RUN NO. 66-X
HOURS 477-500
CATALYST Brownsville
Treated MS Red. @ 660F

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

| | FRESH FEED | | | WET GAS | | | RECYCLE | COMBINED FEED | EFFLUENT | NET CHANGE | | YIELD BASIS $H_2$+CO FED | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | At Wt. Balance | | | | | | | CONDENSATE | | | | | | | | |
| | % | m/hr | #/hr | % | m/hr | #/hr | m/hr | m/hr | m/hr | m/hr | #/hr | #/MCF | #/gal | gal/hr | gal/MCF | YIELDS BASIS BROWNSVILLE DESIGN FEED RATE* | | | | |
| CO 28.010 | 36.423 | 14.022 | 392.74 | 13.207 | 2.371 | 66.41 | 5.688 | 19.710 | 8.059 | -11.651 | -326.33 | | | | | | CORRECTED HEMPEL, % | gal/hr | TREATING RECOVERY,% | gal/hr |
| $H_2$ 2.016 | 60.137 | 23.151 | 46.67 | 48.233 | 8.659 | 17.46 | 20.772 | 43.923 | 29.431 | -14.492 | -29.21 | | | | | 400 EP | 81.4 | 5.039 | 98.0 | 4938 |
| $CO_2$ 44.010 | 2.277 | 0.877 | 38.60 | 23.270 | 4.179 | 183.93 | 10.022 | 10.899 | 14.201 | 3.302 | 145.33 | 10.302 | | | | 400-550 | 7.6 | 0.470 | 91.4 | 0.430 |
| $N_2$ 28.016 | 0.940 | 0.362 | 10.14 | 1.833 | 0.329 | 9.22 | 0.789 | 1.151 | 1.118 | | | | | | | 550 + | 11.0 | 0.681 | 114.6 | 0.780 |
| $CH_4$ 16.042 | 0.223 | 0.086 | 1.38 | 6.460 | 1.160 | 18.61 | 2.782 | 2.868 | 3.942 | 1.074 | 17.23 | 1.221 | | | | | | | | |
| $C_2H_4$ 28.052 | | | | 1.633 | 0.293 | 8.22 | 0.703 | 0.703 | 0.996 | 0.293 | 8.22 | 0.583 | | | | | RECOVERY % | #/hr | gal/hr | |
| $C_2H_6$ 30.068 | | | | 1.120 | 0.201 | 6.04 | 0.482 | 0.482 | 0.683 | 0.201 | 6.04 | 0.428 | | | | PROPYLENE | 30.4 | 4.32 | | |
| $C_1+C_2$ | | | | | | | | | | | 31.49 | 2.232 | | | | $C_3$ POLY GASO. | 87.5 | 3.78 | 0.632 | |
| $C_3H_6$ 42.078 | | | | 1.883 | 0.338 | 14.22 | 0.811 | 0.811 | 1.149 | 0.338 | 14.22 | 1.008 | 4.32 | 3.292 | 0.233 | $C_3$ POLY TAR | 12.5 | 0.54 | 0.071 | |
| $C_3H_8$ 44.094 | | | | 0.180 | 0.032 | 1.41 | 0.078 | 0.078 | 0.110 | 0.032 | 1.41 | 0.100 | 4.24 | 0.333 | 0.024 | | | | | |
| $C_4H_8$ 56.104 | | | | 1.107 | 0.199 | 11.16 | 0.477 | 0.477 | 0.676 | 0.199 | 11.16 | 0.791 | 5.00 | 2.232 | 0.158 | | #/gal | #/hr | gal/hr | RVP |
| $C_4H_{10}$ 58.120 | | | | 0.340 | 0.061 | 3.55 | 0.146 | 0.146 | 0.207 | 0.061 | 3.55 | 0.252 | 4.86 | 0.730 | 0.052 | $C_4H_8$ | 5.00 | 0.18 | 0.036 | 68.0 |
| $C_5H_{10}$ 70.130 | | | | 0.487 | 0.087 | 6.10 | 0.210 | 0.210 | 0.297 | 0.087 | 6.10 | 0.432 | 5.45 | 1.119 | 0.079 | $C_4$ POLY GASO. | 5.98 | 9.61 | 1.607 | 1.5 |
| $C_5H_{12}$ 72.146 | | | | 0.097 | 0.017 | 1.23 | 0.042 | 0.042 | 0.059 | 0.017 | 1.23 | 0.087 | 5.25 | 0.234 | 0.017 | $C_4H_{10}$ | 4.86 | 3.55 | 0.730 | 68.0 |
| $C_6H_{12}$ 84.156 | | | | 0.150 | 0.027 | 2.27 | 0.065 | 0.065 | 0.092 | 0.027 | 2.27 | 0.161 | 5.54 | 0.410 | 0.029 | $C_4$-FREE GASO. | | | 7.333 | 5.8 |
| $C_3$-$C_6$ | | | | | | | | | | | 39.94 | 2.831 | | 8.350 | 0.592 | $C_4$ POLY TAR | 7.53 | 1.37 | 0.182 | |
| TOTAL | | 38.498 | 489.53 | | 17.953 | 349.83 | 43.067 | 81.565 | 66.327 | | | | | | | | | | | |
| $H_2$+CO | 96.560 | 37.173 | 14107 SCFH | | 11.030 | | 26.460 | 63.633 | 37.490 | -26.143 | | | | | | | gal/hr | gal/MCF | Bbl/Day | |
| $H_2$/CO | | 1.65 | Factor 708867 | | 3.65 | | 3.65 | 2.23 | 3.65 | 1.24 | | | | | | 10 # RVP 400 EP GASOLINE | 9.706 | 0.6880 | 3730 | |
| Weight Recovery, % 93.07 | | | Catalyst Age, hrs. | | | Space Velocity, vhv 1488 | | | RECOVERED OIL ** | 0.283 | 39.74 | 2.817 | | 6.190 | 0.439 | GAS OIL | 0.430 | 0.0305 | 165 | |
| Pressure, psig 402 | | | Inlet Velocity, Ft/sec 0.99 | | | Catalyst Vol CF 9.48 | | | TOTAL OIL | | 79.68 | 5.648 | | 14.540 | 1.031 | FUEL OIL | 0.780 | 0.0553 | 300 | |
| Temperature, °F 660 | | | Bed Depth, Ft 14.36 | | | Weight, # 1299 | | | WATER SOLUBLE CHEMICALS ** | 0.270 | 14.32 | 1.015 | | 1.814 | 0.129 | POLY TAR | 0.253 | 0.0179 | 97 | |
| Recycle Ratio 1.12 | | | Bed Density, #/CF 137 | | | Effluent $(H_2)(CO_2)$ / Shift Ratio $(H_2O)(CO)$ = | | | TOTAL LIQUID PRODUCTS $C_3$+ | | 94.00 | 6.663 | | 16.354 | 1.160 | TOTAL | 11.169 | 0.7917 | 4292 | |
| FRESH FEED CONVERSION — % | | | | TOTAL FEED CONVERSION — % | | | SELECTIVITY | | NET WATER ** | 4.754 | 85.64 | 6.071 | | 10.281 | 0.729 | W. S. CHEM. | 1.814 | 0.1286 | 697 | |
| Contraction | CO | $H_2$ | $H_2$+CO | CO | $H_2$ | CO+$H_2$ | $C_3$+/$C_1$+ | | GROSS WATER | | 99.96 | 7.086 | | 12.095 | 0.858 | TOTAL | 12.983 | 0.9203 | 4989 | |
| 53.37 | 83.09 | 62.60 | 70.33 | 59.11 | 32.99 | 41.08 | 74.91 | | HYDROCARBON TOTAL—$C_1$+ | | 125.49 | 8.896 | | | | | | | | |

Form ML—11

** Included in Reactor Effluent Total

g/NCM = 16.91 × #/MCF  *9488 MCFH $H_2$ + CO, Bbl/Day = 5421.6 × gal/MCF

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

RUN NO. 66-X
HOURS 477-500

| OPERATING CONDITIONS | | | | PRODUCT TESTS | | | CATALYST DATA | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PRESSURES PSIG | | RATES S.C.F.H. | | | OIL | WATER | INVENTORY DATA | | PARTICLE SIZE | | | | |
| Oxygen | 424 | Fresh Feed | 14610 | °API | 52.0 | 11.1 | In Reactor at Start of Period | | Screen Analysis | | | Sedimentation | |
| Natural Gas | 416 | Recycle | 16344 | Neut. No. | 48.6 | 40.5 | Fresh Catalyst Added | | Mesh | Microns | % | Microns | % |
| Generator Outlet | 405 | Combined Feed | 30954 | Sap. No. | 66.4 | 42.7 | Total | | On 40 | 419+ | | 80+ | |
| Reactor Inlet | 402 | Wet Gas—Measured | 6153 | Hydrox. No. | | | Catalyst Recovered | 57 | 100 | 150 | | 40—80 | |
| Condenser Inlet | | Adjusted | 6813 | Bromine No. | 96.5 | | In Reactor at End of Period | | 150 | 105 | | 20—40 | |
| Product Accumulator | 377 | Loss | 660 | Pour °F. | | | | | 200 | 74 | | 10—20 | |
| | | | | Chemicals, % by $K_2CO_3$ | | 15.0 | REACTOR d-p, Inches $H_2O$ | | 250 | 62 | | 0—20 | |
| | | | | | | | No. Height | | 325 | 44 | | | |
| TEMPERATURES—°F. | | Recycle/Fresh Feed | 1.12 | | | | 0 See Per. A | | <325 | | | | |
| Oxygen | 486 | Inlet Velocity—ft./sec. | 0.99 | | | | 1 | 68 | CATALYST | | | | |
| Natural Gas | 806 | Fresh Feed Rate—S.C.F.H. | 14107 | HEMPEL, DIST. % | | °API | 2 | 70 | Bulk Density, Lbs./Cu.Ft. | | | | |
| Generator | 2459 | per Cu. Ft. Dense Bed | 1488 | 205 °F. | | | 3 | 69 | Aerated | | | | |
| Quench Accumulator | 141 | per Lb. Catalyst | 10.86 | 400 | 80.4 | 53.6 | 4 | 145 | Settled | | | | |
| Reactor Inlet | 307 | per sq ft | 21378 | 400-550 | 7.6 | 37.1 | Total | 352 | Compacted | | | | |
| Condenser Inlet | 568 | | | 550+ | 12.0 | | | | Particle Density, gm./cc. | | | | |
| Product Accumulator | 67 | | | | | | CALCULATED FROM dp | | $NH_3$ Value, ml./gm. | | | | |
| Catalyst No. Height | | | | A. S. T. M. DIST. ON | | | Density, Lbs./Cu.Ft. | 137 | $N_2$ Surface, $m^2$/gm. | | | | |
| 1 See Per. A | -- | | | Naphtha °F. | | | Inventory, Lbs. | 1299 | | | | | |
| 2 | 663 | | | IBP | 108 | | Bed Depth, Ft. | 14.36 | CHEMICAL ANALYSIS | | | | |
| 3 | 655 | | | 10% | 131 | | Vol cu ft | 9.48 | Fe | | | | |
| 4 | 664 | | | 50% | 218 | | | | C | | | | |
| 5 | 664 | | | 90% | 344 | | | | O | | | | |
| 6 | 668 | | | EP | 400 | | | | H | | | | |
| 7 | 647 | | | Rec | 97.4 | | | | $K_2O$, W+, % basis Fe | | | | |
| 8 | 633 | | | | | | | | X-Ray Analysis— | | | | |
| 9 | 645 | | | | | | | | $Fe_{20}C_9$ | | | | |
| 10 | 643 | | | | | | | | $Fe_3O_4$ | | | | |
| 11 | 623 | | | | | | | | Fe | | | | |

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

RUN NO. 66-Y
HOURS 500-523
CATALYST Brownsville Treated MS Red. @ 660F

| | FRESH FEED % | FRESH FEED m/hr | FRESH FEED #/hr | WET GAS % | WET GAS At Wt. Balance m/hr | WET GAS At Wt. Balance #/hr | RECYCLE m/hr | COMBINED FEED m/hr | EFFLUENT m/hr | NET CHANGE m/hr | NET CHANGE #/hr |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CO 28.010 | 36.074 | 14.108 | 395.17 | 12.743 | 1.943 | 54.42 | 10.350 | 24.458 | 12.293 | -12.165 | -340.75 |
| $H_2$ 2.016 | 60.467 | 23.648 | 47.67 | 44.733 | 6.821 | 13.75 | 36.332 | 59.980 | 43.153 | -16.827 | -33.92 |
| $CO_2$ 44.010 | 2.153 | 0.842 | 37.06 | 24.047 | 3.667 | 161.34 | 19.531 | 20.373 | 23.198 | 2.825 | 124.28 |
| $N_2$ 28.016 | 0.893 | 0.349 | 9.78 | 1.987 | 0.303 | 8.49 | 1.614 | 1.963 | 1.917 | | |
| $CH_4$ 16.042 | 0.413 | 0.162 | 2.60 | 7;720 | 1.177 | 18.88 | 6.270 | 6.432 | 7.447 | 1.015 | 16.28 |
| $C_2H_4$ 28.052 | | | | 2.057 | 0.314 | 8.81 | 1.671 | 1.671 | 1.985 | 0.314 | 8.81 |
| $C_2H_6$ 30.068 | | | | 1.190 | 0.181 | 5.44 | 0.967 | 0.967 | 1.148 | 0.181 | 5.44 |
| $C_1+C_2$ | | | | | | | | | | | 30.53 |
| $C_3H_6$ 42.078 | | | | 2.367 | 0.361 | 15.19 | 1.923 | 1.923 | 2.284 | 0.361 | 15.19 |
| $C_3H_8$ 44.094 | | | | 0.250 | 0.038 | 1.68 | 0.203 | 0.203 | 0.241 | 0.038 | 1.68 |
| $C_4H_8$ 56.104 | | | | 1.483 | 0.226 | 12.68 | 1.205 | 1.205 | 1.431 | 0.226 | 12.68 |
| $C_4H_{10}$ 58.120 | | | | 0.423 | 0.065 | 3.78 | 0.344 | 0.344 | 0.409 | 0.065 | 3.78 |
| $C_5H_{10}$ 70.130 | | | | 0.653 | 0.100 | 7.01 | 0.530 | 0.530 | 0.630 | 0.100 | 7.01 |
| $C_5H_{12}$ 72.146 | | | | 0.140 | 0.021 | 1.52 | 0.114 | 0.114 | 0.135 | 0.021 | 1.52 |
| $C_6H_{12}$ 84.156 | | | | 0.207 | 0.032 | 2.69 | 0.168 | 0.168 | 0.200 | 0.032 | 2.69 |
| $C_3$-$C_4$ | | | | | | | | | | | 44.55 |
| TOTAL | | 39.109 | 492.28 | | 15.249 | 315.68 | 81.222 | 120.331 | 103.115 | | |
| $H_2$+CO | 96.541 | 37.756 | 14329 SCFH | | 8.764 | | 46.682 | 84.438 | 55.446 | -28.992 | |
| $H_2$/CO | | 1.68 | Factor 697885 | | 3.51 | | 3.51 | 2.45 | 3.51 | 1.38 | |

| Weight Recovery, % 93.15 | Catalyst Age, hrs. | Space Velocity, vhv 2174 |
|---|---|---|
| Pressure, psig 403 | Inlet Velocity, Ft/sec 1.46 | Catalyst Vol CF 6.59 |
| Temperature, °F 664 | Bed Depth, Ft 9.99 | Weight, # 751 |
| Recycle Ratio 2.08 | Bed Density, #/CF 114 | Effluent $(H_2)(CO_2)$ / Shift Ratio $(H_2O)(CO)$ = |

| FRESH FEED CONVERSION — % | | | | TOTAL FEED CONVERSION — % | | | SELECTIVITY |
|---|---|---|---|---|---|---|---|
| Contraction | CO | $H_2$ | $H_2$+CO | CO | $H_2$ | CO+$H_2$ | $C_3$+/$C_1$+ |
| 61.09 | 86.23 | 71.16 | 76.79 | 49.74 | 28.05 | 34.34 | 78.81 |

YIELD BASIS $H_2$+CO FED

| | CONDENSATE #/MCF | CONDENSATE #/gal | CONDENSATE gal/hr | CONDENSATE gal/MCF |
|---|---|---|---|---|
| RECOVERED OIL ** | 0.382 | 53.57 | 3.739 | 8.282 | 0.578 |
| TOTAL OIL | | 98.12 | 6.848 | 17.570 | 1.226 |
| WATER SOLUBLE CHEMICALS ** | 0.291 | 15.46 | 1.079 | 1.929 | 0.135 |
| TOTAL LIQUID PRODUCTS $C_3$+ | | 113.58 | 7.927 | 19.499 | 1.361 |
| NET WATER ** | 5.971 | 107.57 | 7.507 | 12.913 | 0.901 |
| GROSS WATER | | 12303 | 8.586 | 14.842 | 1.036 |
| HYDROCARBON TOTAL—$C_1$+ | | 144.11 | 10.058 | | |

YIELDS BASIS BROWNSVILLE DESIGN FEED RATE*

| | CORRECTED HEMPEL, % | gal/hr | TREATING RECOVERY, % | gal/hr |
|---|---|---|---|---|
| 400 EP | 77.8 | 6.444 | 98.0 | 6.315 |
| 400-550 | 12.5 | 1.035 | 91.4 | 0.946 |
| 550 + | 9.7 | 0.803 | 114.6 | 0.920 |

| | RECOVERY % | #/hr | gal/hr | |
|---|---|---|---|---|
| PROPYLENE | 36.2 | 5.50 | | |
| $C_3$ POLY GASO. | 87.5 | 4.81 | 0.804 | |
| $C_3$ POLY TAR | 12.5 | 0.69 | 0.092 | |

| | #/gal | #/hr | gal/hr | RVP |
|---|---|---|---|---|
| $C_4H_8$ | 5.00 | 0.72 | 0.144 | 68.0 |
| $C_4$ POLY GASO. | 5.98 | 10.47 | 1.750 | 1.5 |
| $C_4H_{10}$ | 4.86 | 3.78 | 0.778 | 68.0 |
| $C_4$-FREE GASO. | | | 9.181 | 5.8 |
| $C_4$ POLY TAR | 7.53 | 1.49 | 0.198 | |

| | gal/hr | gal/MCF | Bbl/Day |
|---|---|---|---|
| 10 # RVP 400 EP GASOLINE | 11.853 | 0.8272 | 4485 |
| GAS OIL | 0.946 | 0.0660 | 358 |
| FUEL OIL | 0.920 | 0.0642 | 348 |
| POLY TAR | 0.290 | 0.0202 | 110 |
| TOTAL | 14.009 | 0.9776 | 5301 |
| W. S. CHEM. | 1.929 | 0.1346 | 730 |
| TOTAL | 15.938 | 1.1122 | 6031 |

Form ML—11

** Included in Reactor Effluent Total

g/NCM = 16.91×#/MCF *9488 MCFH $H_2$ + CO, Bbl/Day = 5421.6× gal/MCF

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

RUN NO. 66-Y
HOURS 500-523

| OPERATING CONDITIONS | | | |
|---|---|---|---|
| PRESSURES PSIG | | RATES S.C.F.H. | |
| Oxygen | 427 | Fresh Feed | 14842 |
| Natural Gas | 419 | Recycle | 30824 |
| Generator Outlet | 407 | Combined Feed | 45666 |
| Reactor Inlet | 403 | Wet Gas—Measured | 5169 |
| Condenser Inlet | | Adjusted | 5787 |
| Product Accumulator | 375 | Loss | 618 |
| | | | |
| TEMPERATURES—°F. | | Recycle/Fresh Feed | 2.08 |
| Oxygen | 513 | Inlet Velocity—ft./sec. | 1.46 |
| Natural Gas | 804 | Fresh Feed Rate—S.C.F.H. | 14329 |
| Generator | 2446 | per Cu. Ft. Dense Bed | 2174 |
| Quench Accumulator | 141 | per Lb. Catalyst | 19.08 |
| Reactor Inlet | 339 | per sq ft | 21711 |
| Condenser Inlet | 579 | | |
| Product Accumulator | 73 | | |
| Catalyst No. Height | | | |
| 1 See Per. A | -- | | |
| 2 | 662 | | |
| 3 | 654 | | |
| 4 | 665 | | |
| 5 | 669 | | |
| 6 | 671 | | |
| 7 | 648 | | |
| 8 | 634 | | |
| 9 | 635 | | |
| 10 | 632 | | |
| 11 | 618 | | |

| PRODUCT TESTS | OIL | WATER |
|---|---|---|
| °API | 50.6 | 10.7 |
| Neut. No. | 51.5 | 42.8 |
| Sap. No. | 66.4 | 45.0 |
| Hydrox. No. | | |
| Bromine No. | 96.5 | |
| Pour °F. | | |
| Chemicals, % by $K_2CO_3$ | | 13.0 |
| | | |
| | | |
| HEMPEL, DIST. % | | °API |
| 205 °F. | | |
| 400 | 76.8 | 53.7 |
| 400-550 | 12.5 | 37.1 |
| 550+ | 10.7 | |
| | | |
| A. S. T. M. DIST. ON | | |
| Naphtha °F. | | |
| IBP | 108 | |
| 10% | 132 | |
| 50% | 224 | |
| 90% | 362 | |
| EP | 404 | |
| Rec. | 96.5 | |

| CATALYST DATA | |
|---|---|
| INVENTORY DATA | |
| In Reactor at Start of Period | |
| Fresh Catalyst Added | |
| Total | |
| Catalyst Recovered | 379½ |
| In Reactor at End of Period | |
| | |
| REACTOR d-p, Inches $H_2O$ | |
| No. Height | |
| 0 See Per. A | |
| 1 | 52 |
| 2 | 62 |
| 3 (est.) | 58 |
| 4 (est.) | 25 |
| Total | 197 |
| | |
| CALCULATED FROM dp | |
| Density, Lbs./Cu.Ft. | 114 |
| Inventory, Lbs. | 751 |
| Bed Depth, Ft. | 9.99 |
| Vol cu ft | 6.59 |

| PARTICLE SIZE | | | | |
|---|---|---|---|---|
| Screen Analysis | | | Sedimentation | |
| Mesh | Microns | % | Microns | % |
| On 40 | 419+ | | 80+ | |
| 100 | 150 | | 40—80 | |
| 150 | 105 | | 20—40 | |
| 200 | 74 | | 10—20 | |
| 250 | 62 | | 0—20 | |
| 325 | 44 | | | |
| <325 | | | | |

| CATALYST | |
|---|---|
| Bulk Density, Lbs./Cu.Ft. | |
| Aerated | |
| Settled | |
| Compacted | |
| Particle Density, gm./cc. | |
| $NH_3$ Value, ml./gm. | |
| $N_2$ Surface, $m^2$/gm. | |
| | |
| CHEMICAL ANALYSIS | |
| Fe | |
| C | |
| O | |
| H | |
| $K_2O$, W+, % basis Fe | |
| X-Ray Analysis— | |
| $Fe_{20}C_9$ | |
| $Fe_3O_4$ | |
| Fe | |

RUN NO. 66-Z
HOURS 523-547
CATALYST Brownsville Treated MS Red. @ 660F

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

| | FRESH FEED % | FRESH FEED m/hr | FRESH FEED #/hr | WET GAS % | WET GAS At Wt. Balance m/hr | WET GAS At Wt. Balance #/hr | RECYCLE m/hr | COMBINED FEED m/hr | EFFLUENT m/hr | NET CHANGE m/hr | NET CHANGE #/hr | CONDENSATE #/MCF | CONDENSATE #/gal | CONDENSATE gal/hr | CONDENSATE gal/MCF |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO 28.010 | 36.686 | 14.311 | 400.82 | 13.927 | 2.164 | 60.61 | 11.266 | 25.577 | 13.430 | -12.147 | -340.21 | | | | |
| $H_2$ 2.016 | 59.650 | 23.268 | 46.91 | 43.940 | 6.828 | 13.77 | 35.545 | 58.813 | 42.373 | -16.440 | 33.14 | | | | |
| $CO_2$ 44.010 | 2.237 | 0.873 | 38.42 | 24.344 | 3.784 | 166.55 | 19.693 | 20.566 | 23.477 | 2.911 | 128.13 | 8.984 | | | |
| $N_2$ 28.016 | 0.830 | 0.324 | 9.08 | 1.987 | 0.309 | 8.66 | 1.607 | 1.931 | 1.916 | | | | | | |
| $CH_4$ 16.042 | 0.597 | 0.233 | 3.74 | 7.170 | 1.114 | 17.87 | 5.800 | 6.033 | 6.914 | 0.881 | 14.13 | 0.991 | | | |
| $C_2H_4$ 28.052 | | | | 1.853 | 0.288 | 8.08 | 1.499 | 1.499 | 1.787 | 0.288 | 8.08 | 0.567 | | | |
| $C_2H_6$ 30.068 | | | | 1.073 | 0.167 | 5.02 | 0.868 | 0.868 | 1.035 | 0.167 | 5.02 | 0.352 | | | |
| $C_1+C_2$ | | | | | | | | | | | 27.23 | 1.910 | | | |
| $C_3H_6$ 42.078 | | | | 2.400 | 0.373 | 15.70 | 1.941 | 1.941 | 2.314 | 0.373 | 15.70 | 1.101 | 4.32 | 3.634 | 0.255 |
| $C_3H_8$ 44.094 | | | | 0.207 | 0.032 | 1.41 | 0.167 | 0.167 | 0.199 | 0.032 | 1.41 | 0.099 | 4.24 | 0.333 | 0.023 |
| $C_4H_8$ 56.104 | | | | 1.613 | 0.251 | 14.08 | 1.305 | 1.305 | 1.556 | 0.251 | 14.08 | 0.987 | 5.00 | 2.816 | 0.197 |
| $C_4H_{10}$ 58.120 | | | | 0.480 | 0.075 | 4.36 | 0.388 | 0.388 | 0.463 | 0.075 | 4.36 | 0.306 | 4.86 | 0.897 | 0.063 |
| $C_5H_{10}$ 70.130 | | | | 0.640 | 0.099 | 6.94 | 0.518 | 0.518 | 0.617 | 0.099 | 6.94 | 0.487 | 5.45 | 1.273 | 0.089 |
| $C_5H_{12}$ 72.146 | | | | 0.183 | 0.028 | 2.02 | 0.148 | 0.148 | 0.176 | 0.028 | 2.02 | 0.142 | 5.25 | 0.385 | 0.027 |
| $C_6H_{12}$ 84.156 | | | | 0.183 | 0.028 | 2.36 | 0.148 | 0.148 | 0.176 | 0.028 | 2.36 | 0.165 | 5.54 | 0.426 | 0.030 |
| $C_3$-$C_6$ | | | | | | | | | | | 46.87 | 3.287 | | 9.764 | 0.684 |
| TOTAL | | 39.009 | 498.97 | | 15.540 | 327.43 | 80.893 | 119.902 | 102.916 | | | | | | |
| $H_2$+CO | 96.336 | 37.579 | 14262 SCFH | | 8.992 | | 46.811 | 84.390 | 55.803 | -28.587 | | | | | |
| $H_2$/CO | | 1.63 | Factor 701163 | | 3.16 | | 3.16 | 2.30 | 3.16 | 1.35 | | | | | |
| RECOVERED OIL ** | | | | | | | | | | 0.369 | 51.80 | 3.632 | | 8.134 | 0.570 |
| TOTAL OIL | | | | | | | | | | | 98.67 | 6.919 | | 17.898 | 1.254 |
| WATER SOLUBLE CHEMICALS ** | | | | | | | | | | 0.273 | 14.50 | 1.017 | | 1.805 | 0.127 |
| TOTAL LIQUID PRODUCTS $C_3$+ | | | | | | | | | | | 113.17 | 7.936 | | 19.703 | 1.381 |
| NET WATER ** | | | | | | | | | | 5.841 | 105.24 | 7.379 | | 12.634 | 0.886 |
| GROSS WATER | | | | | | | | | | | 119.74 | 8.396 | | 14.439 | 1.013 |
| HYDROCARBON TOTAL—$C_1$+ | | | | | | | | | | | 140.40 | 9.844 | | | |

Weight Recovery, % 93.14 | Catalyst Age, hrs. | Space Velocity, vhv 2271
Pressure, psig 402 | Inlet Velocity, Ft/sec 1.46 | Catalyst Vol CF 6.28
Temperature, °F 664 | Bed Depth, Ft 9.51 | Weight, # 710
Recycle Ratio 2.07 | Bed Density, #/CF 113 | Effluent $(H_2)(CO_2)$ / Shift Ratio $(H_2O)(CO)$ =

| FRESH FEED CONVERSION — % | | | | TOTAL FEED CONVERSION — % | | | SELECTIVITY |
|---|---|---|---|---|---|---|---|
| Contraction | CO | $H_2$ | $H_2$+CO | CO | $H_2$ | CO+$H_2$ | $C_3$+/$C_1$+ |
| 60.16 | 84.88 | 70.65 | 76.07 | 47.49 | 27.95 | 33.87 | 80.61 |

YIELD BASIS $H_2$+CO FED

| YIELDS BASIS BROWNSVILLE DESIGN FEED RATE* | CORRECTED HEMPEL, % | gal/hr | TREATING RECOVERY, % | gal/hr |
|---|---|---|---|---|
| 400 EP | 76.1 | 6.190 | 98.0 | 6.066 |
| 400-550 | 12.4 | 1.009 | 91.4 | 0.922 |
| 550 + | 11.5 | 0.935 | 114.6 | 1.072 |

| | RECOVERY % | #/hr | gal/hr |
|---|---|---|---|
| PROPYLENE | 35.2 | 5.53 | |
| $C_3$ POLY GASO. | 87.5 | 4.84 | 0.809 |
| $C_3$ POLY TAR | 12.5 | 0.69 | 0.092 |

| | #/gal | #/hr | gal/hr | RVP |
|---|---|---|---|---|
| $C_4H_8$ | 5.00 | 0.24 | 0.048 | 68.0 |
| $C_4$ POLY GASO. | 5.98 | 12.11 | 2.025 | 1.5 |
| $C_4H_{10}$ | 4.86 | 4.36 | 0.897 | 68.0 |
| $C_4$-FREE GASO. | | | 8.959 | 5.8 |
| $C_4$ POLY TAR | 7.53 | 1.73 | 0.230 | |

| | gal/hr | gal/MCF | Bbl/Day |
|---|---|---|---|
| 10 # RVP 400 EP GASOLINE | 11.929 | 0.8364 | 4535 |
| GAS OIL | 0.922 | 0.0646 | 350 |
| FUEL OIL | 1.072 | 0.0752 | 408 |
| POLY TAR | 0.322 | 0.0226 | 123 |
| TOTAL | 14.245 | 0.9988 | 5416 |
| W. S. CHEM. | 1.805 | 0.1266 | 686 |
| TOTAL | 16.050 | 1.1254 | 6102 |

