

## The Western Company—Treatment Report

3093 29

Date 1-31-95 District Fingert N.M. F. Receipt 6309637 Operator J.K. Edwards  
Lease Chaco Well No. 2R1 Field NIP Pictured Cliffs Location Sec 7-T26N-R12W  
County SAN JUAN State N.M. Stage Number 1 This Zone ☒ This Well ☒

| WELL DATA                               |                              |                              |                              |                              |                                      |                                |                         |                                  |
|-----------------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|--------------------------------------|--------------------------------|-------------------------|----------------------------------|
| OGP <input checked="" type="checkbox"/> | NGO <input type="checkbox"/> | NOO <input type="checkbox"/> | OOP <input type="checkbox"/> | WDI <input type="checkbox"/> | IWI <input type="checkbox"/>         | Misc. <input type="checkbox"/> | Depth TD/PB <u>1213</u> | Formation <u>Pictured Cliffs</u> |
| Tubing Size <u>2 7/8</u>                | WT. <u>6.5</u>               | Set at: <u>1213</u>          | Type Packer <u>N/A</u>       | Set At <u>N/A</u>            |                                      |                                |                         |                                  |
| Casing Size <u>N/A</u>                  | WT. <u>N/A</u>               | Set From <u>N/A</u>          | To <u>N/A</u>                | Liner Size <u>N/A</u>        | Wt. <u>N/A</u>                       |                                |                         |                                  |
| Liner Set From <u>N/A</u>               | To <u>N/A</u>                | Open Hole: Size <u>N/A</u>   | From <u>N/A</u>              | To <u>N/A</u>                | Casing Perforations: Size <u>.50</u> |                                |                         |                                  |
| Holes Per Foot <u>2</u>                 | Intervals <u>1132-1142</u>   |                              |                              |                              |                                      |                                |                         |                                  |
| Previous Treatment <u>N/A</u>           | Prior Production <u>N/A</u>  |                              |                              |                              |                                      |                                |                         |                                  |

|                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                          |
|----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| TREATMENT DATA | Pad Used: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Pad Type <u>20" J-4</u><br>Treating Fluid Type: Foam <input checked="" type="checkbox"/> Water <input type="checkbox"/> Acid <input type="checkbox"/> Oil <input type="checkbox"/> Treat. Fluid Vol. <u>9240</u> Gal.<br>Base Fluid Type <u>20" J-4 70QWF</u> Base Fluid Vol. <u>9660</u> Gal.<br>Foam Qual.: <u>70</u> % Mitchell <input checked="" type="checkbox"/> Slurry <input type="checkbox"/> Surface <input type="checkbox"/> Downhole <input type="checkbox"/> Total Prop Qty. <u>38900</u> Lbs.<br>Prop Type: Sand <input checked="" type="checkbox"/> WP-1 <input type="checkbox"/> WP-3 <input type="checkbox"/> Baux. <input type="checkbox"/> Other <u>N/A</u><br>Prop Mesh Sizes, Types and Quantities <u>5800 #40/70 Brady, 2700 #20/40, 6000 #12/20</u><br>Hole Loaded With <u>KCL</u> Treat Via: Tubing <input checked="" type="checkbox"/> Casing <input type="checkbox"/> Anul. <input type="checkbox"/> Tubing & Anul. <input type="checkbox"/><br>Ball Sealers: <u>N/A</u> In <u>N/A</u> Stages of <u>N/A</u><br>Types and Number of Pumps Used <u>2 places after 1000's, 1 blender (3BL12K)</u><br>Auxiliary Materials <u>6 # Frac Gel 20, 8 # B-11, 45 FFI, 300 # J-4, 50 # P-4</u><br><u>pumped 7000 gal J-4 20" pad, 700 # 5389/1885, 5000 gal #40/70 Brady</u><br><u>100 Pumped 5000 gal 1 #20/40, 700 Pumped 966 gal</u><br><u>2 #20/40, 700 Pumped 2079 gal 3 #12/20 Brady, 600</u><br><u>pumped 2500 gal 20" J-4</u> | LIQUID/GAS PUMPED AND CAPACITIES IN BBLs.<br>Tubing Cap. <u>6.5</u><br>Casing Cap. <u>N/A</u><br>Annular Cap. <u>N/A</u><br>Open Hole Cap. <u>N/A</u><br>Fluid to Load <u>3</u><br>Pad Volume <u>50</u><br>Treating Fluid <u>220</u><br>Flush <u>6</u><br>Overflush <u>N/A</u><br>Fluid to Recover <u>230</u><br>Total N <sub>2</sub> <u>212,000</u><br>Total CO <sub>2</sub> <u>N/A</u> |
|                | PROCEDURE SUMMARY                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                          |

[illegible]

Treating Pressure: Min. 1100 Max. 2200 Avg. 1800 Customer Representative Paul Thompson  
 Inj. Rate on Treating Fluid 31 B/m Rate on Flush 21.0 B/m Western Representative T.M. Cnabb, J.B. Stray  
 Avg. Inj. Rate 26.8/m I.S.D.P. 500 Flush Dens. lb./gal. 8.34 Distribution \_\_\_\_\_  
 Final Shut-in Pressure 470 in 15 Minutes \_\_\_\_\_  
 Operator's Maximum Pressure 3000 psi

