

THE TEXAS COMPANY — MONTEBELLO LABORATORY  
YIELD CALCULATIONS

RUN NO. 66-0 (A-E)  
HOURS 0-94  
Catalyst Brownsville Trtd  
Mill Scale @ 660° F.

| FRESH FEED                                |        |                    |                        | WET GAS                   |                     |                                                                                     | RECYCLE           | COMBINED<br>FEED                 | EFFLUENT                                  | NET CHANGE |         | YIELD BASIS H <sub>2</sub> +CO FED |        |          |         |                                |               |           |            |        |         |
|-------------------------------------------|--------|--------------------|------------------------|---------------------------|---------------------|-------------------------------------------------------------------------------------|-------------------|----------------------------------|-------------------------------------------|------------|---------|------------------------------------|--------|----------|---------|--------------------------------|---------------|-----------|------------|--------|---------|
|                                           | %      | m/hr               | #/hr                   | %                         | At Wt. Balance      |                                                                                     | m/hr              | m/hr                             | m/hr                                      | m/hr       | #/hr    | CONDENSATE                         |        |          | YIELDS  | BASIS                          | BROWNSVILLE   | DESIGN    | FEED RATE* | RVP    |         |
|                                           |        |                    |                        |                           | m/hr                | #/hr                                                                                |                   |                                  |                                           |            |         | #/MCF                              | #/gal  | gal/hr   |         |                                |               |           |            |        | gal/MCF |
| CO<br>24.010                              | 36.086 | 15.575             | 436.26                 | 8.805                     | 1.253               | 35.10                                                                               | 3.605             | 19.180                           | 4.858                                     | -14.322    | -401.16 |                                    |        |          |         |                                |               |           |            |        |         |
| H <sub>2</sub><br>28.016                  | 60.971 | 26.317             | 53.06                  | 41.033                    | 5.943               | 11.78                                                                               | 16.802            | 43.119                           | 22.645                                    | -20.474    | -41.28  |                                    |        |          |         | 400 EP                         | 80.34         | 9.204     | 98.0       | 9.020  |         |
| CO <sub>2</sub><br>44.510                 | 2.168  | 0.936              | 41.19                  | 29.503                    | 4.201               | 184.99                                                                              | 12.081            | 13.017                           | 16.282                                    | 3.265      | 143.70  | 9.039                              |        |          |         | 400-550                        | 9.62          | 1.102     | 91.4       | 1.007  |         |
| N <sub>2</sub><br>18.016                  | 0.668  | 0.288              | 8.07                   | 1.715                     | 0.244               | 6.84                                                                                | 0.702             | 0.990                            | 0.946                                     |            |         |                                    |        |          |         | 550 +                          | 10.04         | 1.150     | 114.6      | 1.318  |         |
| CH <sub>4</sub><br>14.042                 | 0.107  | 0.046              | 0.74                   | 9.083                     | 1.294               | 20.76                                                                               | 3.719             | 3.765                            | 5.013                                     | 1.248      | 20.02   | 1.259                              |        |          |         |                                |               |           |            |        |         |
| C <sub>2</sub> H <sub>6</sub><br>28.058   |        |                    |                        | 2.236                     | 0.318               | 8.92                                                                                | 0.916             | 0.916                            | 1.234                                     | 0.318      | 8.92    | 0.561                              |        |          |         |                                | RECOVERY<br>% | #/hr      | gal/hr     |        |         |
| C <sub>3</sub> H <sub>8</sub><br>30.068   |        |                    |                        | 1.399                     | 0.199               | 5.98                                                                                | 0.573             | 0.573                            | 0.722                                     | 0.199      | 5.98    | 0.376                              |        |          |         | PROPYLENE                      | 43.0          | 7.49      |            |        |         |
| C <sub>4</sub> +C <sub>5</sub>            |        |                    |                        |                           |                     |                                                                                     |                   |                                  |                                           |            | 34.92   | 2.196                              |        |          |         | C <sub>3</sub> POLY GASO.      | 87.5          | 6.55      | 1.095      |        |         |
| C <sub>6</sub> H <sub>6</sub><br>42.078   |        |                    |                        | 2.905                     | 0.414               | 17.42                                                                               | 1.189             | 1.189                            | 1.603                                     | 0.414      | 17.42   | 1.096                              | 4.32   | 4.032    | 0.254   | C <sub>3</sub> POLY TAR        | 12.5          | 0.94      | 0.125      |        |         |
| C <sub>7</sub> H <sub>8</sub><br>44.094   |        |                    |                        | 0.313                     | 0.046               | 2.03                                                                                | 0.128             | 0.128                            | 0.174                                     | 0.046      | 2.03    | 0.128                              | 4.24   | 0.479    | 0.030   |                                |               |           |            |        |         |
| C <sub>8</sub> H <sub>10</sub><br>56.104  |        |                    |                        | 1.598                     | 0.228               | 12.79                                                                               | 0.654             | 0.654                            | 0.882                                     | 0.228      | 12.79   | 0.805                              | 5.00   | 2.558    | 0.161   |                                | #/gal         | #/hr      | gal/hr     | RVP    |         |
| C <sub>9</sub> H <sub>12</sub><br>59.120  |        |                    |                        | 0.494                     | 0.070               | 4.07                                                                                | 0.202             | 0.202                            | 0.272                                     | 0.070      | 4.07    | 0.256                              | 4.86   | 0.837    | 0.053   | C <sub>4</sub> H <sub>6</sub>  | 5.00          | 1.34      | 0.268      | 68.0   |         |
| C <sub>10</sub> H <sub>14</sub><br>70.130 |        |                    |                        | 0.609                     | 0.087               | 6.10                                                                                | 0.249             | 0.249                            | 0.336                                     | 0.087      | 6.10    | 0.384                              | 5.45   | 1.119    | 0.070   | C <sub>4</sub> POLY GASO.      | 5.98          | 10.02     | 1.675      | 1.5    |         |
| C <sub>11</sub> H <sub>16</sub><br>72.146 |        |                    |                        | 0.137                     | 0.020               | 1.44                                                                                | 0.056             | 0.056                            | 0.076                                     | 0.020      | 1.44    | 0.091                              | 5.25   | 0.274    | 0.017   | C <sub>4</sub> H <sub>10</sub> | 4.86          | 4.07      | 0.837      | 68.0   |         |
| C <sub>12</sub> H <sub>18</sub><br>84.156 |        |                    |                        | 0.170                     | 0.024               | 2.02                                                                                | 0.070             | 0.070                            | 0.094                                     | 0.024      | 2.02    | 0.127                              | 5.54   | 0.365    | 0.023   | C <sub>4</sub> -FREE GASO.     |               |           | 11.973     | 5.8    |         |
| C <sub>13</sub> -C <sub>14</sub>          |        |                    |                        |                           |                     |                                                                                     |                   |                                  |                                           |            | 45.97   | 2.887                              |        | 9.664    | 0.608   | C <sub>4</sub> POLY TAR        | 7.53          | 1.43      | 0.190      |        |         |
| TOTAL                                     |        | 43.162             | 53.932                 |                           | 14.241              | 320.14                                                                              | 40.946            | 84.108                           | 63.058                                    |            |         |                                    |        |          |         |                                |               |           |            |        |         |
| H <sub>2</sub> +CO                        | 97.057 | 41.892             | 15898                  | SCFH                      | 7.096               |                                                                                     | 20.407            | 62.299                           | 27.503                                    | -34.796    |         |                                    |        |          |         |                                | gal/hr        | gal / MCF | Bbl/Day    |        |         |
| H <sub>2</sub> /CO                        |        | 1.69               | Factor                 | 629009                    | 4.66                |                                                                                     | 4.66              | 2.25                             | 4.66                                      | 1.43       |         |                                    |        |          |         | 10 # RVP 400 EP<br>GASOLINE    | 14.653        | 0.9217    | 4997       |        |         |
| Weight Recovery, %                        |        | Catalyst Age, hrs. |                        | 47                        | Space Velocity, vhr |                                                                                     | 1271              | RECOVERED OIL                    |                                           | 0.517**    | 72.50   | 4.560                              | 11.456 | 0.721    | GAS OIL | 1.007                          | 0.0633        | 343       |            |        |         |
| Pressure, psig                            |        | 404                | Inlet Velocity, Ft/sec |                           | Catalyst            |                                                                                     |                   | TOTAL OIL                        |                                           | 118.37     | 7.447   | 21.120                             | 1.329  | FUEL OIL | 1.318   | 0.0829                         | 449           |           |            |        |         |
| Temperature, °F                           |        | 662                | Bed Depth, Ft          |                           | 18.95               | Weight, #                                                                           |                   | 1931                             | WATER SOLUBLE<br>CHEMICALS                |            | 0.408** | 21.65                              | 1.362  | 2.967    | 2.717   | 0.171                          | POLY TAR      | 0.315     | 0.0198     | 107    |         |
| Recycle Ratio                             |        | 0.95               | Bed Density, #/CF      |                           | 154                 | Effluent (H <sub>2</sub> )(CO) <sub>2</sub><br>Shift Ratio (H <sub>2</sub> O)(CO) = |                   | 10.9                             | TOTAL LIQUID<br>PRODUCTS C <sub>2</sub> + |            | 140.02  | 8.809                              | 23.837 | 1.500    | TOTAL   | 17.293                         | 1.0877        | 5896      |            |        |         |
| FRESH FEED CONVERSION — %                 |        |                    |                        | TOTAL FEED CONVERSION — % |                     |                                                                                     |                   | SELECTIVITY                      |                                           |            |         | NET WATER                          |        | 6.946**  | 125.14  | 7.871                          | W. S. CHEM.   |           | 2.717      | 0.1709 | 927     |
| Contraction                               |        | CO                 | H <sub>2</sub>         | H <sub>2</sub> +CO        | CO                  | H <sub>2</sub>                                                                      | CO+H <sub>2</sub> | C <sub>3</sub> +C <sub>4</sub> + | GROSS WATER                               |            | 146.79  | 9.233                              | TOTAL  |          | 20.010  | 1.2586                         | 6823          |           |            |        |         |
| 87.01                                     |        | 91.96              | 77.80                  | 83.06                     | 74.67               | 47.48                                                                               | 55.85             | 80.04                            | HYDROCARBON<br>TOTAL—C <sub>2</sub> +     |            | 174.94  | 11.004                             |        |          |         |                                |               |           |            |        |         |

Form ML-11

\*\*Included in Reactor Effluent Total

g/NCM = 16.91 X #/MCF \*9488 MCFH H<sub>2</sub> + CO, Bbl/Day = 5421.6 X gal/MCF

THE TEXAS COMPANY — MONTEBELLO LABORATORY  
YIELD CALCULATIONS

RUN NO. 66-1 (F-J)  
HOURS 94-207  
Catalyst Brownsville Trtd  
Mill Scale @ 660° F.

| FRESH FEED                                       |        |                |                        | WET GAS                   |                |                                                                                  |                                  | RECYCLE                            | COMBINED FEED                          | EFFLUENT  | NET CHANGE | YIELD BASIS H <sub>2</sub> + CO FED |       |        |         |         |                                |                          |         |         |      |             |  |        |  |        |  |     |  |
|--------------------------------------------------|--------|----------------|------------------------|---------------------------|----------------|----------------------------------------------------------------------------------|----------------------------------|------------------------------------|----------------------------------------|-----------|------------|-------------------------------------|-------|--------|---------|---------|--------------------------------|--------------------------|---------|---------|------|-------------|--|--------|--|--------|--|-----|--|
|                                                  | %      | m/hr           | #/hr                   | %                         | At Wt. Balance |                                                                                  | m/hr                             | m/hr                               | m/hr                                   | m/hr      | #/hr       | CONDENSATE                          |       |        | YIELDS  | BASIS   | BROWNSVILLE DESIGN             | FEED RATE*               |         |         |      |             |  |        |  |        |  |     |  |
|                                                  |        |                |                        |                           | m/hr           | #/hr                                                                             |                                  |                                    |                                        |           |            | #/MCF                               | #/gal | gal/hr | gal/MCF |         |                                |                          |         |         |      |             |  |        |  |        |  |     |  |
| CO <sub>6A.010</sub>                             | 37.165 | 15.400         | 431.35                 | 9.025                     | 1.342          | 37.59                                                                            | 3.631                            | 19.031                             | 4.973                                  | -14.058   | -393.76    |                                     |       |        |         |         |                                |                          |         |         |      |             |  |        |  |        |  |     |  |
| H <sub>2</sub> <sub>2.016</sub>                  | 59.995 | 24.859         | 50.12                  | 40.444                    | 6.015          | 12.13                                                                            | 16.273                           | 41.132                             | 22.288                                 | -18.844   | -37.99     |                                     |       |        |         | 400 EP  | 81.46                          | 7.138                    | 98.0    | 6.995   |      |             |  |        |  |        |  |     |  |
| CO <sub>2</sub> <sub>44.010</sub>                | 2.191  | 0.908          | 39.96                  | 29.700                    | 4.417          | 194.39                                                                           | 11.950                           | 12.858                             | 16.367                                 | 3.509     | 154.43     | 10.108                              |       |        |         | 400-550 | 8.68                           | 0.761                    | 91.4    | 0.696   |      |             |  |        |  |        |  |     |  |
| N <sub>2</sub> <sub>28.016</sub>                 | 0.572  | 0.237          | 6.64                   | 1.859                     | 0.276          | 7.73                                                                             | 0.748                            | 0.985                              | 1.024                                  |           |            |                                     |       |        |         | 550 +   | 9.86                           | 0.864                    | 114.6   | 0.990   |      |             |  |        |  |        |  |     |  |
| CH <sub>4</sub> <sub>16.022</sub>                | 0.077  | 0.032          | 0.51                   | 8.536                     | 1.270          | 20.37                                                                            | 3.435                            | 3.467                              | 4.705                                  | 1.238     | 19.86      | 1.300                               |       |        |         |         |                                |                          |         |         |      |             |  |        |  |        |  |     |  |
| C <sub>2</sub> H <sub>6</sub> <sub>18.028</sub>  |        |                |                        | 2.225                     | 0.331          | 9.29                                                                             | 0.895                            | 0.895                              | 1.226                                  | 0.331     | 9.29       | 0.608                               |       |        |         |         | RECOVERY %                     | #/hr                     | gal/hr  |         |      |             |  |        |  |        |  |     |  |
| C <sub>3</sub> H <sub>8</sub> <sub>20.068</sub>  |        |                |                        | 1.641                     | 0.244          | 7.34                                                                             | 0.660                            | 0.660                              | 0.904                                  | 0.244     | 7.34       | 0.480                               |       |        |         |         | PROPYLENE                      | 39.3                     | 7.56    |         |      |             |  |        |  |        |  |     |  |
| C <sub>4</sub> +C <sub>5</sub>                   |        |                |                        |                           |                |                                                                                  |                                  |                                    |                                        |           | 36.49      | 2.388                               |       |        |         |         | C <sub>3</sub> POLY GASOL.     | 87.5                     | 6.61    | 1.105   |      |             |  |        |  |        |  |     |  |
| C <sub>2</sub> H <sub>4</sub> <sub>42.078</sub>  |        |                |                        | 3.075                     | 0.457          | 19.23                                                                            | 1.237                            | 1.237                              | 1.694                                  | 0.457     | 19.23      | 1.259                               | 4.32  | 4.451  | 0.291   |         | C <sub>3</sub> POLY TAR        | 12.5                     | 0.95    | 0.126   |      |             |  |        |  |        |  |     |  |
| C <sub>2</sub> H <sub>2</sub> <sub>44.094</sub>  |        |                |                        | 0.336                     | 0.050          | 2.20                                                                             | 0.135                            | 0.135                              | 0.185                                  | 0.050     | 2.20       | 0.144                               | 4.24  | 0.519  | 0.034   |         |                                |                          |         |         |      |             |  |        |  |        |  |     |  |
| C <sub>3</sub> H <sub>6</sub> <sub>56.104</sub>  |        |                |                        | 1.705                     | 0.254          | 14.25                                                                            | 0.686                            | 0.686                              | 0.940                                  | 0.254     | 14.25      | 0.933                               | 5.00  | 2.850  | 0.187   |         |                                | #/gal                    | #/hr    | gal/hr  | RVP  |             |  |        |  |        |  |     |  |
| C <sub>4</sub> H <sub>10</sub> <sub>58.110</sub> |        |                |                        | 0.502                     | 0.075          | 4.36                                                                             | 0.202                            | 0.202                              | 0.277                                  | 0.075     | 4.36       | 0.285                               | 4.86  | 0.897  | 0.059   |         | C <sub>4</sub> H <sub>8</sub>  | 5.00                     | 0.60    | 0.120   | 68.0 |             |  |        |  |        |  |     |  |
| C <sub>5</sub> H <sub>12</sub> <sub>70.130</sub> |        |                |                        | 0.631                     | 0.094          | 6.59                                                                             | 0.254                            | 0.254                              | 0.348                                  | 0.094     | 6.59       | 0.431                               | 5.45  | 1.209  | 0.079   |         | C <sub>4</sub> POLY GASOL.     | 5.98                     | 11.94   | 1.997   | 1.5  |             |  |        |  |        |  |     |  |
| C <sub>6</sub> H <sub>14</sub> <sub>72.146</sub> |        |                |                        | 0.147                     | 0.022          | 1.59                                                                             | 0.059                            | 0.059                              | 0.081                                  | 0.022     | 1.59       | 0.104                               | 5.25  | 0.303  | 0.020   |         | C <sub>4</sub> H <sub>10</sub> | 4.86                     | 4.36    | 0.897   | 68.0 |             |  |        |  |        |  |     |  |
| C <sub>7</sub> H <sub>16</sub> <sub>84.166</sub> |        |                |                        | 0.174                     | 0.026          | 2.19                                                                             | 0.070                            | 0.070                              | 0.096                                  | 0.026     | 2.19       | 0.143                               | 5.84  | 0.395  | 0.026   |         | C <sub>4</sub> -FREE GASOL.    |                          |         | 10.007  | 5.8  |             |  |        |  |        |  |     |  |
| C <sub>8</sub> +C <sub>9</sub>                   |        |                |                        |                           |                |                                                                                  |                                  |                                    |                                        |           | 50.41      | 3.299                               |       | 10.624 | 0.696   |         | C <sub>4</sub> POLY TAR        | 7.53                     | 1.71    | 0.227   |      |             |  |        |  |        |  |     |  |
| TOTAL                                            |        | 41.436         | 528.58                 |                           | 14.873         | 339.25                                                                           | 40.236                           | 81.672                             | 62.166                                 |           |            |                                     |       |        |         |         |                                |                          |         |         |      |             |  |        |  |        |  |     |  |
| H <sub>2</sub> +CO                               | 97.160 | 40.259         | 15278                  | SCFH                      | 7.357          |                                                                                  | 19.904                           | 60.163                             | 27.261                                 | -32.902   |            |                                     |       |        |         |         |                                | gal/hr                   | gal/MCF | Bbl/Day |      |             |  |        |  |        |  |     |  |
| H <sub>2</sub> /CO                               |        | 1.61           | Factor                 | 654535                    | 4.48           |                                                                                  | 4.48                             | 2.16                               | 4.48                                   | 1.34      |            |                                     |       |        |         |         |                                | 10.5 RVP 400 EP GASOLINE | 13.021  | 0.8523  | 4621 |             |  |        |  |        |  |     |  |
| Weight Recovery, %                               |        |                | Catalyst Age, hrs.     | 150                       |                | Space Velocity, vhr                                                              | 1241                             |                                    | RECOVERED OIL                          | 0.394**   | 55.21      | 3.614                               |       | 8.763  | 0.574   |         | GAS OIL                        | 0.696                    | 0.0456  | 247     |      |             |  |        |  |        |  |     |  |
| Pressure, psig                                   | 403    |                | Inlet Velocity, Ft/sec |                           |                | Catalyst                                                                         |                                  |                                    | TOTAL OIL                              |           | 105.62     | 6.913                               |       | 19.387 | 1.270   |         | FUEL OIL                       | 0.990                    | 0.0648  | 351     |      |             |  |        |  |        |  |     |  |
| Temperature, °F                                  | 662    |                | Bed Depth, Ft          | 18.66                     |                | Weight, #                                                                        | 1909                             |                                    | WATER SOLUBLE CHEMICALS                | 0.408**   | 21.63      | 1.416                               | 7.943 | 2.723  | 0.178   |         | POLY TAR                       | 0.353                    | 0.0231  | 125     |      |             |  |        |  |        |  |     |  |
| Recycle Ratio                                    | 0.97   |                | Bed Density, #/CF      | 155                       |                | Effluent (H <sub>2</sub> )(CO) <sub>2</sub> Shift Ratio (H <sub>2</sub> O)(CO) = | 11.7                             |                                    | TOTAL LIQUID PRODUCTS C <sub>2</sub> + |           | 127.25     | 8.329                               |       | 22.110 | 1.448   |         | TOTAL                          | 15.060                   | 0.9858  | 5344    |      |             |  |        |  |        |  |     |  |
| FRESH FEED CONVERSION — %                        |        |                |                        | TOTAL FEED CONVERSION — % |                |                                                                                  | SELECTIVITY                      |                                    |                                        | NET WATER |            | 6.255**                             |       | 112.69 |         | 7.376   |                                | 13.528                   |         | 0.885   |      | W. S. CHEM. |  | 2.723  |  | 0.1782 |  | 966 |  |
| Contraction                                      | CO     | H <sub>2</sub> | H <sub>2</sub> +CO     | CO                        | H <sub>2</sub> | CO+H <sub>2</sub>                                                                | C <sub>3</sub> +C <sub>4</sub> + | GROSS WATER                        |                                        |           |            | 134.32                              |       | 8.792  |         | 16.251  |                                | 1.063                    |         | TOTAL   |      | 17.783      |  | 1.1640 |  | 6310   |  |     |  |
| 64.11                                            | 91.29  | 75.80          | 81.73                  | 73.87                     | 45.81          | 54.69                                                                            | 77.71                            | HYDROCARBON TOTAL—C <sub>2</sub> + |                                        |           |            | 163.74                              |       | 10.717 |         |         |                                |                          |         |         |      |             |  |        |  |        |  |     |  |

Form ML-11

\*\*Included in Reactor Effluent Total

g/NCM = 16.91 X #/MCF \*9488 MCFH H<sub>2</sub> + CO, Bbl/Day = 5421.6 X gal/MCF

THE TEXAS COMPANY — MONTEBELLO LABORATORY  
YIELD CALCULATIONS

RUN NO. 66-2 (K-O)  
HOURS 207-296

CATALYST Brownsville Trtd  
Mill Scale @ 660° F.

| FRESH FEED                               |        |                    |                        | WET GAS                   |                     |                                                                                  |                                   | RECYCLE                              | COMBINED<br>FEED                       | EFFLUENT | NET CHANGE |           | YIELD BASIS H <sub>2</sub> + CO FED |         |        |         |                                            |            |             |         |       |        |      |
|------------------------------------------|--------|--------------------|------------------------|---------------------------|---------------------|----------------------------------------------------------------------------------|-----------------------------------|--------------------------------------|----------------------------------------|----------|------------|-----------|-------------------------------------|---------|--------|---------|--------------------------------------------|------------|-------------|---------|-------|--------|------|
|                                          | %      | m/hr               | #/hr                   | %                         | At Wt. Balance      |                                                                                  |                                   | m/hr                                 | m/hr                                   | m/hr     | m/hr       | #/hr      | CONDENSATE                          |         |        |         | YIELDS BASIS BROWNSVILLE DESIGN FEED RATE* |            |             |         |       |        |      |
|                                          |        |                    |                        |                           | m/hr                | #/hr                                                                             |                                   |                                      |                                        |          |            |           | #/MCF                               | #/gal   | gal/hr | gal/MCF |                                            |            |             |         |       |        |      |
| CO<br>28.010                             | 36.778 | 14.575             | 408.25                 | 8.823                     | 1.309               | 36.67                                                                            |                                   | 3.589                                | 18.164                                 | 4.898    | -13.266    | -371.58   |                                     |         |        |         |                                            |            |             |         |       |        |      |
| H <sub>2</sub><br>2.016                  | 60.197 | 23.855             | 48.09                  | 41.463                    | 6.151               | 12.40                                                                            |                                   | 16.865                               | 40.720                                 | 23.016   | -17.704    | -35.69    |                                     |         |        |         | 400 EP                                     | 82.48      | 6.446       | 98.0    | 6.317 |        |      |
| CO <sub>2</sub><br>4.010                 | 2.325  | 0.921              | 40.53                  | 28.801                    | 4.273               | 188.05                                                                           |                                   | 11.715                               | 12.636                                 | 15.988   | 3.352      | 147.52    | 10.115                              |         |        |         | 400-550                                    | 8.48       | 0.663       | 91.4    | 0.606 |        |      |
| N <sub>2</sub><br>28.016                 | 0.602  | 0.239              | 6.70                   | 1.630                     | 0.242               | 6.78                                                                             |                                   | 0.663                                | 0.902                                  | 0.905    |            |           |                                     |         |        |         | 550 +                                      | 9.04       | 0.706       | 114.6   | 0.809 |        |      |
| CH <sub>4</sub><br>16.042                | 0.098  | 0.039              | 0.63                   | 8.949                     | 1.328               | 21.30                                                                            |                                   | 3.640                                | 3.679                                  | 4.968    | 1.289      | 20.67     | 1.417                               |         |        |         |                                            |            |             |         |       |        |      |
| C <sub>2</sub> H <sub>6</sub><br>28.052  |        |                    |                        | 2.328                     | 0.345               | 9.68                                                                             |                                   | 0.947                                | 0.947                                  | 1.292    | 0.345      | 9.68      | 0.664                               |         |        |         |                                            | RECOVERY % | #/hr        | gal/hr  |       |        |      |
| C <sub>2</sub> H <sub>6</sub><br>30.068  |        |                    |                        | 1.832                     | 0.272               | 8.18                                                                             |                                   | 0.745                                | 0.745                                  | 1.017    | 0.272      | 8.18      | 0.561                               |         |        |         | PROPYLENE                                  | 37.6       | 6.58        |         |       |        |      |
| C <sub>1</sub> + C <sub>2</sub>          |        |                    |                        |                           |                     |                                                                                  |                                   |                                      |                                        |          |            | 38.53     | 2.642                               |         |        |         | C <sub>3</sub> POLY GASO.                  | 87.5       | 5.76        | 0.963   |       |        |      |
| C <sub>3</sub> H <sub>8</sub><br>42.078  |        |                    |                        | 2.805                     | 0.416               | 17.50                                                                            |                                   | 1.141                                | 1.141                                  | 1.557    | 0.416      | 17.50     | 1.200                               | 4.32    | 4.051  | 0.278   | C <sub>3</sub> POLY TAR                    | 12.5       | 0.82        | 0.109   |       |        |      |
| C <sub>4</sub> H <sub>10</sub><br>44.094 |        |                    |                        | 0.320                     | 0.047               | 2.07                                                                             |                                   | 0.130                                | 0.130                                  | 0.177    | 0.047      | 2.07      | 0.142                               | 4.24    | 0.488  | 0.033   |                                            |            |             |         |       |        |      |
| C <sub>4</sub> H <sub>10</sub><br>56.104 |        |                    |                        | 1.587                     | 0.235               | 13.18                                                                            |                                   | 0.646                                | 0.646                                  | 0.881    | 0.235      | 13.18     | 0.904                               | 5.00    | 2.636  | 0.181   |                                            | #/gal      | #/hr        | gal/hr  | RVP   |        |      |
| C <sub>4</sub> H <sub>10</sub><br>58.120 |        |                    |                        | 0.491                     | 0.073               | 4.24                                                                             |                                   | 0.200                                | 0.200                                  | 0.273    | 0.073      | 4.24      | 0.291                               | 4.86    | 0.872  | 0.060   | C <sub>4</sub> H <sub>10</sub>             | 5.00       | 0.36        | 0.072   | 68.0  |        |      |
| C <sub>4</sub> H <sub>10</sub><br>70.130 |        |                    |                        | 0.635                     | 0.094               | 6.59                                                                             |                                   | 0.258                                | 0.258                                  | 0.352    | 0.094      | 6.59      | 0.452                               | 5.45    | 1.209  | 0.083   | C <sub>4</sub> POLY GASO.                  | 5.98       | 11.22       | 1.876   | 1.5   |        |      |
| C <sub>4</sub> H <sub>12</sub><br>72.146 |        |                    |                        | 0.147                     | 0.022               | 1.59                                                                             |                                   | 0.060                                | 0.060                                  | 0.082    | 0.022      | 1.59      | 0.109                               | 5.25    | 0.303  | 0.021   | C <sub>4</sub> H <sub>10</sub>             | 4.86       | 4.24        | 0.872   | 68.0  |        |      |
| C <sub>4</sub> H <sub>12</sub><br>84.156 |        |                    |                        | 0.189                     | 0.028               | 2.36                                                                             |                                   | 0.077                                | 0.077                                  | 0.105    | 0.028      | 2.36      | 0.162                               | 5.54    | 0.426  | 0.029   | C <sub>4</sub> FREE GASO.                  |            |             | 9.218   | 5.8   |        |      |
| C <sub>3</sub> - C <sub>6</sub>          |        |                    |                        |                           |                     |                                                                                  |                                   |                                      |                                        |          |            | 47.53     | 3.260                               |         | 9.985  | 0.685   | C <sub>4</sub> POLY TAR                    | 7.53       | 1.60        | 0.212   |       |        |      |
| TOTAL                                    |        | 39.629             | 504.20                 |                           | 14.835              | 330.59                                                                           |                                   | 40.676                               | 80.305                                 | 61.993   |            |           |                                     |         |        |         |                                            |            |             |         |       |        |      |
| H <sub>2</sub> + CO                      | 96.975 | 38.430             |                        | 14584                     | SCFH                | 7.460                                                                            |                                   | 20.454                               | 58.884                                 | 27.914   | -30.970    |           |                                     |         |        |         |                                            | gal/hr     | gal / MCF   | Bbl/Day |       |        |      |
| H <sub>2</sub> / CO                      |        | 1.64               | Factor                 | 685682                    |                     | 4.70                                                                             |                                   | 4.70                                 | 2.24                                   | 4.70     | 1.33       |           |                                     |         |        |         | 10 # RVP 480 EP GASOLINE                   | 12.038     | 0.8254      | 4475    |       |        |      |
| Weight Recovery, %                       |        | Catalyst Age, hrs. |                        | 252                       | Space Velocity, vhr |                                                                                  | 1179                              | RECOVERED OIL                        |                                        | 0.353**  | 49.45      | 3.391     |                                     | 7.815   | 0.536  |         | GAS OIL                                    | 0.606      | 0.0416      | 226     |       |        |      |
| Pressure, psig                           |        | 403                | Inlet Velocity, Ft/sec |                           | Catalyst            |                                                                                  |                                   | TOTAL OIL                            |                                        |          | 96.98      | 6.651     |                                     | 17.800  | 1.221  |         | FUEL OIL                                   | 0.809      | 0.0555      | 301     |       |        |      |
| Temperature, °F                          |        | 661                | Bed Depth, Ft          |                           | 18.74               | Weight, #                                                                        |                                   | 1837                                 | WATER SOLUBLE CHEMICALS                |          | 0.399**    | 21.15     | 1.450                               | 7.857   | 2.692  | 0.185   | POLY TAR                                   | 0.321      | 0.0220      | 119     |       |        |      |
| Recycle Ratio                            |        | 1.03               | Bed Density, #/CF      |                           | 149                 | Effluent (H <sub>2</sub> )(CO) <sub>2</sub> Shift Ratio (H <sub>2</sub> O)(CO) = |                                   | 13.1                                 | TOTAL LIQUID PRODUCTS C <sub>1</sub> + |          |            | 118.13    | 8.101                               | 20.492  | 1.406  |         | TOTAL                                      | 13.774     | 0.9445      | 5121    |       |        |      |
| FRESH FEED CONVERSION — %                |        |                    |                        | TOTAL FEED CONVERSION — % |                     |                                                                                  |                                   | SELECTIVITY                          |                                        |          |            | NET WATER |                                     | 5.730** | 103.24 | 7.079   | 12.394                                     | 0.850      | W. S. CHEM. |         | 2.692 | 0.1846 | 1001 |
| Contraction                              | CO     | H <sub>2</sub>     | H <sub>2</sub> + CO    | CO                        | H <sub>2</sub>      | CO + H <sub>2</sub>                                                              | C <sub>3</sub> + C <sub>4</sub> + | GROSS WATER                          |                                        |          | 124.39     | 8.529     |                                     | 15.086  | 1.035  |         | TOTAL                                      | 16.466     | 1.1271      | 6122    |       |        |      |
| 62.57                                    | 91.02  | 74.22              | 80.59                  | 73.03                     | 43.48               | 52.59                                                                            | 75.41                             | HYDROCARBON TOTAL — C <sub>1</sub> + |                                        |          | 156.68     | 10.742    |                                     |         |        |         |                                            |            |             |         |       |        |      |

Form ML-11

\*\*Included in Reactor Effluent Total

R/NCM = 16.91 X #/MCF

\*9488 MCFH H<sub>2</sub> + CO, Bbl/Day = 5421.6 X gal/MCF

THE TEXAS COMPANY — MONTEBELLO LABORATORY  
YIELD CALCULATIONS

RUN NO. 66-3 (P-T)  
HOURS 296-416

CATALYST Brownsville Trtd  
Mill Scale @ 660° F.

| Mill Scale @ 660° F.               |        |                        |                    |                           |                                                                                  |                   |                                   |                                        |               |          |            |           |                                     |          |         |          |                                            |                     |             |                      |        |      |
|------------------------------------|--------|------------------------|--------------------|---------------------------|----------------------------------------------------------------------------------|-------------------|-----------------------------------|----------------------------------------|---------------|----------|------------|-----------|-------------------------------------|----------|---------|----------|--------------------------------------------|---------------------|-------------|----------------------|--------|------|
| FRESH FEED                         |        |                        |                    | WET GAS                   |                                                                                  |                   |                                   | RECYCLE                                | COMBINED FEED | EFFLUENT | NET CHANGE |           | YIELD BASIS H <sub>2</sub> + CO FED |          |         |          |                                            |                     |             |                      |        |      |
|                                    | %      | m/hr                   | #/hr               | %                         | At Wt. Balance                                                                   |                   |                                   | m/hr                                   | m/hr          | m/hr     | m/hr       | #/hr      | CONDENSATE                          |          |         |          | YIELDS BASIS BROWNSVILLE DESIGN FEED RATE* |                     |             |                      |        |      |
|                                    |        |                        |                    |                           | m/hr                                                                             | #/hr              |                                   |                                        |               |          |            |           | #/MCF                               | #/gal    | gal/hr  | gal/MCF  |                                            | CORRECTED HEMPEL, % | gal/hr      | TREATING RECOVERY, % | gal/hr |      |
| CO <sub>28.010</sub>               | 36.921 | 13.906                 | 389.51             | 9.352                     | 1.364                                                                            | 38.21             | 3.772                             | 17.678                                 | 5.136         | -12.542  | -351.30    |           |                                     |          |         |          |                                            |                     |             |                      |        |      |
| H <sub>2</sub> <sub>2.016</sub>    | 59.712 | 22.490                 | 45.34              | 41.133                    | 5.996                                                                            | 12.09             | 16.591                            | 39.081                                 | 22.587        | -16.494  | -33.25     |           |                                     |          |         |          | 400 EP                                     | 80.98               | 5.500       | 98.0                 | 5.390  |      |
| CO <sub>24.010</sub>               | 2.315  | 0.872                  | 38.38              | 28.565                    | 4.164                                                                            | 183.26            | 11.521                            | 12.393                                 | 15.685        | 3.292    | 144.88     | 10.488    |                                     |          |         |          | 400-550                                    | 8.70                | 0.591       | 91.4                 | 0.540  |      |
| N <sub>28.016</sub>                | 0.932  | 0.351                  | 9.83               | 2.246                     | 0.327                                                                            | 9.16              | 0.906                             | 1.257                                  | 1.233         |          |            |           |                                     |          |         |          | 550 +                                      | 10.32               | 0.701       | 114.6                | 0.803  |      |
| CH <sub>16.042</sub>               | 0.120  | 0.045                  | 0.72               | 8.477                     | 1.236                                                                            | 19.83             | 3.419                             | 3.464                                  | 4.655         | 1.191    | 19.11      | 1.384     |                                     |          |         |          |                                            |                     |             |                      |        |      |
| C <sub>2</sub> H <sub>28.052</sub> |        |                        |                    | 2.255                     | 0.329                                                                            | 9.23              | 0.910                             | 0.910                                  | 1.239         | 0.329    | 9.23       | 0.668     |                                     |          |         |          |                                            | RECOVERY %          | #/hr        | gal/hr               |        |      |
| C <sub>2</sub> H <sub>30.068</sub> |        |                        |                    | 1.739                     | 0.254                                                                            | 7.64              | 0.701                             | 0.701                                  | 0.955         | 0.254    | 7.64       | 0.553     |                                     |          |         |          | PROPYLENE                                  | 36.3                | 6.32        |                      |        |      |
| C <sub>1</sub> +C <sub>2</sub>     |        |                        |                    |                           |                                                                                  |                   |                                   |                                        |               |          |            |           | 35.98                               | 2.605    |         |          | C <sub>3</sub> POLY GASO.                  | 87.5                | 5.53        | 0.925                |        |      |
| C <sub>3</sub> H <sub>42.078</sub> |        |                        |                    | 2.837                     | 0.414                                                                            | 17.42             | 1.144                             | 1.144                                  | 1.558         | 0.414    | 17.42      | 1.261     | 4.32                                | 4.032    | 0.292   |          | C <sub>3</sub> POLY TAR                    | 12.5                | 0.79        | 0.105                |        |      |
| C <sub>3</sub> H <sub>44.094</sub> |        |                        |                    | 0.302                     | 0.044                                                                            | 1.94              | 0.122                             | 0.122                                  | 0.166         | 0.044    | 1.94       | 0.140     | 4.24                                | 0.458    | 0.033   |          |                                            |                     |             |                      |        |      |
| C <sub>3</sub> H <sub>56.104</sub> |        |                        |                    | 1.638                     | 0.239                                                                            | 13.41             | 0.661                             | 0.661                                  | 0.900         | 0.239    | 13.41      | 0.971     | 5.00                                | 2.682    | 0.194   |          |                                            | #/gal               | #/hr        | gal/hr               | RVP    |      |
| C <sub>4</sub> H <sub>58.120</sub> |        |                        |                    | 0.484                     | 0.071                                                                            | 4.13              | 0.195                             | 0.195                                  | 0.266         | 0.071    | 4.13       | 0.299     | 4.86                                | 0.850    | 0.062   |          | C <sub>4</sub> H <sub>8</sub>              | 5.00                | 0.15        | 0.030                | 68.0   |      |
| C <sub>4</sub> H <sub>70.130</sub> |        |                        |                    | 0.643                     | 0.094                                                                            | 6.59              | 0.259                             | 0.259                                  | 0.353         | 0.094    | 6.59       | 0.477     | 5.45                                | 1.209    | 0.088   |          | C <sub>4</sub> POLY GASO.                  | 5.98                | 11.60       | 1.940                | 1.5    |      |
| C <sub>4</sub> H <sub>72.146</sub> |        |                        |                    | 0.154                     | 0.022                                                                            | 1.59              | 0.062                             | 0.062                                  | 0.084         | 0.022    | 1.59       | 0.115     | 5.25                                | 0.303    | 0.022   |          | C <sub>4</sub> H <sub>10</sub>             | 4.86                | 4.13        | 0.850                | 68.0   |      |
| C <sub>4</sub> H <sub>84.156</sub> |        |                        |                    | 0.175                     | 0.026                                                                            | 2.19              | 0.071                             | 0.071                                  | 0.097         | 0.026    | 2.19       | 0.159     | 5.54                                | 0.395    | 0.029   |          | C <sub>4</sub> FREE GASO.                  |                     |             | 8.222                | 5.8    |      |
| C <sub>3</sub> -C <sub>6</sub>     |        |                        |                    |                           |                                                                                  |                   |                                   |                                        |               |          |            |           | 47.27                               | 3.422    | 9.929   | 0.720    | C <sub>4</sub> POLY TAR                    | 7.53                | 1.66        | 0.260                |        |      |
| TOTAL                              |        | 37.664                 | 483.78             |                           | 14.580                                                                           | 326.69            | 40.334                            | 77.998                                 | 60.797        |          |            |           |                                     |          |         |          |                                            |                     |             |                      |        |      |
| H <sub>2</sub> +CO                 | 96.633 | 36.396                 | 13812              | SCFH                      | 7.360                                                                            |                   |                                   | 20.363                                 | 56.759        | 27.723   | -29.036    |           |                                     |          |         |          |                                            | gal/hr              | gal/MCF     | Bbl/Day              |        |      |
| H <sub>2</sub> /CO                 |        | 1.62                   | Factor             | 724008                    | 4.40                                                                             |                   |                                   | 4.40                                   | 2.21          | 4.40     | 1.32       |           |                                     |          |         |          | 10 # RVP 400 EP GASOLINE                   | 11.042              | 0.7994      | 4334                 |        |      |
| Weight Recovery, %                 |        | Catalyst Age, hrs.     |                    | 356                       | Space Velocity, vhr                                                              |                   | 1124                              | RECOVERED OIL                          |               | 0.307**  | 43.10      | 3.120     | 6.792                               | 0.492    | GAS OIL |          | 0.540                                      | 0.0391              | 212         |                      |        |      |
| Pressure, psig                     | 401    | Inlet Velocity, Ft/sec |                    |                           | Catalyst                                                                         |                   |                                   | TOTAL OIL                              |               | 90.37    | 6.542      | 16.721    | 1.212                               | FUEL OIL |         | 0.803    | 0.0581                                     | 315                 |             |                      |        |      |
| Temperature, °F                    | 661    | Bed Depth, Ft          |                    | 18.61                     | Weight, #                                                                        |                   | 1698                              | WATER SOLUBLE CHEMICALS                |               | 0.386**  | 20.46      | 1.482     | 7.913                               | 2.586    | 0.187   | POLY TAR |                                            | 0.325               | 0.0235      | 127                  |        |      |
| Recycle Ratio                      | 1.07   | Bed Density, #/CF      |                    | 138                       | Effluent (H <sub>2</sub> )(CO) <sub>2</sub> Shift Ratio (H <sub>2</sub> O)(CO) = |                   | 13.3                              | TOTAL LIQUID PRODUCTS C <sub>1</sub> + |               | 110.83   | 8.024      | 19.307    | 1.399                               | TOTAL    |         | 12.710   | 0.9201                                     | 4988                |             |                      |        |      |
| FRESH FEED CONVERSION — %          |        |                        |                    | TOTAL FEED CONVERSION — % |                                                                                  |                   |                                   | SELECTIVITY                            |               |          |            | NET WATER |                                     | 5.190**  | 83.50   | 6.769    | 11.224                                     | 0.813               | W. S. CHEM. | 2.586                | 0.1872 | 1015 |
| Contraction                        | CO     | H <sub>2</sub>         | H <sub>2</sub> +CO | CO                        | H <sub>2</sub>                                                                   | CO+H <sub>2</sub> | C <sub>3</sub> + C <sub>4</sub> + | GROSS WATER                            |               | 113.96   | 8.251      | 13.810    | 1.000                               | TOTAL    |         | 15.296   | 1.1073                                     | 6003                |             |                      |        |      |
| 61.29                              | 90.19  | 73.34                  | 79.78              | 70.95                     | 42.20                                                                            | 51.16             | 75.49                             | HYDROCARBON TOTAL—C <sub>1</sub> +     |               | 146.81   | 10.628     |           |                                     |          |         |          |                                            |                     |             |                      |        |      |