Form ML—11

** Included in Reactor Effluent Total

g/NCM = 16.91 × #/MCF  *9488 MCFH $H_2$ + CO, Bbl/Day = 5421.6 × gal/MCF

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

RUN NO. 66-Z
HOURS 523-547

| OPERATING CONDITIONS | | | |
|---|---|---|---|
| PRESSURES PSIG | | RATES S.C.F.H. | |
| Oxygen | 423 | Fresh Feed | 14804 |
| Natural Gas | 416 | Recycle | 30699 |
| Generator Outlet | 406 | Combined Feed | 45503 |
| Reactor Inlet | 402 | Wet Gas—Measured | 5281 |
| Condenser Inlet | | Adjusted | 5897 |
| Product Accumulator | 375 | Loss | 616 |
| | | | |
| | | | |
| TEMPERATURES—°F. | | Recycle/Fresh Feed | 2.07 |
| Oxygen | 505 | Inlet Velocity—ft./sec. | 1.46 |
| Natural Gas | 799 | Fresh Feed Rate—S.C.F.H. | 14262 |
| Generator | 2428 | per Cu. Ft. Dense Bed | 2271 |
| Quench Accumulator | 140 | per Lb. Catalyst | 20.09 |
| Reactor Inlet | 321 | per sq ft | 21609 |
| Condenser Inlet | 584 | | |
| Product Accumulator | 73 | | |
| Catalyst No. Height | | | |
| 1 See Per. A | — | | |
| 2 | 663 | | |
| 3 | 655 | | |
| 4 | 665 | | |
| 5 | 670 | | |
| 6 | 666 | | |
| 7 | 643 | | |
| 8 | 630 | | |
| 9 | 640 | | |
| 10 | 638 | | |
| 11 | 634 | | |

| PRODUCT TESTS | OIL | WATER |
|---|---|---|
| °API | 53.5 | 10.6 |
| Neut. No. | 50.7 | 43.2 |
| Sap. No. | 65.7 | 44.8 |
| Hydrox. No. | | |
| Bromine No. | 95 | |
| Pour °F. | | |
| Chemicals, % by $K_2CO_3$ | | 12.5 |
| | | |
| | | |
| | | |
| HEMPEL, DIST. % | | °API |
| 205 °F. | | |
| 400 | 75.1 | 55.2 |
| 400-550 | 12.4 | 37.1 |
| 550+ | 12.5 | |
| | | |
| A. S. T. M. DIST. ON | | |
| Naphtha °F. | | |
| IBP | 107 | |
| 10% | 134 | |
| 50% | 224 | |
| 90% | 354 | |
| EP | 406 | |
| Rec. | 96.5 | |

| CATALYST DATA | |
|---|---|
| INVENTORY DATA | |
| In Reactor at Start of Period | |
| Fresh Catalyst Added | |
| Total | |
| Catalyst Recovered | 118.5 |
| In Reactor at End of Period | |
| | |
| | |
| REACTOR d-p, Inches $H_2O$ | |
| No. Height | |
| 0 See Per. A | |
| 1 | 51 |
| 2 | 62 |
| 3 (est.) | 52 |
| 4 (est.) | 20 |
| Total | 185 |
| | |
| CALCULATED FROM dp | |
| Density, Lbs./Cu.Ft. | 113 |
| Inventory, Lbs. | 710 |
| Bed Depth, Ft. | 9.51 |
| Vol cu ft | 6.28 |

| PARTICLE SIZE | | | | |
|---|---|---|---|---|
| Screen Analysis | | | Sedimentation | |
| Mesh | Microns | % | Microns | % |
| On 40 | 419+ | | 80+ | |
| 100 | 150 | | 40—80 | |
| 150 | 105 | | 20—40 | |
| 200 | 74 | | 10—20 | |
| 250 | 62 | | 0—20 | |
| 325 | 44 | | | |
| <325 | | | | |

| CATALYST | |
|---|---|
| Bulk Density, Lbs./Cu.Ft. | |
| Aerated | |
| Settled | |
| Compacted | |
| Particle Density, gm./cc. | |
| $NH_3$ Value, ml./gm. | |
| $N_2$ Surface, $m^2$/gm. | |
| | |
| CHEMICAL ANALYSIS | |
| Fe | |
| C | |
| O | |
| H | |
| $K_2O$, W+, % basis Fe | |
| X-Ray Analysis— | |
| $Fe_{20}C_9$ | |
| $Fe_3O_4$ | |
| Fe | |

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

RUN NO. 66-AA
HOURS 547-571
CATALYST Brownsville Treated MS Red. @ 660F

| | FRESH FEED % | FRESH FEED m/hr | FRESH FEED #/hr | WET GAS % | WET GAS At Wt. Balance m/hr | WET GAS At Wt. Balance #/hr | RECYCLE m/hr | COMBINED FEED m/hr | EFFLUENT m/hr | NET CHANGE m/hr | NET CHANGE #/hr | CONDENSATE #/MCF | CONDENSATE #/gal | CONDENSATE gal/hr | CONDENSATE gal/MCF |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO 28.010 | 36.200 | 14.522 | 406.76 | 13.720 | 2.370 | 66.38 | 11.307 | 25.829 | 13.677 | -12.152 | -340.38 | | | | |
| $H_2$ 2.016 | 60.590 | 24.306 | 49.00 | 46.896 | 8.099 | 16.33 | 38.650 | 62.956 | 46.749 | -16.207 | -32.67 | | | | |
| $CO_2$ 44.010 | 2.214 | 0.888 | 39.08 | 23.970 | 4.142 | 182.30 | 19.755 | 20.643 | 23.897 | 3.254 | 143.22 | 9.720 | | | |
| $N_2$ 28.016 | 0.683 | 0.274 | 7.68 | 1.560 | 0.269 | 7.54 | 1.286 | 1.560 | 1.829 | | | | | | |
| $CH_4$ 16.042 | 0.313 | 0.126 | 2.02 | 6.227 | 1.075 | 17.25 | 5.132 | 5.258 | 6.333 | 0.949 | 15.23 | 1.034 | | | |
| $C_2H_4$ 28.052 | | | | 1.810 | 0.313 | 8.78 | 1.492 | 1.492 | 1.805 | 0.313 | 8.78 | 0.596 | | | |
| $C_2H_6$ 30.068 | | | | 1.033 | 0.178 | 5.35 | 0.851 | 0.851 | 1.029 | 0.178 | 5.35 | 0.363 | | | |
| $C_1+C_2$ | | | | | | | | | | | 29.36 | 1.993 | | | |
| $C_3H_6$ 42.078 | | | | 1.993 | 0.344 | 14.47 | 1.643 | 1.643 | 1.987 | 0.344 | 14.47 | 0.982 | 4.32 | 3.350 | 0.227 |
| $C_3H_8$ 44.094 | | | | 0.227 | 0.039 | 1.72 | 0.187 | 0.187 | 0.226 | 0.039 | 1.72 | 0.117 | 4.24 | 0.406 | 0.028 |
| $C_4H_8$ 56.104 | | | | 1.330 | 0.230 | 12.90 | 1.096 | 1.096 | 1.326 | 0.230 | 12.90 | 0.875 | 5.00 | 2.580 | 0.175 |
| $C_4H_{10}$ 58.120 | | | | 0.337 | 0.058 | 3.37 | 0.278 | 0.278 | 0.336 | 0.058 | 3.37 | 0.229 | 4.86 | 0.693 | 0.047 |
| $C_5H_{10}$ 70.130 | | | | 0.597 | 0.103 | 7.22 | 0.492 | 0.492 | 0.595 | 0.103 | 7.22 | 0.490 | 5.45 | 1.325 | 0.090 |
| $C_5H_{12}$ 72.146 | | | | 0.130 | 0.022 | 1.59 | 0.107 | 0.107 | 0.129 | 0.022 | 1.59 | 0.108 | 5.25 | 0.303 | 0.021 |
| $C_6H_{12}$ 84.156 | | | | 0.170 | 0.029 | 2.44 | 0.140 | 0.140 | 0.169 | 0.029 | 2.44 | 0.166 | 5.54 | 0.440 | 0.030 |
| $C_3$-$C_6$ | | | | | | | | | | | 43.71 | 2.967 | | 9.097 | 0.618 |
| TOTAL | | 40.116 | 504.54 | | 17.271 | 347.64 | 82.416 | 122.532 | 145.689 | | | | | | |
| $H_2$+CO | 96.790 | 38.828 | 14735 SCFH | | 10.469 | 49 | 49.957 | 88.785 | 60.426 | -28.359 | | | | | |
| $H_2$/CO | | 1.67 | Factor 678656 | | 3.42 | | 3.42 | 2.44 | 3.42 | 1.33 | | | | | |
| RECOVERED OIL ** | | | | | | | | | | 0.336 | 47.09 | 3.196 | | 7.246 | 0.492 |
| TOTAL OIL | | | | | | | | | | | 90.80 | 6.163 | | 16.343 | 1.110 |
| WATER SOLUBLE CHEMICALS ** | | | | | | | | | | 0.281 | 14.89 | 1.011 | | 1.855 | 0.126 |
| TOTAL LIQUID PRODUCTS $C_3$+ | | | | | | | | | | | 105.69 | 7.174 | | 18.198 | 1.236 |
| NET WATER ** | | | | | | | | | | 5.269 | 94.92 | 6.442 | | 11.395 | 0.773 |
| GROSS WATER | | | | | | | | | | | 109.81 | 7.453 | | 13.250 | 0.899 |
| HYDROCARBON TOTAL—$C_1$+ | | | | | | | | | | | 135.05 | 9.165 | | | |

| Weight Recovery, % 91.87 | Catalyst Age, hrs. | Space Velocity, vhv 2775 |
|---|---|---|
| Pressure, psig 403 | Inlet Velocity, Ft/sec 1.49 | Catalyst Vol CF 5.31 |
| Temperature, °F 663 | Bed Depth, Ft 8.04 | Weight, # 584 |
| Recycle Ratio 2.05 | Bed Density, #/CF 110 | Effluent $(H_2)(CO_2)$ / Shift Ratio $(H_2O)(CO)$ = |

| FRESH FEED CONVERSION — % | | | | TOTAL FEED CONVERSION — % | | | SELECTIVITY |
|---|---|---|---|---|---|---|---|
| Contraction | CO | $H_2$ | $H_2$+CO | CO | $H_2$ | CO+$H_2$ | $C_3$+/$C_1$+ |
| 56.95 | 83.68 | 66.68 | 73.04 | 47.05 | 25.74 | 31.94 | 78.26 |

YIELD BASIS $H_2$+CO FED

| YIELDS BASIS BROWNSVILLE DESIGN FEED RATE* | CORRECTED HEMPEL, % | gal/hr | TREATING RECOVERY, % | gal/hr |
|---|---|---|---|---|
| 400 EP | 74.7 | 5.413 | 98.0 | 5.305 |
| 400-550 | 12.6 | 0.913 | 91.4 | 0.834 |
| 550 + | 12.7 | 0.920 | 114.6 | 1.054 |

| | RECOVERY % | #/hr | gal/hr | |
|---|---|---|---|---|
| PROPYLENE | 32.7 | 4.73 | | |
| $C_3$ POLY GASO. | 87.5 | 4.14 | 0.692 | |
| $C_3$ POLY TAR | 12.5 | 0.59 | 0.078 | |

| | #/gal | #/hr | gal/hr | RVP |
|---|---|---|---|---|
| $C_4H_8$ | 5.00 | 0.76 | 0.152 | 68.0 |
| $C_4$ POLY GASO. | 5.98 | 10.62 | 1.776 | 1.5 |
| $C_4H_{10}$ | 4.86 | 3.37 | 0.693 | 68.0 |
| $C_4$-FREE GASO. | | | 8.065 | 5.8 |
| $C_4$ POLY TAR | 7.53 | 1.52 | 0.202 | |

| | gal/hr | gal/MCF | Bbl/Day |
|---|---|---|---|
| 10 # RVP 400 EP GASOLINE | 10.686 | 0.7252 | 3932 |
| GAS OIL | 0.834 | 0.0566 | 307 |
| FUEL OIL | 1.054 | 0.0715 | 388 |
| POLY TAR | 0.280 | 0.0190 | 103 |
| TOTAL | 12.854 | 0.8723 | 4730 |
| W. S. CHEM. | 1.855 | 0.1259 | 683 |
| TOTAL | 14.709 | 0.9982 | 5413 |

Form ML—11

** Included in Reactor Effluent Total

g/NCM = 16.91 × #/MCF  *9488 MCFH $H_2$ + CO, Bbl/Day = 5421.6 × gal/MCF

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

RUN NO. 66-AA
HOURS 547-571

| OPERATING CONDITIONS | | | |
|---|---|---|---|
| PRESSURES PSIG | | RATES S.C.F.H. | |
| Oxygen | 425 | Fresh Feed | 15224 |
| Natural Gas | 418 | Recycle | 31277 |
| Generator Outlet | 407 | Combined Feed | 46501 |
| Reactor Inlet | 403 | Wet Gas—Measured | 5781 |
| Condenser Inlet | | Adjusted | 6555 |
| Product Accumulator | 374 | Loss | 774 |
| | | | |
| | | | |
| TEMPERATURES—°F. | | Recycle/Fresh Feed | 2.05 |
| Oxygen | 514 | Inlet Velocity—ft./sec. | 1.49 |
| Natural Gas | 794 | Fresh Feed Rate—S.C.F.H. | 14735 |
| Generator | 2443 | per Cu. Ft. Dense Bed | 2775 |
| Quench Accumulator | 142 | per Lb. Catalyst | 25.23 |
| Reactor Inlet | 311 | per sq ft | 22326 |
| Condenser Inlet | 603 | | |
| Product Accumulator | 75 | | |
| Catalyst No. Height | | | |
| 1 See Per. A | -- | | |
| 2 | 663 | | |
| 3 | 655 | | |
| 4 | 665 | | |
| 5 | 671 | | |
| 6 | 660 | | |
| 7 | 643 | | |
| 8 | 635 | | |
| 9 | 650 | | |
| 10 | 648 | | |
| 11 | 658 | | |

| PRODUCT TESTS | OIL | WATER |
|---|---|---|
| ° API | 49.8 | 10.7 |
| Neut. No. | 53.2 | 46.7 |
| Sap. No. | 66.6 | 49.2 |
| Hydrox. No. | | |
| Bromine No. | 95 | |
| Pour °F. | | |
| Chemicals, % by $K_2CO_3$ | | 14.0 |
| | | |
| | | |
| HEMPEL DIST. % | | °API |
| 205 °F. | | |
| 400 | 73.7 | 54.2 |
| 400-550 | 12.6 | 36.4 |
| 550+ | 13.7 | |
| | | |
| A. S. T. M. DIST. ON | | |
| Naphtha °F. | | |
| IBP | 108 | |
| 10% | 139 | |
| 50% | 228 | |
| 90% | 354 | |
| EP | 401 | |
| Rec | 97.4 | |

| CATALYST DATA | | | | | | |
|---|---|---|---|---|---|---|
| INVENTORY DATA | | PARTICLE SIZE | | | | |
| In Reactor at Start of Period | | Screen Analysis | | | Sedimentation | |
| Fresh Catalyst Added | | Mesh | Microns | % | Microns | % |
| Total | | On 40 | 419+ | | 80+ | |
| Catalyst Recovered | 81 | 100 | 150 | | 40—80 | |
| In Reactor at End of Period | | 150 | 105 | | 20—40 | |
| | | 200 | 74 | | 10—20 | |
| REACTOR d-p, Inches $H_2O$ | | 250 | 62 | | 0—20 | |
| No. Height | | 325 | 44 | | | |
| 0 See Per. A | | <325 | | | | |
| 1 | 52 | CATALYST | | | | |
| 2 | 58 | Bulk Density, Lbs./Cu.Ft. | | | | |
| 3 | 39 | Aerated | | | | |
| 4 | 145 | Settled | | | | |
| Total | 149 | Compacted | | | | |
| | | Particle Density, gm./cc. | | | | |
| CALCULATED FROM dp | | $NH_3$ Value, ml./gm. | | | | |
| Density, Lbs./Cu.Ft. | 110 | $N_2$ Surface, $m^2$/gm. | | | | |
| Inventory, Lbs. | 584 | | | | | |
| Bed Depth, Ft. | 8.04 | CHEMICAL ANALYSIS | | | | |
| Volcu fu | 5.31 | Fe | | | | |
| | | C | | | | |
| | | O | | | | |
| | | H | | | | |
| | | $K_2O$, W+, % basis Fe | | | | |
| | | X-Ray Analysis— | | | | |
| | | $Fe_{20}C_9$ | | | | |
| | | $Fe_3O_4$ | | | | |
| | | Fe | | | | |

RUN NO. 66-BB
HOURS 571-595
CATALYST Brownsville Treated MS Red. @ 660F

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

| | FRESH FEED | | | WET GAS | | | RECYCLE | COMBINED FEED | EFFLUENT | NET CHANGE | | YIELD BASIS $H_2$+CO FED | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | At Wt. Balance | | | | | | | CONDENSATE | | | |
| | % | m/hr | #/hr | % | m/hr | #/hr | m/hr | m/hr | m/hr | m/hr | #/hr | #/MCF | #/gal | gal/hr | gal/MCF |
| CO 28.010 | 36.280 | 14.444 | 404.56 | 16.607 | 3.044 | 85.26 | 13.984 | 28.428 | 17.028 | -11.400 | -319.30 | | | | |
| $H_2$ 2.016 | 60.596 | 24.125 | 48.64 | 48.210 | 8.837 | 17.82 | 40.595 | 64.720 | 49.432 | -15.288 | 30.82 | | | | |
| $CO_2$ 44.010 | 2.167 | 0.863 | 37.98 | 21.343 | 3.912 | 172.16 | 17.972 | 18.835 | 21.884 | 3.049 | 134.18 | 9.167 | | | |
| $N_2$ 28.016 | 0.657 | 0.262 | 7.34 | 1.623 | 0.297 | 8.32 | 1.367 | 1.629 | 1.664 | | | | | | |
| $CH_4$ 16.042 | 0.300 | 0.119 | 1.91 | 5.423 | 0.994 | 15.95 | 4.566 | 4.685 | 5.560 | 0.875 | 14.04 | 0.959 | | | |
| $C_2H_4$ 28.052 | | | | 1.587 | 0.291 | 8.16 | 1.336 | 1.336 | 1.627 | 0.291 | 8.16 | 0.557 | | | |
| $C_2H_6$ 30.069 | | | | 0.877 | 0.161 | 4.84 | 0.738 | 0.738 | 0.899 | 0.161 | 4.84 | 0.331 | | | |
| $C_1+C_2$ | | | | | | | | | | | 27.04 | 1.847 | | | |
| $C_3H_6$ 42.078 | | | | 1.667 | 0.306 | 12.88 | 1.404 | 1.404 | 1.710 | 0.306 | 12.88 | 0.880 | 4.32 | 2.981 | 0.204 |
| $C_3H_8$ 44.094 | | | | 0.153 | 0.028 | 1.23 | 0.129 | 0.129 | 0.157 | 0.028 | 1.23 | 0.084 | 4.24 | 0.290 | 0.020 |
| $C_4H_8$ 56.104 | | | | 1.170 | 0.214 | 12.01 | 0.985 | 0.985 | 1.199 | 0.214 | 12.01 | 0.821 | 5.00 | 2.402 | 0.164 |
| $C_4H_{10}$ 58.120 | | | | 0.440 | 0.081 | 4.71 | 0.370 | 0.370 | 0.451 | 0.081 | 4.71 | 0.322 | 4.86 | 0.969 | 0.066 |
| $C_5H_{10}$ 70.130 | | | | 0.563 | 0.103 | 7.22 | 0.474 | 0.474 | 0.577 | 0.103 | 7.22 | 0.493 | 5.45 | 1.325 | 0.091 |
| $C_5H_{12}$ 72.146 | | | | 0.130 | 0.024 | 1.73 | 0.109 | 0.109 | 0.133 | 0.024 | 1.73 | 0.118 | 5.25 | 0.330 | 0.023 |
| $C_6H_{12}$ 84.156 | | | | 0.207 | 0.038 | 3.20 | 0.174 | 0.174 | 0.212 | 0.038 | 3.20 | 0.219 | 5.54 | 0.578 | 0.039 |
| $C_3$-$C_6$ | | | | | | | | | | | 42.98 | 2.937 | | 8.875 | 0.607 |
| TOTAL | | 39.813 | 500.43 | | 18.330 | 355.49 | 84.203 | 124.016 | 107.936 | | | | | | |
| $H_2$+CO | 96.876 | 38.569 | 14637 SCFH | | 11.881 | 54.579 | 34.579 | 95.148 | 66.460 | -26.688 | | | | | |
| $H_2$/CO | | 1.67 | Factor 683200 | | 2.90 | | 2.90 | 2.28 | 2.90 | 1.34 | | | | | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Weight Recovery, % | 92.02 | Catalyst Age, hrs. | | Space Velocity, vhv | 3049 | RECOVERED OIL ** | 0.310 | 43.51 |
| Pressure, psig | 405 | Inlet Velocity, Ft/sec | 1.49 | Catalyst Vol CF | 4.80 | TOTAL OIL | | 86.49 |
| Temperature, °F | 658 | Bed Depth, Ft | 7.27 | Weight, # | 514 | WATER SOLUBLE CHEMICALS ** | 0.276 | 14.65 |
| Recycle Ratio | 2.11 | Bed Density, #/CF | 107 | Effluent $(H_2)(CO_2)$ / Shift Ratio $(H_2O)(CO)$ | = | TOTAL LIQUID PRODUCTS $C_3$+ | | 101.14 |
| | | | | | | NET WATER ** | 4.815 | 86.78 |
| | | | | | | GROSS WATER | | 101.43 |
| | | | | | | HYDROCARBON TOTAL—$C_1$+ | | 128.18 |

| FRESH FEED CONVERSION — % | | | | TOTAL FEED CONVERSION — % | | | SELECTIVITY |
|---|---|---|---|---|---|---|---|
| Contraction | CO | $H_2$ | $H_2$+CO | CO | $H_2$ | CO+$H_2$ | $C_3$+/$C_1$+ |
| 53.96 | 78.93 | 63.37 | 69.20 | 40.10 | 23.62 | 28.65 | 78.90 |

| YIELDS BASIS BROWNSVILLE DESIGN FEED RATE* | CORRECTED HEMPEL, % | gal/hr | TREATING RECOVERY, % | gal/hr |
|---|---|---|---|---|
| 400 EP | 76.2 | 5.083 | 98.0 | 4.981 |
| 400-550 | 12.9 | 0.860 | 91.4 | 0.786 |
| 550 + | 10.9 | 0.727 | 114.6 | 0.833 |

| | RECOVERY % | #/hr | gal/hr | |
|---|---|---|---|---|
| PROPYLENE | 30.8 | 3.97 | | |
| $C_3$ POLY GASO. | 87.5 | 3.47 | 0.580 | |
| $C_3$ POLY TAR | 12.5 | 0.50 | 0.066 | |

| | #/gal | #/hr | gal/hr | RVP |
|---|---|---|---|---|
| $C_4H_8$ | 5.00 | -- | -- | 68.0 |
| $C_4$ POLY GASO. | 5.98 | 10.51 | 1.757 | 1.5 |
| $C_4H_{10}$ | 4.86 | (4.71) 3.99 | (0.969) 0.822 | 68.0 |
| $C_4$-FREE GASO. | | | 7.794 | 5.8 |
| $C_4$ POLY TAR | 7.53 | 1.50 | 0.199 | |

| | gal/hr | gal/MCF | Bbl/Day |
|---|---|---|---|
| 10 # RVP 400 EP GASOLINE | 10.373 | 0.7087 | 3843 |
| GAS OIL | 0.786 | 0.0537 | 291 |
| FUEL OIL | 0.833 | 0.0569 | 308 |
| POLY TAR | 0.265 | 0.0181 | 98 |
| TOTAL | 12.257 | 0.8374 | 4540 |
| W. S. CHEM. | 1.838 | 0.1256 | 681 |
| TOTAL | 14.095 | 0.9630 | 5221 |

Form ML—11

** Included in Reactor Effluent Total

g/NCM = 16.91 × #/MCF  *9488 MCFH $H_2$ + CO, Bbl/Day = 5421.6 × gal/MCF

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

RUN NO. 66-BB
HOURS 571-595

| OPERATING CONDITIONS | | | |
|---|---|---|---|
| PRESSURES PSIG | | RATES S.C.F.H. | |
| Oxygen | 427 | Fresh Feed | 15109 |
| Natural Gas | 421 | Recycle | 31955 |
| Generator Outlet | 409 | Combined Feed | 47064 |
| Reactor Inlet | 405 | Wet Gas—Measured | 6175 |
| Condenser Inlet | | Adjusted | 6956 |
| Product Accumulator | 375 | Loss | 781 |
| | | | |
| | | | |
| TEMPERATURES—°F. | | Recycle/Fresh Feed | 2.11 |
| Oxygen | 497 | Inlet Velocity—ft./sec. | 1.49 |
| Natural Gas | 788 | Fresh Feed Rate—S.C.F.H. | 14637 |
| Generator | 2441 | per Cu. Ft. Dense Bed | 3049 |
| Quench Accumulator | 142 | per Lb. Catalyst | 28.48 |
| Reactor Inlet | 313 | per sq ft | 22177 |
| Condenser Inlet | 611 | | |
| Product Accumulator | 75 | | |
| Catalyst No. Height | | | |
| 1 See Per. A | -- | | |
| 2 | 659 | | |
| 3 | 652 | | |
| 4 | 662 | | |
| 5 | 666 | | |
| 6 | 652 | | |
| 7 | 645 | | |
| 8 | 646 | | |
| 9 | 653 | | |
| 10 | 648 | | |
| 11 | 658 | | |

| PRODUCT TESTS | OIL | WATER |
|---|---|---|
| °API | 49.1 | 10.9 |
| Neut. No. | 55.4 | 49.8 |
| Sap. No. | 66.6 | 51.3 |
| Hydrox. No. | | |
| Bromine No. | 92 | |
| Pour °F. | Below -20 | |
| Chemicals, % by $K_2CO_3$ | | 15.0 |
| | | |
| | | |
| | | |
| HEMPEL, DIST. % | | °API |
| 205 °F. | | |
| 400 | 75.2 | 53.7 |
| 400-550 | 12.9 | 35.6 |
| 550+ | 11.9 | |
| | | |
| A. S. T. M. DIST. ON | | |
| Naphtha °F. | | |
| IBP | 106 | |
| 10% | 136 | |
| 50% | 228 | |
| 90% | 360 | |
| EP | 407 | |
| Rec. | 96.0 | |

| CATALYST DATA | | | | | | |
|---|---|---|---|---|---|---|
| INVENTORY DATA | | PARTICLE SIZE | | | | |
| | | Screen Analysis | | | Sedimentation | |
| In Reactor at Start of Period | | Mesh | Microns | % | Microns | % |
| Fresh Catalyst Added | | On 40 | 419+ | | 80+ | |
| Total | | 100 | 150 | | 40—80 | |
| Catalyst Recovered | 75 | 150 | 105 | | 20—40 | |
| In Reactor at End of Period | | 200 | 74 | | 10—20 | |
| | | 250 | 62 | | 0—20 | |
| REACTOR d-p, Inches $H_2O$ | | 325 | 44 | | | |
| No. Height | | <325 | | | | |
| 0 See Per. A | | | | | | |
| 1 | 51 | CATALYST | | | | |
| 2 See Per. A | 56 | Bulk Density, Lbs./Cu.Ft. | | | | |
| 3 | 22 | Aerated | | | | |
| 4 | 121 | Settled | | | | |
| Total | 129 | Compacted | | | | |
| | | Particle Density, gm./cc. | | | | |
| CALCULATED FROM dp | | $NH_3$ Value, ml./gm. | | | | |
| Density, Lbs./Cu.Ft. | 107 | $N_2$ Surface, $m^2$/gm. | | | | |
| Inventory, Lbs. | 514 | | | | | |
| Bed Depth, Ft. | 7.27 | CHEMICAL ANALYSIS | | | | |
| Vol cu ft | 4.80 | Fe | | | | |
| | | C | | | | |
| | | O | | | | |
| | | H | | | | |
| | | $K_2O$, W+, % basis Fe | | | | |
| | | X-Ray Analysis— | | | | |
| | | $Fe_{20}C_9$ | | | | |
| | | $Fe_3O_4$ | | | | |
| | | Fe | | | | |

RUN NO. 66-CC
HOURS 595-619
CATALYST Brownsville Treated MS Red. @ 660F

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

| | FRESH FEED | | | WET GAS | | | RECYCLE | COMBINED FEED | EFFLUENT | NET CHANGE | | YIELD BASIS $H_2$+CO FED | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | At Wt. Balance | | | | | | | CONDENSATE | | | |
| | % | m/hr | #/hr | % | m/hr | #/hr | m/hr | m/hr | m/hr | m/hr | #/hr | #/MCF | #/gal | gal/hr | gal/MCF |
| CO 28.010 | 36.360 | 14.461 | 405.08 | 17.007 | 3.371 | 94.42 | 14.497 | 28.958 | 17.868 | -11.090 | -310.66 | | | | |
| $H_2$ 2.016 | 60.313 | 23.989 | 48.36 | 49.576 | 9.826 | 19.81 | 42.261 | 66.250 | 52.087 | -14.163 | -28.55 | | | | |
| $CO_2$ 44.010 | 2.377 | 0.945 | 41.59 | 20.417 | 4.047 | 178.07 | 17.404 | 18.349 | 21.451 | 3.102 | 136.48 | 9.353 | | | |
| $N_2$ 28.016 | 0.627 | 0.247 | 6.98 | 1.553 | 0.308 | 8.63 | 1.324 | 1.573 | 1.632 | | | | | | |
| $CH_4$ 16.042 | 0.323 | 0.129 | 2.07 | 5.240 | 1.039 | 16.67 | 4.467 | 4.596 | 5.506 | 0.910 | 14.60 | 1.001 | | | |
| $C_2H_4$ 28.052 | | | | 1.523 | 0.302 | 8.47 | 1.298 | 1.298 | 1.600 | 0.302 | 8.47 | 0.580 | | | |
| $C_2H_6$ 30.068 | | | | 0.773 | 0.153 | 4.60 | 0.659 | 0.659 | 0.812 | 0.153 | 4.60 | 0.315 | | | |
| $C_1+C_2$ | | | | | | | | | | | 27.67 | 1.896 | | | |
| $C_3H_6$ 42.078 | | | | 1.637 | 0.324 | 13.63 | 1.395 | 1.395 | 1.719 | 0.324 | 13.63 | 0.934 | 4.32 | 3.155 | 0.216 |
| $C_3H_8$ 44.094 | | | | 0.180 | 0.036 | 1.59 | 0.153 | 0.153 | 0.189 | 0.036 | 1.59 | 0.109 | 4.24 | 0.375 | 0.026 |
| $C_4H_8$ 56.104 | | | | 1.033 | 0.205 | 11.50 | 0.881 | 0.881 | 1.086 | 0.205 | 11.50 | 0.788 | 5.00 | 2.300 | 0.158 |
| $C_4H_{10}$ 58.120 | | | | 0.327 | 0.065 | 3.78 | 0.279 | 0.279 | 0.344 | 0.065 | 3.78 | 0.259 | 4.86 | 0.778 | 0.053 |
| $C_5H_{10}$ 70.130 | | | | 0.477 | 0.095 | 6.66 | 0.407 | 0.407 | 0.502 | 0.095 | 6.66 | 0.456 | 5.45 | 1.222 | 0.084 |
| $C_5H_{12}$ 72.146 | | | | 0.100 | 0.020 | 1.44 | 0.085 | 0.085 | 0.105 | 0.020 | 1.44 | 0.099 | 5.25 | 0.274 | 0.019 |
| $C_6H_{12}$ 84.156 | | | | 0.157 | 0.031 | 2.61 | 0.134 | 0.134 | 0.165 | 0.031 | 2.61 | 0.179 | 5.54 | 0.471 | 0.032 |
| $C_3$-$C_6$ | | | | | | | | | | | 41.21 | 2.824 | | 8.575 | 0.588 |
| TOTAL | | 39.773 | 504.08 | | 19.822 | 371.88 | 85.244 | 125.017 | 110.049 | | | | | | |
| $H_2$+CO | 96.673 | 38.450 | 14592 SCFH | | 13.197 | | 56.758 | 95.208 | 69.955 | -25.253 | | | | | |
| $H_2$/CO | | 1.66 | Factor 685307 | | 2.92 | | 2.92 | 2.29 | 2.92 | 1.28 | | | | | |

| YIELDS BASIS BROWNSVILLE DESIGN FEED RATE* | CORRECTED HEMPEL, % | gal/hr | TREATING RECOVERY, % | gal/hr |
|---|---|---|---|---|
| 400 EP | 77.4 | 4.557 | 98.0 | 4.466 |
| 400-550 | 9.9 | 0.583 | 91.4 | 0.533 |
| 550 + | 12.7 | 0.748 | 114.6 | 0.859 |
| | RECOVERY % | #/hr | gal/hr | |
| PROPYLENE | 28.8 | 3.93 | | |
| $C_3$ POLY GASO. | 87.5 | 3.44 | 0.575 | |
| $C_3$ POLY TAR | 12.5 | 0.49 | 0.065 | |
| | #/gal | #/hr | gal/hr | RVP |
| $C_4H_8$ | 5.00 | 0.10 | 0.020 | 68.0 |
| $C_4$ POLY GASO. | 5.98 | 11.84 | 1.980 | 1.5 |
| $C_4H_{10}$ | 4.86 | 3.78 | 0.778 | 68.0 |
| $C_4$-FREE GASO. | | | 7.008 | 5.8 |
| $C_4$ POLY TAR | 7.53 | 1.69 | 0.224 | |
| | gal/hr | gal/MCF | Bbl/Day | |
| 10 # RVP 400 EP GASOLINE | 9.786 | 0.6706 | 3636 | |
| GAS OIL | 0.533 | 0.0365 | 198 | |
| FUEL OIL | 0.859 | 0.0589 | 319 | |
| POLY TAR | 0.289 | 0.0198 | 107 | |
| TOTAL | 11.467 | 0.7858 | 4260 | |
| W. S. CHEM. | 1.700 | 0.1165 | 632 | |
| TOTAL | 13.167 | 0.9023 | 4892 | |

