

VI. APPENDIX

THE TEXAS COMPANY — MONTEBELLO LABORATORY  
YIELD CALCULATIONS

RUN NO. 58-0(A-E)  
HOURS 0-93  
CATALYST Fresh CMS

FRESH FEED				WET GAS		RECYCLE	COMBINED FEED	EFFLUENT	NET CHANGE		YIELD BASIS H <sub>2</sub> + CO FED								
	%	m/hr	#/hr	At Wt. Balance		m/hr	m/hr	m/hr	m/hr	#/hr	CONDENSATE								
				m/hr	#/hr						#/MCF	#/gal	gal/hr	gal/MCF	YIELDS BASIS	BROWNSVILLE	DESIGN	FEED RATE*	
CO		14.862					21.710		-12.101	-338.95									
H <sub>2</sub>		24.440					45.962		-15.868	-31.99					400 EP	76.6	6.522	98.0	6.392
CO <sub>2</sub>									2.925	128.73	8.631				400-550	14.3	1.218	91.4	1.113
N <sub>2</sub>															550 +	9.1	0.775	114.6	0.888
CH <sub>4</sub>									0.990	15.88	1.065								
C <sub>2</sub> H <sub>6</sub>									0.291	8.16	0.547								
C <sub>3</sub> H <sub>8</sub>									0.183	5.50	0.369				PROPYLENE	3.32	4.804		
C <sub>4</sub> +C <sub>5</sub>									29.54	1.981					C <sub>3</sub> POLY GASO.	87.5	4.203	0.703	
C <sub>6</sub> H <sub>6</sub>									0.344	14.47	0.970	4.32	3.350	0.225	C <sub>3</sub> POLY TAR	12.5	0.601	0.080	
C <sub>7</sub> H <sub>8</sub>									0.045	1.98	0.133	4.24	0.467	0.031					
C <sub>8</sub> H <sub>10</sub>									0.198	11.11	0.745	8.00	2.222	0.149					
C <sub>9</sub> H <sub>12</sub>									0.065	3.78	0.253	4.86	0.778	0.052	C <sub>4</sub> H <sub>6</sub>	5.00	0.25	0.050	68.0
C <sub>10</sub> H <sub>14</sub>									0.074	5.19	0.348	8.45	0.952	0.064	C <sub>4</sub> POLY GASO.	5.98	9.50	1.589	1.5
C <sub>11</sub> H <sub>14</sub>									0.011	0.79	0.053	8.25	0.150	0.010	C <sub>4</sub> H <sub>10</sub>	4.86	3.78	0.778	68.0
C <sub>12</sub> H <sub>18</sub>									0.013	1.09	0.073	5.54	0.020	0.001	C <sub>4</sub> -FREE GASO.			8.217	5.8
C <sub>13</sub> +C <sub>14</sub>										38.41	2.575	7.939	0.532		C <sub>4</sub> POLY TAR	7.53	1.36	0.181	
TOTAL																			
H <sub>2</sub> +CO		39.302		14915	SCFH		67.672		-27.969										
H <sub>2</sub> /CO		1.64		Factor	670465														
Weight Recovery, %	94.85	Catalyst Age, hrs.	Ave. 46.5	Space Velocity, vhr	1563	RECOVERED OIL			54.67	3.665	8.515	0.571			GAS OIL	1.113	0.0746	404	
Reactor Back Pressure, psig	361	Inlet Velocity, Ft/sec	0.87	Catalyst Vol., CF	10.17	TOTAL OIL			93.08	6.240	16.454	1.103			FUEL OIL	0.888	0.0595	323	
Temperature, °F	649	Bed Depth, Ft	15.2	Weight, #	1671	WATER SOLUBLE ACID CHEMICALS Alcohol			5.79	0.388	0.712	0.048			POLY TAR	0.261	0.0175	95	
Recycle Ratio	1.09	Bed Density, #/CF	168	Effluent Shift Ratio (H <sub>2</sub> )(CO <sub>2</sub> )/(H <sub>2</sub> O)(CO)		TOTAL LIQUID PRODUCTS C <sub>3</sub> +			113.37	8.601	18.950	1.271			TOTAL	12.896	0.8646	4688	
FRESH FEED CONVERSION — %				TOTAL FEED CONVERSION — %				SELECTIVITY		NET WATER		GROSS WATER		W. S. CHEM.		HYDROCARBON TOTAL — C <sub>1</sub> +			
Conversion	CO	H <sub>2</sub>	H <sub>2</sub> +CO	CO	H <sub>2</sub>	CO+H <sub>2</sub>	C <sub>3</sub> +C <sub>4</sub> +			97.07	6.508	11.635	0.780		0.712	0.0477	259		
	56.43	81.42	64.93	71.16	55.74	34.52	41.33	79.33		117.36	7.869	14.131	0.947		1.784	0.1196	648		
										142.91	9.582								

Form ML-11 AI = (39.53)(0.5400) = 21.35

Acid = Neut No. x 0.117

R/NCM = 16.91 X #/MCF

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







FRESH FEED				WET GAS				RECYCLE		COMBINED FEED		EFFLUENT		NET CHANGE		YIELD BASIS H <sub>2</sub> + CO FED			
%	m/hr	#/hr	%	At Wt. Balance m/hr	#/hr	m/hr	m/hr	m/hr	m/hr	m/hr	#/hr	#/hr	#/hr	#/hr	#/hr	#/hr	#/hr	#/hr	#/hr
CO <sub>2</sub>	36.867	14.817	415.01	17.063	3.278	91.82	7.656	22.475	10.934	-11.539	-323.19								
H <sub>2</sub>	80.770	24.423	49.24	51.056	9.807	19.777	22.910	47.333	32.717	-14.616	-29.47								
CO <sub>2</sub>	2.013	0.809	35.60	18.317	3.519	154.86	8.219	9.028	11.736	2.710	119.26	8.008							
N <sub>2</sub>	0.117	0.047	1.32	0.910	0.175	4.90	0.408	0.455	0.583										
CH <sub>4</sub>	0.233	0.094	1.51	5.887	1.121	18.14	2.641	2.735	3.772	-1.037	16.63	1.117							
C <sub>2</sub> H <sub>6</sub>				1.537	0.295	8.28	0.690	0.690	0.985	0.295	8.28	0.556							
C <sub>3</sub> H <sub>8</sub>				0.957	0.184	5.53	0.429	0.429	0.613	0.184	5.53	0.371							
C <sub>4</sub> +C <sub>5</sub>																			
C <sub>2</sub> H <sub>4</sub>				2.020	0.388	16.33	0.906	0.906	1.294	0.388	16.33	1.097	4.32	3.780	0.254				
C <sub>2</sub> H <sub>2</sub>				0.377	0.072	3.17	0.169	0.169	0.241	0.072	3.17	0.213	4.24	0.748	0.050				
C <sub>2</sub> H <sub>2</sub>				1.073	0.206	11.56	0.481	0.481	0.687	0.206	11.56	0.776	5.00	2.312	0.155				
C <sub>2</sub> H <sub>2</sub>				0.280	0.054	3.14	0.126	0.126	0.180	0.054	3.14	0.211	4.86	0.646	0.043				
C <sub>2</sub> H <sub>2</sub>				0.387	0.074	5.19	0.174	0.174	0.248	0.074	5.19	0.349	5.48	0.952	0.064				
C <sub>2</sub> H <sub>2</sub>				0.063	0.012	0.87	0.028	0.028	0.040	0.012	0.87	0.058	5.28	0.166	0.011				
C <sub>2</sub> H <sub>2</sub>				0.073	0.014	1.18	0.033	0.033	0.047	0.014	1.18	0.079	5.84	0.212	0.014				
C <sub>2</sub> +C <sub>3</sub>																			
TOTAL	40.190	502.68		19.209	344.74	44.870	85.060	70.151											
H <sub>2</sub> +CO	97.637	39,240	14892	SCFH	13,085		30,566	59,806	43,551	-26,155									
H <sub>2</sub> /CO	1.65	Factor	671501	2.99			2.99	2.11	2.99	1.27									

Form ML-11  
\*Included in Reactor Effluent Total  
g/NCM = 16.91 X g/MCF  
g/3845 MCF H<sub>2</sub> + CO, Bbl/Day = 5431.6 X gal/MCF

OPERATING CONDITIONS				PRODUCT TESTS				CATALYST DATA				
PRESSURES PSIG	RATES SCFH			OIL	WATER	INVENTORY DATA	PARTICLE SIZE					
Oxygen	429	Fresh Feed	15252	* API	52.7	10.6	In Reactor at Start of Period	Screen Analysis	Sedimentation			
Natural Gas	425	Recycle	17028	Neut. No.	45.3	44.1	Fresh Catalyst Added	Mesh	Microns	%	Microns	%
Generator Outlet	411	Combined Feed	32280	Sap. No.	54.6	43.8	Total	On 40	419+	48.0	80+	
Reactor Inlet	402	Wet Gas—Measured	6600	Hydrox. No.			Catalyst Recovered	46.0	100	150	42.0	40-80
Condenser Inlet		Adjusted	7282	Bromine No.	97		In Reactor at End of Period	150	105	5.8	20-40	
Product Accumulator	351	Loss	682	Pour °F.			REACTOR 4-p. Inches H <sub>2</sub> O	200	74	2.4	10-20	
				Chemicals, % by K <sub>2</sub> CO <sub>3</sub>	12.7		No. Height	250	62	0.6	0-20	
								325	44	0.6		
TEMPERATURES—°F.		Recycle/Fresh Feed	1.12					0	0-21	3/8	5/4	87
Oxygen	476	Inlet Velocity—ft./sec.	0.77	HEMPEL DIST. %		API		1	21	3/8-52	5/4	87
Natural Gas	763	Fresh Feed Rate—SCFH	14892	205 °F.				2	52	3/4-84	90	
Generator		per Cu. Ft. Dense Bed	1620	400	77.6	56.7		3	84-115	3/8	90	
Quench Accumulator		per Lb. Catalyst	9.15	400-550	15.0	37.7		4	115	3/8-353	1/4	155
Reactor Inlet	380	per sq. ft.	22564	550+	8.4			5			474	
Condenser Inlet								6				
Product Accumulator	66							7				
Catalyst No.	Height			A. S. T. M. DIST. ON				8				
1	0'10"	602		Naphtha °F.				9				
2	0'9"	649		IRP	100			10				
3	1'9"	654		10%	134			11				
4	4'5"	648		50%	222			12				
5	7'10"	658		90%	352			13				
6	12'8"	657		EP	392			14				
7	17'5"	642	844 AVE.	Rec.	96			15				
8	20'0"	626						16				
9	22'7"	630						17				
10	25'2"	637						18				
11	26'11"	605						19				

GAS ANALYSES				GENERATOR BALANCE				WEIGHT BALANCE							
HOOR	1400	2200	0600	AVERAGE	M/HR	C	H	O	Mol %	M/HR	C	H	O	#/hr	At Wt. Balance
FRESH FEED															
CO <sub>2</sub>	36.74	38.91	37.05	36.867	14.817	14.817	14.817		0.19	10.598	0.024			312.46	344.74
H <sub>2</sub>	60.95	60.71	60.65	60.770	24.423	49.846			1.00	0.128	0.128			45.22	45.22
CO	1.71	2.24	2.09	2.013	0.809	0.809	1.618		1.15	0.147				112.72	112.72
N <sub>2</sub>	0.15	0.08	0.12	0.117	0.047				83.03	10.635	10.635	42.540		470.40	502.68
CH <sub>4</sub>	0.45	0.16	0.09	0.233	0.094	0.094	0.376		7.05	0.903	1.806	5.419		602.68	
				M. W.	12.50785				5.27	0.675	2.025	5.400		93.5784	
				H <sub>2</sub> O		8.290	4.145		1.71	0.219	0.876	2.190			
									0.60	0.077	0.385	0.984			
BALANCE					40.190	15.720	57.512	20.580							
									TOTAL	20.01303	15.855	56.472	21.100		

WET GAS				GAS FLOW RATES				LIQUID PRODUCT RATES					
CO <sub>2</sub>	H <sub>2</sub>	CO	N <sub>2</sub>	CH <sub>4</sub>	C <sub>2</sub> H <sub>6</sub>	C <sub>3</sub> H <sub>8</sub>	C <sub>4</sub> +C <sub>5</sub>	WATER	WATER	WATER	WATER	WATER	WATER
16.46	16.73	18.00	17.063										
50.21	49.28	53.68	51.056	FRESH FEED									
19.27	21.08	14.60	18.317	79.31	6.433	20.413	0.9626	1.5214	15252	40.190			
0.75	0.72	1.26	0.910	WET GAS									
6.34	5.50	5.82	5.887	158.44	8.071	4.089	0.9938	1.2701	6600	17.410			
1.55	1.59	1.67	1.537	408.1	8.217	20.562	0.9436	1.2701	16060	42.319			
0.98	0.90	0.99	0.987	79.31	8.217	20.562	0.9436	1.2701	16060	42.319			
1.98	1.93	2.15	2.020	BLEED									
0.36	0.38	0.39	0.377	5.02	7.825	20.562	0.9436	1.2701	969	2.551			
1.16	1.10	0.96	1.073	NATURAL GAS									
0.52	0.56	0.16	0.290	28.43	7.592	20.979	0.8925	1.2027	4961	12.909			
0.48	0.45	0.23	0.387	OXYGEN									
0.05	0.09	0.05	0.063	27.07	7.012	21.074	0.9865		3946	10.398			
0.09	0.09	0.04	0.073	STREAM									
				M. W.	17.94743	215.7	4.354						



THE TEXAS COMPANY — MONTEBELLO LABORATORY  
YIELD CALCULATIONS

RUN NO. 59-0(A-D)  
HOURS 0-86  
CATALYST

FRESH FEED				WET GAS				RECYCLE	COMBINED FEED	EFFLUENT	NET CHANGE	YIELD BASIS H <sub>2</sub> + CO FED					
	%	m/hr	#/hr	%	At Wt. Balance		m/hr	m/hr	m/hr	m/hr	#/hr	CONDENSATE					
					m/hr	#/hr						#/MCF	#/gal	gal/hr	gal/MCF	YIELDS BASIS BROWNSVILLE DESIGN FEED RATE*	
CO	26.010	16.326						19.179			-15.364	-430.35					
H <sub>2</sub>	2.016	27.017						40.649			-22.399	45.16					400 EP 77.2 9.796 98.0 9.600
CO <sub>2</sub>	44.010										3.327	146.42	8.901				400-550 15.2 1.929 91.4 1.763
N <sub>2</sub>	26.016																550 + 7.6 0.964 114.6 1.105
CH <sub>4</sub>	16.042										1.229	19.72	1.199				
C <sub>2</sub> H <sub>6</sub>	28.052										0.292	8.19	0.498				
C <sub>3</sub> H <sub>8</sub>	30.048										0.144	4.33	0.263				PROPYLENE 49.3 7.055
C <sub>4</sub> +C <sub>5</sub>												32.24	1.960				C <sub>3</sub> POLY GASO. 87.5 6.173 1.032
C <sub>6</sub> H <sub>14</sub>	2.078										0.340	14.31	0.870	4.32	3.313	0.201	C <sub>3</sub> POLY TAR 12.6 0.882 0.117
C <sub>7</sub> H <sub>16</sub>	4.094										0.040	1.76	0.107	4.24	0.415	0.025	
C <sub>8</sub> H <sub>18</sub>	2.104										0.254	14.25	0.866	8.00	2.850	0.173	
C <sub>9</sub> H <sub>20</sub>	8.120										0.089	5.17	0.314	4.86	1.064	0.065	C <sub>4</sub> H <sub>6</sub> 5.00 0.87 0.174 68.0
C <sub>10</sub> H <sub>22</sub>	7.010										0.123	8.63	0.525	8.48	1.583	0.096	C <sub>4</sub> POLY GASO. 6.98 11.71 1.958 1.5
C <sub>12</sub> H <sub>26</sub>	7.146										0.032	2.31	0.140	8.28	0.440	0.027	C <sub>4</sub> H <sub>10</sub> 4.86 5.17 1.064 68.0
C <sub>14</sub> H <sub>30</sub>	8.156										0.032	2.69	0.164	8.84	0.486	0.030	C <sub>4</sub> -FREE GASO. 13.141 5.8
C <sub>16</sub> +C <sub>17</sub>												49.12	2.986	10.151	0.617		C <sub>4</sub> POLY TAR 7.58 1.67 0.222
TOTAL																	
H <sub>2</sub> +CO		43.343	16449	SCFH													
H <sub>2</sub> /CO		1.66	Factor 607939														10 # BPP 400 EP GASOLINE 16.337 0.9932 5385
Weight Recovery, %	99.41	Catalyst Age, hrs. Ave.	43	Space Velocity, vhr	1472	RECOVERED OIL					82.02	4.986	12.689	0.771			GAS OIL 1.763 0.1072 581
Pressure, psig	375	Inlet Velocity, Ft/sec	0.98	Catalyst Vol., CF	11.25	TOTAL OIL					131.14	7.973	22.840	1.389			FUEL OIL 1.105 0.0672 364
Temperature, °F	668	Bed Depth, Ft	17.0	Weight, #	1746	WATER SOLUBLE CHEMICALS					Acids 4.25 0.258	2.113	0.539	0.033			POLY TAR 0.339 0.0206 112
Recycle Ratio	0.86	Bed Density, #/CF	155	Effluent (H <sub>2</sub> )(CO) Shift Ratio (H <sub>2</sub> O)(CO) =		TOTAL LIQUID PRODUCTS C <sub>3</sub> +					Alcohols 16.65 1.012	2.113	0.129				TOTAL 19.544 1.1882 6442
FRESH FEED CONVERSION — %				TOTAL FEED CONVERSION — %				SELECTIVITY				NET WATER					
Contraction	CO	H <sub>2</sub>	H <sub>2</sub> +CO	CO	H <sub>2</sub>	CO+H <sub>2</sub>	C <sub>3</sub> +C <sub>4</sub> +	GROSS WATER				144.35	8.776	16.791	1.021	W. S. CHEM. 0.539 0.0388 178	
70.88	94.11	82.91	87.13	80.11	55.10	63.12	82.50	HYDROCARBON TOTAL—C <sub>3</sub> +				165.25	10.046	19.443	1.182	TOTAL 22.196 1.3494 7316	
												184.28	11.203				

Form ML-11 AI = (38.37)(0.8904) = 34.16 g/NCM = 16.91 X #/MCF \*9488 MCFH H<sub>2</sub> + CO, Bbl/Day = 5421.6 X gal/MCF

THE TEXAS COMPANY — MONTEBELLO LABORATORY  
YIELD CALCULATIONS

RUN NO. 59-1(E-H)  
HOURS 86-178  
CATALYST Spent CM&S

FRESH FEED				WET GAS				RECYCLE	COMBINED FEED	EFFLUENT	NET CHANGE	YIELD BASIS H <sub>2</sub> + CO FED					
	%	m/hr	#/hr	%	At Wt. Balance		m/hr	m/hr	m/hr	m/hr	#/hr	CONDENSATE					
					m/hr	#/hr						#/MCF	#/gal	gal/hr	gal/MCF	YIELDS BASIS BROWNSVILLE DESIGN FEED RATE*	
CO	26.010	15.949						18.583			-14.991	-419.90					
H <sub>2</sub>	2.016	28.244						44.073			-22.504	-45.37					400 EP 78.8 8.853 98.0 8.676
CO <sub>2</sub>	44.010										3.458	152.19	9.074				400-550 13.5 1.517 91.4 1.387
N <sub>2</sub>	26.016																550 + 7.7 0.865 114.6 0.991
CH <sub>4</sub>	16.042										1.220	19.57	1.167				
C <sub>2</sub> H <sub>6</sub>	28.052										0.309	8.67	0.517				
C <sub>3</sub> H <sub>8</sub>	30.048										0.144	4.33	0.258				PROPYLENE 45.5 6.971
C <sub>4</sub> +C <sub>5</sub>												32.57	1.942				C <sub>3</sub> POLY GASO. 87.5 6.100 1.020
C <sub>6</sub> H <sub>14</sub>	2.078										0.364	15.32	0.913	4.32	3.546	0.211	C <sub>3</sub> POLY TAR 12.6 0.871 0.116
C <sub>7</sub> H <sub>16</sub>	4.094										0.041	1.81	0.108	4.24	0.427	0.025	
C <sub>8</sub> H <sub>18</sub>	2.104										0.280	15.71	0.937	8.00	3.142	0.187	
C <sub>9</sub> H <sub>20</sub>	8.120										0.081	4.71	0.281	4.86	0.969	0.058	C <sub>4</sub> H <sub>6</sub> 5.00 1.22 0.244 68.0
C <sub>10</sub> H <sub>22</sub>	7.010										0.139	9.75	0.581	8.48	1.789	0.107	C <sub>4</sub> POLY GASO. 6.98 12.68 2.120 1.5
C <sub>12</sub> H <sub>26</sub>	7.146										0.032	2.31	0.138	8.28	0.440	0.026	C <sub>4</sub> H <sub>10</sub> 4.86 4.71 0.969 68.0
C <sub>14</sub> H <sub>30</sub>	8.156										0.037	3.11	0.185	8.84	0.561	0.033	C <sub>4</sub> -FREE GASO. 12.486 5.8
C <sub>16</sub> +C <sub>17</sub>												52.72	3.143	10.874	0.648		C <sub>4</sub> POLY TAR 7.58 1.81 0.240
TOTAL																	
H <sub>2</sub> +CO		44.193	16772	SCFH													
H <sub>2</sub> /CO		1.77	Factor 596231														10 # BPP 400 EP GASOLINE 15.819 0.9432 5114
Weight Recovery, %	98.30	Catalyst Age, hrs. Ave.	132	Space Velocity, vhr	1657	RECOVERED OIL					72.61	4.329	11.235	0.670			GAS OIL 1.387 0.0827 448
Pressure, psig	372	Inlet Velocity, Ft/sec	1.02	Catalyst Vol., CF	10.15	TOTAL OIL					125.33	7.473	22.109	1.318			FUEL OIL 0.991 0.0591 320
Temperature, °F	681	Bed Depth, Ft	15.4	Weight, #	1354	WATER SOLUBLE CHEMICALS					Acids 4.38 0.261	0.555	0.033				POLY TAR 0.356 0.0212 115
Recycle Ratio	0.87	Bed Density, #/CF	133	Effluent (H <sub>2</sub> )(CO) Shift Ratio (H <sub>2</sub> O)(CO) =		TOTAL LIQUID PRODUCTS C <sub>3</sub> +					Alcohols 15.47 0.922	1.962	0.117				TOTAL 18.553 1.1062 5997
FRESH FEED CONVERSION — %				TOTAL FEED CONVERSION — %				SELECTIVITY				NET WATER					
Contraction	CO	H <sub>2</sub>	H <sub>2</sub> +CO	CO	H <sub>2</sub>	CO+H <sub>2</sub>	C <sub>3</sub> +C <sub>4</sub> +	GROSS WATER				131.99	7.870	15.815	0.943	W. S. CHEM. 0.555 0.0331 179	
68.62	93.99	79.68	84.84	80.67	51.06	59.84	81.68	HYDROCARBON TOTAL—C <sub>3</sub> +				151.84	9.053	18.332	1.093	TOTAL 21.070 1.2563 6811	
												177.75	10.598				

Form ML-11 AI = (40.71)(0.8193) = 33.35 g/NCM = 16.91 X #/MCF \*9488 MCFH H<sub>2</sub> + CO, Bbl/Day = 5421.6 X gal/MCF