Form ML-11

\*\*Included in Reactor Effluent Total

R/NCM = 16.91 X #/MCF

\*9488 MCFH H<sub>2</sub> + CO, Bbl/Day = 5421.6 X gal/MCF

THE TEXAS COMPANY — MONTEBELLO LABORATORY  
YIELD CALCULATIONS

13.827  
RUN NO. 66-4 (U-X)  
HOURS 416-500  
Catalyst Brownsville Trtd  
Mill Scale @ 660° F.

| FRESH FEED                                       |        |                |                    | WET GAS                   |                |                   |                                                                                  | RECYCLE          | COMBINED FEED    | EFFLUENT                               | NET CHANGE | YIELD BASIS H <sub>2</sub> + CO FED |        |        |         |                                            |  |  |  |  |  |
|--------------------------------------------------|--------|----------------|--------------------|---------------------------|----------------|-------------------|----------------------------------------------------------------------------------|------------------|------------------|----------------------------------------|------------|-------------------------------------|--------|--------|---------|--------------------------------------------|--|--|--|--|--|
|                                                  | %      | m/hr           | #/hr               | %                         | At Wt. Balance |                   | m/hr                                                                             | m/hr             | m/hr             | m/hr                                   | #/hr       | CONDENSATE                          |        |        |         | YIELDS BASIS BROWNSVILLE DESIGN FEED RATE* |  |  |  |  |  |
|                                                  |        |                |                    |                           | m/hr           | #/hr              |                                                                                  |                  |                  |                                        |            | #/MCF                               | #/gal  | gal/hr | gal/MCF |                                            |  |  |  |  |  |
| CO <sub>28.010</sub>                             | 36.320 | 14.578         | 408.33             | 11.784                    | 2.124          | 59.49             | 4.966                                                                            | 19.544           | 7.090            | -12.454                                | -348.84    |                                     |        |        |         |                                            |  |  |  |  |  |
| H <sub>2</sub> <sub>2.016</sub>                  | 60.450 | 24.264         | 48.92              | 46.748                    | 8.425          | 16.98             | 19.701                                                                           | 43.965           | 28.125           | -15.839                                | -31.94     |                                     |        |        |         | 400 EP                                     |  |  |  |  |  |
| CO <sub>24.010</sub>                             | 2.255  | 0.905          | 39.83              | 24.836                    | 4.476          | 196.99            | 10.466                                                                           | 11.371           | 12.942           | 3.571                                  | 157.16     | 10.662                              |        |        |         | 400-550                                    |  |  |  |  |  |
| N <sub>2</sub> <sub>28.016</sub>                 | 0.835  | 0.335          | 9.39               | 1.910                     | 0.344          | 9.64              | 0.805                                                                            | 1.140            | 1.149            |                                        |            |                                     |        |        |         | 550 +                                      |  |  |  |  |  |
| CH <sub>4</sub> <sub>16.042</sub>                | 0.140  | 0.056          | 0.90               | 6.954                     | 1.253          | 20.10             | 2.930                                                                            | 2.986            | 4.183            | 1.197                                  | 19.20      | 1.303                               |        |        |         |                                            |  |  |  |  |  |
| C <sub>2</sub> H <sub>6</sub> <sub>28.058</sub>  |        |                |                    | 1.744                     | 0.314          | 8.91              | 0.735                                                                            | 0.735            | 1.049            | 0.314                                  | 8.81       | 0.598                               |        |        |         |                                            |  |  |  |  |  |
| C <sub>3</sub> H <sub>8</sub> <sub>30.068</sub>  |        |                |                    | 1.261                     | 0.227          | 6.83              | 0.531                                                                            | 0.531            | 0.758            | 0.227                                  | 6.83       | 0.463                               |        |        |         | PROPYLENE                                  |  |  |  |  |  |
| C <sub>4</sub> +C <sub>6</sub>                   |        |                |                    |                           |                |                   |                                                                                  |                  |                  |                                        |            |                                     |        |        |         |                                            |  |  |  |  |  |
| C <sub>2</sub> H <sub>4</sub> <sub>42.078</sub>  |        |                |                    | 2.096                     | 0.378          | 15.91             | 0.883                                                                            | 0.883            | 1.261            | 0.378                                  | 15.91      | 1.079                               | 4.32   | 3.683  | 0.250   | C <sub>2</sub> POLY GASO.                  |  |  |  |  |  |
| C <sub>3</sub> H <sub>6</sub> <sub>44.094</sub>  |        |                |                    | 0.227                     | 0.041          | 1.81              | 0.096                                                                            | 0.096            | 0.137            | 0.041                                  | 1.81       | 0.123                               | 4.24   | 0.427  | 0.029   | C <sub>3</sub> POLY TAR                    |  |  |  |  |  |
| C <sub>4</sub> H <sub>10</sub> <sub>56.104</sub> |        |                |                    | 1.201                     | 0.216          | 12.12             | 0.506                                                                            | 0.506            | 0.722            | 0.216                                  | 12.12      | 0.823                               | 5.00   | 2.424  | 0.164   |                                            |  |  |  |  |  |
| C <sub>5</sub> H <sub>12</sub> <sub>68.120</sub> |        |                |                    | 0.378                     | 0.068          | 3.95              | 0.159                                                                            | 0.159            | 0.227            | 0.068                                  | 3.95       | 0.268                               | 4.86   | 0.813  | 0.055   |                                            |  |  |  |  |  |
| C <sub>6</sub> H <sub>14</sub> <sub>70.130</sub> |        |                |                    | 0.541                     | 0.097          | 6.80              | 0.228                                                                            | 0.228            | 0.325            | 0.097                                  | 6.80       | 0.461                               | 5.45   | 1.248  | 0.085   |                                            |  |  |  |  |  |
| C <sub>7</sub> H <sub>16</sub> <sub>72.146</sub> |        |                |                    | 0.149                     | 0.027          | 1.95              | 0.063                                                                            | 0.063            | 0.090            | 0.027                                  | 1.95       | 0.132                               | 5.25   | 0.371  | 0.023   |                                            |  |  |  |  |  |
| C <sub>8</sub> H <sub>18</sub> <sub>84.156</sub> |        |                |                    | 0.171                     | 0.031          | 2.61              | 0.072                                                                            | 0.072            | 0.103            | 0.031                                  | 2.61       | 0.177                               | 5.54   | 0.471  | 0.032   |                                            |  |  |  |  |  |
| C <sub>9</sub> -C <sub>10</sub>                  |        |                |                    |                           |                |                   |                                                                                  |                  |                  |                                        |            |                                     |        |        |         |                                            |  |  |  |  |  |
| TOTAL                                            |        | 40.138         | 507.37             |                           | 18.021         | 363.99            | 42.141                                                                           | 82.279           | 65.469           |                                        |            |                                     |        |        |         |                                            |  |  |  |  |  |
| H <sub>2</sub> +CO                               | 96.770 | 38.942         | 14740              | SCFH                      | 10.549         |                   | 24.667                                                                           | 63.509           | 35.216           | -28.293                                |            |                                     |        |        |         |                                            |  |  |  |  |  |
| H <sub>2</sub> /CO                               | 1.66   | Factor         | 678426             |                           | 3.97           |                   | 3.97                                                                             | 2.25             | 3.97             | 1.27                                   |            |                                     |        |        |         |                                            |  |  |  |  |  |
| Weight Recovery, %                               |        |                |                    | Catalyst Age, hrs.        | 458            |                   | Space Velocity, vhr                                                              | 1369             |                  | RECOVERED OIL                          | 0.277**    | 38.89                               | 2.638  | 6.043  | 0.410   |                                            |  |  |  |  |  |
| Pressure, psig                                   | 398    |                |                    | Inlet Velocity, Ft/sec    |                |                   | Catalyst                                                                         |                  |                  | TOTAL OIL                              | 84.04      | 5.701                               | 15.480 | 1.050  |         |                                            |  |  |  |  |  |
| Temperature, °F                                  | 662    |                |                    | Bed Depth, Ft             | 16.31          |                   | Weight, #                                                                        | 1433             |                  | WATER SOLUBLE CHEMICALS                | 0.368**    | 19.53                               | 1.325  | 7.889  | 2.746   | 0.168                                      |  |  |  |  |  |
| Recycle Ratio                                    | 1.05   |                |                    | Bed Density, #/CF         | 133            |                   | Effluent (H <sub>2</sub> )(CO) <sub>2</sub> Shift Ratio (H <sub>2</sub> O)(CO) = | 12.6             |                  | TOTAL LIQUID PRODUCTS C <sub>2</sub> + | 103.57     | 7.026                               | 17.956 | 1.218  |         |                                            |  |  |  |  |  |
| FRESH FEED CONVERSION — %                        |        |                |                    | TOTAL FEED CONVERSION — % |                |                   |                                                                                  | SELECTIVITY      |                  |                                        |            | NET WATER                           |        |        |         |                                            |  |  |  |  |  |
| Contraction                                      | CO     | H <sub>2</sub> | H <sub>2</sub> +CO | CO                        | H <sub>2</sub> | CO+H <sub>2</sub> | C <sub>2</sub> +C <sub>3</sub> +                                                 | C <sub>4</sub> + | C <sub>5</sub> + | GROSS WATER                            | 104.51     | 7.090                               | 12.678 | 0.860  |         |                                            |  |  |  |  |  |
| 55.10                                            | 85.43  | 65.28          | 72.84              | 63.72                     | 36.03          | 44.55             | 74.83                                                                            |                  |                  | HYDROCARBON TOTAL — C <sub>2</sub> +   | 138.41     | 9.390                               |        |        |         |                                            |  |  |  |  |  |

Form ML-11

THE TEXAS COMPANY — MONTEBELLO LABORATORY  
YIELD CALCULATIONS

16.167  
RUN NO. 66-5 (Y-CO)  
HOURS 500-619  
Catalyst Brownsville Trtd  
Mill Scale @ 660° F.

| FRESH FEED                                       |        |                |                    | WET GAS                   |                |                   |                                                                                  | RECYCLE          | COMBINED FEED    | EFFLUENT                               | NET CHANGE | YIELD BASIS H <sub>2</sub> + CO FED |        |        |         |                                            |  |  |  |  |  |
|--------------------------------------------------|--------|----------------|--------------------|---------------------------|----------------|-------------------|----------------------------------------------------------------------------------|------------------|------------------|----------------------------------------|------------|-------------------------------------|--------|--------|---------|--------------------------------------------|--|--|--|--|--|
|                                                  | %      | m/hr           | #/hr               | %                         | At Wt. Balance |                   | m/hr                                                                             | m/hr             | m/hr             | m/hr                                   | #/hr       | CONDENSATE                          |        |        |         | YIELDS BASIS BROWNSVILLE DESIGN FEED RATE* |  |  |  |  |  |
|                                                  |        |                |                    |                           | m/hr           | #/hr              |                                                                                  |                  |                  |                                        |            | #/MCF                               | #/gal  | gal/hr | gal/MCF |                                            |  |  |  |  |  |
| CO <sub>28.010</sub>                             | 36.320 | 14.370         | 402.50             | 14.801                    | 2.552          | 71.48             | 12.255                                                                           | 26.625           | 14.807           | -11.818                                | -331.02    |                                     |        |        |         |                                            |  |  |  |  |  |
| H <sub>2</sub> <sub>2.016</sub>                  | 60.323 | 23.866         | 48.11              | 46.671                    | 8.047          | 16.22             | 38.642                                                                           | 62.508           | 46.689           | -15.819                                | -31.89     |                                     |        |        |         | 400 EP                                     |  |  |  |  |  |
| CO <sub>24.010</sub>                             | 2.230  | 0.982          | 38.82              | 22.824                    | 3.935          | 173.18            | 18.897                                                                           | 19.779           | 22.832           | 3.053                                  | 134.36     | 9.259                               |        |        |         | 400-550                                    |  |  |  |  |  |
| N <sub>2</sub> <sub>28.016</sub>                 | 0.738  | 0.292          | 8.18               | 1.742                     | 0.300          | 8.40              | 1.442                                                                            | 1.734            | 1.742            |                                        |            |                                     |        |        |         | 550 +                                      |  |  |  |  |  |
| CH <sub>4</sub> <sub>16.042</sub>                | 0.389  | 0.154          | 2.47               | 6.356                     | 1.096          | 17.58             | 5.263                                                                            | 5.417            | 6.359            | 0.942                                  | 15.11      | 1.041                               |        |        |         |                                            |  |  |  |  |  |
| C <sub>2</sub> H <sub>6</sub> <sub>28.058</sub>  |        |                |                    | 1.766                     | 0.304          | 8.53              | 1.462                                                                            | 1.462            | 1.766            | 0.304                                  | 8.53       | 0.588                               |        |        |         |                                            |  |  |  |  |  |
| C <sub>3</sub> H <sub>8</sub> <sub>30.068</sub>  |        |                |                    | 0.989                     | 0.171          | 5.14              | 0.819                                                                            | 0.819            | 0.990            | 0.171                                  | 5.14       | 0.354                               |        |        |         | PROPYLENE                                  |  |  |  |  |  |
| C <sub>4</sub> +C <sub>6</sub>                   |        |                |                    |                           |                |                   |                                                                                  |                  |                  |                                        |            |                                     |        |        |         |                                            |  |  |  |  |  |
| C <sub>2</sub> H <sub>4</sub> <sub>42.078</sub>  |        |                |                    | 2.013                     | 0.347          | 14.60             | 1.667                                                                            | 1.667            | 2.014            | 0.347                                  | 14.60      | 1.006                               | 4.32   | 3.380  | 0.233   | C <sub>2</sub> POLY GASO.                  |  |  |  |  |  |
| C <sub>3</sub> H <sub>6</sub> <sub>44.094</sub>  |        |                |                    | 0.203                     | 0.035          | 1.54              | 0.168                                                                            | 0.168            | 0.203            | 0.035                                  | 1.54       | 0.106                               | 4.24   | 0.363  | 0.025   | C <sub>3</sub> POLY TAR                    |  |  |  |  |  |
| C <sub>4</sub> H <sub>10</sub> <sub>56.104</sub> |        |                |                    | 1.326                     | 0.229          | 12.85             | 1.098                                                                            | 1.098            | 1.327            | 0.229                                  | 12.85      | 0.886                               | 5.00   | 2.570  | 0.177   |                                            |  |  |  |  |  |
| C <sub>5</sub> H <sub>12</sub> <sub>68.120</sub> |        |                |                    | 0.401                     | 0.069          | 4.01              | 0.332                                                                            | 0.332            | 0.401            | 0.069                                  | 4.01       | 0.276                               | 4.86   | 0.825  | 0.057   |                                            |  |  |  |  |  |
| C <sub>6</sub> H <sub>14</sub> <sub>70.130</sub> |        |                |                    | 0.586                     | 0.101          | 7.08              | 0.485                                                                            | 0.485            | 0.586            | 0.101                                  | 7.08       | 0.488                               | 5.45   | 1.299  | 0.090   |                                            |  |  |  |  |  |
| C <sub>7</sub> H <sub>16</sub> <sub>72.146</sub> |        |                |                    | 0.137                     | 0.024          | 1.73              | 0.113                                                                            | 0.113            | 0.137            | 0.024                                  | 1.73       | 0.119                               | 5.25   | 0.330  | 0.023   |                                            |  |  |  |  |  |
| C <sub>8</sub> H <sub>18</sub> <sub>84.156</sub> |        |                |                    | 0.185                     | 0.032          | 2.69              | 0.153                                                                            | 0.153            | 0.185            | 0.032                                  | 2.69       | 0.185                               | 5.54   | 0.486  | 0.033   |                                            |  |  |  |  |  |
| C <sub>9</sub> -C <sub>10</sub>                  |        |                |                    |                           |                |                   |                                                                                  |                  |                  |                                        |            |                                     |        |        |         |                                            |  |  |  |  |  |
| TOTAL                                            |        | 39.564         | 500.08             |                           | 17.242         | 345.03            | 82.796                                                                           | 122.360          | 105.696          |                                        |            |                                     |        |        |         |                                            |  |  |  |  |  |
| H <sub>2</sub> +CO                               | 96.643 | 38.236         | 14511              | SCFH                      | 10.599         |                   | 50.897                                                                           | 89.133           | 61.496           | -27.637                                |            |                                     |        |        |         |                                            |  |  |  |  |  |
| H <sub>2</sub> /CO                               | 1.66   | Factor         | 689132             |                           | 3.15           |                   | 3.15                                                                             | 2.35             | 3.15             | 1.34                                   |            |                                     |        |        |         |                                            |  |  |  |  |  |
| Weight Recovery, %                               |        |                |                    | Catalyst Age, hrs.        | 560            |                   | Space Velocity, vhr                                                              | 2668             |                  | RECOVERED OIL                          | 0.334**    | 46.88                               | 3.231  | 7.244  | 0.499   |                                            |  |  |  |  |  |
| Pressure, psig                                   | 404    |                |                    | Inlet Velocity, Ft/sec    |                |                   | Catalyst                                                                         |                  |                  | TOTAL OIL                              | 91.38      | 6.297                               | 16.497 | 1.137  |         |                                            |  |  |  |  |  |
| Temperature, °F                                  | 663    |                |                    | Bed Depth, Ft             | 8.24           |                   | Weight, #                                                                        | 596              |                  | WATER SOLUBLE CHEMICALS                | 0.390**    | 20.67                               | 1.424  | 8.005  | 2.582   | 0.178                                      |  |  |  |  |  |
| Recycle Ratio                                    | 209    |                |                    | Bed Density, #/CF         | 109            |                   | Effluent (H <sub>2</sub> )(CO) <sub>2</sub> Shift Ratio (H <sub>2</sub> O)(CO) = | 14.6             |                  | TOTAL LIQUID PRODUCTS C <sub>2</sub> + | 112.05     | 7.721                               | 19.079 | 1.315  |         |                                            |  |  |  |  |  |
| FRESH FEED CONVERSION — %                        |        |                |                    | TOTAL FEED CONVERSION — % |                |                   |                                                                                  | SELECTIVITY      |                  |                                        |            | NET WATER                           |        |        |         |                                            |  |  |  |  |  |
| Contraction                                      | CO     | H <sub>2</sub> | H <sub>2</sub> +CO | CO                        | H <sub>2</sub> | CO+H <sub>2</sub> | C <sub>2</sub> +C <sub>3</sub> +                                                 | C <sub>4</sub> + | C <sub>5</sub> + | GROSS WATER                            | 109.56     | 7.550                               | 13.253 | 0.913  |         |                                            |  |  |  |  |  |
| 56.42                                            | 82.24  | 66.28          | 72.28              | 44.39                     | 25.31          | 31.01             | 79.56                                                                            |                  |                  | HYDROCARBON TOTAL — C <sub>2</sub> +   | 140.83     | 9.705                               |        |        |         |                                            |  |  |  |  |  |

Form ML-11

\*\* Included in Reactor Effluent Total

g/NCM = 16.91 X #/MCF      \*9488 MCFH H<sub>2</sub> + CO, Bbl/Day = 5421.6 X gal/MCF

THE TEXAS COMPANY — MONTEBELLO LABORATORY  
YIELD CALCULATIONS

RUN NO. 66-A  
HOURS 0-9  
CATALYST Brownville  
Treated Mill Scale  
Reduced at 650°F

| FRESH FEED                     |        |                        |                    | WET GAS                                                                |                |                   |                                | RECYCLE     | COMBINED FEED | EFFLUENT | NET CHANGE | YIELD BASIS H <sub>2</sub> + CO FED |          |             |         |
|--------------------------------|--------|------------------------|--------------------|------------------------------------------------------------------------|----------------|-------------------|--------------------------------|-------------|---------------|----------|------------|-------------------------------------|----------|-------------|---------|
|                                | %      | m/hr                   | #/hr               | %                                                                      | At Wt. Balance |                   |                                |             |               |          |            | CONDENSATE                          |          |             |         |
|                                |        |                        |                    |                                                                        | m/hr           | #/hr              | m/hr                           | m/hr        | m/hr          | m/hr     | #/hr       | #/MCF                               | #/gal    | gal/hr      | gal/MCF |
| CO                             | 36.120 | 14.989                 | 419.86             | 7.445                                                                  | 0.978          | 27.39             | 3.014                          | 18.003      | 3.992         | -14.011  | -392.47    |                                     |          |             |         |
| H <sub>2</sub>                 | 60.855 | 25.255                 | 50.91              | 40.855                                                                 | 5.368          | 10.82             | 16.540                         | 41.795      | 21.908        | -19.887  | -40.09     |                                     |          | 400 EP      | 79.1    |
| CO <sub>2</sub>                | 2.410  | 1.000                  | 44.01              | 31.375                                                                 | 4.123          | 181.42            | 12.702                         | 13.702      | 16.825        | 3.123    | 137.41     | 8.997                               |          | 400-550     | 11.6    |
| N <sub>2</sub>                 | 0.535  | 0.222                  | 6.22               | 1.840                                                                  | 0.242          | 6.78              | 0.745                          | 0.987       | 0.987         |          |            |                                     |          | 550 +       | 9.3     |
| CH <sub>4</sub>                | 0.080  | 0.033                  | 0.53               | 8.770                                                                  | 1.152          | 18.48             | 3.551                          | 3.584       | 4.703         | 1.119    | 17.95      | 1.175                               |          |             |         |
| C <sub>2</sub> H <sub>6</sub>  |        |                        |                    | 2.260                                                                  | 0.297          | 8.33              | 0.915                          | 0.915       | 1.212         | 0.297    | 8.33       | 0.545                               |          |             |         |
| C <sub>3</sub> H <sub>8</sub>  |        |                        |                    | 1.180                                                                  | 0.155          | 4.66              | 0.478                          | 0.478       | 0.633         | 0.155    | 4.66       | 0.306                               |          |             |         |
| C <sub>4</sub> +C <sub>5</sub> |        |                        |                    |                                                                        |                |                   |                                |             |               |          | 30.94      | 2.025                               |          |             |         |
| C <sub>2</sub> H <sub>4</sub>  |        |                        |                    | 2.820                                                                  | 0.371          | 15.61             | 1.142                          | 1.142       | 1.513         | 0.371    | 15.61      | 1.022                               | 4.32     | 3.613       | 0.237   |
| C <sub>2</sub> H <sub>2</sub>  |        |                        |                    | 0.290                                                                  | 0.038          | 1.68              | 0.117                          | 0.117       | 0.155         | 0.038    | 1.68       | 0.110                               | 4.24     | 0.396       | 0.026   |
| C <sub>2</sub> H <sub>6</sub>  |        |                        |                    | 1.545                                                                  | 0.203          | 11.39             | 0.625                          | 0.625       | 0.828         | 0.203    | 11.39      | 0.746                               | 5.00     | 2.278       | 0.149   |
| C <sub>2</sub> H <sub>4</sub>  |        |                        |                    | 0.595                                                                  | 0.078          | 4.53              | 0.241                          | 0.241       | 0.319         | 0.078    | 4.53       | 0.297                               | 4.88     | 0.932       | 0.061   |
| C <sub>2</sub> H <sub>2</sub>  |        |                        |                    | 0.635                                                                  | 0.083          | 5.82              | 0.257                          | 0.257       | 0.340         | 0.083    | 5.82       | 0.381                               | 5.48     | 1.068       | 0.070   |
| C <sub>2</sub> H <sub>2</sub>  |        |                        |                    | 0.180                                                                  | 0.024          | 1.73              | 0.073                          | 0.073       | 0.097         | 0.024    | 1.73       | 0.113                               | 5.28     | 0.330       | 0.022   |
| C <sub>2</sub> H <sub>2</sub>  |        |                        |                    | 0.210                                                                  | 0.028          | 2.36              | 0.085                          | 0.085       | 0.113         | 0.028    | 2.36       | 0.155                               | 5.84     | 0.426       | 0.028   |
| C <sub>3</sub> -C <sub>4</sub> |        |                        |                    |                                                                        |                |                   |                                |             |               |          | 43.12      | 2.824                               | 9.043    | 0.593       |         |
| TOTAL                          |        | 41.499                 | 521.53             |                                                                        | 13.140         | 301.00            | 40.485                         | 81.984      | 61.492        |          |            |                                     |          |             |         |
| H <sub>2</sub> +CO             | 96.975 | 40.244                 | 15273              | SCFH                                                                   | 6.346          |                   | 19.554                         | 59.798      | 25.900        | -33.898  |            |                                     |          |             |         |
| H <sub>2</sub> /CO             |        | 1.68                   | Factor             | 654750                                                                 | 5.49           |                   | 5.49                           | 2.32        | 5.49          | 1.42     |            |                                     |          |             |         |
| Weight Recovery, %             | 92.95  | Catalyst Age, hrs.     |                    | Space Velocity, v/hv                                                   | 1209           |                   | RECOVERED OIL                  | **          | 0.563         | 78.97    | 5.171      | 12.461                              | 0.816    | GAS OIL     | 1.321   |
| Pressure, psig                 | 402    | Inlet Velocity, Ft/sec | 1.00               | Catalyst Vol CF                                                        | 12.63          |                   | TOTAL OIL                      |             | 122.09        | 7.995    | 21.504     | 1.409                               | FUEL OIL | 1.328       | 0.0870  |
| Temperature, °F                | 661    | Bed Depth, Ft          | 19.13              | Weight, #                                                              | 1970           |                   | WATER SOLUBLE                  | **          | 0.284         | 15.09    | 0.988      | 1.876                               | 0.123    | POLY TAR    | 0.290   |
| Recycle Ratio                  | 0.98   | Bed Density, #/CF      | 156                | Effluent (H <sub>2</sub> )(CO)<br>Shift Ratio (H <sub>2</sub> O)(CO) = |                |                   | TOTAL LIQUID                   | **          | 137.18        | 8.983    | 23.380     | 1.532                               | TOTAL    | 18.100      | 1.1852  |
| FRESH FEED CONVERSION — %      |        |                        |                    | TOTAL FEED CONVERSION — %                                              |                |                   |                                | SELECTIVITY |               |          |            | NET WATER                           |          |             |         |
| Contraction                    | CO     | H <sub>2</sub>         | H <sub>2</sub> +CO | CO                                                                     | H <sub>2</sub> | CO+H <sub>2</sub> | C <sub>3</sub> +C <sub>4</sub> | GROSS WATER |               | 141.56   | 9.269      | 17.058                              | 1.117    | W. S. CHEM. | 1.876   |
| 68.34                          | 93.48  | 78.74                  | 84.23              | 77.83                                                                  | 47.58          | 56.69             | 81.60                          | HYDROCARBON |               | 168.12   | 11.008     |                                     |          | TOTAL       | 19.976  |

Form ML-11

\*\* Included in Reactor Effluent Total

R/NCM = 16.91 X #/MCF \*9488 MCF H<sub>2</sub> + CO, Bbl/Day = 5421.6 X gal/MCF

THE TEXAS COMPANY — MONTEBELLO LABORATORY  
DATA SUMMARY

RUN NO. 66-A  
HOURS 0-9

| OPERATING CONDITIONS |        |                          |       | PRODUCT TESTS                                  |      |       | CATALYST DATA                        |       |                                             |               |
|----------------------|--------|--------------------------|-------|------------------------------------------------|------|-------|--------------------------------------|-------|---------------------------------------------|---------------|
| PRESSURES PSIG       |        | RATES S.C.F.H.           |       | OIL                                            |      | WATER | INVENTORY DATA                       |       | PARTICLE SIZE                               |               |
| Oxygen               | 431    | Fresh Feed               | 15749 | * API                                          | 54.4 | 10.5  | In Reactor at Start of Period        |       | Screen Analysis                             | Sedimentation |
| Natural Gas          | 454    | Recycle                  | 15364 | Neut. No.                                      | 45.4 |       | Fresh Catalyst Added                 |       | Mesh                                        | Microns       |
| Generator Outlet     | 406    | Combined Feed            | 31113 | Sap. No.                                       | 57.1 |       | Total                                |       | On 40                                       | 419+          |
| Reactor Inlet        | 402    | Wet Gas—Measured         | 4377  | Hydrox. No.                                    |      |       | Catalyst Recovered                   | 12    | 100                                         | 150           |
| Condenser Inlet      |        | Adjusted                 | 4986  | Bromine No.                                    | 98   |       | In Reactor at End of Period          |       | 150                                         | 105           |
| Product Accumulator  | 375    | Loss                     | 609   | Pour °F.                                       |      |       |                                      |       | 200                                         | 74            |
|                      |        |                          |       | Chemicals, % by K <sub>2</sub> CO <sub>3</sub> |      | 11.0  | REACTOR d-p, Inches H <sub>2</sub> O |       | 250                                         | 62            |
|                      |        |                          |       |                                                |      |       | No. Height                           |       | 325                                         | 44            |
|                      |        |                          |       |                                                |      |       | 0 0-21-3/8                           |       | <325                                        | 0.4           |
| TEMPERATURES—°F.     |        |                          |       | Recycle/Fresh Feed                             | 0.98 |       |                                      |       |                                             |               |
| Oxygen               | 478    | Inlet Velocity—ft./sec.  | 1.00  |                                                |      |       | 1 21-3/8-52-3/4                      | 74    | CATALYST                                    |               |
| Natural Gas          | 763    | Fresh Feed Rate—S.C.F.H. | 15273 | HEMPEL, DIST. %                                |      | °API  | 2 52-3/4-84                          | 73    | Bulk Density, Lbs./Cu.Ft.                   |               |
| Generator            | 2497   | per Cu.Ft. Dense Bed     | 1209  | 205 °F.                                        |      |       | 3 84-115-3/8                         | 90    | Aerated                                     |               |
| Quench Accumulator   | 137    | per Lb. Catalyst         | 7.75  | 400                                            | 78.1 | 53.0  | 4 115-3/8-353-1/8                    | 307   | Settled                                     |               |
| Reactor Inlet        | 196    | per sq ft                | 23141 | 400-550                                        | 11.6 | 34.0  | Total                                | 544   | Compacted                                   |               |
| Condenser Inlet      | 562    |                          |       | 550+                                           | 10.3 |       |                                      |       | Particle Density, gm./cc.                   |               |
| Product Accumulator  | 54     |                          |       |                                                |      |       | CALCULATED FROM dp                   |       | NH <sub>3</sub> Value, ml./gm.              |               |
| Catalyst No.         | Height |                          |       | A. S. T. M. DIST. ON                           |      |       | Density, Lbs./Cu.Ft.                 | 156   | N <sub>2</sub> Surface, m <sup>2</sup> /gm. |               |
| 1                    | 8'6"   | ---                      |       | Naphtha °F.                                    |      |       | Inventory, Lbs.                      | 1970  |                                             |               |
| 2                    | 0'19"  | 661                      |       | IBP                                            | 100  |       | Bed Depth, Ft.                       | 19.13 | CHEMICAL ANALYSIS                           |               |
| 3                    | 1'10"  | 648                      |       | 10%                                            | 121  |       | Vol cu ft                            | 12.63 | Fe                                          |               |
| 4                    | 4'5"   | 661                      |       | 50%                                            | 213  |       |                                      |       | C                                           |               |
| 5                    | 7'10"  | 663                      |       | 90%                                            | 370  |       |                                      |       | O                                           |               |
| 6                    | 12'3"  | 668                      |       | EP                                             | 397  |       |                                      |       | H                                           |               |
| 7                    | 17'5"  | 662                      |       | Rec                                            | 97.0 |       |                                      |       | K <sub>2</sub> O. W+. % basis Fe            |               |
| 8                    | 20'0"  | 648                      |       |                                                |      |       |                                      |       | X-Ray Analysis—                             |               |
| 9                    | 22'17" | 641                      |       |                                                |      |       |                                      |       | Fe <sub>2</sub> O <sub>3</sub>              |               |
| 10                   | 25'2"  | 638                      |       |                                                |      |       |                                      |       | Fe <sub>2</sub> O <sub>4</sub>              |               |
| 11                   | 26'11" | 615                      |       |                                                |      |       |                                      |       | Fe                                          |               |

THE TEXAS COMPANY — MONTEBELLO LABORATORY  
YIELD CALCULATIONS

RUN NO. 66-B  
HOURS 9-22  
CATALYST Brownsville  
Treated MS Red, @ 660P

| FRESH FEED                               |        |                        |                    | WET GAS |                 |                           |                                                                        | RECYCLE                                  | COMBINED FEED | EFFLUENT        | NET CHANGE                              | YIELD BASIS H <sub>2</sub> + CO FED |            |           |         |        |                                            |                          |                      |         |        |  |
|------------------------------------------|--------|------------------------|--------------------|---------|-----------------|---------------------------|------------------------------------------------------------------------|------------------------------------------|---------------|-----------------|-----------------------------------------|-------------------------------------|------------|-----------|---------|--------|--------------------------------------------|--------------------------|----------------------|---------|--------|--|
|                                          | %      | m/hr                   | #/hr               | %       | At. Wt. Balance |                           | m/hr                                                                   | m/hr                                     | m/hr          | m/hr            | #/hr                                    | #/MCF                               | CONDENSATE |           |         |        | YIELDS BASIS BROWNSVILLE DESIGN FEED RATE* |                          |                      |         |        |  |
|                                          |        |                        |                    |         | m/hr            | #/hr                      |                                                                        |                                          |               |                 |                                         |                                     | #/gal      | gal/hr    | gal/MCF |        | CORRECTED HEMPEL, %                        | gal/hr                   | TREATING RECOVERY, % | gal/hr  |        |  |
| CO<br>26.010                             | 35.085 | 15.689                 | 439.46             | 8.650   | 1.268           | 35.52                     | 3.619                                                                  | 19.308                                   | 4.887         | -14.421         | -403.94                                 |                                     |            |           |         |        |                                            |                          |                      |         |        |  |
| H <sub>2</sub><br>2.016                  | 61.980 | 27.716                 | 55.88              | 43.075  | 6.313           | 12.73                     | 18.021                                                                 | 45.737                                   | 24.334        | -21.403         | -43.15                                  |                                     |            |           |         |        | 400 EP                                     | 80.2                     | 9.941                | 98.0    | 9.742  |  |
| CO <sub>2</sub><br>44.010                | 2.060  | 0.921                  | 40.53              | 28.625  | 4.195           | 184.63                    | 11.976                                                                 | 12.897                                   | 16.171        | 3.274           | 144.10                                  | 8.748                               |            |           |         |        | 400-550                                    | 7.7                      | 0.954                | 91.4    | 0.872  |  |
| N <sub>2</sub><br>26.016                 | 0.720  | 0.322                  | 9.02               | 1.785   | 0.262           | 7.34                      | 0.747                                                                  | 1.069                                    | 1.331         |                 |                                         |                                     |            |           |         |        | 550 +                                      | 12.1                     | 1.500                | 114.6   | 1.719  |  |
| CH <sub>4</sub><br>16.042                | 0.155  | 0.069                  | 1.11               | 8.805   | 1.290           | 20.69                     | 3.684                                                                  | 3.753                                    | 5.043         | 1.221           | 19.58                                   | 1.189                               |            |           |         |        |                                            |                          |                      |         |        |  |
| C <sub>2</sub> H <sub>6</sub><br>26.052  |        |                        |                    | 2.150   | 0.315           | 8.84                      | 0.899                                                                  | 0.899                                    | 1.214         | 0.315           | 8.84                                    | 0.537                               |            |           |         |        |                                            | RECOVERY %               | #/hr                 | gal/hr  |        |  |
| C <sub>3</sub> H <sub>8</sub><br>30.088  |        |                        |                    | 1.230   | 0.180           | 5.41                      | 0.515                                                                  | 0.515                                    | 0.695         | 0.180           | 5.41                                    | 0.328                               |            |           |         |        | PROPYLENE                                  | 43.3                     | 6.98                 |         |        |  |
| C <sub>4</sub> +C <sub>5</sub>           |        |                        |                    |         |                 |                           |                                                                        |                                          |               |                 | 33.85                                   | 2.054                               |            |           |         |        | C <sub>3</sub> POLY GASO.                  | 87.5                     | 6.11                 | 1.022   |        |  |
| C <sub>3</sub> H <sub>8</sub><br>42.078  |        |                        |                    | 2.615   | 0.383           | 16.12                     | 1.094                                                                  | 1.094                                    | 1.477         | 0.383           | 16.12                                   | 0.979                               | 4.32       | 3.731     | 0.227   |        | C <sub>3</sub> POLY TAR                    | 12.5                     | 0.87                 | 0.116   |        |  |
| C <sub>4</sub> H <sub>10</sub><br>44.074 |        |                        |                    | 0.290   | 0.042           | 1.85                      | 0.121                                                                  | 0.121                                    | 0.163         | 0.042           | 1.85                                    | 0.112                               | 4.24       | 0.436     | 0.026   |        |                                            |                          |                      |         |        |  |
| C <sub>5</sub> H <sub>12</sub><br>56.104 |        |                        |                    | 1.510   | 0.221           | 12.40                     | 0.632                                                                  | 0.632                                    | 0.853         | 0.221           | 12.40                                   | 0.753                               | 8.00       | 2.480     | 0.151   |        |                                            | #/gal                    | #/hr                 | gal/hr  | RVP    |  |
| C <sub>6</sub> H <sub>14</sub><br>58.112 |        |                        |                    | 0.435   | 0.064           | 3.72                      | 0.182                                                                  | 0.182                                    | 0.246         | 0.064           | 3.72                                    | 0.226                               | 4.88       | 0.765     | 0.046   |        | C <sub>6</sub> H <sub>6</sub>              | 5.00                     | 2.16                 | 0.432   | 68.0   |  |
| C <sub>7</sub> H <sub>16</sub><br>70.132 |        |                        |                    | 0.550   | 0.081           | 5.68                      | 0.230                                                                  | 0.230                                    | 0.311         | 0.081           | 5.68                                    | 0.345                               | 8.48       | 1.042     | 0.063   |        | C <sub>7</sub> POLY GASO.                  | 5.98                     | 12.22                | 2.043   | 1.6    |  |
| C <sub>8</sub> H <sub>18</sub><br>72.146 |        |                        |                    | 0.155   | 0.023           | 1.66                      | 0.065                                                                  | 0.065                                    | 0.088         | 0.023           | 1.66                                    | 0.101                               | 8.28       | 0.316     | 0.019   |        | C <sub>8</sub> H <sub>10</sub>             | 4.86                     | 3.72                 | 0.765   | 68.0   |  |
| C <sub>9</sub> H <sub>20</sub><br>84.156 |        |                        |                    | 0.125   | 0.018           | 1.51                      | 0.052                                                                  | 0.052                                    | 0.070         | 0.018           | 1.51                                    | 0.092                               | 5.84       | 0.273     | 0.017   |        | C <sub>9</sub> -FREE GASO.                 |                          |                      | 12.395  | 5.8    |  |
| C <sub>10</sub> +C <sub>11</sub>         |        |                        |                    |         |                 |                           |                                                                        |                                          |               |                 | 42.94                                   | 2.608                               |            | 9.043     | 0.549   |        | C <sub>10</sub> POLY TAR                   | 7.53                     | 1.74                 | 0.231   |        |  |
| TOTAL                                    |        | 44.717                 | 546.00             |         | 14.655          | 318.10                    | 41.837                                                                 | 86.554                                   | 64.751        |                 |                                         |                                     |            |           |         |        |                                            |                          |                      |         |        |  |
| H <sub>2</sub> +CO                       | 97.065 | 43.405                 | 16472              | SCFH    | 7.581           |                           | 21.640                                                                 | 65.045                                   | 29.221        | -35.824         |                                         |                                     |            |           |         |        |                                            | gal/hr                   | gal/MCF              | Bbl/Day |        |  |
| H <sub>2</sub> /CO                       |        | 1.77                   | Factor             | 607090  | 4.98            |                           | 4.98                                                                   | 2.37                                     | 4.97          | 1.48            |                                         |                                     |            |           |         |        |                                            | 10 # RVP 400 EP GASOLINE | 15.635               | 0.9492  | 5146   |  |
| Weight Recovery, %                       | 94.63  | Catalyst Age, hrs.     |                    |         |                 | Space Velocity, vhr       |                                                                        |                                          | 1366          | RECOVERED OIL** |                                         | 0.562                               | 78.79      | 4.783     | 12.395  | 0.752  | GAS OIL                                    | 0.872                    | 0.0529               | 287     |        |  |
| Pressure, psig                           | 405    | Inlet Velocity, Ft/sec |                    |         |                 | 1.04                      | Catalyst Vol CF                                                        |                                          |               | 12.06           | TOTAL OIL                               |                                     | 121.73     | 7.391     | 21.438  | 1.301  | FUEL OIL                                   | 1.719                    | 0.1044               | 566     |        |  |
| Temperature, °F                          | 661    | Bed Depth, Ft          |                    |         |                 | 18.27                     | Weight, #                                                              |                                          |               | 1881            | WATER SOLUBLE CHEMICALS**               |                                     | 0.298      | 15.81     | 0.960   | 1.978  | 0.120                                      | POLY TAR                 | 0.347                | 0.0211  | 114    |  |
| Recycle Ratio                            | 0.94   | Bed Density, #/CF      |                    |         |                 | 156                       | Effluent (H <sub>2</sub> )(CO)<br>Shift Ratio (H <sub>2</sub> O)(CO) = |                                          |               |                 | TOTAL LIQUID PRODUCTS C <sub>1</sub> ** |                                     | 137.54     | 8.351     | 23.416  | 1.421  | TOTAL                                      | 18.573                   | 1.1276               | 6113    |        |  |
| FRESH FEED CONVERSION — %                |        |                        |                    |         |                 | TOTAL FEED CONVERSION — % |                                                                        |                                          |               | SELECTIVITY     |                                         |                                     |            | NET WATER |         |        |                                            | 7.399                    | 133.30               | 8.093   | 16.002 |  |
| Conversion                               | CO     | H <sub>2</sub>         | H <sub>2</sub> +CO | CO      | H <sub>2</sub>  | CO+H <sub>2</sub>         | C <sub>3</sub> +C <sub>4</sub> +C <sub>5</sub>                         | GROSS WATER                              |               |                 |                                         | 149.11                              | 9.053      | 17.980    | 1.091   | 17.980 | 1.091                                      | W. S. CHEM.              | 1.978                | 0.1201  | 651    |  |
| 67.23                                    | 91.92  | 77.22                  | 82.53              | 74.69   | 46.80           | 55.08                     | 80.26                                                                  | TOTAL — C <sub>1</sub> +<br>INTERLUZOL + |               |                 |                                         | 171.37                              | 10.404     |           |         |        |                                            | TOTAL                    | 20.551               | 1.2477  | 6764   |  |

Form ML-11

\*\* Included in Reactor Effluent Total

g/NCM = 16.91 X #/MCF

\*9488 MCFH H<sub>2</sub> + CO, Bbl/Day = 5421.6 X gal/MCF

THE TEXAS COMPANY — MONTEBELLO LABORATORY  
DATA SUMMARY

RUN NO. 66B  
HOURS 9-22

| OPERATING CONDITIONS |        |                            |       | PRODUCT TESTS                                  |      |       | CATALYST DATA                        |  |                 |                                             |               |       |
|----------------------|--------|----------------------------|-------|------------------------------------------------|------|-------|--------------------------------------|--|-----------------|---------------------------------------------|---------------|-------|
| PRESSURES PSIG       |        | RATES S.C.F.H.             |       |                                                | OIL  | WATER | INVENTORY DATA                       |  | PARTICLE SIZE   |                                             |               |       |
| Oxygen               | 435    | Fresh Feed                 | 16970 | * API                                          | 53.3 | 10.6  | In Reactor at Start of Period        |  | Screen Analysis |                                             | Sedimentation |       |
| Natural Gas          | 430    | Recycle                    | 15877 | Neut. No.                                      | 43.2 | 35.7  | Fresh Catalyst Added                 |  | Mesh            | Microns                                     | %             | %     |
| Generator Outlet     | 410    | Combined Feed              | 32847 | Sap. No.                                       | 56.2 | 38.6  | Total                                |  | On 40           | 419+                                        | 80+           |       |
| Reactor Inlet        | 405    | Wet Gas — Measured         | 5049  | Hydrox. No.                                    |      |       | Catalyst Recovered                   |  | 5               | 100                                         | 150           | 40—80 |
| Condenser Inlet      |        | Adjusted                   | 5562  | Bromine No.                                    | 99   |       | In Reactor at End of Period          |  |                 | 150                                         | 105           | 20—40 |
| Product Accumulator  | 376    | Loss                       | 513   | Pour °F.                                       |      |       |                                      |  |                 | 200                                         | 74            | 10—20 |
|                      |        |                            |       | Chemicals, % by K <sub>2</sub> CO <sub>3</sub> |      | 11.0  | REACTOR d-p, Inches H <sub>2</sub> O |  |                 | 250                                         | 62            | 0—20  |
|                      |        |                            |       |                                                |      |       | No. Height                           |  |                 | 325                                         | 44            |       |
| TEMPERATURES — °F.   |        | Recycle/Fresh Feed         | 0.94  |                                                |      |       | 0 See Per. A                         |  |                 | <325                                        |               |       |
| Oxygen               | 498    | Inlet Velocity — ft./sec.  | 1.04  |                                                |      |       | 1                                    |  | 74              | CATALYST                                    |               |       |
| Natural Gas          | 787    | Fresh Feed Rate — S.C.F.H. | 16472 | HEMPEL, DIST. %                                |      | °API  | 2                                    |  | 76              | Bulk Density, Lbs./Cu.Ft.                   |               |       |
| Generator            | 2498   | per Cu.Ft. Dense Bed       | 1366  | 205 °F.                                        |      |       | 3                                    |  | 83              | Aerated                                     |               |       |
| Quench Accumulator   | 135    | per Lb. Catalyst           | 8.76  | 400                                            | 79.2 | 54.0  | 4                                    |  | 285             | Settled                                     |               |       |
| Reactor Inlet        | 185    | per sq ft                  | 24958 | 400-550                                        | 7.7  | 35.7  | Total                                |  | 518             | Compacted                                   |               |       |
| Condenser Inlet      | 571    |                            |       | 550+                                           | 13.1 |       |                                      |  |                 | Particle Density, gm./cc.                   |               |       |
| Product Accumulator  | 57     |                            |       |                                                |      |       | CALCULATED FROM dp                   |  |                 | NH <sub>3</sub> Value, ml./gm.              |               |       |
| Catalyst No.         | Height |                            |       | A. S. T. M. DIST. ON                           |      |       | Density, Lbs./Cu.Ft.                 |  | 156             | N <sub>2</sub> Surface, m <sup>2</sup> /gm. |               |       |
| 1 See Per. A         | --     |                            |       | Naphtha °F.                                    |      |       | Inventory, Lbs.                      |  | 1881            | CHEMICAL ANALYSIS                           |               |       |
| 2                    | 661    |                            |       | IBP                                            | 101  |       | Bed Depth, Ft.                       |  | 18.27           |                                             |               |       |
| 3                    | 647    |                            |       | 10%                                            | 121  |       | Vol. Cu. Ft.                         |  | 12.06           | Fe                                          |               |       |
| 4                    | 662    |                            |       | 50%                                            | 211  |       |                                      |  |                 | C                                           |               |       |
| 5                    | 664    |                            |       | 90%                                            | 358  |       |                                      |  |                 | O                                           |               |       |
| 6                    | 669    |                            |       | EP                                             | 400  |       |                                      |  |                 | H                                           |               |       |
| 7                    | 663    |                            |       | Rec                                            | 97.5 |       |                                      |  |                 | K <sub>2</sub> O, W +, % basis Fe           |               |       |
| 8                    | 649    |                            |       |                                                |      |       |                                      |  |                 | X-Ray Analysis—                             |               |       |
| 9                    | 644    |                            |       |                                                |      |       |                                      |  |                 | Fe <sub>2</sub> O <sub>3</sub>              |               |       |
| 10                   | 639    |                            |       |                                                |      |       |                                      |  |                 | Fe <sub>3</sub> O <sub>4</sub>              |               |       |
| 11                   | 619    |                            |       |                                                |      |       |                                      |  |                 | Fe                                          |               |       |