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Weight Recovery, % | 92.50 | Catalyst Age, hrs. | | Space Velocity, vhv | 3450 | RECOVERED OIL ** | 0.274 | 38.41 | 2.632 | | 5.888 | 0.404 | GAS OIL | 0.533 | 0.0365 | 198 |
| Pressure, psig | 405 | Inlet Velocity, Ft/sec | 1.51 | Catalyst | Vol CF 4.23 | TOTAL OIL | | 79.62 | 5.456 | | 14.463 | 0.992 | FUEL OIL | 0.859 | 0.0589 | 319 |
| Temperature, °F | 664 | Bed Depth, Ft | 6.41 | Weight, # | 423 | WATER SOLUBLE CHEMICALS ** | 0.255 | 13.55 | 0.929 | | 1.700 | 0.117 | POLY TAR | 0.289 | 0.0198 | 107 |
| Recycle Ratio | 2.14 | Bed Density, #/CF | 100 | Effluent $(H_2)(CO_2)$ / Shift Ratio $(H_2O)(CO)$ = | | TOTAL LIQUID PRODUCTS $C_3$+ | | 93.17 | 6.385 | | 16.163 | 1.109 | TOTAL | 11.467 | 0.7858 | 4260 |
| | | | | | | NET WATER ** | 4.454 | 80.24 | 5.499 | | 9.633 | 0.660 | W. S. CHEM. | 1.700 | 0.1165 | 632 |
| | | | | | | GROSS WATER | | 93.79 | 6.428 | | 11.333 | 0.777 | TOTAL | 13.167 | 0.9023 | 4892 |
| | | | | | | HYDROCARBON TOTAL—$C_1$+ | | 120.84 | 8.281 | | | | | | | |

| FRESH FEED CONVERSION — % | | | | TOTAL FEED CONVERSION — % | | | SELECTIVITY |
|---|---|---|---|---|---|---|---|
| Contraction | CO | $H_2$ | $H_2$+CO | CO | $H_2$ | CO+$H_2$ | $C_3$+/$C_1$+ |
| 50.16 | 76.69 | 59.03 | 65.68 | 38.30 | 21.38 | 26.52 | 77.10 |

Form ML—11

** Included in Reactor Effluent Total

g/NCM = 16.91 × #/MCF  *9488 MCFH $H_2$ + CO, Bbl/Day = 5421.6 × gal/MCF

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

RUN NO. 66-CC
HOURS 595-619

| OPERATING CONDITIONS | | | |
|---|---|---|---|
| PRESSURES PSIG | | RATES S.C.F.H. | |
| Oxygen | 428 | Fresh Feed | 15094 |
| Natural Gas | 422 | Recycle | 32350 |
| Generator Outlet | 410 | Combined Feed | 47444 |
| Reactor Inlet | 405 | Wet Gas—Measured | 6758 |
| Condenser Inlet | | Adjusted | 7522 |
| Product Accumulator | 374 | Loss | 764 |
| | | | |
| TEMPERATURES—°F. | | Recycle/Fresh Feed | 2.14 |
| Oxygen | 483 | Inlet Velocity—ft./sec. | 1.51 |
| Natural Gas | 779 | Fresh Feed Rate—S.C.F.H. | 14592 |
| Generator | 2437 | per Cu. Ft. Dense Bed | 3450 |
| Quench Accumulator | 141 | per Lb. Catalyst | 34.50 |
| Reactor Inlet | 318 | per sq ft | 22109 |
| Condenser Inlet | 595 | | |
| Product Accumulator | 75 | | |
| Catalyst No. Height | | | |
| 1 See Per. A | -- | | |
| 2 | 665 | | |
| 3 | 658 | | |
| 4 | 668 | | |
| 5 | 671 | | |
| 6 | 654 | | |
| 7 | 643 | | |
| 8 | 640 | | |
| 9 | 644 | | |
| 10 | 641 | | |
| 11 | 629 | | |

| PRODUCT TESTS | OIL | WATER |
|---|---|---|
| ° API | 49.1 | 10.9 |
| Neut. No. | 59.4 | 53.8 |
| Sap. No. | 66.4 | 54.7 |
| Hydrox. No. | | |
| Bromine No. | 91.5 | |
| Pour °F. | | |
| Chemicals, % by $K_2CO_3$ | | 15.0 |
| | | |
| | | |
| HEMPEL. DIST. % | | °API |
| 205 °F. | | |
| 400 | 76.4 | 52.6 |
| 400-550 | 9.9 | 36.8 |
| 550+ | 13.7 | |
| | | |
| A. S. T. M. DIST. ON | | |
| Naphtha °F. | | |
| IBP | 112 | |
| 10% | 140 | |
| 50% | 240 | |
| 90% | 376 | |
| EP | 408 | |
| Rec | 97.5 | |

| CATALYST DATA | | | | | | |
|---|---|---|---|---|---|---|
| INVENTORY DATA | | PARTICLE SIZE | | | | |
| | | Screen Analysis | | | Sedimentation | |
| In Reactor at Start of Period | | Mesh | Microns | % | Microns | % |
| Fresh Catalyst Added | | On 40 | 419+ | | 80+ | |
| Total | | 100 | 150 | | 40—80 | |
| Catalyst Recovered | 89 | 150 | 105 | | 20—40 | |
| In Reactor at End of Period | | 200 | 74 | | 10—20 | |
| | | 250 | 62 | | 0—20 | |
| REACTOR d-p, Inches $H_2O$ | | 325 | 44 | | | |
| No. Height | | <325 | | | | |
| 0 See Per. A | | | | | | |
| 1 | 50 | CATALYST | | | | |
| 2 | 50 | Bulk Density, Lbs./Cu.Ft. | | | | |
| 3 | 4 | Aerated | | | | |
| 4 | 100 | Settled | | | | |
| Total | 104 | Compacted | | | | |
| | | Particle Density, gm./cc. | | | | |
| CALCULATED FROM dp | | $NH_3$ Value, ml./gm. | | | | |
| Density, Lbs./Cu.Ft. | 100 | $N_2$ Surface, $m^2$/gm. | | | | |
| Inventory, Lbs. | 423 | | | | | |
| Bed Depth, Ft. | 6.41 | CHEMICAL ANALYSIS | | | | |
| Vol cu ft | 4.23 | Fe | | | | |
| | | C | | | | |
| | | O | | | | |
| | | H | | | | |
| | | $K_2O$, W+, % basis Fe | | | | |
| | | X-Ray Analysis— | | | | |
| | | $Fe_{20}C_9$ | | | | |
| | | $Fe_3O_4$ | | | | |
| | | Fe | | | | |

## THE TEXAS COMPANY — MONTEBELLO LABORATORY

### RATE CALCULATIONS

RUN NO. 66-A
HOURS 0-9

| HOUR | GAS ANALYSES 0200 | 0600 | | AVERAGE |
|---|---|---|---|---|
| FRESH FEED | | | | |
| CO 28.010 | 35.99 | 36.25 | | 36.120 |
| $H_2$ 2.016 | 60.95 | 60.76 | | 60.855 |
| $CO_2$ 44.010 | 2.42 | 2.40 | | 2.410 |
| $N_2$ 28.016 | 0.56 | 0.51 | | 0.535 |
| $CH_4$ 16.042 | 0.08 | 0.08 | | 0.080 |
| | | | M. W | 12.567409 |
| | | | $H_2O$ 18.016 | |
| | | | | |
| | | | BALANCE | |
| WET GAS | | | | |
| CO 28.010 | 7.24 | 7.65 | | 7.445 |
| $H_2$ 2.016 | 41.23 | 40.48 | | 40.855 |
| $CO_2$ 44.010 | 31.24 | 31.51 | | 31.375 |
| $N_2$ 28.016 | 1.94 | 1.74 | | 1.840 |
| $CH_4$ 16.042 | 8.83 | 8.71 | | 8.770 |
| $C_2H_4$ 28.052 | 2.29 | 2.23 | | 2.260 |
| $C_2H_6$ 30.068 | 1.18 | 1.18 | | 1.180 |
| $C_3H_6$ 42.078 | 2.78 | 2.86 | | 2.820 |
| $C_3H_8$ 44.094 | 0.28 | 0.30 | | 0.290 |
| $C_4H_8$ 56.104 | 1.51 | 1.58 | | 1.545 |
| $C_4H_{10}$ 58.120 | 0.60 | 0.59 | | 0.595 |
| $C_5H_{10}$ 70.130 | 0.56 | 0.71 | | 0.635 |
| $C_5H_{12}$ 72.146 | 0.15 | 0.21 | | 0.180 |
| $C_6H_{12}$ 84.156 | 0.17 | 0.25 | | 0.210 |
| | | | M. W. | 22.907283 |

| GENERATOR BALANCE | M/HR | C | H | O |
|---|---|---|---|---|
| | 14.989 | 14.989 | | 14.989 |
| | 25.255 | | 50.510 | |
| | 1.000 | 1.000 | | 2.000 |
| | 0.222 | | | |
| | 0.033 | 0.033 | 0.132 | |
| | | | | |
| | | | 9.252 | 4.626 |
| | | 16.022 | 59.894 | 21.615 |
| | | 97.17 | 100.66 | 99.10 |
| GAS FLOW RATES | | | | |
| FRESH FEED | 79.31 | 6.310 | 20.416 | 1.0156 |
| WET GAS | 158.44 | 5.967 | 4.016 | 1.0255 |
| RECYCLE | 79.31 | 7.867 | 20.460 | 1.0088 |
| BLEED | 5.02 | 7.680 | 20.460 | 1.0000 |
| NATURAL GAS | 28.43 | 7.700 | 21.645 | 0.8986 |
| OXYGEN | 27.07 | 6.978 | 21.100 | 1.0198 |
| STEAM | 215.7 | 6.450 | | |

| | Mol % | M/Hr | C | H | O |
|---|---|---|---|---|---|
| $O_2$ 32.000 | 0.26 | 10.711 0.035 | | | 21.492 |
| $CO_2$ 44.010 | 1.18 | 0.160 | | | 0.320 |
| $N_2$ 28.016 | 0.71 | 0.096 | | | |
| $CH_4$ 16.042 | 84.92 | 11.509 | 11.509 | 46.036 | |
| $C_2H_6$ 30.068 | 5.39 | 0.730 | 1.460 | 4.380 | |
| $C_3H_8$ 44.094 | 5.00 | 0.678 | 2.034 | 5.424 | |
| $C_4H_{10}$ 58.120 | 1.73 | 0.234 | 0.936 | 2.340 | |
| $C_5H_{12}$ 72.146 | 0.81 | 0.110 | 0.550 | 1.320 | |
| MW | 19.83952 | | | | |
| TOTAL | | | 16.489 | 59.500 | 21.812 |

| WEIGHT BALANCE | #/hr Measured | At Wt. Balance |
|---|---|---|
| WET GAS | 264.21 | 301.00 |
| OIL | 78.97 | 78.97 |
| WATER | 141.56 | 141.56 |
| TOTAL | 484.74 | 521.53 |
| FRESH FEED | 521.53 | |
| WEIGHT BALANCE | 92.95 | |
| | | |
| WET GAS FACTOR | 1139245 | |
| INDICATED LOSS—S C F H | 609 | |
| | 4986 | |

| | √h | PRESSURE | TEMP. | M. W. | S. C. F. H. | M/HR |
|---|---|---|---|---|---|---|
| FRESH FEED | | 402.1 | 44.3 | 2303577 | | |
| 79.31 | 6.310 | 20.416 | 1.0156 | 1.5178 | 15749 | 41.499 |
| WET GAS | | 1.43 | 34.4 | 1263790 | | |
| 158.44 | 5.967 | 4.016 | 1.0255 | 1.1242 | 4377 | 11.534 |
| RECYCLE | | 403.9 | 51 | | | |
| 79.31 | 7.867 | 20.460 | 1.0088 | 1.1242 | 14477 | 38.148 |
| BLEED | | | | | | |
| 5.02 | 7.680 | 20.460 | 1.0000 | 1.1242 | 887 | 2.337 |
| NATURAL GAS | | 453.8 | 184 | 1459208 | | |
| 28.43 | 7.700 | 21.645 | 0.8986 | 1.2080 | 5143 | 13.552 |
| OXYGEN | | 430.5 | 40 | | | |
| 27.07 | 6.978 | 21.100 | 1.0198 | | 4065 | 10.711 |
| STEAM | | 25.6 | | | | |
| 215.7 | 6.450 | | | | | |

| HOUR | GAGE | GAL. |
|---|---|---|
| OIL | 3'3" | 174.73 |
| | 1'3" | 65.01 |
| | | |
| | | |
| | | |
| | | |
| | | |
| WATER | 3'10½" | 207.46 |
| | 1'0½" | 54.14 |
| | | |
| | | |
| | | |
| | | |
| | | |

| LIQUID PRODUCT RATES Basis 9 hours | °F | FACTOR | GAL. AT 60 | API° #/GAL. | # | #/HR GAL HR |
|---|---|---|---|---|---|---|
| OIL | 30 | 1.0149 | 177.33 | 54.4 | | |
| | 40 | 1.0099 | 65.65 | 6.337 | | |
| | | | +0.47 | | +3.00 | 78.97 |
| | | | 112.15 | | 710.69 | 12.461 |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| WATER | 40 | 1.00130 | 207.73 | 10.5 | | |
| | 40 | 1.00130 | 54.21 | 8.299 | | 141.56 |
| | | | 153.52 | | 1274.06 | 17.058 |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

## THE TEXAS COMPANY — MONTEBELLO LABORATORY

### RATE CALCULATIONS

RUN NO. 66-B
HOURS 9-22

| HOUR | GAS ANALYSES 2200 | 0200 | | AVERAGE |
|---|---|---|---|---|
| FRESH FEED | | | | |
| CO 28.010 | 36.33 | 33.84 | | 35.085 |
| $H_2$ 2.016 | 60.95 | 63.01 | | 61.980 |
| $CO_2$ 44.010 | 2.03 | 2.09 | | 2.060 |
| $N_2$ 28.016 | 0.61 | 0.83 | | 0.720 |
| $CH_4$ 16.042 | 0.08 | 0.23 | | 0.155 |
| | | | M. W | 12.210012 |
| | | | $H_2O$ 18.016 | |
| | | | | |
| | | | BALANCE | |
| WET GAS | | | | |
| CO 28.010 | 8.85 | 8.45 | | 8.650 |
| $H_2$ 2.016 | 43.13 | 43.02 | | 43.075 |
| $CO_2$ 44.010 | 28.07 | 29.18 | | 28.625 |
| $N_2$ 28.016 | 2.03 | 1.54 | | 1.785 |
| $CH_4$ 16.042 | 8.61 | 9.00 | | 8.805 |
| $C_2H_4$ 28.052 | 2.13 | 2.17 | | 2.150 |
| $C_2H_6$ 30.068 | 1.22 | 1.24 | | 1.230 |
| $C_3H_6$ 42.078 | 2.56 | 2.67 | | 2.615 |
| $C_3H_8$ 44.094 | 0.28 | 0.30 | | 0.290 |
| $C_4H_8$ 56.104 | 1.59 | 1.43 | | 1.510 |
| $C_4H_{10}$ 58.120 | 0.56 | 0.31 | | 0.435 |
| $C_5H_{10}$ 70.130 | 0.61 | 0.49 | | 0.550 |
| $C_5H_{12}$ 72.146 | 0.20 | 0.11 | | 0.155 |
| $C_6H_{12}$ 84.156 | 0.16 | 0.09 | | 0.125 |
| | | | M. W. | 21.705599 |

| GENERATOR BALANCE | M/HR | C | H | O |
|---|---|---|---|---|
| | 15.689 | 15.689 | | 15.689 |
| | 27.716 | | 55.432 | |
| | 0.921 | 0.921 | | 1.842 |
| | 0.322 | | | |
| | 0.069 | 0.069 | 0.276 | |
| | | | | |
| | | | 5.931 | 2.966 |
| | | 16.679 | 61.639 | 20.497 |
| | | 104.31 | 107.48 | 90.53 |
| GAS FLOW RATES | | | | |
| FRESH FEED | 79.31 | 6.700 | 20.494 | 1.0120 |
| WET GAS | 158.44 | 6.708 | 4.025 | 1.0220 |
| RECYCLE | 79.31 | 7.917 | 20.513 | 1.0050 |
| BLEED | 5.02 | 7.792 | 20.513 | 1.0000 |
| NATURAL GAS | 28.43 | 7.725 | 21.088 | 0.8951 |
| OXYGEN | 27.07 | 7.200 | 21.216 | 1.0180 |
| STEAM | 215.7 | 6.225 | 26.1 | |

| | Mol % | M/Hr | C | H | O |
|---|---|---|---|---|---|
| $O_2$ 32.000 | 0.29 | 11.094 0.038 | | | 22.264 |
| $CO_2$ 44.010 | 1.43 | 0.189 | 0.189 | | 0.378 |
| $N_2$ 28.016 | 1.04 | 0.138 | | | |
| $CH_4$ 16.042 | 84.29 | 11.158 | 11.158 | 44.632 | |
| $C_2H_6$ 30.068 | 6.12 | 0.810 | 1.620 | 4.860 | |
| $C_3H_8$ 44.094 | 4.96 | 0.657 | 1.971 | 5.256 | |
| $C_4H_{10}$ 58.120 | 1.42 | 0.188 | 0.752 | 1.880 | |
| $C_5H_{12}$ 72.146 | 0.45 | 0.060 | 0.300 | 0.720 | |
| MW | 19.712496 | | | | |
| TOTAL | | | 15.990 | 57.348 | 22.642 |

| WEIGHT BALANCE | #/hr Measured | At Wt. Balance |
|---|---|---|
| WET GAS | 288.77 | 318.10 |
| OIL | 78.79 | 78.79 |
| WATER | 149.11 | 149.11 |
| TOTAL | 516.67 | 546.00 |
| FRESH FEED | 546.00 | |
| WEIGHT BALANCE | 94.63 | |
| | | |
| WET GAS FACTOR | 1101568 | |
| INDICATED LOSS—S C F H | 513 | |
| | 5562 | |

| | √h | PRESSURE | TEMP. | M. W. | S. C. F. H. | M/HR |
|---|---|---|---|---|---|---|
| FRESH FEED | | 405.3 | 47.7 | 2371005 | | |
| 79.31 | 6.700 | 20.494 | 1.0120 | 1.5398 | 16970 | 44.717 |
| WET GAS | | 1.50 | 37.8 | 1333757 | | |
| 158.44 | 6.708 | 4.025 | 1.0220 | 1.1549 | 5049 | 13.304 |
| RECYCLE | | 406.1 | 54.8 | | | |
| 79.31 | 7.917 | 20.513 | 1.0050 | 1.1549 | 14950 | 39.394 |
| BLEED | | | | | | |
| 5.02 | 7.792 | 20.513 | 1.0000 | 1.1549 | 927 | 2.443 |
| NATURAL GAS | | 430.0 | 189 | 1468611 | | |
| 28.43 | 7.725 | 21.088 | 0.8951 | 1.2119 | 5024 | 13.238 |
| OXYGEN | | 435.4 | 41.8 | | | |
| 27.07 | 7.200 | 21.216 | 1.0180 | | 4210 | 11.094 |
| STEAM | | 26.1 | | | | |
| 215.7 | 6.225 | | | | | |

| HOUR | GAGE | GAL. |
|---|---|---|
| OIL | 6'10" | 362.41 |
| | 4'3½" | 229.28 |
| | | |
| | | |
| | | |
| | | |
| | | |
| WATER | 7'4" | 388.59 |
| | 5'7¼" | 298.03 |
| | 2'8-¾ | 146.17 |
| | 0'9" | 39.17 |
| | | |
| | | |
| | | |

| LIQUID PRODUCT RATES Basis 11 hours | °F | FACTOR | GAL. AT 60 | API° # GAL. | # | #/HR GAL HR |
|---|---|---|---|---|---|---|
| OIL | 34 | 1.0129 | 367.09 | 53.8 | | 78.79 |
| | 47 | 1.0064 | 230.75 | 6.357 | | 12.395 |
| | | | 136.34 | | 866.71 | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| WATER | 48 | 1.0008 | 388.90 | 10.6 | | |
| | 51 | 1.0006 | 298.21 | 8.293 | | |
| | 44 | 1.0009 | 146.30 | | | |
| | 38 | 1.0010 | 39.21 | | | 149.11 |
| | | | 197.78 | | 1640.19 | 17.980 |
| | | | | | | |
| | | | | | | |

## THE TEXAS COMPANY — MONTEBELLO LABORATORY
### RATE CALCULATIONS

RUN NO. 66-C
HOURS 22-46

| | GAS ANALYSES | | | | GENERATOR BALANCE | | | | | | | | | | WEIGHT BALANCE | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| HOUR | 1400 | 2200 | 0600 | AVERAGE | M/HR | C | H | O | | Mol % | M/Hr | C | H | O | | #/hr Measured | At Wt. Balance |
| FRESH FEED | | | | | | | | | $O_2$ 32.000 | 0.33 | 11.036 0.043 | | | 22.158 | WET GAS | 299.51 | 324.92 |
| CO 28.010 | 36.54 | 36.88 | 36.40 | 36.607 | 15.923 | 15.923 | | 15.923 | $CO_2$ 44.010 | 1.32 | 0.174 | 0.174 | | 0.348 | OIL | 73.46 | 73.46 |
| $H_2$ 2.016 | 60.61 | 60.19 | 60.75 | 60.516 | 26.323 | | 52.646 | | $N_2$ 28.016 | 1.62 | 0.213 | | | | WATER | 149.44 | 149.44 |
| $CO_2$ 44.010 | 2.13 | 1.94 | 2.14 | 2.070 | 0.900 | 0.900 | | 1.800 | $CH_4$ 16.042 | 83.21 | 10.948 | 10.948 | 43.792 | | TOTAL | 522.41 | 547.82 |
| $N_2$ 28.016 | 0.58 | 0.81 | 0.62 | 0.670 | 0.291 | | | | $C_2H_4$ 30.068 | 6.42 | 0.845 | 1.690 | 5.070 | | FRESH FEED | 547.82 | |
| $CH_4$ 16.042 | 0.14 | 0.18 | 0.09 | 0.137 | 0.060 | 0.060 | 0.240 | | $C_2H_6$ 44.094 | 5.11 | 0.672 | 2.016 | 5.376 | | WEIGHT BALANCE | 95.36 | |
| | | | M. W | 12.59432 | | | | | $C_4H_{10}$ 58.120 | 1.49 | 0.196 | 0.784 | 1.960 | | | | |
| | | | $H_2O$ 18.016 | | | | 6.835 | 3.418 | $C_5H_{12}$ 72.146 | 0.50 | 0.066 | 0.330 | 0.792 | | WET GAS FACTOR | 1084838 | |
| | | | | | | 16.883 | 59.721 | 21.141 | MW | 19.899226 | | | | | INDICATED LOSS—S C F H | 425 | |
| | | | BALANCE | | | 105.90 | 104.79 | 93.93 | TOTAL | | | 15.942 | 56.990 | 22.506 | | 5438 | |

| WET GAS | | | | | GAS FLOW RATES | | | | | | | | | | LIQUID PRODUCT RATES | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO 28.010 | 8.97 | 9.45 | 9.33 | 9.250 | | $\sqrt{h}$ | PRESSURE | TEMP. | M. W. | S. C. F. H. | M/HR | HOUR | GAGE | GAL. | °F | FACTOR | GAL. AT 60 | API° #/GAL. | # | # HR GAL HR |
| $H_2$ 2.016 | 40.06 | 40.76 | 40.31 | 40.377 | FRESH FEED | | 405 | 56 | 2298655 | | | OIL | 7'7" | 401.69 | 36 | 1.0119 | 406.47 | 54.6 | | |
| $CO_2$ 44.010 | 29.95 | 29.17 | 29.42 | 29.514 | 79.31 | 6.675 | 20.487 | 1.0039 | 1.5161 | 16507 | 43.497 | | 6'10" | 362.41 | 34 | 1.0129 | 367.09 | 6.330 | | |
| $N_2$ 28.016 | 1.72 | 1.60 | 1.60 | 1.640 | WET GAS | | 1.51 | 48 | 1276769 | | | | 5'7¼" | 298103 | 42 | 1.0089 | 300.68 | | | |
| $CH_4$ 16.042 | 9.06 | 9.29 | 9.11 | 9.153 | 158.44 | 6.875 | 4.026 | 1.0117 | 1.1299 | 5013 | 13.209 | | 1'2½" | 62.73 | 38 | 1.0109 | 63.41 | | | |
| $C_2H_4$ 28.052 | 2.20 | 2.15 | 2.39 | 2.247 | RECYCLE | | 406 | 66 | | | | | | | | | +1.86 | | +11.75 | 73.46 |
| $C_2H_6$ 33.068 | 1.41 | 1.44 | 1.47 | 1.440 | 79.31 | 7.942 | 20.511 | 0.9943 | 1.1299 | 14515 | 38.248 | | | | | | 278.51 | | 1762.97 | 11.605 |
| $C_3H_6$ 42.078 | 3.09 | 2.85 | 2.98 | 2.973 | BLEED | | | | | | | | | | | | | | | |
| $C_3H_8$ 44.094 | 0.32 | 0.32 | 0.32 | 0.320 | 5.02 | 8.163 | 20.511 | 1.0000 | 1.2299 | 950 | 2.503 | WATER | 7'2-¾ | 383.14 | 53 | 1.0005 | 383.33 | 10.8 | | |
| $C_4H_8$ 56.104 | 1.78 | 1.54 | 1.73 | 1.683 | NATURAL GAS | | 430 | 188 | 1454830 | | | | 2'8-¾ | 146.17 | 44 | 1.0009 | 146.30 | 8.282 | | |
| $C_4H_{10}$ 58.120 | 0.52 | 0.52 | 0.37 | 0.470 | 28.43 | 7.708 | 21.088 | 0.8958 | 1.2062 | 4993 | 13.157 | | 4'9-¾ | 256.56 | 52 | 1.0006 | 256.71 | | | |
| $C_5H_{10}$ 70.130 | 0.67 | 0.62 | 0.70 | 0.663 | OXYGEN | | 438 | 54 | | | | | 1'2" | 60.66 | 50 | 1.0007 | 60.70 | | | 149.44 |
| $C_5H_{12}$ 72.146 | 0.10 | 0.10 | 0.11 | 0.103 | 27.07 | 7.229 | 21.277 | 1.0058 | | 4188 | 11.036 | | | | | | 433.04 | | 3586.44 | 18.043 |
| $C_6H_{12}$ 84.156 | 0.15 | 0.19 | 0.16 | 0.167 | STEAM | | 26.5 | | | | | | | | | | | | | |
| | | | M. W. | 22.674418 | 215.7 | 6.292 | 0.2773 | | 376 #/hr | | | | | | | | | | | |

## THE TEXAS COMPANY — MONTEBELLO LABORATORY
### RATE CALCULATIONS

RUN NO. 66-D
HOURS 46-70

| | GAS ANALYSES | | | | GENERATOR BALANCE | | | | | | | | | | WEIGHT BALANCE | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| HOUR | 1400 | 2200 | 0600 | AVERAGE | M/HR | C | H | O | | Mol % | M/Hr | C | H | O | | #/hr Measured | At Wt. Balance |
| FRESH FEED | | | | | | | | | $O_2$ 32.000 | 0.27 | 11.133 0.036 | | | 22.338 | WET GAS | 303.66 | 328.73 |
| CO 28.010 | 36.21 | 36.67 | 36.22 | 36.367 | 15.810 | 15.810 | | 15.810 | $CO_2$ 44.010 | 1.36 | 0.180 | 0.180 | | 0.360 | OIL | 67.78 | 67.78 |
| $H_2$ 2.016 | 60.78 | 60.53 | 60.71 | 60.673 | 26.376 | | 52.752 | | $N_2$ 28.016 | 0.47 | 0.062 | | | | WATER | 150.02 | 150.02 |
| $CO_2$ 44.010 | 2.12 | 2.17 | 2.20 | 2.163 | 0.940 | 0.940 | | 1.880 | $CH_4$ 16.042 | 84.56 | 11.204 | 11.204 | 44.816 | | TOTAL | 521.46 | 546.53 |
| $N_2$ 28.016 | 0.71 | 0.57 | 0.78 | 0.687 | 0.299 | | | | $C_2H_4$ 30.068 | 6.19 | 0.820 | 1.640 | 4.920 | | FRESH FEED | 546.53 | |
| $CH_4$ 16.042 | 0.18 | 0.06 | 0.09 | 0.110 | 0.048 | 0.048 | 0.192 | | $C_2H_6$ 44.094 | 5.20 | 0.689 | 2.067 | 5.512 | | WEIGHT BALANCE | 95.41 | |
| | | | M. W | 12.571617 | | | 5.014 | 5.008 | $C_4H_{10}$ 58.120 | 1.46 | 0.193 | 0.772 | 1.930 | | | | |
| | | | $H_2O$ 18.016 | | | | 7.515 | 3.758 | $C_5H_{12}$ 72.146 | 0.49 | 0.065 | 0.325 | 0.780 | | WET GAS FACTOR | 1082559 | |
| | | | | | | 16.798 | 60.459 | 21.448 | MW | 19.73789 | | | | | INDICATED LOSS—S C F H | 428 | |
| | | | BALANCE | | | 103.77 | 104.32 | 94.49 | TOTAL | | | 16.188 | 57.958 | 22.698 | | 5614 | |

| WET GAS | | | | | GAS FLOW RATES | | | | | | | | | | LIQUID PRODUCT RATES | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO 28.010 | 8.70 | 9.34 | 9.17 | 9.070 | | $\sqrt{h}$ | PRESSURE | TEMP. | M. W. | S. C. F. H. | M/HR | HOUR | GAGE | GAL. | °F | FACTOR | GAL. AT 60 | API° #/GAL. | # | # HR GAL HR |
| $H_2$ 2.016 | 41.33 | 41.53 | 40.81 | 41.224 | FRESH FEED | | 405.2 | 55 | 2302806 | | | OIL | 7'3½" | 386.41 | 51 | 1.0044 | 388.11 | 55.0 | | |
| $CO_2$ 44.010 | 27.90 | 28.24 | 29.27 | 28.470 | 79.31 | 6.658 | 20.491 | 1.0048 | 1.5175 | 16498 | 43.473 | | 5'7½" | 298.03 | 42 | 1.0089 | 300.68 | 6.316 | | |
| $N_2$ 28.016 | 1.44 | 1.65 | 1.53 | 1.540 | WET GAS | | 1.61 | 46 | 1302791 | | | | 4'2" | 222.74 | 35 | 1.0124 | 225.50 | | | |
| $CH_4$ 16.042 | 9.85 | 9.50 | 9.36 | 9.570 | 158.44 | 7.004 | 4.039 | 1.0137 | 1.1414 | 5186 | 13.665 | | 1'1" | 56.30 | 59 | 1.0005 | 56.33 | | | |
| $C_2H_4$ 28.052 | 2.37 | 2.27 | 2.27 | 2.303 | RECYCLE | | 406 | 64 | | | | | | | | | +0.95 | | +6.0 | 67.78 |
| $C_2H_6$ 33.068 | 1.57 | 1.53 | 1.54 | 1.547 | 79.31 | 7.938 | 20.511 | 0.9962 | 1.1414 | 14683 | 38.690 | | | | | | 257.55 | | 1626.69 | 10.731 |
| $C_3H_6$ 42.078 | 3.03 | 2.75 | 3.02 | 2.934 | BLEED | | | | | | | | | | | | | | | |
| $C_3H_8$ 44.094 | 0.35 | 0.27 | 0.29 | 0.303 | 5.02 | 8.213 | 20.511 | 1.0000 | 1.1414 | 965 | 2.543 | WATER | 7'3" | 384.23 | 58 | 1.0002 | 384.31 | 10.7 | | |
| $C_4H_8$ 56.104 | 1.82 | 1.41 | 1.49 | 1.573 | NATURAL GAS | | 431.9 | 187 | 1466722 | | | | 4'9-¾ | 256.56 | 52 | 1.0006 | 256.71 | 8.287 | | |
| $C_4H_{10}$ 58.120 | 0.53 | 0.60 | 0.49 | 0.540 | 28.43 | 7.708 | 21.132 | 0.8965 | 1.2111 | 5028 | 13.249 | | 5'11-¾ | 317.67 | 47 | 1.0008 | 317.92 | | | |
| $C_5H_{10}$ 70.130 | 0.74 | 0.56 | 0.51 | 0.603 | OXYGEN | | 438.6 | 51 | | | | | 0'2½" | 11.06 | 68 | 0.9992 | 11.05 | | | 150.02 |
| $C_5H_{12}$ 72.146 | 0.17 | 0.14 | 0.11 | 0.140 | 27.07 | 7.267 | 21.291 | 1.0088 | 4.[illegible] | 4225 | 11.133 | | | | | | 434.47 | | 3600.45 | 18.103 |
| $C_6H_{12}$ 84.156 | 0.20 | 0.21 | 0.14 | 0.183 | STEAM | | 26.3 | | | | | | | | | | | | | |
| | | | M. W. | 22.221516 | 215.7 | 6.471 | 0.2764 | | 386 #/hr | | | | | | | | | | | |