Job Number 150823 Recommendation ID # Fm0251

( ST 65Q AT 1:20 159 slurry SALS 131000 SCF WZ 900 S

CHACO #2R, 01/31/95, L309667

CHACO #2R, 01/31/95, L309332

CHACO #2R - Gas Analyses



Farmington, N.M. 87401  
(505) 325-6622

Analysis No. EDW60004  
Cust. No. 47150-10030

*Copied  
2/13/98  
For Subpoena*

### WELL/LEASE INFORMATION

|               |                             |              |                 |
|---------------|-----------------------------|--------------|-----------------|
| Company       | : J K EDWARDS ASSOCIATES    | Source       | :               |
| Well Name     | : CHACO 2XR                 | Pressure     | : 15 PSIG       |
| County        | : SAN JUAN                  | Sample Temp. | : 60 DEG. F     |
| State         | : NM                        | Well Flowing | : YES           |
| Location      | : SW 7-26N-1 <sup>2</sup> W | Date Sampled | : 10/04/96      |
| Fld/Formation | : PICTURED CLIFFS           | Sampled By   | : PAUL THOMPSON |
| Cust.Stn.No.  | :                           | Foreman/Engr | :               |

Remarks:

### ANALYSIS

| COMPONENT | MOLE %  | GPM**  | B.T.U.* | SP.GR.* |
|-----------|---------|--------|---------|---------|
| NITROGEN  | 0.315   | 0.0000 | 0.00    | 0.0030  |
| CO2       | 0.687   | 0.0000 | 0.00    | 0.0104  |
| METHANE   | 89.855  | 0.0000 | 909.60  | 0.4977  |
| ETHANE    | 5.773   | 1.5443 | 102.40  | 0.0599  |
| PROPANE   | 1.700   | 0.4685 | 42.87   | 0.0259  |
| I-BUTANE  | 0.327   | 0.1070 | 10.66   | 0.0066  |
| N-BUTANE  | 0.441   | 0.1390 | 14.42   | 0.0088  |
| I-PENTANE | 0.178   | 0.0651 | 7.14    | 0.0044  |
| N-PENTANE | 0.124   | 0.0449 | 4.98    | 0.0031  |
| HEXANES   | 0.600   | 0.2617 | 30.85   | 0.0193  |
| TOTAL     | 100.000 | 2.6305 | 1122.92 | 0.6391  |

\* @ 14.730 PSIA DRY & UNCORRECTED FOR COMPRESSIBILITY

\*\* @ 14.730 & 60 DEG. F

|                                |       |        |
|--------------------------------|-------|--------|
| COMPRESSIBILITY FACTOR         | (1/Z) | 1.0027 |
| BTU/CU.FT. (DRY) CORRECTED FOR | (1/Z) | 1125.9 |
| BTU/CU.FT. (WET) CORRECTED FOR | (1/Z) | 1106.4 |
| REAL SPECIFIC GRAVITY          |       | 0.6406 |

ANALYSIS RUN AT 14.730 PSIA & 60 DEGREES F

|                   |                 |
|-------------------|-----------------|
| CYLINDER #        | : AZT019        |
| CYLINDER PRESSURE | : 15 PSIG       |
| DATE RUN          | : 10/07/96      |
| ANALYSIS RUN BY   | : CHELLE DURBIN |

GAS ANALYSIS: TRANSCRIPTION OF TAPE FROM AUTOMATIC CHROMATOGRAPH

NAME/LOCATION:

STREAM NO. 11

DATE:

7

8

81

STATION NO.

908986

Chaco R#2

SPECIFIC GRAVITY 0.6600

BTU/CF 14.73/60F/DRY: 1163.2

| COMPONENT      | MOL %   | G.P.M. |
|----------------|---------|--------|
| CARBON DIOXIDE | 0.422   | 0.0000 |
| NITROGEN       | 0.356   | 0.0000 |
| METHANE        | 88.320  | 0.0000 |
| ETHANE         | 5.960   | 1.5930 |
| PROPANE        | 2.607   | 0.7170 |
| ISOBUTANE      | 0.494   | 0.1610 |
| N-BUTANE       | 0.671   | 0.2110 |
| ISOPENTANE     | 0.281   | 0.1020 |
| N-PENTANE      | 0.196   | 0.0710 |
| HEXANE +       | 0.723   | 0.3180 |
| TOTAL          | 100.030 | 3.1730 |

(CECBTU/074)