THE TEXAS COMPANY — MONTEBELLO LABORATORY  
YIELD CALCULATION

RUN NO. 66-C  
HOURS 22-46  
CATALYST: Brownsville  
Tested M3 Red. @ 550P

| FRESH FEED                                        |        |                        |                    | WET GAS                   |                |                     |                                               | RECYCLE                              | COMBINED FEED | EFFLUENT | NET CHANGE       |                                        | YIELD BASIS H <sub>2</sub> + CO FED |        |        |         |                                           |                          |             |                      |        |        |     |
|---------------------------------------------------|--------|------------------------|--------------------|---------------------------|----------------|---------------------|-----------------------------------------------|--------------------------------------|---------------|----------|------------------|----------------------------------------|-------------------------------------|--------|--------|---------|-------------------------------------------|--------------------------|-------------|----------------------|--------|--------|-----|
|                                                   | %      | m/hr                   | #/hr               | %                         | At Wt. Balance |                     | m/hr                                          | m/hr                                 | m/hr          | m/hr     | #/hr             |                                        | CONDENSATE                          |        |        |         | YIELDS BASIS BROWNSVILLE DESIGN FEED RATE |                          |             |                      |        |        |     |
|                                                   |        |                        |                    |                           | m/hr           | #/hr                |                                               |                                      |               |          |                  |                                        | #/MCF                               | #/gal  | gal/hr | gal/MCF |                                           | CORRECTED HEMPEL, %      | gal/hr      | TREATING RECOVERY, % | gal/hr |        |     |
| CO <sub>28.010</sub>                              | 36.607 | 15.923                 | 446.03             | 9.250                     | 1.326          | 37.14               | 3.769                                         | 19.692                               | 5.095         | -14.597  | 408.89           |                                        |                                     |        |        |         |                                           |                          |             |                      |        |        |     |
| H <sub>2</sub> <sub>2.016</sub>                   | 60.516 | 26.323                 | 53.07              | 40.377                    | 5.786          | 11.66               | 16.454                                        | 42.777                               | 22.240        | -20.537  | 41.41            |                                        |                                     |        |        |         | 400 EP                                    | 80.3                     | 9.319       | 98.0                 | 9.133  |        |     |
| CO <sub>44.010</sub>                              | 2.070  | 0.900                  | 39.61              | 29.514                    | 4.229          | 186.14              | 12.027                                        | 12.927                               | 16.256        | 3.329    | 146.53           | 9.140                                  |                                     |        |        |         | 400-550                                   | 10.8                     | 1.253       | 91.4                 | 1.145  |        |     |
| N <sub>28.016</sub>                               | 0.670  | 0.291                  | 8.15               | 1.640                     | 0.235          | 6.58                | 0.668                                         | 0.959                                | 0.903         |          |                  |                                        |                                     |        |        |         | 550 +                                     | 8.9                      | 1.033       | 114.6                | 1.184  |        |     |
| CH <sub>4</sub> <sub>16.042</sub>                 | 0.137  | 0.060                  | 0.96               | 9.153                     | 1.312          | 21.05               | 3.730                                         | 3.790                                | 5.042         | 1.252    | 20.09            | 1.253                                  |                                     |        |        |         |                                           |                          |             |                      |        |        |     |
| C <sub>2</sub> H <sub>6</sub> <sub>28.052</sub>   |        |                        |                    | 2.247                     | 0.322          | 9.03                | 0.916                                         | 0.916                                | 1.238         | 0.322    | 9.03             | 0.563                                  |                                     |        |        |         |                                           | RECOVERY %               | #/hr        | gal/hr               |        |        |     |
| C <sub>3</sub> H <sub>8</sub> <sub>30.058</sub>   |        |                        |                    | 1.440                     | 0.206          | 6.19                | 0.587                                         | 0.587                                | 0.793         | 0.206    | 6.19             | 0.386                                  |                                     |        |        |         | PROPYLENE                                 | 43.1                     | 7.73        |                      |        |        |     |
| C <sub>4</sub> +C <sub>5</sub>                    |        |                        |                    |                           |                |                     |                                               |                                      |               |          | 35.31            | 2.202                                  |                                     |        |        |         | C <sub>2</sub> POLY GASO.                 | 87.5                     | 6.76        | 1.130                |        |        |     |
| C <sub>6</sub> H <sub>14</sub> <sub>42.078</sub>  |        |                        |                    | 2.973                     | 0.426          | 17.93               | 1.212                                         | 1.212                                | 1.638         | 0.426    | 17.93            | 1.118                                  | 4.32                                | 4.150  | 0.259  |         | C <sub>3</sub> POLY TAR                   | 12.5                     | 0.97        | 0.129                |        |        |     |
| C <sub>7</sub> H <sub>16</sub> <sub>44.074</sub>  |        |                        |                    | 0.320                     | 0.046          | 2.03                | 0.130                                         | 0.130                                | 0.176         | 0.046    | 2.03             | 0.127                                  | 4.24                                | 0.479  | 0.030  |         |                                           |                          |             |                      |        |        |     |
| C <sub>8</sub> H <sub>18</sub> <sub>56.104</sub>  |        |                        |                    | 1.693                     | 0.241          | 13.52               | 0.686                                         | 0.686                                | 0.927         | 0.241    | 13.52            | 0.943                                  | 5.00                                | 2.704  | 0.169  |         |                                           | #/gal                    | #/hr        | gal/hr               | RVP    |        |     |
| C <sub>10</sub> H <sub>22</sub> <sub>58.120</sub> |        |                        |                    | 0.470                     | 0.067          | 3.89                | 0.192                                         | 0.192                                | 0.259         | 0.067    | 3.89             | 0.243                                  | 4.86                                | 0.800  | 0.050  |         | C <sub>4</sub> H <sub>6</sub>             | 5.00                     | 1.64        | 0.328                | 68.0   |        |     |
| C <sub>12</sub> H <sub>26</sub> <sub>70.130</sub> |        |                        |                    | 0.663                     | 0.095          | 6.66                | 0.270                                         | 0.270                                | 0.365         | 0.095    | 6.66             | 0.415                                  | 5.48                                | 1.222  | 0.076  |         | C <sub>4</sub> POLY GASO.                 | 5.98                     | 10.40       | 1.738                | 1.5    |        |     |
| C <sub>14</sub> H <sub>30</sub> <sub>72.146</sub> |        |                        |                    | 0.103                     | 0.015          | 1.08                | 0.042                                         | 0.042                                | 0.057         | 0.015    | 1.08             | 0.067                                  | 5.25                                | 0.206  | 0.013  |         | C <sub>4</sub> H <sub>10</sub>            | 4.86                     | 3.89        | 0.800                | 68.0   |        |     |
| C <sub>16</sub> H <sub>34</sub> <sub>84.156</sub> |        |                        |                    | 0.167                     | 0.024          | 2.02                | 0.068                                         | 0.068                                | 0.092         | 0.024    | 2.02             | 0.126                                  | 5.54                                | 0.365  | 0.023  |         | C <sub>4</sub> -FREE GASO.                |                          |             | 12.056               | 5.8    |        |     |
| C <sub>18</sub> +C <sub>20</sub>                  |        |                        |                    |                           |                |                     |                                               |                                      |               |          | 47.13            | 2.939                                  |                                     | 9.926  | 0.620  |         | C <sub>4</sub> POLY TAR                   | 7.58                     | 1.48        | 0.197                |        |        |     |
| TOTAL                                             |        | 43.497                 | 547.82             |                           | 14.330         | 324.92              | 40.751                                        | 84.248                               | 63.380        |          |                  |                                        |                                     |        |        |         |                                           |                          |             |                      |        |        |     |
| H <sub>2</sub> +CO                                | 97.123 | 42.246                 | 16032              | SCFH                      | 7.112          |                     | 20.223                                        | 62.469                               | 27.335        | -35.134  |                  |                                        |                                     |        |        |         |                                           | gal/hr                   | gal / MCF   | Bbl/Day              |        |        |     |
| H <sub>2</sub> /CO                                |        | 1.65                   | Factor             | 623752                    | 4.36           |                     | 4.37                                          | 2.17                                 | 4.37          | 1.41     |                  |                                        |                                     |        |        |         |                                           | 10 # RVP 400 EP GASOLINE | 14.922      | 0.9308               | 5046   |        |     |
| Weight Recovery, %                                | 95.36  | Catalyst Age, hrs.     |                    |                           |                | Space Velocity, vhr |                                               |                                      |               | 1268     | RECOVERED OIL ** |                                        | 0.524                               | 73.46  | 4.582  |         | 11.605                                    | 0.724                    | GAS OIL     | 1.145                | 0.0714 | 387    |     |
| Pressure, psig                                    | 405    | Inlet Velocity, Ft/sec |                    |                           |                | 1.02                | Catalyst Vol CF                               |                                      |               |          | 12.64            | TOTAL OIL                              |                                     | 120.59 | 7.521  |         | 21.531                                    | 1.344                    | FUEL OIL    | 1.184                | 0.0739 | 401    |     |
| Temperature, °F                                   | 661    | Bed Depth, Ft          |                    |                           |                | 19.15               | Weight, #                                     |                                      |               |          | 19.34            | WATER SOLUBLE CHEMICALS **             |                                     | 0.267  | 14.17  | 0.884   |                                           | 1.804                    | 0.113       | POLY TAR             | 0.326  | 0.0203 | 110 |
| Recycle Ratio                                     | 0.94   | Bed Density, #/CF      |                    |                           |                | 153                 | Effluent (H <sub>2</sub> )(CO) <sub>2</sub> = |                                      |               |          |                  | TOTAL LIQUID PRODUCTS C <sub>1</sub> + |                                     | 134.76 | 8.405  |         | 23.335                                    | 1.457                    | TOTAL       | 17.577               | 1.0964 | 5944   |     |
| FRESH FEED CONVERSION — %                         |        |                        |                    | TOTAL FEED CONVERSION — % |                |                     |                                               | SELECTIVITY                          |               |          |                  | NET WATER **                           |                                     | 7.508  | 135.27 | 8.437   | 16.239                                    | 1.013                    | W. S. CHEM. | 1.804                | 0.1125 | 610    |     |
| Contraction                                       | CO     | H <sub>2</sub>         | H <sub>2</sub> +CO | CO                        | H <sub>2</sub> | CO+H <sub>2</sub>   | C <sub>3</sub> + C <sub>4</sub> +             | GROSS WATER                          |               | 149.44   |                  | 9.321                                  | 18.043                              | 1.126  |        |         | TOTAL                                     | 19.381                   | 1.2089      | 6554                 |        |        |     |
| 67.06                                             | 91.67  | 78.02                  | 83.17              | 74.13                     | 48.01          | 56.24               | 79.24                                         | HYDROCARBON TOTAL — C <sub>1</sub> + |               | 170.07   |                  | 10.608                                 |                                     |        |        |         |                                           |                          |             |                      |        |        |     |

Form ML-11

\*\* INCLUDED in Reactor Effluent Total

g/NCM = 16.91 X #/MCF

\*9488 MCFH H<sub>2</sub> + CO, Bbl/Day = 5421.6 X gal/MCF

THE TEXAS COMPANY — MONTEBELLO LABORATORY  
DATA SUMMARY

RUN NO. 66-C  
HOURS 22-46

| OPERATING CONDITIONS |        |                            |       | PRODUCT TESTS                                  |           |       |       | CATALYST DATA                        |       |                                             |               |
|----------------------|--------|----------------------------|-------|------------------------------------------------|-----------|-------|-------|--------------------------------------|-------|---------------------------------------------|---------------|
| PRESSURES PSIG       |        | RATES S.C.F.H.             |       | OIL                                            |           | WATER |       | INVENTORY DATA                       |       | PARTICLE SIZE                               |               |
| Oxygen               | 438    | Fresh Feed                 | 15507 | * API                                          | 54.6      | 10.9  |       | In Reactor at Start of Period        |       | Screen Analysis                             | Sedimentation |
| Natural Gas          | 430    | Recycle                    | 15465 | Neut. No.                                      | 39.9      | 32.2  |       | Fresh Catalyst Added                 |       | Mesh                                        | Microns       |
| Generator Outlet     | 410    | Combined Feed              | 31972 | Sap. No.                                       | 53.3      | 37.1  |       | Total                                |       | On 40                                       | 419+          |
| Reactor Inlet        | 405    | Wet Gas—Measured           | 5013  | Hydrox. No.                                    |           |       |       | Catalyst Recovered                   | 12    | 100                                         | 150           |
| Condenser Inlet      |        | Adjusted                   | 5438  | Bromine No.                                    | 99        |       |       | In Reactor at End of Period          |       | 150                                         | 105           |
| Product Accumulator  | 376    | Loss                       | 425   | Pour °F.                                       | below -30 |       |       |                                      |       | 200                                         | 74            |
|                      |        |                            |       | Chemicals, % by K <sub>2</sub> CO <sub>3</sub> | 10.0      |       |       | REACTOR d-p, Inches H <sub>2</sub> O |       | 250                                         | 62            |
|                      |        |                            |       |                                                |           |       |       | No. Height                           |       | 325                                         | 44            |
| TEMPERATURES—°F.     |        | Recycle/Fresh Feed         | 0.94  |                                                |           |       |       | 0 See Per. A                         | --    | <325                                        | 0.4           |
| Oxygen               | 498    | Inlet Velocity—ft./sec.    | 1.02  |                                                |           |       |       | 1                                    | 74    | CATALYST                                    |               |
| Natural Gas          | 797    | Fresh Feed Rate—S.C.F.H.   | 16032 | HEMPEL, DIST. %                                |           | 0 API | 2     |                                      | 77    | Bulk Density, Lbs./Cu.Ft.                   |               |
| Generator            | 2500   | per Cu. Ft. Dense Bed      | 1268  | 205 °F.                                        |           |       | 3     |                                      | 81    | Aerated                                     |               |
| Quench Accumulator   | 147    | per Lb. Catalyst           | 8.29  | 400                                            | 79.3      | 56.1  | 4     |                                      | 302   | Settled                                     |               |
| Reactor Inlet        | 211    | per sq ft                  | 24291 | 400-550                                        | 10.8      | 34.8  | Total | 534                                  |       | Compacted                                   |               |
| Condenser Inlet      | 579    | Heat Transfer Calculations | 550+  | 9.9                                            |           |       |       |                                      |       | Particle Density, gm./cc.                   |               |
| Product Accumulator  | 65     | Steam Rate=376 #/hr @ 706  |       |                                                |           |       |       | CALCULATED FROM dp                   |       | NH <sub>3</sub> Value, ml./gm.              |               |
| Catalyst No.         | Height | psia & 505°F=1201 BTU/#    |       | A. S. T. M. DIST. ON                           |           |       |       | Density, Lbs./Cu.Ft.                 | 153   | N <sub>2</sub> Surface, m <sup>2</sup> /gm. |               |
| 1 See Per. A         | --     | Water in @ 58°F=26 BTU/#   |       | Naphtha °F.                                    |           |       |       | Inventory, Lbs.                      | 1934  |                                             |               |
| 2                    | 658    | Net Heat Trans/# steam     | IBP   |                                                | 100       |       |       | Bed Depth, Ft.                       | 19.15 | CHEMICAL ANALYSIS                           |               |
| 3                    | 648    | =1175 BTU                  |       | 10%                                            | 130       |       |       | Vol Cu. Ft.                          | 12.64 | Fe                                          |               |
| 4                    | 660    | (1175) (376)=441800 BTU/hr |       | 50%                                            | 222       |       |       |                                      |       | C                                           |               |
| 5                    | 665    | Ave. Bed Temp=661          |       | 90%                                            | 362       |       |       |                                      |       | O                                           |               |
| 6                    | 670    | dt=661-505=156°F           |       | EP                                             | 398       |       |       |                                      |       | H                                           |               |
| 7                    | 663    | Tube Area=34.6 sq ft       |       | Rec                                            | 96.0      |       |       |                                      |       | K <sub>2</sub> O, W+, % basis Fe            |               |
| 8                    | 650    | K= 441800 / (34.6)(156)    |       |                                                |           |       |       |                                      |       | X-Ray Analysis—                             |               |
| 9                    | 644    | 81.9 BTU/°F/sq ft          |       |                                                |           |       |       |                                      |       | Fe <sub>2</sub> O <sub>3</sub>              |               |
| 10                   | 641    |                            |       |                                                |           |       |       |                                      |       | Fe <sub>2</sub> O <sub>4</sub>              |               |
| 11                   | 622    |                            |       |                                                |           |       |       |                                      |       | Fe                                          |               |

THE TEXAS COMPANY — MONTEBELLO LABORATORY  
YIELD CALCULATIONS

RUN NO. 66-D  
HOURS 46-70  
CATALYST Brownsville  
Tested MS Red @ 660P

| FRESH FEED                      |        |                |                        | WET GAS                   |                |                   |                                                                                   | RECYCLE                               | COMBINED<br>FEED | EFFLUENT                                  | NET CHANGE | YIELD BASIS H <sub>2</sub> + CO FED |        |        |         |                                            |                             |         |                         |        |  |
|---------------------------------|--------|----------------|------------------------|---------------------------|----------------|-------------------|-----------------------------------------------------------------------------------|---------------------------------------|------------------|-------------------------------------------|------------|-------------------------------------|--------|--------|---------|--------------------------------------------|-----------------------------|---------|-------------------------|--------|--|
| CO<br>18.010                    | %      | m/hr           | #/hr                   | %                         | At Wt. Balance |                   | m/hr                                                                              | m/hr                                  | m/hr             | m/hr                                      | #/hr       | CONDENSATE                          |        |        |         | YIELDS BASIS BROWNSVILLE DESIGN FEED RATE* |                             |         |                         |        |  |
|                                 |        |                |                        |                           | m/hr           | #/hr              |                                                                                   |                                       |                  |                                           |            | #/MCF                               | #/gal  | gal/hr | gal/MCF |                                            | CORRECTED<br>RECOVERY, %    | gal/hr  | TREATING<br>RECOVERY, % | gal/hr |  |
| CO                              | 36.367 | 15.810         | 442.84                 | 9.070                     | 1.342          | 37.59             | 3.740                                                                             | 19.550                                | 5.082            | -14.468                                   | -405.25    |                                     |        |        |         | 400 EP                                     | 82.6                        | 8.864   | 98.0                    | 8.687  |  |
| H <sub>2</sub>                  | 60.673 | 26.376         | 53.17                  | 41.224                    | 6.098          | 12.29             | 16.998                                                                            | 43.374                                | 23.096           | -20.278                                   | -40.88     |                                     |        |        |         | 400-550                                    | 9.2                         | 0.987   | 91.4                    | 0.902  |  |
| CO <sub>2</sub>                 | 2.163  | 0.940          | 41.37                  | 28.470                    | 4.210          | 185.29            | 11.739                                                                            | 12.679                                | 15.949           | 3.270                                     | 143.92     | 8.989                               |        |        |         | 550 +                                      | 8.2                         | 0.880   | 114.6                   | 1.008  |  |
| N <sub>2</sub>                  | 0.687  | 0.299          | 8.38                   | 1.540                     | 0.228          | 6.39              | 0.635                                                                             | 0.934                                 | 0.863            |                                           |            |                                     |        |        |         |                                            |                             |         |                         |        |  |
| CH <sub>4</sub>                 | 0.110  | 0.048          | 0.77                   | 9.570                     | 1.416          | 22.72             | 3.946                                                                             | 3.994                                 | 5.362            | 1.368                                     | 21.95      | 1.371                               |        |        |         |                                            |                             |         |                         |        |  |
| C <sub>2</sub> H <sub>6</sub>   |        |                |                        | 2.303                     | 0.341          | 9.57              | 0.950                                                                             | 0.950                                 | 1.291            | 0.341                                     | 9.57       | 0.598                               |        |        |         |                                            | RECOVERY %                  | #/hr    | gal/hr                  |        |  |
| C <sub>3</sub> H <sub>8</sub>   |        |                |                        | 1.547                     | 0.229          | 6.89              | 0.638                                                                             | 0.638                                 | 0.867            | 0.229                                     | 6.89       | 0.430                               |        |        |         | PROPYLENE                                  | 41.6                        | 7.60    |                         |        |  |
| C <sub>4</sub> +C <sub>5</sub>  |        |                |                        |                           |                |                   |                                                                                   |                                       |                  |                                           |            | 38.41                               | 2.599  |        |         | C <sub>3</sub> POLY GASO.                  | 87.5                        | 6.65    | 1.112                   |        |  |
| C <sub>2</sub> H <sub>4</sub>   |        |                |                        | 2.934                     | 0.434          | 18.26             | 1.210                                                                             | 1.210                                 | 1.644            | 0.434                                     | 18.26      | 1.141                               | 4.32   | 4.227  | 0.264   |                                            | C <sub>3</sub> POLY TAR     | 12.5    | 0.95                    | 0.126  |  |
| C <sub>3</sub> H <sub>6</sub>   |        |                |                        | 0.303                     | 0.045          | 1.98              | 0.125                                                                             | 0.125                                 | 0.170            | 0.045                                     | 1.98       | 0.124                               | 4.24   | 0.467  | 0.029   |                                            |                             |         |                         |        |  |
| C <sub>4</sub> H <sub>10</sub>  |        |                |                        | 1.573                     | 0.233          | 13.07             | 0.649                                                                             | 0.649                                 | 0.882            | 0.233                                     | 13.07      | 0.816                               | 5.00   | 2.614  | 0.163   |                                            | #/gal                       | #/hr    | gal/hr                  | RVP    |  |
| C <sub>5</sub> H <sub>12</sub>  |        |                |                        | 0.540                     | 0.080          | 4.65              | 0.223                                                                             | 0.223                                 | 0.303            | 0.080                                     | 4.65       | 0.290                               | 4.86   | 0.957  | 0.060   | C <sub>4</sub> H <sub>8</sub>              | 5.00                        | 0.75    | 0.150                   | 68.0   |  |
| C <sub>6</sub> H <sub>14</sub>  |        |                |                        | 0.603                     | 0.089          | 6.24              | 0.248                                                                             | 0.248                                 | 0.337            | 0.089                                     | 6.24       | 0.390                               | 5.45   | 1.145  | 0.072   | C <sub>4</sub> POLY GASO.                  | 5.98                        | 10.78   | 1.803                   | 1.5    |  |
| C <sub>7</sub> H <sub>16</sub>  |        |                |                        | 0.140                     | 0.021          | 1.52              | 0.058                                                                             | 0.058                                 | 0.079            | 0.021                                     | 1.52       | 0.095                               | 5.25   | 0.290  | 0.018   | C <sub>4</sub> H <sub>10</sub>             | 4.86                        | 4.65    | 0.957                   | 68.0   |  |
| C <sub>8</sub> H <sub>18</sub>  |        |                |                        | 0.183                     | 0.027          | 2.27              | 0.075                                                                             | 0.075                                 | 0.102            | 0.027                                     | 2.27       | 0.142                               | 5.54   | 0.410  | 0.026   | C <sub>4</sub> -FREE GASO.                 |                             |         | 11.644                  | 5.8    |  |
| C <sub>9</sub> -C <sub>10</sub> |        |                |                        |                           |                |                   |                                                                                   |                                       |                  |                                           |            | 47.99                               | 2.998  | 10.110 | 0.632   | C <sub>4</sub> POLY TAR                    | 7.53                        | 1.54    | 0.205                   |        |  |
| TOTAL                           |        | 43.473         | 546.53                 |                           | 14.793         | 328.73            | 41.233                                                                            | 84.706                                | 64.201           |                                           |            |                                     |        |        |         |                                            |                             |         |                         |        |  |
| H <sub>2</sub> +CO              | 97.040 | 42.186         | 16010                  | SCFH                      | 7.440          |                   | 20.738                                                                            | 62.924                                | 28.178           | -34.746                                   |            |                                     |        |        |         |                                            | gal/hr                      | gal/MCF | Bbl/Day                 |        |  |
| H <sub>2</sub> /CO              |        | 1.67           | Factor                 | 624609                    | 4.54           |                   | 4.54                                                                              | 2.22                                  | 4.54             | 1.40                                      |            |                                     |        |        |         |                                            | 10 # RVP 400 PP<br>GASOLINE | 14.554  | 0.9091                  | 4929   |  |
| Weight Recovery, %              | 95.41  |                | Catalyst Age, hrs.     |                           |                |                   | Space Velocity, vhr                                                               | 1248                                  |                  | RECOVERED OIL                             | 0.493      | 67.78                               | 4.234  | *      | 10.731  | 0.670                                      | GAS OIL                     | 0.902   | 0.0563                  | 305    |  |
| Pressure, psig                  | 405    |                | Inlet Velocity, Ft/sec | 1.02                      |                |                   | Catalyst Vol CP                                                                   | 12.83                                 |                  | TOTAL OIL                                 |            | 115.77                              | 7.232  | 20.841 | 1.302   |                                            | FUEL OIL                    | 1.008   | 0.0630                  | 342    |  |
| Temperature, °F                 | 664    |                | Bed Depth, Ft          | 19.44                     |                |                   | Weight, #                                                                         | 1950                                  |                  | WATER SOLUBLE<br>CHEMICALS **             | 0.326      | 17.31                               | 1.081  | 2.172  | 0.136   |                                            | POLY TAR                    | 0.331   | 0.0207                  | 112    |  |
| Recycle Ratio                   | 0.95   |                | Bed Density, #/CF      | 152                       |                |                   | Effluent (H <sub>2</sub> )(CO) <sub>2</sub><br>Shift Ratio (H <sub>2</sub> O)(CO) |                                       |                  | TOTAL LIQUID<br>PRODUCTS C <sub>2</sub> + |            | 133.08                              | 8.313  | 23.013 | 1.438   |                                            | TOTAL                       | 16.795  | 1.0491                  | 5688   |  |
| FRESH FEED CONVERSION — %       |        |                |                        | TOTAL FEED CONVERSION — % |                |                   |                                                                                   | SELECTIVITY                           |                  |                                           |            | NET WATER **                        |        |        |         | W. S. CHEM.                                |                             |         |                         |        |  |
| Contraction                     | CO     | H <sub>2</sub> | H <sub>2</sub> +CO     | CO                        | H <sub>2</sub> | CO+H <sub>2</sub> | C <sub>3</sub> +C <sub>4</sub> +                                                  | GROSS WATER                           |                  |                                           |            | 150.02                              | 9.370  | 18.103 | 1.131   | TOTAL                                      | 18.967                      | 1.1848  | 6424                    |        |  |
| 65.97                           | 91.51  | 76.88          | 82.36                  | 74.01                     | 46.75          | 55.22             | 77.60                                                                             | HYDROCARBON<br>TOTAL—C <sub>1</sub> + |                  |                                           |            | 171.49                              | 10.711 |        |         |                                            |                             |         |                         |        |  |

Form ML-11

\*\* Included in Reactor Effluent Total

g/NCM = 16.91 X #/MCF

\*9488 MCFH H<sub>2</sub> + CO, Bbl/Day = 5421.6 X gal/MCF

THE TEXAS COMPANY — MONTEBELLO LABORATORY  
DATA SUMMARY

RUN NO. 66-D  
HOURS 46-70

| OPERATING CONDITIONS |        |                                         |       | PRODUCT TESTS                                  |      |       |  | CATALYST DATA                        |       |                                             |               |
|----------------------|--------|-----------------------------------------|-------|------------------------------------------------|------|-------|--|--------------------------------------|-------|---------------------------------------------|---------------|
| PRESSURES PSIG       |        | RATES S.C.F.H.                          |       | OIL                                            |      | WATER |  | INVENTORY DATA                       |       | PARTICLE SIZE                               |               |
| Oxygen               | 439    | Fresh Feed                              | 16498 | * API                                          | 55.0 | 10.7  |  | In Reactor at Start of Period        |       | Screen Analysis                             | Sedimentation |
| Natural Gas          | 432    | Recycle                                 | 15648 | Neut. No.                                      | 41.0 | 32.5  |  | Fresh Catalyst Added                 |       | Mesh Microns %                              | Microns %     |
| Generator Outlet     | 410    | Combined Feed                           | 32146 | Sap. No.                                       | 49.2 | 34.1  |  | Total                                |       | On 40 419+ 0.5                              | 80+ 20+       |
| Reactor Inlet        | 405    | Wet Gas — Measured                      | 5186  | Hydrox. No.                                    |      |       |  | Catalyst Recovered                   | 20    | 100 150 57.6                                | 40—80         |
| Condenser Inlet      |        | Adjusted                                | 5614  | Bromine No.                                    | 99   |       |  | In Reactor at End of Period          |       | 150 105 21.4                                | 20—40         |
| Product Accumulator  | 375    | Loss                                    | 428   | Pour °F.                                       |      |       |  |                                      |       | 200 74 13.0                                 | 10—20         |
|                      |        |                                         |       | Chemicals, % by K <sub>2</sub> CO <sub>3</sub> |      | 12.0  |  | REACTOR d-p, Inches H <sub>2</sub> O |       | 250 62 2.6                                  | 0—20          |
|                      |        |                                         |       |                                                |      |       |  | No. Height                           |       | 325 44 3.8                                  |               |
| TEMPERATURES—°F.     |        | Recycle/Fresh Feed                      | 0.95  |                                                |      |       |  | 0 See Per. A                         |       | <325 0.6                                    |               |
| Oxygen               | 522    | Inlet Velocity—ft./sec.                 | 1.02  |                                                |      |       |  | 1                                    | 73    | CATALYST                                    |               |
| Natural Gas          | 793    | Fresh Feed Rate—S.C.F.H.                | 16010 | HEMPEL, DIST. %                                |      | °API  |  | 2                                    | 76    | Bulk Density, Lbs./Cu.Ft.                   |               |
| Generator            | 2500   | per Cu.Ft. Dense Bed                    | 1248  | 205 °F.                                        |      |       |  | 3                                    | 82    | Aerated                                     |               |
| Quench Accumulator   | 151    | per Lb. Catalyst                        | 8.21  | 400                                            | 81.6 | 55.4  |  | 4                                    | 308   | Settled                                     |               |
| Reactor Inlet        | 221    | per sq ft                               | 24258 | 400-550                                        | 9.2  | 38.0  |  | Total                                | 539   | Compacted                                   |               |
| Condenser Inlet      | 585    |                                         |       | 550+                                           | 9.2  |       |  |                                      |       | Particle Density, gm./cc.                   |               |
| Product Accumulator  | 63     | Heat Transfer Calculations              |       |                                                |      |       |  | CALCULATED FROM dp                   |       | NH <sub>3</sub> Value, ml./gm.              |               |
| Catalyst No.         | Height | Steam Rate=386#/hr                      |       | A. S. T. M. DIST. ON                           |      |       |  | Density, Lbs./Cu.Ft.                 | 152   | N <sub>2</sub> Surface, m <sup>2</sup> /gm. |               |
| 1 See Per. A         | --     | @ 706 psia & 505°                       |       | Naphtha °F.                                    |      |       |  | Inventory, Lbs.                      | 1950  |                                             |               |
| 2                    | 662    | 1201 BTU/#                              |       | IBP                                            | 100  |       |  | Bed Depth, Ft.                       | 19.44 | CHEMICAL ANALYSIS                           |               |
| 3                    | 652    | Water in @ 58°F=26 BTU/#                |       | 10%                                            | 126  |       |  | Vol Cu.Ft                            | 12.83 | Fe                                          |               |
| 4                    | 665    | Net Heat Trans/# steam                  |       | 50%                                            | 212  |       |  |                                      |       | C                                           |               |
| 5                    | 668    | 1175 BTU                                |       | 90%                                            | 374  |       |  |                                      |       | O                                           |               |
| 6                    | 671    | (1175)(386)=453550                      |       | EP                                             | 406  |       |  |                                      |       | H                                           |               |
| 7                    | 666    | Ave. Bed Temp=564°F<br>dT=664-505=159°F |       | Rec                                            | 95.0 |       |  |                                      |       | K <sub>2</sub> O, W+, % basis Fe            |               |
| 8                    | 656    | Tube Area=35.2 sq ft                    |       |                                                |      |       |  |                                      |       | X-Ray Analysis—                             |               |
| 9                    | 648    | K= $\frac{453550}{(35.2)(159)}$         |       |                                                |      |       |  |                                      |       | Fe <sub>2</sub> O <sub>3</sub>              |               |
| 10                   | 643    | 81.0 BTU/°F/sq ft                       |       |                                                |      |       |  |                                      |       | Fe <sub>2</sub> O <sub>3</sub>              |               |
| 11                   | 625    |                                         |       |                                                |      |       |  |                                      |       | Fe                                          |               |

| OPERATING CONDITIONS |        |                          |       | PRODUCT TESTS                                  |        |                | CATALYST DATA                        |       |                                             |         |   |               |
|----------------------|--------|--------------------------|-------|------------------------------------------------|--------|----------------|--------------------------------------|-------|---------------------------------------------|---------|---|---------------|
| PRESSURES PSIG       |        | RATES S.C.F.H.           |       | OIL                                            | WATER  | INVENTORY DATA | PARTICLE SIZE                        |       |                                             |         |   |               |
| Oxygen               | 436    | Fresh Feed               | 16176 | * API                                          | 55.6   | 10.7           | In Reactor at Start of Period        |       | Screen Analysis                             |         |   | Sedimentation |
| Natural Gas          | 435    | Recycle                  | 15341 | Neut. No.                                      | 42.1   | 34.2           | Fresh Catalyst Added                 |       | Mesh                                        | Microns | % | Microns %     |
| Generator Outlet     | 410    | Combined Feed            | 31517 | Sap. No.                                       | 53.9   | 37.2           | Total                                |       | On 40                                       | 419+    |   | 80+           |
| Reactor Inlet        | 404    | Wet Gas—Measured         | 4917  | Hydrox. No.                                    |        |                | Catalyst Recovered                   | 12    | 100                                         | 150     |   | 40–80         |
| Condenser Inlet      |        | Adjusted                 | 5423  | Bromine No.                                    | 99     |                | In Reactor at End of Period          |       | 150                                         | 105     |   | 20–40         |
| Product Accumulator  | 375    | Loss                     | 506   | Pour °F.                                       |        |                |                                      |       | 200                                         | 74      |   | 10–20         |
|                      |        |                          |       | Chemicals, % by K <sub>2</sub> CO <sub>3</sub> | 12.0   |                | REACTOR d-p, Inches H <sub>2</sub> O |       | 250                                         | 62      |   | 0–20          |
|                      |        |                          |       | No.                                            | Height |                |                                      |       | 325                                         | 44      |   |               |
| TEMPERATURES—°F.     |        | Recycle/Fresh Feed       | 0.95  |                                                |        |                | 0 See Per. A                         |       | <325                                        |         |   |               |
| Oxygen               | 518    | Inlet Velocity—ft./sec.  | 1.01  |                                                |        |                | 1                                    | 73    | CATALYST                                    |         |   |               |
| Natural Gas          | 792    | Fresh Feed Rate—S.C.F.H. | 15704 | Hempel, Dist. %                                |        | *API           | 2                                    | 81    | Bulk Density, Lbs./Cu.Ft.                   |         |   |               |
| Generator            | 2495   | per Cu.Ft. Dense Bed     | 1267  | 205 °F.                                        |        |                | 3                                    | 81    | Aerated                                     |         |   |               |
| Quench Accumulator   | 148    | per Lb. Catalyst         | 8.18  | 400                                            | 78.5   | 55.0           | 4                                    | 295   | Settled                                     |         |   |               |
| Reactor Inlet        | 235    | per sq ft                | 23794 | 400-550                                        | 8.8    | 34.5           | Total                                | 530   | Compacted                                   |         |   |               |
| Condenser Inlet      | 581    |                          |       | 550+                                           | 12.7   |                |                                      |       | Particle Density, gm./cc.                   |         |   |               |
| Product Accumulator  | 61     |                          |       |                                                |        |                | CALCULATED FROM dp                   |       | NH <sub>3</sub> Value, ml./gm.              |         |   |               |
| Catalyst No.         | Height |                          |       | A. S. T. M. DIST. ON                           |        |                | Density, Lbs./Cu.Ft.                 | 155   | N <sub>2</sub> Surface, m <sup>2</sup> /gm. |         |   |               |
| 1 See Per. A         | --     |                          |       | Naphtha °F.                                    |        |                | Inventory, Lbs.                      | 1920  |                                             |         |   |               |
| 2                    | 662    |                          |       | IBP                                            | 98     |                | Bed Depth, Ft.                       | 18.78 | CHEMICAL ANALYSIS                           |         |   |               |
| 3                    | 652    |                          |       | 10%                                            | 121    |                | Vol Cu. Ft.                          | 12.39 | Fe                                          |         |   |               |
| 4                    | 664    |                          |       | 50%                                            | 208    |                |                                      |       | C                                           |         |   |               |
| 5                    | 666    |                          |       | 90%                                            | 358    |                |                                      |       | O                                           |         |   |               |
| 6                    | 670    |                          |       | EP                                             | 401    |                |                                      |       | H                                           |         |   |               |
| 7                    | 663    |                          |       | Res                                            | 96.0   |                |                                      |       | K <sub>2</sub> O, W+, % basis Fe            |         |   |               |
| 8                    | 652    |                          |       |                                                |        |                |                                      |       | X-Ray Analysis—                             |         |   |               |
| 9                    | 644    |                          |       |                                                |        |                |                                      |       | Fe <sub>2</sub> O <sub>3</sub>              |         |   |               |
| 10                   | 642    |                          |       |                                                |        |                |                                      |       | Fe <sub>2</sub> O <sub>4</sub>              |         |   |               |
| 11                   | 623    |                          |       |                                                |        |                |                                      |       | Fe                                          |         |   |               |