THE TEXAS COMPANY — MONTEBELLO LABORATORY  
YIELD CALCULATIONS

RUN NO. 59-4(U-X)  
HOURS 445-541  
CATALYST Spent CM&S

FRESH FEED				WET GAS		RECYCLE	COMBINED FEED	EFFLUENT	NET CHANGE		YIELD BASIS H <sub>2</sub> + CO FED										
	%	m/hr	#/hr	%	At Wt. Balance	m/hr	m/hr	m/hr	m/hr	#/hr	#/MCF	gal/hr	gal/MCF	gal/MCF	gal/MCF	YIELDS	BASIS	BROWNSVILLE	DESIGN	FEED RATE*	
					m/hr											CORRECTED RECOVERY, %	gal/hr	TREATING RECOVERY, %	gal/hr	gal/hr	
CO		14.627					18.476	-13.497	-378.05												
H <sub>2</sub>		22.484					36.806	-18.284	-36.86							400 EP	76.4	7.336	98.0	7.189	
CO <sub>2</sub>								3.070	135.11	9.594						400-550	13.9	1.335	91.4	1.220	
N <sub>2</sub>																650 +	9.7	0.931	114.6	1.067	
CH <sub>4</sub>								0.970	15.56	1.105											
C <sub>2</sub> H <sub>6</sub>								0.317	8.89	0.631							RECOVERY %	#/hr	gal/hr		
C <sub>3</sub> H <sub>8</sub>								0.180	5.41	0.384						PROPYLENE	44.7	6.432			
C <sub>4</sub> +C <sub>5</sub>								29.86	2.120							C <sub>3</sub> POLY GAS.	87.5	5.628	0.941		
C <sub>2</sub> H <sub>4</sub>								0.342	14.39	1.022	4.32	3.331	0.237			C <sub>3</sub> POLY TAR	12.5	0.804	0.107		
C <sub>2</sub> H <sub>2</sub>								0.036	1.59	0.113	4.24	0.375	0.027								
C <sub>2</sub> H <sub>2</sub>								0.249	13.97	0.992	8.00	2.794	0.198				#/gal	#/hr	gal/hr	RVP	
C <sub>4</sub> H <sub>10</sub>								0.089	5.17	0.367	4.88	1.064	0.076			C <sub>4</sub> H <sub>10</sub>	5.00	--	--	68.0	
C <sub>4</sub> H <sub>10</sub>								0.116	8.14	0.578	8.48	1.494	0.106			C <sub>4</sub> POLY GAS.	5.98	12.22	2.044	1.5	
C <sub>4</sub> H <sub>10</sub>								0.018	1.30	0.092	8.28	0.248	0.018			C <sub>4</sub> H <sub>10</sub>	4.86	(5.17)	(1.064)	68.0	
C <sub>4</sub> H <sub>10</sub>								0.041	3.45	0.245	8.54	0.623	0.044			C <sub>4</sub> FREE GAS.		5.15	1.059		
C <sub>4</sub> +C <sub>5</sub>									48.01	3.409	9.929	0.705				C <sub>4</sub> POLY TAR	7.58	1.75	0.232		
TOTAL																					
H <sub>2</sub> +CO		37.111	14083	SCFH			55.282	-31.781									gal/hr	gal/MCF	Bbl/Day		
H <sub>2</sub> /CO		1.54	Factor	710075													10 # RVP AND EP GASOLINE	13.598	0.9656	5235	
Weight Recovery, %	97.83		Catalyst Age, hrs. Ave.	228	Space Velocity, vhr	1057	RECOVERED OIL	61.38	4.358	9.602	0.682					GAS OIL	1.220	0.0866	470		
Pressure, psig	372	Inlet Velocity, Ft/sec	0.93	Catalyst Vol, CF	13.33	TOTAL OIL	109.39	7.767	19.531	1.387						FUEL OIL	1.067	0.0758	411		
Temperature, °F	653	Bed Depth, Ft	20.2	Weight, #	1982	WATER SOLUBLE CHEMICALS	4.46	0.317	0.568	0.040						POLY TAR	0.339	0.0241	131		
Recycle Ratio	1.08	Bed Density, #/CF	149	Effluent (H <sub>2</sub> )(CO <sub>2</sub> ) Shift Ratio (H <sub>2</sub> O)(CO)	11.66	TOTAL LIQUID PRODUCTS C <sub>3</sub> +	128.76	9.143	21.999	1.562						TOTAL	16.224	1.1520	6246		
FRESH FEED CONVERSION — %				TOTAL FEED CONVERSION — %				SELECTIVITY				NET WATER				GROSS WATER					
Contraction	CO	H <sub>2</sub>	H <sub>2</sub> +CO	CO	H <sub>2</sub>	CO+H <sub>2</sub>	C <sub>3</sub> +C <sub>4</sub> +	C <sub>3</sub> +C <sub>4</sub> +	C <sub>3</sub> +C <sub>4</sub> +	C <sub>3</sub> +C <sub>4</sub> +	C <sub>3</sub> +C <sub>4</sub> +	C <sub>3</sub> +C <sub>4</sub> +	C <sub>3</sub> +C <sub>4</sub> +	C <sub>3</sub> +C <sub>4</sub> +	C <sub>3</sub> +C <sub>4</sub> +	W. S. CHEM.	0.568	0.0403	218		
68.15	92.27	81.32	85.64	73.05	49.68	57.49	81.18	81.18	135.91	9.651	16.424	1.166	TOTAL	18.692	1.3272	7196					

Form ML-11

AI = (32.51)(0.8429) = 27.40

g/NCM = 16.91 X #/MCF

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

THE TEXAS COMPANY — MONTEBELLO LABORATORY  
YIELD CALCULATIONS

RUN NO. 59-5(Y-00)  
HOURS 541-661  
CATALYST Spent CM&S

FRESH FEED				WET GAS		RECYCLE	COMBINED FEED	EFFLUENT	NET CHANGE		YIELD BASIS H <sub>2</sub> + CO FED									
	%	m/hr	#/hr	%	At Wt. Balance	m/hr	m/hr	m/hr	m/hr	#/hr	#/MCF	gal/hr	gal/MCF	gal/MCF	gal/MCF	YIELDS	BASIS	BROWNSVILLE	DESIGN	FEED RATE*
					m/hr											CORRECTED RECOVERY, %	gal/hr	TREATING RECOVERY, %	gal/hr	gal/hr
CO		14.725					17.804	-13.706	-383.91											
H <sub>2</sub>							35.556	-17.937	-35.35							400 EP	75.5	6.764	98.0	6.629
CO <sub>2</sub>								3.250	143.02	10.257						400-550	14.9	1.335	91.4	1.220
N <sub>2</sub>																650 +	9.6	0.860	114.8	0.986
CH <sub>4</sub>								1.002	16.07	1.152										
C <sub>2</sub> H <sub>6</sub>								0.346	9.71	0.696							RECOVERY %	#/hr	gal/hr	
C <sub>3</sub> H <sub>8</sub>								0.175	5.26	0.377						PROPYLENE	42.5	6.384		
C <sub>4</sub> +C <sub>5</sub>								31.04	2.226							C <sub>3</sub> POLY GAS.	87.5	5.586	0.934	
C <sub>2</sub> H <sub>4</sub>								0.357	15.02	1.077	4.32	3.477	0.249			C <sub>3</sub> POLY TAR	12.5	0.798	0.106	
C <sub>2</sub> H <sub>2</sub>								0.041	1.81	0.130	4.24	0.427	0.031							
C <sub>2</sub> H <sub>2</sub>								0.234	13.13	0.942	8.00	2.626	0.188				#/gal	#/hr	gal/hr	RVP
C <sub>4</sub> H <sub>10</sub>								0.085	4.94	0.354	4.88	1.016	0.073			C <sub>4</sub> H <sub>10</sub>	5.00	--	--	68.0
C <sub>4</sub> H <sub>10</sub>								0.123	8.63	0.619	8.48	1.583	0.114			C <sub>4</sub> POLY GAS.	5.98	11.49	1.921	1.5
C <sub>4</sub> H <sub>10</sub>								0.019	1.37	0.098	8.28	0.261	0.019			C <sub>4</sub> H <sub>10</sub>	4.86	(4.94)	(1.016)	68.0
C <sub>4</sub> H <sub>10</sub>								0.043	3.62	0.260	8.54	0.653	0.047			C <sub>4</sub> FREE GAS.		4.91	1.010	
C <sub>4</sub> +C <sub>5</sub>									48.52	3.479	10.043	0.720				C <sub>4</sub> POLY TAR	7.58	1.64	0.218	
TOTAL																				
H <sub>2</sub> +CO		36.745	13945	SCFH			53.360	-31.243									gal/hr	gal/MCF	Bbl/Day	
H <sub>2</sub> /CO		1.50	Factor	717102													10 # RVP AND EP GASOLINE	12.991	0.9316	5051
Weight Recovery, %	95.32		Catalyst Age, hrs. Ave.	303	Space Velocity, vhr	1072	RECOVERED OIL	57.51	4.124	8.959	0.642					GAS OIL	1.220	0.0875	474	
Pressure, psig	365	Inlet Velocity, Ft/sec	1.00	Catalyst Vol, CF	13.01	TOTAL OIL	106.03	7.603	19.002	1.363						FUEL OIL	0.986	0.0707	383	
Temperature, °F	653	Bed Depth, Ft	19.7	Weight, #	1942	WATER SOLUBLE CHEMICALS	5.50	0.394	0.703	0.050						POLY TAR	0.324	0.0232	126	
Recycle Ratio		Bed Density, #/CF	149	Effluent (H <sub>2</sub> )(CO <sub>2</sub> ) Shift Ratio (H <sub>2</sub> O)(CO)	11.92	TOTAL LIQUID PRODUCTS C <sub>3</sub> +	127.16	9.119	21.702	1.556						TOTAL	15.521	1.1130	6034	
FRESH FEED CONVERSION — %				TOTAL FEED CONVERSION — %				SELECTIVITY				NET WATER				GROSS WATER				
Contraction	CO	H <sub>2</sub>	H <sub>2</sub> +CO	CO	H <sub>2</sub>	CO+H <sub>2</sub>	C <sub>3</sub> +C <sub>4</sub> +	C <sub>3</sub> +C <sub>4</sub> +	C <sub>3</sub> +C <sub>4</sub> +	C <sub>3</sub> +C <sub>4</sub> +	C <sub>3</sub> +C <sub>4</sub> +	C <sub>3</sub> +C <sub>4</sub> +	C <sub>3</sub> +C <sub>4</sub> +	C <sub>3</sub> +C <sub>4</sub> +	C <sub>3</sub> +C <sub>4</sub> +	W. S. CHEM.	0.703	0.0504	273	
66.86	93.08	79.64	85.03	76.98	49.32	58.55	80.38	80.38	134.92	9.675	16.318	1.170	TOTAL	18.221	1.3066	7084				

Form ML-11

AI = (32.74)(0.8248) = 27.00

g/NCM = 16.91 X #/MCF

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



THE TEXAS COMPANY — MONTEBELLO LABORATORY  
YIELD CALCULATIONS

RUN NO. 59-A  
HOURS 0-14  
CATALYST AGE 14

FRESH FEED				WET GAS				RECYCLE	COMBINED FEED	EFFLUENT	NET CHANGE		YIELD BASIS H <sub>2</sub> + CO FED												
%	m/hr	#/hr	%	At Wt. Balance		m/hr	m/hr	m/hr	m/hr	m/hr	#/hr	CONDENSATE				YIELDS BASIS BROWNSVILLE DESIGN FEED RATE*									
				m/hr	#/hr							#/MCF	gal/hr	gal/MCF	gal/MCF	gal/MCF	Corrected HEMPEL %	gal/hr	Treating Recovery %	gal/hr					
CO 28.010	56.623	16.267	455.62	8.107	1.024	28.68	3.166	19.433	4.190	-15.243	-426.94														
H <sub>2</sub> 2.016	60.361	28.810	54.05	33.736	4.263	8.59	13.175	39.985	17.438	-22.547	-45.46					400 EP	73.9	10.549	98.0	10.358					
CO <sub>2</sub> 44.010	2.343	1.041	45.81	33.376	4.216	185.57	13.035	14.076	17.251	3.175	139.76	8.549				400-550	18.0	2.569	91.4	2.348					
N <sub>2</sub> 28.016	0.120	0.053	1.48	1.230	0.155	4.34	0.480	0.533	0.655							550 +	8.1	1.156	114.6	1.325					
CH <sub>4</sub> 16.042	0.553	0.246	3.95	13.377	1.690	27.11	5.224	5.470	6.914	1.444	23.16	1.417													
C <sub>2</sub> H <sub>6</sub> 28.032				2.380	0.301	8.44	0.929	0.929	1.230	0.301	8.44	0.516													
C <sub>3</sub> H <sub>8</sub> 20.048				1.397	0.177	5.32	0.546	0.546	0.723	0.177	5.32	0.325				PROPYLENE	50.6	7.75							
C <sub>4</sub> +C <sub>5</sub>																C <sub>4</sub> POLY GASO.	87.5	6.78	1.134						
C <sub>6</sub> H <sub>14</sub> 42.078				2.877	0.364	15.32	1.123	1.123	1.487	0.364	15.32	0.937	4.32	3.546	0.217	C <sub>6</sub> POLY TAR	12.5	0.97	0.129						
C <sub>8</sub> H <sub>18</sub> 44.094				0.530	0.067	2.95	0.207	0.207	0.274	0.067	2.95	0.180	4.24	0.696	0.043										
C <sub>10</sub> H <sub>14</sub> 26.124				1.627	0.206	11.56	0.635	0.635	0.841	0.206	11.56	0.707	5.00	2.312	0.141										
C <sub>10</sub> H <sub>16</sub> 26.120				0.590	0.075	4.36	0.230	0.230	0.305	0.075	4.36	0.267	4.86	0.897	0.055	C <sub>10</sub> H <sub>16</sub>	5.00	1.24	0.248	68.0					
C <sub>10</sub> H <sub>18</sub> 75.130				0.580	0.073	5.12	0.226	0.226	0.299	0.073	5.12	0.313	5.48	0.939	0.057	C <sub>10</sub> POLY GASO.	5.98	9.03	1.510	1.5					
C <sub>12</sub> H <sub>14</sub> 72.144				0.090	0.011	0.79	0.035	0.035	0.046	0.011	0.79	0.048	5.25	0.150	0.009	C <sub>12</sub> H <sub>14</sub>	4.86	4.36	0.897	68.0					
C <sub>12</sub> H <sub>16</sub> 84.196				0.103	0.013	1.09	0.040	0.040	0.053	0.013	1.09	0.067	5.54	0.196	0.012	C <sub>12</sub> POLY GASO.			12.757	5.8					
C <sub>12</sub> H <sub>18</sub>																C <sub>12</sub> POLY TAR	7.53	1.29	0.171						
TOTAL		44.418	560.91		12.635	309.24	39.051	83.469	60.551																
H <sub>2</sub> +CO	96.984	43.077	16348	SCFH	5.287		16.341	59.418	21.628	-37.790															
H <sub>2</sub> /CO		1.65	Factor	611673	4.16		4.16	2.06	4.16	1.48															
OPERATING DATA												Space Vel. = 1383		RECOVERED OIL		0.664**	93.14	5.697	14.274	0.873	GAS OIL		2.348	0.1436	779
Pressure, psig	417	Inlet Velocity, Ft/sec	0.99	Catalyst Spent CM&S		TOTAL OIL		134.33	8.216	23.010	1.407	FUEL OIL		1.325	0.0810	439									
Temperature, °F	668	Bed Depth, Ft	17.91	Weight, #	1785	WATER SOLUBLE CHEMICALS	0.308**	16.33	0.999	2.045	0.125	POLY TAR		0.300	0.0184	100									
Recycle Ratio	0.87	Bed Density, #/CF	151	Volume, Cu ft	11.82	TOTAL LIQUID PRODUCTS C <sub>2</sub> +		150.66	9.215	25.055	1.532	TOTAL		19.385	1.1857	6429									
FRESH FEED CONVERSION — %				TOTAL FEED CONVERSION — %				SELECTIVITY				NET WATER		7.893**	142.20	8.698	17.071	1.044	W. S. CHEM.		2.045	0.1251	678		
Contraction	CO	H <sub>2</sub>	H <sub>2</sub> +CO	CO	H <sub>2</sub>	CO+H <sub>2</sub>	C <sub>3</sub> +C <sub>4</sub> +	GROSS WATER		158.53	9.697	19.116	1.169	TOTAL		21.430	1.3108	7107							
	71.55	93.71	84.10	87.73	78.44	56.39	63.60	80.32	HYDROCARBON TOTAL—C <sub>2</sub> +		187.58	11.473													

Form ML-11 K<sub>2</sub>shift = 9.1 \*\*Included in Reactor Effluent Total g/NCM = 16.91 X g/MCF 99188 MCF H<sub>2</sub> + CO. Bbl/Day = 5421.6 X gal/MCF

THE TEXAS COMPANY — MONTEBELLO LABORATORY  
DATA SUMMARY

RUN NO. 59-A  
HOURS 0-14

OPERATING CONDITIONS				PRODUCT TESTS				CATALYST DATA									
PRESSURES PSIG		RATES S.C.F.H.		OIL		WATER		INVENTORY DATA				PARTICLE SIZE					
Oxygen	441	Fresh Feed	16857	* API	49.4	10.6	In Reactor at Start of Period				2816	Screen Analysis					
Natural Gas	439	Recycle	14820	Neut. No.	21.8	19.6	Recovered During Start-up				842	Mesh Microns % Microns %					
Generator Outlet	423	Combined Feed	31677	Sap. No.	33.2	28.8	Inventory after feed was cut in				1660	On 40 419+ 48.4 80+					
Reactor Inlet	417	Wet Gas—Measured	4800	Hydrox. No.			Catalyst Recovered				12	100 150 39.8 40—80					
Condenser Inlet		Adjusted	4795	Bromine No.	97		In Reactor at End of Period					150 105 7.1 20—40					
Product Accumulator	375	Loss	-5	Pour °F.			Chemicals, % by K <sub>2</sub> CO <sub>3</sub>				10.7	200 74 3.1 10—20					
							REACTOR d-p, Inches H <sub>2</sub> O					250 62 0.4 0—20					
							No. Height					325 44 0.6					
TEMPERATURES — °F.				Recycle/Fresh Feed	0.87			0	0-21	3/8	53	<325	0.6	CATALYST			
Oxygen	293	Inlet Velocity—ft./sec.	0.99				1	21	3/8-52	3/4	75	Bulk Density, Lbs./Cu.Ft.					
Natural Gas	277	Fresh Feed Rate—S.C.F.H. H <sub>2</sub> +CO	16348	HEMPEL DIST. %			2	52	3/4-84		80						
Generator	2468	per Cu. Ft. Dense Bed	1383	205 °F.			3	84-115	3/8		72	Aerated					
Quench Accumulator	201	per Lb. Catalyst	9.16	400	72.9	57.3	4	115	3/8-353	1/8	240	Settled					
Reactor Inlet	140	per Sq. Ft.	24770	400-550	18.0	36.2	Total				520	Compacted					
Condenser Inlet	566			550+	9.1							Particle Density, gm./cc.					
Product Accumulator		Heat Transfer Calculations					CALCULATED FROM dp					NH <sub>3</sub> Value, ml./gm.					
Catalyst No.	Height	Steam Rate = 350 #/hr		A. S. T. M. DIST. ON			Density, Lbs./Cu.Ft.				151	N <sub>2</sub> Surface, m <sup>2</sup> /gm.					
1	0'10"	@696 psia & 513°F. =		Naphtha °F.			Inventory, Lbs.				1785						
2	0'9"	1200 Btu/#		IBP	104		Bed Depth, Ft.				17.91	CHEMICAL ANALYSIS					
3	1'9"	Water in @64°F = 32 Btu/#		10%	134		Vol., Cu. Ft.				11.92	Fe on carry over 82.6					
4	4'5"	Net Btu/# steam = 1168 Btu		50%	228							C on reactor sample 4.77					
5	7'10"	(1168)(350) = 408,900 Btu/hr.		90%	350							O					
6	12'13"	Ave. Bed Temp. = 668°F.		EP	396							H					
7	17'5"	dt = 668-513 = 155°F.		Rec.	96.5							K <sub>2</sub> O W+, % basis Fe					
8	20'10"	Tube Area = 32.5 sq. ft.										X-Ray Analysis—					
9	22'7"	408,900 K = (32.5)/(155) =										Fe <sub>2</sub> O <sub>3</sub>					
10	25'2"	81.2 Btu/°F/sq. ft.										Fe <sub>2</sub> O <sub>4</sub>					
11	26'11"											Fe					





THE TEXAS COMPANY — MONTEBELLO LABORATORY  
YIELD CALCULATIONS

RUN NO. 59-D  
HOURS 62-86  
CATALYST Spent CMS

FRESH FEED				WET GAS				RECYCLE	COMBINED FEED	EFFLUENT	NET CHANGE		YIELD BASIS H <sub>2</sub> + CO FED							
%	m/hr	#/hr	%	At Wt. Balance		m/hr	m/hr	m/hr	m/hr	m/hr	m/hr	#/MCF	CONDENSATE							
				m/hr	#/hr								#/MCF	#/gal	gal/hr	gal/MCF	YIELDS BASIS	BROWNSVILLE DESIGN	FEED RATE*	
CO 29.010	36.450	16.327	457.30	6.060	0.769	21.54	2.268	18.595	3.037	-15.558	-435.76									
H <sub>2</sub> 2.018	60.223	26.975	54.38	34.423	4.367	8.80	12.886	39.861	17.253	-22.608	-45.58					400 EP	80.3	10.341	98.0	10.134
CO <sub>2</sub> 44.010	2.507	1.123	49.42	34.586	4.387	193.08	12.947	14.070	17.354	3.264	143.68	8.742				400-550	14.0	1.803	91.4	1.648
N <sub>2</sub> 28.016	0.057	0.026	0.73	1.570	0.199	5.58	0.588	0.614	0.787							550 +	5.7	0.734	114.6	0.841
CH <sub>4</sub> 16.042	0.763	0.342	5.49	11.907	1.510	24.22	4.458	4.800	5.968	1.168	18.73	1.140								
C <sub>2</sub> H <sub>6</sub> 28.028				2.410	0.306	8.58	0.902	0.902	1.208	0.306	8.58	0.522					RECOVERY	#/hr	gal/hr	
C <sub>2</sub> H <sub>4</sub> 20.028				1.137	0.144	4.33	0.426	0.426	0.570	0.144	4.33	0.263				PROPYLENE	51.0	7.57		
C <sub>3</sub> H <sub>8</sub> 42.078				2.780	0.353	14.85	1.041	1.041	1.394	0.353	14.85	0.904	4.32	3.438	0.209	C <sub>3</sub> POLY GASO.	87.5	6.62	1.107	
C <sub>3</sub> H <sub>6</sub> 44.024				0.327	0.041	1.81	0.122	0.122	0.163	0.041	1.81	0.110	4.24	0.427	0.026	C <sub>3</sub> POLY TAR	12.5	0.95	0.126	
C <sub>4</sub> H <sub>10</sub> 26.124				2.257	0.286	16.05	0.845	0.845	1.131	0.286	16.05	0.977	5.00	3.210	0.195		#/gal	#/hr	gal/hr	RVP
C <sub>4</sub> H <sub>8</sub> 26.120				0.750	0.095	5.52	0.281	0.281	0.376	0.095	5.52	0.336	4.88	1.136	0.069	C <sub>4</sub> H <sub>8</sub>	5.00	1.99	0.398	68.0
C <sub>4</sub> H <sub>10</sub> 70.130				1.140	0.145	10.17	0.427	0.427	0.572	0.145	10.17	0.619	5.48	1.866	0.114	C <sub>4</sub> POLY GASO.	5.98	12.30	2.057	1.5
C <sub>4</sub> H <sub>12</sub> 72.144				0.333	0.042	3.03	0.125	0.125	0.167	0.042	3.03	0.184	5.28	0.577	0.035	C <sub>4</sub> H <sub>10</sub>	4.86	5.52	1.136	68.0
C <sub>4</sub> H <sub>12</sub> 24.136				0.320	0.041	3.45	0.120	0.120	0.161	0.041	3.45	0.210	5.54	0.623	0.038	C <sub>4</sub> -FREE GASO.			14.307	5.8
C <sub>5</sub> -C <sub>6</sub>													54.88	3.340		C <sub>4</sub> POLY TAR	7.53	1.76	0.234	
TOTAL		44.793	567.32		12.685	321.01	37.436	82.229	59.126											
H <sub>2</sub> +CO	96.673	43.302	1643344	SCFH	5.136		15.154	58.466	20.290	-38.166							gal/hr	gal/MCF	Bbl/Day	
H <sub>2</sub> /CO		1.65	Factor	608515	5.68		5.68	2.14	5.68	1.45							10 # RVP 400 EP GASOLINE	17.898	1.0891	5905
Weight Recovery, %	99.92	Catalyst Age, hrs.	74	Space Velocity, vhr	1488	RECOVERED OIL	0.592**	83.04	5.053	12.878	0.784					GAS OIL	1.648	0.1003	544	
Pressure, psig	421	Inlet Velocity, Ft./sec	0.96	Catalyst Vol., CF	11.04	TOTAL OIL		137.92	8.393	24.155	1.470					FUEL OIL	0.841	0.0512	278	
Temperature, °F	673	Bed Depth, Ft	16.73	Weight, #	1634	WATER SOLUBLE CHEMICALS	0.334**	17.71	1.078	2.226	0.135					POLY TAR	0.360	0.0219	119	
Recycle Ratio	0.84	Bed Density, #/CF	148	Effluent (H <sub>2</sub> )/CO <sub>2</sub> Shift Ratio (H <sub>2</sub> O)/CO	12.19	TOTAL LIQUID PRODUCTS C <sub>2</sub> +		155.63	9.471	26.381	1.605					TOTAL	20.747	1.2625	6845	
FRESH FEED CONVERSION -- %				TOTAL FEED CONVERSION -- %				SELECTIVITY				NET WATER								
Contraction	CO	H <sub>2</sub>	H <sub>2</sub> +CO	CO	H <sub>2</sub>	CO+H <sub>2</sub>	C <sub>3</sub> +C <sub>4</sub> +	GROSS WATER				W. S. CHEM.								
71.68	95.29	83.81	88.14	83.67	56.72	65.29	83.10	8.079**	145.56	8.858	17.474	1.063	TOTAL							
								HYDROCARBON TOTAL				TOTAL								
								187.27				11.396								