FEB 4 1995

# THE WESTERN COMPANY

## POSTFRAC TREATMENT SUMMARY

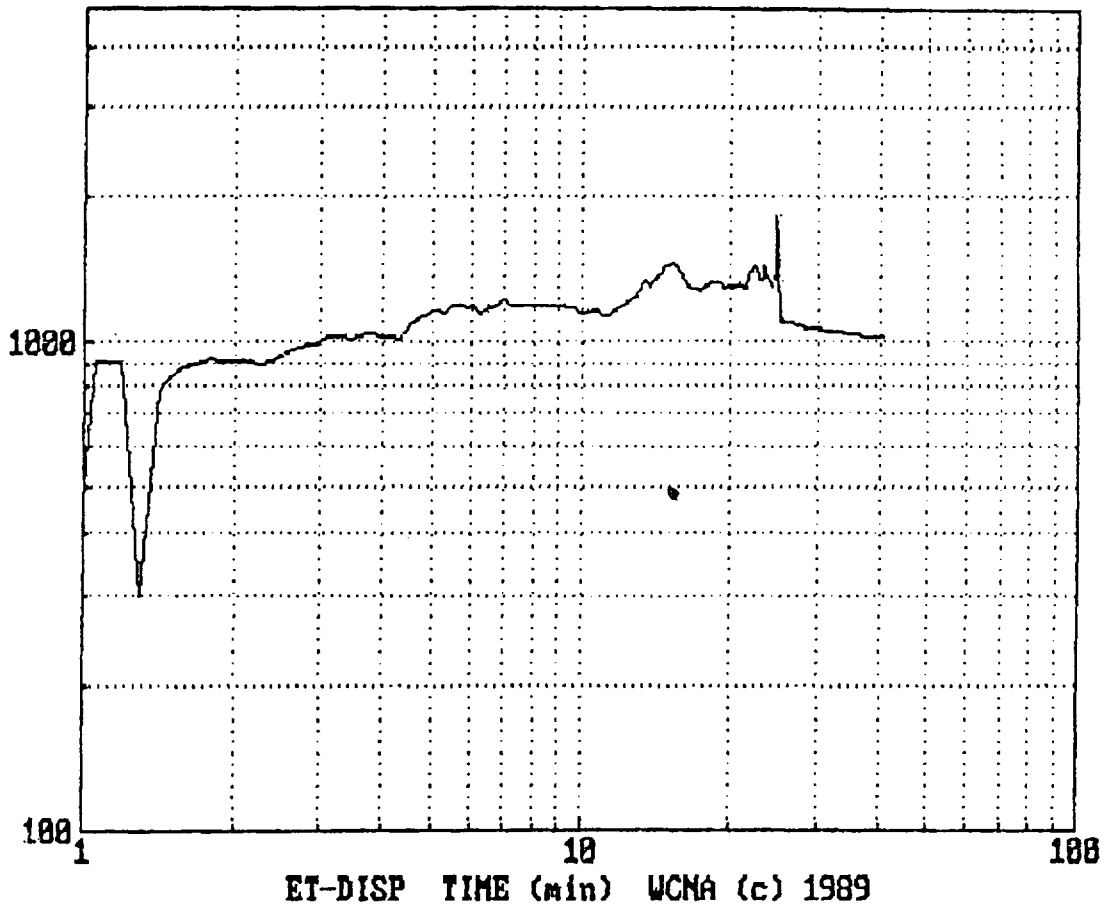
J.K. EDWARDS (WALSH ENG.)  
CHACO #2R  
SEC.07,T26N;R12W  
SAN JUAN COUNTY, NM  
*PICTURED CLIFFS FORMATION*

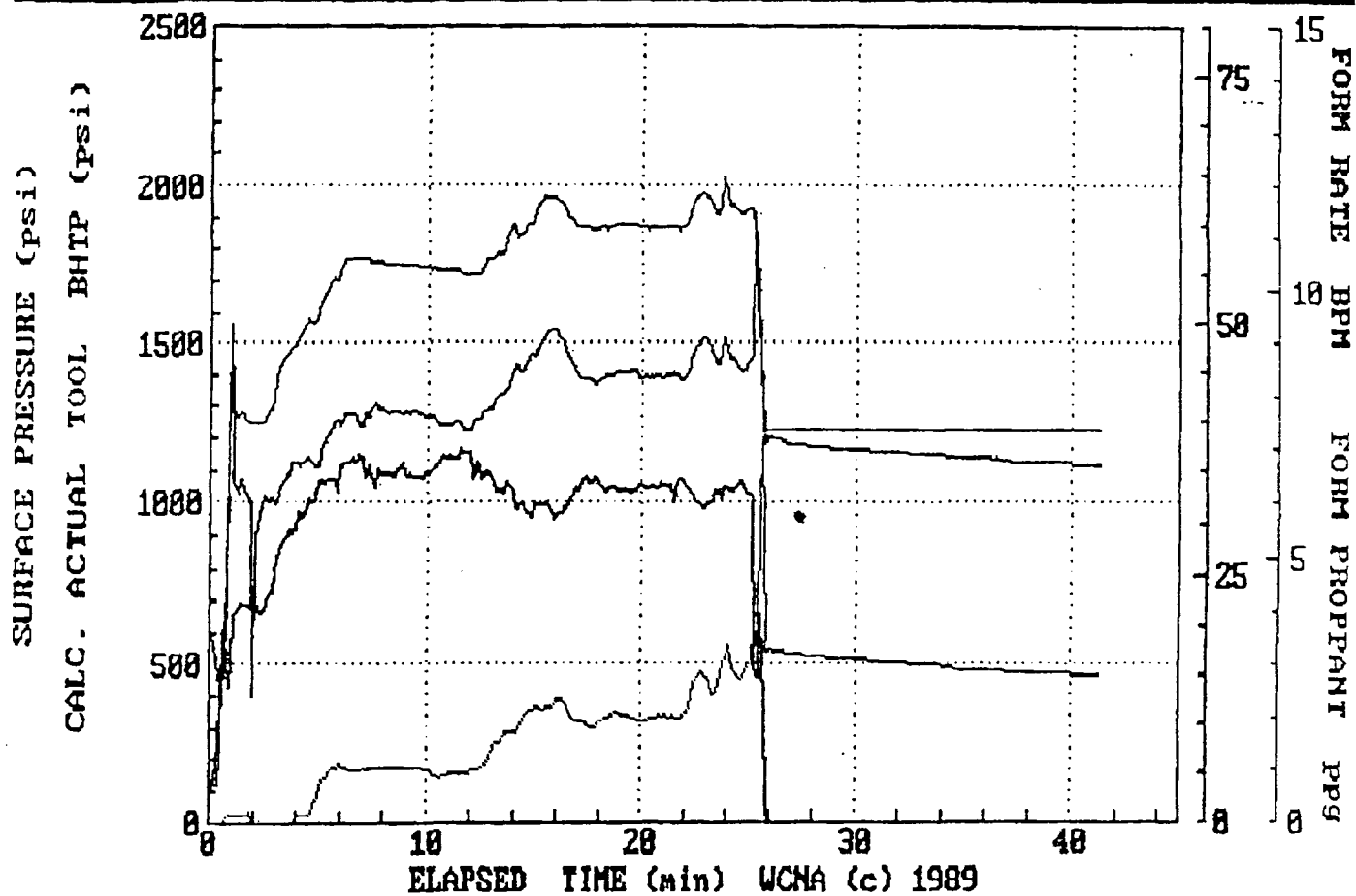
JANUARY 31, 1995  
FARMINGTON, NM  
(505) 327-6222