THE TEXAS COMPANY — MONTEBELLO LABORATORY  
YIELD CALCULATIONS

RUN NO. 66-F  
HOURS 94-115  
CATALYST Brownsville  
Treated MS RED. @ 660P

| FRESH FEED                              |        |                        |                     | WET GAS                   |                |                     | RECYCLE                                                                             | COMBINED<br>FEED                        | EFFLUENT | NET CHANGE    |                                           | YIELD BASIS H <sub>2</sub> + CO FED |        |        |         |                                            |                                |          |                         |         |        |     |  |
|-----------------------------------------|--------|------------------------|---------------------|---------------------------|----------------|---------------------|-------------------------------------------------------------------------------------|-----------------------------------------|----------|---------------|-------------------------------------------|-------------------------------------|--------|--------|---------|--------------------------------------------|--------------------------------|----------|-------------------------|---------|--------|-----|--|
|                                         | %      | m/hr                   | #/hr                | %                         | At Wt. Balance |                     |                                                                                     |                                         |          |               |                                           | CONDENSATE                          |        |        |         | YIELDS BASIS BROWNSVILLE DESIGN FEED RATE* |                                |          |                         |         |        |     |  |
|                                         |        |                        |                     |                           | m/hr           | #/hr                | m/hr                                                                                | m/hr                                    | m/hr     | m/hr          | #/hr                                      | #/MCF                               | #/gal  | gal/hr | gal/MCF |                                            | CORRECTED<br>HENNEL, %         | gal/hr   | TREATING<br>RECOVERY, % | gal/hr  |        |     |  |
| CO<br>26.010                            | 36.775 | 15.332                 | 429.46              | 9.210                     | 1.318          | 36.92               | 3.699                                                                               | 19.031                                  | 5.017    | -14.014       | -392.54                                   |                                     |        |        |         |                                            |                                |          |                         |         |        |     |  |
| H <sub>2</sub><br>2.016                 | 60.385 | 25.176                 | 50.75               | 39.375                    | 5.634          | 11.36               | 15.812                                                                              | 40.988                                  | 21.446   | -191542       | 39.39                                     |                                     |        |        |         |                                            | 400 EP                         | 79.7     | 7.355                   | 98.0    | 7.208  |     |  |
| CO <sub>2</sub><br>44.010               | 2.130  | 0.888                  | 39.08               | 29.725                    | 4.253          | 187.19              | 11.937                                                                              | 12.825                                  | 16.190   | 3.365         | 148.11                                    | 9.634                               |        |        |         |                                            | 400-550                        | 9.4      | 0.868                   | 91.4    | 0.793  |     |  |
| N <sub>2</sub><br>28.016                | 0.625  | 0.261                  | 7.31                | 2.025                     | 0.290          | 8.12                | 0.813                                                                               | 1.074                                   | 1.103    |               |                                           |                                     |        |        |         |                                            | 550 +                          | 10.9     | 1.006                   | 114.6   | 1.153  |     |  |
| CH <sub>4</sub><br>16.042               | 0.085  | 0.035                  | 0.56                | 9.035                     | 1.293          | 20.74               | 3.628                                                                               | 3.663                                   | 4.921    | 1.258         | 20.18                                     | 1.313                               |        |        |         |                                            |                                |          |                         |         |        |     |  |
| C <sub>2</sub> H <sub>2</sub><br>28.032 |        |                        |                     | 2.195                     | 0.314          | 8.81                | 0.881                                                                               | 0.881                                   | 1.195    | 0.314         | 8.81                                      | 0.573                               |        |        |         |                                            |                                |          |                         |         |        |     |  |
| C <sub>3</sub> H <sub>2</sub><br>30.048 |        |                        |                     | 1.640                     | 0.235          | 7.07                | 0.659                                                                               | 0.659                                   | 0.894    | 0.235         | 7.07                                      | 0.460                               |        |        |         |                                            | PROPYLENE                      | 41.2     | 7.75                    | gal/hr  |        |     |  |
| C <sub>4</sub> + C <sub>5</sub>         |        |                        |                     |                           |                |                     |                                                                                     |                                         |          |               | 36.06                                     | 2.346                               |        |        |         |                                            | C <sub>3</sub> POLY GASO.      | 87.5     | 6.78                    | 1.134   |        |     |  |
| C <sub>2</sub> H <sub>2</sub><br>42.078 |        |                        |                     | 3.125                     | 0.447          | 18.81               | 1.255                                                                               | 1.255                                   | 1.702    | 0.447         | 18.81                                     | 1.224                               | 4.32   | 4.354  | 0.283   |                                            |                                |          |                         |         |        |     |  |
| C <sub>3</sub> H <sub>2</sub><br>44.094 |        |                        |                     | 0.345                     | 0.049          | 2.16                | 0.139                                                                               | 0.139                                   | 0.188    | 0.049         | 2.16                                      | 0.141                               | 4.24   | 0.509  | 0.033   |                                            |                                |          |                         |         |        |     |  |
| C <sub>4</sub> H <sub>2</sub><br>56.104 |        |                        |                     | 1.765                     | 0.253          | 14.19               | 0.709                                                                               | 0.709                                   | 0.962    | 0.253         | 14.19                                     | 0.923                               | 5.00   | 2.838  | 0.185   |                                            |                                | #/gal    | #/hr                    | gal/hr  | RVP    |     |  |
| C <sub>5</sub> H <sub>2</sub><br>68.120 |        |                        |                     | 0.555                     | 0.079          | 4.59                | 0.223                                                                               | 0.223                                   | 0.302    | 0.079         | 4.59                                      | 0.299                               | 4.86   | 0.944  | 0.061   |                                            | C <sub>4</sub> H <sub>8</sub>  | 5.00     | 0.47                    | 0.094   | 68.0   |     |  |
| C <sub>6</sub> H <sub>2</sub><br>70.130 |        |                        |                     | 0.670                     | 0.096          | 6.73                | 0.269                                                                               | 0.269                                   | 0.365    | 0.096         | 6.73                                      | 0.438                               | 5.45   | 1.235  | 0.080   |                                            | C <sub>6</sub> POLY GASO.      | 5.98     | 12.01                   | 2.008   | 1.5    |     |  |
| C <sub>7</sub> H <sub>2</sub><br>72.140 |        |                        |                     | 0.140                     | 0.020          | 1.44                | 0.056                                                                               | 0.056                                   | 0.078    | 0.020         | 1.44                                      | 0.094                               | 5.28   | 0.274  | 0.018   |                                            | C <sub>4</sub> H <sub>10</sub> | 4.86     | 4.59                    | 0.944   | 68.0   |     |  |
| C <sub>8</sub> H <sub>2</sub><br>84.150 |        |                        |                     | 0.195                     | 0.028          | 2.36                | 0.078                                                                               | 0.078                                   | 0.106    | 0.028         | 2.36                                      | 0.154                               | 5.54   | 0.426  | 0.028   |                                            | C <sub>4</sub> FREE GASO.      |          |                         | 10.277  | 5.8    |     |  |
| C <sub>9</sub> + C <sub>10</sub>        |        |                        |                     |                           |                |                     |                                                                                     |                                         |          |               | 50.28                                     | 3.273                               |        | 10.580 | 0.688   |                                            | C <sub>4</sub> POLY TAR        | 7.53     | 1.71                    | 0.227   |        |     |  |
| TOTAL                                   |        | 41.692                 | 527.16              |                           | 14.309         | 330.49              | 40.158                                                                              | 81.850                                  | 61.964   |               |                                           |                                     |        |        |         |                                            |                                |          |                         |         |        |     |  |
| H <sub>2</sub> + CO                     | 97.160 | 40.508                 | 15373               | SCFH                      | 6.952          |                     | 19.511                                                                              | 60.019                                  | 26.463   | 33.556        |                                           |                                     |        |        |         |                                            |                                | gal/hr   | gal / MCF               | Bbl/Day |        |     |  |
| H <sub>2</sub> / CO                     |        | 1.64                   | Factor              | 650491                    | 4.27           |                     | 4.27                                                                                | 2.15                                    | 4.27     | 1.39          |                                           |                                     |        |        |         |                                            | 10 # RVP 400 EP<br>GASOLINE    | 13.323   | 0.8666                  | 4698    |        |     |  |
| Weight Recovery, %                      | 93.29  | Catalyst Age, hrs.     |                     |                           |                | Space Velocity, vhr |                                                                                     |                                         | 1243     | RECOVERED OIL |                                           | 0.414                               | 58.08  | 3.778  | 9.229   | 0.600                                      | GAS OIL                        | 0.793    | 0.0516                  | 280     |        |     |  |
| Pressure, psig                          | 404    | Inlet Velocity, Ft/sec |                     |                           |                | 0.99                | Catalyst Vol CF                                                                     |                                         |          | 12.37         | TOTAL OIL                                 |                                     |        | 108.36 | 7.051   | 19.809                                     | 1.288                          | FUEL OIL | 1.153                   | 0.0750  | 407    |     |  |
| Temperature, °F                         | 660    | Bed Depth, Ft          |                     |                           |                | 18.74               | Weight, #                                                                           |                                         |          | 1954          | WATER SOLUBLE<br>CHEMICALS **             |                                     | 0.313  | 16.62  | 1.081   | 2.092                                      | 0.136                          | POLY TAR | 0.356                   | 0.0232  | 126    |     |  |
| Recycle Ratio                           | 0.96   | Bed Density, #/CF      |                     |                           |                | 158                 | Effluent (H <sub>2</sub> ) / CO <sub>2</sub><br>Shift Ratio (H <sub>2</sub> O) / CO |                                         |          |               | TOTAL LIQUID<br>PRODUCTS C <sub>4</sub> + |                                     |        | 124.98 | 8.132   | 21.901                                     | 1.424                          | TOTAL    | 15.625                  | 1.0164  | 5511   |     |  |
| FRESH FEED CONVERSION — %               |        |                        |                     | TOTAL FEED CONVERSION — % |                |                     |                                                                                     | SELECTIVITY                             |          |               |                                           | NET WATER                           |        | 6.770  | 121.97  | 7.934                                      | 14.642                         | 0.952    | W. S. CHEM.             | 2.092   | 0.1361 | 738 |  |
| Contraction                             | CO     | H <sub>2</sub>         | H <sub>2</sub> + CO | CO                        | H <sub>2</sub> | CO + H <sub>2</sub> | C <sub>3</sub> + C <sub>4</sub> +                                                   | GROSS WATER                             |          |               |                                           | 138.59                              | 9.015  | 16.734 | 1.088   |                                            | TOTAL                          | 17.717   | 1.1525                  | 6249    |        |     |  |
| 65.68                                   | 91.40  | 77.62                  | 82.84               | 73.64                     | 47.68          | 55.91               | 77.61                                                                               | HYDROCARBON<br>TOTAL — C <sub>1</sub> + |          |               |                                           | 161.04                              | 10.478 |        |         |                                            |                                |          |                         |         |        |     |  |

Form ML-11

\*\* Included in Reactor Effluent Total

g/NCM = 16.91X#/MCF \*9488 MCFH H<sub>2</sub> + CO, Bbl/Day = 5421.6X gal/MCF

THE TEXAS COMPANY — MONTEBELLO LABORATORY  
DATA SUMMARY

RUN NO. 66-F  
HOURS 94-115

| OPERATING CONDITIONS |        |                         |       | PRODUCT TESTS                                  |      |       |  | CATALYST DATA                        |       |                                             |         |            |         |   |  |
|----------------------|--------|-------------------------|-------|------------------------------------------------|------|-------|--|--------------------------------------|-------|---------------------------------------------|---------|------------|---------|---|--|
| PRESSURES PSIG       |        | RATES SCFH              |       | OIL                                            |      | WATER |  | INVENTORY DATA                       |       | PARTICLE SIZE                               |         |            |         |   |  |
| Oxygen               | 436    | Fresh Feed              | 15822 | * API                                          | 55.7 | 10.8  |  | In Reactor at Start of Period        |       | Screen Analysis                             |         | Settlement |         |   |  |
| Natural Gas          | 435    | Recycle                 | 15240 | Neut. No.                                      | 42.5 | 34.3  |  | Fresh Catalyst Added                 |       | Mesh                                        | Microns | %          | Microns | % |  |
| Generator Outlet     | 410    | Combined Feed           | 31062 | Sap. No.                                       | 51.2 | 39.4  |  | Total                                |       | On 40                                       | 419+    |            | 80+     |   |  |
| Reactor Inlet        | 404    | Wet Gas—Measured        | 4849  | Hydrox. No.                                    |      |       |  | Catalyst Recovered                   | 12    | 100                                         | 150     |            | 40—80   |   |  |
| Condenser Inlet      |        | Adjusted                | 5431  | Bromine No.                                    | 96   |       |  | In Reactor at End of Period          |       | 150                                         | 105     |            | 20—40   |   |  |
| Product Accumulator  | 375    | Loss                    | 582   | Pour °F.                                       |      |       |  |                                      |       | 200                                         | 74      |            | 10—20   |   |  |
|                      |        |                         |       | Chemicals, % by K <sub>2</sub> CO <sub>3</sub> | 12.5 |       |  | REACTOR d-p, Inches H <sub>2</sub> O |       | 250                                         | 62      |            | 0—20    |   |  |
|                      |        |                         |       |                                                |      |       |  | No. Height                           |       | 325                                         | 44      |            |         |   |  |
|                      |        |                         |       |                                                |      |       |  | 0 See Per. A                         |       | <325                                        |         |            |         |   |  |
| TEMPERATURES—°F.     |        | Recycle/Fresh Feed      | 0.96  |                                                |      |       |  | 1                                    | 75    | CATALYST                                    |         |            |         |   |  |
| Oxygen               | 494    | Inlet Velocity—ft./sec. | 0.99  |                                                |      |       |  | 2                                    | 80    | Bulk Density, Lbs./Cu.Ft.                   |         |            |         |   |  |
| Natural Gas          | 793    | Fresh Feed Rate—SCFH    | 15373 | HEMPEL DIST. %                                 |      | °API  |  | 3                                    | 84    | Aerated                                     |         |            |         |   |  |
| Generator            | 2480   | per Cu.Ft. Dense Bed    | 1243  | 205 °F.                                        |      |       |  | 4                                    | 300   | Settled                                     |         |            |         |   |  |
| Quench Accumulator   | 148    | per Lb. Catalyst        | 7.87  | 400                                            | 78.7 | 54.7  |  | Total                                | 539   | Compacted                                   |         |            |         |   |  |
| Reactor Inlet        | 240    |                         | 23292 | 400-550                                        | 9.4  | 34.9  |  |                                      |       | Particle Density, gm./cc.                   |         |            |         |   |  |
| Condenser Inlet      | 577    |                         |       | 550+                                           | 11.9 |       |  |                                      |       | NH <sub>3</sub> Value, ml./gm.              |         |            |         |   |  |
| Product Accumulator  | 62     |                         |       |                                                |      |       |  | CALCULATED FROM dp                   |       | N <sub>2</sub> Surface, m <sup>2</sup> /gm. |         |            |         |   |  |
| Catalyst No.         | Height |                         |       | A. S. T. M. DIST. ON                           |      |       |  | Density, Lbs./Cu.Ft.                 | 158   |                                             |         |            |         |   |  |
| 1 See Per. A         | --     |                         |       | Naphtha °F.                                    |      |       |  | Inventory, Lbs.                      | 1954  |                                             |         |            |         |   |  |
| 2                    | 660    |                         |       | IBP                                            | 101  |       |  | Bed Depth, Ft.                       | 18.74 | CHEMICAL ANALYSIS                           |         |            |         |   |  |
| 3                    | 650    |                         |       | 10%                                            | 124  |       |  | Vol. Cu. Ft.                         | 12.37 | Fe                                          |         |            |         |   |  |
| 4                    | 661    |                         |       | 50%                                            | 201  |       |  |                                      |       | C                                           |         |            |         |   |  |
| 5                    | 663    |                         |       | 90%                                            | 334  |       |  |                                      |       | O                                           |         |            |         |   |  |
| 6                    | 667    |                         |       | EP                                             | 401  |       |  |                                      |       | H                                           |         |            |         |   |  |
| 7                    | 661    |                         |       | Rec                                            | 97.0 |       |  |                                      |       | K <sub>2</sub> O, W+, % basis Fe            |         |            |         |   |  |
| 8                    | 649    |                         |       |                                                |      |       |  |                                      |       | X-Ray Analysis—                             |         |            |         |   |  |
| 9                    | 642    |                         |       |                                                |      |       |  |                                      |       | Fe <sub>2</sub> O <sub>3</sub>              |         |            |         |   |  |
| 10                   | 640    |                         |       |                                                |      |       |  |                                      |       | Fe <sub>2</sub> O <sub>4</sub>              |         |            |         |   |  |
| 11                   | 622    |                         |       |                                                |      |       |  |                                      |       | Fe                                          |         |            |         |   |  |

THE TEXAS COMPANY — MONTEBELLO LABORATORY  
YIELD CALCULATIONS

RUN NO. 66-G  
HOURS 115-135  
CATALYST Brownsville  
Treated MS Red. @ 660P

| FRESH FEED                                |        |                        |                    | WET GAS |                |                           | RECYCLE                                                                          | COMBINED FEED | EFFLUENT                             | NET CHANGE    |                                        | YIELD BASIS H <sub>2</sub> + CO FED |       |        |         |                                            |                            |                       |             |                      |        |        |     |
|-------------------------------------------|--------|------------------------|--------------------|---------|----------------|---------------------------|----------------------------------------------------------------------------------|---------------|--------------------------------------|---------------|----------------------------------------|-------------------------------------|-------|--------|---------|--------------------------------------------|----------------------------|-----------------------|-------------|----------------------|--------|--------|-----|
|                                           | %      | m/hr                   | #/hr               | %       | At Wt. Balance |                           | m/hr                                                                             | m/hr          | m/hr                                 | m/hr          | #/hr                                   | CONDENSATE                          |       |        |         | YIELDS BASIS BROWNSVILLE DESIGN FEED RATE* |                            |                       |             |                      |        |        |     |
|                                           |        |                        |                    |         | m/hr           | #/hr                      |                                                                                  |               |                                      |               |                                        | #/MCF                               | #/gal | gal/hr | gal/MCF |                                            |                            | CORRECTED RECOVERY, % | gal/hr      | TREATING RECOVERY, % | gal/hr |        |     |
| CO<br>28.010                              | 36.980 | 15.231                 | 426.68             | 9.203   | 1.315          | 36.83                     | 3.675                                                                            | 18.906        | 4.990                                | -13.916       | -389.79                                |                                     |       |        |         |                                            |                            |                       |             |                      |        |        |     |
| H <sub>2</sub><br>2.016                   | 60.237 | 24.811                 | 50.02              | 39.574  | 5.654          | 11.40                     | 15.803                                                                           | 40.614        | 21.457                               | -19.157       | -38.62                                 |                                     |       |        |         |                                            | 400 EP                     | 81.0                  | 7.284       | 98.0                 | 7.138  |        |     |
| CO <sub>2</sub><br>4.4.010                | 2.267  | 0.934                  | 41.11              | 30.123  | 4.305          | 189.43                    | 12.030                                                                           | 12.964        | 16.335                               | 3.371         | 148.32                                 | 9.760                               |       |        |         |                                            | 400-550                    | 9.2                   | 0.827       | 91.4                 | 0.756  |        |     |
| N <sub>2</sub><br>28.016                  | 0.433  | 0.178                  | 4.99               | 1.780   | 0.254          | 7.12                      | 0.711                                                                            | 0.889         | 0.965                                |               |                                        |                                     |       |        |         |                                            | 550 +                      | 9.8                   | 0.881       | 114.6                | 1.010  |        |     |
| CH <sub>4</sub><br>16.042                 | 0.083  | 0.034                  | 0.55               | 8.750   | 1.250          | 20.05                     | 3.494                                                                            | 3.528         | 4.744                                | 1.216         | 19.50                                  | 1.283                               |       |        |         |                                            |                            |                       |             |                      |        |        |     |
| C <sub>2</sub> H <sub>6</sub><br>28.028   |        |                        |                    | 2.273   | 0.325          | 9.12                      | 0.908                                                                            | 0.908         | 1.233                                | 0.325         | 9.12                                   | 0.600                               |       |        |         |                                            |                            | RECOVERY %            | #/hr        | gal/hr               |        |        |     |
| C <sub>3</sub> H <sub>8</sub><br>30.048   |        |                        |                    | 1.627   | 0.232          | 6.98                      | 0.650                                                                            | 0.650         | 0.682                                | 0.232         | 6.98                                   | 0.459                               |       |        |         |                                            | PROPYLENE                  | 40.7                  | 7.57        |                      |        |        |     |
| C <sub>4</sub> +C <sub>5</sub>            |        |                        |                    |         |                |                           |                                                                                  |               |                                      |               |                                        |                                     |       |        |         |                                            | C <sub>3</sub> POLY GASOL. | 87.5                  | 6.68        | 1.107                |        |        |     |
| C <sub>6</sub> H <sub>14</sub><br>42.078  |        |                        |                    | 3.097   | 0.442          | 18.60                     | 1.237                                                                            | 1.237         | 1.679                                | 0.442         | 18.60                                  | 1.224                               | 4.32  | 4.306  | 0.283   |                                            | C <sub>3</sub> POLY TAR    | 12.5                  | 0.95        | 0.126                |        |        |     |
| C <sub>7</sub> H <sub>16</sub><br>44.094  |        |                        |                    | 0.323   | 0.046          | 2.03                      | 0.129                                                                            | 0.129         | 0.176                                | 0.046         | 2.03                                   | 0.134                               | 4.24  | 0.479  | 0.032   |                                            |                            |                       |             |                      |        |        |     |
| C <sub>8</sub> H <sub>18</sub><br>56.104  |        |                        |                    | 1.730   | 0.247          | 13.86                     | 0.691                                                                            | 0.691         | 0.938                                | 0.247         | 13.86                                  | 0.912                               | 8.00  | 2.772  | 0.182   |                                            |                            | #/gal                 | #/hr        | gal/hr               | RVP    |        |     |
| C <sub>10</sub> H <sub>22</sub><br>58.120 |        |                        |                    | 0.500   | 0.071          | 4.13                      | 0.200                                                                            | 0.200         | 0.271                                | 0.071         | 4.13                                   | 0.272                               | 4.88  | 0.850  | 0.056   | C <sub>4</sub> H <sub>10</sub>             | 5.00                       | 0.84                  | 0.168       | 68.0                 |        |        |     |
| C <sub>12</sub> H <sub>26</sub><br>70.130 |        |                        |                    | 0.693   | 0.099          | 6.94                      | 0.277                                                                            | 0.277         | 0.376                                | 0.099         | 6.94                                   | 0.457                               | 5.48  | 1.273  | 0.084   | C <sub>4</sub> POLY GASOL.                 | 5.98                       | 11.39                 | 1.905       | 1.5                  |        |        |     |
| C <sub>14</sub> H <sub>30</sub><br>72.148 |        |                        |                    | 0.130   | 0.019          | 1.37                      | 0.052                                                                            | 0.019         | 0.071                                | 0.019         | 1.37                                   | 0.090                               | 8.88  | 0.261  | 0.017   | C <sub>4</sub> H <sub>10</sub>             | 4.88                       | 4.13                  | 0.850       | 68.0                 |        |        |     |
| C <sub>16</sub> H <sub>34</sub><br>84.154 |        |                        |                    | 0.197   | 0.028          | 2.36                      | 0.079                                                                            | 0.028         | 0.107                                | 0.028         | 2.36                                   | 0.155                               | 5.84  | 0.426  | 0.028   | C <sub>4</sub> FREE GASOL.                 |                            |                       | 10.205      | 5.8                  |        |        |     |
| C <sub>18</sub> +C <sub>20</sub>          |        |                        |                    |         |                |                           |                                                                                  |               |                                      |               |                                        |                                     |       |        |         | C <sub>4</sub> POLY TAR                    | 7.38                       | 1.63                  | 0.216       |                      |        |        |     |
| TOTAL                                     |        | 41.188                 |                    |         | 14.287         | 330.22                    | 39.936                                                                           | 81.124        | 61.624                               |               |                                        |                                     |       |        |         |                                            |                            |                       |             |                      |        |        |     |
| H <sub>2</sub> +CO                        | 97.217 | 40.042                 | 15196              | SCFH    | 6.969          |                           | 19.478                                                                           | 59.520        | 26.447                               | -33.073       |                                        |                                     |       |        |         |                                            |                            | gal/hr                | gal/MCF     | Bbl/Day              |        |        |     |
| H <sub>2</sub> /CO                        |        | 1.63                   | Factor             | 658067  | 4.30           |                           | 4.30                                                                             | 2.15          | 4.30                                 | 1.38          |                                        |                                     |       |        |         |                                            | 10 # RVP 400 EP GASOLINE   | 13.128                | 0.8639      | 4684                 |        |        |     |
| Weight Recovery, %                        | 94.30  | Catalyst Age, hrs.     |                    |         |                | Space Velocity, vhr       |                                                                                  |               | 1232                                 | RECOVERED OIL |                                        | **                                  | 0.404 | 56.61  | 3.725   |                                            | 8.992                      | 0.592                 | GAS OIL     | 0.756                | 0.0497 | 269    |     |
| Pressure, psig                            | 401    | Inlet Velocity, Ft/sec |                    |         |                | 0.99                      | Catalyst Vol CF                                                                  |               |                                      | 12.33         | TOTAL OIL                              |                                     |       | 105.90 | 6.969   |                                            | 19.359                     | 1.274                 | FUEL OIL    | 1.010                | 0.0665 | 361    |     |
| Temperature, °F                           | 661    | Bed Depth, Ft          |                    |         |                | 18.68                     | Weight, #                                                                        |               |                                      | 1911          | WATER SOLUBLE CHEMICALS **             |                                     |       | 0.297  | 15.75   | 1.036                                      |                            | 1.976                 | 0.130       | POLY TAR             | 0.342  | 0.0225 | 122 |
| Recycle Ratio                             | 0.97   | Bed Density, #/CF      |                    |         |                | 155                       | Effluent (H <sub>2</sub> )(CO) <sub>2</sub> = Shift Ratio (H <sub>2</sub> O)(CO) |               |                                      |               | TOTAL LIQUID PRODUCTS C <sub>4</sub> + |                                     | **    | 121.65 | 8.005   |                                            | 21.335                     | 1.404                 | TOTAL       | 15.236               | 1.0026 | 5436   |     |
| FRESH FEED CONVERSION — %                 |        |                        |                    |         |                | TOTAL FEED CONVERSION — % |                                                                                  |               |                                      | SELECTIVITY   |                                        | NET WATER                           |       | 6.700  | 120.71  | 7.944                                      | 14.491                     | 0.954                 | W. S. CHEM. | 1.976                | 0.1300 | 705    |     |
| Contraction                               | CO     | H <sub>2</sub>         | H <sub>2</sub> +CO | CO      | H <sub>2</sub> | CO+H <sub>2</sub>         | C <sub>3</sub> + C <sub>4</sub> +                                                |               | GROSS WATER                          |               | 136.46                                 | 8.980                               |       | 16.467 | 1.084   |                                            | TOTAL                      | 17.212                | 1.1326      | 6141                 |        |        |     |
| 65.31                                     | 91.37  | 77.21                  | 82.60              | 73.61   | 47.17          | 55.57                     | 77.36                                                                            |               | HYDROCARBON TOTAL — C <sub>4</sub> + |               | 157.23                                 | 10.347                              |       |        |         |                                            |                            |                       |             |                      |        |        |     |

Form ML-11

\*\* Included in Reactor Effluent Total

g/NCM = 16.91X#/MCF

\*9488 MCFH H<sub>2</sub> + CO, Bbl/Day = 5421.6X gal/MCF

THE TEXAS COMPANY — MONTEBELLO LABORATORY  
DATA SUMMARY

RUN NO. 66-G  
HOURS 115-135

| OPERATING CONDITIONS |            |                          |       | PRODUCT TESTS                                  |           |       | CATALYST DATA                        |       |                                             |               |
|----------------------|------------|--------------------------|-------|------------------------------------------------|-----------|-------|--------------------------------------|-------|---------------------------------------------|---------------|
| PRESSURES PSIG       |            | RATES S.C.F.H.           |       | OIL                                            |           | WATER | INVENTORY DATA                       |       | PARTICLE SIZE                               |               |
| Oxygen               | 430        | Fresh Feed               | 15631 | * API                                          | 55.6      | 10.7  | In Reactor at Start of Period        |       | Screen Analysis                             | Sedimentation |
| Natural Gas          | 429        | Recycle                  | 15156 | Neut. No.                                      | 45.6      | 34.8  | Fresh Catalyst Added                 |       | Mesh                                        | Microns       |
| Generator Outlet     | 406        | Combined Feed            | 30787 | Sap. No.                                       | 57.4      | 39.2  | Total                                |       | On 40                                       | 419+          |
| Reactor Inlet        | 401        | Wet Gas—Measured         | 4932  | Hydrox. No.                                    |           |       | Catalyst Recovered                   | 11    | 100                                         | 150           |
| Condenser Inlet      |            | Adjusted                 | 5422  | Bromine No.                                    | 96        |       | In Reactor at End of Period          |       | 150                                         | 105           |
| Product Accumulator  | 372        | Loss                     | 490   | Pour °F.                                       | below -30 |       |                                      |       | 200                                         | 74            |
|                      |            |                          |       | Chemicals, % by K <sub>2</sub> CO <sub>3</sub> | 12.0      |       | REACTOR d-p, Inches H <sub>2</sub> O |       | 250                                         | 62            |
|                      |            |                          |       |                                                |           |       | No. Height                           |       | 325                                         | 44            |
|                      |            |                          |       |                                                |           |       | 0 See Per. A                         |       | <325                                        |               |
| TEMPERATURES—°F.     |            | Recycle/Fresh Feed       | 0.97  |                                                |           |       | 1                                    | 74    | CATALYST                                    |               |
| Oxygen               | 490        | Inlet Velocity—ft./sec.  | 0.99  |                                                |           |       | 2                                    | 81    | Bulk Density, Lbs./Cu.Ft.                   |               |
| Natural Gas          | 811        | Fresh Feed Rate—S.C.F.H. | 15196 | HEMPEL, DIST. %                                |           | °API  | 3                                    | 80    | Aerated                                     |               |
| Generator            | 2453       | per Cu. Ft. Dense Bed    | 1232  | 205 °F.                                        |           |       | 4                                    | 292   | Settled                                     |               |
| Quench Accumulator   | 158        | per Lb. Catalyst         | 7.95  | 400                                            | 80.0      | 55.1  | Total                                | 527   | Compacted                                   |               |
| Reactor Inlet        | 247        | per sq ft                | 23024 | 400-550                                        | 9.2       | 37.0  |                                      |       | Particle Density, gm./cc.                   |               |
| Condenser Inlet      | 575        |                          |       | 550+                                           | 10.8      |       |                                      |       | NH <sub>3</sub> Value, ml./gm.              |               |
| Product Accumulator  | 63         |                          |       |                                                |           |       | CALCULATED FROM dp                   |       | N <sub>2</sub> Surface, m <sup>2</sup> /gm. |               |
| Catalyst No.         | Height     |                          |       | A. S. T. M. DIST. ON                           |           |       | Density, Lbs./Cu.Ft.                 | 155   | CHEMICAL ANALYSIS                           |               |
| 1                    | See Per. A |                          |       | Naphtha °F.                                    |           |       | Inventory, Lbs.                      | 1911  |                                             |               |
| 2                    | 661        |                          |       | IBP                                            | 100       |       | Bed Depth, Ft.                       | 18.68 |                                             |               |
| 3                    | 651        |                          |       | 10%                                            | 142       |       | Vol cu ft                            | 12.33 | Fe                                          |               |
| 4                    | 662        |                          |       | 50%                                            | 224       |       |                                      |       | C                                           |               |
| 5                    | 664        |                          |       | 90%                                            | 350       |       |                                      |       | O                                           |               |
| 6                    | 667        |                          |       | EP                                             | 394       |       |                                      |       | H                                           |               |
| 7                    | 662        |                          |       | Rec                                            | 96.5      |       |                                      |       | K <sub>2</sub> O, W+, % basis Fe            |               |
| 8                    | 648        |                          |       |                                                |           |       |                                      |       | X-Ray Analysis—                             |               |
| 9                    | 641        |                          |       |                                                |           |       |                                      |       | Fe <sub>2</sub> O <sub>3</sub>              |               |
| 10                   | 641        |                          |       |                                                |           |       |                                      |       | Fe <sub>3</sub> O <sub>4</sub>              |               |
| 11                   | 618        |                          |       |                                                |           |       |                                      |       | Fe                                          |               |

THE TEXAS COMPANY — MONTEBELLO LABORATORY  
YIELD CALCULATIONS

RUN NO. 66-H  
HOURS 135-159  
CATALYST Brownsville  
Treated MS Red. @ 660P

| FRESH FEED                                |        |                        |                    | WET GAS                   |                             | RECYCLE                                                                              | COMBINED<br>FEED                   | EFFLUENT                              | NET CHANGE                                |              | YIELD BASIS H <sub>2</sub> + CO FED |        |        |         |                                            |          |               |           |            |     |
|-------------------------------------------|--------|------------------------|--------------------|---------------------------|-----------------------------|--------------------------------------------------------------------------------------|------------------------------------|---------------------------------------|-------------------------------------------|--------------|-------------------------------------|--------|--------|---------|--------------------------------------------|----------|---------------|-----------|------------|-----|
|                                           | %      | m/hr                   | #/hr               | %                         | At Wt. Balance<br>m/hr #/hr | m/hr                                                                                 | m/hr                               | m/hr                                  | m/hr                                      | #/hr         | CONDENSATE                          |        |        |         | YIELDS BASIS BROWNSVILLE DESIGN FEED RATE* |          |               |           |            |     |
| CO<br>28.010                              | 37.427 | 15.519                 | 434.66             | 9.000                     | 1.319 36.95                 | 3.608                                                                                | 19.127                             | 4.927                                 | -14.200                                   | -397.71      | #/MCF                               | #/gal  | gal/hr | gal/MCF | H <sub>2</sub>                             | BASIS    | BROWNSVILLE   | DESIGN    | FEED RATE* |     |
| H <sub>2</sub><br>2.016                   | 59.876 | 24.827                 | 50.05              | 40.620                    | 5.952 12.00                 | 16.286                                                                               | 41.113                             | 22.238                                | -18.875                                   | -38.05       |                                     |        |        |         | 400 EP                                     | 82.0     | 7.409         | 98.0      | 7.261      |     |
| CO <sub>2</sub><br>44.010                 | 2.097  | 0.970                  | 38.29              | 30.320                    | 4.444 195.57                | 12.156                                                                               | 13.026                             | 16.600                                | 3.574                                     | 157.28       | 10.272                              |        |        |         | 400-550                                    | 8.0      | 0.723         | 91.4      | 0.661      |     |
| N <sub>2</sub><br>26.016                  | 0.537  | 0.223                  | 6.25               | 1.657                     | 0.243 6.81                  | 0.664                                                                                | 0.887                              | 0.907                                 |                                           |              |                                     |        |        |         | 550 +                                      | 10.0     | 0.904         | 114.6     | 1.036      |     |
| CH <sub>4</sub><br>16.042                 | 0.063  | 0.026                  | 0.42               | 7.770                     | 1.139 18.27                 | 3.115                                                                                | 3.141                              | 4.254                                 | 1.113                                     | 17.85        | 1.166                               |        |        |         |                                            |          |               |           |            |     |
| C <sub>2</sub> H <sub>6</sub><br>26.062   |        |                        |                    | 2.343                     | 0.343 9.62                  | 0.939                                                                                | 0.939                              | 1.282                                 | 0.343                                     | 9.62         | 0.628                               |        |        |         |                                            |          | RECOVERY<br>% | #/hr      | gal/hr     |     |
| C <sub>3</sub> H <sub>8</sub><br>30.068   |        |                        |                    | 1.663                     | 0.244 7.34                  | 0.667                                                                                | 0.667                              | 0.911                                 | 0.244                                     | 7.34         | 0.479                               |        |        |         | PROPYLENE                                  | 40.0     | 7.34          |           |            |     |
| C <sub>4</sub> +C <sub>5</sub>            |        |                        |                    |                           |                             |                                                                                      |                                    |                                       |                                           |              |                                     |        |        |         | C <sub>4</sub> POLY GASO.                  | 87.5     | 6.42          | 1.074     |            |     |
| C <sub>6</sub> H <sub>12</sub><br>42.078  |        |                        |                    | 2.977                     | 0.436 18.35                 | 1.194                                                                                | 1.194                              | 1.630                                 | 0.436                                     | 18.35        | 1.198                               | 4.32   | 4.248  | 0.277   | C <sub>6</sub> POLY TAR                    | 12.5     | 0.92          | 0.122     |            |     |
| C <sub>8</sub> H <sub>18</sub><br>44.034  |        |                        |                    | 0.323                     | 0.047 2.07                  | 0.129                                                                                | 0.129                              | 0.176                                 | 0.047                                     | 2.07         | 0.135                               | 4.24   | 0.498  | 0.032   |                                            |          |               |           |            |     |
| C <sub>10</sub> H <sub>16</sub><br>56.104 |        |                        |                    | 1.743                     | 0.255 14.31                 | 0.699                                                                                | 0.699                              | 0.954                                 | 0.255                                     | 14.31        | 0.935                               | 5.00   | 2.962  | 0.187   |                                            | #/gal    | #/hr          | gal/hr    | RVP        |     |
| C <sub>12</sub> H <sub>20</sub><br>58.120 |        |                        |                    | 0.585                     | 0.085 4.94                  | 0.234                                                                                | 0.234                              | 0.319                                 | 0.085                                     | 4.94         | 0.323                               | 4.86   | 1.016  | 0.066   | C <sub>12</sub> H <sub>20</sub>            | 5.00     | 0.17          | 0.034     | 68.0       |     |
| C <sub>14</sub> H <sub>22</sub><br>70.130 |        |                        |                    | 0.647                     | 0.095 6.66                  | 0.259                                                                                | 0.259                              | 0.354                                 | 0.095                                     | 6.66         | 0.435                               | 5.45   | 1.222  | 0.080   | C <sub>14</sub> POLY GASO.                 | 5.98     | 12.37         | 2.069     | 1.5        |     |
| C <sub>16</sub> H <sub>24</sub><br>72.146 |        |                        |                    | 0.177                     | 0.026 1.88                  | 0.071                                                                                | 0.071                              | 0.097                                 | 0.026                                     | 1.88         | 0.123                               | 5.25   | 0.358  | 0.023   | C <sub>16</sub> H <sub>24</sub>            | 4.86     | 4.94          | 1.016     | 68.0       |     |
| C <sub>18</sub> H <sub>26</sub><br>84.156 |        |                        |                    | 0.177                     | 0.026 2.19                  | 0.071                                                                                | 0.071                              | 0.097                                 | 0.026                                     | 2.19         | 0.143                               | 5.54   | 0.395  | 0.026   | C <sub>18</sub> -FREE GASO.                |          |               | 10.310    | 5.8        |     |
| C <sub>20</sub> -C <sub>24</sub>          |        |                        |                    |                           |                             |                                                                                      |                                    |                                       |                                           |              |                                     | 50.40  | 3.292  |         | C <sub>20</sub> POLY TAR                   | 7.53     | 1.77          | 0.235     |            |     |
| TOTAL                                     |        | 41.465                 | 529.67             |                           | 14.654 336.96               | 40.092                                                                               | 81.557                             | 62.117                                |                                           |              |                                     |        |        |         |                                            |          |               |           |            |     |
| H <sub>2</sub> +CO                        | 97.303 | 40.346                 | 15322              | SCFH                      | 7.271                       |                                                                                      | 19.894                             | 60.240                                | 27.165                                    | -33.075      |                                     |        |        |         |                                            |          | gal/hr        | gal / MCF | Bbl/Day    |     |
| H <sub>2</sub> /CO                        |        | 1.60                   | Factor             | 658082                    | 4.51                        |                                                                                      | 4.51                               | 2.15                                  | 4.51                                      | 1.33         |                                     |        |        |         | 10 # RVP 400 EP<br>GASOLINE                | 13.428   | 0.9770        | 4755      |            |     |
| Weight Recovery, %                        | 94.00  | Catalyst Age, hrs.     |                    |                           | Space Velocity, whv         |                                                                                      | 1247                               | RECOVERED OIL **                      |                                           | 0.406        | 56.89                               | 3.715  | 9.036  | 0.590   | GAS OIL                                    | 0.661    | 0.0432        | 234       |            |     |
| Pressure, psig                            | 404    | Inlet Velocity, Ft/sec |                    |                           | 0.99                        | Catalyst Vol CF                                                                      |                                    | 12.28                                 | TOTAL OIL                                 |              | 107.29                              | 7.007  | 19.625 | 1.281   | FUEL OIL                                   | 1.036    | 0.0677        | 367       |            |     |
| Temperature, °F                           | 663    | Bed Depth, Ft          |                    |                           | 18.61                       | Weight, #                                                                            |                                    | 1903                                  | WATER SOLUBLE<br>CHEMICALS **             |              | 0.296                               | 15.68  | 1.024  | 1.967   | 0.128                                      | POLY TAR | 0.357         | 0.0233    | 126        |     |
| Recycle Ratio                             | 0.97   | Bed Density, #/CF      |                    |                           | 155                         | Effluent (H <sub>2</sub> )(CO <sub>2</sub> ) =<br>Shift Ratio (H <sub>2</sub> O)(CO) |                                    |                                       | TOTAL LIQUID<br>PRODUCTS C <sub>6</sub> + |              | 122.97                              | 8.031  | 21.592 | 1.409   | TOTAL                                      | 15.483   | 1.0112        | 5482      |            |     |
| FRESH FEED CONVERSION — %                 |        |                        |                    | TOTAL FEED CONVERSION — % |                             |                                                                                      |                                    | SELECTIVITY                           |                                           | NET WATER ** |                                     | 6.669  | 120.14 | 7.946   | 14.422                                     | 0.942    | W. S. CHEM.   | 1.967     | 0.1285     | 697 |
| Contraction                               | CO     | H <sub>2</sub>         | H <sub>2</sub> +CO | CO                        | H <sub>2</sub>              | CO+H <sub>2</sub>                                                                    | C <sub>3</sub> + /C <sub>4</sub> + | GROSS WATER                           |                                           | 135.82       | 8.970                               | 16.389 | 1.070  | TOTAL   | 17.450                                     | 1.1397   | 6199          |           |            |     |
| 64.66                                     | 91.50  | 76.02                  | 81.98              | 74.24                     | 45.91                       | 54.91                                                                                | 77.94                              | HYDROCARBON<br>TOTAL—C <sub>1</sub> + |                                           | 157.78       | 10.304                              |        |        |         |                                            |          |               |           |            |     |

Form ML-11

\*\* Included in Reactor Effluent Total

g/NCM = 16.91 X #/MCF \*9488 MCFH H<sub>2</sub> + CO, Bbl/Day = 5421.6 X gal/MCF

THE TEXAS COMPANY — MONTEBELLO LABORATORY  
DATA SUMMARY

RUN NO. 66-H  
HOURS 135-159

| OPERATING CONDITIONS |        |                          |       | PRODUCT TESTS                                  |      |       | CATALYST DATA                        |  |       |                                             |         |   |               |   |
|----------------------|--------|--------------------------|-------|------------------------------------------------|------|-------|--------------------------------------|--|-------|---------------------------------------------|---------|---|---------------|---|
| PRESSURES PSIG       |        | RATES S.C.F.H.           |       |                                                | OIL  | WATER | INVENTORY DATA                       |  |       | PARTICLE SIZE                               |         |   |               |   |
| Oxygen               | 434    | Fresh Feed               | 15736 | * API                                          | 55.6 | 10.7  | In Reactor at Start of Period        |  |       | Screen Analysis                             |         |   | Sedimentation |   |
| Natural Gas          | 431    | Recycle                  | 15215 | Neut. No.                                      | 45.7 | 35.7  | Fresh Catalyst Added                 |  |       | Mesh                                        | Microns | % | Microns       | % |
| Generator Outlet     | 409    | Combined Feed            | 30951 | Sap. No.                                       | 59.8 | 39.2  | Total                                |  |       | On 40                                       | 419+    |   | 80+           |   |
| Reactor Inlet        | 404    | Wet Gas—Measured         | 5037  | Hydrox. No.                                    |      |       | Catalyst Recovered                   |  | 10    | 100                                         | 150     |   | 40—80         |   |
| Condenser Inlet      |        | Adjusted                 | 5561  | Bromine No.                                    | 96   |       | In Reactor at End of Period          |  |       | 150                                         | 105     |   | 20—40         |   |
| Product Accumulator  | 375    | Loss                     | 524   | Pour °F.                                       |      |       |                                      |  |       | 200                                         | 74      |   | 10—20         |   |
|                      |        |                          |       | Chemicals, % by K <sub>2</sub> CO <sub>3</sub> |      | 12.0  | REACTOR d-p, Inches H <sub>2</sub> O |  |       | 250                                         | 62      |   | 0—20          |   |
|                      |        |                          |       |                                                |      |       | No. Height                           |  |       | 325                                         | 44      |   |               |   |
| TEMPERATURES—°F.     |        | Recycle/Fresh Feed       | 0.97  |                                                |      |       | 0 See Per. A                         |  |       | <325                                        |         |   |               |   |
| Oxygen               | 498    | Inlet Velocity—ft./sec.  | 0.99  |                                                |      |       | 1                                    |  | 74    | CATALYST                                    |         |   |               |   |
| Natural Gas          | 801    | Fresh Feed Rate—S.C.F.H. | 15312 | HEMPEL, DIST. %                                |      | *API  | 2                                    |  | 81    | Bulk Density, Lbs./Cu.Ft.                   |         |   |               |   |
| Generator            | 2427   | per Cu.Ft. Dense Bed     | 1247  | 205 °F.                                        |      |       | 3                                    |  | 80    | Aerated                                     |         |   |               |   |
| Quench Accumulator   | 159    | per Lb. Catalyst         | 8.05  | 400                                            | 81.0 | 54.9  | 4                                    |  | 290   | Settled                                     |         |   |               |   |
| Reactor Inlet        | 248    | per sq ft                | 23200 | 400-550                                        | 8.0  | 37.4  | Total                                |  | 525   | Compacted                                   |         |   |               |   |
| Condenser Inlet      | 580    |                          |       | 550+                                           | 11.0 |       |                                      |  |       | Particle Density, gm./cc.                   |         |   |               |   |
| Product Accumulator  | 65     |                          |       |                                                |      |       | CALCULATED FROM dp                   |  |       | NH <sub>3</sub> Value, ml./gm.              |         |   |               |   |
| Catalyst No.         | Height |                          |       | A. S. T. M. DIST. ON                           |      |       | Density, Lbs./Cu.Ft.                 |  | 155   | N <sub>2</sub> Surface, m <sup>2</sup> /gm. |         |   |               |   |
| 1 See Per. A         | --     |                          |       | Naphtha °F.                                    |      |       | Inventory, Lbs.                      |  | 1903  |                                             |         |   |               |   |
| 2                    | 662    |                          |       | IBP                                            | 100  |       | Bed Depth, Ft.                       |  | 18.61 | CHEMICAL ANALYSIS                           |         |   |               |   |
| 3                    | 653    |                          |       | 10%                                            | 126  |       | Vol cu ft                            |  | 12.28 | Fe                                          |         |   |               |   |
| 4                    | 664    |                          |       | 50%                                            | 210  |       |                                      |  |       | C                                           |         |   |               |   |
| 5                    | 665    |                          |       | 90%                                            | 35d  |       |                                      |  |       | O                                           |         |   |               |   |
| 6                    | 669    |                          |       | EP                                             | 402  |       |                                      |  |       | H                                           |         |   |               |   |
| 7                    | 663    |                          |       | Rec                                            | 97.0 |       |                                      |  |       | K <sub>2</sub> O, W+, % basis Fe            |         |   |               |   |
| 8                    | 651    |                          |       |                                                |      |       |                                      |  |       | X-Ray Analysis—                             |         |   |               |   |
| 9                    | 644    |                          |       |                                                |      |       |                                      |  |       | Fe <sub>2</sub> O <sub>3</sub>              |         |   |               |   |
| 10                   | 645    |                          |       |                                                |      |       |                                      |  |       | Fe <sub>3</sub> O <sub>4</sub>              |         |   |               |   |
| 11                   | 625    |                          |       |                                                |      |       |                                      |  |       | Fe                                          |         |   |               |   |

