORPORATION
 WELL BRIDGES STATE, No. 130
 LOCATION UNIT H SEC. 15 17 S 34 E
 COUNTY LEA NEW MEXICO
 DATE DECEMBER 19, 1969

EUGENE DIETZGEN CO.

NO. 340-LB-1 DIETZGEN GRAPH PAPER
LOGARITHMIC
CYCLES X 1 CYCLES



$Q_1 = 3300 \text{ MCFD}; \text{LOG } Q_1 = 3.51851$
 $Q_2 = 655 \text{ MCFD}; \text{LOG } Q_2 = 2.81624$
 $n = 0.71227 = 0.712$