## THE TEXAS COMPANY — MONTEBELLO LABORATORY

### RATE CALCULATIONS

RUN NO. 66-E
HOURS 70-94

| | GAS ANALYSES | | | | GENERATOR BALANCE | | | | | | | | | | WEIGHT BALANCE | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| HOUR | 1400 | 2200 | 0600 | AVERAGE | M/HR | C | H | O | | Mol % | M/Hr | C | H | O | | #/hr Measured | At Wt. Balance |
| FRESH FEED | | | | | | | | | $O_2$ 32.000 | 0.31 | 10.730<br>0.040 | | | 21.540 | WET GAS | 296.38 | 326.86 |
| CO 28.010 | 36.58 | 36.37 | 35.80 | 36.250 | 15.452 | 15.452 | | 15.452 | $CO_2$ 44.010 | 1.52 | 0.194 | 0.194 | | 0.388 | OIL | 63.51 | 63.51 |
| $H_2$ 2.016 | 60.55 | 60.75 | 61.20 | 60.833 | 25.929 | | 51.858 | | $N_2$ 28.016 | 1.78 | 0.227 | | | | WATER | 143.84 | 143.84 |
| $CO_2$ 44.010 | 1.99 | 2.19 | 2.23 | 2.137 | 0.911 | 0.911 | | 1.822 | $CH_4$ 16.042 | 83.73 | 10.669 | 10.669 | 42.676 | | TOTAL | 503.73 | 534.21 |
| $N_2$ 28.016 | 0.82 | 0.65 | 0.71 | 0.727 | 0.310 | | | | $C_2H_6$ 30.068 | 6.21 | 0.791 | 1.582 | 4.746 | | FRESH FEED | 534.21 | |
| $CH_4$ 16.042 | 0.06 | 0.04 | 0.06 | 0.053 | 0.023 | 0.023 | 0.092 | | $C_3H_8$ 44.094 | 4.77 | 0.608 | 1.824 | 4.864 | | WEIGHT BALANCE | 94.29 | |
| | | | M. W | 12.53269 | | | | 4654 | $C_4H_{10}$ 58.120 | 1.28 | 0.163 | 0.652 | 1.630 | | | | |
| | | | $H_2O$ 18.016 | | | | 5.943 | 2.972 | $C_5H_{12}$ 72.146 | 0.40 | 0.051 | 0.255 | 0.612 | | WET GAS FACTOR | 1102840 | |
| | | | | | | 16.386 | 57.893 | 20.246 | MW | 19.70183 | | | | | INDICATED LOSS—S C F H | 506 | |
| | | | BALANCE | | | 107.97 | 106.17 | 92.33 | TOTAL | | | 15.176 | 54.528 | 21.928 | | 5423 | |

| WET GAS | | | | | GAS FLOW RATES | | | | | | | | | | LIQUID PRODUCT RATES | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO 28.010 | 9.47 | 9.86 | 9.50 | 9.610 | | $\sqrt{h}$ | PRESSURE | TEMP. | M. W. | S. C. F. H. | M/HR | HOUR | GAGE | GAL. | °F | FACTOR | GAL. AT 60 | API° #/GAL. | # | #/HR GAL HR |
| $H_2$ 2.016 | 40.00 | 38.97 | 39.93 | 39.633 | FRESH FEED | | 404.1 | 53 | 2309958 | | | OIL | 7'4½" | 390.78 | 41 | 1.0094 | 394.45 | 55.6 | | |
| $CO_2$ 44.010 | 29.35 | 29.76 | 29.49 | 29.533 | 79.31 | 6.513 | 20.465 | 1.0068 | 1.5199 | 16176 | 42.625 | | 4'2" | 222.74 | 35 | 1.0124 | 225.50 | 6.296 | | |
| $N_2$ 28.016 | 1.67 | 1.82 | 1.81 | 1.767 | WET GAS | | 1.54 | 44 | 1265615 | | | | 2'7½" | 140.41 | 32 | 1.0139 | 142.36 | | | |
| $CH_4$ 16.042 | 9.21 | 8.96 | 9.18 | 9.117 | 158.44 | 6.738 | 4.030 | 1.0158 | 1.1250 | 4917 | 12.957 | | 1'4" | 69.39 | 42 | 1.0089 | 70.01 | | | |
| $C_2H_4$ 28.052 | 2.21 | 2.10 | 2.35 | 2.220 | RECYCLE | | 405 | 62 | | | | | | | | | +0.79<br>242.09 | | +5.00<br>1524.20 | 63.51 |
| $C_2H_6$ 33.068 | 1.51 | 1.61 | 1.67 | 1.597 | 79.31 | 7.900 | 20.487 | 0.9981 | 1.1250 | 14413 | 37.979 | | | | | | | | | 10.087 |
| $C_3H_6$ 42.078 | 3.04 | 3.26 | 3.25 | 3.183 | BLEED | | | | | | | | | | | | | | | |
| $C_3H_8$ 44.094 | 0.35 | 0.37 | 0.37 | 0.363 | 5.02 | 8.021 | 20.487 | 1.0000 | 1.1250 | 928 | 2.445 | WATER | 7'4" | 388.59 | 50 | 1.00070 | 388.86 | 10.7 | | |
| $C_4H_8$ 56.104 | 1.70 | 1.81 | 1.53 | 1.680 | NATURAL GAS | | 434.5 | 186 | 1469406 | | | | 5'11-3/4 | 317.67 | 47 | 1.00080 | 317.92 | 8.287 | | |
| $C_4H_{10}$ 58.120 | 0.52 | 0.51 | 0.26 | 0.430 | 28.43 | 7.379 | 21.194 | 0.8972 | 1.2122 | 4836 | 12.743 | | 7'5" | 392.96 | 46 | 1.00090 | 393.31 | | | |
| $C_5H_{10}$ 70.130 | 0.65 | 0.63 | 0.50 | 0.593 | OXYGEN | | 436.3 | 51 | | | | | 0'11" | 47.65 | 55 | 1.00039 | 47.67 | | | 143.84 |
| $C_5H_{12}$ 72.146 | 0.13 | 0.13 | 0.06 | 0.107 | 27.07 | 7.021 | 21.237 | 1.0088 | | 4072 | 10.730 | | | | | | 416.58 | | 3452.20 | 17.358 |
| $C_6H_{12}$ 84.156 | 0.19 | 0.21 | 0.10 | 0.167 | STEAM | | 26.9 | | | | | | | | | | | | | |
| | | | M. W. | 22.87424 | 215.7 | 6.175 | | | | | | | | | | | | | | |

## THE TEXAS COMPANY — MONTEBELLO LABORATORY

### RATE CALCULATIONS

RUN NO. 66-F
HOURS 94-115

| | GAS ANALYSES | | | | GENERATOR BALANCE | | | | | | | | | | WEIGHT BALANCE | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| HOUR | 1000 | 2200 | | AVERAGE | M/HR | C | H | O | | Mol % | M/Hr | C | H | O | | #/hr Measured | At Wt. Balance |
| FRESH FEED | | | | | | | | | $O_2$ 32.000 | 0.33 | 10.559<br>0.041 | | | 21.200 | WET GAS | 295.10 | 330.49 |
| CO 28.010 | 36.82 | 36.73 | | 36.775 | 15.332 | 15.332 | | 15.332 | $CO_2$ 44.010 | 1.48 | 0.182 | 0.182 | | 0.364 | OIL | 58.08 | 58.08 |
| $H_2$ 2.016 | 60.37 | 60.40 | | 60.385 | 25.176 | | 50.352 | | $N_2$ 28.016 | 2.08 | 0.256 | | | | WATER | 138.59 | 138.59 |
| $CO_2$ 44.010 | 2.12 | 2.14 | | 2.130 | 0.888 | 0.888 | | 1.776 | $CH_4$ 16.042 | 82.46 | 10.133 | 10.133 | 40.532 | | TOTAL | 491.77 | 527.16 |
| $N_2$ 28.016 | 0.58 | 0.67 | | 0.625 | 0.261 | | | | $C_2H_6$ 30.068 | 6.15 | 0.756 | 1.512 | 4.536 | | FRESH FEED | 527.16 | |
| $CH_4$ 16.042 | 0.11 | 0.06 | | 0.085 | 0.035 | 0.035 | 0.140 | | $C_3H_8$ 44.094 | 5.38 | 0.661 | 1.983 | 5.288 | | WEIGHT BALANCE | 93.29 | |
| | | | M. W | 12.64419 | | | | | $C_4H_{10}$ 58.120 | 1.52 | 0.187 | 0.748 | 1.870 | | | | |
| | | | $H_2O$ 18.016 | | | | 5.767 | 2.884 | $C_5H_{12}$ 72.146 | 0.60 | 0.074 | 0.370 | 0.888 | | WET GAS FACTOR | 1119925 | |
| | | | | | | 16.255 | 56.259 | 19.992 | MW | 20.10565 | | | | | INDICATED LOSS—S C F H | 582 | |
| | | | BALANCE | | | 108.89 | 105.92 | 92.71 | TOTAL | | | 14.928 | 53.114 | 21.564 | | 5431 | |

| WET GAS | 1400 | 2200 | | | GAS FLOW RATES | | | | | | | | | | LIQUID PRODUCT RATES | | | | | | Basis 21 hours |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO 28.010 | 8.97 | 9.45 | | 9.210 | | $\sqrt{h}$ | PRESSURE | TEMP. | M. W. | S. C. F. H. | M/HR | HOUR | GAGE | GAL. | °F | FACTOR | GAL. AT 60 | API° #/GAL. | # | #/HR GAL HR | |
| $H_2$ 2.016 | 38.62 | 40.13 | | 39.375 | FRESH FEED | | 404.1 | 57 | 2289589 | | | OIL | 6'3" | 331.85 | 40 | 1.0099 | 335.14 | 55.7 | | | |
| $CO_2$ 44.010 | 30.00 | 29.45 | | 29.725 | 79.31 | 6.424 | 20.465 | 1.0029 | 1.5131 | 15822 | 41.692 | | 2'7½" | 140.41 | 32 | 1.0139 | 142.36 | 6.293 | | | |
| $N_2$ 28.016 | 2.20 | 1.85 | | 2.025 | WET GAS | | 1.56 | 47 | 1253468 | | | | | | | | +1.03 | | +6.50 | 58.08 | |
| $CH_4$ 16.042 | 8.92 | 9.15 | | 9.035 | 158.44 | 6.695 | 4.032 | 1.0227 | 1.1196 | 4849 | 12.777 | | | | | | 193.81 | | 1219.65 | 9.229 | |
| $C_2H_4$ 28.052 | 2.26 | 2.13 | | 2.195 | RECYCLE | | 405 | 65 | | | | | | | | | | | | | |
| $C_2H_6$ 33.068 | 1.65 | 1.63 | | 1.640 | 79.31 | 7.908 | 20.487 | 0.9952 | 1.1196 | 14317 | 37.726 | | | | | | | | | | |
| $C_3H_6$ 42.078 | 3.41 | 2.84 | | 3.125 | BLEED | | | | | | | | | | | | | | | | |
| $C_3H_8$ 44.094 | 0.38 | 0.31 | | 0.345 | 5.02 | 8.014 | 20.487 | 1.0000 | 1.1196 | 923 | 2.432 | WATER | 7'0½" | 373.32 | 50 | 1.00070 | 373.58 | 10.8 | | | |
| $C_4H_8$ 56.104 | 2.01 | 1.52 | | 1.765 | NATURAL GAS | | 435.2 | 188 | 1439893 | | | | 0'5" | 22.13 | 32 | 1.00170 | 22.17 | 8.282 | | 138.59 | |
| $C_4H_{10}$ 58.120 | 0.51 | 0.60 | | 0.555 | 28.43 | 7.195 | 21.211 | 0.8958 | 1.2000 | 4664 | 12.290 | | | | | | 351.41 | | 2910.38 | 16.734 | |
| $C_5H_{10}$ 70.130 | 0.74 | 0.60 | | 0.670 | OXYGEN | | 435.6 | 58 | | | | | | | | | | | | | |
| $C_5H_{12}$ 72.146 | 0.14 | 0.14 | | 0.140 | 27.07 | 6.962 | 21.220 | 1.0019 | | 4007 | 10.559 | | | | | | | | | | |
| $C_6H_{12}$ 84.156 | 0.19 | 0.20 | | 0.195 | STEAM | | 25.5 | | | | | | | | | | | | | | |
| | | | M. W. | 23.09591 | 215.7 | 5.904 | | | | | | | | | | | | | | | |

## THE TEXAS COMPANY — MONTEBELLO LABORATORY

### RATE CALCULATIONS

RUN NO. 66-G
HOURS 115-135

| | GAS ANALYSES | | | | GENERATOR BALANCE | | | | | | | | | | WEIGHT BALANCE | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| HOUR | 1400 | 1800 | 0600 | AVERAGE | M/HR | C | H | O | | Mol % | M/Hr | C | H | O | | #/hr Measured | At Wt. Balance |
| FRESH FEED | | | | | | | | | $O_2$ 32.000 | 0.35 | 10.711<br>0.043 | | | 21.508 | WET GAS | 300.39 | 330.22 |
| CO 28.010 | 36.93 | 37.10 | 36.91 | 36.980 | 15.231 | 15.231 | | 15.231 | $CO_2$ 44.010 | 1.41 | 0.173 | 0.173 | | 0.346 | OIL | 56.61 | 56.61 |
| $H_2$ 2.016 | 60.60 | 59.96 | 60.15 | 60.237 | 24.811 | | 49.622 | | $N_2$ 28.016 | 2.07 | 0.254 | | | | WATER | 136.46 | 136.46 |
| $CO_2$ 44.010 | 2.02 | 2.42 | 2.36 | 2.267 | 0.934 | 0.934 | | 1.868 | $CH_4$ 16.042 | 82.88 | 10.169 | 10.169 | 40.676 | | TOTAL | 493.46 | 523.29 |
| $N_2$ 28.016 | 0.32 | 0.46 | 0.52 | 0.433 | 0.178 | | | | $C_2H_4$ 30.068 | 6.26 | 0.768 | 1.536 | 4.608 | | FRESH FEED | 523.29 | |
| $CH_4$ 16.042 | 0.13 | 0.06 | 0.06 | 0.083 | 0.034 | 0.034 | 0.136 | | $C_2H_6$ 44.094 | 5.07 | 0.622 | 1.866 | 4.976 | | WEIGHT BALANCE | 94.30 | |
| | | | M. W | 12.704807 | | | | | $C_3H_{10}$ 58.120 | 1.47 | 0.180 | 0.720 | 1.800 | | | | |
| | | | $H_2O$ 18.016 | | | | 6.266 | 3.133 | $C_5H_{12}$ 72.146 | 0.49 | 0.060 | 0.300 | 0.720 | | WET GAS FACTOR | 1099304 | |
| | | | | | | 16.199 | 56.024 | 20.232 | MW | 19.933784 | | | | | INDICATED LOSS—S C F H | 490 | |
| | | | BALANCE | | | 109.72 | 106.15 | 92.58 | TOTAL | | | 14.764 | 52.780 | 21.854 | | 5422 | |

| WET GAS | | | | | GAS FLOW RATES | | | | | | | | | | LIQUID PRODUCT RATES | | | | | | Basis 18 hours |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO 28.010 | 9.56 | 9.65 | 8.40 | 9.203 | | $\sqrt{h}$ | PRESSURE | TEMP. | M. W. | S. C. F. H. | M/HR | HOUR | GAGE | GAL. | °F | FACTOR | GAL. AT 60 | API° #/GAL. | # | # HR GAL HR |
| $H_2$ 2.016 | 39.76 | 39.18 | 39.78 | 39.574 | FRESH FEED | | 401.3 | 57 | 2278665 | | | OIL | 7'4" | 388.59 | 56 | 1.0020 | 389.37 | 55.6 | | |
| $CO_2$ 44.010 | 29.12 | 30.53 | 30.72 | 30.123 | 79.31 | 6.383 | 20.396 | 1.0029 | 1.5095 | 15631 | 41.188 | | 6'5¼" | 341.67 | 40 | 1.0099 | 345.05 | 6.296 | | |
| $N_2$ 28.016 | 1.58 | 1.80 | 1.96 | 1.780 | WET GAS | | 1.53 | 47 | 1252474 | | | | 1'11½" | 102.89 | 45 | 1.0074 | 103.65 | | | |
| $CH_4$ 16.042 | 8.71 | 8.61 | 8.93 | 8.750 | 158.44 | 6.817 | 4.029 | 1.0127 | 1.1191 | 4932 | 12.996 | | 1'0¼" | 53.06 | 67 | 0.9965 | 52.87 | | | |
| $C_2H_4$ 28.052 | 2.34 | 2.18 | 2.30 | 2.273 | RECYCLE | | 402.2 | 67 | | | | | 3'4½" | 180.18 | 34 | 1.0129 | 182.50 | | | |
| $C_2H_6$ 30.068 | 1.66 | 1.58 | 1.64 | 1.627 | 79.31 | 7.889 | 20.418 | 0.9933 | 1.1191 | 14201 | 37.420 | | 2'2" | 114.67 | 41 | 1.0094 | 115.75 | | | 56.61 |
| $C_3H_6$ 42.078 | 3.21 | 2.85 | 3.23 | 3.097 | BLEED | | | | | | | | | | | | 161.85 | | 1019.01 | 8.992 |
| $C_3H_8$ 44.094 | 0.33 | 0.30 | 0.34 | 0.323 | 5.02 | 8.328 | 20.418 | 1.0000 | 1.1191 | 955 | 2.516 | WATER | 4'3½" | 229.28 | 59 | 1.0009 | 229.30 | 10.7 | | |
| $C_4H_8$ 56.104 | 2.01 | 1.62 | 1.56 | 1.730 | NATURAL GAS | | 429.2 | 190 | 1452308 | | | | 0'11" | 47.65 | 50 | 1.00070 | 47.68 | 8.287 | | |
| $C_4H_{10}$ 58.120 | 0.47 | 0.64 | 0.39 | 0.500 | 28.43 | 7.211 | 21.069 | 0.8944 | 1.2051 | 4656 | 12.269 | | 6'11¼" | 367.86 | 48 | 1.00081 | 368.16 | | | |
| $C_5H_{10}$ 70.130 | 0.87 | 0.68 | 0.53 | 0.693 | | | 430.2 | 55 | | | | | 4'9" | 253.29 | 56 | 1.00033 | 253.37 | | | 136.46 |
| $C_5H_{12}$ 72.146 | 0.14 | 0.14 | 0.11 | 0.130 | OXYGEN 27.07 | 7.085 | 21.093 | 1.0048 | | 4065 | 10.711 | | | | | | 296.41 | | 2456.35 | 16.467 |
| $C_6H_{12}$ 84.156 | 0.24 | 0.24 | 0.11 | 0.197 | | | 26.4 | | | | | | | | | | | | | |
| | | | M. W. | 23.114235 | STEAM 215.7 | | | | | | | | | | | | | | | |

## THE TEXAS COMPANY — MONTEBELLO LABORATORY

### RATE CALCULATIONS

RUN NO. 66-H
HOURS 135-159

| | GAS ANALYSES | | | | GENERATOR BALANCE | | | | | | | | | | WEIGHT BALANCE | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| HOUR | 1400 | 2200 | 0600 | AVERAGE | M/HR | C | H | O | | Mol % | M/Hr | C | H | O | | #/hr Measured | At Wt. Balance |
| FRESH FEED | | | | | | | | | $O_2$ 32.000 | 0.30 | 10.661<br>0.036 | | | 21.394 | WET GAS | 305.20 | 336.96 |
| CO 28.010 | 37.24 | 37.41 | 37.63 | 37.427 | 15.519 | 15.519 | | 15.519 | $CO_2$ 44.010 | 1.71 | 0.207 | 0.207 | | 0.414 | OIL | 56.89 | 56.89 |
| $H_2$ 2.016 | 60.08 | 60.02 | 59.53 | 59.876 | 24.827 | | 49.654 | | $N_2$ 28.016 | 0.86 | 0.104 | | | | WATER | 135.82 | 135.82 |
| $CO_2$ 44.010 | 1.90 | 2.06 | 2.33 | 2.097 | 0.870 | 0.870 | | 1.740 | $CH_4$ 16.042 | 81.43 | 9.878 | 9.878 | 39.512 | | TOTAL | 497.91 | |
| $N_2$ 28.016 | 0.71 | 0.45 | 0.45 | 0.537 | 0.223 | | | | $C_2H_4$ 30.068 | 7.20 | 0.873 | 1.746 | 5.238 | | FRESH FEED | 529.67 | |
| $CH_4$ 16.042 | 0.07 | 0.06 | 0.06 | 0.063 | 0.026 | 0.026 | 0.104 | | $C_2H_6$ 44.094 | 6.11 | 0.741 | 2.223 | 5.928 | | WEIGHT BALANCE | 94.00 | |
| | | | M. W | 12.773845 | | | | | $C_4H_{10}$ 58.120 | 1.76 | 0.213 | 0.852 | 2.130 | | | | |
| | | | $H_2O$ 18.016 | | | | 6.536 | 3.268 | $C_5H_{12}$ 72.146 | 0.63 | 0.077 | 0.385 | 0.924 | | WET GAS FACTOR | 1104062 | |
| | | | | | | 16.415 | 56.294 | 20.527 | MW | 20.48898 | | | | | INDICATED LOSS—S C F H | 524 | |
| | | | BALANCE | | | 107.35 | 104.77 | 94.13 | TOTAL | | | 15.291 | 53.732 | 21.808 | | 5561 | |

| WET GAS | | | | | GAS FLOW RATES | | | | | | | | | | LIQUID PRODUCT RATES | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO 28.010 | 8.87 | 9.46 | 8.67 | 9.000 | | $\sqrt{h}$ | PRESSURE | TEMP. | M. W. | S. C. F. H. | M/HR | HOUR | GAGE | GAL. | °F | FACTOR | GAL. AT 60 | API° #/GAL. | # | # HR GAL HR |
| $H_2$ 2.016 | 40.38 | 40.63 | 40.85 | 40.620 | FRESH FEED | | 404 | 58 | 2266349 | | | OIL | 7'5½" | 395.14 | 44 | 1.0079 | 398.26 | 55.6 | | |
| $CO_2$ 44.010 | 30.62 | 29.86 | 30.48 | 30.320 | 79.31 | 6.429 | 20.462 | 1.0019 | 1.5054 | 15736 | 41465 | | 3'4½" | 180.18 | 34 | 1.0129 | 182.50 | 6.296 | | |
| $N_2$ 28.016 | 1.66 | 1.65 | 1.66 | 1.657 | WET GAS | | 1.50 | 48 | 1259033 | | | | | | | | 41.11 | | 47.00 | 56.89 |
| $CH_4$ 16.042 | 7.87 | 7.63 | 7.81 | 7.770 | 158.44 | 6.958 | 4.025 | 1.0117 | 1.1221 | 5037 | 13.273 | | | | | | 216.87 | | 1365.41 | 9.036 |
| $C_2H_4$ 28.052 | 2.44 | 2.23 | 2.36 | 2.343 | RECYCLE | | 405 | 69 | | | | | | | | | | | | |
| $C_2H_6$ 30.068 | 1.66 | 1.65 | 1.68 | 1.663 | 79.31 | 7.908 | 20.487 | 0.9915 | 1.1221 | 14295 | 37.668 | | | | | | | | | |
| $C_3H_6$ 42.078 | 2.74 | 2.95 | 3.24 | 2.977 | BLEED | | | | | | | | | | | | | | | |
| $C_3H_8$ 44.094 | 0.33 | 0.30 | 0.34 | 0.323 | 5.02 | 7.975 | 20.487 | 1.0000 | 1.1221 | 920 | 2.424 | WATER | 7'3½" | 386.41 | 48 | 1.00081 | 386.72 | 10.7 | | |
| $C_4H_8$ 56.104 | 1.75 | 1.80 | 1.68 | 1.743 | NATURAL GAS | | 431.0 | 189 | 1412954 | | | | 6'11¼" | 367.86 | 48 | 1.00081 | 368.16 | 8.287 | | |
| $C_4H_{10}$ 58.120 | 0.61 | 0.72 | 0.42 | 0.583 | 28.43 | 7.208 | 21.112 | 0.8951 | 1.1887 | 4603 | 12.129 | | 7'2½" | 382.05 | 53 | 1.00052 | 382.25 | | | |
| $C_5H_{10}$ 70.130 | 0.65 | 0.71 | 0.58 | 0.647 | OXYGEN | | 434.0 | 56 | | | | | 1'1" | 56.30 | 38 | 1.00136 | 56.38 | | | |
| $C_5H_{12}$ 72.146 | 0.24 | 0.19 | 0.10 | 0.177 | 27.07 | 7.029 | 21.183 | 1.0039 | -- | 4046 | 10.661 | | 2'0" | 105.19 | 52 | 1.00059 | 105.25 | | | |
| $C_6H_{12}$ 84.156 | 0.18 | 0.22 | 0.13 | 0.177 | | | 24.5 | | | | | | 1'1" | 56.30 | 49 | 1.00076 | 56.34 | | | 135.82 |
| | | | M. W. | 22.993823 | STEAM 215.7 | 5.863 | | | | | | | | | | | 393.34 | | 3269.61 | 16.389 |

## THE TEXAS COMPANY — MONTEBELLO LABORATORY

### RATE CALCULATIONS

RUN NO. 66-I
HOURS 159-183

| GAS ANALYSES | | | | |
|---|---|---|---|---|
| HOUR | 1400 | 2200 | 0600 | AVERAGE |
| FRESH FEED | | | | |
| CO 28.010 | 37.58 | 37.93 | 37.68 | 37.730 |
| $H_2$ 2.016 | 59.75 | 59.05 | 59.65 | 59.484 |
| $CO_2$ 44.010 | 2.01 | 2.30 | 2.17 | 2.160 |
| $N_2$ 28.016 | 0.57 | 0.60 | 0.46 | 0.543 |
| $CH_4$ 16.042 | 0.09 | 0.12 | 0.04 | 0.083 |
| | | | M. W | 12.88343 |
| | | | $H_2O$ 18.016 | |
| | | | BALANCE | |

| GENERATOR BALANCE | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| M/HR | C | H | O | | Mol % | M/Hr | C | H | O |
| | | | | $O_2$ 32.000 | 0.28 | 10.648<br>0.035 | | | 21.366 |
| 15.706 | 15.706 | | 15.706 | $CO_2$ 44.010 | 1.35 | 0.168 | 0.168 | | 0.336 |
| 24.762 | | 49.524 | | $N_2$ 28.016 | 1.67 | 0.208 | | | |
| 0.899 | 0.899 | | 1.798 | $CH_4$ 16.042 | 83.39 | 10.373 | 10.373 | 41.492 | |
| 0.226 | | | | $C_2H_6$ 30.068 | 6.11 | 0.760 | 1.520 | 4.560 | |
| 0.035 | 0.035 | 0.140 | | $C_3H_8$ 44.094 | 5.12 | 0.637 | 1.911 | 5.096 | |
| | | | | $C_4H_{10}$ 58.120 | 1.55 | 0.193 | 0.772 | 1.930 | |
| | | 6.301 | 3.151 | $C_5H_{12}$ 72.146 | 0.53 | 0.066 | 0.330 | 0.792 | |
| | 16.640 | 55.965 | 20.655 | MW | 19.907027 | | | | |
| | 110.39 | 103.89 | 95.18 | TOTAL | | | 15.074 | 53.870 | 21.702 |

| WEIGHT BALANCE | | |
|---|---|---|
| | #/hr Measured | At Wt. Balance |
| WET GAS | 313.65 | 348.32 |
| OIL | 54.03 | 54.03 |
| WATER | 133.96 | 133.96 |
| TOTAL | 501.64 | 536.31 |
| FRESH FEED | 536.31 | |
| WEIGHT BALANCE | 93.54 | |
| WET GAS FACTOR | 1110537 | |
| INDICATED LOSS—S C F H | 585 | |
| | 5875 | |

| WET GAS | | | | |
|---|---|---|---|---|
| CO 28.010 | 8.02 | 8.28 | 8.66 | 8.320 |
| $H_2$ 2.016 | 40.89 | 41.60 | 41.49 | 41.326 |
| $CO_2$ 44.010 | 29.57 | 29.11 | 29.59 | 29.423 |
| $N_2$ 28.016 | 2.05 | 1.88 | 1.64 | 1.857 |
| $CH_4$ 16.042 | 8.52 | 9.01 | 8.50 | 8.677 |
| $C_2H_6$ 28.052 | 2.08 | 2.19 | 2.14 | 2.137 |
| $C_2H_4$ 30.068 | 1.67 | 1.66 | 1.66 | 1.663 |
| $C_3H_6$ 42.078 | 3.33 | 3.04 | 3.02 | 3.130 |
| $C_3H_8$ 44.094 | 0.35 | 0.36 | 0.34 | 0.350 |
| $C_4H_8$ 56.104 | 1.93 | 1.62 | 1.66 | 1.737 |
| $C_4H_{10}$ 58.120 | 0.62 | 0.43 | 0.40 | 0.483 |
| $C_5H_{10}$ 70.130 | 0.68 | 0.59 | 0.65 | 0.640 |
| $C_5H_{12}$ 72.146 | 0.16 | 0.10 | 0.10 | 0.120 |
| $C_6H_{12}$ 84.156 | 0.13 | 0.13 | 0.15 | 0.137 |
| | | | M. W. | 22.50166 |

| GAS FLOW RATES | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | $\sqrt{h}$ | PRESSURE | TEMP. | M. W. | S. C. F. H. | M/HR | HOUR | GAGE | GAL. |
| FRESH FEED 79.31 | 6.467 | 403.5 | 55 | 2247072 | 15798 | 41.628 | OIL | 5'3-3/4 | 282.75 |
| | | 20.450 | 1.0048 | 1.4990 | | | | 1'6¼" | 79.27 |
| WET GAS 158.44 | 7.217 | 1.61 | 50 | 1286571 | 5290 | 13.939 | | | |
| | | 4.039 | 1.0098 | 1.1343 | | | | | |
| RECYCLE 79.31 | 7.892 | 404.5 | 72 | | 14372 | 37.871 | | | |
| | | 20.474 | 0.9887 | 1.1343 | | | | | |
| BLEED 5.02 | 8.071 | 20.474 | 1.0000 | 1.1343 | 941 | 2.480 | WATER | 7'2" | 379.86 |
| NATURAL GAS 28.43 | 7.217 | 430.5 | 176 | 1454260 | 4721 | 12.440 | | 2'0" | 105.19 |
| | | 21.100 | 0.9048 | 1.2059 | | | | 2'11½" | 158.84 |
| OXYGEN 27.07 | 7.000 | 434.8 | 54 | | 4041 | 10.648 | | 0'10½" | 45.50 |
| | | 21.201 | 1.0058 | | | | | | |
| STEAM 215.7 | 6.196 | 24.3 | | | | | | | |

| LIQUID PRODUCT RATES | | | | | |
|---|---|---|---|---|---|
| °F | FACTOR | GAL. AT 60 | API° #/GAL | # | # HR GAL HR |
| 44 | 1.0079 | 284.98 | 55.4 | | |
| 46 | 1.0069 | 79.82 | 6.303 | | |
| | | +0.56 | | +3.50 | 54.03 |
| | | 205.72 | | 1296.65 | 8.572 |
| 53 | 1.00052 | 380.06 | 10.8 | | |
| 52 | 1.00059 | 105.25 | 8.282 | | |
| 54 | 1.00047 | 158.91 | | | |
| 49 | 1.00076 | 45.53 | | | 133.96 |
| | | 388.19 | | 3214.99 | 16.175 |