**THE TEXAS COMPANY — MONTEBELLO LABORATORY  
YIELD CALCULATIONS**

RUN NO. **66-I**  
HOURS **159-183**  
CATALYST **Brownsville**  
**Treated MS Red, @ 650P**

| FRESH FEED                                        |        |                        |                    | WET GAS                   |                |                                                                                   |                                  | RECYCLE                            | COMBINED FEED | EFFLUENT                               | NET CHANGE |              | YIELD BASIS H <sub>2</sub> + CO FED |        |         |                                            |                           |        |                      |         |        |     |
|---------------------------------------------------|--------|------------------------|--------------------|---------------------------|----------------|-----------------------------------------------------------------------------------|----------------------------------|------------------------------------|---------------|----------------------------------------|------------|--------------|-------------------------------------|--------|---------|--------------------------------------------|---------------------------|--------|----------------------|---------|--------|-----|
|                                                   | %      | m/hr                   | #/hr               | %                         | At Wt. Balance |                                                                                   | m/hr                             | m/hr                               | m/hr          | m/hr                                   | #/hr       | #/MCF        | #/gal                               | gal/hr | gal/MCF | YIELDS BASIS BROWNSVILLE DESIGN FEED RATE* |                           |        |                      |         |        |     |
|                                                   |        |                        |                    |                           | m/hr           | #/hr                                                                              |                                  |                                    |               |                                        |            |              |                                     |        |         |                                            | CORRECTED RECOVERY, %     | gal/hr | TREATING RECOVERY, % | gal/hr  |        |     |
| CO <sub>28.010</sub>                              | 37.730 | 15.706                 | 439.94             | 8.320                     | 1.288          | 36.08                                                                             | 3.357                            | 19.063                             | 4.645         | -14.418                                | -403.86    |              |                                     |        |         |                                            |                           |        |                      |         |        |     |
| H <sub>2</sub> <sub>2.016</sub>                   | 59.484 | 24.762                 | 49.92              | 41.326                    | 6.397          | 12.90                                                                             | 16.676                           | 41.438                             | 23.073        | -18.365                                | -37.02     |              |                                     |        |         |                                            | 400 EP                    | 82.6   | 7.080                | 98.0    | 6.938  |     |
| CO <sub>24.010</sub>                              | 2.160  | 0.899                  | 39.56              | 29.423                    | 4.555          | 200.42                                                                            | 11.874                           | 12.773                             | 16.429        | 3.656                                  | 160.86     | 10.474       |                                     |        |         |                                            | 400-550                   | 8.0    | 0.686                | 91.4    | 0.627  |     |
| N <sub>2</sub> <sub>2.016</sub>                   | 0.543  | 0.226                  | 6.33               | 1.857                     | 0.287          | 8.04                                                                              | 0.749                            | 0.975                              | 1.036         |                                        |            |              |                                     |        |         |                                            | 550 +                     | 9.4    | 0.806                | 114.6   | 0.924  |     |
| CH <sub>4</sub> <sub>16.042</sub>                 | 0.083  | 0.035                  | 0.56               | 8.677                     | 1.343          | 21.54                                                                             | 3.501                            | 3.536                              | 4.844         | 1.308                                  | 20.98      | 1.366        |                                     |        |         |                                            |                           |        |                      |         |        |     |
| C <sub>2</sub> H <sub>6</sub> <sub>28.028</sub>   |        |                        |                    | 2.137                     | 0.331          | 9.29                                                                              | 0.862                            | 0.862                              | 1.193         | 0.331                                  | 9.29       | 0.605        |                                     |        |         |                                            | RECOVERY %                | #/hr   | gal/hr               |         |        |     |
| C <sub>3</sub> H <sub>8</sub> <sub>30.028</sub>   |        |                        |                    | 1.663                     | 0.257          | 7.73                                                                              | 0.671                            | 0.671                              | 0.928         | 0.257                                  | 7.73       | 0.503        |                                     |        |         |                                            | PROPYLENE                 | 37.8   | 7.71                 |         |        |     |
| C <sub>4</sub> +C <sub>5</sub>                    |        |                        |                    |                           |                |                                                                                   |                                  |                                    |               |                                        | 38.00      | 2.474        |                                     |        |         |                                            | C <sub>4</sub> POLY GASO. | 87.5   | 6.75                 | 1.129   |        |     |
| C <sub>6</sub> H <sub>14</sub> <sub>42.078</sub>  |        |                        |                    | 3.130                     | 0.485          | 20.41                                                                             | 1.263                            | 1.265                              | 1.748         | 20.485                                 | 20.41      | 1.329        | 4.32                                | 4.725  | 0.308   |                                            | C <sub>6</sub> POLY TAR   | 12.5   | 0.96                 | 0.127   |        |     |
| C <sub>8</sub> H <sub>18</sub> <sub>44.094</sub>  |        |                        |                    | 0.350                     | 0.054          | 2.38                                                                              | 0.141                            | 0.141                              | 0.195         | 0.054                                  | 2.38       | 0.155        | 4.24                                | 0.561  | 0.037   |                                            |                           |        |                      |         |        |     |
| C <sub>10</sub> H <sub>22</sub> <sub>56.104</sub> |        |                        |                    | 1.737                     | 0.269          | 15.09                                                                             | 0.701                            | 0.701                              | 0.970         | 0.269                                  | 15.09      | 0.983        | 5.00                                | 3.018  | 0.197   |                                            |                           | #/gal  | #/hr                 | gal/hr  | RVP    |     |
| C <sub>12</sub> H <sub>26</sub> <sub>68.120</sub> |        |                        |                    | 0.483                     | 0.075          | 4.36                                                                              | 0.195                            | 0.195                              | 0.270         | 0.075                                  | 4.36       | 0.284        | 4.86                                | 0.897  | 0.058   | C <sub>12</sub> H <sub>26</sub>            | 5.00                      | 0.65   | 0.130                | 68.0    |        |     |
| C <sub>14</sub> H <sub>30</sub> <sub>70.130</sub> |        |                        |                    | 0.640                     | 0.099          | 6.94                                                                              | 0.258                            | 0.258                              | 0.357         | 0.099                                  | 6.94       | 0.452        | 5.48                                | 1.273  | 0.083   | C <sub>14</sub> POLY GASO.                 | 5.98                      | 12.64  | 2.113                | 1.5     |        |     |
| C <sub>16</sub> H <sub>34</sub> <sub>72.146</sub> |        |                        |                    | 0.120                     | 0.019          | 1.37                                                                              | 0.048                            | 0.048                              | 0.067         | 0.019                                  | 1.37       | 0.089        | 8.28                                | 0.261  | 0.017   | C <sub>16</sub> H <sub>34</sub>            | 4.86                      | 4.36   | 0.897                | 68.0    |        |     |
| C <sub>18</sub> H <sub>38</sub> <sub>84.156</sub> |        |                        |                    | 0.137                     | 0.021          | 1.77                                                                              | 0.055                            | 0.055                              | 0.076         | 0.021                                  | 1.77       | 0.115        | 8.54                                | 0.319  | 0.021   | C <sub>18</sub> FREE GASO.                 |                           |        | 9.920                | 5.8     |        |     |
| C <sub>20</sub> +C <sub>22</sub>                  |        |                        |                    |                           |                |                                                                                   |                                  |                                    |               |                                        |            | 52.32        | 3.407                               |        | 11.054  | 0.721                                      | C <sub>20</sub> POLY TAR  | 7.53   | 1.80                 | 0.239   |        |     |
| TOTAL                                             |        | 41.628                 | 536.31             |                           | 15.480         | 348.32                                                                            | 40.351                           | 81.979                             | 63.063        |                                        |            |              |                                     |        |         |                                            |                           |        |                      |         |        |     |
| H <sub>2</sub> +CO                                | 97.214 | 40.468                 | 15358              | SCFH                      | 7.685          |                                                                                   | 20.033                           | 60.501                             | 27.718        | -32.783                                |            |              |                                     |        |         |                                            |                           | gal/hr | gal/MCF              | Bbl/Day |        |     |
| H <sub>2</sub> /CO                                |        | 1.58                   | Factor             | 651126                    | 4.97           |                                                                                   | 4.97                             | 2.17                               | 4.97          | 1.27                                   |            |              |                                     |        |         |                                            | 10 # RVP 400 EP GASOLINE  | 13.060 | 0.8504               | 4611    |        |     |
| Weight Recovery, %                                | 93.54  | Catalyst Age, hrs.     |                    |                           |                | Space Velocity, vhr                                                               |                                  |                                    | 1245          | RECOVERED OIL **                       |            | 0.385        | 54.03                               | 3.518  | 8.572   | 0.558                                      | GAS OIL                   | 0.627  | 0.0408               | 221     |        |     |
| Pressure, psig                                    | 404    | Inlet Velocity, Ft/sec |                    |                           | 0.99           | Catalyst Vol CF                                                                   |                                  |                                    | 12.34         | TOTAL OIL                              |            | 106.35       | 6.925                               | 19.626 | 1.279   | FUEL OIL                                   | 0.924                     | 0.0602 | 326                  |         |        |     |
| Temperature, °F                                   | 663    | Bed Depth, Ft          |                    |                           | 18.69          | Weight, #                                                                         |                                  |                                    | 1900          | WATER SOLUBLE CHEMICALS **             |            | 0.303        | 16.07                               | 1.046  | 2.022   | 0.132                                      | POLY TAR                  | 0.566  | 0.0238               | 129     |        |     |
| Recycle Ratio                                     | 0.97   | Bed Density, #/CF      |                    |                           | 154            | Effluent Shift Ratio (H <sub>2</sub> )(CO <sub>2</sub> )/(H <sub>2</sub> O)(CO) = |                                  |                                    |               | TOTAL LIQUID PRODUCTS C <sub>2</sub> + |            | 122.42       | 7.971                               | 21.648 | 1.411   | TOTAL                                      | 14.977                    | 0.9752 | 5287                 |         |        |     |
| FRESH FEED CONVERSION — %                         |        |                        |                    | TOTAL FEED CONVERSION — % |                |                                                                                   |                                  | SELECTIVITY                        |               |                                        |            | NET WATER ** |                                     | 6.544  | 117.89  | 7.676                                      | 14.153                    | 0.922  | W. S. CHEM.          | 2.022   | 0.1317 | 714 |
| Contraction                                       | CO     | H <sub>2</sub>         | H <sub>2</sub> +CO | CO                        | H <sub>2</sub> | CO+H <sub>2</sub>                                                                 | C <sub>3</sub> +C <sub>4</sub> + |                                    |               |                                        |            | GROSS WATER  |                                     | 133.96 | 8.722   | 16.175                                     | 1.054                     | TOTAL  | 16.999               | 1.1069  | 6001   |     |
| 62.81                                             | 91.80  | 74.17                  | 81.01              | 75.63                     | 44.32          | 54.19                                                                             | 76.31                            | HYDROCARBON TOTAL—C <sub>2</sub> + |               |                                        |            |              |                                     | 160.42 | 10.445  |                                            |                           |        |                      |         |        |     |

Form ML-11

\*\* Included in Reactor Effluent Total

g/NCM = 16.91 X #/MCF \*9488 MCFH H<sub>2</sub> + CO, Bbl/Day = 5421.6 X gal/MCF

**THE TEXAS COMPANY — MONTEBELLO LABORATORY  
DATA SUMMARY**

RUN NO. **66-I**  
HOURS **159-183**

| OPERATING CONDITIONS |        |                          |       | PRODUCT TESTS                                  |      |       |   | CATALYST DATA                        |       |                                             |               |
|----------------------|--------|--------------------------|-------|------------------------------------------------|------|-------|---|--------------------------------------|-------|---------------------------------------------|---------------|
| PRESSURES PSIG       |        | RATES S.C.F.H.           |       | OIL                                            |      | WATER |   | INVENTORY DATA                       |       | PARTICLE SIZE                               |               |
| Oxygen               | 435    | Fresh Feed               | 15798 | * API                                          | 55.4 | 10.8  |   | In Reactor at Start of Period        |       | Screen Analysis                             | Sedimentation |
| Natural Gas          | 431    | Recycle                  | 15313 | Neut. No.                                      | 46.5 | 35.4  |   | Fresh Catalyst Added                 |       | Mesh                                        | Microns       |
| Generator Outlet     | 408    | Combined Feed            | 31111 | Sap. No.                                       | 60.2 | 39.8  |   | Total                                |       | On 40                                       | 419+          |
| Reactor Inlet        | 404    | Wet Gas—Measured         | 5290  | Hydrox. No.                                    |      |       |   | Catalyst Recovered                   | 13    | 100                                         | 150           |
| Condenser Inlet      |        | Adjusted                 | 5875  | Bromine No.                                    | 96   |       |   | In Reactor at End of Period          |       | 150                                         | 105           |
| Product Accumulator  | 375    | Loss                     | 585   | Pour °F.                                       |      |       |   |                                      |       | 200                                         | 74            |
|                      |        |                          |       | Chemicals, % by K <sub>2</sub> CO <sub>3</sub> | 12.5 |       |   | REACTOR d-p, Inches H <sub>2</sub> O |       | 250                                         | 62            |
|                      |        |                          |       | No. Height                                     |      |       |   | No. Height                           |       | 325                                         | 44            |
| TEMPERATURES—°F.     |        | Recycle/Fresh Feed       | 0.97  | 0 See Per. A                                   |      |       |   | 0 See Per. A                         |       | <325                                        |               |
| Oxygen               | 495    | Inlet Velocity—ft./sec.  | 0.99  |                                                |      |       |   | 1                                    | 74    | CATALYST                                    |               |
| Natural Gas          | 795    | Fresh Feed Rate—S.C.F.H. | 15358 | HEMPEL DIST. %                                 |      | °API  | 2 | 80                                   |       | Bulk Density, Lbs./Cu.Ft.                   |               |
| Generator            | 2411   | per Cu.Ft. Dense Bed     | 1245  | 205 °F.                                        |      |       | 3 | 80                                   |       | Aerated                                     |               |
| Quench Accumulator   | 161    | per Lb. Catalyst         | 8.08  | 400                                            | 81.6 | 54.6  | 4 | 290                                  |       | Settled                                     |               |
| Reactor Inlet        | 244    | per sq ft                | 23270 | 400-550                                        | 8.0  | 37.2  |   | Total                                | 524   | Compacted                                   |               |
| Condenser Inlet      | 576    |                          |       | 550+                                           | 10.4 |       |   |                                      |       | Particle Density, gm./cc.                   |               |
| Product Accumulator  | 66     |                          |       |                                                |      |       |   | CALCULATED FROM dp                   |       | NH <sub>3</sub> Value, ml./gm.              |               |
| Catalyst No.         | Height |                          |       | A. S. T. M. DIST. ON                           |      |       |   | Density, Lbs./Cu.Ft.                 | 154   | N <sub>2</sub> Surface, m <sup>2</sup> /gm. |               |
| 1 See Per. A         | --     |                          |       | Naphtha °F.                                    |      |       |   | Inventory, Lbs.                      | 1900  | CHEMICAL ANALYSIS                           |               |
| 2                    | 662    |                          |       | IBP                                            | 100  |       |   | Bed Depth, Ft.                       | 18.69 |                                             |               |
| 3                    | 652    |                          |       | 10%                                            | 126  |       |   | Vol Cu. Ft.                          | 12.34 | Fe                                          |               |
| 4                    | 664    |                          |       | 50%                                            | 208  |       |   |                                      |       | C                                           |               |
| 5                    | 667    |                          |       | 90%                                            | 340  |       |   |                                      |       | O                                           |               |
| 6                    | 670    |                          |       | EP                                             | 398  |       |   |                                      |       | H                                           |               |
| 7                    | 664    |                          |       | Red.                                           | 97.0 |       |   |                                      |       | K <sub>2</sub> O, W+, % basis Fe            |               |
| 8                    | 652    |                          |       |                                                |      |       |   |                                      |       | X-Ray Analysis—                             |               |
| 9                    | 645    |                          |       |                                                |      |       |   |                                      |       | Fe <sub>2</sub> O <sub>3</sub>              |               |
| 10                   | 647    |                          |       |                                                |      |       |   |                                      |       | Fe <sub>3</sub> O <sub>4</sub>              |               |
| 11                   | 625    |                          |       |                                                |      |       |   |                                      |       | Fe                                          |               |

THE TEXAS COMPANY — MONTEBELLO LABORATORY  
YIELD CALCULATIONS

RUN NO. 66-J  
HOURS 183-207  
CATALYST Brownsville  
Treated MS Red. @ 650P

| FRESH FEED                               |        |                        |                     | WET GAS                   |                |                     |                                                                              | RECYCLE                              | COMBINED FEED | EFFLUENT      | NET CHANGE                             | YIELD BASIS H <sub>2</sub> + CO FED |        |        |         |        |          |             |             |           |        |       |
|------------------------------------------|--------|------------------------|---------------------|---------------------------|----------------|---------------------|------------------------------------------------------------------------------|--------------------------------------|---------------|---------------|----------------------------------------|-------------------------------------|--------|--------|---------|--------|----------|-------------|-------------|-----------|--------|-------|
|                                          | %      | m/hr                   | #/hr                | %                         | At Wt. Balance |                     | m/hr                                                                         | m/hr                                 | m/hr          | m/hr          | #/hr                                   | CONDENSATE                          |        |        |         | YIELDS | BASIS    | BROWNSVILLE | DESIGN      | FEED RATE |        |       |
|                                          |        |                        |                     |                           | m/hr           | #/hr                |                                                                              |                                      |               |               |                                        | #/MCF                               | #/gal  | gal/hr | gal/MCF |        |          |             |             |           |        |       |
| CO<br>26.010                             | 36.915 | 15.212                 | 426.05              | 9.393                     | 1.469          | 41.15               | 34818                                                                        | 19.030                               | 5.287         | -13.743       | 384.90                                 |                                     |        |        |         |        |          |             |             |           |        |       |
| H <sub>2</sub><br>2.016                  | 59.995 | 24.721                 | 49.84               | 41.326                    | 6.462          | 13.03               | 16.796                                                                       | 41.517                               | 23.258        | -18.259       | 36.81                                  |                                     |        |        |         |        |          | 400 EP      | 82.0        | 6.549     | 98.0   | 6.418 |
| CO <sub>2</sub><br>4.010                 | 2.300  | 0.948                  | 41.72               | 28.907                    | 4.521          | 198.96              | 11.749                                                                       | 12.697                               | 16.270        | 3.573         | 157.24                                 | 10.375                              |        |        |         |        |          | 400-550     | 8.8         | 0.703     | 91.4   | 0.643 |
| N <sub>2</sub><br>26.016                 | 0.720  | 0.297                  | 8.32                | 1.973                     | 0.308          | 8.63                | 0.802                                                                        | 1.099                                | 1.110         |               |                                        |                                     |        |        |         |        |          | 550 +       | 9.2         | 0.735     | 114.6  | 0.942 |
| CH <sub>4</sub><br>16.042                | 0.070  | 0.029                  | 0.47                | 8.447                     | 1.321          | 21.19               | 3.433                                                                        | 3.462                                | 4.754         | 1.292         | 20.72                                  | 1.367                               |        |        |         |        |          |             |             |           |        |       |
| C <sub>2</sub> H <sub>6</sub><br>26.052  |        |                        |                     | 2.177                     | 0.340          | 9.54                | 0.985                                                                        | 0.985                                | 1.225         | 0.340         | 9.54                                   | 0.629                               |        |        |         |        |          |             |             |           |        |       |
| C <sub>2</sub> H <sub>4</sub><br>30.068  |        |                        |                     | 1.613                     | 0.252          | 7.58                | 0.656                                                                        | 0.656                                | 0.908         | 0.252         | 7.58                                   | 0.500                               |        |        |         |        |          |             |             |           |        |       |
| C <sub>1</sub> + C <sub>2</sub>          |        |                        |                     |                           |                |                     |                                                                              |                                      |               |               |                                        |                                     |        |        |         |        |          |             |             |           |        |       |
| C <sub>2</sub> H <sub>2</sub><br>42.078  |        |                        |                     | 3.047                     | 0.476          | 20.03               | 1.238                                                                        | 1.238                                | 1.714         | 0.476         | 20.03                                  | 1.322                               | 4.32   | 4.637  | 0.306   |        |          |             |             |           |        |       |
| C <sub>2</sub> H <sub>6</sub><br>44.094  |        |                        |                     | 0.340                     | 0.053          | 2.34                | 0.138                                                                        | 0.138                                | 0.191         | 0.053         | 2.34                                   | 0.154                               | 4.24   | 0.552  | 0.036   |        |          |             |             |           |        |       |
| C <sub>2</sub> H <sub>4</sub><br>54.104  |        |                        |                     | 1.550                     | 0.242          | 13.58               | 0.630                                                                        | 0.630                                | 0.872         | 0.242         | 13.58                                  | 0.896                               | 5.00   | 2.716  | 0.179   |        |          |             |             |           |        |       |
| C <sub>2</sub> H <sub>10</sub><br>56.120 |        |                        |                     | 0.387                     | 0.061          | 3.55                | 0.157                                                                        | 0.157                                | 0.218         | 0.061         | 3.55                                   | 0.234                               | 4.86   | 0.730  | 0.048   |        |          |             |             |           |        |       |
| C <sub>2</sub> H <sub>12</sub><br>70.130 |        |                        |                     | 0.507                     | 0.079          | 5.54                | 0.206                                                                        | 0.206                                | 0.285         | 0.079         | 5.54                                   | 0.366                               | 5.45   | 1.017  | 0.067   |        |          |             |             |           |        |       |
| C <sub>2</sub> H <sub>12</sub><br>72.144 |        |                        |                     | 0.170                     | 0.027          | 1.95                | 0.069                                                                        | 0.069                                | 0.096         | 0.027         | 1.95                                   | 0.129                               | 5.25   | 0.371  | 0.024   |        |          |             |             |           |        |       |
| C <sub>2</sub> H <sub>12</sub><br>84.154 |        |                        |                     | 0.163                     | 0.025          | 2.10                | 0.066                                                                        | 0.066                                | 0.091         | 0.025         | 2.10                                   | 0.139                               | 5.54   | 0.379  | 0.025   |        |          |             |             |           |        |       |
| C <sub>3</sub> - C <sub>6</sub>          |        |                        |                     |                           |                |                     |                                                                              |                                      |               |               |                                        |                                     |        |        |         |        |          |             |             |           |        |       |
| TOTAL                                    |        | 41.207                 | 526.40              |                           | 15.636         | 349.17              | 40.643                                                                       | 81.950                               | 63.078        |               | 49.09                                  | 3.240                               |        | 10.402 | 0.685   |        |          |             |             |           |        |       |
| H <sub>2</sub> + CO                      | 96.910 | 39.933                 | 15155               | SCFH                      | 7.931          |                     | 20.614                                                                       | 60.547                               | 28.545        | -32.002       |                                        |                                     |        |        |         |        |          |             |             |           |        |       |
| H <sub>2</sub> /CO                       |        | 1.63                   | Factor              | 659848                    | 4.40           |                     | 4.40                                                                         | 2.18                                 | 4.40          | 1.33          |                                        |                                     |        |        |         |        |          |             |             |           |        |       |
| Weight Recovery, %                       | 92.31  | Catalyst Age, hrs.     |                     |                           |                | Space Velocity, v/v |                                                                              |                                      | 1236          | RECOVERED OIL |                                        | 0.360                               | 50.45  | 3.329  | 7.987   | 0.527  | GAS OIL  | 0.643       | 0.0424      | 230       |        |       |
| Pressure, psig                           | 404    | Inlet Velocity, Ft/sec |                     |                           |                | 0.99                | Catalyst Vol CF                                                              |                                      |               | 12.26         | TOTAL OIL                              |                                     | 99.54  | 6.569  | 18.389  | 1.212  | FUEL OIL | 0.842       | 0.0556      | 301       |        |       |
| Temperature, °F                          | 562    | Bed Depth, Ft          |                     |                           |                | 18.57               | Weight, #                                                                    |                                      |               | 1876          | WATER SOLUBLE CHEMICALS                |                                     | 0.308  | 16.32  | 1.077   | 2.070  | 0.137    | POLY TAR    | 0.332       | 0.0219    | 119    |       |
| Recycle Ratio                            | 0.99   | Bed Density, #/CF      |                     |                           |                | 153                 | Effluent (H <sub>2</sub> )/CO <sub>2</sub> Shift Ratio (H <sub>2</sub> O)/CO |                                      |               |               | TOTAL LIQUID PRODUCTS C <sub>2</sub> + |                                     | 115.86 | 7.646  | 20.459  | 1.349  | TOTAL    | 13.859      | 0.9145      | 4958      |        |       |
| FRESH FEED CONVERSION — %                |        |                        |                     | TOTAL FEED CONVERSION — % |                |                     |                                                                              | SELECTIVITY                          |               |               |                                        | NET WATER                           |        | 6.131  | 110.46  | 7.289  | 13.260   | 0.975       | W. S. CHEM. | 2.070     | 0.1366 | 741   |
| Contraction                              | CO     | H <sub>2</sub>         | H <sub>2</sub> + CO | CO                        | H <sub>2</sub> | CO + H <sub>2</sub> | C <sub>2</sub> + C <sub>1</sub> +                                            | GROSS WATER                          |               |               |                                        | 126.78                              | 6.366  |        |         |        |          |             |             |           |        |       |
| 62.05                                    | 90.34  | 73.86                  | 80.14               | 72.22                     | 43.98          | 52.85               | 75.38                                                                        | HYDROCARBON TOTAL — C <sub>1</sub> + |               |               |                                        | 153.70                              | 10.142 |        |         |        |          |             |             |           |        |       |

Form ML-11

\*\* Included in Reactor Effluent Total

g/NCM = 16.91 X #/MCF \*9488 MCFH H<sub>2</sub> + CO, Bbl/Day = 5421.6 X gal/MCF

THE TEXAS COMPANY — MONTEBELLO LABORATORY  
DATA SUMMARY

RUN NO. 66-J  
HOURS 183-207

| OPERATING CONDITIONS |      |                          |       | PRODUCT TESTS                                  |      |       | CATALYST DATA                        |  |                 |         |
|----------------------|------|--------------------------|-------|------------------------------------------------|------|-------|--------------------------------------|--|-----------------|---------|
| PRESSURES PSIG       |      | RATES S.C.F.H.           |       |                                                | OIL  | WATER | INVENTORY DATA                       |  | PARTICLE SIZE   |         |
| Oxygen               | 435  | Fresh Feed               | 15638 | * API                                          | 55.0 | 11.0  | In Reactor at Start of Period        |  | Screen Analysis |         |
| Natural Gas          | 430  | Recycle                  | 15424 | Neut. No.                                      | 47.0 | 36.2  | Fresh Catalyst Added                 |  | Mesh            | Microns |
| Generator Outlet     | 407  | Combined Feed            | 31052 | Sap. No.                                       | 65.3 | 39.8  | Total                                |  | On 40           | 419+    |
| Reactor Inlet        | 404  | Wet Gas—Measured         | 5246  | Hydrox. No.                                    |      |       | Catalyst Recovered                   |  | 100             | 150     |
| Condenser Inlet      |      | Adjusted                 | 5934  | Bromine No.                                    | 96   |       | In Reactor at End of Period          |  | 150             | 105     |
| Product Accumulator  | 375  | Loss                     | 688   | Pour °F.                                       |      |       | REACTOR d-p. Inches H <sub>2</sub> O |  | 200             | 74      |
|                      |      |                          |       | Chemicals, % by K <sub>2</sub> CO <sub>3</sub> |      | 13.5  | No. Height                           |  | 250             | 62      |
|                      |      |                          |       |                                                |      |       | 0 See Per. A                         |  | 325             | 44      |
| TEMPERATURES—°F.     |      | Recycle/Fresh Feed       | 0.99  |                                                |      |       | Catalyst                             |  | <325            |         |
| Oxygen               | 490  | Inlet Velocity—ft./sec.  | 0.99  |                                                |      |       | 1                                    |  | 73              |         |
| Natural Gas          | 801  | Fresh Feed Rate—S.C.F.H. | 15155 | HEMPEL DIST. %                                 |      | 0 API | 2                                    |  | 79              |         |
| Generator            | 2438 | per Cu.Ft. Dense Bed     | 1236  | 205 °F.                                        |      |       | 3                                    |  | 80              |         |
| Quench Accumulator   | 163  | per Lb. Catalyst         | 8.08  | 400                                            | 81.0 | 56.4  | 4                                    |  | 285             |         |
| Reactor Inlet        | 248  | per sq ft                | 22962 | 400-550                                        | 8.8  | 37.4  | Total                                |  | 517             |         |
| Condenser Inlet      | 581  |                          |       | 550+                                           | 10.2 |       | CALCULATED FROM dp                   |  |                 |         |
| Product Accumulator  | 65   |                          |       |                                                |      |       | Density, Lbs./Cu.Ft.                 |  | 153             |         |
| Catalyst No. Height  |      |                          |       | A. S. T. M. DIST. ON                           |      |       | Inventory, Lbs.                      |  | 1876            |         |
| 1 See Per. A         | --   |                          |       | Naphtha °F.                                    |      |       | Bed Depth, Ft.                       |  | 18.57           |         |
| 2                    | 662  |                          |       | IBP                                            | 100  |       | Vol cu ft                            |  | 12.26           |         |
| 3                    | 650  |                          |       | 10%                                            | 126  |       |                                      |  |                 |         |
| 4                    | 662  |                          |       | 50%                                            | 210  |       |                                      |  |                 |         |
| 5                    | 666  |                          |       | 90%                                            | 340  |       |                                      |  |                 |         |
| 6                    | 670  |                          |       | EP                                             | 394  |       |                                      |  |                 |         |
| 7                    | 664  |                          |       | Rec.                                           | 96.5 |       |                                      |  |                 |         |
| 8                    | 652  |                          |       |                                                |      |       |                                      |  |                 |         |
| 9                    | 645  |                          |       |                                                |      |       |                                      |  |                 |         |
| 10                   | 650  |                          |       |                                                |      |       |                                      |  |                 |         |
| 11                   | 631  |                          |       |                                                |      |       |                                      |  |                 |         |

**THE TEXAS COMPANY — MONTEBELLO LABORATORY**  
**YIELD CALCULATIONS**

66-K  
RUN NO. 207-231  
HOURS  
CATALYST **Brownsville**  
Treated MS Red. @ 660°

| FRESH FEED                              |        |                |                        | WET GAS                   |                |                     |                                                                        | RECYCLE     | COMBINED<br>FEED | EFFLUENT | NET CHANGE                                |            | YIELD BASIS H <sub>2</sub> + CO FED |        |         |                                |        |                                    |                  |         |      |  |
|-----------------------------------------|--------|----------------|------------------------|---------------------------|----------------|---------------------|------------------------------------------------------------------------|-------------|------------------|----------|-------------------------------------------|------------|-------------------------------------|--------|---------|--------------------------------|--------|------------------------------------|------------------|---------|------|--|
|                                         | %      | m/hr           | #/hr                   | %                         | At Wt. Balance |                     | m/hr                                                                   | m/hr        | m/hr             | m/hr     | #/hr                                      | CONDENSATE |                                     |        |         | YIELDS                         |        | BASIS BROWNSVILLE DESIGN FEED RATE |                  |         |      |  |
|                                         |        |                |                        |                           | m/hr           | #/hr                |                                                                        |             |                  |          |                                           | #/MCF      | #/gal                               | gal/hr | gal/MCF |                                |        |                                    |                  |         |      |  |
| CO<br>28.010                            | 37.140 | 15.277         | 427.89                 | 9.107                     | 1.446          | 40.50               | 3.705                                                                  | 18.982      | 5.151            | -13.831  | -387.39                                   |            |                                     |        |         |                                |        |                                    |                  |         |      |  |
| H <sub>2</sub><br>2.014                 | 59.723 | 24.565         | 49.52                  | 41.793                    | 6.634          | 13.37               | 17.003                                                                 | 41.568      | 23.637           | -17.931  | -36.15                                    |            |                                     |        |         | 400 EP                         | 84.3   | 6.629                              | 98.0             | 6.496   |      |  |
| CO <sub>2</sub><br>44.010               | 2.350  | 0.967          | 42.56                  | 28.653                    | 4.548          | 200.19              | 11.657                                                                 | 12.624      | 16.205           | 3.581    | 157.63                                    | 10.425     |                                     |        |         | 400-550                        | 8.0    | 0.629                              | 91.4             | 0.575   |      |  |
| N <sub>2</sub><br>38.016                | 0.710  | 0.292          | 8.18                   | 1.900                     | 0.302          | 8.46                | 0.773                                                                  | 1.065       | 1.075            |          |                                           |            |                                     |        |         | 550 +                          | 7.7    | 0.606                              | 114.6            | 0.694   |      |  |
| CH <sub>4</sub><br>16.042               | 0.077  | 0.032          | 0.51                   | 8.553                     | 1.358          | 21.79               | 3.480                                                                  | 3.512       | 4.838            | 1.326    | 21.28                                     | 1.407      |                                     |        |         |                                |        |                                    |                  |         |      |  |
| C <sub>2</sub> H <sub>6</sub><br>28.028 |        |                |                        | 2.317                     | 0.368          | 10.32               | 0.943                                                                  | 0.943       | 1.311            | 0.368    | 10.32                                     | 0.683      |                                     |        |         |                                |        | RECOVERY %                         | #/hr             | gal/hr  |      |  |
| C <sub>2</sub> H <sub>4</sub><br>30.068 |        |                |                        | 1.700                     | 0.270          | 8.12                | 0.692                                                                  | 0.692       | 0.962            | 0.270    | 8.12                                      | 0.537      |                                     |        |         | PROPYLENE                      | 36.4   | 6.43                               |                  |         |      |  |
| C <sub>3</sub> +C <sub>4</sub>          |        |                |                        |                           |                |                     |                                                                        |             |                  |          | 39.72                                     | 2.627      |                                     |        |         | C <sub>3</sub> POLY GASO.      | 87.5   | 5.63                               | 0.941            |         |      |  |
| C <sub>2</sub> H <sub>2</sub><br>42.079 |        |                |                        | 2.647                     | 0.420          | 17.67               | 1.077                                                                  | 1.077       | 1.497            | 0.420    | 17.67                                     | 1.169      | 4.32                                | 4.090  | 0.271   | C <sub>3</sub> POLY TAR        | 12.5   | 0.80                               | 0.106            |         |      |  |
| C <sub>2</sub> H <sub>2</sub><br>44.094 |        |                |                        | 0.240                     | 0.038          | 1.68                | 0.098                                                                  | 0.098       | 0.336            | 0.038    | 1.68                                      | 0.111      | 4.24                                | 0.396  | 0.026   |                                |        |                                    |                  |         |      |  |
| C <sub>2</sub> H <sub>2</sub><br>56.104 |        |                |                        | 1.573                     | 0.250          | 14.03               | 0.640                                                                  | 0.640       | 0.890            | 0.250    | 14.03                                     | 0.928      | 5.00                                | 2.806  | 0.186   |                                |        | #/gal                              | #/hr             | gal/hr  |      |  |
| C <sub>2</sub> H <sub>2</sub><br>68.120 |        |                |                        | 0.557                     | 0.088          | 5.11                | 0.227                                                                  | 0.227       | 0.315            | 0.088    | 5.11                                      | 0.338      | 4.86                                | 1.051  | 0.070   | C <sub>4</sub> H <sub>6</sub>  | 5.00   | --                                 | --               | 68.0    |      |  |
| C <sub>2</sub> H <sub>2</sub><br>70.120 |        |                |                        | 0.610                     | 0.097          | 6.80                | 0.248                                                                  | 0.248       | 0.345            | 0.097    | 6.80                                      | 0.450      | 5.48                                | 1.248  | 0.083   | C <sub>4</sub> POLY GASO.      | 5.98   | 12.28                              | 2.053            | 1.5     |      |  |
| C <sub>2</sub> H <sub>2</sub><br>72.146 |        |                |                        | 0.160                     | 0.025          | 1.80                | 0.065                                                                  | 0.065       | 0.090            | 0.025    | 1.80                                      | 0.119      | 5.28                                | 0.343  | 0.023   | C <sub>4</sub> H <sub>10</sub> | 4.86   | (5.11)<br>4.80                     | (1.051)<br>0.988 | 68.0    |      |  |
| C <sub>2</sub> H <sub>2</sub><br>84.156 |        |                |                        | 0.190                     | 0.030          | 2.52                | 0.077                                                                  | 0.077       | 0.107            | 0.030    | 2.52                                      | 0.167      | 5.54                                | 0.455  | 0.030   | C <sub>4</sub> -FREE GASO.     |        |                                    | 9.483            | 5.8     |      |  |
| C <sub>3</sub> -C <sub>4</sub>          |        |                |                        |                           |                |                     |                                                                        |             |                  |          | 49.61                                     | 3.282      |                                     | 10.389 | 0.689   | C <sub>4</sub> POLY TAR        | 7.53   | 1.75                               | 0.232            |         |      |  |
| TOTAL                                   |        | 41.133         | 528.66                 |                           | 15.874         | 352.36              | 40.685                                                                 | 81.818      | 63.342           |          |                                           |            |                                     |        |         |                                |        |                                    |                  |         |      |  |
| H <sub>2</sub> +CO                      | 96.863 | 39.842         | 15120                  | SCFH                      | 8.080          |                     | 20.708                                                                 | 60.550      | 28.788           | -31.762  |                                           |            |                                     |        |         |                                |        | gal/hr                             | gal / MCF        | Bbl/Day |      |  |
| H <sub>2</sub> /CO                      |        | 1.61           | Factor                 | 661375                    | 4.59           |                     | 4.59                                                                   | 2.19        | 4.59             | 1.30     |                                           |            |                                     |        |         | 10 # RVP 400 EP<br>GASOLINE    | 12.524 | 0.8283                             | 4491             |         |      |  |
| Weight Recovery, %                      | 92.40  |                | Catalyst Age, hrs.     |                           |                |                     | Space Velocity, v/hv                                                   |             | 1240             |          | RECOVERED OIL                             | 0.355      | 49.73                               | 3.289  |         | 7.864                          | 0.520  | GAS OIL                            | 0.575            | 0.0380  | 206  |  |
| Pressure, psig                          | 403    |                | Inlet Velocity, Ft/sec |                           |                | 0.99                | Catalyst Vol CF                                                        |             | 12.19            |          | TOTAL OIL                                 |            | 99.34                               | 6.571  |         | 18.253                         | 1.209  | FUEL OIL                           | 0.694            | 0.0459  | 249  |  |
| Temperature, °F                         | 663    |                | Bed Depth, Ft          |                           |                | 18.47               | Weight, #                                                              |             | 1865             |          | WATER SOLUBLE<br>CHEMICALS **             | 0.307      | 16.29                               | 1.077  |         | 2.066                          | 0.137  | POLY TAR                           | 0.338            | 0.0224  | 121  |  |
| Recycle Ratio                           | 0.99   |                | Bed Density, #/CF      |                           |                | 153                 | Effluent (H <sub>2</sub> )(CO)<br>Shift Ratio (H <sub>2</sub> O)(CO) = |             |                  |          | TOTAL LIQUID<br>PRODUCTS C <sub>4</sub> + |            | 115.63                              | 9.648  |         | 20.319                         | 1.346  | TOTAL                              | 14.131           | 0.9346  | 5067 |  |
| FRESH FEED CONVERSION — %               |        |                |                        | TOTAL FEED CONVERSION — % |                |                     |                                                                        | SELECTIVITY |                  |          |                                           | NET WATER  |                                     |        |         | GROSS WATER                    |        |                                    |                  |         |      |  |
| Contraction                             | CO     | H <sub>2</sub> | H <sub>2</sub> + CO    | CO                        | H <sub>2</sub> | CO + H <sub>2</sub> | C <sub>3</sub> + C <sub>4</sub> +                                      |             |                  |          | HYDROCARBON<br>TOTAL — C <sub>4</sub> +   |            | 155.35                              | 10.274 |         | 15.305                         | 1.013  | TOTAL                              | 16.197           | 1.0712  | 5808 |  |
| 61.41                                   | 90.53  | 72.99          | 79.72                  | 72.86                     | 43.14          | 52.46               | 74.43                                                                  |             |                  |          |                                           |            |                                     |        |         |                                |        |                                    |                  |         |      |  |

Form ML-11

\*\* Included in Reactor Effluent Total

g/NCM = 16.91 X #/MCF      \*9488 MCFH H<sub>2</sub> + CO, Bbl/Day = 5421.6 X gal/MCF

**THE TEXAS COMPANY — MONTEBELLO LABORATORY**  
**DATA SUMMARY**

66-K  
RUN NO. 207-231  
HOURS

| OPERATING CONDITIONS |            |                          |       | PRODUCT TESTS                                  |           |       |  | CATALYST DATA                        |       |                                             |               |
|----------------------|------------|--------------------------|-------|------------------------------------------------|-----------|-------|--|--------------------------------------|-------|---------------------------------------------|---------------|
| PRESSURES PSIG       |            | RATES S.C.F.H.           |       | OIL                                            |           | WATER |  | INVENTORY DATA*                      |       | PARTICLE SIZE                               |               |
| Oxygen               | 435        | Fresh Feed               | 15610 | * API                                          | 54.8      | 11.0  |  | In Reactor at Start of Period        |       | Screen Analysis                             | Sedimentation |
| Natural Gas          | 431        | Recycle                  | 15440 | Neut. No.                                      | 49.7      | 37.2  |  | Fresh Catalyst Added                 |       | Mesh                                        | Microns       |
| Generator Outlet     | 407        | Combined Feed            | 31050 | Sap. No.                                       | 65.6      | 41.1  |  | Total                                |       | On 40                                       | 419+          |
| Reactor Inlet        | 403        | Wet Gas—Measured         | 5337  | Hydrox. No.                                    |           |       |  | Catalyst Recovered                   | 13    | 100                                         | 150           |
| Condenser Inlet      |            | Adjusted                 | 6024  | Bromine No.                                    | 96        |       |  | In Reactor at End of Period          |       | 150                                         | 105           |
| Product Accumulator  | 375        | Loss                     | 687   | Pour °F.                                       | Below -30 |       |  |                                      |       | 200                                         | 74            |
|                      |            |                          |       | Chemicals, % by K <sub>2</sub> CO <sub>3</sub> |           | 13.5  |  | REACTOR d-p, Inches H <sub>2</sub> O |       | 250                                         | 62            |
|                      |            |                          |       |                                                |           |       |  | No. Height                           |       | 325                                         | 44            |
| TEMPERATURES — °F.   |            | Recycle/Fresh Feed       | 0.99  |                                                |           |       |  | 0 See Per. A                         |       | <325                                        |               |
| Oxygen               | 501        | Inlet Velocity—ft./sec.  | 0.99  |                                                |           |       |  | 1                                    | 73    | CATALYST                                    |               |
| Natural Gas          | 791        | Fresh Feed Rate—S.C.F.H. | 15120 | HEMPEL, DIST. %                                |           | °API  |  | 2                                    | 79    | Bulk Density, Lbs./Cu.Ft.                   |               |
| Generator            | 2418       | per Cu.Ft. Dense Bed     | 1240  | 205 °F.                                        |           |       |  | 3                                    | 80    | Aerated                                     |               |
| Quench Accumulator   | 160        | per Lb. Catalyst         | 8.11  | 400                                            | 83.3      | 55.8  |  | 4                                    | 282   | Settled                                     |               |
| Reactor Inlet        | 255        | per sq ft                | 22909 | 400-550                                        | 8.0       | 37.4  |  | Total                                | 514   | Compacted                                   |               |
| Condenser Inlet      | 583        |                          |       | 550+                                           | 8.7       |       |  |                                      |       | Particle Density, gm./cc.                   |               |
| Product Accumulator  | 66         |                          |       |                                                |           |       |  | CALCULATED FROM dp                   |       | NH <sub>3</sub> Value, ml./gm.              |               |
| Catalyst No.         | Height     |                          |       | A. S. T. M. DIST. ON                           |           |       |  | Density, Lbs./Cu.Ft.                 | 153   | N <sub>2</sub> Surface, m <sup>2</sup> /gm. |               |
| 1                    | See Per. A | --                       |       | Naphtha °F.                                    |           |       |  | Inventory, Lbs.                      | 1865  |                                             |               |
| 2                    | 662        |                          |       | IBP                                            |           | 100   |  | Bed Depth, Ft.                       | 18.47 | CHEMICAL ANALYSIS                           |               |
| 3                    | 653        |                          |       | 10%                                            |           | 126   |  | Vol cu ft                            | 12.19 | Fe                                          |               |
| 4                    | 664        |                          |       | 50%                                            |           | 210   |  |                                      |       | C                                           |               |
| 5                    | 666        |                          |       | 90%                                            |           | 350   |  |                                      |       | O                                           |               |
| 6                    | 670        |                          |       | EP                                             |           | 408   |  |                                      |       | H                                           |               |
| 7                    | 665        |                          |       | Rec.                                           |           | 96.5  |  |                                      |       | K <sub>2</sub> O, W+, % basis Fe            |               |
| 8                    | 652        |                          |       |                                                |           |       |  |                                      |       | X-Ray Analysis—                             |               |
| 9                    | 645        |                          |       |                                                |           |       |  |                                      |       | Fe <sub>2</sub> O <sub>3</sub>              |               |
| 10                   | 652        |                          |       |                                                |           |       |  |                                      |       | Fe <sub>3</sub> O <sub>4</sub>              |               |
| 11                   | 644        |                          |       |                                                |           |       |  |                                      |       | Fe                                          |               |