Form ML-11

\*\*Included in Reactor Effluent Total

g/NCM = 16.91 x / MCF      99488 MCF H<sub>2</sub> + CO, Bbl/Day = 5421.6 x gal/MCF

THE TEXAS COMPANY — MONTEBELLO LABORATORY  
DATA SUMMARY

RUN NO. 59-D  
HOURS 58-82

OPERATING CONDITIONS				PRODUCT TESTS				CATALYST DATA					
PRESSURES PSIG		RATES S.C.F.H.		OIL		WATER		INVENTORY DATA		PARTICLE SIZE			
Oxygen	449	Fresh Feed	16999	* API	51.1	10.7	In Reactor at Start of Period	Screen Analysis		Sedimentation			
Natural Gas	445	Recycle	14207	Neut. No.	26.0	23.0	Fresh Catalyst Added	Mesh	Microns	%	Microns	%	
Generator Outlet	428	Combined Feed	31206	Sap. No.	39.8	30.8	Total	100	419+	70.5	80+		
Reactor Inlet	421	Wet Gas - Measured	4807	Hydrox. No.			Catalyst Recovered	86 1/2	150	150	27.5	40-80	
Condenser Inlet		Adjusted	4814	Bromine No.	97		In Reactor at End of Period	150	105	1.2	20-40		
Product Accumulator	375	Loss	7	Pour °F.				200	74	0.2	10-20		
				Chemicals, % by K <sub>2</sub> CO <sub>3</sub>	11.3		REACTOR 4-p. Inches H <sub>2</sub> O	250	62	0.2	0-20		
				No. Height				325	44	0.2			
TEMPERATURES -- °F.				Recycle/Fresh Feed	0.84		0	See Period A	52	<325	0.2		
Oxygen	318	Inlet Velocity - ft./sec.	0.96	HEMPEL, DIST. %			1	79	CATALYST				
Natural Gas	305	Fresh Feed Rate = S.C.F.H. / H <sub>2</sub> + CO	16433	* API			2	74	Bulk Density, Lbs./Cu.Ft.				
Generator		per Cu.Ft. Dense Bed	1488	205 °F.			3	71	Aerated				
Quench Accumulator	198	per Lb. Catalyst	10.06	400	79.3	56.7	4	200	Settled				
Reactor Inlet	155	per Sq. Ft.	24898	400-550	14.0	36.9	Total	476	Compacted				
Condenser Inlet	572			550+	6.7				Particle Density, gm./cc.				
Product Accumulator	94	Heat Transfer Calculations							CALCULATED FROM dp				
Catalyst No.	Height	Steam Rate = 369 #/hr.		A. S. T. M. DIST. ON			Density, Lbs./Cu.Ft.	148	NH <sub>3</sub> Value, ml./gm.				
1	See Period A	@694 psia & 514 °F. =		Naphtha °F.			Inventory, Lbs.	1634	N <sub>2</sub> Surface, m <sup>2</sup> /gm.				
2		1199 Btu/#		IBP	100		Bed Depth, Ft.	16.73	CHEMICAL ANALYSIS				
3		Water in @70.3 °F. = 38.3 Btu/# <sup>10%</sup>		50%	216		Vol., Cu. Ft.	11.04	Fe				
4		Net Btu/# steam = 1161 Btu		90%	340				C				
5		(1161)(369) = 428,409		EP	398				O				
6		Ave. Bed Temp. = 673 °F.		Rec.	97.5				H				
7		ΔT = 673-514 = 159 °F.							K <sub>2</sub> O, W+, % basis Fe				
8		Tube Area = 30.4 sq. ft.							X-Ray Analysis-				
9		428,409							Fe <sub>2</sub> O <sub>3</sub>				
10		K = (30.4)(159) =							Fe <sub>2</sub> O <sub>3</sub>				
11		88.6 Btu/or./sq. ft.							Fe				





THE TEXAS COMPANY — MONTEBELLO LABORATORY  
DATA SUMMARY

RUN NO. 59-P  
HOURS 106-130

OPERATING CONDITIONS				PRODUCT TESTS			CATALYST DATA						
PRESSURES PSIG		RATES S.C.F.H.			OIL	WATER	INVENTORY DATA		PARTICLE SIZE				
Oxygen	444	Fresh Feed	17316	° API	52.1	10.8	In Reactor at Start of Period		Screen Analysis				
Natural Gas	439	Recycle	15099	Neut. No.	26.0	23.7	Fresh Catalyst Added		Mesh	Microns	%	Microns	%
Generator Outlet	424	Combined Feed	32415	Sap. No.	38.4	30.6	Total		On 40	419+	64.9	80+	
Reactor Inlet	416	Wet Gas—Measured	5122	Hydrox. No.			Catalyst Recovered		96 1/2	100	150	29.6	40-80
Condenser Inlet		Adjusted	5233	Bromine No.	101		In Reactor at End of Period		150	105	3.1	20-40	
Product Accumulator	372	Loss	111	Pour °F.	below -40		REACTOR d-p, Inches H <sub>2</sub> O		200	74	1.4	10-20	
				Chemicals, % by K <sub>2</sub> CO <sub>3</sub>		10.7	No. Height		250	62	0.2	0-20	
							See Period A		325	44	0.4		
TEMPERATURES—°F.				Recycle/Fresh Feed	0.87				<325		0.4		
Oxygen	314	Inlet Velocity—ft./sec.	1.02				1		65	CATALYST			
Natural Gas	312	Fresh Feed Rate— $\frac{S.C.F.H.}{H_2 + CO}$	16843	HEMPEL DIST. %		° API	2		69	Bulk Density, Lbs./Cu.Ft.			
Generator	-	per Cu.Ft. Dense Bed	1596	205 °F.			3		66	Aerated		140	
Quench Accumulator	206	per Lb. Catalyst	12.09	400	77.6	56.4	4		160	Settled		141	
Reactor Inlet	152	per Sq. Ft.	25520	400-550	12.4	35.7	Total		406	Compacted		187	
Condenser Inlet	575			550+	10.0					Particle Density, gm./cc.		4.52	
Product Accumulator	90	Heat Transfer Calculations					CALCULATED FROM dp			NH <sub>3</sub> Value, ml./gm.			
Catalyst No.	Height	Steam Rate = 343 #/hr.			A. S. T. M. DIST. ON		Density, Lbs./Cu.Ft.		132	N <sub>2</sub> Surface, m <sup>2</sup> /gm.			
1	See Period A	@694 psia & 514 °F =			Naphtha °F.		Inventory, Lbs.		1393				
2	672	1199 Btu/#			IBP		104	Bed Depth, Ft.		15.99	CHEMICAL ANALYSIS		
3	684	Water in @64.7 °F = 33 Btu/#			10%		132	Vol., Cu. Ft.		10.55	Fe		
4	657	Net Btu/# steam = 1166 Btu			50%		218				C		
5	690	(1166)(343) = 399,938 Btu/hr.			90%		356				O		
6	686	Ave. Bed Temp. = 678 °F			EP		394				H		
7	665	dT = 678-514 = 164 °F.			Rec.		95.5				K <sub>2</sub> O, W+, % basis Fe		
8	647	Tube Area = 29.0 sq. ft.									X-Ray Analysis—		
9	648	K = $\frac{399,938}{(29.0)(164)}$ =									Fe <sub>2</sub> O <sub>3</sub>		
10	643	84.09 Btu/°F./sq. ft.									Fe <sub>3</sub> O <sub>4</sub>		
11	623										Fe		

THE TEXAS COMPANY — MONTEBELLO LABORATORY  
YIELD CALCULATIONS

RUN NO. 59-P  
HOURS 110-134  
CATALYST Spent CM&S

FRESH FEED				WET GAS			RECYCLE	COMBINED FEED	EFFLUENT	NET CHANGE		YIELD BASIS H <sub>2</sub> + CO FED											
	%	m/hr	#/hr	%	At Wt. Balance							CONDENSATE				YIELDS BASIS BROWNSVILLE DESIGN FEED RATE*							
					m/hr	#/hr	m/hr	m/hr	m/hr	m/hr	#/hr	#/MCF	#/gal	gal/hr	gal/MCF		CORRECTED HEMPEL, %	gal/hr	TREATING RECOVERY, %	gal/hr			
CO	28.010	35.057	15.996	448.06	6.303	0.869	24.34	2.508	18.504	3.377	-15.127	-423.72											
H <sub>2</sub>	2.016	62.210	28.365	57.22	40.167	5.540	11.17	15.991	44.566	21.431	-22.845	-46.05						400 EP	78.6	9.328	98.0	9.141	
CO <sub>2</sub>	44.010	2.173	0.991	43.61	31.430	4.334	190.74	12.505	13.496	16.839	3.343	147.13	8.735					400-550	12.4	1.472	91.4	1.345	
N <sub>2</sub>	28.016	0.087	0.040	1.12	1.210	0.187	4.68	0.481	0.521	0.648								550 +	9.0	1.068	114.6	1.224	
CH <sub>4</sub>	16.042	0.473	0.216	3.47	10.343	1.426	22.88	4.115	4.331	5.641	1.210	19.41	1.152										
C <sub>2</sub> H <sub>6</sub>	28.082				2.350	0.321	9.00	0.927	0.927	1.248	0.321	9.00	0.534										
C <sub>3</sub> H <sub>8</sub>	30.028				1.040	0.143	4.30	0.414	0.414	0.557	0.143	4.30	0.255						PROPYLENE	47.0	7.55		
C <sub>4</sub> +C <sub>5</sub>												32.71	1.941						C <sub>3</sub> POLY GASO.	87.5	6.61	1.105	
C <sub>2</sub> H <sub>4</sub>	42.078				2.773	0.382	16.07	1.103	1.103	1.485	0.382	16.07	0.954	4.32	3.720	0.221			C <sub>3</sub> POLY TAR	12.5	0.94	0.125	
C <sub>3</sub> H <sub>6</sub>	44.094				0.290	0.040	1.76	0.115	0.115	0.155	0.040	1.76	0.104	4.24	0.415	0.025							
C <sub>4</sub> H <sub>10</sub>	56.104				2.027	0.280	15.71	0.806	0.806	1.086	0.280	15.71	0.933	5.00	3.142	0.187							
C <sub>5</sub> H <sub>12</sub>	58.120				0.580	0.080	4.65	0.231	0.231	0.311	0.080	4.65	0.276	4.86	0.957	0.057			C <sub>4</sub> H <sub>8</sub>	5.00	1.46	0.292	68.0
C <sub>6</sub> H <sub>14</sub>	70.130				1.000	0.138	9.68	0.398	0.398	0.536	0.138	9.68	0.575	5.45	1.776	0.105			C <sub>4</sub> POLY GASO.	5.98	14.25	2.085	1.5
C <sub>7</sub> H <sub>16</sub>	72.142				0.220	0.030	2.16	0.088	0.088	0.118	0.030	2.16	0.128	5.25	0.411	0.024			C <sub>4</sub> H <sub>10</sub>	4.86	4.65	0.957	68.0
C <sub>8</sub> H <sub>18</sub>	84.152				0.287	0.040	3.37	0.114	0.114	0.154	0.040	3.37	0.200	5.54	0.608	0.036			C <sub>4</sub> FREE GASO.			13.041	5.8
C <sub>9</sub> +C <sub>10</sub>												53.40	3.170		11.029	0.655			C <sub>4</sub> POLY TAR	7.58	1.78	0.237	
TOTAL		45.628	553.48		13.790	320.51	39.786	85.414	62.259														
H <sub>2</sub> +CO		97.267	44.381	16843	SCPH	6.409		18.489	62.870	24.808	-37.972												
H <sub>2</sub> /CO		1.77		Factor	593718	6.38		6.38	2.40	6.38	1.51												
Weight Recovery, %	98.77	Catalyst Age, hrs.		134	Space Velocity, v/hv	1596	RECOVERED OIL	0.540**	75.69	4.494	11.868	0.705	GAS OIL		1.345	0.080	434						
Pressure, psig	416	Inlet Velocity, Ft/sec		1.02	Catalyst Vol., CP	10.55	TOTAL OIL	129.09	7.664	22.897	1.359	FUEL OIL		1.224	0.073	396							
Temperature, °F	678	Bed Depth, Ft		15.99	Weight, #	1393	WATER SOLUBLE CHEMICALS	0.302**	16.01	0.951	2.032	0.121	POLY TAR		0.362	0.021	114						
Recycle Ratio	0.87	Bed Density, #/CF		132	Effluent (H <sub>2</sub> )(CO <sub>2</sub> ) Shift Ratio (H <sub>2</sub> O)(CO)	13.63	TOTAL LIQUID PRODUCTS C <sub>4</sub> +	145.10	8.615	24.929	1.480	TOTAL		19.306	1.146	6214							
FRESH FEED CONVERSION — %				TOTAL FEED CONVERSION — %				SELECTIVITY		NET WATER		7.841**	141.27	8.387	16.959	1.007	W. S. CHEM.		2.032	0.121	656		
Contraction	CO	H <sub>2</sub>	H <sub>2</sub> +CO	CO	H <sub>2</sub>	CO+H <sub>2</sub>	C <sub>3</sub> +C <sub>4</sub> +	GROSS WATER		157.28	9.338	18.991	1.128	TOTAL		21.338	1.267	6870					
69.78	94.57	80.48	85.56	81.75	51.49	60.40	81.60	HYDROCARBON TOTAL—C <sub>4</sub> +		177.81	10.557												

Form ML-11

\*\*Included in Reactor Effluent Total

g/NCM = 16.91 X #/MCF

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

THE TEXAS COMPANY — MONTEBELLO LABORATORY  
DATA SUMMARY

RUN NO. 59-G  
HOURS 130-154

OPERATING CONDITIONS				PRODUCT TESTS			CATALYST DATA					
PRESSURES PSIG		RATES S.C.F.H.		OIL		WATER		INVENTORY DATA			PARTICLE SIZE	
Oxygen	444	Fresh Feed	17351	* API	50.2	10.7	In Reactor at Start of Period			Screen Analysis		
Natural Gas	440	Recycle	15156	Neut. No.	29.9	25.9	Fresh Catalyst Added			Mesh	Microns	
Generator Outlet	424	Combined Feed	32507	Sap. No.	45.9	33.8	Total			On 40	419+	
Reactor Inlet	416	Wet Gas—Measured	5440	Hydrox. No.			Catalyst Recovered			100	150	
Condenser Inlet		Adjusted	5611	Bromine No.	95		In Reactor at End of Period			150	105	
Product Accumulator	372	Loss	171	Pour °F.	below -40		REACTOR d-p. Inches H <sub>2</sub> O			200	74	
				Chemicals, % by K <sub>2</sub> CO <sub>3</sub>	10.7		No. Height			250	62	
							0 See Period A			325	44	
TEMPERATURES — °F.		Recycle/Fresh Feed	0.87				CATALYST			<325	1.2	
Oxygen	322	Inlet Velocity—ft./sec.	1.02	HEMPEL, DIST. %		°API	1			68		
Natural Gas	305	Fresh Feed Rate—S.C.F.H. H <sub>2</sub> + CO	16243	205 °F.			2			68	Bulk Density, Lbs./Cu.Ft.	
Generator	-	per Cu.Ft. Dense Bed	1705	400	77.6	55.0	3			66	Aerated	
Quench Accumulator	196	per Lb. Catalyst	12.82	400-550	12.4	34.4	4			135	Settled	
Reactor Inlet	152	per Sq. Ft.	25520	550+	10.0		Total			383	Compacted	
Condenser Inlet	572										Particle Density, gm./cc.	
Product Accumulator	91	Heat Transfer Calculations					CALCULATED FROM dp				4.44	
Catalyst No.	Height	Steam Rate = 328 #/hr.		A. S. T. M. DIST. ON			Density, Lbs./Cu.Ft.			133	NH <sub>3</sub> Value, ml./gm.	
1	See Period A	@694 psia & 514 °P =		Naphtha °F.			Inventory, Lbs.			1314	N <sub>2</sub> Surface, m <sup>2</sup> /gm.	
2	670	1199 Btu/#		IBP	104		Bed Depth, Ft.			14.97	CHEMICAL ANALYSIS	
3	686	Water in @66.9 °F. = 34.9 Btu/#		10%	134		Vol., Cu. Ft.			9.88	Fe	
4	661	Net Btu/# steam = 1164 Btu		50%	226						C	
5	693	(1164)(328) = 381,792 Btu/hr.		90%	350						O	
6	690	Ave. Bed Temp. = 166 °P.		EP	396						H	
7	663	dT = 680-514 = 166 °P.		Rec.	97.0						K <sub>2</sub> O, W+, % basis Fe	
8	649	Tube Area = 27.2 sq. ft.									X-Ray Analysis—	
9	651	K = $\frac{381,792}{(27.2)(166)} =$									Fe <sub>2</sub> O <sub>3</sub>	
10	647	84.6 Btu/°P./sq. ft.									Fe <sub>3</sub> O <sub>4</sub>	
11	629										Fe	

THE TEXAS COMPANY — MONTEBELLO LABORATORY  
YIELD CALCULATIONS

RUN NO. 59-G  
HOURS 134-158  
CATALYST Spent CM&S

FRESH FEED				WET GAS				RECYCLE		COMBINED FEED		EFFLUENT		NET CHANGE		YIELD BASIS H <sub>2</sub> + CO FED			
%		m/hr		#/hr		%		At Wt. Balance		m/hr		m/hr		m/hr		CONDENSATE		YIELDS BASIS BROWNSVILLE DESIGN FEED RATE*	
								m/hr		m/hr		m/hr		m/hr		#/MCF		CORRECTED HEMPEL, %	
CO	34.993	15.999	448.14	7.373	1.090	30.53	2.945	18.944	4.035	-14.909	-417.61								
H <sub>2</sub>	62.080	28.384	57.22	41.084	6.075	12.25	16.407	44.791	22.482	-22.509	-44.97								
CO <sub>2</sub>	2.353	1.076	47.36	31.370	4.638	204.10	12.528	13.604	17.166	3.562	156.74	9.306							
N <sub>2</sub>	0.077	0.035	0.98	1.270	0.188	5.27	0.507	0.542	0.695										
CH <sub>4</sub>	0.497	0.227	4.64	9.660	1.428	22.91	3.856	4.085	5.286	1.201	18.27	1.085							
C <sub>2</sub> H <sub>6</sub>				2.013	0.298	8.36	0.804	0.804	1.102	0.298	8.36	0.496							
C <sub>3</sub> H <sub>8</sub>				0.970	0.143	4.30	0.387	0.387	0.530	0.143	4.30	0.255							
C <sub>4</sub> +C <sub>5</sub>																			
C <sub>2</sub> H <sub>4</sub>				2.533	0.375	15.78	1.012	1.012	1.387	0.375	15.78	0.937	4.32	3.653	0.217				
C <sub>3</sub> H <sub>6</sub>				0.267	0.039	1.72	0.107	0.107	0.146	0.039	1.72	0.102	4.24	0.406	0.024				
C <sub>4</sub> H <sub>10</sub>				1.790	0.265	14.88	0.715	0.715	0.980	0.265	14.88	0.983	8.00	2.976	0.177				
C <sub>5</sub> H <sub>12</sub>				0.447	0.066	3.84	0.179	0.179	0.245	0.066	3.84	0.228	4.86	0.790	0.047				
C <sub>6</sub> +C <sub>7</sub>				0.960	0.127	8.91	0.343	0.343	0.470	0.127	8.91	0.529	8.48	1.635	0.097				
C <sub>8</sub> +C <sub>9</sub>				0.160	0.024	1.73	0.064	0.064	0.088	0.024	1.73	0.103	8.28	0.330	0.020				
C <sub>10</sub> +C <sub>11</sub>				0.203	0.030	2.52	0.081	0.081	0.111	0.030	2.52	0.150	5.84	0.455	0.027				
TOTAL		45.721	557.34		14.786	337.10	39.937	85.658	63.002										
H <sub>2</sub> +CO	97.073	44.383	16843136	SCFH	7.165		19.352	63.735	26.517	-37.218									
H <sub>2</sub> /CO		1.77	Factor	5937136	5.57		5.57	2.36	5.57	1.50									
Weight Recovery, %	98.15	Catalyst Age, hrs.	158	Space Velocity, v <sub>h</sub>	1705	RECOVERED OIL	0.498**	69.90	4.150	10.693	0.635								
Pressure, psig	416	Inlet Velocity, Ft/sec	1.02	Catalyst Vol., CF	9.88	TOTAL OIL		119.28	7.082	20.938	1.244								
Temperature, °F	680	Bed Depth, Ft	14.97	Weight, #	1314	WATER SOLUBLE CHEMICALS	0.290**	15.39	0.914	1.941	0.115								
Recycle Ratio	0.87	Bed Density, #/CF	133	Effluent (H <sub>2</sub> /CO) Shift Ratio (H <sub>2</sub> O)/CO	12.77	TOTAL LIQUID PRODUCTS C <sub>2</sub> +		134.67	7.996	22.879	1.359								
FRESH FEED CONVERSION — %				TOTAL FEED CONVERSION — %				SELECTIVITY				NET WATER							
Contraction	CO	H <sub>2</sub>	H <sub>2</sub> +CO	CO	H <sub>2</sub>	CO+H <sub>2</sub>	C <sub>3</sub> +C <sub>4</sub> +	GROSS WATER											
67.66	93.19	78.60	83.86	78.70	49.81	58.39	81.32	HYDROCARBON TOTAL—C <sub>1</sub> +	160.34	8.926	18.141	1.077							
									165.80	9.832									