## THE TEXAS COMPANY — MONTEBELLO LABORATORY

### RATE CALCULATIONS

RUN NO. 66-J
HOURS 183-207

| GAS ANALYSES | | | | |
|---|---|---|---|---|
| HOUR | 1400 | 2200 | | AVERAGE |
| FRESH FEED | | | | |
| CO 28.010 | 36.88 | 36.95 | | 36.915 |
| $H_2$ 2.016 | 60.14 | 59.85 | | 59.995 |
| $CO_2$ 44.010 | 2.16 | 2.44 | | 2.300 |
| $N_2$ 28.016 | 0.72 | 0.72 | | 0.720 |
| $CH_4$ 16.042 | 0.10 | 0.04 | | 0.070 |
| | | | M. W | 12.77457 |
| | | | $H_2O$ 18.016 | |
| | | | BALANCE | |

| GENERATOR BALANCE | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| M HR | C | H | O | | Mol % | M/Hr | C | H | O |
| | | | | $O_2$ 32.000 | 0.41 | 10.659<br>0.051 | | | 21.420 |
| 15.212 | 15.212 | | 15.212 | $CO_2$ 44.010 | 1.32 | 0.163 | 0.163 | | 0.326 |
| 24.721 | | 49.442 | | $N_2$ 28.016 | 0.97 | 0.120 | | | |
| 0.948 | 0.948 | | 1.896 | $CH_4$ 16.042 | 83.87 | 10.332 | 10.332 | 41.328 | |
| 0.297 | | | | $C_2H_6$ 30.068 | 6.36 | 0.784 | 1.568 | 4.704 | |
| 0.029 | 0.029 | 0.116 | | $C_3H_8$ 44.094 | 5.52 | 0.680 | 2.040 | 5.440 | |
| | | | | $C_4H_{10}$ 58.120 | 1.14 | 0.140 | 0.560 | 1.400 | |
| | | 6.601 | 3.301 | $C_5H_{12}$ 72.146 | 0.41 | 0.051 | 0.255 | 0.612 | |
| | 16.189 | 56.159 | 20.409 | MW | 19.742993 | | | | |
| | | | | TOTAL | | | 14.918 | 53.484 | 21.746 |

| WEIGHT BALANCE | | |
|---|---|---|
| | # hr Measured | At Wt Balance |
| WET GAS | 308.69 | 349.17 |
| OIL | 50.45 | 50.45 |
| WATER | 126.78 | 126.78 |
| TOTAL | 485.92 | 526.40 |
| FRESH FEED | 526.40 | |
| WEIGHT BALANCE | 92.31 | |
| WET GAS FACTOR | 1131134 | |
| INDICATED LOSS—S C F H | 688 | |
| | 5934 | |

| WET GAS | | | | |
|---|---|---|---|---|
| CO 28.010 | 8.87 | 9.76 | 9.55 | 9.393 |
| $H_2$ 2.016 | 41.60 | 41.33 | 41.05 | 41.326 |
| $CO_2$ 44.010 | 28.97 | 28.39 | 29.36 | 28.907 |
| $N_2$ 28.016 | 1.75 | 2.05 | 2.12 | 1.973 |
| $CH_4$ 16.042 | 8.97 | 8.03 | 8.34 | 8.447 |
| $C_2H_6$ 28.052 | 2.25 | 2.18 | 2.10 | 2.177 |
| $C_2H_4$ 30.068 | 1.64 | 1.60 | 1.60 | 1.613 |
| $C_3H_6$ 42.078 | 2.96 | 3.24 | 2.94 | 3.047 |
| $C_3H_8$ 44.094 | 0.34 | 0.38 | 0.30 | 0.340 |
| $C_4H_8$ 56.104 | 1.51 | 1.71 | 1.43 | 1.550 |
| $C_4H_{10}$ 58.120 | 0.36 | 0.34 | 0.46 | 0.387 |
| $C_5H_{10}$ 70.130 | 0.55 | 0.54 | 0.43 | 0.507 |
| $C_5H_{12}$ 72.146 | 0.10 | 0.28 | 0.13 | 0.170 |
| $C_6H_{12}$ 84.156 | 0.13 | 0.17 | 0.19 | 0.163 |
| | | | M. W. | 22.33155 |

| GAS FLOW RATES | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | $\sqrt{h}$ | PRESSURE | TEMP. | M. W. | S. C. F. H. | M/HR | HOUR | GAGE | GAL. |
| FRESH FEED 79.31 | 6.371 | 403.9 | 55 | 2266221 | 15638 | 41.207 | OIL | 7'3-3/4 | 387.50 |
| | | 20.460 | 1.0048 | 1.5054 | | | | 5'3-3/4 | 282.75 |
| WET GAS 158.44 | 7.117 | 1.61 | 48 | 1296372 | 5246 | 13.823 | | 2'8¼" | 143.87 |
| | | 4.039 | 1.0117 | 1.1386 | | | | 1'1¼" | 57.39 |
| RECYCLE 79.31 | 7.879 | 404 | 66 | | 14476 | 38.145 | | | |
| | | 20.463 | 0.9943 | 1.1386 | | | | | |
| BLEED 5.02 | 8.108 | 20.463 | 1.0000 | 1.1386 | 948 | 2.498 | WATER | 7'1¼" | 376.59 |
| NATURAL GAS 28.43 | 7.200 | 430.2 | 190 | 1466343 | | | | 2'11⅛" | 158.84 |
| | | 21.093 | 0.8944 | 1.2109 | 4676 | 12.321 | | 3'9⅛" | 203.10 |
| OXYGEN 27.07 | 7.000 | 434.8 | 53 | | | | | 1'0¼" | 53.06 |
| | | 21.201 | 1.0068 | | 4045 | 10.659 | | | |
| STEAM 215.7 | 6.079 | 23.8 | | | | | | | |

| LIQUID PRODUCT RATES | | | | | |
|---|---|---|---|---|---|
| °F | FACTOR | GAL. AT 60 | API° #/GAL | # | # HR GAL HR |
| 50 | 1.0049 | 389.40 | 55.0 | | |
| 44 | 1.0079 | 284.98 | 6.316 | | |
| 47 | 1.0064 | 144.79 | | | |
| 47 | 1.0064 | 57.76 | | | |
| | | +0.24 | | +1.50 | 50.45 |
| | | 191.69 | | 1210.71 | 7.987 |
| 57 | 1.00025 | 376.68 | 11.0 | | |
| 54 | 1.00047 | 158.91 | 8.270 | | |
| 49 | 1.00076 | 203.25 | | | |
| 48 | 1.00081 | 53.10 | | | 126.78 |
| | | 367.92 | | 3042.70 | 15.330 |

## THE TEXAS COMPANY — MONTEBELLO LABORATORY

### RATE CALCULATIONS

RUN NO. 66-K
HOURS 207-231

| | GAS ANALYSES | | | | GENERATOR BALANCE | | | | | | | | | | WEIGHT BALANCE | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| HOUR | 1400 | 2200 | 0600 | AVERAGE | M/HR | C | H | O | | Mol % | M/Hr | C | H | O | | #/hr Measured | At Wt. Balance |
| FRESH FEED | | | | | | | | | $O_2$ 32.000 | 0.28 | 10.614<br>0.035 | | | 21.298 | WET GAS | 312.17 | 352.36 |
| CO 28.010 | 37.31 | 36.79 | 37.32 | 37.140 | 15.277 | 15.277 | | 15.277 | $CO_2$ 44.010 | 1.35 | 0.167 | 0.167 | | 0.334 | OIL | 49.73 | 49.73 |
| $H_2$ 2.016 | 59.43 | 60.07 | 59.67 | 59.723 | 24.565 | | 49.130 | | $N_2$ 28.016 | 1.14 | 0.141 | | | | WATER | 126.57 | 126.57 |
| $CO_2$ 44.010 | 2.38 | 2.42 | 2.25 | 2.350 | 0.967 | 0.967 | | 1.934 | $CH_4$ 16.042 | 84.33 | 10.419 | 10.419 | 41.676 | | TOTAL | 488.47 | 528.66 |
| $N_2$ 28.016 | 0.79 | 0.64 | 0.70 | 0.710 | 0.292 | | | | $C_2H_6$ 30.068 | 5.99 | 0.740 | 1.480 | 4.440 | | FRESH FEED | 528.66 | |
| $CH_4$ 16.042 | 0.09 | 0.08 | 0.06 | 0.077 | 0.032 | 0.032 | 0.128 | | $C_3H_8$ 44.094 | 4.88 | 0.603 | 1.809 | 4.824 | | WEIGHT BALANCE | 92.40 | |
| | | | M. W | 12.85243 | | | | | $C_4H_{10}$ 58.120 | 1.45 | 0.179 | 0.716 | 1.790 | | | | |
| | | | $H_2O$ 18.016 | | | | 6.589 | 3.295 | $C_5H_{12}$ 72.146 | 0.58 | 0.072 | 0.360 | 0.864 | | WET GAS FACTOR | 1128743 | |
| | | | | | | 16.276 | 55.847 | 20.506 | MW | 19.74538 | | | | | INDICATED LOSS—S C F H | 687 | |
| | | | BALANCE | | | 108.86 | 104.20 | 94.79 | TOTAL | | | 14.951 | 53.594 | 21.632 | | 6024 | |

| WET GAS | | | | | GAS FLOW RATES | | | | | | | | | | LIQUID PRODUCT RATES | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO 28.010 | 9.07 | 9.08 | 9.17 | 9.107 | | $\sqrt{h}$ | PRESSURE | TEMP. | M. W. | S. C. F. H. | M/HR | HOUR | GAGE | GAL. | °F | FACTOR | GAL. AT 60 | API° #/GAL. | # | # HR GAL HR |
| $H_2$ 2.016 | 40.87 | 41.71 | 42.80 | 41.793 | FRESH FEED | | 403.3 | 57 | 2252492 | | | OIL | 6'2½" | 329.67 | 45 | 1.0074 | 332.11 | 54.8 | | |
| $CO_2$ 44.010 | 29.43 | 28.96 | 27.57 | 28.653 | 79.31 | 6.396 | 20.445 | 1.0029 | 1.5008 | 15610 | 41.133 | | 2'8¼" | 143.87 | 47 | 1.0064 | 144.79 | 6.323 | | |
| $N_2$ 28.016 | 2.45 | 1.63 | 1.62 | 1.900 | WET GAS | | 1.55 | 50 | 1304165 | | | | | | | | 81.42 | | 49.00 | 49.73 |
| $CH_4$ 16.042 | 8.61 | 8.48 | 8.57 | 8.553 | 158.44 | 7.246 | 4.031 | 1.0098 | 1.1420 | 5337 | 14.063 | | | | | | 188.74 | | 1193.40 | 7.864 |
| $C_2H_4$ 28.052 | 2.48 | 2.09 | 2.38 | 2.317 | RECYCLE | | 403.2 | 70 | | | | | | | | | | | | |
| $C_2H_6$ 30.068 | 1.62 | 1.69 | 1.79 | 1.700 | 79.31 | 7.904 | 20.443 | 0.9905 | 1.1420 | 14496 | 38.198 | | | | | | | | | |
| $C_3H_6$ 42.078 | 2.21 | 2.84 | 2.89 | 2.647 | BLEED | | | | | | | | | | | | | | | |
| $C_3H_8$ 44.094 | 0.25 | 0.16 | 0.31 | 0.240 | 5.02 | 8.058 | 20.443 | 1.0000 | 1.1420 | 944 | 2.487 | WATER | 7'3½" | 386.41 | 54 | 1.00047 | 386.59 | 11.0 | | |
| $C_4H_8$ 56.104 | 1.53 | 1.63 | 1.56 | 1.573 | NATURAL GAS | | 430.8 | 186 | 1466165 | | | | 3'9½" | 203.10 | 49 | 1.00076 | 203.25 | 8.270 | | |
| $C_4H_{10}$ 58.120 | 0.48 | 0.79 | 0.40 | 0.557 | 28.43 | 7.192 | 21.107 | 0.8972 | 1.2109 | 4689 | 12.356 | | 4'8¼" | 250.02 | 53 | 1.00052 | 250.15 | | | |
| $C_5H_{10}$ 70.130 | 0.65 | 0.56 | 0.62 | 0.610 | OXYGEN | | 434.7 | 56 | | | | | 1'3¼" | 66.11 | 44 | 1.00103 | 66.18 | | | 126.57 |
| $C_5H_{12}$ 72.146 | 0.16 | 0.19 | 0.13 | 0.160 | 27.07 | 6.992 | 21.199 | 1.0039 | | 4028 | 10.614 | | | | | | 367.31 | | 3037.65 | 15.305 |
| $C_6H_{12}$ 84.156 | 0.19 | 0.19 | 0.19 | 0.190 | STEAM | | 23.7 | | | | | | | | | | | | | |
| | | | M. W. | 22.198098 | 215.7 | 6.036 | | | | | | | | | | | | | | |

## THE TEXAS COMPANY — MONTEBELLO LABORATORY

### RATE CALCULATIONS

RUN NO. 66-L
HOURS 231-238

| | GAS ANALYSES | | | | GENERATOR BALANCE | | | | | | | | | | WEIGHT BALANCE | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| HOUR | 1000 | 1400 | | AVERAGE | M/HR | C | H | O | | Mol % | M/Hr | C | H | O | | # hr Measured | At Wt. Balance |
| FRESH FEED | | | | | | | | | $O_2$ 32.000 | 0.28 | 10.677<br>0.035 | | | 21.424 | WET GAS | 316.99 | 359.33 |
| CO 28.010 | 37.08 | 37.44 | | 37.260 | 15.242 | 15.242 | | 15.242 | $CO_2$ 44.010 | 1.35 | 0.169 | 0.169 | | 0.338 | OIL | 49.84 | 49.84 |
| $H_2$ 2.016 | 59.73 | 58.59 | | 59.210 | 24.219 | [illegible] | 48.438 | | $N_2$ 28.016 | 1.14 | 0.143 | | | | WATER | 125.05 | 125.05 |
| $CO_2$ 44.010 | 2.48 | 3.15 | | 2.815 | 1.152 | 1.152 | | 2.304 | $CH_4$ 16.042 | 84.33 | 10.550 | 10.550 | 42.200 | | TOTAL | 491.88 | 534.22 |
| $N_2$ 28.016 | 0.64 | 0.63 | | 0.635 | 0.260 | | | | $C_2H_6$ 30.068 | 5.99 | 0.749 | 1.498 | 4.494 | | FRESH FEED | 534.22 | |
| $CH_4$ 16.042 | 0.07 | 0.09 | | 0.080 | 0.033 | 0.033 | 0.132 | | $C_3H_8$ 44.094 | 4.88 | 0.611 | 1.833 | 4.888 | | WEIGHT BALANCE | 92.07 | |
| | | | M. W | 13.059816 | | | | | $C_4H_{10}$ 58.120 | 1.45 | 0.181 | 0.724 | 1.810 | | | | |
| | | | $H_2O$ 18.016 | | | | 7.065 | 3.533 | $C_5H_{12}$ 72.146 | 0.58 | 0.073 | 0.365 | 0.876 | | WET GAS FACTOR | 1133568 | |
| | | | | | | 16.427 | 55.635 | 21.079 | MW | 19.74538 | | | | | INDICATED LOSS—S C F H | 723 | |
| | | | BALANCE | | | 108.51 | 102.52 | 96.86 | TOTAL | | | 15.139 | 54.268 | 21.762 | | 6136 | |

| WET GAS | 1000 | 1400 | | | GAS FLOW RATES | | | | | | | | | | LIQUID PRODUCT RATES | | | | | Basis 7 hours |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO 28.010 | 9.45 | 9.16 | | 9.305 | | $\sqrt{h}$ | PRESSURE | TEMP. | M. W. | S. C. F. H. | M/HR | HOUR | GAGE | GAL. | °F | FACTOR | GAL. AT 60 | API° #/GAL. | # | # HR GAL HR |
| $H_2$ 2.016 | 41.41 | 42.22 | | 41.915 | FRESH FEED | | 400.9 | 50 | 2216723 | | | OIL | 7'3" | 384.23 | 45 | 1.0074 | 387.07 | 54.6 | | |
| $CO_2$ 44.010 | 29.16 | 28.43 | | 28.795 | 79.35 | 6.386 | 20.386 | 1.0098 | 1.4889 | 15524 | 40.906 | | 6'2" | 329.67 | 45 | 1.0074 | 332.11 | 6.330 | | |
| $N_2$ 28.016 | 1.72 | 1.56 | | 1.640 | WET GAS | | 1.50 | 49 | 1302687 | | | | | | | | 40.16 | | 41.00 | 49.34 |
| $CH_4$ 16.042 | 8.31 | 8.54 | | 8.425 | 158.44 | 7.357 | 4.025 | 1.0108 | 1.1414 | 5413 | 14.264 | | | | | | 55.12 | | 348.91 | 7.874 |
| $C_2H_4$ 28.052 | 2.21 | 2.31 | | 2.260 | RECYCLE | | 402.6 | 65 | | | | | | | | | | | | |
| $C_2H_6$ 30.068 | 1.78 | 1.81 | | 1.795 | 79.31 | 7.914 | 20.428 | 0.9952 | 1.1414 | 14565 | 38.379 | | | | | | | | | |
| $C_3H_6$ 42.078 | 2.59 | 2.70 | | 2.645 | BLEED | | | | | | | | | | | | | | | |
| $C_3H_8$ 44.094 | 0.28 | 0.32 | | 0.300 | 5.02 | 8.114 | 20.428 | 1.0000 | 1.1414 | 950 | 2.503 | WATER | 6'8½" | 355.86 | 52 | 1.00059 | 356.07 | 11.1 | | |
| $C_4H_8$ 56.104 | 1.56 | 1.53 | | 1.545 | NATURAL GAS | | 431.3 | 172 | 1466165 | | | | 4'8¼" | 250.02 | 53 | 1.00052 | 250.15 | 8.264 | | 125.05 |
| $C_4H_{10}$ 58.120 | 0.52 | 0.47 | | 0.495 | 28.43 | 7.200 | 21.119 | 0.9071 | 1.2109 | 4748 | 12.511 | | | | | | 105.92 | | 875.32 | 15.131 |
| $C_5H_{10}$ 70.130 | 0.66 | 0.63 | | 0.645 | OXYGEN | | 434.6 | 51 | | | | | | | | | | | | |
| $C_5H_{12}$ 72.146 | 0.16 | 0.13 | | 0.145 | 27.07 | 7.000 | 21.197 | 1.0088 | -- | 4052 | 10.677 | | | | | | | | | |
| $C_6H_{12}$ 84.156 | 0.19 | 0.19 | | 0.190 | STEAM | | 23.6 | | | | | | | | | | | | | |
| | | | M. W. | 22.22329 | 215.7 | 5.900 | | | | | | | | | | | | | | |

## THE TEXAS COMPANY — MONTEBELLO LABORATORY

### RATE CALCULATIONS

RUN NO. 66-M
HOURS 238-248

| | GAS ANALYSES | | | | GENERATOR BALANCE | | | | | | | | | | WEIGHT BALANCE | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| HOUR | 0200 | 0600 | | AVERAGE | M/HR | C | H | O | | Mol % | M/Hr | C | H | O | | #/hr Measured | At Wt. Balance |
| FRESH FEED | | | | | | | | | $O_2$ 32.000 | 0.30 | 9.773<br>0.037 | | | 19.620 | WET GAS | 280.73 | 304.12 |
| CO 28.010 | 36.09 | 35.96 | | 36.025 | 13.788 | 13.788 | | 13.788 | $CO_2$ 44.010 | 1.56 | 0.190 | 0.190 | | 0.380 | OIL | 50.54 | 50.54 |
| $H_2$ 2.016 | 61.03 | 61.34 | | 61.185 | 25.419 | | 46.838 | | $N_2$ 28.016 | 1.20 | 0.146 | | | | WATER | 121.31 | 121.31 |
| $CO_2$ 44.010 | 2.27 | 2.00 | | 2.135 | 0.817 | 0.817 | | 1.634 | $CH_4$ 16.042 | 84.44 | 10.302 | 10.302 | 41.208 | | TOTAL | 452.58 | 475.97 |
| $N_2$ 28.016 | 0.55 | 0.57 | | 0.560 | 0.214 | | | | $C_2H_4$ 30.068 | 5.86 | 0.715 | 1.430 | 4.290 | | FRESH FEED | 475.97 | |
| $CH_4$ 16.042 | 0.06 | 0.13 | | 0.095 | 0.036 | 0.036 | 0.144 | | $C_2H_6$ 44.094 | 4.80 | 0.586 | 1.758 | 4.688 | | WEIGHT BALANCE | 95.09 | |
| | | | M. W | 12.435835 | | | | | $C_4H_{10}$ 58.120 | 1.34 | 0.163 | 0.652 | 1.630 | | | | |
| | | | $H_2O$ 18.016 | | | | 7.361 | 3.681 | $C_5H_{12}$ 72.146 | 0.50 | 0.061 | 0.305 | 0.732 | | WET GAS FACTOR | 1083318 | |
| | | | | | | 14.641 | 54.343 | 19.103 | MW | 19.682648 | | | | | INDICATED LOSS—S C F H | 401 | |
| | | | BALANCE | | | 100.03 | 103.42 | 95.52 | TOTAL | | | 14.637 | 52.548 | 20.000 | | 5212 | |

| WET GAS | 0200 | 0600 | | | GAS FLOW RATES | | | | | | | | | | | LIQUID PRODUCT RATES | | | | Basis 9 hours | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO 28.010 | 9.27 | 8.90 | | 9.085 | | $\sqrt{H}$ | PRESSURE | TEMP. | M. W. | S. C. F. H. | M/HR | HOUR | GAGE | GAL. | °F | FACTOR | GAL. AT 60 | API° #/GAL. | # | # HR GAL HR |
| $H_2$ 2.016 | 41.73 | 41.84 | | 41.785 | FRESH FEED 79.31 | 5.850 | 403.0 | 56 | 2327949 | | | OIL | 3'1" | 165.75 | 46 | 1.0069 | 166.89 | 54.0 | | |
| $CO_2$ 44.010 | 28.75 | 28.26 | | 28.505 | | | 20.438 | 1.0039 | 1.5258 | 14525 | 38.274 | | 1'10" | 96.02 | 53 | 1.0035 | 96.36 | 6.350 | | |
| $N_2$ 28.016 | 1.34 | 1.33 | | 1.335 | WET GAS 158.44 | 6.540 | 1.50 | 51 | 1307309 | | | | | | | | +1.10 | | +7.00 | 50.54 |
| $CH_4$ 16.042 | 8.88 | 9.10 | | 8.990 | | | 4.025 | 1.0088 | 1.1434 | 4811 | 12.677 | | | | | | 71.63 | | 454.85 | 7.959 |
| $C_2H_4$ 28.052 | 2.27 | 2.38 | | 2.325 | RECYCLE 79.31 | 7.930 | 402.2 | 66 | | | | | | | | | | | | |
| $C_2H_6$ 33.068 | 1.71 | 1.75 | | 1.730 | | | 20.418 | 0.9943 | 1.1434 | 14599 | 38.469 | | | | | | | | | |
| $C_3H_6$ 42.078 | 2.88 | 2.93 | | 2.905 | BLEED 5.02 | 8.030 | | | | | | | | | | | | | | |
| $C_3H_8$ 44.094 | 0.37 | 0.35 | | 0.360 | | | 20.418 | 1.0000 | 1.1434 | 941 | 2.480 | WATER | 4'3" | 227.10 | 54 | 1.00047 | 227.21 | 11.1 | | |
| $C_4H_8$ 56.104 | 1.51 | 1.68 | | 1.595 | NATURAL GAS 28.43 | 7.190 | 420.0 | 188 | 1470838 | | | | 1'10" | 96.02 | 53 | 1.00052 | 96.07 | 8.264 | | |
| $C_4H_{10}$ 58.120 | 0.43 | 0.42 | | 0.425 | | | 20.849 | 0.8958 | 1.2128 | 4630 | 12.200 | | | | | | +0.97 | | +8.00 | 121.31 |
| $C_5H_{10}$ 70.130 | 0.56 | 0.69 | | 0.625 | OXYGEN 27.07 | 6.510 | 424.9 | 56 | | | | | | | | | 132.11 | | 1091.76 | 14.679 |
| $C_5H_{12}$ 72.146 | 0.16 | 0.16 | | 0.160 | | | 20.967 | 1.0039 | -- | 3709 | 9.773 | | | | | | | | | |
| $C_6H_{12}$ 84.156 | 0.14 | 0.21 | | 0.175 | STEAM 215.7 | 5.680 | 22.9 | | | | | | | | | | | | | |
| | | | M. W. | 22.14471 | | | | | | | | | | | | | | | | |

## THE TEXAS COMPANY — MONTEBELLO LABORATORY

### RATE CALCULATIONS

RUN NO. 66-N
HOURS 248-272

| | GAS ANALYSES | | | | GENERATOR BALANCE | | | | | | | | | | WEIGHT BALANCE | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| HOUR | 1400 | 2200 | 0600 | AVERAGE | M/HR | C | H | O | | Mol % | M/Hr | C | H | O | | #/hr Measured | At Wt. Balance |
| FRESH FEED | | | | | | | | | $O_2$ 32.000 | 0.30 | 9.802<br>0.038 | | | 19.680 | WET GAS | 290.12 | 319.24 |
| CO 28.010 | 36.46 | 37.15 | 36.85 | 36.820 | 14.459 | 14.459 | | 14.459 | $CO_2$ 44.010 | 1.44 | 0.182 | 0.182 | | 0.364 | OIL | 49.96 | 49.96 |
| $H_2$ 2.016 | 61.00 | 60.21 | 60.28 | 60.497 | 23.757 | | 47.514 | | $N_2$ 28.016 | 0.82 | 0.104 | | | | WATER | 126.56 | 126.56 |
| $CO_2$ 44.010 | 1.99 | 2.17 | 2.48 | 2.213 | 0.869 | 0.869 | | 1.738 | $CH_4$ 16.042 | 84.72 | 10.711 | 10.711 | 42.844 | | TOTAL | 466.64 | 495.76 |
| $N_2$ 28.016 | 0.41 | 0.31 | 0.34 | 0.353 | 0.139 | | | | $C_2H_4$ 30.068 | 5.97 | 0.755 | 1.510 | 4.530 | | FRESH FEED | 495.76 | |
| $CH_4$ 16.042 | 0.14 | 0.16 | 0.05 | 0.117 | 0.046 | 0.046 | 0.184 | | $C_2H_6$ 44.094 | 4.88 | 0.617 | 1.851 | 4.936 | | WEIGHT BALANCE | 94.13 | |
| | | | M. W | 12.624508 | | | | 3847 | $C_4H_{10}$ 58.120 | 1.34 | 0.169 | 0.676 | 1.690 | | | | |
| | | | $H_2O$ 18.016 | | | | 7.400 | 3.700 | $C_5H_{12}$ 72.146 | 0.53 | 0.067 | 0.335 | 0.804 | | WET GAS FACTOR | 1100372 | |
| | | | | | | 15.374 | 55.098 | 19.897 | MW | 19.658286 | | | | | INDICATED LOSS—S C F H | 491 | |
| | | | BALANCE | | | 100.71 | 100.54 | 99.27 | TOTAL | | | 15.265 | 54.804 | 20.044 | | 5382 | |

| WET GAS | | | | | GAS FLOW RATES | | | | | | | | | | | LIQUID PRODUCT RATES | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO 28.010 | 8.78 | 8.20 | 8.57 | 8.517 | | $\sqrt{H}$ | PRESSURE | TEMP. | M. W. | S. C. F. H. | M/HR | HOUR | GAGE | GAL. | °F | FACTOR | GAL. AT 60 | API° #/GAL. | # | # HR GAL HR |
| $H_2$ 2.016 | 41.07 | 41.10 | 40.11 | 40.760 | FRESH FEED 79.31 | 6.033 | 403.5 | 54 | 2293158 | | | OIL | 6'7-3/4 | 352.59 | 46 | 1.0069 | 355.02 | 55.1 | | |
| $CO_2$ 44.010 | 28.61 | 29.23 | 30.16 | 29.333 | | | 20.450 | 1.0058 | 1.5143 | 14903 | 39.270 | | 3'1" | 165.75 | 46 | 1.0069 | 166.89 | 6.313 | | |
| $N_2$ 28.016 | 1.53 | 1.30 | 1.11 | 1.313 | WET GAS 158.44 | 6.688 | 1.52 | 49 | 1286054 | | | | | | | | +1.82 | | +11.50 | 49.96 |
| $CH_4$ 16.042 | 9.45 | 9.64 | 9.13 | 9.406 | | | 4.027 | 1.0108 | 1.1340 | 4891 | 12.88 | | | | | | 189.95 | | 1199.15 | 7.915 |
| $C_2H_4$ 28.052 | 2.34 | 2.39 | 2.46 | 2.397 | RECYCLE 79.31 | 7.900 | 404.3 | 73 | | | | | | | | | | | | |
| $C_2H_6$ 33.068 | 1.88 | 1.95 | 1.96 | 1.930 | | | 20.469 | 0.9877 | 1.1340 | 14364 | 37.850 | | | | | | | | | |
| $C_3H_6$ 42.078 | 2.97 | 2.93 | 3.09 | 2.997 | BLEED 5.02 | 8.008 | | | | | | | | | | | | | | |
| $C_3H_8$ 44.094 | 0.37 | 0.40 | 0.41 | 0.393 | | | 20.469 | 1.0000 | 1.1340 | 933 | 2.458 | WATER | 7'2½" | 382.05 | 54 | 1.00047 | 382.23 | 11.0 | | |
| $C_4H_8$ 56.104 | 1.57 | 1.53 | 1.66 | 1.587 | NATURAL GAS 28.43 | 7.204 | 425.4 | 154 | 1472661 | | | | 4'3" | 227.10 | 54 | 1.00047 | 227.21 | 8.270 | | |
| $C_4H_{10}$ 58.120 | 0.49 | 0.41 | 0.36 | 0.420 | | | 20.979 | 0.9203 | 1.2135 | 4798 | 12.643 | | 5'6½" | 294.75 | 54 | 1.00047 | 294.89 | | | |
| $C_5H_{10}$ 70.130 | 0.63 | 0.61 | 0.67 | 0.637 | OXYGEN 27.07 | 6.508 | 427.8 | 56 | | | | | 1'7" | 82.59 | 52 | 1.00059 | 82.64 | | | 126.56 |
| $C_5H_{12}$ 72.146 | 0.10 | 0.10 | 0.10 | 0.100 | | | 21.036 | 1.0039 | -- | 3720 | 9.802 | | | | | | 367.27 | | 3037.32 | 15.303 |
| $C_6H_{12}$ 84.156 | 0.21 | 0.21 | 0.21 | 0.210 | STEAM 215.7 | 6.317 | 24.1 | | | | | | | | | | | | | |
| | | | M. W. | 22.510709 | | | | | | | | | | | | | | | | |