**THE TEXAS COMPANY — MONTEBELLO LABORATORY  
YIELD CALCULATIONS**

RUN NO. 66-L  
HOURS 231-238  
CATALYST Brownsville  
Treated MS Red. @ 660F

| FRESH FEED                               |        |                        |                     | WET GAS                   |                |                | RECYCLE                                                                | COMBINED<br>FEED | EFFLUENT                          | NET CHANGE                                |           | YIELD BASIS H <sub>2</sub> + CO FED |            |        |        |         |                                     |                           |           |                        |        |  |
|------------------------------------------|--------|------------------------|---------------------|---------------------------|----------------|----------------|------------------------------------------------------------------------|------------------|-----------------------------------|-------------------------------------------|-----------|-------------------------------------|------------|--------|--------|---------|-------------------------------------|---------------------------|-----------|------------------------|--------|--|
|                                          | %      | m/hr                   | #/hr                | %                         | At Wt. Balance |                | m/hr                                                                   | m/hr             | m/hr                              | #/hr                                      | m/hr      | #/hr                                | CONDENSATE |        |        | YIELDS  | BASIS BROWNSVILLE DESIGN FEED RATE* |                           |           |                        |        |  |
|                                          |        |                        |                     |                           | m/hr           | #/hr           |                                                                        |                  |                                   |                                           |           |                                     | #/MCF      | #/gal  | gal/hr | gal/MCF |                                     | corrected<br>hemph.-<br>% | gal/hr    | treating<br>recovery-% | gal/hr |  |
| CO<br>26.010                             | 37.260 | 15.242                 | 426.90              | 9.305                     | 1.505          | 42.16          | 3.904                                                                  | 19.046           | 5.309                             | -13.737-                                  | 394.74    |                                     |            |        |        |         |                                     |                           |           |                        |        |  |
| H <sub>2</sub><br>2.016                  | 59.210 | 24.219                 | 48.82               | 41.815                    | 6.761          | 13.63          | 17.095                                                                 | 41.314           | 23.856                            | -17.458-                                  | 35.19     |                                     |            |        |        |         | 400 EP                              | 82.8                      | 6.519     | 98.0                   | 6.389  |  |
| CO <sub>2</sub><br>1.010                 | 2.915  | 1.152                  | 50.69               | 28.795                    | 4.656          | 204.90         | 11.772                                                                 | 12.924           | 16.428                            | 3.504                                     | 154.21    | 10.297                              |            |        |        |         | 400-550                             | 8.3                       | 0.654     | 91.4                   | 0.598  |  |
| N <sub>2</sub><br>26.016                 | 0.635  | 0.260                  | 7.28                | 1.640                     | 0.265          | 7.42           | 0.670                                                                  | 0.930            | 0.935                             |                                           |           |                                     |            |        |        |         | 550 +                               | 8.9                       | 0.701     | 114.6                  | 0.903  |  |
| CH <sub>4</sub><br>16.042                | 0.090  | 0.033                  | 0.53                | 8.425                     | 1.362          | 21.85          | 3.444                                                                  | 3.477            | 4.806                             | 1.329                                     | 21.32     | 1.424                               |            |        |        |         |                                     |                           |           |                        |        |  |
| C <sub>2</sub> H <sub>6</sub><br>26.038  |        |                        |                     | 2.260                     | 0.365          | 10.24          | 0.924                                                                  | 0.924            | 1.289                             | 0.365                                     | 10.24     | 0.684                               |            |        |        |         |                                     | recovery %                | #/hr      | gal/hr                 |        |  |
| C <sub>3</sub> H <sub>8</sub><br>30.068  |        |                        |                     | 1.795                     | 0.290          | 8.72           | 0.734                                                                  | 0.734            | 1.024                             | 0.290                                     | 8.72      | 0.582                               |            |        |        |         | PROPYLENE                           | 35.5                      | 6.39      |                        |        |  |
| C <sub>4</sub> + C <sub>5</sub>          |        |                        |                     |                           |                |                |                                                                        |                  |                                   |                                           | 40.28     | 2.690                               |            |        |        |         | C <sub>3</sub> POLY GAS.            | 87.5                      | 5.59      | 0.935                  |        |  |
| C <sub>2</sub> H <sub>4</sub><br>42.078  |        |                        |                     | 2.645                     | 0.428          | 18.01          | 1.081                                                                  | 1.081            | 1.509                             | 0.428                                     | 18.01     | 1.203                               | 4.32       | 4.169  | 0.278  |         | C <sub>3</sub> POLY TAR             | 12.5                      | 0.90      | 0.106                  |        |  |
| C <sub>3</sub> H <sub>6</sub><br>44.094  |        |                        |                     | 0.300                     | 0.049          | 2.16           | 0.123                                                                  | 0.123            | 0.172                             | 0.049                                     | 2.16      | 0.144                               | 4.24       | 0.509  | 0.034  |         |                                     |                           |           |                        |        |  |
| C <sub>4</sub> H <sub>10</sub><br>56.104 |        |                        |                     | 1.545                     | 0.250          | 14.03          | 0.632                                                                  | 0.632            | 0.882                             | 0.250                                     | 14.03     | 0.937                               | 5.00       | 2.806  | 0.197  |         |                                     | #/gal                     | #/hr      | gal/hr                 | RVP    |  |
| C <sub>5</sub> H <sub>12</sub><br>58.123 |        |                        |                     | 0.495                     | 0.080          | 4.65           | 0.202                                                                  | 0.202            | 0.282                             | 0.080                                     | 4.65      | 0.310                               | 4.86       | 0.957  | 0.064  |         | C <sub>4</sub> H <sub>8</sub>       | 5.00                      | 0.13      | 0.026                  | 68.0   |  |
| C <sub>6</sub> H <sub>14</sub><br>70.130 |        |                        |                     | 0.645                     | 0.104          | 7.29           | 0.264                                                                  | 0.264            | 0.368                             | 0.104                                     | 7.29      | 0.487                               | 5.45       | 1.338  | 0.089  |         | C <sub>4</sub> POLY GAS.            | 5.98                      | 12.16     | 2.034                  | 1.5    |  |
| C <sub>7</sub> H <sub>16</sub><br>72.146 |        |                        |                     | 0.145                     | 0.023          | 1.66           | 0.059                                                                  | 0.059            | 0.082                             | 0.023                                     | 1.66      | 0.111                               | 5.25       | 0.316  | 0.021  |         | C <sub>4</sub> H <sub>10</sub>      | 4.86                      | 4.65      | 0.957                  | 68.0   |  |
| C <sub>8</sub> H <sub>18</sub><br>84.156 |        |                        |                     | 0.190                     | 0.031          | 2.61           | 0.078                                                                  | 0.078            | 0.109                             | 0.031                                     | 2.61      | 0.174                               | 5.54       | 0.471  | 0.031  |         | C <sub>4</sub> FREE GAS.            |                           |           | 9.449                  | 5.8    |  |
| C <sub>9</sub> - C <sub>10</sub>         |        |                        |                     |                           |                |                |                                                                        |                  |                                   |                                           | 50.41     | 3.366                               |            |        | 10.566 | 0.704   | C <sub>4</sub> POLY TAR             | 7.53                      | 1.74      | 0.231                  |        |  |
| TOTAL                                    |        | 40.906                 | 534.22              |                           | 16.169         | 359.33         | 40.882                                                                 | 81.788           | 63.759                            |                                           |           |                                     |            |        |        |         |                                     |                           |           |                        |        |  |
| H <sub>2</sub> + CO                      | 96.470 | 39.461                 | 14976               | SCFH                      | 8.266          |                | 20.999                                                                 | 60.360           | 29.165                            | -31.195                                   |           |                                     |            |        |        |         |                                     | gal/hr                    | gal / MCF | Bbl/Day                |        |  |
| H <sub>2</sub> / CO                      |        | 1.59                   | Factor              | 667735                    | 4.49           |                | 4.49                                                                   | 2.17             | 4.49                              | 1.27                                      |           |                                     |            |        |        |         | 10 # RVP 400 EP<br>GASOLINE         | 12.466                    | 0.8324    | 4513                   |        |  |
| Weight Recovery, %                       | 92.07  | Catalyst Age, hrs.     |                     |                           |                |                | Space Velocity, v/hv                                                   | 1224             | RECOVERED OIL                     |                                           | **        | 0.355                               | 49.94      | 3.328  |        | 7.874   | 0.526                               | GAS OIL                   | 0.598     | 0.0399                 | 216    |  |
| Pressure, psig                           | 401    | Inlet Velocity, Ft/sec |                     |                           |                | 1.00           | Catalyst                                                               | Vol 1            | CF                                | 12.24                                     | TOTAL OIL |                                     | 100.25     | 6.694  | 18.440 | 1.230   | FUEL OIL                            | 0.903                     | 0.0536    | 291                    |        |  |
| Temperature, °F                          | 662    | Bed Depth, Ft          |                     |                           |                | 18.55          | Weight, #                                                              | 1860             |                                   | WATER SOLUBLE<br>CHEMICALS                |           | **                                  | 0.302      | 16.03  | 1.070  | 2.043   | 0.136                               | POLY TAR                  | 0.337     | 0.0225                 | 122    |  |
| Recycle Ratio                            | 1.00   | Bed Density, #/CF      |                     |                           |                | 152            | Effluent (H <sub>2</sub> )(CO)<br>Shift Ratio (H <sub>2</sub> O)(CO) = |                  |                                   | TOTAL LIQUID<br>PRODUCTS C <sub>2</sub> + |           | **                                  | 116.28     | 7.764  | 20.483 | 1.366   | TOTAL                               | 14.204                    | 0.9494    | 5142                   |        |  |
| FRESH FEED CONVERSION — %                |        |                        |                     | TOTAL FEED CONVERSION — % |                |                |                                                                        | SELECTIVITY      |                                   | NET WATER                                 |           | 6.051                               | 109.02     | 7.280  | 13.088 | 0.974   | W. S. CHEM.                         | 2.043                     | 0.1364    | 740                    |        |  |
| Contraction                              | CO     | H <sub>2</sub>         | H <sub>2</sub> + CO |                           | CO             | H <sub>2</sub> | CO + H <sub>2</sub>                                                    |                  | C <sub>3</sub> + C <sub>4</sub> + | GROSS WATER                               |           | 125.05                              | 8.350      | 15.131 | 1.010  | TOTAL   | 16.247                              | 1.0948                    | 5882      |                        |        |  |
| 60.47                                    | 90.13  | 72.08                  | 79.05               |                           | 72.13          | 42.26          | 51.68                                                                  |                  | 74.27                             | HYDROCARBON<br>TOTAL — C <sub>2</sub> +   |           | 156.56                              | 10.454     |        |        |         |                                     |                           |           |                        |        |  |

Form ML-11

\*\* Included in Reactor Effluent Total

g/NCM = 16.91 X #/MCF \*9488 MCFH<sub>2</sub> + CO, Bbl/Day = 5421.6 X gal/MCF

**THE TEXAS COMPANY — MONTEBELLO LABORATORY  
DATA SUMMARY**

RUN NO. 66-L  
HOURS 231-238

| OPERATING CONDITIONS |            |                          |       | PRODUCT TESTS                                  |      |       | CATALYST DATA                        |  |                 |                                             |               |
|----------------------|------------|--------------------------|-------|------------------------------------------------|------|-------|--------------------------------------|--|-----------------|---------------------------------------------|---------------|
| PRESSURES PSIG       |            | RATES S.C.F.H.           |       |                                                | OIL  | WATER | INVENTORY DATA                       |  | PARTICLE SIZE   |                                             |               |
| Oxygen               | 435        | Fresh Feed               | 15524 | * API                                          | 54.6 | 11.1  | In Reactor at Start of Period        |  | Screen Analysis |                                             | Sedimentation |
| Natural Gas          | 431        | Recycle                  | 15515 | Neut. No.                                      | 49.4 | 36.7  | Fresh Catalyst Added                 |  | Mesh            | Microns                                     | %             |
| Generator Outlet     | 406        | Combined Feed            | 31039 | Sap. No.                                       | 66.2 | 40.3  | Total                                |  | On 40           | 419+                                        | 80+           |
| Reactor Inlet        | 401        | Wet Gas—Measured         | 5413  | Hydrox. No.                                    |      |       | Catalyst Recovered                   |  | 2               | 100                                         | 150           |
| Condenser Inlet      |            | Adjusted                 | 6136  | Bromine No.                                    | 96   |       | In Reactor at End of Period          |  | 150             | 105                                         | 20-40         |
| Product Accumulator  | 374        | Loss                     | 723   | Pour °F.                                       |      |       |                                      |  | 200             | 74                                          | 10-20         |
|                      |            |                          |       | Chemicals, % by K <sub>2</sub> CO <sub>3</sub> |      | 13.5  | REACTOR d-p, Inches H <sub>2</sub> O |  | 250             | 62                                          | 0-20          |
|                      |            |                          |       |                                                |      |       | No. Height                           |  | 325             | 44                                          |               |
| TEMPERATURES—°F.     |            |                          |       | Recycle/Fresh Feed                             | 1.00 |       | 0 See Per. A                         |  | <325            |                                             |               |
| Oxygen               | 508        | Inlet Velocity—ft./sec.  | 1.00  |                                                |      |       | 1                                    |  | 73              | CATALYST                                    |               |
| Natural Gas          | 773        | Fresh Feed Rate—S.C.F.H. | 14976 | HEMPEL, DIST. %                                |      | °API  | 2                                    |  | 78              | Bulk Density, Lbs./Cu.Ft.                   |               |
| Generator            | 2441       | per Cu.Ft. Dense Bed     | 1224  | 205 °F.                                        |      |       | 3                                    |  | 80              | Aerated                                     |               |
| Quench Accumulator   | 158        | per Lb. Catalyst         | 8.05  | 400                                            | 81.8 | 55.5  | 4                                    |  | 282             | Settled                                     |               |
| Reactor Inlet        | 255        | per sq ft                | 22691 | 400-550                                        | 8.3  | 36.8  | Total                                |  | 513             | Compacted                                   |               |
| Condenser Inlet      | 583        |                          |       | 550+                                           | 9.9  |       |                                      |  |                 | Particle Density, gm./cc.                   |               |
| Product Accumulator  | 65         |                          |       |                                                |      |       | CALCULATED FROM dp                   |  |                 | NH <sub>3</sub> Value, ml./gm.              |               |
| Catalyst No.         | Height     |                          |       | A. S. T. M. DIST. ON                           |      |       | Density, Lbs./Cu.Ft.                 |  | 152             | N <sub>2</sub> Surface, m <sup>2</sup> /gm. |               |
| 1                    | See Per. A | --                       |       | Naphtha °F.                                    |      |       | Inventory, Lbs.                      |  | 1860            |                                             |               |
| 2                    | 661        |                          |       | IBP                                            | 104  |       | Bed Depth, Ft.                       |  | 18.55           | CHEMICAL ANALYSIS                           |               |
| 3                    | 653        |                          |       | 10%                                            | 130  |       | Vol cu ft                            |  | 12.24           | Fe                                          |               |
| 4                    | 663        |                          |       | 50%                                            | 214  |       |                                      |  |                 | C                                           |               |
| 5                    | 664        |                          |       | 90%                                            | 353  |       |                                      |  |                 | O                                           |               |
| 6                    | 668        |                          |       | EP                                             | 404  |       |                                      |  |                 | H                                           |               |
| 7                    | 665        |                          |       | Rec                                            | 97   |       |                                      |  |                 | K <sub>2</sub> O, W+, % basis Fe            |               |
| 8                    | 665        |                          |       |                                                |      |       |                                      |  |                 | X-Ray Analysis—                             |               |
| 9                    | 650        |                          |       |                                                |      |       |                                      |  |                 | Fe <sub>2</sub> O <sub>3</sub>              |               |
| 10                   | 653        |                          |       |                                                |      |       |                                      |  |                 | Fe <sub>2</sub> O <sub>4</sub>              |               |
| 11                   | 656        |                          |       |                                                |      |       |                                      |  |                 | Fe                                          |               |

**THE TEXAS COMPANY — MONTEBELLO LABORATORY**  
**YIELD CALCULATIONS**

RUN NO. **66-M**  
HOURS **238-248**  
CATALYST **Brownsville**  
**Treated NS Red. @ 680°**

| FRESH FEED                      |        |                        |                    | WET GAS                   |                     |                                                                                   | RECYCLE                          | COMBINED FEED                        | EFFLUENT      | NET CHANGE                             |         | YIELD BASIS H <sub>2</sub> + CO FED |        |        |         |                                            |      |       |       |       |  |
|---------------------------------|--------|------------------------|--------------------|---------------------------|---------------------|-----------------------------------------------------------------------------------|----------------------------------|--------------------------------------|---------------|----------------------------------------|---------|-------------------------------------|--------|--------|---------|--------------------------------------------|------|-------|-------|-------|--|
|                                 | %      | m/hr                   | #/hr               | %                         | At Wt. Balance      |                                                                                   |                                  |                                      |               |                                        |         | CONDENSATE                          |        |        |         | YIELDS BASIS BROWNSVILLE DESIGN FEED RATE* |      |       |       |       |  |
|                                 |        |                        |                    |                           | m/hr                | #/hr                                                                              | m/hr                             | m/hr                                 | m/hr          | m/hr                                   | #/hr    | #/MCF                               | #/gal  | gal/hr | gal/MCF |                                            |      |       |       |       |  |
| CO                              | 36.025 | 13.788                 | 386.22             | 9.085                     | 1.248               | 34.96                                                                             | 3.720                            | 17.508                               | 4.968         | -12.540                                | -351.26 |                                     |        |        |         |                                            |      |       |       |       |  |
| H <sub>2</sub>                  | 61.185 | 23.419                 | 47.22              | 41.785                    | 5.738               | 11.57                                                                             | 17.110                           | 40.529                               | 22.848        | -17.681                                | -35.64  |                                     |        |        |         | 400 EP                                     | 82.7 | 6.582 | 98.0  | 6.450 |  |
| CO <sub>2</sub>                 | 2.135  | 0.817                  | 35.96              | 28.505                    | 3.915               | 172.29                                                                            | 11.673                           | 12.490                               | 15.588        | 3.098                                  | 136.33  | 9.655                               |        |        |         | 400-550                                    | 8.0  | 0.637 | 91.4  | 0.582 |  |
| N <sub>2</sub>                  | 0.560  | 0.214                  | 6.00               | 1.335                     | 0.183               | 5.13                                                                              | 0.547                            | 0.761                                | 0.730         |                                        |         |                                     |        |        |         | 550 +                                      | 9.3  | 0.740 | 114.6 | 0.848 |  |
| CH <sub>4</sub>                 | 0.095  | 0.036                  | 0.58               | 8.990                     | 1.235               | 19.81                                                                             | 3.681                            | 3.717                                | 4.916         | 1.199                                  | 19.23   | 1.362                               |        |        |         |                                            |      |       |       |       |  |
| C <sub>2</sub> H <sub>6</sub>   |        |                        |                    | 2.325                     | 0.319               | 8.95                                                                              | 0.952                            | 0.952                                | 1.271         | 0.319                                  | 8.95    | 0.634                               |        |        |         |                                            |      |       |       |       |  |
| C <sub>3</sub> H <sub>8</sub>   |        |                        |                    | 1.730                     | 0.238               | 7.16                                                                              | 0.708                            | 0.708                                | 0.946         | 0.238                                  | 7.16    | 0.507                               |        |        |         |                                            |      |       |       |       |  |
| C <sub>4</sub> +C <sub>5</sub>  |        |                        |                    |                           |                     |                                                                                   |                                  |                                      |               |                                        | 35.34   | 2.503                               |        |        |         |                                            |      |       |       |       |  |
| C <sub>2</sub> H <sub>4</sub>   |        |                        |                    | 2.905                     | 0.399               | 16.79                                                                             | 1.190                            | 1.190                                | 1.589         | 0.399                                  | 16.79   | 1.189                               | 4.32   | 3.387  | 0.275   |                                            |      |       |       |       |  |
| C <sub>3</sub> H <sub>6</sub>   |        |                        |                    | 0.360                     | 0.049               | 2.16                                                                              | 0.147                            | 0.147                                | 0.196         | 0.049                                  | 2.16    | 0.153                               | 4.24   | 0.509  | 0.036   |                                            |      |       |       |       |  |
| C <sub>4</sub> H <sub>10</sub>  |        |                        |                    | 1.595                     | 0.219               | 12.29                                                                             | 0.653                            | 0.653                                | 0.872         | 0.219                                  | 12.29   | 0.870                               | 5.00   | 2.458  | 0.174   |                                            |      |       |       |       |  |
| C <sub>5</sub> H <sub>12</sub>  |        |                        |                    | 0.425                     | 0.058               | 3.37                                                                              | 0.174                            | 0.174                                | 0.232         | 0.058                                  | 3.37    | 0.239                               | 4.86   | 0.693  | 0.049   |                                            |      |       |       |       |  |
| C <sub>6</sub> H <sub>14</sub>  |        |                        |                    | 0.625                     | 0.086               | 6.03                                                                              | 0.256                            | 0.256                                | 0.342         | 0.086                                  | 6.03    | 0.427                               | 5.45   | 1.106  | 0.078   |                                            |      |       |       |       |  |
| C <sub>7</sub> H <sub>16</sub>  |        |                        |                    | 0.160                     | 0.022               | 1.59                                                                              | 0.066                            | 0.066                                | 0.088         | 0.022                                  | 1.59    | 0.113                               | 5.25   | 0.303  | 0.021   |                                            |      |       |       |       |  |
| C <sub>8</sub> H <sub>18</sub>  |        |                        |                    | 0.175                     | 0.024               | 2.02                                                                              | 0.072                            | 0.072                                | 0.096         | 0.024                                  | 2.02    | 0.143                               | 5.54   | 0.365  | 0.026   |                                            |      |       |       |       |  |
| C <sub>9</sub> -C <sub>10</sub> |        |                        |                    |                           |                     |                                                                                   |                                  |                                      |               |                                        | 44.25   | 3.134                               | 9.321  | 0.659  |         |                                            |      |       |       |       |  |
| TOTAL                           |        | 38.274                 | 475.97             |                           | 13.733              | 304.12                                                                            | 40.949                           | 79.223                               | 61.183        |                                        |         |                                     |        |        |         |                                            |      |       |       |       |  |
| H <sub>2</sub> +CO              | 97.210 | 37.207                 | 14120              | SCFH                      | 6.986               |                                                                                   | 20.830                           | 58.037                               | 47.816        | -30.221                                |         |                                     |        |        |         |                                            |      |       |       |       |  |
| H <sub>2</sub> /CO              |        | 1.70                   | Factor             | 708215                    | 4.60                |                                                                                   | 4.60                             | 2.31                                 | 4.60          | 1.41                                   |         |                                     |        |        |         |                                            |      |       |       |       |  |
| Weight Recovery, %              | 95.09  | Catalyst Age, hrs.     |                    |                           | Space Velocity, vhr |                                                                                   |                                  | 1138                                 | RECOVERED OIL | 0.360                                  | 50.54   | 3.579                               | 7.959  | 0.564  |         |                                            |      |       |       |       |  |
| Pressure, psig                  | 403    | Inlet Velocity, Ft/sec |                    |                           | 0.96                | Catalyst Vol CF                                                                   |                                  |                                      | 12.41         | TOTAL OIL                              | 94.79   | 6.713                               | 17.280 | 1.223  |         |                                            |      |       |       |       |  |
| Temperature, °F                 | 656    | Bed Depth, Ft          |                    |                           | 18.80               | Weight, #                                                                         |                                  |                                      | 1849          | WATER SOLUBLE CHEMICALS                | 0.304   | 16.15                               | 1.144  | 2.055  | 0.146   |                                            |      |       |       |       |  |
| Recycle Ratio                   | 1.07   | Bed Density, #/CF      |                    |                           | 149                 | Effluent (H <sub>2</sub> )(CO <sub>2</sub> ) Shift Ratio (H <sub>2</sub> O)(CO) = |                                  |                                      |               | TOTAL LIQUID PRODUCTS C <sub>4</sub> + | 110.94  | 7.857                               | 19.335 | 1.369  |         |                                            |      |       |       |       |  |
| FRESH FEED CONVERSION — %       |        |                        |                    | TOTAL FEED CONVERSION — % |                     |                                                                                   |                                  | SELECTIVITY                          |               | NET WATER                              | 5.837   | 105.16                              | 7.448  | 12.624 | 0.894   |                                            |      |       |       |       |  |
| Contraction                     | CO     | H <sub>2</sub>         | H <sub>2</sub> +CO | CO                        | H <sub>2</sub>      | CO+H <sub>2</sub>                                                                 | C <sub>3</sub> +C <sub>4</sub> + | GROSS WATER                          |               | 121.31                                 | 8.592   | 14.679                              | 1.040  |        |         |                                            |      |       |       |       |  |
| 64.12                           | 90.95  | 75.50                  | 81.22              | 71.62                     | 43.63               | 52.07                                                                             | 75.84                            | HYDROCARBON TOTAL — C <sub>1</sub> + |               | 146.28                                 | 10.360  |                                     |        |        |         |                                            |      |       |       |       |  |

Form ML-11

\*\* Included in Reactor Effluent Total

g/NCM = 16.91 X g/MCF

\*0488 MCF H<sub>2</sub> + CO, Bbl/Day = 5421.6 X gal/MCF

**THE TEXAS COMPANY — MONTEBELLO LABORATORY**  
**DATA SUMMARY**

RUN NO. **66-M**  
HOURS **238-248**

| OPERATING CONDITIONS |        |                          |       | PRODUCT TESTS                                  |      |       |  | CATALYST DATA                        |       |                                             |               |
|----------------------|--------|--------------------------|-------|------------------------------------------------|------|-------|--|--------------------------------------|-------|---------------------------------------------|---------------|
| PRESSURES PSIG       |        | RATES S.C.F.H.           |       | OIL                                            |      | WATER |  | INVENTORY DATA                       |       | PARTICLE SIZE                               |               |
| Oxygen               | 425    | Fresh Feed               | 14525 | * API                                          | 54.0 | 11.1  |  | In Reactor at Start of Period        |       | Screen Analysis                             | Sedimentation |
| Natural Gas          | 420    | Recycle                  | 15540 | Neut. No.                                      | 48.3 | 37.0  |  | Fresh Catalyst Added                 |       | Mesh                                        | Microns       |
| Generator Outlet     | 406    | Combined Feed            | 30065 | Sap. No.                                       | 66.1 | 40.8  |  | Total                                |       | On 40                                       | 419+          |
| Reactor Inlet        | 403    | Wet Gas—Measured         | 4811  | Hydrox. No.                                    |      |       |  | Catalyst Recovered                   |       | 100                                         | 150           |
| Condenser Inlet      |        | Adjusted                 | 5212  | Bromine No.                                    | 96   |       |  | In Reactor at End of Period          |       | 150                                         | 105           |
| Product Accumulator  | 375    | Loss                     | 401   | Pour °F.                                       |      |       |  |                                      |       | 200                                         | 74            |
|                      |        |                          |       | Chemicals, % by K <sub>2</sub> CO <sub>3</sub> | 14.0 |       |  | REACTOR d-p, Inches H <sub>2</sub> O |       | 250                                         | 62            |
|                      |        |                          |       |                                                |      |       |  | No. Height                           |       | 325                                         | 44            |
| TEMPERATURES—°F.     |        | Recycle/Fresh Feed       | 1.07  |                                                |      |       |  | 0 See Per. A                         |       | <325                                        |               |
| Oxygen               | 473    | Inlet Velocity—ft./sec.  | 0.96  |                                                |      |       |  | 1                                    | 70    | CATALYST                                    |               |
| Natural Gas          | 776    | Fresh Feed Rate—S.C.F.H. | 14120 | HEMPEL, DIST. %                                |      | °API  |  | 2                                    | 77    | Bulk Density, Lbs./Cu.Ft.                   |               |
| Generator            | 2502   | per Cu.Ft. Dense Bed     | 1138  | 205 °F.                                        |      |       |  | 3                                    | 78    | Aerated                                     |               |
| Quench Accumulator   | 140    | per Lb. Catalyst         | 7.64  | 400                                            | 81.7 | 54.7  |  | 4                                    | 285   | Settled                                     |               |
| Reactor Inlet        | 296    | per sq ft                | 21394 | 400-550                                        | 8.0  | 37.0  |  | Total                                | 510   | Compacted                                   |               |
| Condenser Inlet      | 563    |                          |       | 550+                                           | 10.3 |       |  |                                      |       | Particle Density, gm./cc.                   |               |
| Product Accumulator  | 67     |                          |       |                                                |      |       |  | CALCULATED FROM dp                   |       | NH <sub>3</sub> Value, ml./gm.              |               |
| Catalyst No.         | Height |                          |       | A. S. T. M. DIST. ON                           |      |       |  | Density, Lbs./Cu.Ft.                 | 149   | N <sub>2</sub> Surface, m <sup>2</sup> /gm. |               |
| 1 See Per. A         | --     |                          |       | Naphtha °F.                                    |      |       |  | Inventory, Lbs.                      | 1849  | CHEMICAL ANALYSIS                           |               |
| 2                    | 658    |                          |       | IBP                                            | 104  |       |  | Bed Depth, Ft.                       | 18.80 |                                             |               |
| 3                    | 647    |                          |       | 10%                                            | 130  |       |  | Vol cu ft                            | 12.41 | Fe                                          |               |
| 4                    | 657    |                          |       | 50%                                            | 214  |       |  |                                      |       | C                                           |               |
| 5                    | 658    |                          |       | 90%                                            | 353  |       |  |                                      |       | O                                           |               |
| 6                    | 661    |                          |       | EP                                             | 404  |       |  |                                      |       | H                                           |               |
| 7                    | 657    |                          |       | Rec.                                           | 97   |       |  |                                      |       | K <sub>2</sub> O, W+. % basis Fe            |               |
| 8                    | 641    |                          |       |                                                |      |       |  |                                      |       | X-Ray Analysis—                             |               |
| 9                    | 637    |                          |       |                                                |      |       |  |                                      |       | Fe <sub>2</sub> O <sub>3</sub>              |               |
| 10                   | 638    |                          |       |                                                |      |       |  |                                      |       | Fe <sub>3</sub> O <sub>4</sub>              |               |
| 11                   | 615    |                          |       |                                                |      |       |  |                                      |       | Fe                                          |               |



THE TEXAS COMPANY — MONTEBELLO LABORATORY  
YIELD CALCULATIONS

RUN NO. 66-N  
HOURS 248-272  
CATALYST Brownsville  
Treated NS Red. @ 660F

| FRESH FEED                                |        |                        |                    | WET GAS                   |                |                      | RECYCLE                                                                             | COMBINED FEED                        | EFFLUENT                               | NET CHANGE |         | YIELD BASIS H <sub>2</sub> + CO FED |        |        |         |                                            |          |        |        |       |             |       |        |     |
|-------------------------------------------|--------|------------------------|--------------------|---------------------------|----------------|----------------------|-------------------------------------------------------------------------------------|--------------------------------------|----------------------------------------|------------|---------|-------------------------------------|--------|--------|---------|--------------------------------------------|----------|--------|--------|-------|-------------|-------|--------|-----|
|                                           | %      | m/hr                   | #/hr               | %                         | At Wt. Balance |                      | m/hr                                                                                | m/hr                                 | m/hr                                   | m/hr       | #/hr    | CONDENSATE                          |        |        |         | YIELDS BASIS BROWNSVILLE DESIGN FEED RATE* |          |        |        |       |             |       |        |     |
|                                           |        |                        |                    |                           | m/hr           | #/hr                 |                                                                                     |                                      |                                        |            |         | #/MCF                               | #/gal  | gal/hr | gal/MCF |                                            |          |        |        |       |             |       |        |     |
| CO<br>28.010                              | 36.820 | 14.459                 | 405.00             | 8.517                     | 1.208          | 33.84                | 3.433                                                                               | 17.892                               | 4.641                                  | -13.251    | -371.16 |                                     |        |        |         |                                            |          |        |        |       |             |       |        |     |
| H <sub>2</sub><br>2.016                   | 60.497 | 23.757                 | 47.89              | 40.760                    | 5.780          | 11.65                | 16.430                                                                              | 40.187                               | 22.210                                 | -17.977    | -36.24  |                                     |        |        |         | 400 EP                                     | 81.0     | 6.411  | 98.0   | 6.282 |             |       |        |     |
| CO <sub>2</sub><br>44.010                 | 2.213  | 0.869                  | 38.24              | 29.333                    | 4.160          | 183.06               | 11.824                                                                              | 12.693                               | 15.984                                 | 3.291      | 144.82  | 9.986                               |        |        |         | 400-550                                    | 9.1      | 0.720  | 91.4   | 0.658 |             |       |        |     |
| N <sub>2</sub><br>28.016                  | 0.353  | 0.139                  | 3.89               | 1.313                     | 0.186          | 5.21                 | 0.529                                                                               | 0.668                                | 0.715                                  |            |         |                                     |        |        |         | 550 +                                      | 9.9      | 0.784  | 114.6  | 0.898 |             |       |        |     |
| CH <sub>4</sub><br>16.042                 | 0.117  | 0.046                  | 0.74               | 9.406                     | 1.334          | 21.40                | 3.791                                                                               | 3.837                                | 5.125                                  | 1.288      | 20.66   | 1.425                               |        |        |         |                                            |          |        |        |       |             |       |        |     |
| C <sub>2</sub> H <sub>6</sub><br>28.052   |        |                        |                    | 2.397                     | 0.340          | 9.54                 | 0.966                                                                               | 0.966                                | 1.306                                  | 0.340      | 9.54    | 0.658                               |        |        |         |                                            |          |        |        |       |             |       |        |     |
| C <sub>3</sub> H <sub>8</sub><br>30.058   |        |                        |                    | 1.930                     | 0.274          | 8.24                 | 0.778                                                                               | 0.778                                | 1.052                                  | 0.274      | 8.24    | 0.668                               |        |        |         | PROPYLENE                                  | 39.0     | 6.97   |        |       |             |       |        |     |
| C <sub>4</sub> +C <sub>5</sub>            |        |                        |                    |                           |                |                      |                                                                                     |                                      |                                        |            | 38.44   | 2.651                               |        |        |         | C <sub>3</sub> POLY GASO.                  | 87.5     | 6.10   | 1.020  |       |             |       |        |     |
| C <sub>6</sub> H <sub>14</sub><br>42.078  |        |                        |                    | 2.997                     | 0.425          | 17.88                | 1.208                                                                               | 1.208                                | 1.633                                  | 0.425      | 17.88   | 1.233                               | 4.32   | 4.139  | 0.285   | C <sub>3</sub> POLY TAR                    | 12.5     | 0.87   | 0.116  |       |             |       |        |     |
| C <sub>7</sub> H <sub>16</sub><br>44.094  |        |                        |                    | 0.393                     | 0.056          | 2.47                 | 0.158                                                                               | 0.158                                | 0.214                                  | 0.056      | 2.47    | 0.170                               | 4.24   | 0.583  | 0.040   |                                            |          |        |        |       |             |       |        |     |
| C <sub>8</sub> H <sub>18</sub><br>56.104  |        |                        |                    | 1.587                     | 0.225          | 12.62                | 0.640                                                                               | 0.640                                | 0.865                                  | 0.225      | 12.62   | 0.870                               | 5.00   | 2.524  | 0.174   |                                            | #/gal    | #/hr   | gal/hr | RVP   |             |       |        |     |
| C <sub>10</sub> H <sub>22</sub><br>58.120 |        |                        |                    | 0.420                     | 0.060          | 3.49                 | 0.169                                                                               | 0.169                                | 0.229                                  | 0.060      | 3.49    | 0.241                               | 4.86   | 0.718  | 0.049   | C <sub>4</sub> H <sub>6</sub>              | 5.00     | 0.96   | 0.192  | 68.0  |             |       |        |     |
| C <sub>12</sub> H <sub>26</sub><br>70.130 |        |                        |                    | 0.637                     | 0.090          | 6.31                 | 0.257                                                                               | 0.257                                | 0.347                                  | 0.090      | 6.31    | 0.435                               | 5.48   | 1.158  | 0.079   | C <sub>4</sub> POLY GASO.                  | 5.98     | 10.20  | 1.706  | 1.5   |             |       |        |     |
| C <sub>14</sub> H <sub>30</sub><br>72.146 |        |                        |                    | 0.100                     | 0.014          | 1.01                 | 0.040                                                                               | 0.040                                | 0.054                                  | 0.014      | 1.01    | 0.070                               | 5.28   | 0.192  | 0.013   | C <sub>4</sub> H <sub>10</sub>             | 4.86     | 3.49   | 0.718  | 68.0  |             |       |        |     |
| C <sub>16</sub> H <sub>34</sub><br>84.156 |        |                        |                    | 0.210                     | 0.030          | 2.52                 | 0.085                                                                               | 0.085                                | 0.115                                  | 0.030      | 2.52    | 0.174                               | 5.54   | 0.455  | 0.031   | C <sub>4</sub> FREE GASO.                  |          |        | 9.108  | 5.8   |             |       |        |     |
| C <sub>18</sub> +C <sub>20</sub>          |        |                        |                    |                           |                |                      |                                                                                     |                                      |                                        |            | 46.30   | 3.193                               |        | 9.769  | 0.671   | C <sub>4</sub> POLY TAR                    | 7.53     | 1.46   | 0.194  |       |             |       |        |     |
| TOTAL                                     |        | 39.270                 | 495.76             |                           | 14.182         | 319.24               | 40.308                                                                              | 79.578                               | 61.297                                 |            |         |                                     |        |        |         |                                            |          |        |        |       |             |       |        |     |
| H <sub>2</sub> +CO                        | 97.317 | 38.216                 | 14503              | SCFH                      | 6.988          |                      | 19.863                                                                              | 58.079                               | 26.851                                 | -31.228    |         |                                     |        |        |         |                                            |          |        |        |       |             |       |        |     |
| H <sub>2</sub> /CO                        |        | 1.64                   | Factor             | 689512                    | 4.79           |                      | 4.79                                                                                | 2.25                                 | 4.79                                   | 1.36       |         |                                     |        |        |         | 16 @ RVP 480 PP GASOLINE                   | 11.724   | 0.8084 | 4383   |       |             |       |        |     |
| Weight Recovery, %                        | 94.13  | Catalyst Age, hrs.     |                    |                           |                | Space Velocity, v/hv |                                                                                     | 1171                                 | RECOVERED OIL **                       |            | 0.356   | 49.96                               | 3.445  |        | 7.915   | 0.546                                      | GAS OIL  | 0.658  | 0.0454 | 246   |             |       |        |     |
| Pressure, psig                            | 404    | Inlet Velocity, Ft/sec |                    |                           |                | 0.97                 | Catalyst Vol CF                                                                     | 12.38                                | TOTAL OIL                              |            | 96.26   | 6.638                               |        | 17.684 | 1.217   | FUEL OIL                                   | 0.898    | 0.0619 | 336    |       |             |       |        |     |
| Temperature, °F                           | 665    | Bed Depth, Ft          |                    |                           |                | 18.76                | Weight, #                                                                           | 1820                                 | WATER SOLUBLE CHEMICALS **             |            | 0.295   | 15.65                               | 1.079  |        | 1.989   | 0.137                                      | POLY TAR | 0.510  | 0.0214 | 116   |             |       |        |     |
| Recycle Ratio                             | 1.03   | Bed Density, #/CF      |                    |                           |                | 147                  | Effluent (H <sub>2</sub> )/(CO <sub>2</sub> ) Shift Ratio (H <sub>2</sub> O)/(CO) = |                                      | TOTAL LIQUID PRODUCTS C <sub>2</sub> + |            | 111.91  | 7.717                               |        | 19.673 | 1.354   | TOTAL                                      | 13.590   | 0.9371 | 5081   |       |             |       |        |     |
| FRESH FEED CONVERSION - %                 |        |                        |                    | TOTAL FEED CONVERSION - % |                |                      |                                                                                     | SELECTIVITY                          |                                        |            |         | NET WATER                           |        |        |         | 6.156                                      | 110.91   | 7.647  | 13.314 | 0.918 | W. S. CHEM. | 1.989 | 0.1371 | 743 |
| Contraction                               | CO     | H <sub>2</sub>         | H <sub>2</sub> +CO | CO                        | H <sub>2</sub> | CO+H <sub>2</sub>    | C <sub>3</sub> +C <sub>4</sub>                                                      | GROSS WATER                          |                                        | 126.56     | 8.726   |                                     | 15.303 | 1.055  | TOTAL   | 15.579                                     | 1.0742   | 5824   |        |       |             |       |        |     |
| 63.89                                     | 91.65  | 75.67                  | 81.71              | 74.06                     | 44.73          | 53.77                | 74.43                                                                               | HYDROCARBON TOTAL - C <sub>2</sub> + |                                        | 150.35     | 10.367  |                                     |        |        |         |                                            |          |        |        |       |             |       |        |     |

Form ML-11

\*\* Included in Reactor Effluent Total

g/NCM = 16.91 X #/MCF \*9488 MCFH H<sub>2</sub> + CO, Bbl/Day = 3421.6 X gal/MCF

THE TEXAS COMPANY — MONTEBELLO LABORATORY  
DATA SUMMARY

RUN NO. 66-N  
HOURS 248-272

| OPERATING CONDITIONS |            |                          |       | PRODUCT TESTS                                  |      |       | CATALYST DATA                        |  |       |                                             |         |   |               |   |
|----------------------|------------|--------------------------|-------|------------------------------------------------|------|-------|--------------------------------------|--|-------|---------------------------------------------|---------|---|---------------|---|
| PRESSURES PSIG       |            | RATES S.C.F.H.           |       |                                                | OIL  | WATER | INVENTORY DATA                       |  |       | PARTICLE SIZE                               |         |   |               |   |
| Oxygen               | 428        | Fresh Feed               | 14903 | * API                                          | 55.1 | 11.0  | In Reactor at Start of Period        |  |       | Screen Analysis                             |         |   | Sedimentation |   |
| Natural Gas          | 425        | Recycle                  | 15297 | Neut. No.                                      | 46.5 | 35.2  | Fresh Catalyst Added                 |  |       | Mesh                                        | Microns | % | Microns       | % |
| Generator Outlet     | 407        | Combined Feed            | 30200 | Sap. No.                                       | 62.9 | 39.7  | Total                                |  |       | On 40                                       | 419+    |   | 80+           |   |
| Reactor Inlet        | 404        | Wet Gas—Measured         | 4891  | Hydrox. No.                                    |      |       | Catalyst Recovered                   |  | 12    | 100                                         | 150     |   | 40—80         |   |
| Condenser Inlet      |            | Adjusted                 | 5382  | Bromine No.                                    | 80   |       | In Reactor at End of Period          |  |       | 150                                         | 105     |   | 20—40         |   |
| Product Accumulator  | 375        | Loss                     | 491   | Pour °F.                                       |      |       |                                      |  |       | 200                                         | 74      |   | 10—20         |   |
|                      |            |                          |       | Chemicals, % by K <sub>2</sub> CO <sub>3</sub> |      | 13.0  | REACTOR d-p, Inches H <sub>2</sub> O |  |       | 250                                         | 62      |   | 0—20          |   |
|                      |            |                          |       |                                                |      |       | No. Height                           |  |       | 325                                         | 44      |   |               |   |
| TEMPERATURES—°F.     |            | Recycle/Fresh Feed       | 1.03  |                                                |      |       | 0 See Per. A                         |  |       | <325                                        |         |   |               |   |
| Oxygen               | 487        | Inlet Velocity—ft./sec.  | 0.97  |                                                |      |       | 1                                    |  | 69    | CATALYST                                    |         |   |               |   |
| Natural Gas          | 768        | Fresh Feed Rate—S.C.F.H. | 14503 | HEMPEL DIST. %                                 |      | °API  | 2                                    |  | 75    | Bulk Density, Lbs./Cu.Ft.                   |         |   |               |   |
| Generator            | 2406       | per Cu.Ft. Dense Bed     | 1171  | 205 °F.                                        |      |       | 3                                    |  | 78    | Aerated                                     |         |   |               |   |
| Quench Accumulator   | 141        | per Lb. Catalyst         | 7.97  | 400                                            | 80.0 | 53.6  | 4                                    |  | 280   | Settled                                     |         |   |               |   |
| Reactor Inlet        | 271        | per sq ft                | 21974 | 400-550                                        | 9.1  | 36.0  | Total                                |  | 502   | Compacted                                   |         |   |               |   |
| Condenser Inlet      | 560        |                          |       | 550+                                           | 10.9 |       |                                      |  |       | Particle Density, gm./cc.                   |         |   |               |   |
| Product Accumulator  | 66         |                          |       |                                                |      |       | CALCULATED FROM dp                   |  |       | NH <sub>3</sub> Value, ml./gm.              |         |   |               |   |
| Catalyst No.         | Height     |                          |       | A. S. T. M. DIST. ON                           |      |       | Density, Lbs./Cu.Ft.                 |  | 147   | N <sub>2</sub> Surface, m <sup>2</sup> /gm. |         |   |               |   |
| 1                    | See Per. A | --                       |       | Naptha °F.                                     |      |       | Inventory, Lbs.                      |  | 1820  | CHEMICAL ANALYSIS                           |         |   |               |   |
| 2                    | 664        |                          |       | IBP                                            | 100  |       | Bed Depth, Ft.                       |  | 18.76 |                                             |         |   |               |   |
| 3                    | 658        |                          |       | 10%                                            | 137  |       | Vol cu ft                            |  | 12.38 | Fe                                          |         |   |               |   |
| 4                    | 667        |                          |       | 50%                                            | 210  |       |                                      |  |       | C                                           |         |   |               |   |
| 5                    | 666        |                          |       | 90%                                            | 344  |       |                                      |  |       | O                                           |         |   |               |   |
| 6                    | 668        |                          |       | EP                                             | 373  |       |                                      |  |       | H                                           |         |   |               |   |
| 7                    | 664        |                          |       | Rec                                            | 96   |       |                                      |  |       | K <sub>2</sub> O, W+, % basis Fe            |         |   |               |   |
| 8                    | 648        |                          |       |                                                |      |       |                                      |  |       | X-Ray Analysis—                             |         |   |               |   |
| 9                    | 643        |                          |       |                                                |      |       |                                      |  |       | Fe <sub>2</sub> O <sub>3</sub>              |         |   |               |   |
| 10                   | 647        |                          |       |                                                |      |       |                                      |  |       | Fe <sub>3</sub> O <sub>4</sub>              |         |   |               |   |
| 11                   | 624        |                          |       |                                                |      |       |                                      |  |       | Fe                                          |         |   |               |   |