Form ML-11

\*\*Included in Reactor Effluent Total

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





THE TEXAS COMPANY — MONTEBELLO LABORATORY  
YIELD CALCULATIONS

RUN NO. 59-J  
HOURS 206-230  
CATALYST Spent CM&S

FRESH FEED				WET GAS				RECYCLE	COMBINED FEED	EFFLUENT	NET CHANGE	YIELD BASIS H <sub>2</sub> + CO FED											
	%	m/hr	#/hr	%	At Wt. Balance		m/hr	m/hr	m/hr	m/hr	#/hr	CONDENSATE				YIELDS BASIS BROWNSVILLE DESIGN FEED RATE*							
					m/hr	#/hr						#/MCF	gal	gal/hr	gal/MCF		CORRECTED HEMPEL, %	gal/hr	TREATING RECOVERY, %	gal/hr			
CO	37.477	16.399	459.35	6.420	0.965	27.03	2,504	18,903	3,469	-15,434	-432.30							400 EP	73.0	8,339	98.0	8,172	
H <sub>2</sub>	58.500	25.598	51.60	37.350	5.616	11.32	14,565	40,163	20,181	-19,982	-40.28							400-550	14.0	1,599	91.4	1,461	
CO <sub>2</sub>	2.433	1.065	46.87	31.255	4.697	206.72	12,188	13,253	16,985	3,632	159.85	10.030						550 +	13.0	1,485	114.6	1,702	
N <sub>2</sub>	0.150	0.066	1.85	2.280	0.343	9.61	0.889	0.955	1,232														
CH <sub>4</sub>	1.440	0.630	10.10	13.360	2.008	32.21	5,210	5,840	7,218	1,378	22.11	1,387											
C <sub>2</sub> H <sub>6</sub>				2.590	0.389	10.91	1,010	1,010	1,399	0.389	10.91	0.685						RECOVERY %	#/hr	gal/hr			
C <sub>3</sub> H <sub>8</sub>				0.875	0.132	3.97	0.341	0.341	0.473	0.132	3.97	0.249						PROPYLENE	41.2	5.69			
C <sub>4</sub> +C <sub>5</sub>											36.99	2,321						C <sub>3</sub> POLY GAS.	87.5	4.98	0.833		
C <sub>2</sub> H <sub>4</sub>				2.180	0.328	13.80	0.850	0.850	1,178	0.328	13.80	0.866	4.32	3,194	0.200			C <sub>3</sub> POLY TAR	12.5	0.71	0.094		
C <sub>2</sub> H <sub>2</sub>				0.200	0.030	1.32	0.078	0.078	0.108	0.030	1.32	0.083	4.24	0.311	0.020								
C <sub>2</sub> H <sub>2</sub>				1.555	0.234	13.13	0.606	0.606	0.840	0.234	13.13	0.824	8.00	2,626	0.165			#/gal	#/hr	gal/hr	RVP		
C <sub>3</sub> H <sub>6</sub>				0.630	0.095	5.52	0.246	0.246	0.341	0.095	5.52	0.346	4.86	1,136	0.071			C <sub>4</sub> H <sub>8</sub>	5.00	-	-	68.0	
C <sub>4</sub> H <sub>10</sub>				0.795	0.120	8.42	0.310	0.310	0.430	0.120	8.42	0.528	8.48	1,545	0.097			C <sub>4</sub> POLY GAS.	5.98	11.49	1,921	1.5	
C <sub>5</sub> H <sub>12</sub>				0.225	0.034	2.45	0.088	0.088	0.122	0.034	2.45	0.154	5.25	0,467	0,029			C <sub>4</sub> POLY GAS.	4.86	(5.52)	(1,136)	68.0	
C <sub>6</sub> H <sub>14</sub>				0.285	0.043	3.62	0.111	0.111	0.154	0.043	3.62	0.227	5.54	0,653	0,041			C <sub>4</sub> -FREE GAS.			11,870	5.8	
C <sub>3</sub> -C <sub>6</sub>											48.26	3,028		9,932	0,623			C <sub>4</sub> POLY TAR	7.58	1.64	0,218		
TOTAL		43,758	569.75		15,034	350.03	38,996	82,754	62,046														
H <sub>2</sub> +CO	95.977	41.997	1593794	SCFH	6.581		17,069	59,066	23,650	-35,416									gal/hr	gal/MCF	Bbl/Day		
H <sub>2</sub> /CO		1.56	Factor	627433	5.82		5.82	2.12	5.82	1.29									10 # RVP 400 EP GASOLINE	14,718	0,9235	5007	
Weight Recovery, %	96.97	Catalyst Age, hrs.	230	Space Velocity, vhw	2404	RECOVERED OIL	0,530**	74.33	4,664	11,423	0,717							GAS OIL	1,461	0,0917	497		
Pressure, psig	402	Inlet Velocity, Ft/sec	1.03	Catalyst Vol., CF	7.21	TOTAL OIL		122.59	7,692	21,355	1,340							FUEL OIL	1,702	0,1068	579		
Temperature, °F	700	Bed Depth, Ft	10.93	Weight, #	765	WATER SOLUBLE CHEMICALS	0,301**	15.95	1,001	1,980	0,124							POLY TAR	0,312	0,0196	106		
Recycle Ratio	0.89	Bed Density, #/CF	116	Effluent (H <sub>2</sub> )(CO) Shift Ratio (H <sub>2</sub> O)(CO)	= 13.67	TOTAL LIQUID PRODUCTS C <sub>3</sub> +		138.54	8,693	23,335	1,464							TOTAL	18,193	1,1416	6189		
FRESH FEED CONVERSION - %				TOTAL FEED CONVERSION - %				SELECTIVITY	NET WATER	7,185**	129.44	8,121	15,539	0,975				W S CHEM.	1,980	0,1242	673		
Contraction	CO	H <sub>2</sub>	H <sub>2</sub> +CO	CO	H <sub>2</sub>	CO+H <sub>2</sub>	C <sub>3</sub> +C <sub>4</sub> +	GROSS WATER HYDROCARBON TOTAL - C <sub>3</sub> +		145.39	9,122	17,519	1,099					TOTAL	20,173	1,2658	6862		
65.64	94.12	78.06	84.33	81.65	49.75	59.96	78.93			175.53	11,014												

Form ML-11

\*\*Included in Reactor Effluent Total

g/NCM = 16.91 X #/MCF 99488 MCF H<sub>2</sub> + CO, Bbl/Day = 5421.6 X gal/MCF

THE TEXAS COMPANY — MONTEBELLO LABORATORY  
DATA SUMMARY

RUN NO. 59-J  
HOURS 206-230

OPERATING CONDITIONS				PRODUCT TESTS				CATALYST DATA			
PRESSURES PSIG		RATES S.C.F.H.		OIL		WATER		INVENTORY DATA		PARTICLE SIZE	
Oxygen	429	Fresh Feed	16606	*API	49.3	10.5		In Reactor at Start of Period		Screen Analysis	Sedimentation
Natural Gas	427	Recycle	14799	Neut. No.	28.1	28.2		Fresh Catalyst Added		Mesh	Microns
Generator Outlet	410	Combined Feed	31405	Sap. No.	45.2	37.7		Total		On 40	419+
Reactor Inlet	402	Wet Gas—Measured	5424	Hydrox. No.				Catalyst Recovered	100	100	150
Condenser Inlet		Adjusted	5706	Bromine No.	89			In Reactor at End of Period		150	105
Product Accumulator	374	Loss	282	Pour °F.	below -35°					200	74
				Chemicals, % by K <sub>2</sub> CO <sub>3</sub>		11.3		REACTOR d-p, Inches H <sub>2</sub> O		250	62
								No. Height		325	44
TEMPERATURES—°F.		Recycle/Fresh Feed	0.89					0 See Period A	39	<325	0.9
Oxygen	331	Inlet Velocity—ft./sec.	1.03						56	CATALYST	
Natural Gas	322	Fresh Feed Rate—S.C.F.H.	15938	HEMPEL, DIST. %		°API			55	Bulk Density, Lbs./Cu.Ft.	
Generator	--	per Cu.Ft. Dense Bed	2404	205 °F.					50	Aerated	
Quench Accumulator	148	per Lb. Catalyst	20.73	400	72.0	53.8			24	Settled	
Reactor Inlet	120	per Sq. Ft.	24148	400-550	14.0	35.9		Total	224	Compacted	
Condenser Inlet	580			550+	14.0					Particle Density, gm./cc.	
Product Accumulator	92	Heat Transfer Calculations						CALCULATED FROM dp		NH <sub>3</sub> Value, ml./gm.	
Catalyst No.	Height	Steam Rate = 316#/hr		A. S. T. M. DIST. ON				Density, Lbs./Cu.Ft.	116	N <sub>2</sub> Surface, m <sup>2</sup> /gm.	
1 See Period A	621	@ 728 psia & 489°F		Naphtha °F.				Inventory, Lbs.	769		
2	701	1203 BTU/#		IBP	106			Bed Depth, Ft.	10.04	CHEMICAL ANALYSIS	
3	708	Water In @ 70.6°F = 39°F		10%	146			Vol., Cu. Ft.	6.63	Fe	
4	680	Net BTU/# steam = 1164		50%	236					C	
5	714	1164 x 316 = 367824		90%	356					O	
6	698	Ave. Bed Temp = 700°F		EP	392					H	
7	676	dT = 700-489=211°F		Rec.	97.0					K <sub>2</sub> O, W+, % basis Fe	
8	665	Tube Area = 19.7 sq ft								X-Ray Analysis—	
9	667									Fe <sub>2</sub> O <sub>3</sub>	
10	660	K = 387824 / (19.7)(211) = 88.5 BTU/°F/sq ft								Fe <sub>3</sub> O <sub>4</sub>	
11	637									Fe	



THE TEXAS COMPANY — MONTEBELLO LABORATORY  
YIELD CALCULATIONS

RUN NO. 59-L  
HOURS 254-267  
CATALYST

	FRESH FEED				WET GAS			RECYCLE	COMBINED FEED	EFFLUENT	NET CHANGE		YIELD BASIS H <sub>2</sub> + CO FED								
	%	m/hr	#/hr	%	At. Wt. Balance	m/hr	#/hr				#/MCF	gal/hr	gal/MCF	YIELDS	BASIS	BROWNSVILLE	DESIGN	FEED RATE*			
CO <sub>20.010</sub>	36.437	14.514	406.54	9.360	1.110	31.08	3.945	18.459	5.055	-13.404	-375.48										
H <sub>2</sub> <sub>28.016</sub>	60.180	23.972	48.33	34.040	4.036	8.13	14.348	38.320	18.384	-19.936	-40.20				400 EP	71.9	7.889	98.0	7.731		
CO <sub>44.010</sub>	2.463	0.981	43.17	32.826	3.991	171.23	13.836	14.817	17.727	2.910	128.06	8.768			400-550	12.8	1.404	91.4	1.283		
N <sub>2</sub> <sub>28.016</sub>	0.107	0.043	1.20	1.457	0.173	4.85	0.614	0.657	0.787						550 +	15.3	1.679	114.6	1.924		
CH <sub>4</sub> <sub>16.042</sub>	0.913	0.324	5.20	11.660	1.382	22.17	4.914	5.238	6.296	1.058	16.97	1.162									
C <sub>2</sub> H <sub>6</sub> <sub>28.058</sub>				2.557	0.303	8.50	1.078	1.078	1.381	0.303	8.50	0.582									
C <sub>3</sub> H <sub>8</sub> <sub>38.048</sub>				1.427	0.169	5.08	0.601	0.601	0.770	0.169	5.08	0.348			PROPYLENE	48.0	6.24				
C <sub>4</sub> +C <sub>2</sub>											30.55	2.092			C <sub>3</sub> POLY GASO.	87.5	5.46	0.913			
C <sub>2</sub> H <sub>4</sub> <sub>42.078</sub>				2.610	0.309	13.00	1.100	1.100	1.409	0.309	13.00	0.890	4.32	3.009	0.206	C <sub>3</sub> POLY TAR	12.5	0.78	0.104		
C <sub>2</sub> H <sub>2</sub> <sub>44.024</sub>				0.313	0.037	1.63	0.132	0.132	0.169	0.037	1.63	0.112	4.24	0.384	0.026						
C <sub>2</sub> H <sub>2</sub> <sub>54.104</sub>				1.753	0.208	11.67	0.739	0.739	0.947	0.208	11.67	0.799	5.00	2.334	0.160						
C <sub>2</sub> H <sub>2</sub> <sub>58.120</sub>				0.733	0.087	5.05	0.309	0.309	0.396	0.087	5.05	0.346	4.86	1.039	0.071	C <sub>4</sub> H <sub>6</sub>	5.00	-	-	68.0	
C <sub>2</sub> H <sub>2</sub> <sub>70.130</sub>				0.940	0.100	7.01	0.354	0.354	0.454	0.100	7.01	0.480	5.48	1.286	0.088	C <sub>4</sub> POLY GASO.	5.98	10.21	1.708	1.5	
C <sub>2</sub> H <sub>2</sub> <sub>72.144</sub>				0.207	0.025	1.80	0.087	0.087	0.112	0.025	1.80	0.123	5.25	0.343	0.023	C <sub>4</sub> H <sub>10</sub>	4.86	(5.05) 4.97	(1.039) 1.025	68.0	
C <sub>2</sub> H <sub>2</sub> <sub>84.152</sub>				0.217	0.026	2.19	0.091	0.091	0.117	0.026	2.19	0.150	5.54	0.395	0.027	C <sub>4</sub> FREE GASO.				10.668	
C <sub>2</sub> -C <sub>6</sub>													42.35	2.900	8.790	0.601	C <sub>4</sub> POLY TAR	7.53	1.46	0.194	
TOTAL		39.834	504.44		11.856	293.39	42.148	81.982	61.717												
H <sub>2</sub> +CO	96.617	38.486	1460559	SCFH	5.146		18.293	56.779	23.439	-33.340						gal/hr	gal/MCF	Bbl/Day			
H <sub>2</sub> /CO		1.65	Factor	684669	3.64		3.64	2.08	3.64	1.49						10 # RVP 400 EP GASOLINE	13.399	0.9174	4974		
Weight Recovery, %	97.98	Catalyst Age, hrs.		Space Velocity, v/v	1586		RECOVERED OIL	0.502**	70.47	4.825	10.972	0.751			GAS OIL	1.283	0.0878	476			
Pressure, psig	410	Inlet Velocity, Ft/sec	0.97	Catalyst, Vol., CF	9.21		TOTAL OIL		112.82	7.725	19.762	1.352			FUEL OIL	1.924	0.1317	714			
Temperature, °F	657	Bed Depth, Ft	13.95	Weight, #	1225		WATER SOLUBLE CHEMICALS	0.304**	16.15	1.106	2.037	0.139			POLY TAR	0.298	0.0204	111			
Recycle Ratio	1.06	Bed Density, #/CF	133	Effluent (H <sub>2</sub> )(CO) Shift Ratio (H <sub>2</sub> )(CO)	9.33		TOTAL LIQUID PRODUCTS C <sub>4</sub> +		128.97	8.831	21.799	1.491			TOTAL	16.904	1.1573	6275			
FRESH FEED CONVERSION — %		TOTAL FEED CONVERSION — %		SELECTIVITY			NET WATER	6.907**	124.43	8.519	14.937	1.023			W. S. CHEM.	2.037	0.1395	756			
Contraction	CO	H <sub>2</sub>	H <sub>2</sub> +CO	CO	H <sub>2</sub>	CO+H <sub>2</sub>	C <sub>2</sub> +C <sub>4</sub> +	GROSS WATER			140.58	9.625	16.974	1.162	TOTAL	18.941	1.2968	7031			
70.24	92.35	83.16	86.63	72.61	52.03	58.72	80.85	HYDROCARBON TOTAL—C <sub>4</sub> +			159.52	10.923									

Form ML-11      \*\*Included in Reactor Effluent Total      R/NCM = 16.91 X #/MCF      \*9488 MCFH<sub>2</sub> + CO, Bbl/Day = 5421.6 X gal/MCF

THE TEXAS COMPANY — MONTEBELLO LABORATORY  
DATA SUMMARY

RUN NO. 59-L  
HOURS 254-267

OPERATING CONDITIONS				PRODUCT TESTS				CATALYST DATA			
PRESSURES PSIG		RATES S.C.F.H.		OIL		WATER		INVENTORY DATA		PARTICLE SIZE	
Oxygen	435	Fresh Feed	15117	° API	10.8	51.9		In Reactor at Start of Period		Screen Analysis	Sedimentation
Natural Gas	435	Recycle	15995	Neut. No.	29.2	25.8		Fresh Catalyst Added	307	Mesh	Microns %
Generator Outlet	417	Combined Feed	31112	Sap. No.	47.8	35.0		Total		On 40	419+ 36.1
Reactor Inlet	410	Wet Gas—Measured	4343	Hydrox. No.				Catalyst Recovered	52	100	150 41.7
Condenser Inlet		Adjusted	4499	Bromine No.	89			In Reactor at End of Period		150	105 8.3
Product Accumulator	375	Loss	156	Pour °F.	below -40					200	74 6.5
				Chemicals, % by K <sub>2</sub> CO <sub>3</sub>		12.0		REACTOR d-p, Inches H <sub>2</sub> O		250	62 2.0
								No. Height		325	44 3.6
TEMPERATURES — °F.		Recycle/Fresh Feed	1.06					0 See Period A	46	<325	1.8
Oxygen	300	Inlet Velocity—ft./sec.	0.97					1	66	CATALYST	
Natural Gas	334	Fresh Feed Rate—S.C.F.H.	14606	HEMPEL, DIST. %				2	68	Bulk Density, Lbs./Cu.Ft.	
Generator		per Cu. Ft. Dense Bed	1586	205 °F.		°API		3	67	Aerated	
Quench Accumulator	138	per Lb. Catalyst	11.92	400	70.9	54.6		4	156	Settled	
Reactor Inlet	208	per Sq. Ft.	22130	400-550	12.8	36.8		Total	357	Compacted	
Condenser Inlet	549			550+	16.3					Particle Density, gm./cc.	
Product Accumulator	87	Heat Transfer Calculations						CALCULATED FROM dp		NH <sub>3</sub> Value, ml./gm.	
Catalyst No.	Height	Steam Rate = 359#/hr		A. S. T. M. DIST. ON				Density, Lbs./Cu.Ft.	133	N <sub>2</sub> Surface, m <sup>2</sup> /gm.	
1 See Period A	617	@ 707 psia & 505 °F		Naphtha °F.				Inventory, Lbs.	1225		
2	654	1201 BTU/#		IBP	104			Bed Depth, Ft.	13.95	CHEMICAL ANALYSIS	
3	660	Water in @ 59.1=27.1		10%	140			Vol., Cu. Ft.	9.21	Fe	
4	642	Net BTU/# steam=1174		50%	224					C	
5	666	1174x359=421466		90%	348					O	
6	667	Ave. Bed Temp.=657 °F		EP	392					H	
7	653	dT=657-505=152 °F		Rec.	97.5					K <sub>2</sub> O, W+, % basis Fe	
8	633	Tube Area=25.4 sq ft								X-Ray Analysis—	
9	629									Fe <sub>2</sub> O <sub>3</sub>	
10	626	K=421466/(25.4)(152) = 110.7 BTU/°F/sq ft								Fe <sub>3</sub> O <sub>4</sub>	
11	599									Fe	

THE TEXAS COMPANY — MONTEBELLO LABORATORY  
YIELD CALCULATIONS

RUN NO. 59-M  
HOURS 267-291  
CATALYST

FRESH FEED				WET GAS				RECYCLE	COMBINED FEED	EFFLUENT	NET CHANGE		YIELD BASIS H <sub>2</sub> + CO FED							
%	m/hr	#/hr	%	At Wt. Balance		m/hr	m/hr	m/hr	m/hr	m/hr	#/hr	CONDENSATE								
				m/hr	#/hr						#/MCF	#/gal	gal/hr	gal/MCF	YIELDS	BASIS	BROWNSVILLE	DESIGN	FEED RATE*	
CO	37.333	14.247	399.07	7.840	0.872	24.42	3.226	17.473	4.098	-13.375	-374.65									
H <sub>2</sub>	59.107	22.556	45.47	31.484	3.503	7.06	12.957	35.513	16.460	-19.053	-38.41				400 EP	72.0	7.182	98.0	7.038	
CO <sub>2</sub>	2.627	1.002	44.10	34.267	3.812	167.78	14.101	15.103	17.913	2.810	123.68	8.856			400-550	14.4	1.436	91.4	1.313	
N <sub>2</sub>	0.063	0.024	0.67	1.863	0.207	5.80	0.767	0.791	0.974						550 +	13.6	1.357	114.6	1.555	
CH <sub>4</sub>	0.970	0.332	5.33	11.953	1.330	21.34	4.919	5.251	6.249	0.998	16.01	1.146								
C <sub>2</sub> H <sub>6</sub>				2.850	0.317	8.89	1.173	1.173	1.490	0.317	8.89	0.637								
C <sub>3</sub> H <sub>8</sub>				1.610	0.179	5.38	0.663	0.663	0.842	0.179	5.38	0.385			PROPYLENE	49.2	7.72			
C <sub>4</sub> +C <sub>2</sub>											30.28	2.168			C <sub>3</sub> POLY GAS.	87.5	6.75	1.129		
C <sub>2</sub> H <sub>4</sub>				3.353	0.373	15.70	1.380	1.380	1.753	0.373	15.70	1.124	4.32	3.634	0.260					
C <sub>2</sub> H <sub>2</sub>				0.400	0.045	1.98	0.165	0.165	0.210	0.045	1.98	0.142	4.24	0.467	0.033					
C <sub>2</sub> H <sub>2</sub>				2.257	0.251	14.08	0.929	0.929	1.180	0.251	14.08	1.008	5.00	2.816	0.202					
C <sub>2</sub> H <sub>10</sub>				0.687	0.076	4.42	0.283	0.283	0.359	0.076	4.42	0.316	4.88	0.909	0.065	C <sub>2</sub> H <sub>6</sub>	5.00	0.63	0.126	68.0
C <sub>2</sub> H <sub>10</sub>				1.013	0.113	7.92	0.417	0.417	0.530	0.113	7.92	0.567	5.48	1.453	0.104	C <sub>2</sub> POLY GAS.	5.98	11.77	1.968	1.5
C <sub>2</sub> H <sub>12</sub>				0.210	0.023	1.66	0.086	0.086	0.109	0.023	1.66	0.119	5.28	0.316	0.023	C <sub>2</sub> H <sub>10</sub>	4.86	4.42	0.909	68.0
C <sub>2</sub> H <sub>12</sub>				0.213	0.024	2.02	0.088	0.088	0.112	0.024	2.02	0.145	5.54	0.365	0.026	C <sub>2</sub> -FREE GAS.				10.301
C <sub>2</sub> -C <sub>2</sub>											47.78	3.421		9.960	0.713	C <sub>2</sub> POLY TAR	7.53	1.68	0.223	
TOTAL		38.166	494.64		11.125	288.45	41.154	79.320	60.042											
H <sub>2</sub> +CO	96.440	36.803	1396644	SCFH	4.375		16.183	52.986	20.558	-32.428										
H <sub>2</sub> /CO		1.58	Factor	716002	4.02		4.02	2.03	4.02	1.42										
Weight Recovery, %	97.95	Catalyst Age, hrs.		Space Velocity, v/v	1073		RECOVERED OIL	0.454**	63.70	4.561		9.975	0.714		GAS OIL	1.313	0.0940	510		
Pressure, psig	417	Inlet Velocity, Ft/sec	0.92	Catalyst Vol., CF	13.01		TOTAL OIL		111.48	7.982		19.935	1.427		FUEL OIL	1.555	0.1113	603		
Temperature, °F	650	Bed Depth, Ft	19.71	Weight, #	1795		WATER SOLUBLE CHEMICALS	0.309**	16.37	1.172		2.065	0.148		POLY TAR	0.352	0.0252	137		
Recycle Ratio	1.08	Bed Density, #/CF	138	Effluent (H <sub>2</sub> )/CO <sub>2</sub> Shift Ratio (H <sub>2</sub> O)/CO	10.28		TOTAL LIQUID PRODUCTS C <sub>2</sub> +		127.85	9.154		22.000	1.575		TOTAL	16.524	1.1831	6415		
FRESH FEED CONVERSION - %				TOTAL FEED CONVERSION - %				SELECTIVITY				NET WATER								
Contraction	CO	H <sub>2</sub>	H <sub>2</sub> +CO	CO	H <sub>2</sub>	CO+H <sub>2</sub>	C <sub>2</sub> +C <sub>2</sub>	GROSS WATER HYDROCARBON TOTAL - C <sub>2</sub> +				TOTAL								
70.85	93.88	84.47	88.11	76.55	53.65	61.20	80.85	142.49	10.202	17.205	1.232	158.13	11.322							