## THE TEXAS COMPANY — MONTEBELLO LABORATORY

### RATE CALCULATIONS

RUN NO. 66-0
HOURS 272-296

| | GAS ANALYSES | | | |
|---|---|---|---|---|
| HOUR | 1400 | 2200 | 0600 | AVERAGE |
| FRESH FEED | | | | |
| CO 28.010 | 37.35 | 36.27 | 36.32 | 36.647 |
| $H_2$ 2.016 | 59.90 | 60.68 | 60.52 | 60.367 |
| $CO_2$ 44.010 | 2.02 | 2.11 | 2.21 | 2.113 |
| $N_2$ 28.016 | 0.57 | 0.81 | 0.87 | 0.750 |
| $CH_4$ 16.042 | 0.16 | 0.13 | 0.08 | 0.123 |
| | | | M. W | 12.641606 |
| | | | $H_2O$ 18.016 | |
| | | | BALANCE | |
| WET GAS | | | | |
| CO 28.010 | 7.98 | 8.11 | 8.21 | 8.100 |
| $H_2$ 2.016 | 41.06 | 41.99 | 40.43 | 41.160 |
| $CO_2$ 44.010 | 28.99 | 28.24 | 28.93 | 28.720 |
| $N_2$ 28.016 | 1.62 | 1.89 | 2.38 | 1.963 |
| $CH_4$ 16.042 | 9.55 | 9.19 | 9.37 | 9.370 |
| $C_2H_4$ 28.052 | 2.36 | 2.26 | 2.41 | 2.343 |
| $C_2H_6$ 30.068 | 2.05 | 1.94 | 2.02 | 2.003 |
| $C_3H_6$ 42.078 | 2.85 | 2.75 | 2.89 | 2.830 |
| $C_3H_8$ 44.094 | 0.31 | 0.29 | 0.32 | 0.307 |
| $C_4H_8$ 56.104 | 1.67 | 1.69 | 1.55 | 1.637 |
| $C_4H_{10}$ 58.120 | 0.54 | 0.57 | 0.57 | 0.560 |
| $C_5H_{10}$ 70.130 | 0.69 | 0.69 | 0.59 | 0.657 |
| $C_5H_{12}$ 72.146 | 0.16 | 0.19 | 0.16 | 0.170 |
| $C_6H_{12}$ 84.156 | 0.17 | 0.20 | 0.17 | 0.180 |
| | | | M. W. | 22.35583 |

| GENERATOR BALANCE | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| M/HR | C | H | O | | Mol % | M/Hr | C | H | O |
| | | | | $O_2$ 32.000 | 0.35 | 9.784 0.043 | | | 19.654 |
| 14.131 | 14.131 | | 14.131 | $CO_2$ 44.010 | 1.29 | 0.157 | 0.157 | | 0.314 |
| 23.279 | | 46.558 | | $N_2$ 28.016 | 1.92 | 0.234 | | | |
| 0.815 | 0.815 | | 1.630 | $CH_4$ 16.042 | 83.39 | 10.176 | 10.176 | 40.704 | |
| 0.289 | | | | $C_2H_4$ 30.068 | 6.16 | 0.752 | 1.504 | 4.512 | |
| 0.047 | 0.047 | 0.188 | | $C_2H_6$ 44.094 | 4.89 | 0.597 | 1.791 | 4.776 | |
| | | 5.810 | 4.207 | $C_4H_{10}$ 58.120 | 1.49 | 0.182 | 0.728 | 1.820 | |
| | | 7.112 | 3.556 | $C_5H_{12}$ 72.146 | 0.51 | 0.062 | 0.310 | 0.744 | |
| | 14.993 | 53.858 | 19.317 | MW | 19.837378 | | | | |
| | 102.23 | 102.48 | 96.74 | TOTAL | | | 14.666 | 52.556 | 19.968 |

| GAS FLOW RATES | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | $\sqrt{h}$ | PRESSURE | TEMP. | M. W. | S. C. F. H. | M/HR | HOUR | GAGE | GAL. | °F | FACTOR |
| FRESH FEED 79.31 | 5.958 | 403.3 | 59 | 2290057 | | | OIL | 7'2½" | 382.05 | 47 | 1.0064 |
| | | 20.445 | 1.0010 | 1.5133 | 14634 | 38.561 | | 6'7-3/4 | 352.59 | 46 | 1.0069 |
| WET GAS 158.44 | 6.617 | 1.52 | 52 | 1294964 | | | | 4'3" | 227.10 | 42 | 1.0089 |
| | | 4.027 | 1.0078 | 1.1380 | 4842 | 12.759 | | 1'6½" | 80.37 | 50 | 1.0049 |
| RECYCLE 79.31 | 7.913 | 403.4 | 71 | | | | | | | | |
| | | 20.447 | 0.9896 | 1.1380 | 14451 | 38.079 | | | | | |
| BLEED 5.02 | 8.050 | 20.447 | 1.0000 | 1.1380 | 940 | 2.477 | WATER | 7'3" | 384.23 | 56 | 1.00033 |
| NATURAL GAS 28.43 | 7.200 | 427.1 | 195 | 1459366 | | | | 5'6½" | 294.75 | 54 | 1.00047 |
| | | 21.019 | 0.8910 | 1.2080 | 4631 | 12.203 | | 5'6" | 292.57 | 54 | 1.00047 |
| OXYGEN 27.07 | 6.392 | 428.2 | 56 | | | | | 0'6" | 26.55 | 58 | 1.00018 |
| | | 21.045 | 1.0039 | | 3713 | 9.784 | | | | | |
| STEAM 215.7 | 5.850 | 23.3 | | | | | | | | | |

| LIQUID PRODUCT RATES | | | | | |
|---|---|---|---|---|---|
| GAL. AT 60 | API° #/GAL. | # | # HR GAL HR |
| 384.50 | 54.8 | | |
| 355.02 | 6.323 | | |
| 229.12 | | | |
| 80.76 | | | |
| +1.27 | | +8.00 | 47.19 |
| 179.11 | | 1132.51 | 7.463 |
| 384.36 | 11.1 | | |
| 294.89 | 8.264 | | |
| 292.71 | | | |
| 26.55 | | | 122.46 |
| 355.63 | | 2938.93 | 14.818 |

| WEIGHT BALANCE | # hr Measured | At Wt. Balance |
|---|---|---|
| WET GAS | 285.24 | 317.82 |
| OIL | 47.19 | 47.19 |
| WATER | 122.46 | 122.46 |
| TOTAL | 454.89 | 487.47 |
| FRESH FEED | 487.47 | |
| WEIGHT BALANCE | 93.32 | |
| WET GAS FACTOR | 1114219 | |
| INDICATED LOSS—S C F H | 553 | |
| | 5395 | |

## THE TEXAS COMPANY — MONTEBELLO LABORATORY

### RATE CALCULATIONS

RUN NO. 66-P
HOURS 296-320

| | GAS ANALYSES | | | |
|---|---|---|---|---|
| HOUR | 1400 | 2200 | 0600 | AVERAGE |
| FRESH FEED | | | | |
| CO 28.010 | 35.13 | 36.39 | 36.26 | 35.927 |
| $H_2$ 2.016 | 61.78 | 60.41 | 60.47 | 60.887 |
| $CO_2$ 44.010 | 2.04 | 2.25 | 2.38 | 2.223 |
| $N_2$ 28.016 | 0.88 | 0.85 | 0.82 | 0.850 |
| $CH_4$ 16.042 | 0.17 | 0.10 | 0.07 | 0.113 |
| | | | M. W | 12.52524 |
| | | | $H_2O$ 18.016 | |
| | | | BALANCE | |
| WET GAS | 1400 | 2200 | | |
| CO 28.010 | 8.22 | 8.57 | | 8.395 |
| $H_2$ 2.016 | 41.22 | 40.51 | | 40.865 |
| $CO_2$ 44.010 | 28.48 | 29.18 | | 28.830 |
| $N_2$ 28.016 | 1.97 | 2.22 | | 2.095 |
| $CH_4$ 16.042 | 9.23 | 8.92 | | 9.075 |
| $C_2H_4$ 28.052 | 2.34 | 2.39 | | 2.365 |
| $C_2H_6$ 30.068 | 1.77 | 1.79 | | 1.780 |
| $C_3H_6$ 42.078 | 2.95 | 2.79 | | 2.870 |
| $C_3H_8$ 44.094 | 0.30 | 0.28 | | 0.290 |
| $C_4H_8$ 56.104 | 1.87 | 1.68 | | 1.775 |
| $C_4H_{10}$ 58.120 | 0.48 | 0.54 | | 0.510 |
| $C_5H_{10}$ 70.130 | 0.78 | 0.73 | | 0.755 |
| $C_5H_{12}$ 72.146 | 0.18 | 0.19 | | 0.185 |
| $C_6H_{12}$ 84.156 | 0.21 | 0.21 | | 0.210 |
| | | | M. W. | 22.572196 |

| GENERATOR BALANCE | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| M/HR | C | H | O | | Mol % | M/Hr | C | H | O |
| | | | | $O_2$ 32.000 | 0.50 | 9.715 0.061 | | | 19.552 |
| 13.690 | 13.690 | | 13.690 | $CO_2$ 44.010 | 1.17 | 0.143 | 0.143 | | 0.286 |
| 23.201 | | 46.402 | | $N_2$ 28.016 | 2.07 | 0.253 | | | |
| 0.847 | 0.847 | | 1.694 | $CH_4$ 16.042 | 82.70 | 10.102 | 10.102 | 40.408 | |
| 0.324 | | | | $C_2H_4$ 30.068 | 6.53 | 0.798 | 1.596 | 4.788 | |
| 0.043 | 0.043 | 0.172 | | $C_3H_8$ 44.094 | 5.19 | 0.634 | 1.902 | 5.072 | |
| | | | | $C_4H_{10}$ 58.120 | 1.36 | 0.166 | 0.664 | 1.660 | |
| | | 7.485 | 3.743 | $C_5H_{12}$ 72.146 | 0.48 | 0.059 | 0.295 | 0.708 | |
| | 14.580 | 54.059 | 19.127 | MW | 19.910234 | | | | |
| | 99.17 | 102.70 | 96.42 | TOTAL | | | 14.702 | 52.636 | 19.838 |

| GAS FLOW RATES | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | $\sqrt{h}$ | PRESSURE | TEMP. | M. W. | S. C. F. H. | M/HR | HOUR | GAGE | GAL. | °F | FACTOR |
| FRESH FEED 79.31 | 5.863 | 402.9 | 59 | 2311332 | | | OIL | 7'3" | 384.23 | 44 | 1.0079 |
| | | 20.435 | 1.0010 | 1.5203 | 14461 | 38.105 | | 4'3" | 227.10 | 42 | 1.0089 |
| WET GAS 158.44 | 6.567 | 1.50 | 51 | 1282551 | | | | 2'4½" | 126.59 | 43 | 1.0084 |
| | | 4.025 | 1.0088 | 1.1325 | 4785 | 12.609 | | 2'1" | 109.84 | 46 | 1.0069 |
| RECYCLE 79.31 | 7.933 | 403.2 | 70 | | | | | | | | |
| | | 20.443 | 0.9905 | 1.1325 | 14428 | 38.018 | | | | | |
| BLEED 5.02 | 7.983 | 20.443 | 1.0000 | 1.1325 | 928 | 2.445 | WATER | 7'2" | 379.86 | 56 | 1.00033 |
| NATURAL GAS 28.43 | 7.200 | 427.5 | 192 | 1454026 | | | | 5'6" | 292.57 | 54 | 1.00047 |
| | | 21.029 | 0.8931 | 1.2058 | 4636 | 12.216 | | 5'10¼" | 311.12 | 54 | 1.00047 |
| OXYGEN 27.07 | 6.458 | 427.5 | 57 | | | | | 0'11½" | 49.82 | 64 | 0.99963 |
| | | 21.029 | 1.0029 | | 3687 | 9.715 | | | | | |
| STEAM 215.7 | 5.808 | 22.9 | | | | | | | | | |

| LIQUID PRODUCT RATES | | | | | |
|---|---|---|---|---|---|
| GAL. AT 60 | API° #/GAL. | # | # HR GAL HR |
| 387.27 | 53.4 | | |
| 229.12 | 6.371 | | |
| 127.65 | | | |
| 110.60 | | | |
| +0.39 | | +2.50 | 46.61 |
| 175.59 | | 1118.68 | 7.316 |
| 379.99 | 11.1 | | |
| 292.71 | 8.264 | | |
| 311.27 | | | |
| 49.80 | | | 120.09 |
| 348.75 | | 2882.07 | 14.531 |

| WEIGHT BALANCE | # hr Measured | At Wt. Balance |
|---|---|---|
| WET GAS | 284.61 | 310.57 |
| OIL | 46.61 | 46.61 |
| WATER | 120.09 | 120.09 |
| TOTAL | 451.31 | 477.27 |
| FRESH FEED | 477.27 | |
| WEIGHT BALANCE | 94.56 | |
| WET GAS FACTOR | 1091212 | |
| INDICATED LOSS—S C F H | 436 | |
| | 5221 | |

## THE TEXAS COMPANY — MONTEBELLO LABORATORY

### RATE CALCULATIONS

RUN NO. 66-Q
HOURS 320-344

| | GAS ANALYSES | | | | GENERATOR BALANCE | | | | | | | | | | WEIGHT BALANCE | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| HOUR | 1400 | 2200 | | AVERAGE | M/HR | C | H | O | | Mol % | M/Hr | C | H | O | | #/hr Measured | At Wt. Balance |
| FRESH FEED | | | | | | | | | $O_2$ 32.000 | 0.54 | 9.776<br>0.066 | | | 19.684 | WET GAS | 292.10 | 323.02 |
| CO 28.010 | 37.65 | 36.55 | 37.26 | 37.153 | 13.914 | 13.914 | | 13.914 | $CO_2$ 44.010 | 1.51 | 0.186 | 0.186 | | 0.372 | OIL | 44.63 | |
| $H_2$ 2.016 | 58.47 | 60.08 | 59.31 | 59.287 | 22.204 | | 44.408 | | $N_2$ 28.016 | 2.28 | 0.280 | | | | WATER | 118.58 | |
| $CO_2$ 44.010 | 2.77 | 2.32 | 2.44 | 2.510 | 0.940 | 0.940 | | 1.880 | $CH_4$ 16.042 | 82.92 | 10.186 | 10.186 | 40.744 | | TOTAL | 455.41 | 486.33 |
| $N_2$ 28.016 | 0.93 | 0.92 | 0.92 | 0.923 | 0.346 | | | | $C_2H_4$ 30.068 | 6.11 | 0.751 | 1.502 | 4.506 | | FRESH FEED | 486.33 | |
| $CH_4$ 16.042 | 0.18 | 0.13 | 0.07 | 0.127 | 0.048 | 0.048 | 0.192 | | $C_2H_6$ 44.094 | 4.81 | 0.591 | 1.773 | 4.728 | | WEIGHT BALANCE | 93.64 | |
| | | | M. W | 12.985383 | | | | | $C_4H_{10}$ 58.120 | 1.39 | 0.171 | 0.684 | 1.710 | | | | |
| | | | $H_2O$ 18.016 | | | | 8.130 | 4.065 | $C_5H_{12}$ 72.146 | 0.44 | 0.054 | 0.270 | 0.648 | | WET GAS FACTOR | 1105854 | |
| | | | | | 37.452 | 14.902 | | 19.859 | MW | 19.8615 | | | | | INDICATED LOSS—S C F H | 521 | |
| | | | BALANCE | | | 102.06 | 100.75 | 99.27 | TOTAL | | | 14.601 | 52.336 | 20.056 | | | |

| WET GAS | | | | | GAS FLOW RATES | | | | | | | | | | LIQUID PRODUCT RATES | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO 28.010 | 9.01 | 9.10 | 9.22 | 9.110 | | $\sqrt{h}$ | PRESSURE | TEMP. | M. W. | S. C. F. H. | M/HR | HOUR | GAGE | GAL. | °F | FACTOR | GAL. AT 60 | API° #/GAL. | # | # HR GAL HR |
| $H_2$ 2.016 | 40.21 | 41.14 | 40.48 | 40.610 | FRESH FEED | | 402.7 | 60 | 2.22943 | | | OIL | 5'6½" | 293.66 | 43 | 1.0084 | 296.13 | 54.8 | | |
| $CO_2$ 44.010 | 30.14 | 28.59 | 29.12 | 29.283 | 79.31 | 5.875 | 20.430 | 1.0000 | 1.4931 | 14213 | 37.452 | | 2'4½" | 126.59 | 43 | 1.0084 | 127.65 | 6.323 | | |
| $N_2$ 28.016 | 2.07 | 2.28 | 2.31 | 2.220 | WET GAS | | 1.562 | 51 | | | | | | | | | +0.91 | | +5.75 | 44.63 |
| $CH_4$ 16.042 | 8.87 | 8.85 | 8.43 | 8.716 | 158.44 | 6.738 | 4.0326 | 1.0088 | 1.1342 | 4926 | 12.980 | | | | | | 169.39 | | 1071.05 | 7.058 |
| $C_2H_4$ 28.052 | 2.26 | 2.31 | 2.24 | 2.270 | RECYCLE | | 402.6 | 73 | | | | | | | | | | | | |
| $C_2H_6$ 33.068 | 1.80 | 1.84 | 1.87 | 1.837 | 79.31 | 7.917 | 20.428 | 0.9877 | 1.1342 | 14369 | | | | | | | | | | |
| $C_3H_6$ 42.078 | 3.09 | 2.86 | 2.74 | 2;897 | BLEED | | | | | | 40.269 | | | | | | | | | |
| $C_3H_8$ 44.094 | 0.32 | 0.30 | 0.28 | 0.300 | 5.02 | 7.946 | 20.428 | 0.9877 | 1.1342 | 913 | | WATER | 7'5-3/4 | 396.23 | 55 | 1.00039 | 396.38 | 11.0 | | |
| $C_4H_8$ 56.104 | 1.37 | 1.45 | 1.64 | 1.487 | NATURAL GAS | | 428.9 | 189 | | | | | 5'10¼" | 311.12 | 54 | 1.00047 | 311.27 | 8.270 | | |
| $C_4H_{10}$ 58.120 | 0.42 | 0.46 | 0.61 | 0.497 | 28.43 | 7.204 | 21.062 | 0.8951 | 1.2073 | 4662 | 12.285 | | 5'10" | 310.03 | 52 | 1.00059 | 310.21 | | | |
| $C_5H_{10}$ 70.130 | 0.30 | 0.55 | 0.68 | 0.510 | OXYGEN | | 427.8 | 57 | | | | | 0'11-3/4 | 50.90 | 57 | 1.00025 | 50.91 | | | 118.68 |
| $C_5H_{12}$ 72.146 | 0.10 | 0.13 | 0.19 | 0.140 | 27.07 | 6.496 | 21.036 | 1.0029 | -- | 3710 | 9.776 | | | | | | 344.41 | | 2848.27 | 14.350 |
| $C_6H_{12}$ 84.156 | 0.04 | 0.14 | 0.19 | 0.123 | STEAM | | 22.4 | | | | | | | | | | | | | |
| | | | M. W. | 22.503746 | 215.7 | 5.733 | | | | | | | | | | | | | | |

## THE TEXAS COMPANY — MONTEBELLO LABORATORY

### RATE CALCULATIONS

RUN NO. 66-R
HOURS 344-368

| | GAS ANALYSES | | | | GENERATOR BALANCE | | | | | | | | | | WEIGHT BALANCE | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| HOUR | 1400 | 2200 | 0600 | AVERAGE | M/HR | C | H | O | | Mol % | M/Hr | C | H | O | | #/hr Measured | At Wt. Balance |
| FRESH FEED | | | | | | | | | $O_2$ 32.000 | 0.36 | 9.639<br>0.044 | | | 19.366 | WET GAS | 291.88 | 321.66 |
| CO 28.010 | 36.60 | 36.11 | 36.57 | 36.427 | 13.634 | 13.634 | | 13.634 | $CO_2$ 44.010 | 1.39 | 0.171 | 0.171 | | 0.342 | OIL | 42.93 | 42.93 |
| $H_2$ 2.016 | 60.19 | 60.21 | 59.86 | 60.086 | 22.489 | | 44.978 | | $N_2$ 28.016 | 2.25 | 0.277 | | | | WATER | 112.22 | 112.22 |
| $CO_2$ 44.010 | 2.09 | 2.34 | 2.32 | 2.250 | 0.842 | 0.842 | | 1.684 | $CH_4$ 16.042 | 83.24 | 10.241 | 10.241 | 40.964 | | TOTAL | 447.03 | 476.81 |
| $N_2$ 28.016 | 1.02 | 1.21 | 1.18 | 1.137 | 0.426 | | | | $C_2H_4$ 30.068 | 6.07 | 0.747 | 1.494 | 4.482 | | FRESH FEED | 476.81 | |
| $CH_4$ 16.042 | 0.10 | 0.13 | 0.07 | 0.100 | 0.037 | 0.037 | 0.148 | | $C_2H_6$ 44.094 | 4.82 | 0.593 | 1.779 | 4.744 | | WEIGHT BALANCE | 93.75 | |
| | | | M. W | 12.73935 | | | | | $C_4H_{10}$ 58.120 | 1.36 | 0.167 | 0.668 | 1.670 | | | | |
| | | | $H_2O$ 18.016 | | | | 8.135 | 4.068 | $C_5H_{12}$ 72.146 | 0.51 | 0.063 | 0.315 | 0.756 | | WET GAS FACTOR | 1102028 | |
| | | | | | | 14.513 | 53.261 | 19.386 | MW | 19.819495 | | | | | INDICATED LOSS—S C F H | 511 | |
| | | | BALANCE | | | 98.94 | 101.23 | 98.37 | TOTAL | | | 14.668 | 52.616 | 19.708 | | 5522 | |

| WET GAS | | | | | GAS FLOW RATES | | | | | | | | | | LIQUID PRODUCT RATES | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO 28.010 | 8.90 | 9.14 | 8.97 | 9.003 | | $\sqrt{h}$ | PRESSURE | TEMP. | M. W. | S. C. F. H. | M/HR | HOUR | GAGE | GAL. | °F | FACTOR | GAL. AT 60 | API° #/GAL. | # | # HR GAL HR |
| $H_2$ 2.016 | 41.34 | 42.14 | 41.88 | 41.787 | FRESH FEED | | 401.3 | 57 | 2272486 | | | OIL | 7'2½" | 382.05 | 51 | 1.0044 | 383.73 | 55.3 | | |
| $CO_2$ 44.010 | 28.79 | 27.09 | 28.01 | 27.963 | 79.31 | 5.808 | 20.396 | 1.0029 | 1.5075 | 14204 | 37.428 | | 5'6½" | 293.66 | 43 | 1.0084 | 296.13 | 6.306 | | |
| $N_2$ 28.016 | 2.63 | 2.84 | 2.91 | 2.793 | WET GAS | | 1.55 | 49 | 1309611 | | | | 3'10¼" | 206.37 | 40 | 1.0099 | 208.41 | | | |
| $CH_4$ 16.042 | 8.17 | 8.68 | 8.40 | 8.417 | 158.44 | 6.783 | 4.031 | 1.0108 | 1.1444 | 5011 | 13.204 | | 2'6" | 133.50 | 54 | 1.0030 | 133.90 | | | |
| $C_2H_4$ 28.052 | 2.20 | 2.26 | 2.21 | 2.223 | RECYCLE | | 401.9 | 69 | | | | | | | | | +1.27 | | +8.00 | 42.93 |
| $C_2H_6$ 33.068 | 1.66 | 1.78 | 1.77 | 1.737 | 79.31 | 7.933 | 20.411 | 0.9915 | 1.1444 | 14571 | 38.395 | | | | | | 163.38 | | 1030.27 | 6.808 |
| $C_3H_6$ 42.078 | 2.76 | 2.94 | 2.60 | 2.767 | BLEED | | | | | | | | | | | | | | | |
| $C_3H_8$ 44.094 | 0.27 | 0.33 | 0.30 | 0.300 | 5.02 | 8.025 | 20.411 | 1.0000 | 1.1444 | 941 | 2.480 | WATER | 7'4-3/4 | 391.87 | 56 | 1.00033 | 392.00 | 11.0 | | |
| $C_4H_8$ 56.104 | 1.68 | 1.57 | 1.46 | 1.570 | NATURAL GAS | | 429.6 | 190 | 1460683 | | | | 5'10" | 310.03 | 52 | 1.00059 | 310.21 | 8.270 | | |
| $C_4H_{10}$ 58.120 | 0.52 | 0.38 | 0.57 | 0.490 | 28.43 | 7.209 | 21.078 | 0.8944 | 1.2086 | 4669 | 12.303 | | 6'2¼" | 328.58 | 51 | 1.00064 | 328.79 | | | |
| $C_5H_{10}$ 70.130 | 0.70 | 0.55 | 0.59 | 0.613 | OXYGEN | | 427.1 | 56 | | | | | 1'7-3/4 | 85.91 | 54 | 1.00047 | 85.95 | | | |
| $C_5H_{12}$ 72.146 | 0.16 | 0.16 | 0.16 | 0.160 | 27.07 | 6.404 | 21.019 | 1.0039 | | 3658 | 9.639 | | | | | | +1.03 | | +8.50 | 112.22 |
| $C_6H_{12}$ 84.156 | 0.22 | 0.14 | 0.17 | 0.177 | STEAM | | 21.9 | | | | | | | | | | 325.66 | | 2693.21 | 13.569 |
| | | | M. W. | 22.105789 | 215.7 | 5.629 | | | | | | | | | | | | | | |

## THE TEXAS COMPANY — MONTEBELLO LABORATORY

**RATE CALCULATIONS**

RUN NO. 66-S
HOURS 368-392

| GAS ANALYSES | | | | |
|---|---|---|---|---|
| HOUR | 1400 | 2200 | 0600 | AVERAGE |
| FRESH FEED | | | | |
| CO 28.010 | 38.57 | 38.89 | 37.60 | 38.387 |
| $H_2$ 2.016 | 57.74 | 57.32 | 58.47 | 57.843 |
| $CO_2$ 44.010 | 2.23 | 2.51 | 2.52 | 2.420 |
| $N_2$ 28.016 | 1.15 | 1.18 | 1.27 | 1.200 |
| $CH_4$ 16.042 | 0.21 | 0.10 | 0.14 | 0.150 |
| | | | M. W | 13.3436 |
| | | | $H_2O$ 18.016 | |
| | | | BALANCE | |
| WET GAS | | | | |
| CO 28.010 | 10.34 | 10.27 | 10.62 | 10.410 |
| $H_2$ 2.016 | 38.90 | 39.01 | 40.26 | 39.390 |
| $CO_2$ 44.010 | 28.90 | 29.09 | 28.68 | 28.890 |
| $N_2$ 28.016 | 2.72 | 2.77 | 2.61 | 2.700 |
| $CH_4$ 16.042 | 8.32 | 8.41 | 8.37 | 8.367 |
| $C_2H_4$ 28.052 | 2.41 | 2.36 | 2.21 | 2.327 |
| $C_2H_6$ 30.068 | 1.88 | 1.79 | 1.79 | 1.820 |
| $C_3H_6$ 42.078 | 3.04 | 2.96 | 2.66 | 2.887 |
| $C_3H_8$ 44.094 | 0.33 | 0.34 | 0.30 | 0.323 |
| $C_4H_8$ 56.104 | 1.77 | 1.62 | 1.30 | 1.563 |
| $C_4H_{10}$ 58.120 | 0.43 | 0.46 | 0.49 | 0.460 |
| $C_5H_{10}$ 70.130 | 0.66 | 0.59 | 0.47 | 0.573 |
| $C_5H_{12}$ 72.146 | 0.16 | 0.16 | 0.10 | 0.140 |
| $C_6H_{12}$ 84.156 | 0.14 | 0.17 | 0.14 | 0.150 |
| | | | M. W. | 22.8537 |

| GENERATOR BALANCE | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| M/HR | C | H | O | | Mol % | M/Hr | C | H | O |
| | | | | $O_2$ 32.000 | 0.31 | 9.584<br>0.038 | | | 19.244 |
| 13.988 | 13.988 | | 13.988 | $CO_2$ 44.010 | 1.54 | 0.189 | 0.189 | | 0.378 |
| 21.078 | | 42.156 | | $N_2$ 28.016 | 1.32 | 0.162 | | | |
| 0.882 | 0.882 | | 1.764 | $CH_4$ 16.042 | 83.98 | 10.280 | 10.280 | 41.120 | |
| 0.437 | | | | $C_2H_6$ 30.068 | 6.10 | 0.747 | 1.494 | 4.482 | |
| 0.055 | 0.055 | 0.220 | | $C_3H_8$ 44.094 | 4.92 | 0.602 | 1.806 | 4.816 | |
| | | | | $C_4H_{10}$ 58.120 | 1.34 | 0.164 | 0.656 | 1.640 | |
| | | 9.072 | 4.536 | $C_5H_{12}$ 72.146 | 0.49 | 0.060 | 0.300 | 0.720 | |
| | 14.925 | 51.448 | 20.288 | MW | 19.7547 | | | | |
| | 101.36 | 97.48 | 103.39 | TOTAL | | | 14.725 | 52.778 | 19.622 |

| WEIGHT BALANCE | #/hr Measured | At Wt. Balance |
|---|---|---|
| WET GAS | 301.39 | 336.68 |
| OIL | 39.94 | |
| WATER | 109.62 | |
| TOTAL | 450.95 | 486.24 |
| FRESH FEED | 486.24 | |
| WEIGHT BALANCE | 92.74 | |
| WET GAS FACTOR | 111709 | |
| INDICATED LOSS—S C F H | 586 | |
| | 5591 | |

| GAS FLOW RATES | | | | | | | |
|---|---|---|---|---|---|---|---|
| | $\sqrt{H}$ | PRESSURE | TEMP. | M. W. | S. C. F. H. | M/HR |
| FRESH FEED 79.31 | 5.804 | 401.3<br>20.396 | 60<br>1.000 | 2.16957<br>1.4730 | 13829 | 36.440 |
| WET GAS 158.44 | 6.904 | 1.57<br>4.034 | 52<br>1.0078 | 1.26675<br>1.12550 | 5005 | 13.188 |
| RECYCLE 79.31 | 7.900 | 401.3<br>20.396 | 71<br>0.9896 | 1.12550 | 14229 | |
| BLEED 5.02 | 8.000 | 401.3<br>20.396 | 71<br>0.9896 | 1.12550 | 912 | 39.897 |
| NATURAL GAS 28.43 | 7.200 | 426.0<br>20.993 | 192<br>0.8931 | 1.46547<br>1.2106 | 4646 | 12.242 |
| OXYGEN 27.07 | 6.396 | 426.5<br>21.005 | 60<br>1.000 | | 3637 | 9.584 |
| STEAM 215.7 | 5.533 | | | | | |

| HOUR | GAGE | GAL. |
|---|---|---|
| OIL | 6'8-3/4 | 356.95 |
| | 3'10¼" | 206.37 |
| WATER | 7'6¼" | 398.41 |
| | 6'2¼" | 328.58 |
| | 5'10¼" | 311.12 |
| | 1'2⅛" | 62.73 |

| LIQUID PRODUCT RATES | | | | | |
|---|---|---|---|---|---|
| °F | FACTOR | GAL. AT 60 | API° #/GAL. | # | # HR GAL HR |
| 46 | 1.0069 | 359.41 | 54.1 | | |
| 40 | 1.0099 | 208.41 | 6.347 | | 39.94 |
| | | 151.00 | | | 6.292 |
| 52 | 1.00059 | 398.65 | 11.1 | | |
| 51 | 1.00064 | 328.79 | 8.264 | | |
| 54 | 1.00047 | 311.27 | | | |
| 52 | 1.00059 | 62.77 | | | 109.62 |
| | | 318.36 | | | 13.265 |