1995 WCNA STIMULATION SERVICES

2R

CALC. ACTUAL TOOL NET PRESSURE (psi)





WELL DELIVERABILITY TEST REPORT FOR 19 83

|                  |                      |                                        |                    |
|------------------|----------------------|----------------------------------------|--------------------|
| WELL NAME<br>WAW | WELL SLOPE<br>n= .85 | FORMATION<br>Fruitland Pictured Cliffs | COUNTY<br>San Juan |
|------------------|----------------------|----------------------------------------|--------------------|

|                                          |                               |                                         |                                          |                                                  |                                   |
|------------------------------------------|-------------------------------|-----------------------------------------|------------------------------------------|--------------------------------------------------|-----------------------------------|
| COMPANY<br>Merrion Oil & Gas Corporation |                               |                                         | WELL NAME AND NUMBER<br>Chaco 2R         |                                                  |                                   |
| UNIT LETTER<br>N                         | SECTION<br>7                  | TOWNSHIP<br>26N                         | RANGE<br>12W                             | PURCHASING PIPELINE<br>Gas Company of New Mexico |                                   |
| CASING O.D. - INCHES<br>2.875            | CASING I.D. - INCHES<br>2.441 | DEPT AT DEPTH - FEET<br>1249            | TUBING O.D. - INCHES<br>1.315            | TUBING I.D. - INCHES<br>1.049                    | TOP - TUBING PERF. - FEET<br>1132 |
| GAS PAY ZONE<br>FROM 1132 TO 1142        |                               | WELL PRODUCING FROM<br>CASING TUBING XX |                                          | GAS GRAVITY<br>.650                              | GRAVITY X LENGTH<br>736           |
| DATE OF FLOW TEST<br>FROM 6/20 TO 6/28   |                               |                                         | DATE SHUT-IN PRESSURE MEASURED<br>7/5/83 |                                                  |                                   |

PRESSURE DATA - ALL PRESSURES IN PSIA

|                                            |                                                |                                          |                                          |                                               |                                            |                                                             |
|--------------------------------------------|------------------------------------------------|------------------------------------------|------------------------------------------|-----------------------------------------------|--------------------------------------------|-------------------------------------------------------------|
| (a) Flowing Casing Pressure (DWI)<br>80    | (b) Flowing Tubing Pressure (DWI)<br>55        | (c) Flowing Meter Pressure (DWI)<br>55   | (d) Flow Chart Static Reading<br>50      | (e) Meter Error (Item c - Item d)<br>5        | (f) Friction Loss (a - c) or (b - c)<br>0  | (g) Average Meter Pressure (Integr.)<br>34                  |
| (h) Corrected Meter Pressure (g + e)<br>39 | (i) Avg. Wellhead Press. $P_1 = (h + f)$<br>39 | (j) Shut-in Casing Pressure (DWI)<br>110 | (k) Shut-in Tubing Pressure (DWI)<br>107 | (l) $P_c$ = Higher value of (j) or (k)<br>110 | (m) Del. Pressure $P_d = 80$ % $P_c$<br>88 | (n) Separator or Dehydrator Pr. (DWI) for critical flow onl |

FLOW RATE CORRECTION (METER ERROR)

|                                |                                                          |                                                        |                                 |
|--------------------------------|----------------------------------------------------------|--------------------------------------------------------|---------------------------------|
| Integrated Volume - MCF/D<br>9 | Quotient of $\frac{\text{Item c}}{\text{Item d}}$<br>1.1 | $\sqrt{\frac{\text{Item c}}{\text{Item d}}}$<br>1.0488 | Corrected Volume<br>Q = 9 MCF/D |
|--------------------------------|----------------------------------------------------------|--------------------------------------------------------|---------------------------------|

WORKING PRESSURE CALCULATION

|                       |                             |                                              |                 |                               |                            |
|-----------------------|-----------------------------|----------------------------------------------|-----------------|-------------------------------|----------------------------|
| $(1 - a - b)$<br>.072 | $(P_c Q_m)^2 (1000)$<br>206 | $R^2 = (1 - a - b) (P_c Q_m)^2 (1000)$<br>15 | $P_c^2$<br>1521 | $P_w^2 = P_c^2 + R^2$<br>1536 | $P_w = \sqrt{P_w^2}$<br>39 |
|-----------------------|-----------------------------|----------------------------------------------|-----------------|-------------------------------|----------------------------|

DELIVERABILITY CALCULATION

|                                                                                                                                                   |
|---------------------------------------------------------------------------------------------------------------------------------------------------|
| $D = Q \left[ \frac{P_c^2 - P_d^2}{P_c^2 - P_w^2} \right]^{\frac{1}{n}} = 9 \left[ \frac{4356}{10579} \right]^{\frac{1}{.4118}} = .4704 = 4$ MCF/ |
|---------------------------------------------------------------------------------------------------------------------------------------------------|