Form ML-11

\*\*Included in Reactor Effluent Total

g/NCM = 16.91 x #/MCF

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

THE TEXAS COMPANY — MONTEBELLO LABORATORY  
DATA SUMMARY

RUN NO. 59-M  
HOURS 267-291

OPERATING CONDITIONS				PRODUCT TESTS				CATALYST DATA			
PRESSURES PSIG		RATES S.C.F.H.		OIL		WATER		INVENTORY DATA		PARTICLE SIZE	
Oxygen	440	Fresh Feed	1442	°API	52.5	10.9		In Reactor at Start of Period		Screen Analysis	Sedimentation
Natural Gas	440	Recycle	15618	Neut. No.	30.2	26.8		Fresh Catalyst Added	288	Mesh	Microns
Generator Outlet	423	Combined Feed	30100	Sap. No.	49.1	35.8		Total	On 40	419+	45.8
Reactor Inlet	417	Wet Gas - Measured	4073	Hydrox. No.				Catalyst Recovered	64.3	100	150
Condenser Inlet		Adjusted	4222	Bromine No.	89			In Reactor at End of Period	150	105	7.3
Product Accumulator	373	Loss	149	Pour °F.	below -40				200	74	4.9
				Chemicals, % by K <sub>2</sub> CO <sub>3</sub>	12.0			REACTOR d-p, Inches H <sub>2</sub> O	250	62	1.0
								No. Height	325	44	1.4
TEMPERATURES - °F.		Recycle/Fresh Feed	1.08					0 See Period A	48	<325	0.4
Oxygen	303	Inlet Velocity - ft./sec.	0.92					1	68	CATALYST	
Natural Gas	331	Fresh Feed Rate - S.C.F.H.	13966	HEMPEL DIST. %		°API		2	72	Bulk Density, Lbs./Cu.Ft.	
Generator		per Cu.Ft. Dense Bed	1073	205 °F.				3	70	Aerated	
Quench Accumulator	157	per Lb. Catalyst	7.78	400	71.0	54.5		4	265	Settled	
Reactor Inlet	296	per Sq. Ft.	21161	400-550	14.4	37.1		Total	523	Compacted	
Condenser Inlet	544	Heat Transfer Calculations	550+	14.6						Particle Density, gm./cc.	
Product Accumulator	90	Steam Rate = 389#/hr						CALCULATED FROM dp			
Catalyst No.	Height	@ 705 psia & 506 °P =		A. S. T. M. DIST. ON				Density, Lbs./Cu.Ft.	138	NH <sub>3</sub> Value, ml./gm.	
1	See Period A	1201 BTU/#		Naphtha °F.				Inventory, Lbs.	1795	N <sub>2</sub> Surface, m <sup>2</sup> /gm.	
2	652	Water in @ 61.3 = 29.3		IBP	108			Bed Depth, Ft.	19.71	CHEMICAL ANALYSIS	
3	659	Net BTU/# steam = 1172		10%	144			Vol., Cu. Ft.	13.01	Fe	
4	621	1172 x 389 = 455908		50%	228					C	
5	664	Ave. Bed Temp = 650		90%	350					O	
6	663	dT = 650 - 506 = 144 °P		EP	390					H	
7	652	Tube Area = 35.7 sq ft		Rec.	97.0					K <sub>2</sub> O, W+. % basis Fe	
8	642									X-Ray Analysis -	
9	633	K = $\frac{455908}{(35.7)(144)} = 88.7$ BTU/°P/sqft								Fe <sub>2</sub> O <sub>3</sub>	
10	627									Fe <sub>2</sub> O <sub>4</sub>	
11	604									Fe	



THE TEXAS COMPANY — MONTEBELLO LABORATORY  
YIELD CALCULATIONS

RUN NO. 59-N  
HOURS 291-315  
CATALYST Spent CMS

FRESH FEED				WET GAS				RECYCLE	COMBINED FEED	EFFLUENT	NET CHANGE		YIELD BASIS H <sub>2</sub> + CO FED														
	%	m/hr	#/hr	%	At Wt. Balance		m/hr	m/hr	m/hr	m/hr	#/hr	CONDENSATE				YIELDS BASIS BROWNSVILLE DESIGN FEED RATE*											
					m/hr	#/hr						#/MCF	#/gal	gal/hr	gal/MCF		CONNECTED HEMPEL. %	gal/hr	TREATING RECOVERY, %	gal/hr							
CO	38.420	14.040	393.25	7.670	0.844	23.64	3.160	17.200	4.004	-13.196	-369.61																
H <sub>2</sub>	57.890	21.150	42.63	31.302	3.444	6.95	12.898	34.048	16.342	-17.706	-35.66						400 EP	74.7	6.803	98.0	6.471						
CO <sub>2</sub>	2.676	0.978	43.04	36.600	4.029	177.32	15.080	16.058	19.109	3.051	154.28	10.055					400-550	11.6	1.025	91.4	0.937						
N <sub>2</sub>	0.177	0.065	1.82	1.617	0.178	4.99	0.666	0.731	0.844								550 +	13.7	1.211	114.6	1.388						
CH <sub>4</sub>	0.847	0.310	4.97	11.413	1.256	20.15	4.703	5.013	5.959	0.946	15.18	1.137															
C <sub>2</sub> H <sub>6</sub>				2.747	0.302	8.47	1.132	1.132	1.434	0.302	8.47	0.634															
C <sub>3</sub> H <sub>8</sub>				1.623	0.179	5.38	0.669	0.669	0.848	0.179	5.38	0.403															
C <sub>4</sub> +C <sub>5</sub>											29.03	2.174															
C <sub>2</sub> H <sub>4</sub>				2.767	0.305	12.83	1.140	1.140	1.445	0.305	12.83	0.961	4.32	2.970	0.222												
C <sub>3</sub> H <sub>6</sub>				0.317	0.035	1.54	0.131	0.131	0.166	0.035	1.54	0.115	4.24	0.363	0.027												
C <sub>4</sub> H <sub>10</sub>				1.867	0.205	11.50	0.769	0.769	0.974	0.205	11.50	0.861	5.00	2.300	0.172												
C <sub>5</sub> H <sub>12</sub>				0.640	0.070	4.07	0.264	0.264	0.334	0.070	4.07	0.305	4.88	0.837	0.063												
C <sub>6</sub> H <sub>14</sub>				0.973	0.107	7.50	0.401	0.401	0.508	0.107	7.50	0.582	5.45	1.376	0.103												
C <sub>7</sub> H <sub>16</sub>				0.197	0.022	1.59	0.081	0.081	0.103	0.022	1.59	0.119	5.23	0.303	0.023												
C <sub>8</sub> H <sub>18</sub>				0.267	0.029	2.44	0.110	0.110	0.139	0.029	2.44	0.183	5.54	0.440	0.033												
C <sub>9</sub> +C <sub>10</sub>											41.47	3.106															
TOTAL		36.543	485.71		11.005	288.37	41.204	77.747	59.849																		
H <sub>2</sub> +CO	96.300	35.190	1335.4884	SCFH	4.288		16.058	51.248	20.346	-30.902																	
H <sub>2</sub> /CO		1.51	Factor	748789	4.08		4.08	1.98	4.08	1.34																	
Weight Recovery, %	95.71	Catalyst Age, hrs.		Space Velocity, vhr	1102		RECOVERED OIL	0.400**	56.14	4.204			8.839	0.662													
Pressure, psig	420	Inlet Velocity, Ft/sec	0.90	Catalyst Vol., CP	12.12		TOTAL OIL		97.61	7.310			17.428	1.305													
Temperature, °F	653	Bed Depth, Ft	18.36	Weight, #	1709		WATER SOLUBLE CHEMICALS	0.308**	16.32	1.222			2.044	0.153													
Recycle Ratio	1.13	Bed Density, #/CF	141	Effluent (H <sub>2</sub> )/CO	11.25		TOTAL LIQUID PRODUCTS C <sub>2</sub> +		113.93	8.532			19.472	1.468													
FRESH FEED CONVERSION — %				TOTAL FEED CONVERSION — %				SELECTIVITY		NET WATER		6.932**		124.88		9.351		14.991		1.123		W. S. CHEM. 2.044		0.1531		830	
Contraction	CO	H <sub>2</sub>	H <sub>2</sub> +CO	CO	H <sub>2</sub>	CO+H <sub>2</sub>	C <sub>3</sub> +C <sub>4</sub>	GROSS WATER			141.20		10.573		17.035		1.276		TOTAL		16.677		1.2488		6770		
69.98	93.99	83.72	87.81	76.72	52.00	60.30	79.69	HYDROCARBON TOTAL — C <sub>2</sub> +			142.96		10.706														

Form ML-11

\*\*Included in Reactor Effluent Total

g/NCM = 16.91 x g/MCF

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

THE TEXAS COMPANY — MONTEBELLO LABORATORY  
DATA SUMMARY

RUN NO. 59-N  
HOURS 291-315

OPERATING CONDITIONS				PRODUCT TESTS				CATALYST DATA					
PRESSURES PSIG		RATES S.C.F.H.		OIL		WATER		INVENTORY DATA		PARTICLE SIZE			
Oxygen	442	Fresh Feed	13868	° API	53.5	10.7	In Reactor at Start of Period		Screen Analysis		Sedimentation		
Natural Gas	441	Recycle	15637	Neut. No.	31.1	26.0	Fresh Catalyst Added		Mesh	Microns	%	Microns	%
Generator Outlet	425	Combined Feed	29505	Sap. No.	51.2	34.4	Total		On 40	419+	40.6	80+	
Reactor Inlet	420	Wet Gas — Measured	3875	Hydrox. No.			Catalyst Recovered	47	100	150	39.3	40-80	
Condenser Inlet		Adjusted	4177	Bromine No.	91		In Reactor at End of Period		150	105	8.0	20-40	
Product Accumulator	375	Loss	302	Pour °F.	below -40				200	74	6.0	10-20	
				Chemicals, % by K <sub>2</sub> CO <sub>3</sub>	12.0		REACTOR d.p. Inches H <sub>2</sub> O		250	62	3.2	0-20	
							No. Height		325	44	2.0		
TEMPERATURES — °F.		Recycle/Fresh Feed	1.13				0 See period A	49	<325		0.4		
Oxygen	345	Inlet Velocity — ft./sec.	0.90				1	70	CATALYST				
Natural Gas	307	Fresh Feed Rate — S.C.F.H.	13355	HEMPEL DIST. %		° API	2	73	Bulk Density, Lbs./Cu.Ft.				
Generator	--	per Cu. Ft. Dense Bed	1102	205 °F.			3	71	Aerated				145
Quench Accumulator	156	per Lb. Catalyst	7.81	400	73.7	54.6	4	235	Settled				146
Reactor Inlet	316	per Sq. Ft.	20235	400-550	11.6	36.2	Total	498	Compacted				169
Condenser Inlet	545	Heat Transfer Calculations	550+	14.7					Particle Density, gm./cc.				4.42
Product Accumulator	88	Steam Rate = 382#/hr							CALCULATED FROM dp				
Catalyst No. Height		@ 705 psia & 506°F		A. S. T. M. DIST. ON					Density, Lbs./Cu.Ft.	141	N <sub>2</sub> Surface, m <sup>2</sup> /gm.		
1 See Period A	631	1201 BTU/#		Naphtha °F.					Inventory, Lbs.	1702			
2	650	Water in @ 64.1 = 32°F		IRP	114				Bed Depth, Ft.	18.36	CHEMICAL ANALYSIS		
3	656	Net BTU/# steam = 1169		10%	142				Vol., Cu. Ft.	12.12	Fe		69.7
4	642	1169 x 382 = 446558		50%	224						C		7.61
5	661	Ave. Bed Temp = 653°F		90%	356						O		.16
6	660	dT = 653 - 506 = 147°F		EP	386						H		
7	650	Tube Area = 33.4 sq ft		Rec.	96.5						K <sub>2</sub> O, W+, % basis Fe		
8	637	K = 446558 / (33.4)(147) = 90.95 BTU/°F/sq ft									X-Ray Analysis —		
9	628										Fe <sub>2</sub> O <sub>3</sub>		
10	626										Fe <sub>3</sub> O <sub>4</sub>		
11	603										Fe		

THE TEXAS COMPANY — MONTEBELLO LABORATORY  
YIELD CALCULATIONS

RUN NO. 59-0  
HOURS 315-339  
CATALYST Spent CM&S

FRESH FEED				WET GAS			RECYCLE	COMBINED FEED	EFFLUENT	NET CHANGE		YIELD BASIS H <sub>2</sub> + CO FED										
	%	m/hr	#/hr	%	At Wt. Balance		m/hr	m/hr	m/hr	m/hr	#/hr	CONDENSATE			YIELDS BASIS BROWNSVILLE DESIGN FEED RATE*							
					m/hr	#/hr						#/MCF	#/gal	gal/hr	gal/MCF		CORRECTED HEMPEL, %	gal/hr	TREATING RECOVERY, %	gal/hr		
CO	38.015	13.513	372.89	8.523	0.966	27.06	3.537	16.850	4.503	-12.347	-345.83											
H <sub>2</sub>	59.030	20.323	40.97	32.010	3.630	7.32	13.284	33.607	16.914	-16.693	-33.65						400 EP	73.0	5.489	98.0	5.379	
CO <sub>2</sub>	2.773	0.971	42.73	35.900	4.071	179.13	14.897	15.868	18.968	3.100	136.40	10.685					400-550	14.0	1.053	91.4	0.962	
N <sub>2</sub>	0.237	0.083	2.35	1.317	0.149	4.17	0.547	0.630	0.696								550 +	13.0	0.978	114.6	1.121	
CH <sub>4</sub>	0.947	0.332	5.33	11.427	1.296	20.79	4.742	5.074	6.038	0.964	15.46	1.211										
C <sub>2</sub> H <sub>6</sub>				2.583	0.293	8.22	1.072	1.072	1.365	0.293	8.22	0.644										
C <sub>3</sub> H <sub>8</sub>				1.583	0.179	5.38	0.657	0.657	0.836	0.179	5.38	0.421						PROPYLENE	44.0	5.89		
C <sub>4</sub> +											29.06	2.276						C <sub>3</sub> POLY GASO.	87.5	5.15	0.861	
C <sub>2</sub> H <sub>4</sub>				2.803	0.318	13.38	1.163	1.163	1.481	0.318	13.38	1.048	4.32	3.097	0.245			C <sub>3</sub> POLY TAR	12.5	0.74	0.098	
C <sub>2</sub> H <sub>2</sub>				0.313	0.035	1.54	0.130	0.130	0.165	0.035	1.54	0.121	4.24	0.363	0.028							
C <sub>2</sub> H <sub>2</sub>				1.710	0.194	10.88	0.710	0.710	0.904	0.194	10.88	0.952	5.00	2.176	0.170							
C <sub>2</sub> H <sub>2</sub>				0.577	0.065	3.78	0.239	0.239	0.304	0.065	3.78	0.296	4.86	0.778	0.061			C <sub>4</sub> H <sub>6</sub>	5.00	0.21	0.042	68.0
C <sub>2</sub> H <sub>2</sub>				0.797	0.090	6.31	0.331	0.331	0.421	0.090	6.31	0.494	5.48	1.158	0.091			C <sub>4</sub> POLY GASO.	5.98	9.34	1.561	1.5
C <sub>2</sub> H <sub>2</sub>				0.210	0.024	1.73	0.087	0.087	0.111	0.024	1.73	0.136	5.25	0.330	0.025			C <sub>4</sub> H <sub>10</sub>	4.86	3.78	0.778	68.0
C <sub>2</sub> H <sub>2</sub>				0.247	0.028	2.36	0.103	0.103	0.131	0.028	2.36	0.185	5.84	0.426	0.033			C <sub>4</sub> -FREE GASO.			8.154	5.8
C <sub>2</sub> -C <sub>6</sub>											39.98	3.132		8.328	0.652			C <sub>4</sub> POLY TAR	7.53	1.33	0.177	
TOTAL		35.022	464.25		11.339	292.15	41.499	76.521	59.513													
H <sub>2</sub> +CO	96.043	33.636	12765075	SCFH	4.596		16.821	50.457	21.417	-29.040												
H <sub>2</sub> /CO		1.53	Factor	783387	3.76		3.76	1.99	3.76	1.35								10 # RVP 400 EP GASOLINE	10.535	0.8253	4474	
Weight Recovery, %	94.07	Catalyst Age, hrs.			Space Velocity, vhr	1120	RECOVERED OIL		0.543**	48.06	3.765	7.520	0.589	GAS OIL		0.962	0.0754	409				
Pressure, psig	419	Inlet Velocity, Ft/sec			0.89	Catalyst Vol., CF		11.40	TOTAL OIL		88.04	6.897	15.948	1.241	FUEL OIL		1.121	0.0878	476			
Temperature, °F	657	Bed Depth, Ft			17.27	Weight, #		1630	WATER SOLUBLE CHEMICALS		0.284**	15.08	1.181	1.903	0.149	POLY TAR		0.275	0.0215	117		
Recycle Ratio	1.18	Bed Density, #/CF			143	Effluent (H <sub>2</sub> )(CO) <sub>2</sub> Shift Ratio (H <sub>2</sub> O)(CO)		11.78	TOTAL LIQUID PRODUCTS C <sub>2</sub> +		103.12	8.078	17.751	1.390	TOTAL		12.893	1.0100	5476			
FRESH FEED CONVERSION — %				TOTAL FEED CONVERSION — %				SELECTIVITY				NET WATER				6.048**						
Contraction	CO	H <sub>2</sub>	H <sub>2</sub> +CO	CO	H <sub>2</sub>	CO+H <sub>2</sub>	C <sub>2</sub> +C <sub>3</sub> +	GROSS WATER				124.04				9.717						
67.62	92.74	82.14	86.34	73.28	49.67	57.55	78.01	HYDROCARBON TOTAL—C <sub>2</sub> +				132.18				10.354						

Form ML-11

\*\*Included in Reactor Effluent Total

g/NCM = 16.91 x #/MCF

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

THE TEXAS COMPANY — MONTEBELLO LABORATORY  
DATA SUMMARY

RUN NO. 59-0  
HOURS 315-339

OPERATING CONDITIONS				PRODUCT TESTS				CATALYST DATA						
PRESSURES PSIG		RATES S.C.F.H.		OIL		WATER		INVENTORY DATA		PARTICLE SIZE				
Oxygen	442	Fresh Feed	13291	° API	52.5	11.0	In Reactor at Start of Period		Screen Analysis		Sedimentation			
Natural Gas	441	Recycle	15749	Neut. No.	32.4	27.9	Fresh Catalyst Added		Mesh	Microns	%	Microns	%	
Generator Outlet	425	Combined Feed	29040	Sap. No.	51.7	37.3	Total		On 40	419+	56.9	80+		
Reactor Inlet	419	Wet Gas—Measured	3898	Hydrox. No.			Catalyst Recovered	81	100	150	35.7	40-80		
Condenser Inlet		Adjusted	4303	Bromine No.	93		In Reactor at End of Period		150	105	4.4	20-40		
Product Accumulator	375	Loss	405	Pour °F.					200	74	1.6	10-20		
				Chemicals, % by K <sub>2</sub> CO <sub>3</sub>		12.7	REACTOR d-p, Inches H <sub>2</sub> O		250	62	0.6	0-20		
				No.			No.	Height	325	44	0.4			
TEMPERATURES — °F.		Recycle/Fresh Feed	1.18				0	See Period A	49	<85	0.4			
Oxygen	308	Inlet Velocity—ft./sec.	0.89				1		71	CATALYST				
Natural Gas	351	Fresh Feed Rate—S.C.F.H.	12765	HEMPEL, DIST. %			2		73	Bulk Density, Lbs./Cu.Ft.				
Generator	---	per Cu.Ft. Dense Bed	1120	205 °F.			3		72	Aerated			145	
Quench Accumulator	145	per Lb. Catalyst	7.83	400	72.0	54.6	4		210	Settled			146	
Reactor Inlet	336	per Sq. Ft.	19341	400-550	14.0	36.2	Total		475	Compacted			167	
Condenser Inlet	548			550+	14.0					Particle Density, gm./cc.			4.55	
Product Accumulator	90	Heat Transfer Calculations							CALCULATED FROM dp			NH <sub>3</sub> Value, ml./gm.		
Catalyst No.	Height	Steam Rate=374#/hr		A. S. T. M. DIST. ON					Density, Lbs./Cu.Ft.	143	N <sub>2</sub> Surface, m <sup>2</sup> /gm.			
1	See Period A	@705 psia & 506°F		Naphtha °F.					Inventory, Lbs.	1630				
2	655	1201 BTU/#		IBP		118			Bed Depth, Ft.	17.27	CHEMICAL ANALYSIS			
3	657	Water in @ 76.3=44.3 °F		10%		144			Vol., Cu. Ft.	11.40	Fe			
4	650	Net BTU/# steam=1157		50%		224					C			8.52
5	663	1157x374=432718		90%		340					O			
6	661	Ave. Bed Temp=657 °F		EP		380					H			
7	652	ΔT=657-506=151 °F		Rec.		98.0					K <sub>2</sub> O, W+, % basis Fe			
8	633	Tube Area=31.4 sq ft									X-Ray Analysis—			
9	630	K <sub>a</sub> =432718 / (31.4)(151) = 91.3 BTU/°F/sq ft									Fe <sub>2</sub> O <sub>3</sub>			
10	630										Fe <sub>2</sub> O <sub>4</sub>			
11	605										Fe			