## THE TEXAS COMPANY — MONTEBELLO LABORATORY

**RATE CALCULATIONS**

RUN NO. 66-T
HOURS 392-416

| GAS ANALYSES | | | | |
|---|---|---|---|---|
| HOUR | 1400 | 2200 | 0600 | AVERAGE |
| FRESH FEED | | | | |
| CO 28.010 | 36.88 | 36.75 | 36.51 | 36.713 |
| $H_2$ 2.016 | 60.47 | 60.15 | 60.75 | 60.457 |
| $CO_2$ 44.010 | 1.96 | 2.41 | 2.15 | 2.173 |
| $N_2$ 28.016 | 0.60 | 0.56 | 0.48 | 0.547 |
| $CH_4$ 16.042 | 0.09 | 0.13 | 0.11 | 0.110 |
| | | | M. W | 12.62936 |
| | | | $H_2O$ 18.016 | |
| | | | BALANCE | |
| WET GAS | | | | |
| CO 28.010 | 10.10 | 9.58 | | 9.840 |
| $H_2$ 2.016 | 44.58 | 41.45 | | 43.015 |
| $CO_2$ 44.010 | 26.74 | 28.98 | | 27.860 |
| $N_2$ 28.016 | 1.60 | 1.24 | | 1.420 |
| $CH_4$ 16.042 | 8.05 | 7.57 | | 7.810 |
| $C_2H_4$ 28.052 | 2.02 | 2.16 | | 2.090 |
| $C_2H_6$ 30.068 | 1.50 | 1.54 | | 1.520 |
| $C_3H_6$ 42.078 | 2.40 | 3.13 | | 2.765 |
| $C_3H_8$ 44.094 | 0.26 | 0.33 | | 0.295 |
| $C_4H_8$ 56.104 | 1.41 | 2.18 | | 1.795 |
| $C_4H_{10}$ 58.120 | 0.42 | 0.51 | | 0.465 |
| $C_5H_{10}$ 70.130 | 0.59 | 0.94 | | 0.765 |
| $C_5H_{12}$ 72.146 | 0.16 | 0.13 | | 0.145 |
| $C_6H_{12}$ 84.156 | 0.17 | 0.26 | | 0.215 |
| | | | M. W. | 21.97148 |

| GENERATOR BALANCE | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| M HR | C | H | O | | Mol % | M/Hr | C | H | O |
| | | | | $O_2$ 32.000 | 0.36 | 9.895<br>0.043 | | | 19.876 |
| 14.280 | 14.280 | | 14.280 | $CO_2$ 44.010 | 0.67 | 0.081 | 0.081 | | 0.162 |
| 23.515 | | 47.030 | | $N_2$ 28.016 | 2.03 | 0.245 | | | |
| 0.845 | 0.845 | | 1.690 | $CH_4$ 16.042 | 81.92 | 9.877 | 9.877 | 39.508 | |
| 0.213 | | | | $C_2H_6$ 30.068 | 6.93 | 0.836 | 1.672 | 5.016 | |
| 0.043 | 0.043 | 0.172 | | $C_3H_8$ 44.094 | 5.88 | 0.709 | 2.127 | 5.672 | |
| | | | | $C_4H_{10}$ 58.120 | 1.64 | 0.198 | 0.792 | 1.980 | |
| | | 6.969 | 3.485 | $C_5H_{12}$ 72.146 | 0.57 | 0.069 | 0.345 | 0.828 | |
| | 15.168 | 54.171 | 19.455 | MW | 20.161238 | | | | |
| | 101.84 | 102.20 | 97.09 | TOTAL | | | 14.894 | 53.004 | 20.038 |

| WEIGHT BALANCE | # hr Measured | At Wt. Balance |
|---|---|---|
| WET GAS | 318.30 | 340.63 |
| OIL | 41.40 | 41.40 |
| WATER | 109.20 | 109.20 |
| TOTAL | 468.90 | 491.23 |
| FRESH FEED | 491.23 | |
| WEIGHT BALANCE | 95.45 | |
| WET GAS FACTOR | 1070153 | |
| INDICATED LOSS—S C F H | 386 | |
| | 5884 | |

| GAS FLOW RATES | | | | | | | |
|---|---|---|---|---|---|---|---|
| | $\sqrt{H}$ | PRESSURE | TEMP. | M. W. | S. C. F. H. | M/HR |
| FRESH FEED 79.31 | 6.092 | 395.6<br>20.256 | 64<br>0.9962 | 2292277<br>1.5140 | 14761 | 38.896 |
| WET GAS 158.44 | 7.429 | 1.73<br>4.053 | 56<br>1.0039 | 1317617<br>1.1479 | 5498 | 14.487 |
| RECYCLE 79.31 | 7.875 | 396.1<br>20.268 | 77<br>0.9840 | 1.1479 | 14298 | 37.676 |
| BLEED 5.02 | 8.088 | 20.268 | 1.0000 | 1.1479 | 945 | 2.490 |
| NATURAL GAS 28.43 | 7.200 | 425.0<br>20.969 | 197<br>0.8897 | 1435923<br>1.1983 | 4576 | 12.058 |
| OXYGEN 27.07 | 6.658 | 422.7<br>20.914 | 64<br>0.9962 | -- | 3755 | 9.895 |
| STEAM 215.7 | 5.479 | 22.0 | | | | |

| HOUR | GAGE | GAL. |
|---|---|---|
| OIL | 7'3½" | 386.41 |
| | 6'8-3/4 | 356.95 |
| | 3'11-3/4 | 212.92 |
| | 1'8½" | 88.12 |
| WATER | 7'4-3/4 | 391.87 |
| | 5'10¼" | 311.12 |
| | 5'7½" | 299.12 |
| | 1'2⅛" | 62.73 |

| LIQUID PRODUCT RATES | | | | | |
|---|---|---|---|---|---|
| °F | FACTOR | GAL. AT 60 | API° #/GAL. | # | # HR GAL HR |
| 50 | 1.0049 | 388.30 | 53.0 | | |
| 46 | 1.0069 | 359.41 | 6.385 | | |
| 48 | 1.0059 | 214.18 | | | |
| 50 | 1.0049 | 88.55 | | | |
| | | +1.10 | | +7.00 | 41.40 |
| | | 155.62 | | 993.63 | 6.484 |
| 57 | 1.00025 | 391.97 | 11.1 | | |
| 54 | 1.00047 | 311.27 | 8.264 | | |
| 57 | 1.00025 | 299.19 | | | |
| 56 | 1.00033 | 62.75 | | | 109.20 |
| | | 317.14 | | 2620.84 | 13.214 |

## THE TEXAS COMPANY — MONTEBELLO LABORATORY

### RATE CALCULATIONS

RUN NO. 66-U
HOURS 416-440

| GAS ANALYSES | | | | | GENERATOR BALANCE | | | | | | | | | | WEIGHT BALANCE | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| HOUR | 1400 | 2200 | 0600 | AVERAGE | M/HR | C | H | O | | Mol % | M/Hr | C | H | O | | #/hr Measured | At Wt. Balance |
| FRESH FEED | | | | | | | | | $O_2$ 32.000 | 0.30 | 10.308<br>0.039 | | | 20.690 | WET GAS | 332.26 | 366.91 |
| CO 28.010 | 36.87 | 36.63 | 36.57 | 36.690 | 14.885 | 14.885 | | 14.885 | $CO_2$ 44.010 | 1.27 | 0.163 | 0.163 | | 0.326 | OIL | 37.83 | 37.83 |
| $H_2$ 2.016 | 60.39 | 60.27 | 60.58 | 60.413 | 24.509 | | 49.018 | | $N_2$ 28.016 | 2.31 | 0.297 | | | | WATER | 108.21 | 108.21 |
| $CO_2$ 44.010 | 2.04 | 2.31 | 2.16 | 2.170 | 0.880 | 0.880 | | 1.760 | $CH_4$ 16.042 | 82.76 | 10.646 | 10.646 | 42.584 | | TOTAL | 478.30 | 512.95 |
| $N_2$ 28.016 | 0.62 | 0.72 | 0.60 | 0.647 | 0.262 | | | | $C_2H_4$ 30.068 | 6.14 | 0.790 | 1.580 | 4.740 | | FRESH FEED | 512.95 | |
| $CH_4$ 16.042 | 0.08 | 0.07 | 0.09 | 0.080 | 0.033 | 0.033 | 0.132 | | $C_2H_6$ 44.094 | 5.07 | 0.652 | 1.956 | 5.216 | | WEIGHT BALANCE | 93.24 | |
| | | | M. W | 12.64391 | | | | 4371 | $C_4H_{10}$ 58.120 | 1.52 | 0.196 | 0.784 | 1.960 | | | | |
| | | | $H_2O$ 18.016 | | | | 7.532 | 3.766 | $C_5H_{12}$ 72.146 | 0.63 | 0.081 | 0.405 | 0.972 | | WET GAS FACTOR | 1104285 | |
| | | | | | | 15.798 | 56.682 | 20.411 | MW | 19.99814 | | | | | INDICATED LOSS—S C F H | 637 | |
| | | | BALANCE | | | 101.70 | 102.18 | 97.12 | TOTAL | | | 15.534 | 55.472 | 21.016 | | 6741 | |

| WET GAS | | | | | GAS FLOW RATES | | | | | | | | | | LIQUID PRODUCT RATES | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO 28.010 | 10.48 | 11.28 | 11.29 | 11.017 | | $\sqrt{H}$ | PRESSURE | TEMP. | M. W. | S. C. F. H. | M/HR | HOUR | GAGE | GAL. | °F | FACTOR | GAL. AT 60 | API° #/GAL. | # | # HR GAL HR |
| $H_2$ 2.016 | 45.48 | 45.69 | 45.87 | 45.680 | FRESH FEED | | 394.8 | 61 | 2289639 | | | OIL | 6'8" | 353.68 | 49 | 1.0054 | 355.59 | 52.0 | | |
| $CO_2$ 44.010 | 26.34 | 25.24 | 25.78 | 25.787 | 79.31 | 6.346 | 20.236 | 0.9990 | 1.5132 | 15396 | 40.569 | | 3'11-3/4 | 212.92 | 48 | 1.0059 | 214.18 | 6.420 | | |
| $N_2$ 28.016 | 1.66 | 2.07 | 1.95 | 1.893 | WET GAS | | 1.755 | 56 | 1401390 | | | | | | | | 141.41 | | 907.85 | 37.83 |
| $CH_4$ 16.042 | 7.66 | 7.22 | 7.08 | 7.320 | 158.44 | 7.992 | 4.056 | 1.0039 | 1.1838 | 6104 | 16.084 | | | | | | | | | 5.892 |
| $C_2H_4$ 28.052 | 1.89 | 1.84 | 1.79 | 1.840 | RECYCLE | | 395.0 | 76 | | | | | | | | | | | | |
| $C_2H_6$ 33.068 | 1.36 | 1.39 | 1.42 | 1.390 | 79.31 | 7.904 | 20.241 | 0.9850 | 1.1838 | 14795 | 38.986 | | | | | | | | | |
| $C_3H_6$ 42.078 | 2.31 | 2.27 | 2.12 | 2.233 | BLEED | | | | | | | | | | | | | | | |
| $C_3H_8$ 44.094 | 0.26 | 0.26 | 0.26 | 0.260 | 5.02 | 8.025 | 20.241 | 1.0000 | 1.1838 | 965 | 2.543 | WATER | 7'5-1/8 | 393.50 | 57 | 1.00025 | 393.60 | 11.1 | | |
| $C_4H_8$ 56.104 | 1.37 | 1.35 | 1.23 | 1.317 | NATURAL GAS | | 433.8 | 187 | 1447616 | | | | 5'7 1/8" | 299.12 | 57 | 1.00025 | 299.19 | 8.264 | | |
| $C_4H_{10}$ 58.120 | 0.36 | 0.42 | 0.33 | 0.370 | 28.43 | 7.517 | 21.178 | 0.8965 | 1.2032 | 4882 | 12.864 | | 5'9" | 305.66 | 55 | 1.00039 | 305.78 | | | |
| $C_5H_{10}$ 70.130 | 0.56 | 0.62 | 0.54 | 0.573 | OXYGEN | | 422.8 | 62 | | | | | 1'7-3/4 | 85.91 | 57 | 1.00025 | 85.93 | | | 108.21 |
| $C_5H_{12}$ 72.146 | 0.13 | 0.13 | 0.13 | 0.130 | 27.07 | 6.921 | 20.916 | 0.9981 | | 3911 | 10.306 | | | | | | 314.26 | | 2597.04 | 13.094 |
| $C_6H_{12}$ 84.156 | 0.14 | 0.22 | 0.21 | 0.190 | STEAM | | 21.8 | | | | | | | | | | | | | |
| | | | M. W. | 20.65806 | 215.7 | 5.438 | | | | | | | | | | | | | | |

## THE TEXAS COMPANY — MONTEBELLO LABORATORY

### RATE CALCULATIONS

RUN NO. 66-V
HOURS 440-464

| GAS ANALYSES | | | | | GENERATOR BALANCE | | | | | | | | | | WEIGHT BALANCE | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| HOUR | 1400 | 2200 | 0600 | AVERAGE | M/HR | C | H | O | | Mol % | M/Hr | C | H | O | | #/hr Measured | At Wt. Balance |
| FRESH FEED | | | | | | | | | $O_2$ 32.000 | 0.34 | 10.332<br>0.044 | | | 20.752 | WET GAS | 337.49 | 362.78 |
| CO 28.010 | 35.94 | 35.85 | 35.94 | 35.910 | 14.598 | 14.598 | | 14.598 | $CO_2$ 44.010 | 1.30 | 0.169 | 0.169 | | 0.338 | OIL | 39.56 | 39.56 |
| $H_2$ 2.016 | 60.88 | 60.71 | 60.70 | 60.763 | 24.700 | | 49.400 | | $N_2$ 28.016 | 1.83 | 0.238 | | | | WATER | 108.31 | 108.31 |
| $CO_2$ 44.010 | 2.17 | 2.24 | 2.35 | 2.253 | 0.916 | 0.916 | | 1.832 | $CH_4$ 16.042 | 83.40 | 10.836 | 10.836 | 43.344 | | TOTAL | 485.36 | 510.65 |
| $N_2$ 28.016 | 0.84 | 1.13 | 0.90 | 0.957 | 0.389 | | | | $C_2H_4$ 30.068 | 6.24 | 0.811 | 1.622 | 4.866 | | FRESH FEED | 510.65 | |
| $CH_4$ 16.042 | 0.17 | 0.07 | 0.11 | 0.117 | 0.048 | 0.048 | 0.192 | | $C_2H_6$ 44.094 | 4.93 | 0.641 | 1.923 | 5.128 | | WEIGHT BALANCE | 95.05 | |
| | | | M. W | 12.56180 | | | 6.428 | 4660 | $C_4H_{10}$ 58.120 | 1.41 | 0.183 | 0.732 | 1.830 | | | | |
| | | | $H_2O$ 18.016 | | | | 7.874 | 3.937 | $C_5H_{12}$ 72.146 | 0.55 | 0.071 | 0.355 | 0.852 | | WET GAS FACTOR | 1074935 | |
| | | | | | | 15.562 | 57.466 | 20.367 | MW | 19.83902 | | | | | INDICATED LOSS—S C F H | 467 | |
| | | | BALANCE | | | 99.52 | 102.58 | 96.57 | TOTAL | | | 15.637 | 56.020 | 21.090 | | 6701 | |

| WET GAS | | | | | GAS FLOW RATES | | | | | | | | | | LIQUID PRODUCT RATES | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO 28.010 | 10.86 | 11.61 | 11.34 | 11.270 | | $\sqrt{H}$ | PRESSURE | TEMP. | M. W. | S. C. F. H. | M/HR | HOUR | GAGE | GAL. | °F | FACTOR | GAL. AT 60 | API° #/GAL. | # | # HR GAL HR |
| $H_2$ 2.016 | 46.93 | 46.42 | 45.03 | 46.127 | FRESH FEED | | 396.2 | 62 | 2304606 | | | OIL | 7'4-5/8 | 391.32 | 50 | 1.0049 | 393.24 | 51.6 | | |
| $CO_2$ 44.010 | 25.00 | 25.41 | 25.90 | 25.437 | 79.31 | 6.333 | 20.271 | 0.9981 | 1.5181 | 15427 | 40.651 | | 6'8" | 353.68 | 49 | 1.0054 | 355.59 | 6.434 | | |
| $N_2$ 28.016 | 1.68 | 1.97 | 2.41 | 2.020 | WET GAS | | 1.74 | 58 | 1409123 | | | | 3'11 1/8" | 211.83 | 52 | 1.0039 | 212.66 | | | |
| $CH_4$ 16.042 | 7.45 | 6.92 | 6.87 | 7.080 | 158.44 | 8.158 | 4.055 | 1.0019 | 1.1871 | 6234 | 16.427 | | 1'11-3/4 | 104.04 | 52 | 1.0039 | 104.45 | | | |
| $C_2H_4$ 28.052 | 1.78 | 1.81 | 1.56 | 1.717 | RECYCLE | | 396.0 | 75 | | | | | | | | | +1.71 | | +11.00 | 39.56 |
| $C_2H_6$ 33.068 | 1.34 | 1.27 | 1.24 | 1.283 | 79.31 | 7.913 | 20.266 | 0.9859 | 1.1871 | 14885 | 39.223 | | | | | | 147.57 | | 949.47 | 6.149 |
| $C_3H_6$ 42.078 | 2.06 | 2.19 | 2.25 | 2.167 | BLEED | | | | | | | | | | | | | | | |
| $C_3H_8$ 44.094 | 0.23 | 0.26 | 0.21 | 0.233 | 5.02 | 8.029 | 20.266 | 1.0000 | 1.1871 | 970 | 2.556 | WATER | 7'8" | 406.05 | 56 | 1.00033 | 406.18 | 11.1 | | |
| $C_4H_8$ 56.104 | 1.33 | 1.03 | 1.17 | 1.177 | NATURAL GAS | | 434.9 | 195 | 1459245 | | | | 5'9" | 305.66 | 55 | 1.00039 | 305.78 | 8.264 | | |
| $C_4H_{10}$ 58.120 | 0.43 | 0.30 | 0.69 | 0.473 | 28.43 | 7.600 | 21.204 | 0.8910 | 1.2080 | 4931 | 12.993 | | 5'9" | 305.66 | 59 | 1.00009 | 305.69 | | | |
| $C_5H_{10}$ 70.130 | 0.58 | 0.54 | 0.60 | 0.573 | OXYGEN | | 423.5 | 59 | | | | | 1'9" | 91.50 | 55 | 1.00039 | 91.54 | | | 108.31 |
| $C_5H_{12}$ 72.146 | 0.19 | 0.10 | 0.47 | 0.253 | 27.07 | 6.913 | 20.933 | 1.0010 | | 3921 | 10.332 | | | | | | 314.55 | | 2599.44 | 13.106 |
| $C_6H_{12}$ 84.156 | 0.14 | 0.17 | 0.26 | 0.190 | STEAM | | 21.0 | | | | | | | | | | | | | |
| | | | M. W. | 20.544665 | 215.7 | 5.288 | | | | | | | | | | | | | | |

## THE TEXAS COMPANY — MONTEBELLO LABORATORY

### RATE CALCULATIONS

RUN NO. 66-W
HOURS 464-477

| | GAS ANALYSES | | | | GENERATOR BALANCE | | | | | | | | | | WEIGHT BALANCE | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| HOUR | 1400 | 1800 | | AVERAGE | M/HR | C | H | O | | Mol % | M/Hr | C | H | O | | #/hr Measured | At Wt. Balance |
| FRESH FEED | | | | | | | | | $O_2$ 32.000 | 0.32 | 10.377<br>0.042 | | | 20.838 | WET GAS | 336.25 | 376.28 |
| CO 28.010 | 35.99 | 36.53 | | 36.260 | 14.807 | 14.807 | | 14.807 | $CO_2$ 44.010 | 1.30 | 0.169 | 0.169 | | 0.338 | OIL | 38.41 | 38.41 |
| $H_2$ 2.016 | 60.69 | 60.28 | | 60.485 | 24.699 | | 49.398 | | $N_2$ 28.016 | 3.08 | 0.400 | | | | WATER | 101.55 | 101.55 |
| $CO_2$ 44.010 | 2.25 | 2.39 | | 2.320 | 0.947 | 0.947 | | 1.894 | $CH_4$ 16.042 | 82.28 | 10.685 | 10.685 | 42.740 | | TOTAL | 476.21 | 516.24 |
| $N_2$ 28.016 | 0.89 | 0.70 | | 0.795 | 0.325 | | | | $C_2H_6$ 30.068 | 6.07 | 0.788 | 1.576 | 4.728 | | FRESH FEED | 516.24 | |
| $CH_4$ 16.042 | 0.18 | 0.10 | | 0.140 | 0.057 | 0.057 | 0.228 | | $C_3H_8$ 44.094 | 4.91 | 0.638 | 1.914 | 5.104 | | WEIGHT BALANCE | 92.25 | |
| | | | M. W | 12.64202 | | | | 4475 | $C_4H_{10}$ 58.120 | 1.49 | 0.193 | 0.772 | 1.930 | | | | |
| | | | $H_2O$ 18.016 | | | | 7.339 | 3.670 | $C_5H_{12}$ 72.146 | 0.55 | 0.071 | 0.355 | 0.852 | | WET GAS FACTOR | 1119048 | |
| | | | | | | 15.811 | 56.965 | 20.371 | MW | 19.989714 | | | | | INDICATED LOSS—S C F H | 755 | |
| | | | BALANCE | | | 102.20 | 102.91 | 96.20 | TOTAL | | | 15.471 | 55.354 | 21.176 | | 7101 | |

| WET GAS | | | | | GAS FLOW RATES | | | | | | | | | | LIQUID PRODUCT RATES | | | | | Basis 13 hours |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO 28.010 | 11.46 | 11.82 | | 11.640 | | $\sqrt{h}$ | PRESSURE | TEMP. | M. W. | S. C. F. H. | M/HR | HOUR | GAGE | GAL. | °F | FACTOR | GAL. AT 60 | API° #/GAL | # | # HR GAL HR |
| $H_2$ 2.016 | 47.10 | 46.80 | | 46.950 | FRESH FEED | | 398.9 | 67 | 2289982 | | | OIL | 5'5¼" | 289.30 | 56 | 1.0020 | 289.88 | 50.7 | | |
| $CO_2$ 44.010 | 24.40 | 25.30 | | 24.850 | 79.31 | 6.392 | 20.337 | 0.9933 | 1.5133 | 15497 | 40.835 | | 3'1½" | 211.83 | 52 | 1.0039 | 212.66 | 6.466 | | 38.41 |
| $N_2$ 28.016 | 1.99 | 1.81 | | 1.900 | WET GAS | | 1.75 | 61 | 1439713 | | | | | | | | 77.22 | | 499.30 | 5.940 |
| $CH_4$ 16.042 | 7.15 | 6.76 | | 6.955 | 158.44 | 8.238 | 4.056 | 0.9990 | 1.1999 | 6346 | 16.722 | | | | | | | | | |
| $C_2H_6$ 28.052 | 1.79 | 1.78 | | 1.785 | RECYCLE | | 398.0 | 78 | | | | | | | | | | | | |
| $C_2H_6$ 30.068 | 1.26 | 1.24 | | 1.250 | 79.31 | 7.908 | 20.315 | 0.9831 | 1.1999 | 15030 | 39.605 | | | | | | | | | |
| $C_3H_6$ 42.078 | 2.15 | 2.05 | | 2.100 | BLEED | | | | | | | | | | | | | | | |
| $C_3H_8$ 44.094 | 0.25 | 0.22 | | 0.235 | 5.02 | 8.015 | 20.315 | 1.0000 | 1.1999 | 981 | 2.585 | WATER | 7'6" | 397.32 | 62 | 0.99982 | 397.25 | 11.1 | | |
| $C_4H_8$ 56.104 | 1.27 | 1.14 | | 1.205 | NATURAL GAS | | 437.8 | 195 | 1448244 | | | | 5'9" | 305.66 | 59 | 1.00009 | 305.69 | 8.264 | | |
| $C_4H_{10}$ 58.120 | 0.36 | 0.30 | | 0.330 | 28.43 | 7.600 | 21.272 | 0.8910 | 1.2034 | 4928 | 12.986 | | 1'6¼" | 79.27 | 64 | 0.99963 | 79.24 | | | |
| $C_5H_{10}$ 70.130 | 0.55 | 0.51 | | 0.530 | OXYGEN | | 426.0 | 66 | | | | | 0'2½" | 11.06 | 70 | 0.99896 | 11.05 | | | 101.55 |
| $C_5H_{12}$ 72.146 | 0.13 | 0.10 | | 0.115 | 27.07 | 6.969 | 20.993 | 0.9943 | | 3938 | 10.377 | | | | | | 159.75 | | 1320.17 | 12.288 |
| $C_6H_{12}$ 84.156 | 0.14 | 0.17 | | 0.155 | STEAM | | 21.3 | | | | | | | | | | | | | |
| | | | M. W. | 20.108171 | 215.7 | 5.462 | | | | | | | | | | | | | | |

## THE TEXAS COMPANY — MONTEBELLO LABORATORY

### RATE CALCULATIONS

RUN NO. 66-X
HOURS 477-500

| | GAS ANALYSES | | | | GENERATOR BALANCE | | | | | | | | | | WEIGHT BALANCE | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| HOUR | 1400 | 2200 | 0600 | AVERAGE | M/HR | C | H | O | | Mol % | M/Hr | C | H | O | | # hr Measured | At Wt. Balance |
| FRESH FEED | | | | | | | | | $O_2$ 32.000 | 0.29 | 9.855<br>0.037 | | | 19.784 | WET GAS | 315.92 | 349.83 |
| CO 28.010 | 36.39 | 36.41 | 36.47 | 36.423 | 14.022 | 14.022 | | 14.022 | $CO_2$ 44.010 | 1.40 | 0.177 | 0.177 | | 0.354 | OIL | 39.74 | 39.74 |
| $H_2$ 2.016 | 60.17 | 60.13 | 60.11 | 60.137 | 23.151 | | 46.302 | | $N_2$ 28.016 | 2.06 | 0.261 | | | | WATER | 99.96 | 99.96 |
| $CO_2$ 44.010 | 2.18 | 2.27 | 2.38 | 2.277 | 0.877 | 0.877 | | 1.754 | $CH_4$ 16.042 | 82.57 | 10.453 | 10.453 | 41.812 | | TOTAL | 455.62 | 489.53 |
| $N_2$ 28.016 | 0.99 | 0.99 | 0.84 | 0.940 | 0.362 | | | | $C_2H_6$ 30.068 | 6.37 | 0.807 | 1.614 | 4.842 | | FRESH FEED | 489.53 | |
| $CH_4$ 16.042 | 0.27 | 0.20 | 0.20 | 0.223 | 0.086 | 0.086 | 0.344 | | $C_3H_8$ 44.094 | 5.23 | 0.662 | 1.986 | 5.296 | | WEIGHT BALANCE | 93.07 | |
| | | | M. W | 12.71568 | | | 8.084 | 4.362 | $C_4H_{10}$ 58.120 | 1.53 | 0.194 | 0.776 | 1.940 | | | | |
| | | | $H_2O$ 18.016 | | | | 8.404 | 4.202 | $C_5H_{12}$ 72.146 | 0.55 | 0.070 | 0.350 | 0.840 | | WET GAS FACTOR | 1107337 | |
| | | | | | | 14.985 | 55.050 | 19.978 | MW | 20.039436 | | | | | INDICATED LOSS—S C F H | 660 | |
| | | | BALANCE | | | 97.58 | 100.58 | 99.21 | TOTAL | | | 15.356 | 54.730 | 20.138 | | 6813 | |

| WET GAS | | | | | GAS FLOW RATES | | | | | | | | | | LIQUID PRODUCT RATES | | | | | Basis 22 hours |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO 28.010 | 13.06 | 12.99 | 13.57 | 13.207 | | $\sqrt{h}$ | PRESSURE | TEMP. | M. W. | S. C. F. H. | M/HR | HOUR | GAGE | GAL. | °F | FACTOR | GAL. AT 60 | API° #/GAL | # | # HR GAL HR |
| $H_2$ 2.016 | 47.78 | 48.15 | 48.77 | 48.233 | FRESH FEED | | 401.6 | 69 | 2276716 | | | OIL | 7'1½" | 377.68 | 57 | 1.0015 | 378.25 | 52.0 | | |
| $CO_2$ 44.010 | 23.70 | 23.58 | 22.53 | 23.270 | 79.31 | 6.035 | 20.403 | 0.9915 | 1.5089 | 14610 | 38.498 | | 5'7¼" | 298.03 | 54 | 1.0030 | 298.92 | 6.420 | | |
| $N_2$ 28.016 | 1.76 | 1.78 | 1.96 | 1.833 | WET GAS | | 1.72 | 55 | 1485711 | | | | 2'8½" | 143.87 | 42 | 1.0089 | 145.15 | | | |
| $CH_4$ 16.042 | 6.64 | 6.37 | 6.37 | 6.460 | 158.44 | 7.825 | 4.052 | 1.0048 | 1.2189 | 6153 | 16.213 | | 1'8¼" | 88.12 | 56 | 1.0020 | 88.30 | | | 39.74 |
| $C_2H_6$ 28.052 | 1.62 | 1.64 | 1.64 | 1.633 | RECYCLE | | 402.3 | 77 | | | | | | | | | 136.18 | | 874.28 | 6.190 |
| $C_2H_6$ 30.068 | 1.12 | 1.13 | 1.11 | 1.120 | 79.31 | 7.892 | 20.421 | 0.9840 | 1.2189 | 15330 | 40.395 | | | | | | | | | |
| $C_3H_6$ 42.078 | 1.93 | 1.75 | 1.97 | 1.883 | BLEED | | | | | | | | | | | | | | | |
| $C_3H_8$ 44.094 | 0.20 | 0.20 | 0.14 | 0.180 | 5.02 | 8.117 | 20.421 | 1.0000 | 1.2189 | 1014 | 2.672 | WATER | 7'0" | 371.14 | 53 | 1.00052 | 371.33 | 11.1 | | |
| $C_4H_8$ 56.104 | 1.13 | 1.13 | 1.06 | 1.107 | NATURAL GAS | | 415.6 | 195 | 1444651 | | | | 2'0" | 105.19 | 55 | 1.00039 | 105.23 | 8.264 | | 99.96 |
| $C_4H_{10}$ 58.120 | 0.34 | 0.42 | 0.26 | 0.340 | 28.43 | 7.608 | 20.744 | 0.8910 | 1.2019 | 4805 | 12.661 | | | | | | 266.10 | | 2199.05 | 12.095 |
| $C_5H_{10}$ 70.130 | 0.49 | 0.54 | 0.43 | 0.487 | OXYGEN | | 423.6 | 60 | | | | | | | | | | | | |
| $C_5H_{12}$ 72.146 | 0.10 | 0.13 | 0.06 | 0.097 | 27.07 | 6.600 | 20.936 | 1.0000 | | 3740 | 9.855 | | | | | | | | | |
| $C_6H_{12}$ 84.156 | 0.13 | 0.19 | 0.13 | 0.150 | STEAM | | 22.8 | | | | | | | | | | | | | |
| | | | M. W. | 19.485608 | 215.7 | 5.071 | | | | | | | | | | | | | | |