THE TEXAS COMPANY — MONTEBELLO LABORATORY  
YIELD CALCULATIONS

RUN NO. 66-0  
HOURS 272-296  
CATALYST

| FRESH FEED                                |        |                |                        | WET GAS                   |                                                                                        |                   |                                  | RECYCLE                                   | COMBINED<br>FEED | EFFLUENT | NET CHANGE |                                       | YIELD BASIS H <sub>2</sub> + CO FED |        |        |             |                                           |        |                |                  |       |        |         |         |     |  |  |  |
|-------------------------------------------|--------|----------------|------------------------|---------------------------|----------------------------------------------------------------------------------------|-------------------|----------------------------------|-------------------------------------------|------------------|----------|------------|---------------------------------------|-------------------------------------|--------|--------|-------------|-------------------------------------------|--------|----------------|------------------|-------|--------|---------|---------|-----|--|--|--|
|                                           | %      | m/hr           | #/hr                   | %                         | At Wt. Balance                                                                         |                   |                                  | m/hr                                      | m/hr             | m/hr     | m/hr       | #/hr                                  | CONDENSATE                          |        |        |             | YIELDS BASIS BROWNSVILLE DESIGN FEED RATE |        |                |                  |       |        |         |         |     |  |  |  |
|                                           |        |                |                        |                           | m/hr                                                                                   | #/hr              |                                  |                                           |                  |          |            |                                       | #/MCF                               | #/gal  | gal/hr | gal/MCF     |                                           |        |                |                  |       |        |         |         |     |  |  |  |
| CO<br>28.010                              | 36.647 | 14.131         | 395.82                 | 8.100                     | 1.151                                                                                  | 32.24             | 3.285                            | 17.416                                    | 4.436            | -12.980  | -563.58    |                                       |                                     |        |        |             |                                           |        |                |                  |       |        |         |         |     |  |  |  |
| H <sub>2</sub><br>2.016                   | 60.367 | 23.279         | 46.93                  | 41.160                    | 5.851                                                                                  | 11.80             | 16.695                           | 39.972                                    | 22.544           | -17.428  | -35.13     |                                       |                                     |        |        |             | 400 EP                                    | 81.6   | 6.089          | 98.0             | 5.967 |        |         |         |     |  |  |  |
| CO <sub>2</sub><br>44.010                 | 2.113  | 0.815          | 35.87                  | 28.720                    | 4.083                                                                                  | 179.66            | 11.648                           | 12.463                                    | 15.731           | 3.268    | 143.79     | 10.128                                |                                     |        |        |             | 400-550                                   | 9.0    | 0.872          | 91.4             | 0.614 |        |         |         |     |  |  |  |
| N <sub>2</sub><br>28.016                  | 0.750  | 0.289          | 8.10                   | 1.963                     | 0.279                                                                                  | 7.82              | 0.796                            | 1.085                                     | 1.075            |          |            |                                       |                                     |        |        |             | 550 +                                     | 9.4    | 0.702          | 114.6            | 0.804 |        |         |         |     |  |  |  |
| CH <sub>4</sub><br>16.042                 | 0.123  | 0.047          | 0.75                   | 9.370                     | 1.332                                                                                  | 21.37             | 3.800                            | 3.947                                     | 5.132            | 1.285    | 20.82      | 1.452                                 |                                     |        |        |             |                                           |        |                |                  |       |        |         |         |     |  |  |  |
| C <sub>2</sub> H <sub>6</sub><br>28.082   |        |                |                        | 2.343                     | 0.333                                                                                  | 9.34              | 0.950                            | 0.950                                     | 1.283            | 0.333    | 9.34       | 0.658                                 |                                     |        |        |             |                                           |        |                |                  |       |        |         |         |     |  |  |  |
| C <sub>3</sub> H <sub>8</sub><br>30.048   |        |                |                        | 2.003                     | 0.285                                                                                  | 8.57              | 0.812                            | 0.812                                     | 1.097            | 0.285    | 8.57       | 0.604                                 |                                     |        |        |             | PROPYLENE                                 | 38.1   | 6.45           |                  |       |        |         |         |     |  |  |  |
| C <sub>4</sub> +C <sub>5</sub>            |        |                |                        |                           |                                                                                        |                   |                                  |                                           |                  |          |            |                                       |                                     |        |        |             | C <sub>4</sub> POLY GASO.                 | 87.5   | 5.64           | 0.943            |       |        |         |         |     |  |  |  |
| C <sub>6</sub> H <sub>14</sub><br>42.078  |        |                |                        | 2.830                     | 0.402                                                                                  | 16.92             | 1.148                            | 1.148                                     | 1.550            | 0.402    | 16.92      | 1.192                                 | 4.32                                | 3.917  | 0.276  |             | C <sub>6</sub> POLY TAR                   | 12.5   | 0.81           | 0.108            |       |        |         |         |     |  |  |  |
| C <sub>8</sub> H <sub>18</sub><br>44.094  |        |                |                        | 0.307                     | 0.044                                                                                  | 1.94              | 0.125                            | 0.125                                     | 0.169            | 0.044    | 1.94       | 0.137                                 | 4.24                                | 0.458  | 0.032  |             |                                           |        |                |                  |       |        |         |         |     |  |  |  |
| C <sub>10</sub> H <sub>16</sub><br>56.104 |        |                |                        | 1.637                     | 0.233                                                                                  | 13.07             | 0.664                            | 0.664                                     | 0.897            | 0.233    | 13.07      | 0.921                                 | 5.00                                | 2.614  | 0.184  |             |                                           |        |                |                  |       | #/gal  | #/hr    | gal/hr  | RVP |  |  |  |
| C <sub>12</sub> H <sub>20</sub><br>58.120 |        |                |                        | 0.560                     | 0.080                                                                                  | 4.65              | 0.227                            | 0.227                                     | 0.307            | 0.080    | 4.65       | 0.328                                 | 4.86                                | 0.957  | 0.067  |             | C <sub>12</sub> H <sub>20</sub>           | 5.00   | --             | --               | 68.0  |        |         |         |     |  |  |  |
| C <sub>14</sub> H <sub>22</sub><br>70.130 |        |                |                        | 0.657                     | 0.093                                                                                  | 6.52              | 0.266                            | 0.266                                     | 0.359            | 0.093    | 6.52       | 0.459                                 | 5.48                                | 1.196  | 0.084  |             | C <sub>14</sub> POLY GASO.                | 5.98   | 11.44          | 1.912            | 1.5   |        |         |         |     |  |  |  |
| C <sub>16</sub> H <sub>24</sub><br>72.140 |        |                |                        | 0.170                     | 0.024                                                                                  | 1.73              | 0.069                            | 0.069                                     | 0.093            | 0.024    | 1.73       | 0.122                                 | 5.25                                | 0.330  | 0.023  |             | C <sub>16</sub> H <sub>24</sub>           | 4.86   | (4.65)<br>4.47 | (0.957)<br>0.920 | 68.0  |        |         |         |     |  |  |  |
| C <sub>18</sub> H <sub>26</sub><br>84.150 |        |                |                        | 0.180                     | 0.026                                                                                  | 2.19              | 0.073                            | 0.073                                     | 0.099            | 0.026    | 2.19       | 0.154                                 | 5.54                                | 0.395  | 0.028  |             | C <sub>18</sub> FREE GASO.                |        |                | 8.831            | 5.8   |        |         |         |     |  |  |  |
| C <sub>20</sub> +C <sub>22</sub>          |        |                |                        |                           |                                                                                        |                   |                                  |                                           |                  |          |            |                                       |                                     |        |        |             | C <sub>20</sub> POLY TAR                  | 7.53   | 1.63           | 0.215            |       |        |         |         |     |  |  |  |
| TOTAL                                     |        | 38.561         | 487.47                 |                           | 14.216                                                                                 | 317.82            | 40.556                           | 79.117                                    | 61.353           |          |            |                                       |                                     |        |        |             |                                           |        |                |                  |       |        |         |         |     |  |  |  |
| H <sub>2</sub> +CO                        | 97.014 | 37.410         | 14197                  | SCFH                      | 7.002                                                                                  |                   | 19.978                           | 57.388                                    | 26.980           | -30.408  |            |                                       |                                     |        |        |             |                                           |        |                |                  |       | gal/hr | gal/MCF | Bbl/Day |     |  |  |  |
| H <sub>2</sub> /CO                        |        | 1.65           | Factor                 | 704374                    | 5.08                                                                                   |                   | 5.08                             | 2.30                                      | 5.08             | 1.34     |            |                                       |                                     |        |        |             | 10 # RVP 400 EP<br>GASOLINE               | 11.663 | 0.8215         | 4454             |       |        |         |         |     |  |  |  |
| Weight Recovery, %                        | 93.32  |                | Catalyst Age, hrs.     |                           | Space Velocity, vhr                                                                    | 1124              |                                  | RECOVERED OIL **                          | 0.336            | 47.19    | 3.324      |                                       | 7.463                               | 0.526  |        |             | GAS OIL                                   | 0.614  | 0.0432         | 234              |       |        |         |         |     |  |  |  |
| Pressure, psig                            | 403    |                | Inlet Velocity, Ft/sec | 0.96                      | Catalyst Vol CF                                                                        | 12.63             |                                  | TOTAL OIL                                 |                  | 94.21    | 6.637      |                                       | 17.330                              | 1.220  |        |             | FUEL OIL                                  | 0.804  | 0.0566         | 307              |       |        |         |         |     |  |  |  |
| Temperature, °F                           | 660    |                | Bed Depth, Ft          | 19.13                     | Weight, #                                                                              | 1793              |                                  | WATER SOLUBLE<br>CHEMICALS **             | 0.284            | 15.07    | 1.061      |                                       | 1.926                               | 0.136  |        |             | POLY TAR                                  | 0.324  | 0.0228         | 124              |       |        |         |         |     |  |  |  |
| Recycle Ratio                             | 1.05   |                | Bed Density, #/CF      | 142                       | Effluent (H <sub>2</sub> )/(CO <sub>2</sub> ) =<br>Shift Ratio (H <sub>2</sub> O)/(CO) |                   |                                  | TOTAL LIQUID<br>PRODUCTS C <sub>2</sub> + |                  | 109.28   | 7.698      |                                       | 19.256                              | 1.356  |        |             | TOTAL                                     | 13.405 | 0.9441         | 5119             |       |        |         |         |     |  |  |  |
| FRESH FEED CONVERSION — %                 |        |                |                        | TOTAL FEED CONVERSION — % |                                                                                        |                   |                                  | SELECTIVITY                               |                  |          |            | NET WATER **                          |                                     |        |        | W. S. CHEM. |                                           |        |                |                  |       |        |         |         |     |  |  |  |
| Contraction                               | CO     | H <sub>2</sub> | H <sub>2</sub> +CO     | CO                        | H <sub>2</sub>                                                                         | CO+H <sub>2</sub> | C <sub>3</sub> +C <sub>4</sub> + |                                           |                  |          |            | GROSS WATER                           |                                     |        |        |             |                                           |        |                |                  |       |        |         |         |     |  |  |  |
| 63.13                                     | 91.85  | 74.87          | 81.28                  | 74.53                     | 43.60                                                                                  | 52.99             | 73.93                            |                                           |                  |          |            | HYDROCARBON<br>TOTAL—C <sub>2</sub> + | 122.46                              | 8.625  | 14.818 | 1.044       |                                           |        |                |                  | TOTAL | 15.331 | 1.0799  | 5855    |     |  |  |  |
|                                           |        |                |                        |                           |                                                                                        |                   |                                  |                                           |                  |          |            |                                       | 147.81                              | 10.412 |        |             |                                           |        |                |                  |       |        |         |         |     |  |  |  |

Form ML-11

\*\* Included in Reactor Effluent Total

g/NCM = 16.91 X #/MCF

\*9488 MCFH H<sub>2</sub> + CO, Bbl/Day = 3421.6 X gal/MCF

THE TEXAS COMPANY — MONTEBELLO LABORATORY  
DATA SUMMARY

RUN NO. 66-0  
HOURS 272-296

| OPERATING CONDITIONS |            |                          |       | PRODUCT TESTS                                  |      |       |  | CATALYST DATA                        |       |                                             |         |   |               |   |  |
|----------------------|------------|--------------------------|-------|------------------------------------------------|------|-------|--|--------------------------------------|-------|---------------------------------------------|---------|---|---------------|---|--|
| PRESSURES PSIG       |            | RATES S.C.F.H.           |       | OIL                                            |      | WATER |  | INVENTORY DATA                       |       | PARTICLE SIZE                               |         |   |               |   |  |
| Oxygen               | 428        | Fresh Feed               | 14634 | * API                                          | 54.8 | 11.1  |  | In Reactor at Start of Period        |       | Screen Analysis                             |         |   | Sedimentation |   |  |
| Natural Gas          | 427        | Recycle                  | 15391 | Neut. No.                                      | 48.4 | 36.2  |  | Fresh Catalyst Added                 |       | Mesh                                        | Microns | % | Microns       | % |  |
| Generator Outlet     | 407        | Combined Feed            | 30025 | Sap. No.                                       | 63.0 | 39.6  |  | Total                                |       | On 40                                       | 419+    |   | 80+           |   |  |
| Reactor Inlet        | 403        | Wet Gas—Measured         | 4842  | Hydrox. No.                                    |      |       |  | Catalyst Recovered                   |       | 100                                         | 150     |   | 40—80         |   |  |
| Condenser Inlet      |            | Adjusted                 | 5395  | Bromine No.                                    | 93   |       |  | In Reactor at End of Period          | 5     | 150                                         | 105     |   | 20—40         |   |  |
| Product Accumulator  | 375        | Loss                     | 553   | Pour °F.                                       |      |       |  |                                      |       | 200                                         | 74      |   | 10—20         |   |  |
|                      |            |                          |       | Chemicals, % by K <sub>2</sub> CO <sub>3</sub> | 13.0 |       |  | REACTOR d-p, Inches H <sub>2</sub> O |       | 250                                         | 62      |   | 0—20          |   |  |
|                      |            |                          |       | No. Height                                     |      |       |  |                                      |       | 325                                         | 44      |   |               |   |  |
| TEMPERATURES—°F.     |            | Recycle/Fresh Feed       | 1.05  |                                                |      |       |  | 0 See Per. A                         |       | <325                                        |         |   |               |   |  |
| Oxygen               | 783        | Inlet Velocity—ft./sec.  | 0.96  |                                                |      |       |  | 1                                    | 69    | CATALYST                                    |         |   |               |   |  |
| Natural Gas          | 465        | Fresh Feed Rate—S.C.F.H. | 14197 | HEMPEL, DIST. %                                |      | °API  |  | 2                                    | 74    | Bulk Density, Lbs./Cu.Ft.                   |         |   |               |   |  |
| Generator            | 2501       | per Cu. Ft. Dense Bed    | 1124  | 205 °F.                                        |      |       |  | 3                                    | 72    | Aerated                                     |         |   |               |   |  |
| Quench Accumulator   | 142        | per Lb. Catalyst         | 7.92  | 400                                            | 80.6 | 53.6  |  | 4                                    | 280   | Settled                                     |         |   |               |   |  |
| Reactor Inlet        | 286        | per sq ft                | 21511 | 400-550                                        | 9.0  | 35.8  |  | Total                                | 495   | Compacted                                   |         |   |               |   |  |
| Condenser Inlet      | 569        |                          |       | 550+                                           | 10.4 |       |  |                                      |       | Particle Density, gm./cc.                   |         |   |               |   |  |
| Product Accumulator  | 70         |                          |       |                                                |      |       |  | CALCULATED FROM dp                   |       | NH <sub>3</sub> Value, ml./gm.              |         |   |               |   |  |
| Catalyst No.         | Height     |                          |       | A. S. T. M. DIST. ON                           |      |       |  | Density, Lbs./Cu.Ft.                 | 142   | N <sub>2</sub> Surface, m <sup>2</sup> /gm. |         |   |               |   |  |
| 1                    | See Per. A | --                       |       | Naphtha °F.                                    |      |       |  | Inventory, Lbs.                      | 1793  |                                             |         |   |               |   |  |
| 2                    | 660        |                          |       | IBP                                            |      | 100   |  | Bed Depth, Ft.                       | 19.13 | CHEMICAL ANALYSIS                           |         |   |               |   |  |
| 3                    | 654        |                          |       | 10%                                            |      | 129   |  | Vol cu ft                            | 12.63 | Fe                                          |         |   |               |   |  |
| 4                    | 664        |                          |       | 50%                                            |      | 213   |  |                                      |       | C                                           |         |   |               |   |  |
| 5                    | 663        |                          |       | 90%                                            |      | 348   |  |                                      |       | O                                           |         |   |               |   |  |
| 6                    | 660        |                          |       | EP                                             |      | 392   |  |                                      |       | H                                           |         |   |               |   |  |
| 7                    | 660        |                          |       | Rec                                            |      | 96.5  |  |                                      |       | K <sub>2</sub> O, W+, % basis Fe            |         |   |               |   |  |
| 8                    | 645        |                          |       |                                                |      |       |  |                                      |       | X-Ray Analysis—                             |         |   |               |   |  |
| 9                    | 640        |                          |       |                                                |      |       |  |                                      |       | Fe <sub>2</sub> O <sub>3</sub>              |         |   |               |   |  |
| 10                   | 643        |                          |       |                                                |      |       |  |                                      |       | Fe <sub>2</sub> O <sub>4</sub>              |         |   |               |   |  |
| 11                   | 632        |                          |       |                                                |      |       |  |                                      |       | Fe                                          |         |   |               |   |  |

$$\text{g/NCM} = 16.91 \times \frac{\#}{\text{MCF}} \quad \#9488 \text{ MCFH H}_2\text{O} + \text{CO}_2 \text{ Bbl/D}_{\text{ay}} = 5421.6 \times \frac{\text{gal}}{\text{MCF}}$$

RUN NO. \_\_\_\_\_ 00-1  
HOURS 296-320

| OPERATING CONDITIONS |            |                          |                | PRODUCT TESTS                                  |      |       | CATALYST DATA                        |  |       |                                             |         |   |               |   |
|----------------------|------------|--------------------------|----------------|------------------------------------------------|------|-------|--------------------------------------|--|-------|---------------------------------------------|---------|---|---------------|---|
| PRESSURES PSIG       |            |                          | RATES S.C.F.H. |                                                | OIL  | WATER | INVENTORY DATA                       |  |       | PARTICLE SIZE                               |         |   |               |   |
| Oxygen               | 428        | Fresh Feed               | 14461          | * API                                          | 53.4 | 11.1  | In Reactor at Start of Period        |  |       | Screen Analysis                             |         |   | Sedimentation |   |
| Natural Gas          | 428        | Recycle                  | 15356          | Neut. No.                                      | 46.8 | 36.4  | Fresh Catalyst Added                 |  |       | Mesh                                        | Microns | % | Microns       | % |
| Generator Outlet     | 407        | Combined Feed            | 29817          | Sap. No.                                       | 63.8 | 39.6  | Total                                |  |       | On 40                                       | 419+    |   | 80+           |   |
| Reactor Inlet        | 403        | Wet Gas—Measured         | 4785           | Hydrox. No.                                    |      |       | Catalyst Recovered                   |  | 13    | 100                                         | 150     |   | 40—80         |   |
| Condenser Inlet      |            | Adjusted                 | 5221           | Bromine No.                                    | 91   |       | In Reactor at End of Period          |  |       | 150                                         | 105     |   | 20—40         |   |
| Product Accumulator  | 375        | Loss                     | 436            | Pour °F.                                       |      |       |                                      |  |       | 200                                         | 74      |   | 10—20         |   |
|                      |            |                          |                | Chemicals, % by K <sub>2</sub> CO <sub>3</sub> |      | 13.5  | REACTOR d-p, Inches H <sub>2</sub> O |  |       | 250                                         | 62      |   | 0—20          |   |
|                      |            |                          |                |                                                |      |       | No. Height                           |  |       | 325                                         | 44      |   |               |   |
| TEMPERATURES—°F.     |            | Recycle/Fresh Feed       | 1.06           |                                                |      |       | 0 See Per. A                         |  |       | <325                                        |         |   |               |   |
| Oxygen               | 479        | Inlet Velocity—ft./sec.  | 0.95           |                                                |      |       | 1                                    |  | 68    | CATALYST                                    |         |   |               |   |
| Natural Gas          | 793        | Fresh Feed Rate—S.C.F.H. | 14000          | HEMPEL DIST. %                                 |      | °API  | 2                                    |  | 74    | Bulk Density, Lbs./Cu.Ft.                   |         |   |               |   |
| Generator            | 2473       | per Cu.Ft. Dense Bed     | 1115           | 205 °F.                                        |      |       | 3                                    |  | 72    | Aerated                                     |         |   |               |   |
| Quench Accumulator   | 141        | per Lb. Catalyst         | 7.91           | 400                                            | 81.0 | 53.0  | 4                                    |  | 275   | Settled                                     |         |   |               |   |
| Reactor Inlet        | 292        | per sq ft                | 21212          | 400-550                                        | 8.6  | 35.1  | Total                                |  | 489   | Compacted                                   |         |   |               |   |
| Condenser Inlet      | 575        |                          |                | 550+                                           | 10.4 |       |                                      |  |       | Particle Density, gm./cc.                   |         |   |               |   |
| Product Accumulator  | 69         |                          |                |                                                |      |       | CALCULATED FROM dp                   |  |       | NH <sub>3</sub> Value, ml./gm.              |         |   |               |   |
| Catalyst No.         | Height     |                          |                | A. S. T. M. DIST. ON                           |      |       | Density, Lbs./Cu.Ft.                 |  | 141   | N <sub>2</sub> Surface, m <sup>2</sup> /gm. |         |   |               |   |
| 1                    | See Per. A | --                       |                | Naphtha °F.                                    |      |       | Inventory, Lbs.                      |  | 1771  |                                             |         |   |               |   |
| 2                    | 661        |                          |                | IBP                                            |      | 100   | Bed Depth, Ft.                       |  | 19.03 | CHEMICAL ANALYSIS                           |         |   |               |   |
| 3                    | 654        |                          |                | 10%                                            |      | 123   | Vol cu ft                            |  | 12.56 | Fe                                          |         |   |               |   |
| 4                    | 664        |                          |                | 50%                                            |      | 200   |                                      |  |       | C                                           |         |   |               |   |
| 5                    | 664        |                          |                | 90%                                            |      | 333   |                                      |  |       | O                                           |         |   |               |   |
| 6                    | 668        |                          |                | EP                                             |      | 379   |                                      |  |       | H                                           |         |   |               |   |
| 7                    | 662        |                          |                | Rec                                            |      | 96    |                                      |  |       | K <sub>2</sub> O, W+. % basis Fe            |         |   |               |   |
| 8                    | 648        |                          |                |                                                |      |       |                                      |  |       | X-Ray Analysis—                             |         |   |               |   |
| 9                    | 644        |                          |                |                                                |      |       |                                      |  |       | Fe <sub>2</sub> O <sub>3</sub>              |         |   |               |   |
| 10                   | 650        |                          |                |                                                |      |       |                                      |  |       | Fe <sub>3</sub> O <sub>4</sub>              |         |   |               |   |
| 11                   | 651        |                          |                |                                                |      |       |                                      |  |       | Fe                                          |         |   |               |   |

THE TEXAS COMPANY — MONTEBELLO LABORATORY  
YIELD CALCULATIONS

RUN NO. 66-Q  
HOURS 320-344  
CATALYST Brownsville  
Treated MS Red. @ 660P

| FRESH FEED                              |        |                        |                     | WET GAS                   |                |                     |                                                                                     | RECYCLE                               | COMBINED<br>FEED | EFFLUENT                                     | NET CHANGE |        | YIELD BASIS H <sub>2</sub> + CO FED |        |         |            |       |  |                                |                             |                                     |                  |       |  |
|-----------------------------------------|--------|------------------------|---------------------|---------------------------|----------------|---------------------|-------------------------------------------------------------------------------------|---------------------------------------|------------------|----------------------------------------------|------------|--------|-------------------------------------|--------|---------|------------|-------|--|--------------------------------|-----------------------------|-------------------------------------|------------------|-------|--|
|                                         | %      | m/hr                   | #/hr                | %                         | At Wt. Balance |                     | m/hr                                                                                | m/hr                                  | m/hr             | m/hr                                         | #/hr       | #/MCF  | #/gal                               | gal/hr | gal/MCF | CONDENSATE |       |  |                                | YIELDS                      | BASIS BROWNSVILLE DESIGN FEED RATE* |                  |       |  |
|                                         |        |                        |                     |                           | m/hr           | #/hr                |                                                                                     |                                       |                  |                                              |            |        |                                     |        |         |            |       |  |                                |                             |                                     |                  |       |  |
| CO<br>28.010                            | 37.153 | 13.914                 | 389.74              | 9.110                     | 1.308          | 36.64               | 3.669                                                                               | 17.583                                | 4.977            | 12.606                                       | 353.10     |        |                                     |        |         |            |       |  |                                |                             |                                     |                  |       |  |
| H <sub>2</sub><br>2.016                 | 59.287 | 22.204                 | 44.76               | 40.610                    | 5.829          | 11.75               | 16.353                                                                              | 38.557                                | 22.182           | 16.375                                       | 33.01      |        |                                     |        |         |            |       |  | 400 EP                         | 80.7                        | 5.696                               | 98.0             | 5.582 |  |
| CO <sub>2</sub><br>41.010               | 2.510  | 0.940                  | 41.37               | 29.283                    | 4.203          | 184.98              | 11.792                                                                              | 12.732                                | 15.995           | 3.263                                        | 143.61     | 10.477 |                                     |        |         |            |       |  | 400-550                        | 10.0                        | 0.706                               | 91.4             | 0.645 |  |
| N <sub>2</sub><br>28.016                | 0.923  | 0.346                  | 9.69                | 2.220                     | 0.319          | 8.94                | 0.894                                                                               | 1.240                                 | 1.213            |                                              |            |        |                                     |        |         |            |       |  | 550 +                          | 9.3                         | 0.656                               | 114.6            | 0.752 |  |
| CH <sub>4</sub><br>16.042               | 0.127  | 0.048                  | 0.77                | 8.716                     | 1.251          | 20.07               | 3.510                                                                               | 3.558                                 | 4.761            | 1.203                                        | 19.30      | 1.486  |                                     |        |         |            |       |  |                                |                             |                                     |                  |       |  |
| C <sub>2</sub> H <sub>6</sub><br>28.028 |        |                        |                     | 2.270                     | 0.326          | 9.15                | 0.914                                                                               | 0.914                                 | 1.240            | 0.326                                        | 9.15       | 0.668  |                                     |        |         |            |       |  |                                |                             |                                     |                  |       |  |
| C <sub>3</sub> H <sub>8</sub><br>30.068 |        |                        |                     | 1.837                     | 0.264          | 7.94                | 0.740                                                                               | 0.740                                 | 1.004            | 0.264                                        | 7.94       | 0.579  |                                     |        |         |            |       |  | PROPYLENE                      | 36.5                        | 6.39                                |                  |       |  |
| C <sub>4</sub> + C <sub>5</sub>         |        |                        |                     |                           |                |                     |                                                                                     |                                       |                  |                                              |            |        |                                     |        |         |            |       |  | C <sub>3</sub> POLY GASO.      | 87.5                        | 5.59                                | 0.935            |       |  |
| C <sub>2</sub> H <sub>4</sub><br>42.072 |        |                        |                     | 2.897                     | 0.416          | 17.50               | 1.167                                                                               | 1.167                                 | 1.583            | 0.416                                        | 17.50      | 1.277  | 4.32                                | 4.051  | 0.296   |            |       |  | C <sub>3</sub> POLY TAR        | 12.5                        | 0.080                               | 0.106            |       |  |
| C <sub>2</sub> H <sub>2</sub><br>44.074 |        |                        |                     | 0.300                     | 0.043          | 1.90                | 0.121                                                                               | 0.121                                 | 0.164            | 0.043                                        | 1.90       | 0.139  | 4.24                                | 0.448  | 0.033   |            |       |  |                                |                             |                                     |                  |       |  |
| C <sub>2</sub> H <sub>2</sub><br>56.104 |        |                        |                     | 1.487                     | 0.213          | 11.95               | 0.599                                                                               | 0.599                                 | 0.812            | 0.213                                        | 11.95      | 0.872  | 5.00                                | 2.390  | 0.174   |            |       |  |                                |                             |                                     |                  |       |  |
| C <sub>2</sub> H <sub>2</sub><br>58.020 |        |                        |                     | 0.497                     | 0.071          | 4.13                | 0.200                                                                               | 0.200                                 | 0.271            | 0.071                                        | 4.13       | 0.301  | 4.86                                | 0.850  | 0.062   |            |       |  | C <sub>4</sub> H <sub>6</sub>  | 5.00                        | --                                  | --               | 68.0  |  |
| C <sub>2</sub> H <sub>2</sub><br>70.130 |        |                        |                     | 0.510                     | 0.073          | 5.12                | 0.205                                                                               | 0.205                                 | 0.278            | 0.073                                        | 5.12       | 0.374  | 5.45                                | 0.939  | 0.069   |            |       |  | C <sub>4</sub> POLY GASO.      | 5.98                        | 10.46                               | 1.749            | 1.5   |  |
| C <sub>2</sub> H <sub>2</sub><br>72.146 |        |                        |                     | 0.140                     | 0.020          | 1.44                | 0.056                                                                               | 0.056                                 | 0.076            | 0.020                                        | 1.44       | 0.105  | 5.25                                | 0.274  | 0.020   |            |       |  | C <sub>4</sub> H <sub>10</sub> | 4.86                        | (4.13)<br>4.06                      | (0.850)<br>0.836 | 68.0  |  |
| C <sub>2</sub> H <sub>2</sub><br>84.156 |        |                        |                     | 0.123                     | 0.018          | 1.51                | 0.050                                                                               | 0.050                                 | 0.068            | 0.018                                        | 1.51       | 0.110  | 5.54                                | 0.273  | 0.020   |            |       |  | C <sub>4</sub> -FREE GASO.     |                             |                                     | 8.003            | 5.8   |  |
| C <sub>3</sub> -C <sub>6</sub>          |        |                        |                     |                           |                |                     |                                                                                     |                                       |                  |                                              |            |        |                                     |        |         |            |       |  | C <sub>4</sub> POLY TAR        | 7.53                        | 1.49                                | 0.198            |       |  |
| TOTAL                                   |        | 37.452                 | 486.33              |                           | 14.354         | 323.02              | 40.269                                                                              | 77.721                                | 60.979           |                                              |            |        |                                     |        |         |            |       |  |                                |                             |                                     |                  |       |  |
| H <sub>2</sub> + CO                     | 96.440 | 36.118                 | 13707               | SCFH                      | 7.137          |                     | 20.022                                                                              | 56.140                                | 27.159           | 28.981                                       |            |        |                                     |        |         |            |       |  |                                |                             |                                     |                  |       |  |
| H <sub>2</sub> /CO                      |        | 1.60                   | Factor              | 729554                    | 4.46           |                     | 4.46                                                                                | 2.19                                  | 4.46             | 1.30                                         |            |        |                                     |        |         |            |       |  |                                | 10 # RVP 400 EP<br>GASOLINE | 10.588                              | 0.7725           | 4188  |  |
| Weight Recovery, %                      | 93.64  | Catalyst Age, hrs.     |                     |                           |                | Space Velocity, vhr |                                                                                     | 1091                                  | RECOVERED OIL ** |                                              | 0.318      | 44.64  | 3.257                               |        | 7.058   | 0.515      |       |  | GAS OIL                        | 0.645                       | 0.0471                              | 255              |       |  |
| Pressure, psig                          | 403    | Inlet Velocity, Ft/sec |                     |                           |                | 0.94                | Catalyst Vol CP                                                                     |                                       | 12.56            | TOTAL OIL                                    |            | 88.19  | 6.434                               |        | 16.283  | 1.189      |       |  | FUEL OIL                       | 0.752                       | 0.0549                              | 298              |       |  |
| Temperature, °F                         | 662    | Bed Depth, Ft          |                     |                           |                | 19.03               | Weight, #                                                                           |                                       | 1746             | WATER SOLUBLE<br>CHEMICALS **                |            | 0.283  | 14.99                               | 1.094  |         | 1.866      | 0.136 |  |                                | POLY TAR                    | 0.304                               | 0.0222           | 120   |  |
| Recycle Ratio                           | 1.08   | Bed Density, #/CF      |                     |                           |                | 139                 | Effluent (H <sub>2</sub> )(CO) <sub>2</sub><br>Shift Ratio (H <sub>2</sub> O)(CO) = |                                       |                  | TOTAL LIQUID<br>PRODUCTS C <sub>2</sub> + ** |            | 103.18 | 7.528                               |        | 18.149  | 1.325      |       |  | TOTAL                          | 12.289                      | 0.8967                              | 4861             |       |  |
| FRESH FEED CONVERSION — %               |        |                        |                     | TOTAL FEED CONVERSION — % |                |                     |                                                                                     | SELECTIVITY                           |                  | NET WATER                                    |            | 5.755  | 103.69                              | 7.565  |         | 12.484     | 0.911 |  | W. S. CHEM.                    | 1.866                       | 0.1361                              | 738              |       |  |
| Contraction                             | CO     | H <sub>2</sub>         | H <sub>2</sub> + CO | CO                        | H <sub>2</sub> | CO + H <sub>2</sub> | C <sub>3</sub> + C <sub>4</sub> +                                                   | GROSS WATER                           |                  | 118.68                                       | 8.658      |        | 14.350                              | 1.047  |         |            |       |  | TOTAL                          | 14.155                      | 1.0328                              | 5599             |       |  |
| 61.67                                   | 90.60  | 73.75                  | 80.24               | 71.69                     | 42.47          | 51.62               | 73.93                                                                               | HYDROCARBON<br>TOTAL—C <sub>2</sub> + |                  | 139.57                                       | 10.183     |        |                                     |        |         |            |       |  |                                |                             |                                     |                  |       |  |

Form ML-11

\*\* Included in Reactor Effluent Total

g/NCM = 16.91 X #/MCF \*9488 MCFH H<sub>2</sub> + CO, Bbl/Day = 5421.6 X gal/MCF

THE TEXAS COMPANY — MONTEBELLO LABORATORY  
DATA SUMMARY

RUN NO. 66-Q  
HOURS 320-344

| OPERATING CONDITIONS |            |                          |                | PRODUCT TESTS                                  |           |       | CATALYST DATA                        |  |       |                                             |         |   |               |   |
|----------------------|------------|--------------------------|----------------|------------------------------------------------|-----------|-------|--------------------------------------|--|-------|---------------------------------------------|---------|---|---------------|---|
| PRESSURES PSIG       |            |                          | RATES S.C.F.H. |                                                | OIL       | WATER | INVENTORY DATA                       |  |       | PARTICLE SIZE                               |         |   |               |   |
| Oxygen               | 428        | Fresh Feed               | 14213          | * API                                          | 54.8      | 11.0  | In Reactor at Start of Period        |  |       | Screen Analysis                             |         |   | Sedimentation |   |
| Natural Gas          | 429        | Recycle                  | 15282          | Neut. No.                                      | 48.2      | 37.6  | Fresh Catalyst Added                 |  |       | Mesh                                        | Microns | % | Microns       | % |
| Generator Outlet     | 407        | Combined Feed            | 29495          | Sap. No.                                       | 64.5      | 40.6  | Total                                |  |       | On 40                                       | 419+    |   | 80+           |   |
| Reactor Inlet        | 403        | Wet Gas—Measured         | 4926           | Hydrox. No.                                    |           |       | Catalyst Recovered                   |  |       | 100                                         | 150     |   | 40—80         |   |
| Condenser Inlet      |            | Adjusted                 | 5447           | Bromine No.                                    | 98        |       | In Reactor at End of Period          |  |       | 150                                         | 105     |   | 20—40         |   |
| Product Accumulator  | 375        | Loss                     | 521            | Pour °F.                                       | Below -30 |       |                                      |  |       | 200                                         | 74      |   | 10—20         |   |
|                      |            |                          |                | Chemicals, % by K <sub>2</sub> CO <sub>3</sub> |           | 13.0  | REACTOR d-p, Inches H <sub>2</sub> O |  |       | 250                                         | 62      |   | 0—20          |   |
|                      |            |                          |                |                                                |           |       | No. Height                           |  |       | 325                                         | 44      |   |               |   |
| TEMPERATURES—°F.     |            | Recycle/Fresh Feed       | 1.08           |                                                |           |       | 0 See Per. A                         |  |       | <325                                        |         |   |               |   |
| Oxygen               | 490        | Inlet Velocity—ft./sec.  | 0.94           |                                                |           |       | 1                                    |  | 67    | CATALYST                                    |         |   |               |   |
| Natural Gas          | 802        | Fresh Feed Rate—S.C.F.H. | 13707          | HEMPEL, DIST. %                                |           | *API  | 2                                    |  | 73    | Bulk Density, Lbs./Cu.Ft.                   |         |   |               |   |
| Generator            | 2478       | per Cu. Ft. Dense Bed    | 1091           | 205 °F.                                        |           |       | 3                                    |  | 70    | Aerated                                     |         |   |               |   |
| Quench Accumulator   | 143        | per Lb. Catalyst         | 7.85           | 400                                            | 79.7      | 53.9  | 4                                    |  | 272   | Settled                                     |         |   |               |   |
| Reactor Inlet        | 292        | per sq ft                | 20768          | 400-550                                        | 10.0      | 37.1  | Total                                |  | 482   | Compacted                                   |         |   |               |   |
| Condenser Inlet      | 580        |                          |                | 550+                                           | 10.3      |       |                                      |  |       | Particle Density, gm./cc.                   |         |   |               |   |
| Product Accumulator  | 68         |                          |                |                                                |           |       | CALCULATED FROM dp                   |  |       | NH <sub>3</sub> Value, ml./gm.              |         |   |               |   |
| Catalyst No.         | Height     |                          |                | A. S. T. M. DIST. ON                           |           |       | Density, Lbs./Cu.Ft.                 |  | 139   | N <sub>2</sub> Surface, m <sup>2</sup> /gm. |         |   |               |   |
| 1                    | See Per. A | --                       |                | Naphtha °F.                                    |           |       | Inventory, Lbs.                      |  | 1746  |                                             |         |   |               |   |
| 2                    | 662        |                          |                | IBP                                            | 100       |       | Bed Depth, Ft.                       |  | 19.03 | CHEMICAL ANALYSIS                           |         |   |               |   |
| 3                    | 655        |                          |                | 10%                                            | 124       |       | Vol cu ft                            |  | 12.56 | Fe                                          |         |   |               |   |
| 4                    | 664        |                          |                | 50%                                            | 208       |       |                                      |  |       | C                                           |         |   |               |   |
| 5                    | 664        |                          |                | 90%                                            | 339       |       |                                      |  |       | O                                           |         |   |               |   |
| 6                    | 667        |                          |                | EP                                             | 373       |       |                                      |  |       | H                                           |         |   |               |   |
| 7                    | 663        |                          |                | Rec                                            | 96.5      |       |                                      |  |       | K <sub>2</sub> O, W+, % basis Fe            |         |   |               |   |
| 8                    | 649        |                          |                |                                                |           |       |                                      |  |       | X-Ray Analysis—                             |         |   |               |   |
| 9                    | 646        |                          |                |                                                |           |       |                                      |  |       | Fe <sub>2</sub> O <sub>3</sub>              |         |   |               |   |
| 10                   | 655        |                          |                |                                                |           |       |                                      |  |       | Fe <sub>2</sub> O <sub>4</sub>              |         |   |               |   |
| 11                   | 652        |                          |                |                                                |           |       |                                      |  |       | Fe                                          |         |   |               |   |