THE TEXAS COMPANY — MONTEBELLO LABORATORY  
YIELD CALCULATIONS

RUN NO. 59-P  
HOURS 339-363  
CATALYST

FRESH FEED				WET GAS				RECYCLE	COMBINED FEED	EFFLUENT	NET CHANGE		YIELD BASIS H <sub>2</sub> + CO FED								
%	m/hr	#/hr	%	At Wt. Balance	m/hr	m/hr	m/hr	m/hr	m/hr	m/hr	#/hr	CONDENSATE									
				m/hr	#/hr							#/MCF	#/gal	gal/hr	gal/MCF	YIELDS	BASIS	BROWNVILLE DESIGN FEED RATE*			
CO	37.087	12.356	346.09	9.570	0.971	27.20	3.980	16.336	4.951	-11.385	-318.88										
H <sub>2</sub>	59.113	19.693	39.70	35.763	3.427	6.91	14.042	33.735	17.469	-16.286	-32.79					400 EP	75.0	5.640	98.0		
CO <sub>2</sub>	2.620	0.873	38.42	35.580	3.611	158.95	14.796	15.669	18.407	2.738	120.53	9.910				400-550	14.4	1.083	91.4		
N <sub>2</sub>	0.180	0.060	1.68	1.600	0.162	4.54	0.665	0.725	0.827							550 +	10.6	0.797	114.6		
CH <sub>4</sub>	1.000	0.333	5.34	9.413	0.955	15.32	3.914	4.247	4.869	0.622	9.99	0.821									
C <sub>2</sub> H <sub>6</sub>				2.170	0.220	6.17	0.902	0.902	1.122	0.220	6.17	0.507									
C <sub>2</sub> H <sub>4</sub>				1.373	0.139	4.18	0.517	0.517	0.710	0.139	4.18	0.344					PROPYLENE	46.8	4.94		
C <sub>3</sub> H <sub>8</sub>											20.33	1.672					C <sub>3</sub> POLY GASO.	87.5	4.32	0.722	
C <sub>3</sub> H <sub>6</sub>				2.470	0.251	10.56	1.027	1.027	1.278	0.251	10.56	0.868	4.32	2.444	0.201		C <sub>3</sub> POLY TAR	12.5	0.82	0.082	
C <sub>4</sub> H <sub>10</sub>				0.287	0.029	1.28	0.119	0.119	0.148	0.029	1.28	0.105	4.24	0.302	0.025						
C <sub>4</sub> H <sub>8</sub>				1.707	0.173	9.71	0.710	0.710	0.883	0.173	9.71	0.798	8.00	1.942	0.160						
C <sub>5</sub> H <sub>12</sub>				0.690	0.070	4.07	0.287	0.287	0.357	0.070	4.07	0.335	4.86	0.837	0.069		C <sub>4</sub> H <sub>6</sub>	5.00	-	68.0	
C <sub>5</sub> H <sub>10</sub>				0.877	0.089	6.24	0.365	0.365	0.454	0.089	6.24	0.513	5.48	1.145	0.094		C <sub>4</sub> POLY GASO.	5.98	8.50	1.421	
C <sub>6</sub> H <sub>14</sub>				0.180	0.018	1.30	0.075	0.075	0.093	0.018	1.30	0.107	5.28	0.248	0.020		C <sub>4</sub> H <sub>10</sub>	4.86	(4.07)	(0.837)	
C <sub>6</sub> H <sub>12</sub>				0.320	0.032	2.69	0.133	0.133	0.165	0.032	2.69	0.221	5.54	0.486	0.040		C <sub>4</sub> FREE GASO.			8.128	
C <sub>7</sub> -C <sub>8</sub>													35.85	2.947			C <sub>4</sub> POLY TAR	7.53	1.21	0.161	
TOTAL		33.315	431.22			10.147	259.12	41.586	74.901	58.408											
H <sub>2</sub> +CO	96.200	32.049	12162566	SCFH	4.398		18.022	50.071	22.420	-27.651											
H <sub>2</sub> /CO	1.59		Factor	822194	3.53		3.53	2.07	3.52	1.43											
Weight Recovery, %	99.00		Catalyst Age, hrs.			Space Velocity, vhr	1128		RECOVERED OIL	0.343**	48.06	3.951	7.520	0.618							
Pressure, psig	419		Inlet Velocity, Ft/sec	0.87		Catalyst Vol., CF	10.78		TOTAL OIL		85.91	6.898	14.924	1.227							
Temperature, °F	654		Bed Depth, Ft	16.33		Weight, #	1520		WATER SOLUBLE CHEMICALS	0.284**	16.08	1.240	1.903	0.156							
Recycle Ratio	1.25		Bed Density, #/CF	141		Effluent (H <sub>2</sub> )/CO <sub>2</sub> Shift Ratio (H <sub>2</sub> O)/CO	10.74		TOTAL LIQUID PRODUCTS C <sub>2</sub> +		98.99	8.138	16.827	1.383							
FRESH FEED CONVERSION — %				TOTAL FEED CONVERSION — %				SELECTIVITY		NET WATER		6.048**		108.96		8.959		13.080		1.075	
Contraction	CO	H <sub>2</sub>	H <sub>2</sub> +CO	CO	H <sub>2</sub>	CO+H <sub>2</sub>	C <sub>2</sub> +C <sub>3</sub> +	GROSS WATER		124.04		10.199		14.983		1.231		TOTAL		14.395	
69.54	92.14	82.60	86.28	69.69	48.22	55.92	82.96	HYDROCARBON TOTAL — C <sub>1</sub> +		119.32		9.810									

Form ML-11

\*\*Included in Reactor Effluent Total

g/NCM = 16.91 X #/MCF

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

THE TEXAS COMPANY — MONTEBELLO LABORATORY  
DATA SUMMARY

RUN NO. 59-P  
HOURS 339-363

OPERATING CONDITIONS				PRODUCT TESTS				CATALYST DATA					
PRESSURES PSIG		RATES S.C.F.H.		OIL		WATER		INVENTORY DATA		PARTICLE SIZE			
Oxygen	442	Fresh Feed	12643	*API	52.4	11.0		In Reactor at Start of Period		Screen Analysis			
Natural Gas	441	Recycle	15782	Neut. No.	33.2	29.4		Fresh Catalyst Added		Mesh	Microns	%	Sedimentation
Generator Outlet	424	Combined Feed	28425	Sap. No.	52.4	39.0		Total		On 40	419+	39.1	80+
Reactor Inlet	419	Wet Gas—Measured	3787	Hydrox. No.				Catalyst Recovered	76	100	150	40.7	40—80
Condenser Inlet		Adjusted	3851	Bromine No.	91			In Reactor at End of Period		150	105	8.4	20—40
Product Accumulator	375	Loss	64	Pour °F.						200	74	7.2	10—20
				Chemicals, % by K <sub>2</sub> CO <sub>3</sub>		12.7		REACTOR d-p, Inches H <sub>2</sub> O		250	62	1.6	0—20
				No. Height				No. Height		325	44	2.0	
TEMPERATURES—°F.		Recycle/Fresh Feed	1.25					0 See Period A	49	<325		1.0	
Oxygen	319	Inlet Velocity—ft./sec.	0.87					1	71	CATALYST			
Natural Gas	327	Fresh Feed Rate—S.C.F.H.	12163	HEMPEL, DIST. %		°API		2	72	Bulk Density, Lbs./Cu.Ft.			
Generator		per Cu. Ft. Dense Bed	1128	205 °F.				3	71	Aerated			
Quench Accumulator	147	per Lb. Catalyst	8.00	400	74.0	53.1		4	180	Settled			
Reactor Inlet	336	per Sq. Ft.	18429	400-550	14.4	37.4		Total	443	Compacted			
Condenser Inlet	544			550+	11.6					Particle Density, gm./cc.			
Product Accumulator	91	Heat Transfer Calculations								CALCULATED FROM dp			
Catalyst No.	Height	Steam Rate=350#/hr		A. S. T. M. DIST. ON				Density, Lbs./Cu.Ft.	141	NH <sub>3</sub> Value, ml./gm.			
1	See Per. A	@ 705 psia & 506°F		Naphtha °F.				Inventory, Lbs.	1520	N <sub>2</sub> Surface, m <sup>2</sup> /gm.			
2	652	1201 BTU/#		IBP	114			Bed Depth, Ft.	16.33	CHEMICAL ANALYSIS			
3	657	Water in @ 76.7=45°F		10%	140			Vol., Cu. Ft.	10.78	Fe			
4	645	Net BTU/# steam=1156		50%	224					C			
5	660	1156x350=404600		90%	352					O			
6	658	Ave. Bed Temp=554°F		EP	388					H			
7	647	dT2554-506=148°F		Rec.	97.0					K <sub>2</sub> O, W+, % basis Fe			
8	627	Tube Area=29.6 sq ft								X-Ray Analysis—			
9	629	K=404600/(29.6)(148)=92.4 BTU/°F/sq ft								Fe <sub>2</sub> O <sub>3</sub>			
10	626									Fe <sub>3</sub> O <sub>4</sub>			
11	600									Fe			





THE TEXAS COMPANY — MONTEBELLO LABORATORY  
YIELD CALCULATIONS

RUN NO. 59-S  
HOURS 411-421  
CATALYST Spent CM-3

FRESH FEED				WET GAS				RECYCLE	COMBINED FEED	EFFLUENT	NET CHANGE		YIELD BASIS H <sub>2</sub> + CO FED																														
	%	m/hr	#/hr	%	At Wt. Balance	m/hr	m/hr	m/hr	m/hr	#/hr	#/MCF	#/gal	gal/hr	gal/MCF	YIELDS	BASIS	BROWNSVILLE	DESIGN	FEED RATE*																								
					m/hr	#/hr									CORRECTED HEMPEL, %	gal/hr	TREATING RECOVERY, %	gal/hr																									
CO	37.947	14.576	408.28	11.490	1.710	47.90	5.169	19.745	6.979	-12.866	-360.38																																
H <sub>2</sub>	58.850	22.605	45.58	41.824	6.225	12.55	18.818	41.423	25.043	-16.380	-33.03				400 EP	75.0	6.916	98.0	6.778																								
CO <sub>2</sub>	2.560	0.983	43.26	25.623	3.816	167.94	11.528	12.511	15.344	2.833	124.68	8.836			400-550	16.0	1.516	91.4	1.386																								
N <sub>2</sub>	0.350	0.134	3.76	1.737	0.259	7.26	0.781	0.915	1.040						550 +	11.0	1.042	114.6	1.194																								
CH <sub>4</sub>	0.293	0.113	1.81	10.213	1.520	24.38	4.595	4.708	6.115	1.407	22.57	1.600																															
C <sub>2</sub> H <sub>6</sub>				2.303	0.343	9.62	1.036	1.036	1.379	0.343	9.62	0.682																															
C <sub>3</sub> H <sub>8</sub>				1.313	0.195	5.86	0.591	0.591	0.786	0.195	5.86	0.415			PROPYLENE	36.3	4.55																										
C <sub>4</sub> +C <sub>5</sub>											38.05	2.697			C <sub>4</sub> POLY GASO.	87.5	3.98	0.666																									
C <sub>2</sub> H <sub>4</sub>				2.003	0.298	12.54	0.901	0.901	1.199	0.298	12.54	0.889	4.32	2.903	0.206																												
C <sub>2</sub> H <sub>2</sub>				0.403	0.060	2.65	0.181	0.181	0.241	0.060	2.65	0.188	4.24	0.625	0.044																												
C <sub>2</sub> H <sub>2</sub>				1.317	0.196	11.00	0.593	0.593	0.789	0.196	11.00	0.780	5.00	2.200	0.156																												
C <sub>2</sub> H <sub>2</sub>				0.687	0.102	5.93	0.309	0.309	0.411	0.102	5.93	0.420	4.86	1.220	0.086	C <sub>4</sub> H <sub>6</sub>	5.00	-	-	68.0																							
C <sub>2</sub> H <sub>2</sub>				0.707	0.105	7.36	0.318	0.318	0.423	0.105	7.36	0.522	5.45	1.350	0.096	C <sub>4</sub> POLY GASO.	5.98	9.63	1.610	1.5																							
C <sub>2</sub> H <sub>2</sub>				0.177	0.026	1.88	0.090	0.090	0.106	0.026	1.88	0.133	5.25	0.358	0.025	C <sub>4</sub> H <sub>10</sub>	4.86	(5.92)	(1.220)	68.0																							
C <sub>2</sub> H <sub>2</sub>				0.203	0.030	2.52	0.091	0.091	0.121	0.030	2.52	0.179	5.84	0.455	0.032	C <sub>4</sub> FREE GASO.			9.607	5.8																							
C <sub>3</sub> -C <sub>6</sub>											43.88	3.111		9.111	0.645	C <sub>4</sub> POLY TAR	7.53	1.37	0.182																								
TOTAL		38.411	502.69		14.985	319.39	44.991	83.402	66.594																																		
H <sub>2</sub> +CO	96.797	37.181	14110099	SCFH	7.935			23.987	61.168	31.922	-29.246																																
H <sub>2</sub> /CO		1.55	Factor	708712	3.64			3.64	2.10	3.64	1.27				10 # RVP 400 EP GASOLINE	12.148	0.8609	4667																									
Weight Recovery, %	93.85	Catalyst Age, hrs.		Space Velocity, vhr	1512	RECOVERED OIL	0.438**	61.48	4.357	9.474	0.671				GAS OIL	1.386	0.0982	532																									
Pressure, psig	416	Inlet Velocity, Ft/sec	0.98	Catalyst Vol., CF	9.33	TOTAL OIL		105.36	7.468	18.585	1.316				FUEL OIL	1.194	0.0846	459																									
Temperature, °F	656	Bed Depth, Ft	14.13	Weight, #	1352	WATER SOLUBLE CHEMICALS	0.248**	13.14	0.931	1.662	0.118				POLY TAR	0.258	0.0183	99																									
Recycle Ratio	1.17	Bed Density, #/CF	145	Effluent Shift Ratio (H <sub>2</sub> )(CO <sub>2</sub> ) / (H <sub>2</sub> O)(CO) =	9.26	TOTAL LIQUID PRODUCTS C <sub>2</sub> +		118.50	8.399	20.257	1.434				TOTAL	14.986	1.0620	5757																									
FRESH FEED CONVERSION — %				TOTAL FEED CONVERSION — %				SELECTIVITY				NET WATER				6.032**				108.68				7.702				13.047				0.925											
Contraction	CO	H <sub>2</sub>	H <sub>2</sub> +CO	CO	H <sub>2</sub>	CO+H <sub>2</sub>	C <sub>3</sub> +C <sub>4</sub>	GROSS WATER				121.82				8.635				14.709				1.043				TOTAL				16.648				1.1798				6396			
61.25	88.27	72.46	78.66	65.16	39.54	47.91	75.69	HYDROCARBON TOTAL — C <sub>2</sub> +				156.55				11.096																											

Form ML-11

\*\*Included in Reactor Effluent Total

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

THE TEXAS COMPANY — MONTEBELLO LABORATORY  
DATA SUMMARY

RUN NO. 59-S  
HOURS 411-421

OPERATING CONDITIONS				PRODUCT TESTS				CATALYST DATA						
PRESSURES PSIG		RATES S.C.F.H.		OIL		WATER		INVENTORY DATA		PARTICLE SIZE				
Oxygen	437	Fresh Feed	14577	* API	50.0	10.8	In Reactor at Start of Period		Screen Analysis	Sedimentation				
Natural Gas	436	Recycle	17074	Neut. No.	32.3	29.3	Fresh Catalyst Added		Mesh	Microns	%	Microns	%	
Generator Outlet	422	Combined Feed	31651	Sap. No.	49.9	38.4	Total		On 40	419+	32.5	80+		
Reactor Inlet	416	Wet Gas — Measured	5102	Hydrox. No.			Catalyst Recovered	30%	100	150	41.8	40-80		
Condenser Inlet		Adjusted	5649	Bromine No.	91		In Reactor at End of Period		150	105	10.8	20-40		
Product Accumulator	375	Loss	547	Pour °F.					200	74	8.7	10-20		
				Chemicals, % by K <sub>2</sub> CO <sub>3</sub>	11.3		REACTOR d-p, Inches H <sub>2</sub> O		250	62	3.2	0-20		
				No. Height					325	44	1.6			
TEMPERATURES — °F.		Recycle/Fresh Feed	1.17				0 See Period A	50	<325		1.4			
Oxygen	316	Inlet Velocity — ft./sec.	0.98				1	72	CATALYST					
Natural Gas	301	Fresh Feed Rate — S.C.F.H.	14110	HEMPEL, DIST. %		API	2	74	Bulk Density, Lbs./Cu.Ft.					
Generator		per Cu. Ft. Dense Bed	1512	205 °F.			3	73	Aerated				146	
Quench Accumulator	130	per Lb. Catalyst	10.44	400	72.0	55.0	4	125	Settled				148	
Reactor Inlet	243	per Sq. Ft.	21379	400-550	16.0	36.7	Total	394	Compacted				172	
Condenser Inlet	544			550+	12.0				Particle Density, gm./cc.				4.46	
Product Accumulator	97.2	Heat Transfer Calculations							CALCULATED FROM dp					
Catalyst No.	Height	Steam Rate	272#/hr	A. S. T. M. DIST. ON					Density, Lbs./Cu.Ft.		145	NH <sub>3</sub> Value, ml./gm.		
1 See Per. A	611	@ 705 psia & 506°F		Naphtha °F.					Inventory, Lbs.		1552	N <sub>2</sub> Surface, m <sup>2</sup> /gm.		
2	650	1201 BTU/#		IBP	118				Bed Depth, Ft.		14.13	CHEMICAL ANALYSIS		
3	658	Water in @ 670°F = 350°F		10%	144				Vol., Cu. Ft.		9.33	Fe		
4	642	Net BTU/# steam = 1166		50%	236							C		9.36
5	664	1166 x 272 = 317152		90%	350							O		
6	665	Ave. Bed Temp = 656°F		EP	380							H		
7	639	ΔT = 656 - 506 = 150°F		Rec.	97.0							K <sub>2</sub> O, W+, % basis Fe		
8	625	Tube Area = 25.6										X-Ray Analysis —		
9	626	K = 317152 / (25.6)(150) = 82.6 BTU/°F/sq ft										Fe <sub>2</sub> O <sub>3</sub>		
10	622											Fe <sub>3</sub> O <sub>4</sub>		
11	593											Fe		

THE TEXAS COMPANY — MONTEBELLO LABORATORY  
YIELD CALCULATIONS

RUN NO. 59-T  
HOURS 421-445  
CATALYST Spent CM&S

FRESH FEED				WET GAS				RECYCLE	COMBINED FEED	EFFLUENT	NET CHANGE		YIELD BASIS H <sub>2</sub> + CO FED								
	%	m/hr	#/hr	At Wt. Balance		m/hr	m/hr	m/hr	m/hr	m/hr	#/hr	#/MCF	CONDENSATE			YIELDS BASIS BROWNSVILLE DESIGN FEED RATE*					
				m/hr	#/hr								#/gal	gal/hr	gal/MCF	CORRECTED HEMPEL, %	gal/hr	TREATING RECOVERY, %	gal/hr		
CO <sub>28.010</sub>	38.173	14.530	406.98	11.550	1.672	46.83	5.049	19.579	6.721	-12.858	-360.15										
H <sub>2</sub> <sub>24.016</sub>	58.327	22.201	44.76	39.490	5.717	11.53	17.265	39.466	22.982	-16.484	-33.23					400 EP	71.5	5.511	98.0	5.401	
CO <sub>24.010</sub>	2.903	1.105	48.63	30.730	4.448	195.78	13.435	14.540	17.883	3.343	147.15	10.556				400-550	16.0	1.233	91.4	1.127	
N <sub>2</sub>	0.297	0.113	3.17	1.650	0.239	6.70	0.721	0.834	0.960							550 +	12.5	0.964	114.6	1.105	
CH <sub>4</sub> <sub>16.142</sub>	0.300	0.114	1.83	7.617	1.103	17.69	3.330	3.444	4.433	0.989	15.86	1.138									
C <sub>2</sub> H <sub>6</sub> <sub>28.032</sub>				2.207	0.319	8.95	0.965	0.965	1.284	0.319	8.95	0.642									
C <sub>2</sub> H <sub>4</sub> <sub>30.058</sub>				1.183	0.171	5.14	0.517	0.517	0.688	0.171	5.14	0.369				PROPYLENE	37.0	4.92			
C <sub>3</sub> +C <sub>4</sub>																C <sub>3</sub> POLY GASO.	87.5	4.30	0.719		
C <sub>3</sub> H <sub>8</sub> <sub>42.078</sub>				2.183	0.316	13.30	0.954	0.954	1.270	0.316	13.30	0.954	4.32	3.079	0.221	C <sub>3</sub> POLY TAR	12.5	0.62	0.082		
C <sub>4</sub> H <sub>10</sub> <sub>44.094</sub>				0.283	0.041	1.81	0.124	0.124	0.165	0.041	1.81	0.130	4.24	0.427	0.031						
C <sub>4</sub> H <sub>8</sub> <sub>56.104</sub>				1.417	0.205	11.50	0.619	0.619	0.824	0.205	11.50	0.825	5.00	2.300	0.165						
C <sub>4</sub> H <sub>10</sub> <sub>70.130</sub>				0.537	0.078	4.53	0.235	0.235	0.313	0.078	4.53	0.325	4.86	0.932	0.067	C <sub>4</sub> H <sub>6</sub>	5.00	--	--	68.0	
C <sub>4</sub> H <sub>12</sub> <sub>72.146</sub>				0.750	0.109	7.64	0.328	0.328	0.437	0.109	7.64	0.548	5.48	1.402	0.101	C <sub>4</sub> POLY GASO.	5.98	10.06	1.683	1.5	
C <sub>4</sub> H <sub>12</sub> <sub>84.156</sub>				0.133	0.019	1.37	0.058	0.058	0.077	0.019	1.37	0.098	5.28	0.261	0.019	C <sub>4</sub> H <sub>10</sub>	4.86	(4.53) 4.15	(0.932) 0.853	68.0	
C <sub>3</sub> -C <sub>4</sub>				0.270	0.039	3.28	0.118	0.118	0.157	0.039	3.28	0.235	5.54	0.592	0.042	C <sub>4</sub> -FREE GASO.				8.375	5.8
TOTAL		38.063	505.37		14.476	336.05	43.718	81.781	64.646												
H <sub>2</sub> +CO	95.500	36.731	13939425	SCFH	7.389		22.314	59.045	29.703	-29.342											
H <sub>2</sub> /CO		1.53	Factor	717389	3.42		3.42	2.02	3.42	1.28											
Weight Recovery, %	95.51		Catalyst Age, hrs.		Space Velocity, v/hv	1537	RECOVERED OIL	0.355**	49.86	3.577	7.708	0.553	GAS OIL	1.127	0.0808	438					
Pressure, psig	419		Inlet Velocity, Ft/sec	0.95	Catalyst, Vol. CP	9.07	TOTAL OIL	93.29	6.692	16.701	1.199	FUEL OIL	1.105	0.0793	430						
Temperature, °F	657		Bed Depth, Ft	13.74	Weight, #	1270	WATER SOLUBLE CHEMICALS	0.275**	14.57	1.045	1.832	0.131	POLY TAR	0.273	0.0196	106					
Recycle Ratio	1.15		Bed Density, #/CF	140	Effluent Shift Ratio (H <sub>2</sub> )(CO <sub>2</sub> )/(H <sub>2</sub> O)(CO)	10.50	TOTAL LIQUID PRODUCTS C <sub>3</sub> +	107.86	7.737	18.533	1.330	TOTAL	13.416	0.9624	5217						
FRESH FEED CONVERSION — %				TOTAL FEED CONVERSION — %				SELECTIVITY				NET WATER									
Contraction	CO	H <sub>2</sub>	H <sub>2</sub> +CO	CO	H <sub>2</sub>	CO+H <sub>2</sub>	C <sub>3</sub> +C <sub>4</sub>	GROSS WATER													
61.97	88.49	74.25	79.88	65.67	41.77	49.69	78.27	HYDROCARBON TOTAL — C <sub>3</sub> +	137.81	9.886											

Form ML-11      \*\*Included in Reactor Effluent Total      g/NCM = 16.91 X #/MCF      \*9488 MCFH<sub>2</sub> + CO, Bbl/Day = 5421.6 X gal/MCF