## THE TEXAS COMPANY — MONTEBELLO LABORATORY

### RATE CALCULATIONS

RUN NO. 66-Y
HOURS 500-523

| GAS ANALYSES | | | | |
|---|---|---|---|---|
| HOUR | 1400 | 2200 | 0600 | AVERAGE |
| FRESH FEED | | | | |
| $CO_{28.010}$ | 35.94 | 36.03 | 36.25 | 36.074 |
| $H_{2.016}$ | 60.40 | 60.61 | 60.39 | 60.467 |
| $CO_{2.44.010}$ | 2.03 | 2.14 | 2.29 | 2.153 |
| $N_{2.28.016}$ | 0.83 | 1.04 | 0.81 | 0.893 |
| $CH_{4.16.042}$ | 0.80 | 0.18 | 0.26 | 0.413 |
| | | | M. W | 12.58731 |
| | | | $H_2O$ 18.016 | |
| | | | BALANCE | |
| WET GAS | | | | |
| $CO_{28.010}$ | 11.98 | 12.52 | 13.73 | 12.743 |
| $H_{2.016}$ | 44.43 | 43.14 | 46.63 | 44.733 |
| $CO_{2.44.010}$ | 23.80 | 25.79 | 22.55 | 24.047 |
| $N_{2.28.016}$ | 1.88 | 2.05 | 2.03 | 1.987 |
| $CH_{4.16.042}$ | 9.02 | 7.08 | 7.06 | 7.720 |
| $C_2H_{4.28.052}$ | 2.14 | 2.03 | 2.00 | 2.057 |
| $C_2H_{6.30.068}$ | 1.28 | 1.17 | 1.12 | 1.190 |
| $C_3H_{6.42.078}$ | 2.44 | 2.33 | 2.33 | 2.367 |
| $C_3H_{8.44.094}$ | 0.28 | 0.24 | 0.23 | 0.250 |
| $C_4H_{8.56.104}$ | 1.42 | 1.68 | 1.35 | 1.483 |
| $C_4H_{10.58.120}$ | 0.38 | 0.61 | 0.28 | 0.423 |
| $C_5H_{10.70.130}$ | 0.61 | 0.82 | 0.53 | 0.653 |
| $C_5H_{12.72.146}$ | 0.13 | 0.23 | 0.06 | 0.140 |
| $C_6H_{12.84.156}$ | 0.21 | 0.31 | 0.10 | 0.207 |
| | | | M. W. | 20.70142 |

| GENERATOR BALANCE | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| M/HR | C | H | O | | Mol % | M/Hr | C | H | O |
| | | | | $O_{2.32.000}$ | 0.32 | 9.794<br>0.041 | | | 19.670 |
| 14.108 | 14.108 | | 14.108 | $CO_{2.44.010}$ | 1.55 | 0.197 | 0.197 | | 0.394 |
| 23.648 | | 47.296 | | $N_{2.28.016}$ | 1.22 | 0.155 | | | |
| 0.842 | 0.842 | | 1.684 | $CH_{4.16.042}$ | 82.88 | 10.537 | 10.537 | 42.148 | |
| 0.349 | | | | $C_2H_{6.30.068}$ | 6.46 | 0.821 | 1.642 | 4.926 | |
| 0.162 | 0.162 | 0.648 | | $C_2H_{8.44.094}$ | 5.40 | 0.687 | 2.061 | 5.496 | |
| | | | 4.272 | $C_4H_{10.58.120}$ | 1.55 | 0.197 | 0.788 | 1.970 | |
| | | 8.044 | 4.022 | $C_5H_{12.72.146}$ | 0.62 | 0.079 | 0.395 | 0.948 | |
| | 15.112 | 55.988 | 19.814 | MW | 20.09359 | | | | |
| | 96.75 | 100.90 | 98.75 | TOTAL | | | 15.620 | 55.488 | 20.064 |

| WEIGHT BALANCE | # /hr Measured | At Wt Balance |
|---|---|---|
| WET GAS | 281.97 | 315.68 |
| OIL | 53.57 | 53.57 |
| WATER | 123.03 | 123.03 |
| TOTAL | 458.57 | 492.28 |
| FRESH FEED | 492.28 | |
| WEIGHT BALANCE | 93.15 | |
| WET GAS FACTOR | 1119551 | |
| INDICATED LOSS—S C F H | 618 | |
| | 5787 | |

| GAS FLOW RATES | | | | | | | |
|---|---|---|---|---|---|---|---|
| | $\sqrt{H}$ | PRESSURE | TEMP. | M. W. | S. C. F. H. | M/HR | |
| FRESH FEED | | 402.6 | 71 | 2299935 | | | |
| 79.31 | 6.104 | 20.428 | 0.9896 | 1.5166 | 14842 | 39.109 | |
| WET GAS | | 1.625 | 59 | 1398454 | | | |
| 158.44 | 6.821 | 4.040 | 1.0010 | 1.1826 | 5169 | 13.621 | |
| RECYCLE | | 402.8 | 73 | | | | |
| 158.44 | 7.896 | 20.433 | 0.9877 | 1.1826 | 29858 | 78.677 | |
| BLEED | | | | | | | |
| 5.02 | 7.964 | 20.433 | 1.0000 | 1.1826 | 966 | 2.545 | |
| NATURAL GAS | | 418.8 | 192 | 1440757 | | | |
| 28.43 | 7.604 | 20.821 | 0.8931 | 1.2003 | 4825 | 12.714 | |
| OXYGEN | | 426.8 | 60 | | | | |
| 27.07 | 6.535 | 21.012 | 1.0000 | | 3717 | 9.794 | |
| STEAM | | 21.6 | | | | | |
| 215.7 | 4.591 | | | | | | |

| HOUR | GAGE | GAL. |
|---|---|---|
| OIL | 6'4" | 336.22 |
| | 2'9½" | 149.62 |
| | | |
| | | |
| | | |
| | | |
| WATER | 6'11" | 366.77 |
| | 0'5-¾ | 25.45 |
| | | |
| | | |
| | | |
| | | |
| | | |

| LIQUID PRODUCT RATES | | | | | |
|---|---|---|---|---|---|
| °F | FACTOR | GAL. AT 60 | API° # GAL | # | # HR GAL HR |
| 46 | 1.0079 | 338.88 | 50.6 | | |
| 42 | 1.0089 | 150.95 | 6.469 | | |
| | | +2.55 | | +16.50 | 53.57 |
| | | 190.48 | | 1232.22 | 8.282 |
| | | | | | |
| | | | | | |
| 58 | 1.00018 | 366.84 | 10.7 | | |
| 44 | 1.00104 | 25.48 | 8.287 | | 123.03 |
| | | 341.46 | | 2829.68 | 14.842 |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

## THE TEXAS COMPANY — MONTEBELLO LABORATORY

### RATE CALCULATIONS

RUN NO. 66-Z
HOURS 523-547

| GAS ANALYSES | | | | |
|---|---|---|---|---|
| HOUR | 1400 | 2200 | 0600 | AVERAGE |
| FRESH FEED | | | | |
| $CO_{28.010}$ | 36.40 | 36.62 | 37.04 | 36.686 |
| $H_{2.016}$ | 59.69 | 60.00 | 59.26 | 59.650 |
| $CO_{2.44.010}$ | 2.11 | 2.24 | 2.36 | 2.237 |
| $N_{2.28.016}$ | 0.79 | 0.83 | 0.87 | 0.830 |
| $CH_{4.16.042}$ | 1.01 | 0.31 | 0.47 | 0.597 |
| | | | M. W | 12.7911 |
| | | | $H_2O$ 18.016 | |
| | | | BALANCE | |
| WET GAS | | | | |
| $CO_{28.010}$ | 14.21 | 13.74 | 13.83 | 13.927 |
| $H_{2.016}$ | 43.05 | 43.71 | 45.06 | 43.940 |
| $CO_{2.44.010}$ | 24.26 | 24.39 | 24.38 | 24.344 |
| $N_{2.28.016}$ | 1.87 | 2.09 | 2.00 | 1.987 |
| $CH_{4.16.042}$ | 7.93 | 6.82 | 6.76 | 7.170 |
| $C_2H_{4.28.052}$ | 1.80 | 1.89 | 1.87 | 1.853 |
| $C_2H_{6.30.068}$ | 1.07 | 1.11 | 1.04 | 1.073 |
| $C_3H_{6.42.078}$ | 2.35 | 2.67 | 2.18 | 2.400 |
| $C_3H_{8.44.094}$ | 0.19 | 0.23 | 0.20 | 0.207 |
| $C_4H_{8.56.104}$ | 1.67 | 1.75 | 1.42 | 1.613 |
| $C_4H_{10.58.120}$ | 0.54 | 0.55 | 0.35 | 0.480 |
| $C_5H_{10.70.130}$ | 0.70 | 0.61 | 0.61 | 0.640 |
| $C_5H_{12.72.146}$ | 0.19 | 0.23 | 0.13 | 0.183 |
| $C_6H_{12.84.156}$ | 0.17 | 0.21 | 0.17 | 0.183 |
| | | | M. W. | 21.069845 |

| GENERATOR BALANCE | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| M/HR | C | H | O | | Mol % | M/Hr | C | H | O |
| | | | | $O_{2.32.000}$ | 0.41 | 9.597<br>0.052 | | | 19.298 |
| 14.311 | 14.311 | | 14.311 | $CO_{2.44.010}$ | 1.47 | 0.187 | 0.187 | | 0.374 |
| 23.268 | | 46.536 | | $N_{2.28.016}$ | 2.19 | 0.279 | | | |
| 0.873 | 0.873 | | 1.746 | $CH_{4.16.042}$ | 82.43 | 10.488 | 10.488 | 41.952 | |
| 0.324 | | | | $C_2H_{6.30.068}$ | 6.48 | 0.825 | 1.650 | 4.950 | |
| 0.233 | 0.233 | 0.932 | | $C_3H_{8.44.094}$ | 4.73 | 0.602 | 1.806 | 4.816 | |
| | | | 3.615 | $C_4H_{10.58.120}$ | 1.71 | 0.218 | 0.872 | 2.180 | |
| | | 7.274 | 3.637 | $C_5H_{12.72.146}$ | 0.58 | 0.074 | 0.370 | 0.888 | |
| | 15.417 | 54.742 | 19.694 | MW | 20.06147 | | | | |
| | 100.29 | 99.92 | 100.11 | TOTAL | | | 15.373 | 54.786 | 19.672 |

| WEIGHT BALANCE | # hr Measured | At Wt Balance |
|---|---|---|
| WET GAS | 293.21 | 327.43 |
| OIL | 51.80 | 51.80 |
| WATER | 119.74 | 119.74 |
| TOTAL | 464.75 | 498.97 |
| FRESH FEED | 498.97 | |
| WEIGHT BALANCE | 93.14 | |
| | | |
| WET GAS FACTOR | 1116708 | |
| INDICATED LOSS—S C F H | 616 | |
| | 5897 | |

| GAS FLOW RATES | | | | | | | |
|---|---|---|---|---|---|---|---|
| | $\sqrt{H}$ | PRESSURE | TEMP. | M. W. | S. C. F. H. | M/HR | |
| FRESH FEED | | 402 | 63 | 2263292 | | | |
| 79.31 | 6.096 | 20.413 | 0.9971 | 1.5044 | 14804 | 39.009 | |
| WET GAS | | 1.70 | 58 | 1374001 | | | |
| 158.44 | 7.008 | 4.050 | 1.0019 | 1.1722 | 5281 | 13.916 | |
| RECYCLE | | 402 | | | | | |
| 158.44 | 7.929 | 20.413 | 0.9896 | 1.1722 | 29748 | 78.387 | |
| BLEED | | | | | | | |
| 5.02 | 7.913 | 20.413 | 1.0000 | 1.1722 | 951 | 2.506 | |
| NATURAL GAS | | 416 | 187 | 1443064 | | | |
| 28.43 | 7.600 | 20.753 | 0.8965 | 1.2013 | 4829 | 12.725 | |
| OXYGEN | | 423 | 57 | | | | |
| 27.07 | 6.413 | 20.921 | 1.0029 | | 3642 | 9.597 | |
| STEAM | | 17.3 | | | | | |
| 215.7 | 4.558 | | | | | | |

| HOUR | GAGE | GAL. |
|---|---|---|
| OIL | 7'2½" | 382.05 |
| | 6'4" | 336.22 |
| | 3'7½" | 194.37 |
| | 0'11¼" | 48.74 |
| | | |
| | | |
| WATER | 7'3" | 384.23 |
| | 6'11" | 366.77 |
| | 7'3" | 384.23 |
| | 1'0-¾ | 55.23 |
| | | |
| | | |
| | | |
| | | |

| LIQUID PRODUCT RATES | | | | | |
|---|---|---|---|---|---|
| °F | FACTOR | GAL. AT 60 | API° # GAL | # | # HR GAL HR |
| 46 | 1.0069 | 384.69 | 53.5 | | |
| 46 | 1.0069 | 338.54 | 6.368 | | |
| 50 | 1.0049 | 195.32 | | | |
| 52 | 1.0039 | 48.93 | | | |
| | | +2.67 | | +17.00 | 51.80 |
| | | 195.21 | | 1243.10 | 8.134 |
| | | | | | |
| 57 | 1.00025 | 384.33 | 10.6 | | |
| 58 | 1.00018 | 366.84 | 8.293 | | |
| 57 | 1.00025 | 384.33 | | | |
| 44 | 1.00104 | 55.29 | | | 119.74 |
| | | 346.53 | | 2873.77 | 14.439 |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

## THE TEXAS COMPANY — MONTEBELLO LABORATORY

### RATE CALCULATIONS

RUN NO. 66-AA
HOURS 547-571

| | GAS ANALYSES | | | | GENERATOR BALANCE | | | | | | | | | | WEIGHT BALANCE | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| HOUR | 1400 | 2200 | 0600 | AVERAGE | M/HR | C | H | O | | Mol % | M/Hr | C | H | O | | #/hr Measured | At Wt. Balance |
| FRESH FEED | | | | | | | | | $O_2$ 32.000 | 0.36 | 9.866<br>0.046 | | | 19.824 | WET GAS | 306.61 | 347.64 |
| CO 28.010 | 36.24 | 36.23 | 36.13 | 36.200 | 14.522 | 14.522 | | 14.522 | $CO_2$ 44.010 | 1.29 | 0.164 | 0.164 | | 0.328 | OIL | 47.09 | 47.09 |
| $H_2$ 2.016 | 60.43 | 60.68 | 60.66 | 60.590 | 24.306 | | 48.612 | | $N_2$ 28.016 | 1.72 | 0.219 | | | | WATER | 109.81 | 109.81 |
| $CO_2$ 44.010 | 2.24 | 2.15 | 2.25 | 2.214 | 0.888 | 0.888 | | 1.776 | $CH_4$ 16.042 | 82.39 | 10.491 | 10.491 | 41.964 | | TOTAL | 463.51 | 504.54 |
| $N_2$ 28.016 | 0.74 | 0.60 | 0.71 | 0.683 | 0.274 | | | | $C_2H_4$ 30.068 | 6.73 | 0.857 | 1.714 | 5.142 | | FRESH FEED | 504.54 | |
| $CH_4$ 16.042 | 0.35 | 0.34 | 0.25 | 0.313 | 0.126 | 0.126 | 0.504 | | $C_2H_6$ 44.094 | 5.35 | 0.681 | 2.043 | 5.448 | | WEIGHT BALANCE | 91.87 | |
| | | | M. W | 12.57706 | | | | 3.854 | $C_4H_{10}$ 58.120 | 1.56 | 0.199 | 0.796 | 1.990 | | | | |
| | | | $H_2O$ 18.016 | | | | 7.024 | 3.512 | $C_5H_{12}$ 72.146 | 0.60 | 0.076 | 0.380 | 0.912 | | WET GAS FACTOR | 1133818 | |
| | | | | | | 15.536 | 56.140 | 19.810 | MW | 20.10396 | | | | | INDICATED LOSS—S C F H | 774 | |
| | | | BALANCE | | | 99.67 | 101.23 | 98.30 | TOTAL | | | 15.588 | 55.456 | 20.152 | | 6555 | |

| WET GAS | | | | | GAS FLOW RATES | | | | | | | | | | LIQUID PRODUCT RATES | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO 28.010 | 13.71 | 13.79 | 13.66 | 13.720 | | $\sqrt{h}$ | PRESSURE | TEMP. | M. W. | S. C. F. H. | M/HR | HOUR | GAGE | GAL. | °F | FACTOR | GAL. AT 60 | API° #/GAL. | # | #/HR GAL HR |
| $H_2$ 2.016 | 45.21 | 47.62 | 47.86 | 46.896 | FRESH FEED | | 402.5 | 59 | 2301809 | | | OIL | 6'11" | 366.77 | 55 | 1.0025 | 367.69 | 49.8 | | |
| $CO_2$ 44.010 | 24.48 | 23.83 | 23.60 | 23.970 | 79.31 | 6.188 | 20.425 | 1.0010 | 1.5172 | 15224 | 40.116 | | 3'7½" | 194.37 | 50 | 1.0049 | 195.32 | 6.498 | | |
| $N_2$ 28.016 | 1.68 | 1.67 | 1.33 | 1.560 | WET GAS | | 1.74 | 63 | 1438280 | | | | | | | | +1.54 | | +10.00 | 47.09 |
| $CH_4$ 16.042 | 6.36 | 6.14 | 6.18 | 6.227 | 158.44 | 7.525 | 4.055 | 0.9971 | 1.1993 | 5781 | 15.233 | | | | | | 173.91 | | 1130.07 | 7.246 |
| $C_2H_4$ 28.052 | 1.90 | 1.77 | 1.76 | 1.810 | RECYCLE | | 402.8 | 75 | | | | | | | | | | | | |
| $C_2H_6$ 33.068 | 1.13 | 0.97 | 1.00 | 1.033 | 158.44 | 7.917 | 20.433 | 0.9859 | 1.1993 | 30305 | 79.855 | | | | | | | | | |
| $C_3H_6$ 42.078 | 2.30 | 1.74 | 1.94 | 1.993 | BLEED | | | | | | | | | | | | | | | |
| $C_3H_8$ 44.094 | 0.25 | 0.20 | 0.23 | 0.227 | 5.02 | 7.904 | 20.433 | 1.0000 | 1.1993 | 972 | 2.561 | WATER | 7'6¼" | 398.41 | 57 | 1.00025 | 398.51 | 10.7 | | |
| $C_4H_8$ 56.104 | 1.58 | 1.14 | 1.27 | 1.330 | NATURAL GAS | | 417.5 | 187 | 1440014 | | | | 7'3" | 384.23 | 57 | 1.00025 | 384.33 | 8.287 | | |
| $C_4H_{10}$ 58.120 | 0.41 | 0.30 | 0.30 | 0.337 | 28.43 | 7.600 | 20.789 | 0.8965 | 1.2000 | 4832 | 12.733 | | 6'10-3/4 | 365.68 | 62 | 0.99982 | 365.61 | | | |
| $C_5H_{10}$ 70.130 | 0.62 | 0.53 | 0.57 | 0.597 | OXYGEN | | 425.0 | 62 | | | | | 1'2½" | 61.74 | 52 | 1.00059 | 61.78 | | | 109.81 |
| $C_5H_{12}$ 72.146 | 0.13 | 0.13 | 0.13 | 0.130 | 27.07 | 6.608 | 20.969 | 0.9981 | | 3744 | 9.866 | | | | | | 318.01 | | 2635.35 | 13.250 |
| $C_6H_{12}$ 84.156 | 0.17 | 0.17 | 0.17 | 0.170 | STEAM | | 16.2 | | | | | | | | | | | | | |
| | | | M. W. | 20.1282 | 08 215.7 | 4.133 | | | | | | | | | | | | | | |

## THE TEXAS COMPANY — MONTEBELLO LABORATORY

### RATE CALCULATIONS

RUN NO. 66-BB
HOURS 571-595

| | GAS ANALYSES | | | | GENERATOR BALANCE | | | | | | | | | | WEIGHT BALANCE | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| HOUR | 1400 | 2200 | 0600 | AVERAGE | M/HR | C | H | O | | Mol % | M/Hr | C | H | O | | #/hr Measured | At Wt. Balance |
| FRESH FEED | | | | | | | | | $O_2$ 32.000 | 0.35 | 9.887<br>0.045 | | | 19.864 | WET GAS | 315.56 | 355.49 |
| CO 28.010 | 36.86 | 36.87 | 35.11 | 36.280 | 14.444 | 14.444 | | 14.444 | $CO_2$ 44.010 | 1.44 | 0.184 | 0.184 | | 0.368 | OIL | 43.51 | 43.51 |
| $H_2$ 2.016 | 59.88 | 60.01 | 61.90 | 60.596 | 24.125 | | 48.250 | | $N_2$ 28.016 | 1.18 | 0.151 | | | | WATER | 101.43 | 101.43 |
| $CO_2$ 44.010 | 1.97 | 2.30 | 2.23 | 2.167 | 0.863 | 0.863 | | 1.726 | $CH_4$ 16.042 | 83.46 | 10.688 | 10.688 | 42.752 | | TOTAL | 460.50 | 500.43 |
| $N_2$ 28.016 | 0.62 | 0.68 | 0.67 | 0.657 | 0.262 | | | | $C_2H_4$ 30.068 | 6.66 | 0.853 | 1.706 | 5.118 | | FRESH FEED | 500.43 | |
| $CH_4$ 16.042 | 0.67 | 0.14 | 0.09 | 0.300 | 0.119 | 0.119 | 0.476 | | $C_2H_6$ 44.094 | 4.98 | 0.638 | 1.914 | 5.104 | | WEIGHT BALANCE | 92.02 | |
| | | | M. W | 12.56953 | | | 6.848 | | $C_4H_{10}$ 58.120 | 1.42 | 0.182 | 0.728 | 1.820 | | | | |
| | | | $H_2O$ 18.016 | | | | 7.486 | 3.743 | $C_5H_{12}$ 72.146 | 0.51 | 0.065 | 0.325 | 0.780 | | WET GAS FACTOR | 1126536 | |
| | | | | | | 15.426 | 56.212 | 19.913 | MW | 19.85664 | | | | | INDICATED LOSS—S C F H | 781 | |
| | | | BALANCE | | | 99.23 | 101.15 | 98.42 | TOTAL | | | 15.545 | 55.574 | 20.232 | | 6956 | |

| WET GAS | | | | | GAS FLOW RATES | | | | | | | | | | LIQUID PRODUCT RATES | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO 28.010 | 16.06 | 16.83 | 10.93 | 16.607 | | $\sqrt{h}$ | PRESSURE | TEMP. | M. W. | S. C. F. H. | M/HR | HOUR | GAGE | GAL. | °F | FACTOR | GAL. AT 60 | API° #/GAL. | # | #/HR GAL HR |
| $H_2$ 2.016 | 48.07 | 47.55 | 49.01 | 48.210 | FRESH FEED | | 404.9 | 63 | 2303188 | | | OIL | 7'1" | 375.50 | 56 | 1.0020 | 376.25 | 49.1 | | |
| $CO_2$ 44.010 | 21.18 | 21.79 | 21.06 | 21.343 | 79.31 | 6.146 | 20.484 | 0.9971 | 1.5176 | 15109 | 39.813 | | 6'11" | 366.77 | 55 | 1.0025 | 367.69 | 6.523 | | |
| $N_2$ 28.016 | 1.41 | 1.62 | 1.84 | 1.623 | WET GAS | | 1.77 | 63 | 1492729 | | | | 4'2½" | 224.92 | 48 | 1.0059 | 226.25 | | | |
| $CH_4$ 16.042 | 6.46 | 4.86 | 4.95 | 5.423 | 158.44 | 7.883 | 4.058 | 0.9971 | 1.2218 | 6175 | 16.271 | | 1'5½" | 75.97 | 52 | 1.0039 | 76.27 | | | |
| $C_2H_4$ 28.052 | 1.72 | 1.62 | 1.42 | 1.587 | RECYCLE | | 405.4 | 73 | | | | | | | | | +1.53 | | +10.00 | 43.51 |
| $C_2H_6$ 33.068 | 1.01 | 0.82 | 0.80 | 0.877 | 158.44 | 7.904 | 20.496 | 0.9877 | 1.2218 | 30,975 | 81.621 | | | | | | 160.07 | | 1044.14 | 6.670 |
| $C_3H_6$ 42.078 | 1.81 | 1.58 | 1.61 | 1.667 | BLEED | | | | | | | | | | | | | | | |
| $C_3H_8$ 44.094 | 0.17 | 0.16 | 0.13 | 0.153 | 5.02 | 7.796 | 20.496 | 1.0000 | 1.2218 | 980 | 2.582 | WATER | 7'2¼" | 380.96 | 61 | 0.99992 | 380.93 | 10.9 | | |
| $C_4H_8$ 56.104 | 1.10 | 1.35 | 1.06 | 1.170 | NATURAL GAS | | 420.6 | 193 | 1457950 | | | | 6'10-¾ | 365.68 | 62 | 0.99982 | 365.61 | 8.276 | | |
| $C_4H_{10}$ 58.120 | 0.26 | 0.52 | 0.54 | 0.440 | 28.43 | 7.604 | 20.864 | 0.8924 | 1.2075 | 4860 | 12.806 | | 6'4" | 336.22 | 59 | 1.00009 | 336.25 | | | |
| $C_5H_{10}$ 70.130 | 0.48 | 0.75 | 0.46 | 0.563 | OXYGEN | | 427.2 | 61 | | | | | 1'1¼" | 57.39 | 54 | 1.00047 | 57.42 | | | 101.43 |
| $C_5H_{12}$ 72.146 | 0.10 | 0.23 | 0.06 | 0.130 | 27.07 | 6.600 | 21.021 | 0.9990 | | 3752 | 9.887 | | | | | | 294.15 | | 2434.39 | 12.256 |
| $C_6H_{12}$ 84.156 | 0.17 | 0.32 | 0.13 | 0.207 | STEAM | | 14.8 | | | | | | | | | | | | | |
| | | | M. W. | 19.3940 | 01 215.7 | 3.950 | | | | | | | | | | | | | | |

THE TEXAS COMPANY — MONTEBELLO LABORATORY

**RATE CALCULATIONS**

RUN NO. 66-CC
HOURS 595-619

| | GAS ANALYSES | | | |
|---|---|---|---|---|
| HOUR | 1400 | 2200 | 0600 | AVERAGE |
| FRESH FEED | | | | |
| CO 28.010 | 36.08 | 36.48 | 36.52 | 36.360 |
| $H_2$ 2.016 | 60.29 | 60.17 | 60.48 | 60.313 |
| $CO_2$ 44.010 | 2.22 | 2.48 | 2.43 | 2.377 |
| $N_2$ 28.016 | 0.71 | 0.74 | 0.43 | 0.627 |
| $CH_4$ 16.042 | 0.70 | 0.13 | 0.14 | 0.323 |
| | | | M. W | 12.67394 |
| | | | $H_2O$ 18.016 | |
| | | | | |
| | | | BALANCE | |
| WET GAS | | | | |
| CO 28.010 | 15.65 | 17.23 | 18.14 | 17.007 |
| $H_2$ 2.016 | 49.42 | 48.78 | 50.53 | 49.576 |
| $CO_2$ 44.010 | 20.71 | 20.92 | 19.62 | 20.417 |
| $N_2$ 28.016 | 1.56 | 1.61 | 1.49 | 1.553 |
| $CH_4$ 16.042 | 6.35 | 5.07 | 4.30 | 5.240 |
| $C_2H_4$ 28.052 | 1.57 | 1.57 | 1.43 | 1.523 |
| $C_2H_6$ 30.068 | 0.80 | 0.81 | 0.71 | 0.773 |
| $C_3H_6$ 42.078 | 1.65 | 1.71 | 1.55 | 1.637 |
| $C_3H_8$ 44.094 | 0.20 | 0.20 | 0.14 | 0.180 |
| $C_4H_8$ 56.104 | 0.99 | 1.07 | 1.04 | 1.033 |
| $C_4H_{10}$ 58.120 | 0.36 | 0.32 | 0.30 | 0.327 |
| $C_5H_{10}$ 70.130 | 0.47 | 0.48 | 0.48 | 0.477 |
| $C_5H_{12}$ 72.146 | 0.10 | 0.10 | 0.10 | 0.100 |
| $C_6H_{12}$ 84.156 | 0.17 | 0.13 | 0.17 | 0.157 |
| | | | M. W. | 18.760565 |

| GENERATOR BALANCE | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| M/HR | C | H | O | | Mol % | M/Hr | C | H | O |
| | | | | $O_2$ 32.000 | 0.36 | 9.887<br>0.047 | | | 19.868 |
| 14.461 | 14.461 | | 14.461 | $CO_2$ 44.010 | 1.52 | 0.198 | 0.198 | | 0.396 |
| 23.989 | | 47;978 | | $N_2$ 28.016 | 2.55 | 0.331 | | | |
| 0.945 | 0.945 | | 1.890 | $CH_4$ 16.042 | 82.84 | 10.766 | 10.766 | 43.064 | |
| 0.249 | | | | $C_2H_6$ 30.068 | 6.10 | 0.793 | 1.586 | 4.758 | |
| 0.129 | 0.129 | 0.516 | | $C_3H_8$ 44.094 | 4.75 | 0.617 | 1.851 | 4.936 | |
| | | | | $C_4H_{10}$ 58.120 | 1.45 | 0.188 | 0.752 | 1.880 | |
| | | 7.321 | 3.661 | $C_5H_{12}$ 72.146 | 0.43 | 0.056 | 0.280 | 0.672 | |
| | 15.535 | 55.815 | 20.012 | MW | 19.869334 | | | | |
| | 100.66 | 100.91 | 98.76 | TOTAL | | | 15.433 | 55.310 | 20.264 |

| WEIGHT BALANCE | | |
|---|---|---|
| | #/hr Measured | At Wt. Balance |
| WET GAS | 334.09 | 371.88 |
| OIL | 38.41 | 38.41 |
| WATER | 93.79 | 93.79 |
| TOTAL | 466.29 | 504.08 |
| FRESH FEED | 504.08 | |
| WEIGHT BALANCE | 92.50 | |
| | | |
| WET GAS FACTOR | 1113113 | |
| INDICATED LOSS—S C F H | 764 | |
| | 7522 | |

| GAS FLOW RATES | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | $\sqrt{h}$ | PRESSURE | TEMP. | M. W. | S. C. F. H. | M/HR | HOUR | GAGE | GAL. | °F | FACTOR | GAL. AT 60 | API° #/GAL. | # | # HR GAL HR |
| FRESH FEED 79.31 | 6.167 | 405.4<br>20.496 | 64<br>0.9962 | 2284214<br>1.5114 | 15094 | 39.773 | OIL | 6'10½" | 364.59 | 51 | 1.0044 | 366.19 | 49.1 | | |
| | | | | | | | | 4'2½" | 224.92 | 48 | 1.0059 | 226.25 | 6.523 | | |
| WET GAS 158.44 | 8.463 | 1.92<br>4.077 | 65<br>0.9952 | 1543130<br>1.2422 | 6758 | 17.808 | | | | | | 41.38<br>141.32 | | 49.00<br>921.83 | 38.41<br>5.888 |
| RECYCLE 158.44 | 7.888 | 405.4<br>20.496 | 76<br>0.9850 | 1.2422 | 31342 | 82.588 | | | | | | | | | |
| BLEED 5.02 | 7.883 | 20.496 | 1.0000 | 1.2422 | 1008 | 2.656 | WATER | 7'3½" | 386.41 | 60 | 1.00000 | 386.41 | 10.9 | | |
| NATURAL GAS 28.43 | 7.708 | 421.8<br>20.893 | 193<br>0.8924 | 1457019<br>1.2071 | 4932 | 12.996 | | 6'4" | 336.22 | 59 | 1.00009 | 336.25 | 8.276 | | |
| | | | | | | | | 4'10-¾ | 260.93 | 58 | 1.00018 | 260.98 | | | |
| OXYGEN 27.07 | 6.614 | 427.9<br>21.038 | 64<br>0.9962 | | 3752 | 9.887 | | 0'9". | 39.17 | 65 | 0.99953 | 39.15<br>271.99 | 2250.99 | 2250.99 | 93.79<br>11.333 |
| STEAM 215.7 | 3.742 | 14.7 | | | | | | | | | | | | | |