REMARKS:

SUMMARY

Item k 39 P<sub>sh</sub>  
 P<sub>c</sub> 110 P<sub>sh</sub>  
 Q 9 MCF/D  
 P<sub>w</sub> 39 P<sub>sh</sub>  
 P<sub>d</sub> 88 P<sub>sh</sub>  
 D 4 MCF/D

Company MERRION OIL & GAS CORPORATION  
 By Timothy L. Merilatt  
 Title Measurement Technician  
 Witnessed By Rick Dean  
 Company Merrion Oil & Gas Corporation

WELL DELIVERABILITY TEST REPORT FOR 19 81

| WELL NAME          | WELL DEPTH | FORMATION             | COUNTY   |
|--------------------|------------|-----------------------|----------|
| WAW Fr/Pic. Cliffs | 2611 .85   | Fruitland/Pic. Cliffs | San Juan |

| COMPANY              |                      |                     | WELL NAME AND NUMBER           |                        |                           |
|----------------------|----------------------|---------------------|--------------------------------|------------------------|---------------------------|
| Merrion & Bayless    |                      |                     | Chaco #2-R                     |                        |                           |
| UNIT LETTER          | SECTION              | TOWNSHIP            | RANGE                          | PURCHASING PIPELINE    |                           |
| N                    | 7                    | 26N                 | 12W                            | Western Gas Interstate |                           |
| CASING O.D. - INCHES | CASING I.D. - INCHES | NET AS DEPTH - FEET | TUBING O.D. - INCHES           | TUBING I.D. - INCHES   | TOP - TUBING PERF. - FEET |
| 2.875                | 2.441                | 1249                | 1.315                          | 1.049                  | 1132                      |
| GAS PAY ZONE         |                      | WELL PRODUCING ZONE |                                | GAS GRAVITY            | GRAVITY LENGTH            |
| FROM 1132            | TO 1142              | CASING              | TUBING XX                      | .653                   | 739                       |
| DATE OF FLOW TEST    |                      |                     | DATE SHUT-IN PRESSURE MEASURED |                        |                           |
| FROM 5/17/81         | TO 5/25/81           |                     | 6/1/81                         |                        |                           |

PRESSURE DATA - ALL PRESSURES IN PSIA

| (a) Flowing Casing Pressure (DWI)    | (b) Flowing Tubing Pressure (DWI)        | (c) Flowing Meter Pressure (DWI)  | (d) Flow Chart Static Reading     | (e) Meter Error (Item c - Item d)      | (f) Friction Loss (a - c) or (b - c)               | (g) Average Meter Pressure (Inlet)                         |
|--------------------------------------|------------------------------------------|-----------------------------------|-----------------------------------|----------------------------------------|----------------------------------------------------|------------------------------------------------------------|
| 127                                  | 52                                       | 25                                | 25                                | 0                                      | 27                                                 | 31                                                         |
| (h) Corrected Meter Pressure (k + e) | (i) Avg. Wellhead Press. $P_h = (h + f)$ | (j) Shut-in Casing Pressure (DWI) | (k) Shut-in Tubing Pressure (DWI) | (l) $P_c$ = higher value of (j) or (k) | (m) Del. Pressure $P_d = \frac{80}{106} \cdot P_c$ | (n) Separator or Dehydrator Pr. (DWI) for critical flow on |
| 31                                   | -58                                      | 132                               | 117                               | 132                                    |                                                    |                                                            |

FLOW RATE CORRECTION (METER ERROR)

| Integrated Volume - MCF/D | Quotient of $\frac{\text{Item c}}{\text{Item d}}$ | $\sqrt{\frac{\text{Item c}}{\text{Item d}}}$ | Corrected Volume |
|---------------------------|---------------------------------------------------|----------------------------------------------|------------------|
| 47                        | 1                                                 | 1                                            | Q = 47 MCF/D     |

WORKING PRESSURE CALCULATION

| $(1 - a - b)$ | $(P_c Q_m)^2 (1000)$ | $R^2 = (1 - a - b) (P_c Q_m)^2 (1000)$ | $P_1^2$ | $P_w^2 = P_1^2 + R^2$ | $P_w = \sqrt{P_w^2}$ |
|---------------|----------------------|----------------------------------------|---------|-----------------------|----------------------|
| .053          | 5611                 | 297                                    | 3364    | 3661                  | 61                   |

DELIVERABILITY CALCULATION

$$D = Q \left[ \frac{P_c^2 - P_d^2}{P_c^2 - P_w^2} \right]^a = \frac{47}{\left[ \frac{6188}{13763} \right]^a} = \frac{47}{.4496} = 104.54 = 24 \text{ MCF/D}$$

REMARKS:

SUMMARY

|        |     |       |
|--------|-----|-------|
| Item k | 31  | Feet  |
| $P_c$  | 132 | Feet  |
| Q      | 47  | MCF/D |
| $P_w$  | 61  | Feet  |
| $P_d$  | 106 | Feet  |
| D      | 24  | MCF/D |

|              |                   |
|--------------|-------------------|
| Company      | Merrion & Bayless |
| By           | John Anderson     |
| Title        | Field Foreman     |
| Witnessed By | Tim Merilatt      |
| Company      | Merrion & Bayless |

RECEIVED

JUN 22 1981

OIL CON. COM.