THE TEXAS COMPANY — MONTEBELLO LABORATORY  
DATA SUMMARY

RUN NO. 59-T  
HOURS 421-445

OPERATING CONDITIONS				PRODUCT TESTS				CATALYST DATA					
PRESSURES PSIG		RATES S.C.F.H.		OIL		WATER		INVENTORY DATA		PARTICLE SIZE			
Oxygen	441	Fresh Feed	14445	° API	50.4	10.8	In Reactor at Start of Period	Screen Analysis		Sedimentation			
Natural Gas	439	Recycle	16591	Neut. No.	34.6	32.3	Fresh Catalyst Added	Mesh	Microns	%	Microns	%	
Generator Outlet	425	Combined Feed	31056	Sap. No.	54.3	41.6	Total	On 40	419+	36.3	80+		
Reactor Inlet	419	Wet Gas—Measured	5123	Hydrox. No.			Catalyst Recovered	48	100	150	42.7	40—80	
Condenser Inlet		Adjusted	5494	Bromine No.	93		In Reactor at End of Period	150	105	9.2	20—40		
Product Accumulator	375	Loss	371	Pour °F.			Chemicals, % by K <sub>2</sub> CO <sub>3</sub>	12.7	REACTOR 4-p, Inches H <sub>2</sub> O	200	62	1.8	0—20
							No. Height	325	44	1.2			
							0 See Period A	48	<325	1.8			
TEMPERATURES — °F.				Recycle/Fresh Feed	1.15								
Oxygen	313	Inlet Velocity—ft./sec.	0.96				1	70	CATALYST				
Natural Gas	313	Fresh Feed Rate—S.C.F.H.	15939	HEMPEL, DIST. %		° API	2	70	Bulk Density, Lbs./Cu.Ft.				
Generator		per Cu.Ft. Dense Bed	1537	205 °F.			3	72	Aerated				
Quench Accumulator	136	per Lb. Catalyst	10.98	400	70.5	52.8	4	110	Settled				
Reactor Inlet	270	per Sq. Ft.	21120	400-550	16.0	36.8	Total	370	Compacted				
Condenser Inlet	568			550+	13.5				Particle Density, gm./cc.				
Product Accumulator	96.5	Heat Transfer Calculations							CALCULATED FROM dp				
Catalyst No.	Height	Steam Rate=280#/hr		A. S. T. M. DIST. ON					Density, Lbs./Cu.Ft.	140	N <sub>2</sub> Surface, m <sup>2</sup> /gm.		
1 See Per. A	618	@ 705 psia & 506°F		Naphtha °F.					Inventory, Lbs.	1270			
2	652	1201 BTU/#		IBP	120				Bed Depth, Ft.	13.74	CHEMICAL ANALYSIS		
3	659	Water in @ 670°F=350°F		10%	144				Vol., Cu. Ft.	9.07	Fe		
4	644	Net BTU/# steam=1166		50%	234						C		
5	665	1166x280=326480		90%	350						O		
6	665	Ave. Bed Temp=657°F		EP	380						H		
7	639	ΔT=657-506=151°F		Rec.	96.5						K <sub>2</sub> O, W+, % basis Fe		
8	634	Tube Area=24.8 sq ft									X-Ray Analysis—		
9	638	326480 / 24.8 = 87.2 BTU/°F/sq ft									Fe <sub>2</sub> O <sub>3</sub>		
10	636										Fe <sub>2</sub> O <sub>4</sub>		
11	608										Fe		

THE TEXAS COMPANY — MONTEBELLO LABORATORY  
YIELD CALCULATIONS

RUN NO. 59-U  
HOURS 445-469  
CATALYST

FRESH FEED				WET GAS				RECYCLE	COMBINED FEED	EFFLUENT	NET CHANGE		YIELD BASIS H <sub>2</sub> + CO FED									
%	m/hr	#/hr	%	At Wt. Balance		m/hr	m/hr	m/hr	m/hr	#/hr	#/hr	CONDENSATE										
				m/hr	#/hr							#/MCF	#/gal	gal/hr	gal/MCF	YIELDS BASIS BROWNSVILLE DESIGN FEED RATE*						
CO	38.220	14.623	409.59	7.430	0.906	25.38	3.085	17.706	3.989	-13.717	-584.21					400 EP	CONVERTED RECOVER. %	gal/hr	TREATING RECOVER. %	gal/hr		
H <sub>2</sub>	58.197	22.267	44.89	33.936	4.137	8.34	14.082	36.349	18.219	-18.130	-36.55					400-550	75.9	7.368	98.0	7.221		
CO <sub>2</sub>	2.883	1.103	48.54	34.890	4.253	187.17	14.478	15.581	18.731	-3.150	138.63	9.902				550 +	14.8	1.437	91.4	1.313		
N <sub>2</sub>	0.467	0.179	5.01	2.987	0.364	10.20	1.240	1.419	1.604								9.3	0.803	114.6	1.035		
CH <sub>4</sub>	0.233	0.089	1.43	9.167	1.117	17.92	3.804	3.893	4.921	1.028	16.49	1.178										
C <sub>2</sub> H <sub>6</sub>				2.227	0.271	7.60	0.924	0.924	1.195	0.271	7.60	0.543					RECOVERY %	#/hr	gal/hr			
C <sub>2</sub> H <sub>4</sub>				1.493	0.182	5.47	0.620	0.620	0.802	0.182	5.47	0.391					PROPYLENE	44.6	6.31			
C <sub>3</sub> +C <sub>4</sub>											29.56	2.112					C <sub>3</sub> POLY GASO.	87.5	5.52	0.923		
C <sub>5</sub> H <sub>12</sub>				2.760	0.363	14.14	1.145	1.145	1.481	0.336	14.14	1.010	4.32	3.273	0.234		C <sub>3</sub> POLY TAR	12.5	0.79	0.105		
C <sub>6</sub> H <sub>14</sub>				0.270	0.033	1.46	0.112	0.112	0.145	0.033	1.46	0.104	4.24	0.344	0.025							
C <sub>7</sub> H <sub>16</sub>				2.730	0.333	18.68	1.133	1.133	1.466	0.333	18.68	1.334	8.00	3.736	0.267							
C <sub>8</sub> H <sub>18</sub>				0.677	0.083	4.82	0.281	0.281	0.364	0.083	4.82	0.344	4.88	0.992	0.071		C <sub>4</sub> H <sub>6</sub>	5.00	0.77	0.154	68.0	
C <sub>9</sub> H <sub>20</sub>				0.937	0.114	7.99	0.389	0.389	0.503	0.114	7.99	0.571	8.48	1.466	0.105		C <sub>4</sub> POLY GASO.	5.98	15.67	2.621	1.5	
C <sub>10</sub> H <sub>22</sub>				0.163	0.020	1.44	0.068	0.068	0.088	0.020	1.44	0.103	8.28	0.274	0.020		C <sub>4</sub> H <sub>10</sub>	4.86	4.82	0.992	68.0	
C <sub>11</sub> H <sub>24</sub>				0.333	0.041	3.45	0.138	0.138	0.179	0.041	3.45	0.246	5.54	0.623	0.045		C <sub>4</sub> -FREE GASO.			10.507	5.8	
C <sub>12</sub> +C <sub>14</sub>											51.98	3.712		10.708	0.767		C <sub>4</sub> POLY TAR	7.58	2.24	0.297		
TOTAL	38.261	509.47		12.190	314.04	41.497	79.758	61.022														
H <sub>2</sub> +CO	96.417	38.890	139997484	SCFH	5.043		17.165	54.055	22.208	-31.847								gal/hr	gal/MCF	Bbl/Day		
H <sub>2</sub> /CO	1.52		Factor	714298	4.57		4.57	2.05	4.57	1.32								10 # RVP 400 EP GASOLINE	14.274	1.0196	5528	
Weight Recovery, %			Catalyst Age, hrs.		Space Velocity, v/v	1039	RECOVERED OIL	0.440**	61.68	4.406	9.708	0.693						GAS OIL	1.313	0.0938	509	
Pressure, psig	422		Inlet Velocity, Ft/sec	0.91	Catalyst, Vol. CF	13.47	TOTAL OIL		113.66	8.118	20.416	1.460						FUEL OIL	1.035	0.0739	401	
Temperature, °F	646		Bed Depth, Ft	20.41	Weight, #	1990	WATER SOLUBLE CHEMICALS	0.272**	14.43	1.031	1.825	0.130						POLY TAR	0.402	0.0287	156	
Recycle Ratio	1.08		Bed Density, #/CF	147	Effluent (H <sub>2</sub> )(CO) <sub>2</sub> Shift Ratio (H <sub>2</sub> O)(CO)	15.47	TOTAL LIQUID PRODUCTS C <sub>1</sub> +		128.09	9.149	22.241	1.590						TOTAL	17.024	1.2160	6594	
FRESH FEED CONVERSION — %				TOTAL FEED CONVERSION — %				SELECTIVITY	NET WATER	6.623**	119.32	8.523	14.324	1.023				W. S. CHEM.	1.825	0.1304	707	
Contraction	CO	H <sub>2</sub>	H <sub>2</sub> +CO	CO	H <sub>2</sub>	CO+H <sub>2</sub>	C <sub>3</sub> +C <sub>4</sub> +	GROSS WATER	133.75	9.554	16.149	1.154						TOTAL	18.949	1.3464	7301	
68.14	93.80	81.42	86.33	77.47	49.88	58.92	81.25	HYDROCARBON TOTAL—C <sub>1</sub> +	157.65	11.261												

Form ML-11

\*\*Included in Reactor Effluent Total

g/ANCM = 16.91 X #/MCF 99488 MCFH H<sub>2</sub> + CO, Bbl/Day = 5421.6 X gal/MCF

THE TEXAS COMPANY — MONTEBELLO LABORATORY  
DATA SUMMARY

RUN NO. 59-U  
HOURS 445-469

OPERATING CONDITIONS				PRODUCT TESTS				CATALYST DATA				
PRESSURES PSIG		RATES S.C.F.H.		OIL		WATER		INVENTORY DATA		PARTICLE SIZE		
Oxygen	445	Fresh Feed	14520	°API	52.0	10.8	In Reactor at Start of Period		Screen Analysis	Sedimentation		
Natural Gas	444	Recycle	15748	Neut. No.	31.0	27.7	Fresh Catalyst Added	468	Mesh	Microns	%	
Generator Outlet	428	Combined Feed	30268	Sap. No.	49.6	37.6	Total		On 40	419+	34.0	
Reactor Inlet	422	Wet Gas—Measured	4224	Hydrox. No.			Catalyst Recovered	137.7	100	150	40.0	
Condenser Inlet		Adjusted	4626	Bromine No.	93		In Reactor at End of Period		150	105	10.6	
Product Accumulator	375	Loss	402	Pour °F.					200	74	8.4	
				Chemicals, % by K <sub>2</sub> CO <sub>3</sub>	11.3		REACTOR d-p, Inches H <sub>2</sub> O		250	62	0.6	
							No. Height		325	44	4.8	
TEMPERATURES—°F.		Recycle/Fresh Feed	1.08				0 See Period A	50	<325		1.6	
Oxygen	313	Inlet Velocity—ft./sec.	0.91				1	73	CATALYST			
Natural Gas	313	Fresh Feed Rate—S.C.F.H.	14000	HEMPEL, DIST. %			2	75	Bulk Density, Lbs./Cu.Ft.			
Generator		per Cu. Ft. Dense Bed	1039	205 °F.			3	74	Aerated			
Quench Accumulator	144	per Lb. Catalyst	7.07	400	74.9	55.5	4	305	Settled			
Reactor Inlet	292	per Sq. Ft.	21212	400-550	14.8	38.3	Total	577	Compacted			
Condenser Inlet	549			550+	10.3				Particle Density, gm./cc.			
Product Accumulator	99	Heat Transfer Calculations							CALCULATED FROM dp			
Catalyst No. Height		Steam Rate=341#/hr		A. S. T. M. DIST. ON					Density, Lbs./Cu.Ft.	147	N <sub>2</sub> Surface, m <sup>2</sup> /gm.	
1 See Per. A	616	@ 705 psia & 506°F		Naphtha °F.					Inventory, Lbs.	1980		
2	641	1201 BTU/#		IBP	108				Bed Depth, Ft.	20.41	CHEMICAL ANALYSIS	
3	648	Water in @ 68.5=37 BTU/#		10%	136				Vol., Cu. Ft.	13.47	Fe	
4	654	Net BTU/# steam=1164		50%	224						C	
5	654	1164x341=396924		90%	350						O	
6	654	Ave. Bed Temp=646		EP	392						H	
7	645	dT=646-506=140°F		Rec.	96.0						K <sub>2</sub> O, W+, % basis Fe	
8	638	Tube Area=36.7 sq ft									X-Ray Analysis—	
9	629	396924 / (36.7)(140) = 77.3 BTU/°F/sq ft									Fe <sub>2</sub> O <sub>3</sub>	
10	624										Fe <sub>2</sub> O <sub>4</sub>	
11	599										Fe	





THE TEXAS COMPANY — MONTEBELLO LABORATORY  
YIELD CALCULATIONS

RUN NO. 59-W  
HOURS 493-517  
CATALYST Spent CMS

FRESH FEED				WET GAS				RECYCLE	COMBINED FEED	EFFLUENT	NET CHANGE		YIELD BASIS H <sub>2</sub> + CO FED								
%	m/hr	#/hr	%	At Wt. Balance		m/hr	m/hr	m/hr	m/hr	m/hr	#/hr	#/MCF	#/gal	gal/hr	gal/MCF	YIELDS	BASIS	BROWNSVILLE	DESIGN	FEED RATE*	
				m/hr	#/hr											CORRECTED RECOVER. %	gal/hr	TREATING RECOVERY %	gal/hr		
CO <sub>2</sub>	37.133	14.369	402.48	9.130	1.113	31.18	3.823	18.192	4.936	-13.256	-371.30										
H <sub>2</sub>	59.624	23.072	46.51	34.917	4.254	8.58	14.621	37.693	18.875	-18.818	-37.93					400 EP	76.2	7.534	98.0	7.383	
CO <sub>2</sub>	2.693	1.042	45.86	33.700	4.107	180.70	14.112	15.154	18.219	3.065	134.84	9.490				400-550	12.4	1.226	91.4	1.121	
N <sub>2</sub>	0.140	0.054	1.51	1.903	0.232	6.50	0.797	0.851	1.029							550 +	11.4	1.127	114.6	1.292	
CH <sub>4</sub>	0.410	0.159	2.55	8.900	1.085	17.41	3.727	3.886	4.812	0.926	14.86	1.046									
C <sub>2</sub> H <sub>6</sub>				2.753	0.335	9.40	1.153	1.153	1.488	0.335	9.40	0.662									
C <sub>3</sub> H <sub>8</sub>				1.457	0.178	5.35	0.610	0.610	0.788	0.178	5.35	0.377				PROPYLENE	45.2	6.75			
C <sub>4</sub> +C <sub>5</sub>											29.61	2.085				C <sub>4</sub> POLY GASO.	87.5	5.91	0.988		
C <sub>6</sub> H <sub>14</sub>				2.917	0.355	14.94	1.222	1.222	1.577	0.355	14.94	1.051	4.32	3.458	0.234	C <sub>6</sub> POLY TAR	12.5	0.84	0.112		
C <sub>7</sub> H <sub>16</sub>				0.300	0.037	1.63	0.126	0.126	0.165	0.037	1.63	0.115	4.24	0.394	0.027						
C <sub>8</sub> H <sub>18</sub>				1.883	0.229	12.85	0.789	0.789	1.018	0.229	12.85	0.904	5.00	2.570	0.181						
C <sub>10</sub> H <sub>22</sub>				0.680	0.083	4.82	0.285	0.285	0.368	0.083	4.82	0.339	4.86	0.992	0.070	C <sub>10</sub> H <sub>20</sub>	5.00	0.29	0.058	68.0	
C <sub>10</sub> H <sub>20</sub>				0.980	0.119	8.35	0.410	0.410	0.529	0.119	8.35	0.588	5.48	1.532	0.108	C <sub>10</sub> POLY GASO.	5.98	10.99	1.838	1.5	
C <sub>12</sub> H <sub>26</sub>				0.153	0.019	1.37	0.064	0.064	0.083	0.019	1.37	0.096	5.25	0.261	0.016	C <sub>12</sub> H <sub>24</sub>	4.86	4.82	0.992	68.0	
C <sub>12</sub> H <sub>24</sub>				0.327	0.040	3.37	0.137	0.137	0.177	0.040	3.37	0.237	5.54	0.608	0.043	C <sub>12</sub> FREE GASO.				10.772	5.8
C <sub>3</sub> -C <sub>6</sub>											47.33	3.330		9.805	0.690	C <sub>4</sub> POLY TAR	7.58	1.57	0.208		
TOTAL		38.696	498.91		12.186	306.45	41.876	80.572	61.140												
H <sub>2</sub> +CO		96.757	37.441		14208765	SCFH	5.367		18.444	55.885	23.811										
H <sub>2</sub> /CO		1.61			Factor	703790			3.82	2.07	3.82										
Weight Recovery, %					Catalyst Age, hrs.		Space Velocity, vhr	1071	RECOVERED OIL	0.452**	63.34	4.458		9.887	0.696	GAS OIL	1.121	0.0789	428		
Pressure, psig	421				Inlet Velocity, Ft/sec	0.93	Catalyst, Vol. CF	13.27	TOTAL OIL		110.67	7.788		19.692	1.386	FUEL OIL	1.292	0.0909	493		
Temperature, °F	654				Bed Depth, Ft	20.11	Weight, #	1991	WATER SOLUBLE CHEMICALS	0.278**	14.75	1.038		1.872	0.132	POLY TAR	0.320	0.0225	122		
Recycle Ratio	1.08				Bed Density, #/CF	150	Effluent (H <sub>2</sub> )/(CO <sub>2</sub> ) Shift Ratio (H <sub>2</sub> O)/(CO)	10.97	TOTAL LIQUID PRODUCTS C <sub>3</sub> +		125.42	8.826		21.564	1.516	TOTAL	16.393	1.1537	6255		
FRESH FEED CONVERSION - %					TOTAL FEED CONVERSION - %		SELECTIVITY		NET WATER	6.348**	114.37	8.049		13.730	0.966	W. S. CHEM.	1.872	0.1317	714		
Contraction	CO	H <sub>2</sub>	H <sub>2</sub> +CO	CO	H <sub>2</sub>	CO+H <sub>2</sub>	C <sub>3</sub> +C <sub>4</sub> +		GROSS WATER		129.12	9.087		15.602	1.098	TOTAL	18.265	1.2854	6969		
68.51	92.25	81.56	85.67	72.87	49.92	57.39	80.90		HYDROCARBON TOTAL - C <sub>3</sub> +		155.03	10.911									

Form ML-11

\*\*Included in Reactor Effluent Total

g/NCM = 16.91 X #/MCF      89488 MCFH<sub>2</sub> + CO, Bbl/Day = 5421.6 X gal/MCF

THE TEXAS COMPANY — MONTEBELLO LABORATORY  
DATA SUMMARY

RUN NO. 59-W  
HOURS 493-517

OPERATING CONDITIONS				PRODUCT TESTS				CATALYST DATA			
PRESSURES PSIG		RATES S.C.F.H.		OIL		WATER		INVENTORY DATA		PARTICLE SIZE	
Oxygen	445	Fresh Feed	14685	° API	52.4	10.9		In Reactor at Start of Period		Screen Analysis	Sedimentation
Natural Gas	442	Recycle	15892	Neut. No.	30.7	27.7		Fresh Catalyst Added	35	Mesh	Microns %
Generator Outlet	427	Combined Feed	30577	Sap. No.	50.4	36.9		Total		On 40	419+ 42.5
Reactor Inlet	421	Wet Gas - Measured	4212	Hydrox. No.				Catalyst Recovered	68.5	100	150 40.8
Condenser Inlet		Adjusted	4624	Bromine No.	93			In Reactor at End of Period		150	105 7.7
Product Accumulator	372	Loss	412	Pour °F.						200	74 4.8
				Chemicals, % by K <sub>2</sub> CO <sub>3</sub>		12.0		REACTOR d-p, Inches H <sub>2</sub> O		250	62 0.8
								No. Height		325	44 2.2
TEMPERATURES - °F.		Recycle/Fresh Feed	1.08					0 See Period A	52	<325	1.2
Oxygen	323	Inlet Velocity - ft./sec.	0.93					1	75	CATALYST	
Natural Gas	304	Fresh Feed Rate - S.C.F.H.	14209	HEMPEL, DIST. %		° API	2	78	Bulk Density, Lbs./Cu.Ft.		
Generator	--	per Cu. Ft. Dense Bed	1071	205 °F.			3	75	Aerated		
Quench Accumulator	145	per Lb. Catalyst	7.14	400	75.2	55.1	4	300	Settled		
Reactor Inlet	350	per Sq. Ft.	21529	400-550	12.4	37.3	Total	580	Compacted		
Condenser Inlet	540			550+	12.4				Particle Density, gm./cc.		
Product Accumulator	96	Heat Transfer Calculations						CALCULATED FROM dp		NH <sub>3</sub> Value, ml./gm.	
Catalyst No.	Height	Steam Rate=366#/hr		A. S. T. M. DIST. ON				Density, Lbs./Cu.Ft.	150	N <sub>2</sub> Surface, m <sup>2</sup> /gm.	
1 See Per. A	624	@ 705 psia & 506°F.		Naphtha °F.				Inventry, Lbs.	1991		
2	652	1201 BTU		IBP	110			Bed Depth, Ft.	20.11	CHEMICAL ANALYSIS	
3	659	Water in @ 75°F=43°F		10%	142			Vol., Cu. Ft.	13.27	Fe	
4	647	Net BTU/# Steam=1158		50%	224					C	
5	660	1158x366=423828		90%	350					O	
6	659	Ave. Bed Temp=654°F		EP	388					H	
7	649	dt=654-506=148		Rec.	97.5					K <sub>2</sub> O, W+, % basis Fe	
8	639	Tube Area=36.2 sq ft								X-Ray Analysis-	
9	628	K= (423828)/(36.2)(148) = 79.1 BTU/°F/sq ft								Fe <sub>2</sub> O <sub>3</sub>	
10	625									Fe <sub>3</sub> O <sub>4</sub>	
11	602									Fe	