**THE TEXAS COMPANY — MONTEBELLO LABORATORY**  
**YIELD CALCULATIONS**

RUN NO. 66-R  
HOURS 344-368  
CATALYST Brownville  
Treated MS Rec. @ 660P

| FRESH FEED                                |        |                |                        | WET GAS                   |                                                                                     |                     |                                           | RECYCLE                                              | COMBINED<br>FEED | EFFLUENT | NET CHANGE |        | YIELD BASIS H <sub>2</sub> + CO FED |         |                                            |                                |        |                         |         |       |  |  |
|-------------------------------------------|--------|----------------|------------------------|---------------------------|-------------------------------------------------------------------------------------|---------------------|-------------------------------------------|------------------------------------------------------|------------------|----------|------------|--------|-------------------------------------|---------|--------------------------------------------|--------------------------------|--------|-------------------------|---------|-------|--|--|
|                                           | %      | m/hr           | #/hr                   | %                         | At Wt. Balance                                                                      |                     | m/hr                                      | m/hr                                                 | m/hr             | #/hr     | CONDENSATE |        |                                     |         | YIELDS BASIS BROWNSVILLE DESIGN FEED RATE* |                                |        |                         |         |       |  |  |
|                                           |        |                |                        |                           | m/hr                                                                                | #/hr                |                                           |                                                      |                  |          | #/MCF      | #/gal  | gal/hr                              | gal/MCF |                                            | CORRECTED<br>HEMPEL, %         | gal/hr | TREATING<br>RECOVERY, % | gal/hr  |       |  |  |
| CO<br>28.010                              | 36.427 | 13.634         | 381.89                 | 9.003                     | 1.310                                                                               | 36.69               | 3.680                                     | 17.314                                               | 4.990            | -12.324  | 345.20     |        |                                     |         |                                            |                                |        |                         |         |       |  |  |
| H <sub>2</sub><br>2.016                   | 60.086 | 22.489         | 45.34                  | 41.787                    | 6.080                                                                               | 12.26               | 17.080                                    | 39.569                                               | 23.160           | -16.409  | -33.08     |        |                                     |         |                                            | 400 EP                         | 80.5   | 5.480                   | 98.0    | 5.370 |  |  |
| CO <sub>2</sub><br>44.010                 | 2.250  | 0.842          | 37.06                  | 27.963                    | 4.070                                                                               | 179.11              | 11.430                                    | 12.272                                               | 15.600           | 3.228    | 142.05     | 10.362 |                                     |         |                                            | 400-550                        | 8.0    | 0.545                   | 91.4    | 0.498 |  |  |
| N <sub>2</sub><br>26.016                  | 1.137  | 0.426          | 11.93                  | 2.793                     | 0.406                                                                               | 11.37               | 1.142                                     | 1.568                                                | 1.548            |          |            |        |                                     |         |                                            | 550 +                          | 11.5   | 0.783                   | 114.6   | 0.897 |  |  |
| CH <sub>4</sub><br>16.042                 | 0.100  | 0.037          | 0.59                   | 8.417                     | 1.225                                                                               | 19.65               | 3.440                                     | 3.477                                                | 4.665            | 1.188    | 19.06      | 1.390  |                                     |         |                                            |                                |        |                         |         |       |  |  |
| C <sub>2</sub> H <sub>6</sub><br>26.028   |        |                |                        | 2.223                     | 0.323                                                                               | 9.06                | 0.909                                     | 0.909                                                | 1.232            | 0.323    | 9.06       | 0.661  |                                     |         |                                            |                                |        |                         |         |       |  |  |
| C <sub>3</sub> H <sub>8</sub><br>30.028   |        |                |                        | 1.737                     | 0.253                                                                               | 7.61                | 0.710                                     | 0.710                                                | 0.963            | 0.253    | 7.61       | 0.555  |                                     |         |                                            | PROPYLENE                      | 36.2   | 6.14                    |         |       |  |  |
| C <sub>4</sub> + C <sub>5</sub>           |        |                |                        |                           |                                                                                     |                     |                                           |                                                      |                  | 35.73    | 2.606      |        |                                     |         |                                            | C <sub>3</sub> POLY GASOL.     | 87.5   | 5.37                    | 0.898   |       |  |  |
| C <sub>6</sub> H <sub>14</sub><br>42.078  |        |                |                        | 2.767                     | 0.403                                                                               | 16.96               | 1.131                                     | 1.131                                                | 1.534            | 0.403    | 16.96      | 1.257  | 4.32                                | 3.926   | 0.286                                      | C <sub>3</sub> POLY TAR        | 12.5   | 0.77                    | 0.102   |       |  |  |
| C <sub>8</sub> H <sub>18</sub><br>44.094  |        |                |                        | 0.300                     | 0.044                                                                               | 1.94                | 0.123                                     | 0.123                                                | 0.167            | 0.044    | 1.94       | 0.142  | 4.24                                | 0.458   | 0.033                                      |                                |        |                         |         |       |  |  |
| C <sub>10</sub> H <sub>22</sub><br>54.104 |        |                |                        | 1.570                     | 0.228                                                                               | 12.79               | 0.642                                     | 0.642                                                | 0.870            | 0.228    | 12.79      | 0.933  | 3.00                                | 2.558   | 0.187                                      |                                | #/gal  | #/hr                    | gal/hr  | RVP   |  |  |
| C <sub>12</sub> H <sub>26</sub><br>58.120 |        |                |                        | 0.490                     | 0.071                                                                               | 4.13                | 0.200                                     | 0.200                                                | 0.271            | 0.071    | 4.13       | 0.301  | 4.86                                | 0.850   | 0.062                                      | C <sub>4</sub> H <sub>10</sub> | 5.00   | 0.06                    | 0.012   | 68.0  |  |  |
| C <sub>14</sub> H <sub>30</sub><br>70.130 |        |                |                        | 0.613                     | 0.089                                                                               | 6.24                | 0.251                                     | 0.251                                                | 0.340            | 0.089    | 6.24       | 0.455  | 5.48                                | 1.145   | 0.084                                      | C <sub>4</sub> POLY GASOL.     | 5.98   | 11.14                   | 1.863   | 1.5   |  |  |
| C <sub>16</sub> H <sub>34</sub><br>72.146 |        |                |                        | 0.160                     | 0.023                                                                               | 1.66                | 0.065                                     | 0.065                                                | 0.088            | 0.023    | 1.66       | 0.121  | 3.25                                | 0.316   | 0.023                                      | C <sub>4</sub> H <sub>10</sub> | 4.86   | 4.13                    | 0.850   | 68.0  |  |  |
| C <sub>18</sub> H <sub>38</sub><br>84.156 |        |                |                        | 0.177                     | 0.026                                                                               | 2.19                | 0.072                                     | 0.072                                                | 0.098            | 0.026    | 2.19       | 0.160  | 5.54                                | 0.395   | 0.029                                      | C <sub>4</sub> -FREE GASOL.    |        |                         | 8.124   | 5.8   |  |  |
| C <sub>2</sub> -C <sub>4</sub>            |        |                |                        |                           |                                                                                     |                     |                                           |                                                      |                  |          |            |        | 45.91                               | 3.349   |                                            | C <sub>4</sub> POLY TAR        | 7.53   | 1.59                    | 0.211   |       |  |  |
| TOTAL                                     |        | 37.428         | 476.81                 |                           | 14.551                                                                              | 321.66              | 40.875                                    | 78.303                                               | 61.381           |          |            |        |                                     |         |                                            |                                |        |                         |         |       |  |  |
| H <sub>2</sub> + CO                       | 96.513 | 36.123         | 13709                  | SCFH                      | 7.390                                                                               |                     | 20.760                                    | 56.883                                               | 28.150           | -28.733  |            |        |                                     |         |                                            |                                | gal/hr | gal/MCF                 | Bbl/Day |       |  |  |
| H <sub>2</sub> /CO                        |        | 1.65           | Factor                 | 729447                    | 4.64                                                                                |                     | 4.64                                      | 2.29                                                 | 4.64             | 1.33     |            |        |                                     |         |                                            | 10 # RVP 400 EP<br>GASOLINE    | 10.849 | 0.7914                  | 4291    |       |  |  |
| Weight Recovery, %                        | 93.75  |                | Catalyst Age, hrs.     |                           | Space Velocity, vhr                                                                 | 1111                | RECOVERED OIL **                          | 0.306                                                | 42.93            | 3.132    |            |        | 6.808                               | 0.497   |                                            | GAS OIL                        | 0.498  | 0.0363                  | 197     |       |  |  |
| Pressure, psig                            | 401    |                | Inlet Velocity, Ft/sec | 0.95                      | Catalyst Vol CF                                                                     | 12.34               | TOTAL OIL                                 |                                                      | 88.94            | 6.481    |            |        | 16.456                              | 1.201   |                                            | FUEL OIL                       | 0.897  | 0.0654                  | 355     |       |  |  |
| Temperature, °F                           | 659    |                | Bed Depth, Ft          | 18.69                     | Weight, #                                                                           | 1715                | WATER SOLUBLE<br>CHEMICALS **             | 0.298                                                | 15.81            | 1.153    |            |        | 1.995                               | 0.146   |                                            | POLY TAR                       | 0.313  | 0.0228                  | 124     |       |  |  |
| Recycle Ratio                             | 1.09   |                | Bed Density, #/CF      | 139                       | Effluent (H <sub>2</sub> )(CO) <sub>2</sub><br>Shift Ratio (H <sub>2</sub> O)(CO) = |                     | TOTAL LIQUID<br>PRODUCTS C <sub>4</sub> + |                                                      | 104.65           | 7.634    |            |        | 18.451                              | 1.347   |                                            | TOTAL                          | 12.557 | 0.9159                  | 4967    |       |  |  |
| FRESH FEED CONVERSION — %                 |        |                |                        | TOTAL FEED CONVERSION — % |                                                                                     |                     | SELECTIVITY                               | NET WATER **                                         | 5.351            | 96.41    | 7.033      |        | 11.574                              | 0.844   |                                            | W. S. CHEM.                    | 1.995  | 0.1455                  | 789     |       |  |  |
| Contraction                               | CO     | H <sub>2</sub> | H <sub>2</sub> + CO    | CO                        | H <sub>2</sub>                                                                      | CO + H <sub>2</sub> | C <sub>3</sub> + C <sub>4</sub> +         | GROSS WATER<br>HYDROCARBON<br>TOTAL—C <sub>4</sub> + |                  | 112.22   | 8.186      |        | 13.569                              | 0.990   |                                            | TOTAL                          | 14.552 | 1.0614                  | 5756    |       |  |  |
| 61.12                                     | 90.39  | 72.96          | 79.54                  | 71.18                     | 41.47                                                                               | 50.51               | 74.55                                     |                                                      |                  | 140.38   | 10.240     |        |                                     |         |                                            |                                |        |                         |         |       |  |  |

Form ML-11

\*\* Included in Reactor Effluent Total

g/NCM = 16.91 X #/MCF \*9488 MCFH H<sub>2</sub> + CO, Bbl/Day = 5421.6 X gal/MCF

**THE TEXAS COMPANY — MONTEBELLO LABORATORY**  
**DATA SUMMARY**

RUN NO. 66-R  
HOURS 344-368

| OPERATING CONDITIONS |        |                          |       | PRODUCT TESTS                                  |      |       | CATALYST DATA                        |  |                 |                                             |               |         |   |
|----------------------|--------|--------------------------|-------|------------------------------------------------|------|-------|--------------------------------------|--|-----------------|---------------------------------------------|---------------|---------|---|
| PRESSURES PSIG       |        | RATES S.C.F.H.           |       |                                                | OIL  | WATER | INVENTORY DATA                       |  | PARTICLE SIZE   |                                             |               |         |   |
| Oxygen               | 427    | Fresh Feed               | 14204 | ° API                                          | 55.3 | 11.0  | In Reactor at Start of Period        |  | Screen Analysis |                                             | Sedimentation |         |   |
| Natural Gas          | 430    | Recycle                  | 15512 | Neut. No.                                      | 49.2 | 37.8  | Fresh Catalyst Added                 |  | Mesh            | Microns                                     | %             | Microns | % |
| Generator Outlet     | 406    | Combined Feed            | 29716 | Sap. No.                                       | 66.9 | 41.5  | Total                                |  | On 40           | 419+                                        |               | 80+     |   |
| Reactor Inlet        | 401    | Wet Gas—Measured         | 5011  | Hydrox. No.                                    |      |       | Catalyst Recovered                   |  | 21              | 100                                         | 150           | 40—80   |   |
| Condenser Inlet      |        | Adjusted                 | 5522  | Bromine No.                                    | 98   |       | In Reactor at End of Period          |  | 150             | 105                                         |               | 20—40   |   |
| Product Accumulator  | 375    | Loss                     | 511   | Pour °F.                                       |      |       |                                      |  | 200             | 74                                          |               | 10—20   |   |
|                      |        |                          |       | Chemicals, % by K <sub>2</sub> CO <sub>3</sub> |      | 14.7  | REACTOR d-p, Inches H <sub>2</sub> O |  | 250             | 62                                          |               | 0—20    |   |
|                      |        |                          |       |                                                |      |       | No. Height                           |  | 325             | 44                                          |               |         |   |
| TEMPERATURES—°F.     |        | Recycle/Fresh Feed       | 1.09  |                                                |      |       | 0 See Per. A                         |  | <325            |                                             |               |         |   |
| Oxygen               | 479    | Inlet Velocity—ft./sec.  | 0.95  |                                                |      |       | 1                                    |  | 66              | CATALYST                                    |               |         |   |
| Natural Gas          | 797    | Fresh Feed Rate—S.C.F.H. | 13709 | HEMPEL, DIST. %                                |      | °API  | 2                                    |  | 72              | Bulk Density, Lbs./Cu.Ft.                   |               |         |   |
| Generator            | 2489   | per Cu.Ft. Dense Bed     | 1111  | 205 °F.                                        |      |       | 3                                    |  | 73              | Aerated                                     |               |         |   |
| Quench Accumulator   | 140    | per Lb. Catalyst         | 7.99  | 400                                            | 79.5 | 55.6  | 4                                    |  | 262             | Settled                                     |               |         |   |
| Reactor Inlet        | 290    | per sq ft                | 20771 | 400-550                                        | 8.0  | 36.0  | Total                                |  | 473             | Compacted                                   |               |         |   |
| Condenser Inlet      | 572    |                          |       | 550+                                           | 12.5 |       |                                      |  |                 | Particle Density, gm./cc.                   |               |         |   |
| Product Accumulator  | 65     |                          |       |                                                |      |       | CALCULATED FROM dp                   |  |                 | NH <sub>3</sub> Value, ml./gm.              |               |         |   |
| Catalyst No.         | Height |                          |       | A. S. T. M. DIST. ON                           |      |       | Density, Lbs./Cu.Ft.                 |  | 139             | N <sub>2</sub> Surface, m <sup>2</sup> /gm. |               |         |   |
| 1 See Per. A         | --     |                          |       | Naphtha °F.                                    |      |       | Inventory, Lbs.                      |  | 1715            |                                             |               |         |   |
| 2                    | 658    |                          |       | IBP                                            | 100  |       | Bed Depth, Ft.                       |  | 18.69           | CHEMICAL ANALYSIS                           |               |         |   |
| 3                    | 651    |                          |       | 10%                                            | 124  |       | Vol cu ft                            |  | 12.34           | Fe                                          |               |         |   |
| 4                    | 661    |                          |       | 50%                                            | 200  |       |                                      |  |                 | C                                           |               |         |   |
| 5                    | 661    |                          |       | 90%                                            | 330  |       |                                      |  |                 | O                                           |               |         |   |
| 6                    | 665    |                          |       | EP                                             | 374  |       |                                      |  |                 | H                                           |               |         |   |
| 7                    | 660    |                          |       | Rec                                            | 96   |       |                                      |  |                 | K <sub>2</sub> O, W+-. % basis Fe           |               |         |   |
| 8                    | 648    |                          |       |                                                |      |       |                                      |  |                 | X-Ray Analysis—                             |               |         |   |
| 9                    | 645    |                          |       |                                                |      |       |                                      |  |                 | Fe <sub>2</sub> O <sub>3</sub>              |               |         |   |
| 10                   | 654    |                          |       |                                                |      |       |                                      |  |                 | Fe <sub>2</sub> O <sub>4</sub>              |               |         |   |
| 11                   | 642    |                          |       |                                                |      |       |                                      |  |                 | Fe                                          |               |         |   |

**THE TEXAS COMPANY — MONTEBELLO LABORATORY**  
**YIELD CALCULATIONS**

RUN NO. 66-3  
HOURS 368-392  
CATALYST Brownsville  
Treated MS Red. @ 650P

| FRESH FEED                              |        |                        |                    | WET GAS                   |                |                     | RECYCLE                                                                           | COMBINED<br>FEED | EFFLUENT                              | NET CHANGE |               | YIELD BASIS H <sub>2</sub> + CO FED       |        |        |         |                                            |                           |                        |                             |                         |             |        |        |     |
|-----------------------------------------|--------|------------------------|--------------------|---------------------------|----------------|---------------------|-----------------------------------------------------------------------------------|------------------|---------------------------------------|------------|---------------|-------------------------------------------|--------|--------|---------|--------------------------------------------|---------------------------|------------------------|-----------------------------|-------------------------|-------------|--------|--------|-----|
|                                         | %      | m/hr                   | #/hr               | %                         | At Wt. Balance |                     | m/hr                                                                              | m/hr             | m/hr                                  | m/hr       | #/hr          | CONDENSATE                                |        |        |         | YIELDS BASIS BROWNSVILLE DESIGN FEED RATE* |                           |                        |                             |                         |             |        |        |     |
|                                         |        |                        |                    |                           | m/hr           | #/hr                |                                                                                   |                  |                                       |            |               | #/MCF                                     | #/gal  | gal/hr | gal/MCF |                                            |                           | CORRECTED<br>HEMPR., % | gal/hr                      | TREATING<br>RECOVERY, % | gal/hr      |        |        |     |
| CO<br>28.010                            | 38.387 | 13.988                 | 391.90             | 10.410                    | 1.534          | 42.97               | 4.153                                                                             | 18.141           | 5.687                                 | -12.454    | -348.83       |                                           |        |        |         |                                            |                           |                        |                             |                         |             |        |        |     |
| H <sub>2</sub><br>2.016                 | 57.843 | 21.078                 | 42.49              | 39.390                    | 5.802          | 11.70               | 15.715                                                                            | 36.793           | 21.517                                | -15.276    | -30.79        |                                           |        |        |         |                                            | 400 EP                    | 80.9                   | 5.090                       | 98.0                    | 4.988       |        |        |     |
| CO <sub>2</sub><br>44.010               | 2.420  | 0.882                  | 38.82              | 28.890                    | 4.256          | 187.31              | 11.526                                                                            | 12.408           | 15.782                                | 3.374      | 148.49        | 11.158                                    |        |        |         |                                            | 400-550                   | 8.1                    | 0.510                       | 91.4                    | 0.499       |        |        |     |
| N <sub>2</sub><br>28.016                | 1.200  | 0.437                  | 12.24              | 2.700                     | 0.398          | 11.15               | 1.077                                                                             | 1.514            | 1.475                                 |            |               |                                           |        |        |         |                                            | 550 +                     | 11.0                   | 0.692                       | 114.6                   | 0.793       |        |        |     |
| CH <sub>4</sub><br>16.042               | 0.150  | 0.055                  | 0.88               | 8.367                     | 1.233          | 19.78               | 3.338                                                                             | 3.283            | 4.571                                 | 1.178      | 18.90         | 1.420                                     |        |        |         |                                            |                           |                        |                             |                         |             |        |        |     |
| C <sub>2</sub> H <sub>6</sub><br>28.028 |        |                        |                    | 2.327                     | 0.343          | 9.62                | 0.928                                                                             | 0.928            | 1.271                                 | 0.343      | 9.62          | 0.723                                     |        |        |         |                                            |                           | RECOVERY               | #/hr                        | gal/hr                  |             |        |        |     |
| C <sub>3</sub> H <sub>8</sub><br>30.068 |        |                        |                    | 1.820                     | 0.268          | 8.06                | 0.726                                                                             | 0.726            | 0.994                                 | 0.268      | 8.06          | 0.606                                     |        |        |         |                                            | PROPYLENE                 | 33.0                   | 5.900                       |                         |             |        |        |     |
| C <sub>4</sub> + C <sub>5</sub>         |        |                        |                    |                           |                |                     |                                                                                   |                  |                                       |            | 36.58         | 2.749                                     |        |        |         |                                            | C <sub>3</sub> POLY GASO. | 87.5                   | 5.163                       | 0.863                   |             |        |        |     |
| C <sub>2</sub> H <sub>4</sub><br>42.078 |        |                        |                    | 2.887                     | 0.425          | 17.88               | 1.152                                                                             | 1.152            | 1.577                                 | 0.425      | 17.88         | 1.344                                     | 4.32   | 4.139  | 0.311   |                                            | C <sub>3</sub> POLY TAR   | 12.5                   | 0.737                       | 0.098                   |             |        |        |     |
| C <sub>2</sub> H <sub>2</sub><br>44.024 |        |                        |                    | 0.323                     | 0.048          | 2.12                | 0.129                                                                             | 0.129            | 0.177                                 | 0.048      | 2.12          | 0.159                                     | 4.24   | 0.500  | 0.038   |                                            |                           |                        |                             |                         |             |        |        |     |
| C <sub>2</sub> H <sub>6</sub><br>56.104 |        |                        |                    | 1.563                     | 0.230          | 12.90               | 0.624                                                                             | 0.624            | 0.854                                 | 0.230      | 12.90         | 0.969                                     | 8.00   | 2.580  | 0.194   |                                            |                           | #/gal                  | #/hr                        | gal/hr                  | RVP         |        |        |     |
| C <sub>2</sub> H <sub>4</sub><br>58.120 |        |                        |                    | 0.460                     | 0.068          | 3.95                | 0.184                                                                             | 0.184            | 0.252                                 | 0.068      | 3.95          | 0.297                                     | 4.86   | 0.813  | 0.061   | C <sub>4</sub> H <sub>8</sub>              | 5.00                      | 0.05                   | 0.010                       | 68.0                    |             |        |        |     |
| C <sub>2</sub> H <sub>6</sub><br>70.130 |        |                        |                    | 0.573                     | 0.084          | 5.89                | 0.229                                                                             | 0.229            | 0.313                                 | 0.084      | 5.89          | 0.443                                     | 5.45   | 1.081  | 0.081   | C <sub>4</sub> POLY GASO.                  | 5.98                      | 11.24                  | 1.880                       | 1.5                     |             |        |        |     |
| C <sub>2</sub> H <sub>4</sub><br>72.146 |        |                        |                    | 0.140                     | 0.021          | 1.52                | 0.056                                                                             | 0.056            | 0.077                                 | 0.021      | 1.52          | 0.114                                     | 5.25   | 0.290  | 0.022   | C <sub>4</sub> H <sub>10</sub>             | 4.86                      | 3.95                   | 0.813                       | 68.0                    |             |        |        |     |
| C <sub>2</sub> H <sub>2</sub><br>84.152 |        |                        |                    | 0.150                     | 0.022          | 1.85                | 0.060                                                                             | 0.060            | 0.082                                 | 0.022      | 1.85          | 0.139                                     | 5.84   | 0.334  | 0.025   | C <sub>4</sub> FREE GASO.                  |                           |                        | 7.556                       | 5.8                     |             |        |        |     |
| C <sub>3</sub> -C <sub>4</sub>          |        |                        |                    |                           |                |                     |                                                                                   |                  |                                       |            | 46.11         | 3.465                                     |        | 9.737  | 0.732   | C <sub>4</sub> POLY TAR                    | 7.53                      | 1.61                   | 0.214                       |                         |             |        |        |     |
| TOTAL                                   | 36.440 | 36.440                 | 486.24             |                           | 14.732         | 336.68              | 39.897                                                                            | 76.337           | 60.422                                |            |               |                                           |        |        |         |                                            |                           |                        |                             |                         |             |        |        |     |
| H <sub>2</sub> +CO                      |        | 35.066                 | 13308              | SCFH                      | 7.336          |                     | 19.868                                                                            | 54.934           | 27.204                                | -27.730    |               |                                           |        |        |         |                                            |                           |                        | gal/hr                      | gal / MCF               | Bbl/Day     |        |        |     |
| H <sub>2</sub> /CO                      |        | 1.51                   | Factor             | 751427                    | 3.78           |                     | 3.78                                                                              | 2.03             | 3.78                                  | 1.23       |               |                                           |        |        |         |                                            |                           |                        | 10 # RVP 400 EP<br>GASOLINE | 10.259                  | 0.7709      | 4180   |        |     |
| Weight Recovery, %                      | 92.74  | Catalyst Age, hrs.     |                    |                           |                | Space Velocity, vhr |                                                                                   |                  |                                       | 1104       | RECOVERED OIL |                                           | **     | 0.285  | 39.94   | 3.001                                      |                           | 6.292                  | 0.472                       | GAS OIL                 | 0.499       | 0.0375 | 203    |     |
| Pressure, psig                          | 401    | Inlet Velocity, Ft/sec |                    |                           |                | 0.93                | Catalyst Vol CF                                                                   |                  |                                       |            | 12.05         | TOTAL OIL                                 |        |        | 86.05   | 6.466                                      |                           | 16.029                 | 1.204                       | FUEL OIL                | 0.793       | 0.0596 | 323    |     |
| Temperature, °F                         | 656    | Bed Depth, Ft          |                    |                           |                | 18.25               | Weight, #                                                                         |                  |                                       |            | 1639          | WATER SOLUBLE<br>CHEMICALS **             |        | 0.295  | 15.70   | 1.180                                      |                           | 1.990                  | 0.150                       | POLY TAR                | 0.312       | 0.0234 | 127    |     |
| Recycle Ratio                           | 1.09   | Bed Density, #/CF      |                    |                           |                | 136                 | Effluent (H <sub>2</sub> )/CO <sub>2</sub><br>Shift Ratio (H <sub>2</sub> O)/CO = |                  |                                       |            |               | TOTAL LIQUID<br>PRODUCTS C <sub>4</sub> + |        | **     | 101.75  | 7.646                                      |                           | 18.019                 | 1.354                       | TOTAL                   | 11.863      | 0.8914 | 4833   |     |
| FRESH FEED CONVERSION — %               |        |                        |                    | TOTAL FEED CONVERSION — % |                |                     |                                                                                   | SELECTIVITY      |                                       |            |               | NET WATER                                 |        | **     | 5.213   | 93.92                                      | 7.057                     |                        | 11.275                      | 0.847                   | W. S. CHEM. | 1.990  | 0.1495 | 811 |
| Contraction                             | CO     | H <sub>2</sub>         | H <sub>2</sub> +CO | CO                        | H <sub>2</sub> | CO+H <sub>2</sub>   | C <sub>3</sub> + /C <sub>4</sub> +                                                |                  | GROSS WATER                           |            |               | 109.62                                    | 8.237  |        | 13.265  | 0.997                                      |                           | TOTAL                  | 13.853                      | 1.0409                  | 5644        |        |        |     |
| 59.57                                   | 89.03  | 72.47                  | 79.08              | 68.65                     | 41.52          | 50.48               | 73.56                                                                             |                  | HYDROCARBON<br>TOTAL—C <sub>4</sub> + |            |               | 138.33                                    | 10.394 |        |         |                                            |                           |                        |                             |                         |             |        |        |     |

Form ML-11

\*\* Included in Reactor Effluent Total

g/NCM = 16.91 X #/MCF

\*9488 MCFH H<sub>2</sub> + CO, Bbl/Day = 5421.6 X gal/MCF

**THE TEXAS COMPANY — MONTEBELLO LABORATORY**  
**DATA SUMMARY**

RUN NO. 66-3  
HOURS 368-392

| OPERATING CONDITIONS |        |                          |       | PRODUCT TESTS                                  |      |       | CATALYST DATA                        |  |                 |                                             |
|----------------------|--------|--------------------------|-------|------------------------------------------------|------|-------|--------------------------------------|--|-----------------|---------------------------------------------|
| PRESSURES PSIG       |        | RATES S.C.F.H.           |       |                                                | OIL  | WATER | INVENTORY DATA                       |  | PARTICLE SIZE   |                                             |
| Oxygen               | 427    | Fresh Feed               | 13829 | * API                                          | 54.1 | 11.1  | In Reactor at Start of Period        |  | Screen Analysis |                                             |
| Natural Gas          | 426    | Recycle                  | 15141 | Neut. No.                                      | 50.7 | 38.2  | Fresh Catalyst Added                 |  | Mesh            | Microns %                                   |
| Generator Outlet     | 406    | Combined Feed            | 28970 | Sap. No.                                       | 67.4 | 41.2  | Total                                |  | On 40           | 419+ %                                      |
| Reactor Inlet        | 401    | Wet Gas—Measured         | 5005  | Hydrox. No.                                    |      |       | Catalyst Recovered                   |  | 100             | 150                                         |
| Condenser Inlet      |        | Adjusted                 | 5591  | Bromine No.                                    | 100  |       | In Reactor at End of Period          |  | 150             | 105                                         |
| Product Accumulator  | 375    | Loss                     | 586   | Pour °F.                                       |      |       |                                      |  | 200             | 74                                          |
|                      |        |                          |       | Chemicals, % by K <sub>2</sub> CO <sub>3</sub> |      | 15.0  | REACTOR d-p, Inches H <sub>2</sub> O |  | 250             | 62                                          |
|                      |        |                          |       |                                                |      |       | No. Height                           |  | 325             | 44                                          |
|                      |        |                          |       |                                                |      |       | O See Per. A                         |  | <325            |                                             |
| TEMPERATURES—°F.     |        | Recycle/Fresh Feed       | 1.09  |                                                |      |       |                                      |  |                 |                                             |
| Oxygen               | 496    | Inlet Velocity—ft./sec.  | 0.93  |                                                |      |       | 1                                    |  | 64              | CATALYST                                    |
| Natural Gas          | 793    | Fresh Feed Rate—S.C.F.H. | 13308 | HEMPEL, DIST. %                                |      |       | 2                                    |  | 73              | Bulk Density, Lbs./Cu.Ft.                   |
| Generator            | 2463   | per Cu.Ft. Dense Bed     | 1104  | 205 °F.                                        |      |       | 3                                    |  | 69              | Aerated                                     |
| Quench Accumulator   | 139    | per Lb. Catalyst         | 8.12  | 400                                            | 79.9 | 54.0  | 4                                    |  | 245             | Settled                                     |
| Reactor Inlet        | 300    | per sq ft                | 20164 | 400-550                                        | 8.1  | 34.5  | Total                                |  | 451             | Compacted                                   |
| Condenser Inlet      | 572    |                          |       | 550+                                           | 12.0 |       |                                      |  |                 | Particle Density, gm./cc.                   |
| Product Accumulator  | 67     |                          |       |                                                |      |       | CALCULATED FROM dp                   |  |                 | NH <sub>3</sub> Value, ml./gm.              |
| Catalyst No.         | Height |                          |       | A. S. T. M. DIST. ON                           |      |       | Density, Lbs./Cu.Ft.                 |  | 136             | N <sub>2</sub> Surface, m <sup>2</sup> /gm. |
| 1 See Per. A         | --     |                          |       | Naphtha °F.                                    |      |       | Inventory, Lbs.                      |  | 1639            |                                             |
| 2                    | 657    |                          |       | IBP                                            | 101  |       | Bed Depth, Ft.                       |  | 18.25           | CHEMICAL ANALYSIS                           |
| 3                    | 651    |                          |       | 10%                                            | 121  |       | Vol cu ft                            |  | 12.05           | Fe                                          |
| 4                    | 660    |                          |       | 50%                                            | 196  |       |                                      |  |                 | C                                           |
| 5                    | 660    |                          |       | 90%                                            | 324  |       |                                      |  |                 | O                                           |
| 6                    | 663    |                          |       | EP                                             | 378  |       |                                      |  |                 | H                                           |
| 7                    | 659    |                          |       | Rec                                            | 97   |       |                                      |  |                 | K <sub>2</sub> O, W+, % basis Fe            |
| 8                    | 643    |                          |       |                                                |      |       |                                      |  |                 | X-Ray Analysis—                             |
| 9                    | 647    |                          |       |                                                |      |       |                                      |  |                 | Fe <sub>2</sub> O <sub>3</sub>              |
| 10                   | 656    |                          |       |                                                |      |       |                                      |  |                 | Fe <sub>2</sub> O <sub>4</sub>              |
| 11                   | 639    |                          |       |                                                |      |       |                                      |  |                 | Fe                                          |

THE TEXAS COMPANY — MONTEBELLO LABORATORY  
YIELD CALCULATIONS

RUN NO. 66-T  
HOURS 392-416  
CATALYST Brownsville  
Treated NS Red. @ 660P

| FRESH FEED                                |        |                        |                    | WET GAS |                |                           |                                                                        | RECYCLE                               | COMBINED<br>FEED | EFFLUENT                     | NET CHANGE                                | YIELD BASIS H <sub>2</sub> + CO FED |        |           |         |                                            |                             |                        |         |                         |        |       |
|-------------------------------------------|--------|------------------------|--------------------|---------|----------------|---------------------------|------------------------------------------------------------------------|---------------------------------------|------------------|------------------------------|-------------------------------------------|-------------------------------------|--------|-----------|---------|--------------------------------------------|-----------------------------|------------------------|---------|-------------------------|--------|-------|
|                                           | %      | m/hr                   | #/hr               | %       | At Wt. Balance |                           | m/hr                                                                   | m/hr                                  | m/hr             | m/hr                         | #/hr                                      | CONDENSATE                          |        |           |         | YIELDS BASIS BROWNSVILLE DESIGN FEED RATE* |                             |                        |         |                         |        |       |
|                                           |        |                        |                    |         | m/hr           | #/hr                      |                                                                        |                                       |                  |                              |                                           | #/MCF                               | #/gal  | gal/hr    | gal/MCF |                                            |                             | CORRECTED<br>HEATL., % | gal/hr  | TREATING<br>RECOVERY, % | gal/hr |       |
| CO<br>28.010                              | 36.713 | 14.280                 | 399.97             | 9.840   | 1.525          | 42.72                     | 3.952                                                                  | 18.232                                | 5.477            | -12.755                      | -357.25                                   |                                     |        |           |         |                                            |                             |                        |         |                         |        |       |
| H <sub>2</sub><br>2.016                   | 60.457 | 23.515                 | 47.41              | 43.015  | 6.669          | 13.44                     | 17.278                                                                 | 40.793                                | 23.947           | -16.846                      | -33.97                                    |                                     |        |           |         |                                            | 400 EP                      | 80.8                   | 5.239   | 98.0                    | 5.134  |       |
| CO <sub>2</sub><br>44.010                 | 2.173  | 0.845                  | 37.19              | 27.860  | 4.319          | 190.11                    | 11.191                                                                 | 12.036                                | 15.510           | 3.474                        | 152.92                                    | 10.662                              |        |           |         |                                            | 400-550                     | 6.8                    | 0.571   | 91.4                    | 0.522  |       |
| N <sub>2</sub><br>28.016                  | 0.547  | 0.213                  | 5.97               | 1.420   | 0.220          | 6.16                      | 0.570                                                                  | 0.783                                 | 0.790            |                              |                                           |                                     |        |           |         |                                            | 550 +                       | 10.4                   | 0.674   | 114.6                   | 0.772  |       |
| CH <sub>4</sub><br>16.042                 | 0.110  | 0.043                  | 0.69               | 7.810   | 1.211          | 19.43                     | 3.137                                                                  | 3.180                                 | 4.348            | 1.168                        | 18.74                                     | 1.307                               |        |           |         |                                            |                             |                        |         |                         |        |       |
| C <sub>2</sub> H <sub>6</sub><br>28.038   |        |                        |                    | 2.090   | 0.324          | 9.09                      | 0.839                                                                  | 0.839                                 | 1.163            | 0.324                        | 9.09                                      | 0.634                               |        |           |         |                                            |                             | RECOVERY<br>%          | #/hr    | gal/hr                  |        |       |
| C <sub>3</sub> H <sub>8</sub><br>30.008   |        |                        |                    | 1.520   | 0.236          | 7.10                      | 0.611                                                                  | 0.611                                 | 0.847            | 0.236                        | 7.10                                      | 0.495                               |        |           |         |                                            | PROPYLENE                   | 35.0                   | 6.318   |                         |        |       |
| C <sub>4</sub> +C <sub>5</sub>            |        |                        |                    |         |                |                           |                                                                        |                                       |                  |                              | 34.93                                     | 2.436                               |        |           |         |                                            | C <sub>4</sub> POLY GASO.   | 87.5                   | 5.528   | 0.924                   |        |       |
| C <sub>6</sub> H <sub>14</sub><br>42.078  |        |                        |                    | 2.765   | 0.429          | 18.05                     | 1.111                                                                  | 1.111                                 | 1.540            | 0.429                        | 18.05                                     | 1.258                               | 4.32   | 4.178     | 0.291   |                                            | C <sub>6</sub> POLY TAR     | 12.5                   | 0.790   | 0.105                   |        |       |
| C <sub>8</sub> H <sub>18</sub><br>44.094  |        |                        |                    | 0.295   | 0.046          | 2.03                      | 0.118                                                                  | 0.118                                 | 0.164            | 0.046                        | 2.03                                      | 0.142                               | 4.24   | 0.479     | 0.033   |                                            |                             |                        |         |                         |        |       |
| C <sub>10</sub> H <sub>22</sub><br>56.104 |        |                        |                    | 1.795   | 0.278          | 15.60                     | 0.721                                                                  | 0.721                                 | 0.999            | 0.278                        | 15.60                                     | 1.088                               | 8.00   | 3.120     | 0.218   |                                            |                             | #/gal                  | #/hr    | gal/hr                  | RVP    |       |
| C <sub>12</sub> H <sub>26</sub><br>58.120 |        |                        |                    | 0.465   | 0.072          | 4.18                      | 0.187                                                                  | 0.187                                 | 0.259            | 0.072                        | 4.18                                      | 0.291                               | 4.86   | 0.860     | 0.060   | C <sub>12</sub> H <sub>26</sub>            | 5.00                        | 0.37                   | 0.074   | 68.0                    |        |       |
| C <sub>14</sub> H <sub>30</sub><br>70.130 |        |                        |                    | 0.765   | 0.119          | 8.35                      | 0.307                                                                  | 0.307                                 | 0.426            | 0.119                        | 8.35                                      | 0.582                               | 5.48   | 1.532     | 0.107   | C <sub>14</sub> POLY GASO.                 | 5.98                        | 13.33                  | 2.228   | 1.5                     |        |       |
| C <sub>16</sub> H <sub>34</sub><br>72.146 |        |                        |                    | 0.145   | 0.022          | 1.59                      | 0.058                                                                  | 0.058                                 | 0.080            | 0.022                        | 1.59                                      | 0.111                               | 5.25   | 0.303     | 0.021   | C <sub>16</sub> H <sub>34</sub>            | 4.86                        | 4.18                   | 0.860   | 68.0                    |        |       |
| C <sub>18</sub> H <sub>38</sub><br>84.156 |        |                        |                    | 0.215   | 0.033          | 2.78                      | 0.086                                                                  | 0.086                                 | 0.119            | 0.033                        | 2.78                                      | 0.194                               | 5.54   | 0.502     | 0.035   | C <sub>18</sub> -FREE GASO.                |                             |                        | 8.395   | 5.8                     |        |       |
| C <sub>20</sub> -C <sub>22</sub>          |        |                        |                    |         |                |                           |                                                                        |                                       |                  |                              | 52.58                                     | 3.666                               |        | 10.974    | 0.765   | C <sub>20</sub> POLY TAR                   | 7.53                        | 1.90                   | 0.252   |                         |        |       |
| TOTAL                                     |        | 38.896                 | 491.23             |         | 15.503         | 340.63                    | 40.166                                                                 | 79.062                                | 61.464           |                              |                                           |                                     |        |           |         |                                            |                             |                        |         |                         |        |       |
| H <sub>2</sub> +CO                        | 97.170 | 37.795                 | 14343              | SCFH    | 8.194          |                           | 21.230                                                                 | 59.025                                | 29.424           | -29.601                      |                                           |                                     |        |           |         |                                            |                             | gal/hr                 | gal/MCF | Bbl/Day                 |        |       |
| H <sub>2</sub> /CO                        |        | 1.65                   | Factor             | 697204  | 4.37           |                           | 4.37                                                                   | 2.24                                  | 4.37             | 1.32                         |                                           |                                     |        |           |         |                                            | 10 # RVP 400 EP<br>GASOLINE | 11.557                 | 0.8058  | 4369                    |        |       |
| Weight Recovery, %                        | 95.45  | Catalyst Age, hrs.     |                    |         |                | Space Velocity, v/v       |                                                                        | 1203                                  | RECOVERED OIL    |                              | **                                        | 0.295                               | 41.40  | 2.886     |         | 6.484                                      | 0.452                       | GAS OIL                | 0.522   | 0.0364                  | 197    |       |
| Pressure, psig                            | 396    | Inlet Velocity, Ft/sec |                    |         |                | 0.98                      | Catalyst Vol CF                                                        |                                       | 11.92            | TOTAL OIL                    |                                           |                                     | 93.98  | 6.552     |         | 17.458                                     | 1.217                       | FUEL OIL               | 0.772   | 0.0538                  | 292    |       |
| Temperature, °F                           | 662    | Bed Depth, Ft          |                    |         |                | 18.06                     | Weight, #                                                              |                                       | 1621             | WATER SOLUBLE**<br>CHEMICALS |                                           | 0.288                               | 15.30  | 1.067     |         | 1.942                                      | 0.135                       | POLY TAR               | 0.357   | 0.0249                  | 135    |       |
| Recycle Ratio                             | 1.03   | Bed Density, #/CF      |                    |         |                | 136                       | Effluent (H <sub>2</sub> )(CO)<br>Shift Ratio (H <sub>2</sub> O)(CO) = |                                       |                  |                              | TOTAL LIQUID<br>PRODUCTS C <sub>3</sub> + |                                     | **     | 109.28    | 7.619   |                                            | 19.400                      | 1.352                  | TOTAL   | 13.208                  | 0.9209 | 4993  |
| FRESH FEED CONVERSION — %                 |        |                        |                    |         |                | TOTAL FEED CONVERSION — % |                                                                        |                                       |                  | SELECTIVITY                  |                                           |                                     |        | NET WATER |         |                                            |                             | 5.212                  | 93.90   | 6.547                   | 11.272 | 0.786 |
| Contraction                               | CO     | H <sub>2</sub>         | H <sub>2</sub> +CO | CO      | H <sub>2</sub> | CO+H <sub>2</sub>         | C <sub>3</sub> + C <sub>4</sub> +                                      | GROSS WATER                           |                  |                              |                                           | 109.20                              | 7.614  |           | 13.214  | 0.921                                      | W. S. CHEM.                 | 1.942                  | 0.1354  | 734                     |        |       |
| 60.14                                     | 89.32  | 71.64                  | 78.32              | 69.96   | 41.30          | 50.15                     | 75.78                                                                  | HYDROCARBON<br>TOTAL—C <sub>3</sub> + |                  |                              |                                           | 144.21                              | 10.055 |           |         |                                            | TOTAL                       | 15.150                 | 1.0563  | 5727                    |        |       |

Form ML-11

\*\* Included in Reactor Effluent Total

R/NCM = 16.91 X #/MCF \*9488 MCF H<sub>2</sub> + CO, Bbl/Day = 5421.6 X gal/MCF

THE TEXAS COMPANY — MONTEBELLO LABORATORY  
DATA SUMMARY

RUN NO. 66-T  
HOURS 392-416

| OPERATING CONDITIONS |        |                          |       | PRODUCT TESTS                                  |      |       | CATALYST DATA                        |     |                           |                                             |               |
|----------------------|--------|--------------------------|-------|------------------------------------------------|------|-------|--------------------------------------|-----|---------------------------|---------------------------------------------|---------------|
| PRESSURES PSIG       |        | RATES S.C.F.H.           |       | OIL                                            |      | WATER | INVENTORY DATA                       |     | PARTICLE SIZE             |                                             |               |
| Oxygen               | 423    | Fresh Feed               | 14761 | * API                                          | 53.0 | 11.1  | In Reactor at Start of Period        |     | Screen Analysis           |                                             | Sedimentation |
| Natural Gas          | 425    | Recycle                  | 15243 | Neut. No.                                      | 48.8 | 38.3  | Fresh Catalyst Added                 |     | Mesh                      | Microns                                     | %             |
| Generator Outlet     | 401    | Combined Feed            | 30004 | Sap. No.                                       | 66.8 | 41.2  | Total                                |     | On 40                     | 419+                                        | 80+           |
| Reactor Inlet        | 396    | Wet Gas—Measured         | 5498  | Hydrox. No.                                    |      |       | Catalyst Recovered                   |     | 44                        | 100                                         | 150           |
| Condenser Inlet      |        | Adjusted                 | 5884  | Bromine No.                                    | 99   |       | In Reactor at End of Period          |     | 150                       | 105                                         | 20—40         |
| Product Accumulator  | 371    | Loss                     | 386   | Pour °F.                                       |      |       |                                      |     | 200                       | 74                                          | 10—20         |
|                      |        |                          |       | Chemicals, % by K <sub>2</sub> CO <sub>3</sub> | 14.7 |       | REACTOR d-p, Inches H <sub>2</sub> O |     | 250                       | 62                                          | 0—20          |
|                      |        |                          |       |                                                |      |       | No. Height                           |     | 325                       | 44                                          |               |
| TEMPERATURES—°F.     |        | Recycle/Fresh Feed       | 1.03  |                                                |      |       | 0 See Per. A                         |     | <325                      |                                             |               |
| Oxygen               | 498    | Inlet Velocity—ft./sec.  | 0.98  |                                                |      |       | 1                                    | 64  | CATALYST                  |                                             |               |
| Natural Gas          | 795    | Fresh Feed Rate—S.C.F.H. | 14343 | HEMPEL, DIST. %                                |      | *API  | 2                                    | 73  | Bulk Density, Lbs./Cu.Ft. |                                             |               |
| Generator            | 2468   | per Cu. Ft. Dense Bed    | 1203  | 205 °F.                                        |      |       | 3                                    | 69  | Aerated                   |                                             |               |
| Quench Accumulator   | 141    | per Lb. Catalyst         | 8.85  | 400                                            | 79.8 | 53.0  | 4                                    | 240 | Settled                   |                                             |               |
| Reactor Inlet        | 291    | per sq ft                | 21732 | 400-550                                        | 8.8  | 33.7  | Total                                |     | 446                       | Compacted                                   |               |
| Condenser Inlet      | 585    |                          |       | 550+                                           | 11.4 |       |                                      |     |                           | Particle Density, gm./cc.                   |               |
| Product Accumulator  | 69     |                          |       |                                                |      |       | CALCULATED FROM dp                   |     |                           | NH <sub>3</sub> Value, ml./gm.              |               |
| Catalyst No.         | Height |                          |       | A. S. T. M. DIST. ON                           |      |       | Density, Lbs./Cu.Ft.                 |     | 136                       | N <sub>2</sub> Surface, m <sup>2</sup> /gm. |               |
| 1 See Per. A         | --     |                          |       | Naphtha °F.                                    |      |       | Inventory, Lbs.                      |     | 1621                      | CHEMICAL ANALYSIS                           |               |
| 2                    | 660    |                          |       | IBP                                            |      | 100   | Bed Depth, Ft.                       |     | 18.06                     |                                             |               |
| 3                    | 654    |                          |       | 10%                                            |      | 123   | Vol cu ft                            |     | 11.92                     | Fe                                          |               |
| 4                    | 664    |                          |       | 50%                                            |      | 201   |                                      |     |                           | C                                           |               |
| 5                    | 664    |                          |       | 90%                                            |      | 335   |                                      |     |                           | O                                           |               |
| 6                    | 668    |                          |       | EP                                             |      | 380   |                                      |     |                           | H                                           |               |
| 7                    | 663    |                          |       | Red                                            |      | 96.5  |                                      |     |                           | K <sub>2</sub> O, W+, % basis Fe            |               |
| 8                    | 647    |                          |       |                                                |      |       |                                      |     |                           | X-Ray Analysis—                             |               |
| 9                    | 653    |                          |       |                                                |      |       |                                      |     |                           | Fe <sub>2</sub> O <sub>3</sub>              |               |
| 10                   | 664    |                          |       |                                                |      |       |                                      |     |                           | Fe <sub>2</sub> O <sub>4</sub>              |               |
| 11                   | 648    |                          |       |                                                |      |       |                                      |     |                           | Fe                                          |               |