DIST. 3

WELL DELIVERABILITY TEST REPORT FOR 19 81

|                                 |                      |                                    |                    |
|---------------------------------|----------------------|------------------------------------|--------------------|
| POOL NAME<br>WAW Fr/Pic. Cliffs | POOL DEPTH<br>n= .85 | FORMATION<br>Fruitland/Pic. Cliffs | COUNTY<br>San Juan |
|---------------------------------|----------------------|------------------------------------|--------------------|

|                                              |                               |                                         |                                          |                                               |                                   |
|----------------------------------------------|-------------------------------|-----------------------------------------|------------------------------------------|-----------------------------------------------|-----------------------------------|
| COMPANY<br>Merrion & Bayless                 |                               |                                         | WELL NAME AND NUMBER<br>Chaco #2-R       |                                               |                                   |
| UNIT LETTER<br>N                             | SECTION<br>7                  | TOWNSHIP<br>26N                         | RANGE<br>12W                             | PURCHASING PIPELINE<br>Western Gas Interstate |                                   |
| LASTING O.D. - INCHES<br>2.875               | CASING I.D. - INCHES<br>2.441 | KEY AT DEPTH - FEET<br>1249             | TUBING O.D. - INCHES<br>1.315            | TUBING I.D. - INCHES<br>1.049                 | TDP - TUBING PERF. - FEET<br>1132 |
| GAS PAY ZONE<br>FROM 1132 TO 1142            |                               | WELL PRODUCING THRU<br>CASING TUBING XX |                                          | GAS GRAVITY<br>.653                           | GRAVITY LENGTH<br>739             |
| DATE OF FLOW TEST<br>FROM 5/17/81 TO 5/25/81 |                               |                                         | DATE SHUT-IN PRESSURE MEASURED<br>6/1/81 |                                               |                                   |

PRESSURE DATA - ALL PRESSURES IN PSIA

|                                            |                                                |                                          |                                          |                                               |                                                    |                                                            |
|--------------------------------------------|------------------------------------------------|------------------------------------------|------------------------------------------|-----------------------------------------------|----------------------------------------------------|------------------------------------------------------------|
| (a) Flowing Casing Pressure (DWI)<br>127   | (b) Flowing Tubing Pressure (DWI)<br>52        | (c) Flowing Meter Pressure (DWI)<br>25   | (d) Flow Chart Static Reading<br>25      | (e) Meter Error (Item c - Item d)<br>0        | (f) Friction Loss (a - c) or (b - c)<br>27         | (g) Average Meter Pressure (Integ)<br>31                   |
| (h) Corrected Meter Pressure (g + e)<br>31 | (i) Avg. Wellhead Press. $P_i = (h + f)$<br>58 | (j) Shut-in Casing Pressure (DWI)<br>132 | (k) Shut-in Tubing Pressure (DWI)<br>117 | (l) $P_c$ = Higher value of (j) or (k)<br>132 | (m) Del. Pressure $P_d = \frac{80}{106} \cdot P_c$ | (n) Separator or Dehydrator Pr. (DWI) for critical flow on |

FLOW RATE CORRECTION (METER ERROR)

|                                 |                                                        |                                                   |                                  |
|---------------------------------|--------------------------------------------------------|---------------------------------------------------|----------------------------------|
| Integrated Volume - MCF/D<br>47 | Quotient of $\frac{\text{Item c}}{\text{Item d}}$<br>1 | $\sqrt{\frac{\text{Item c}}{\text{Item d}}}$<br>1 | Corrected Volume<br>Q = 47 MCF/D |
|---------------------------------|--------------------------------------------------------|---------------------------------------------------|----------------------------------|

WORKING PRESSURE CALCULATION

|                        |                              |                                                |                 |                               |                            |
|------------------------|------------------------------|------------------------------------------------|-----------------|-------------------------------|----------------------------|
| $(1 - a^{-2})$<br>.053 | $(P_c Q_m)^2 (1000)$<br>5611 | $R^2 = (1 - a^{-2}) (P_c Q_m)^2 (1000)$<br>297 | $P_i^2$<br>3364 | $P_w^2 = P_i^2 + R^2$<br>3661 | $P_w = \sqrt{P_w^2}$<br>61 |
|------------------------|------------------------------|------------------------------------------------|-----------------|-------------------------------|----------------------------|

DELIVERABILITY CALCULATION

|                                                                   |                                                                                                |       |
|-------------------------------------------------------------------|------------------------------------------------------------------------------------------------|-------|
| $D = Q \left[ \frac{P_c^2 - P_d^2}{P_c^2 - P_w^2} \right]^a = 47$ | $\left[ \left( \frac{6188}{13763} \right)^b \left( \frac{.4496}{.5069} \right)^c \right] = 24$ | MCF/D |
|-------------------------------------------------------------------|------------------------------------------------------------------------------------------------|-------|

REMARKS:

SUMMARY

|        |     |       |
|--------|-----|-------|
| Item h | 31  | Psia  |
| $P_c$  | 132 | Psia  |
| Q      | 47  | MCF/D |
| $P_w$  | 61  | Psia  |
| $P_d$  | 106 | Psia  |
| D      | 24  | MCF/D |

|              |                   |
|--------------|-------------------|
| Company      | Merrion & Bayless |
| By           | John Anderson     |
| Title        | Field Foreman     |
| Witnessed By | Tim Merilatt      |
| Company      | Merrion & Bayless |

Merrion & Bayless  
Petroleum Club Plaza Bldg.  
P.O. Box 507  
Farmington, N.M. 87401

[illegible]

ARE IN QUADRUPLICATE- ORIGINAL-WELL OPERATORS  
COPY 1-DISPATCH MANAGER-FARMINGTON

COPY 2-OIL CONSERVATION COMMISSION-SANTE FE, NEW MEXICO  
COPY 3-OIL CONSERVATION COMMISSION-AZTEC, NEW MEXICO

WELL DELIVERABILITY TEST  
Form 23-82 (Rev. 5-78)

|                                          |  |                 |             |
|------------------------------------------|--|-----------------|-------------|
| WELL NAME<br><u>Chaco #2-R</u>           |  | TESTER          | OPER CODE   |
| WELL LOCATION<br><u>S. 7, 26 N, 12 W</u> |  | FLG. OFF/SMITHS | TEST SCHED. |

|                          |                                       |
|--------------------------|---------------------------------------|
| CONDITION-<br>ING PERIOD | FROM <u>5-1-81</u> TO <u>5-17-81</u>  |
| FLOW<br>PERIOD           | FROM <u>5-17-81</u> TO <u>5-25-81</u> |
| SHUT-IN<br>PERIOD        | FROM <u>5-25-81</u> TO <u>6-1-81</u>  |

|   |   |   |   |                 |   |    |  |
|---|---|---|---|-----------------|---|----|--|
| B | Y | A | A | METER<br>NUMBER | 5 | 11 |  |
|---|---|---|---|-----------------|---|----|--|

FLOWING PRESSURES:

NOTE TO TESTER

Please mark flow  
chart as "Test  
Chart"

|          |    |    |      |          |
|----------|----|----|------|----------|
| Casing = | 14 | 17 | 15   | P.S.I.G. |
| Tubing = | 18 | 21 | 40   | P.S.I.G. |
| Meter =  | 24 | 27 | 1300 | P.S.I.G. |
|          | 28 | 31 |      | P.S.I.G. |

Meter Static 5.0  
Static Spring 250

Producing String Code:  
Enter "1" if producing thru casing  
Enter "2" if producing thru tubing

|                         |                 |     |      |
|-------------------------|-----------------|-----|------|
| PROD.<br>STRING<br>CODE | DATE FLOW MEAS. |     |      |
|                         | MONTH           | DAY | YEAR |
| 32                      | 34              | 37  | 38   |
| 2                       | 05              | 25  | 81   |

SHUT-IN PRESSURES:

NOTE TO TESTER

Please initial card  
in meter house  
when flowing and  
shut-in pressures  
are measured.

|          |    |    |     |          |
|----------|----|----|-----|----------|
| Casing = | 40 | 43 | 20  | P.S.I.G. |
| Tubing = | 44 | 47 | 105 | P.S.I.G. |

|                   |     |      |
|-------------------|-----|------|
| DATE S.I.P. MEAS. |     |      |
| MONTH             | DAY | YEAR |
| 52                | 55  | 57   |
| 06                | 01  | 81   |

Transmission No. =

IF WELL FAILS DELIVERABILITY TEST, NOTIFY

WELL DELIVERABILITY TEST REPORT FOR 19 80

|                                  |                       |                                    |                    |
|----------------------------------|-----------------------|------------------------------------|--------------------|
| WELL NAME<br>WAW Fr./Pic. Cliffs | POOL SLOPE<br>n = .85 | FORMATION<br>Fruitland/Pic. Cliffs | COUNTY<br>San Juan |
|----------------------------------|-----------------------|------------------------------------|--------------------|

|                                            |                               |                                        |                                           |                                               |                                   |
|--------------------------------------------|-------------------------------|----------------------------------------|-------------------------------------------|-----------------------------------------------|-----------------------------------|
| COMPANY<br>Merrion & Bayless               |                               |                                        | WELL NAME AND NUMBER<br>Chaco #2-R        |                                               |                                   |
| UNIT LETTER<br>N                           | SECTION<br>7                  | TOWNSHIP<br>26N                        | RANGE<br>12W                              | PURCHASING PIPELINE<br>Western Gas Interstate |                                   |
| CASING O.D. - INCHES<br>2.875              | CASING I.D. - INCHES<br>2.441 | SET AT DEPTH - FEET<br>1249            | TUBING O.D. - INCHES<br>1.315             | TUBING I.D. - INCHES<br>1.049                 | TOP - TUBING PLAF. - FEET<br>1132 |
| GAS PAY IONE<br>FROM 1132 TO 1142          |                               | WELL PRODUCING THRU<br>CASING TUBING X |                                           | GAS GRAVITY<br>.650                           | GRAVITY X LENGTH<br>736           |
| DATE OF FLOW TEST<br>FROM 6/1/80 TO 6/9/80 |                               |                                        | DATE SHUT-IN PRESSURE MEASURED<br>6/16/80 |                                               |                                   |

PRESSURE DATA - ALL PRESSURES IN PSIA

|                                            |                                                |                                          |                                          |                                               |                                                           |                                                              |
|--------------------------------------------|------------------------------------------------|------------------------------------------|------------------------------------------|-----------------------------------------------|-----------------------------------------------------------|--------------------------------------------------------------|
| (a) Flowing Casing Pressure (DWI)<br>101   | (b) Flowing Tubing Pressure (DWI)<br>60        | (c) Flowing Meter Pressure (DWI)<br>58   | (d) Flow Chart Static Reading<br>56      | (e) Meter Error (Item c - Item d)<br>2        | (f) Friction Loss (a - c) or (b - c)<br>2                 | (g) Average Meter Pressure (Lnigr.)<br>60                    |
| (h) Corrected Meter Pressure (g + e)<br>62 | (i) Avg. Wellhead Press. $P_i = (h + f)$<br>64 | (j) Shut-In Casing Pressure (DWI)<br>152 | (k) Shut-In Tubing Pressure (DWI)<br>152 | (l) $P_c =$ higher value of (j) or (k)<br>152 | (m) Del. Pressure $P_d = 80$ % $P_c$<br><del>112/22</del> | (n) Separator or Dehydrator Pr. (DWI) for critical flow only |

FLOW RATE CORRECTION (METER ERROR)

|                                 |                                                            |                                                       |                                  |
|---------------------------------|------------------------------------------------------------|-------------------------------------------------------|----------------------------------|
| Integrated Volume - MCF/D<br>70 | Quotient of $\frac{\text{Item c}}{\text{Item d}}$<br>1.035 | $\sqrt{\frac{\text{Item c}}{\text{Item d}}}$<br>1.018 | Corrected Volume<br>Q = 71 MCF/D |
|---------------------------------|------------------------------------------------------------|-------------------------------------------------------|----------------------------------|

WORKING-PRESSURE CALCULATION

|                         |                               |                                                |                 |                               |                            |
|-------------------------|-------------------------------|------------------------------------------------|-----------------|-------------------------------|----------------------------|
| $(1 - e^{-x})$<br>.0525 | $(P_o Q_m)^2 (1000)$<br>12804 | $R^2 = (1 - e^{-x}) (P_o Q_m)^2 (1000)$<br>672 | $P_i^2$<br>4096 | $P_w^2 = P_i^2 + R^2$<br>4768 | $P_w = \sqrt{P_w^2}$<br>69 |
|-------------------------|-------------------------------|------------------------------------------------|-----------------|-------------------------------|----------------------------|

DELIVERABILITY CALCULATION

|                                                                   |                                                                                                                      |
|-------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------|
| $D = Q \left[ \frac{P_c^2 - P_d^2}{P_c^2 - P_w^2} \right]^n = 71$ | $\left[ \frac{8220}{18336} \right]^n = \left( \frac{4483}{5759} \right)^n = \frac{5056}{.6256} = \frac{4436}{MCF/D}$ |
|-------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------|

REMARKS:

I-A

SUMMARY

|        |                   |       |
|--------|-------------------|-------|
| Item h | 62                | Psia  |
| $P_d$  | 152               | Psia  |
| Q      | 71                | MCF/D |
| $P_o$  | 69                | Psia  |
| $P_d$  | <del>112/22</del> | Psia  |
| D      | 436               | MCF/D |

R-2

Company Merrion & Bayless  
By John Anderson  
Title Field Foreman  
Witnessed By Bob Harris  
Company Fizz's Pumping Service



# WELL DELIVERABILITY TEST

Form 22-42 (Rev. 5-78)

|                                                                                                              |                                |                   |                |
|--------------------------------------------------------------------------------------------------------------|--------------------------------|-------------------|----------------|
| WELL NAME<br><b>Chaco 2-R</b>                                                                                |                                | TESTER            | OPER CODE      |
| WELL LOCATION<br><b>7-26N-12W</b>                                                                            |                                | CHT. CHG.         | TEST SCHED.    |
| CONDITION-<br>ING PERIOD                                                                                     | FROM <b>5/17</b> TO <b>6/1</b> |                   |                |
| FLOW PERIOD                                                                                                  | FROM <b>6/1</b> TO <b>6/9</b>  |                   |                |
| SHUT-IN PERIOD                                                                                               | FROM <b>6/9</b> TO <b>6/16</b> |                   |                |
| B Y A A                                                                                                      | METER NUMBER                   |                   |                |
| FLOWING PRESSURES:                                                                                           |                                |                   |                |
| <b>NOTE TO TESTER</b><br>Please mark flow chart as "Test Chart"                                              | Casing =                       | 14                | 17             |
|                                                                                                              | Tubing =                       | 18                | 21             |
|                                                                                                              | Meter =                        | 24                | 27             |
|                                                                                                              |                                | 28                | 31             |
| Meter Static <b>4.8</b>                                                                                      |                                |                   |                |
| Static Spring <b>250 lb</b>                                                                                  |                                |                   |                |
| Producing String Code:                                                                                       |                                | DATE FLOW MEAS.   |                |
| Enter "1" if producing thru casing                                                                           |                                | PROD. STRING CODE | MONTH DAY YEAR |
| Enter "2" if producing thru tubing                                                                           |                                | 32                | 34 36 38       |
|                                                                                                              |                                | 2                 | 6 6 80         |
| SHUT-IN PRESSURES:                                                                                           |                                |                   |                |
| <b>NOTE TO TESTER</b><br>Please initial card in meter house—when flowing and shut-in pressures are measured. | Casing =                       | 40                | 43             |
|                                                                                                              | Tubing =                       | 44                | 47             |
|                                                                                                              | DATE S.I.P. MEAS.              |                   |                |
|                                                                                                              | MONTH DAY YEAR                 | 52 57             |                |
|                                                                                                              |                                | 6                 | 1 6 80         |
| Transmission No. =                                                                                           |                                | 72                | 77             |

IF WELL FAILS DELIVERABILITY TEST, NOTIFY

*Speed these results as soon as test is complete. The 90-day period is up June 28.*

*Thanks!  
Eileen*