THE TEXAS COMPANY — MONTEBELLO LABORATORY  
YIELD CALCULATIONS

RUN NO. 59-Y  
HOURS 541-565  
CATALYST Spent CM&S

FRESH FEED				WET GAS				RECYCLE	COMBINED FEED	EFFLUENT	NET CHANGE		YIELD BASIS H <sub>2</sub> + CO FED									
	%	m/hr	#/hr	%	At Wt. Balance		m/hr	m/hr	m/hr	m/hr	#/hr	CONDENSATE				YIELDS BASIS BROWNSVILLE DESIGN FEED RATE*						
					m/hr	#/hr						#/MCF	#/gal	gal/hr	gal/MCF		gal/hr	gal/hr	gal/hr	gal/hr	gal/hr	
CO	58.547	14.711	412.05	9.737	1.222	34.23	3.798	18.509	5.020	-13.489	-377.82											
H <sub>2</sub>	58.076	22.163	44.67	34.966	4.389	8.85	13.639	35.802	18.028	-17.774	-35.82						400 EP	77.0	6.951	98.0	6.812	
CO <sub>2</sub>	2.460	0.939	41.33	32.937	4.134	181.95	12.848	13.787	16.982	3.195	140.62	10.049					400-550	14.0	1.264	91.4	1.155	
N <sub>2</sub>	0.310	0.118	3.31	1.803	0.226	6.33	0.703	0.821	0.929								550 +	9.0	0.812	114.6	0.931	
CH <sub>4</sub>	0.607	0.232	3.72	10.137	1.272	20.41	3.954	4.186	5.226	1.040	16.69	1.193										
C <sub>2</sub> H <sub>6</sub>				2.603	0.327	9.17	1.015	1.015	1.342	0.327	9.17	0.655										
C <sub>3</sub> H <sub>8</sub>				1.317	0.165	4.96	0.514	0.514	0.879	0.165	4.96	0.354					PROPYLENE	43.2	6.23			
C <sub>4</sub> +C <sub>5</sub>											30.82	2.202					C <sub>4</sub> POLY GASOL	87.5	5.45	0.911		
C <sub>6</sub> H <sub>14</sub>				2.730	0.343	14.43	1.065	1.065	1.408	0.343	14.43	1.031	4.32	3.340	0.239		C <sub>6</sub> POLY TAR	12.5	0.78	0.104		
C <sub>8</sub> H <sub>18</sub>				0.320	0.040	1.76	0.126	0.125	0.165	0.040	1.76	0.126	4.24	0.415	0.030							
C <sub>10</sub> H <sub>22</sub>				1.627	0.204	11.45	0.635	0.635	0.859	0.204	11.45	0.818	5.00	2.290	0.164							
C <sub>12</sub> H <sub>26</sub>				0.547	0.069	4.01	0.213	0.213	0.282	0.069	4.01	0.287	4.88	0.825	0.059		C <sub>12</sub> H <sub>26</sub>	5.00	0.62	0.124	68.0	
C <sub>14</sub> H <sub>22</sub>				0.813	0.102	7.15	0.317	0.317	0.419	0.102	7.15	0.511	5.48	1.312	0.094		C <sub>14</sub> POLY GASOL	5.98	9.48	1.585	1.5	
C <sub>16</sub> H <sub>22</sub>				0.150	0.019	1.37	0.059	0.059	0.078	0.019	1.37	0.098	8.28	0.261	0.019		C <sub>16</sub> H <sub>22</sub>	4.86	4.01	0.825	68.0	
C <sub>18</sub> H <sub>22</sub>				0.313	0.039	3.28	0.122	0.122	0.161	0.039	3.28	0.234	5.54	0.592	0.042		C <sub>18</sub> -FREE GASOL				9.888	5.8
C <sub>20</sub> +C <sub>22</sub>											43.45	3.105		9.035	0.647		C <sub>20</sub> POLY TAR	7.53	1.35	0.179		
TOTAL		38.163	505.08		12.551	309.35	39.007	77.170	59056													
H <sub>2</sub> +CO	96.623	36.874	13993909	SCFH	5.611		17.437	54.311	23.048	-31.263												
H <sub>2</sub> /CO		1.51	Factor	714596	3.59		3.59	1.93	3.59	1.32												
Weight Recovery, %	95.06		Catalyst Age, hrs.		Space Velocity, vhr	1064		RECOVERED OIL	0.413	57.97	4.143	9.027	0.645				GAS OIL	1.155	0.0825	447		
Pressure, psig	416		Inlet Velocity, Ft/sec	0.90	Catalyst, % Vol. CF	13.25		TOTAL OIL	101.42	7.248	18.062	1.292					FUEL OIL	0.931	0.0665	361		
Temperature, °F	657		Bed Depth, Ft	19.93	Weight, #	1960		WATER SOLUBLE CHEMICALS	0.289	15.32	1.095	2.004	0.143				POLY TAR	0.283	0.0202	110		
Recycle Ratio	1.02		Bed Density, #/CF	149	Effluent Shift Ratio (H <sub>2</sub> )/(CO <sub>2</sub> )	8.97		TOTAL LIQUID PRODUCTS C <sub>4</sub> +	116.74	8.343	20.066	1.435					TOTAL	14.791	1.0569	5731		
FRESH FEED CONVERSION — %			TOTAL FEED CONVERSION — %		SELECTIVITY			NET WATER	6.796	122.44	8.760	14.699	1.050				W S CHEM.	2.004	0.1432	776		
Contraction	CO	H <sub>2</sub>	H <sub>2</sub> +CO	CO	H <sub>2</sub>	CO+H <sub>2</sub>	C <sub>3</sub> + C <sub>4</sub>	GROSS WATER	137.76	9.845	16.703	1.193					TOTAL	16.795	1.2001	6507		
67.11	91.69	90.20	84.78	72.88	49.65	57.56	79.11	HYDROCARBON TOTAL—C <sub>1</sub> +	147.58	10.545												

Form ML-11

\*\* Included in Reactor Effluent Total

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

THE TEXAS COMPANY — MONTEBELLO LABORATORY  
DATA SUMMARY

RUN NO. 59-Y  
HOURS 541-565

OPERATING CONDITIONS				PRODUCT TESTS				CATALYST DATA								
PRESSURES PSIG		RATES S.C.F.H.		OIL		WATER		INVENTORY DATA				PARTICLE SIZE				
Oxygen	441	Fresh Feed	14483	* API	52.0	11.0	In Reactor at Start of Period					Screen Analysis		Sedimentation		
Natural Gas	438	Recycle	14803	Neut. No.	35.8	33.2	Fresh Catalyst Added	35				Mesh	Microns	%	Microns	%
Generator Outlet	422	Combined Feed	29286	Sap. No.	49.0	37.8	Total					On 40	419+	54.8	80+	
Reactor Inlet	416	Wet Gas—Measured	4379	Hydrox. No.			Catalyst Recovered	69½				100	150	33.9	40—80	
Condenser Inlet		Adjusted	4763	Bromine No.		93	In Reactor at End of Period					150	105	4.5	20—40	
Product Accumulator	369	Loss	384	Pour °F.		below -35						200	74	3.6	10—20	
				Chemicals, % by K <sub>2</sub> CO <sub>3</sub>		12.0	REACTOR d-p, Inches H <sub>2</sub> O					250	62	0.8	0—20	
				No. Height								325	44	1.2		
TEMPERATURES — °F.		Recycle/Fresh Feed	1.02				0 See Period A	51				<325		1.2		
Oxygen	324	Inlet Velocity—ft./sec.	0.90				1	75				CATALYST				
Natural Gas	313	Fresh Feed Rate—S.C.F.H. H <sub>2</sub> +CO	13994	HEMPEL, DIST. %		°API	2	76				Bulk Density, Lbs./Cu.Ft.				
Generator		per Cu. Ft. Dense Bed	1064	205 °F.			3	74				Aerated				
Quench Accumulator	153	per Lb. Catalyst	7.14	400	76.0	54.7	4	295				Settled				
Reactor Inlet	306	per Sq. Ft.	21203	400-550	14.0	37.7	Total	571				Compacted				
Condenser Inlet	538			550+	10.0							Particle Density, gm./cc.				
Product Accumulator	98	Heat Transfer Calculations										CALCULATED FROM dp				
Catalyst No.	Height	Steam Rate=356#/hr		A. S. T. M. DIST. ON								Density, Lbs./Cu.Ft.				
1 See Per. A	611	@ 705 psia & 506°F		Naphtha °F.								Inventory, Lbs.				
2	651	1201 BTU/#		IBP	110							Bed Depth, Ft.				
3	668	Water in @ 82.7=41 BTU/#		10%	140							Vol., Cu. Ft.				
4	652	Net BTU/# Steam=1160		50%	224							Fe				
5	662	1160x356=412960		90%	348							O				
6	660	Ave. Bed Temp=657		EP	392							H				
7	650	dT=657-506=151°F		Rec.	97.0							K <sub>2</sub> O, W+, % basis Fe				
8	639	Tube Area=36.0 sq ft										X-Ray Analysis—				
9	627	K <sub>2</sub> = 412960 / (36.0)(151) = 76.0 BTU/°F/sq ft										Fe <sub>2</sub> O <sub>3</sub>				
10	624											Fe				
11	601											Fe				

THE TEXAS COMPANY — MONTEBELLO LABORATORY  
YIELD CALCULATIONS

RUN NO. 59-Z  
HOURS 565-589  
CATALYST Spent CM&S

FRESH FEED				WET GAS			RECYCLE	COMBINED FEED	EFFLUENT	NET CHANGE		YIELD BASIS H <sub>2</sub> + CO FED									
	%	m/hr	#/hr	%	At Wt. Balance	#/hr	m/hr	m/hr	m/hr	m/hr	#/hr	CONDENSATE			YIELDS BASIS BROWNSVILLE DESIGN FEED RATE#						
					m/hr							#/MCF	#/gal	gal/hr	gal/MCF		CORRECTED HEMPEL, %	gal/hr	TREATING RECOVERY, %	gal/hr	
CO	40.040	15.074	422.22	8.313	1.076	30.14	3.200	18.274	4.276	-13.998	-392.08										
H <sub>2</sub>	56.717	21.352	43.05	36.407	4.710	9.50	14.013	35.365	18.723	-16.642	-33.55						400 EP	74.4	6.826	98.0	6.689
CO <sub>2</sub>	2.463	0.927	40.80	32.360	4.188	184.31	12.455	13.382	16.643	3.261	143.51	10.381					400-550	14.8	1.358	91.4	1.241
N <sub>2</sub>	0.213	0.080	2.24	1.807	0.234	6.56	0.696	0.776	0.930								550 +	10.8	0.991	114.6	1.136
CH <sub>4</sub>	0.567	0.214	3.43	9.630	1.246	19.99	3.707	3.921	4.953	1.032	16.56	1.198									
C <sub>2</sub> H <sub>6</sub>				2.653	0.343	9.62	1.021	1.021	1.346	0.343	9.62	0.696					RECOVERY %	#/hr	gal/hr		
C <sub>3</sub> H <sub>8</sub>				1.377	0.178	5.35	0.530	0.530	0.708	0.178	5.35	0.387					PROPYLENE	40.9	6.38		
C <sub>4</sub> +C <sub>5</sub>																	C <sub>3</sub> POLY GASO.	87.5	5.58	0.933	
C <sub>2</sub> H <sub>4</sub>				2.867	0.371	15.61	1.104	1.104	1.475	0.371	15.61	1.129	4.32	3.613	0.261		C <sub>3</sub> POLY TAR	12.5	0.80	0.106	
C <sub>2</sub> H <sub>2</sub>				0.543	0.044	1.94	0.132	0.132	0.176	0.044	1.94	0.140	4.24	0.458	0.033						
C <sub>2</sub> H <sub>2</sub>				1.903	0.246	13.80	0.732	0.732	0.978	0.246	13.80	0.998	5.00	2.760	0.200			#/gal	#/hr	gal/hr	RVP
C <sub>2</sub> H <sub>2</sub>				0.897	0.116	6.74	0.345	0.345	0.461	0.116	6.74	0.489	4.88	1.387	0.100		C <sub>4</sub> H <sub>10</sub>	5.00			68.0
C <sub>2</sub> H <sub>2</sub>				0.983	0.127	8.91	0.378	0.378	0.505	0.127	8.91	0.645	5.48	1.635	0.118		C <sub>4</sub> POLY GASO.	5.98	12.08	2.019	1.5
C <sub>2</sub> H <sub>2</sub>				0.133	0.017	1.23	0.051	0.051	0.068	0.017	1.23	0.089	5.28	0.234	0.017		C <sub>4</sub> H <sub>10</sub>	4.86	(5.74) 5.00	(1.387) 1.029	68.0
C <sub>2</sub> H <sub>2</sub>				0.327	0.042	3.53	0.126	0.126	0.168	0.042	3.53	0.255	5.84	0.637	0.046		C <sub>4</sub> FREE GASO.			10.128	5.8
C <sub>2</sub> -C <sub>2</sub>																	C <sub>4</sub> POLY TAR	7.53	1.73	0.230	
TOTAL		37.647	511.74		12.938	317.24	38.490	76.137	58.791												
H <sub>2</sub> +CO	96.757	36.426	13824	SCFH	5.786		17.213	53.639	22.999	-30.640								gal/hr	gal/MCF	Bbl/Day	
H <sub>2</sub> /CO	1.42		Factor	723396	4.38		4.38	1.94	4.38	1.19								10 # BY 400 EP GASOLINE	13.176	0.9531	5167
Weight Recovery, %	95.21		Catalyst Age, hrs.		Space Velocity, vhr	1050		RECOVERED OIL	0.418	58.67	4.244	9.175	0.664				GAS OIL	1.241	0.0898	487	
Pressure, psig	413		Inlet Velocity, Ft/sec	0.88	Catalyst, Vol. CF	13.17		TOTAL OIL		110.45	7.988	19.899	1.440				FUEL OIL	1.136	0.0822	446	
Temperature, °F	648		Bed Depth, Ft	19.95	Weight, #	1963		WATER SOLUBLE CHEMICALS	0.308	16.25	1.176	2.069	0.150				POLY TAR	0.336	0.0243	132	
Recycle Ratio	1.02		Bed Density, #/CF	149	Effluent (H <sub>2</sub> /CO) Shift Ratio (H <sub>2</sub> O)/CO	10.98		TOTAL LIQUID PRODUCTS C <sub>2</sub> +		126.68	9.164	21.968	1.590				TOTAL	15.889	1.494	6232	
FRESH FEED CONVERSION — %				TOTAL FEED CONVERSION — %				SELECTIVITY	NET WATER	6.637	119.58	8.650	14.355	1.038			W. S. CHEM.	2.069	0.1497	812	
Contraction	CO	H <sub>2</sub>	H <sub>2</sub> +CO	CO	H <sub>2</sub>	CO+H <sub>2</sub>	C <sub>3</sub> +C <sub>4</sub>	GROSS WATER		135.83	9.826	16.424	1.188				TOTAL	17.958	1.2991	7043	
65.63	92.86	77.94	84.12	76.60	47.06	57.12	80.07	HYDROCARBON TOTAL —, +		158.21	11.445										

Form ML-11

\*\* Included in Reactor Effluent Total

g/NCM = 16.91 X #/MCF \*9488 MCFH<sub>2</sub> + CO, Bbl/Day = 5431.6 X gal/MCF

THE TEXAS COMPANY — MONTEBELLO LABORATORY  
DATA SUMMARY

RUN NO. 59-Z  
HOURS 565-589

OPERATING CONDITIONS				PRODUCT TESTS				CATALYST DATA					
PRESSURES PSIG		RATES S.C.F.H.		OIL		WATER		INVENTORY DATA		PARTICLE SIZE			
Oxygen	436	Fresh Feed	14287	° API	52.3	11.1		In Reactor at Start of Period		Screen Analysis	Sedimentation		
Natural Gas	433	Recycle	14607	Neut. No.	35.4	34.0		Fresh Catalyst Added	34	Mesh	Microns	%	
Generator Outlet	418	Combined Feed	28894	Sap. No.	49.7	37.5		Total		On 40	419+	40.4	80+
Reactor Inlet	413	Wet Gas—Measured	4531	Hydrox. No.				Catalyst Recovered	65	100	150	37.4	40—80
Condenser Inlet		Adjusted	4910	Bromine No.	93			In Reactor at End of Period		150	105	8.9	20—40
Product Accumulator	368	Loss	379	Pour °F.	-30					200	74	7.3	10—20
				Chemicals, % by K <sub>2</sub> CO <sub>3</sub>		12.6		REACTOR d-p, Inches H <sub>2</sub> O		250	62	1.2	0—20
				No.				No.	Height	325	44	3.4	
TEMPERATURES — °F.		Recycle/Fresh Feed	1.02					0	See Period A	51	<325		1.4
Oxygen	339	Inlet Velocity—ft./sec.	0.88					1		75			
Natural Gas	323	Fresh Feed Rate—S.C.F.H.	13824	HEMPEL DIST. %				2		76			
Generator		per Cu. Ft. Dense Bed	1050	205 °F.				3		75			
Quench Accumulator	148	per Lb. Catalyst	7.04	400	73.4	54.9		4		295			150
Reactor Inlet	255	per Sq. Ft.	20945	400-550	14.8	38.6		Total		572			171
Condenser Inlet	528			550+	11.8	--							4.52
Product Accumulator	98	Heat Transfer Calculations						CALCULATED FROM dp					
Catalyst No.	Height	Steam Rate=321#/hr		A. S. T. M. DIST. ON				Density, Lbs./Cu.Ft.	149	NH <sub>3</sub> Value, ml./gm.			
1	See Per. A	@ 705 psia & 507°F		Naphtha °F.				Inventory, Lbs.	1963	N <sub>2</sub> Surface, m <sup>2</sup> /gm.			
2	635	1201 BTU		IBP	110			Bed Depth, Ft.	19.96	CHEMICAL ANALYSIS			
3	664	Water in @ 85°F=53°F		10%	144			Vol., Cu. Ft.	13.17	Fe			
4	649	Net BTU/# Steam=1148		50%	228					C			6.86
5	649	1148x321=368508		90%	350					O			
6	650	Ave. Bed Temp=548		EP	394					H			
7	641	dT=648-507=141°F		Rec.	97.0					K <sub>2</sub> O, W+, % basis Fe			
8	631	Tube Area=36.0 sq ft								X-Ray Analysis—			
9	621	368508 K = (36.0)(141) = 72.6 BTU/°F/sq ft								Fe <sub>2</sub> O <sub>3</sub>			
10	616									Fe <sub>2</sub> O <sub>4</sub>			
11	593									Fe			



THE TEXAS COMPANY — MONTEBELLO LABORATORY  
YIELD CALCULATIONS

RUN NO. 59-BB  
HOURS 613-637  
CATALYST Spent ONAS

Table with columns: FRESH FEED, WET GAS, RECYCLE, COMBINED FEED, EFFLUENT, NET CHANGE, YIELD BASIS H2 + CO FED. Rows include CO, H2, CO2, N2, CH4, C2H4, C2H6, C3H8, C4H10, C4H8, C4H6, C4H2, C3-C4, TOTAL, H2+CO, H2/CO, Weight Recovery, Pressure, Temperature, Recycle Ratio, FRESH FEED CONVERSION, and various chemical species.

Form ML-11

\*\* Included in Reactor Effluent Total

g/NCM = 16.91 x #/MCF \*9488 MCF H2 + CO, Bbl/Day = 5421.6 x gal/MCF

THE TEXAS COMPANY — MONTEBELLO LABORATORY  
DATA SUMMARY

RUN NO. 59-BB  
HOURS 613-637

Table with columns: OPERATING CONDITIONS, PRODUCT TESTS, CATALYST DATA. Rows include Pressures, Temperatures, Catalyst No., Height, Steam Rate, Water in, Net BTU, Ave. Bed Temp, dt, Tube Area, K, and various catalyst and product analysis data.

THE TEXAS COMPANY — MONTEBELLO LABORATORY  
YIELD CALCULATIONS

RUN NO. 59-CC  
HOURS 637-661  
CATALYST Spent GMS

FRESH FEED				WET GAS				RECYCLE	COMBINED FEED	EFFLUENT	NET CHANGE		YIELD BASIS H <sub>2</sub> + CO FED								
	%	m/hr	#/hr	At Wt. Balance		m/hr	m/hr	m/hr	m/hr	m/hr	#/hr	CONDENSATE									
				m/hr	#/hr							#/MCF	#/gal	gal/hr	gal/MCF	YIELDS BASIS	BROWNSVILLE	DESIGN FEED RATE*			
CO <sub>2</sub>	37.990	14.430	404.19	4.983	0.617	17.28	1.864	16.294	2.481	-13.813	-386.91										
H <sub>2</sub>	58.077	22.060	44.47	34.687	4.294	8.66	12.979	35.039	17.273	-17.766	-35.81				400 EP	75.8	6.770	98.0	6.655		
CO	2.683	1.095	48.19	33.924	4.198	184.77	12.694	13.789	16.892	3.103	136.58	9.863			400-550	15.2	1.358	91.4	1.241		
N <sub>2</sub>	0.517	0.180	3.36	2.273	0.281	7.87	0.850	0.970	1.131						550 +	9.0	0.804	114.6	0.921		
CH <sub>4</sub>	0.733	0.279	4.48	11.220	1.389	22.28	4.198	4.477	5.587	1.110	17.86	1.285									
C <sub>2</sub> H <sub>6</sub>				3.127	0.587	10.86	1.170	1.170	1.557	0.387	10.86	0.784					RECOVERY %	#/hr	gal/hr		
C <sub>3</sub> H <sub>8</sub>				1.657	0.205	6.16	0.620	0.620	0.825	0.1205	6.16	0.445			PROPYLENE	43.6	7.39				
C <sub>4</sub> +C <sub>5</sub>															C <sub>3</sub> POLY GAS.	87.5	6.47	1.082			
C <sub>2</sub> H <sub>4</sub>				3.253	0.403	16.96	1.217	1.217	1.620	0.403	16.96	1.225	4.32	3.926	0.284	C <sub>3</sub> POLY TAR	12.5	0.92	0.122		
C <sub>2</sub> H <sub>2</sub>				0.363	0.045	1.98	0.136	0.136	0.181	0.045	1.98	0.143	4.24	0.487	0.034						
C <sub>2</sub> H <sub>2</sub>				2.143	0.265	14.87	0.802	0.802	1.067	0.265	14.87	1.074	8.00	2.974	0.215		#/gal	#/hr	gal/hr	RVP	
C <sub>2</sub> H <sub>4</sub>				0.667	0.083	4.82	0.250	0.250	0.333	0.083	4.82	0.348	4.88	0.992	0.072	C <sub>4</sub> H <sub>6</sub>	5.00	0.42	0.084	68.0	
C <sub>2</sub> H <sub>6</sub>				1.117	0.138	9.68	0.418	0.418	0.556	0.138	9.68	0.699	5.48	1.776	0.128	C <sub>4</sub> POLY GAS.	5.98	12.64	2.114	1.5	
C <sub>2</sub> H <sub>2</sub>				0.193	0.024	1.73	0.072	0.072	0.096	0.024	1.73	0.125	8.28	0.330	0.024	C <sub>4</sub> H <sub>10</sub>	4.86	4.82	0.992	68.0	
C <sub>2</sub> H <sub>2</sub>				0.393	0.049	4.12	0.147	0.147	0.196	0.049	4.12	0.298	8.84	0.744	0.054	C <sub>4</sub> FREE GAS.			1.0	5.67	5.8
C <sub>3</sub> -C <sub>6</sub>											54.16	3.912	11.209	0.811	C <sub>4</sub> POLY TAR	7.53	1.81	0.240			
TOTAL		37.984	504.69		12.378	312.04	87.417	75.401	57.144												
H <sub>2</sub> +CO	96.067	36.490	13848058	SCFH	4.911		14.843	51.333	19.754	-31.579							gal/hr	gal/MCF	Bbl/Day		
H <sub>2</sub> /CO		1.53	Factor	722122	6.96		6.96	2.15	6.96	1.29							10 # RVP 400 EP GASOLINE	13.757	0.9934	5386	
Weight Recovery, %	96.24	Catalyst Age, hrs.		Space Velocity, whv		1082	RECOVERED OIL		0.409	57.33	4.140	8.932	0.645	GAS OIL	1.241	0.0896	486				
Pressure, psig	408	Inlet Velocity, Ft/sec		0.90	Catalyst, Vol, CP		12.80	TOTAL OIL		111.49	8.052	20.141	1.456	FUEL OIL	0.921	0.0665	361				
Temperature, °F	657	Bed Depth, Ft		19.50	Weight, #		1908	WATER SOLUBLE CHEMICALS		0.294	15.59	1.126	1.960	0.142	POLY TAR	0.382	0.0261	142			
Recycle Ratio	0.99	Bed Density, #/CF		149	Effluent (H <sub>2</sub> )(CO <sub>2</sub> ) Shift Ratio (H <sub>2</sub> O)(CO)		17.70	TOTAL LIQUID PRODUCTS C <sub>2</sub> +		127.08	9.178	22.101	1.598	TOTAL	16.281	1.1756	6375				
FRESH FEED CONVERSION - %				TOTAL FEED CONVERSION - %				SELECTIVITY		NET WATER		6.646	119.73	8.646	14.373	1.038	W. S. CHEM.	1.960	0.1415	767	
Contraction	CO	H <sub>2</sub>	H <sub>2</sub> +CO	CO	H <sub>2</sub>	CO+H <sub>2</sub>	C <sub>3</sub> +C <sub>4</sub> +	GROSS WATER		135.32	9.772	1.6.333	1.180	TOTAL	18.241	1.3171	7142				
87.41	95.72	80.53	86.54	84.77	50.70	61.52	78.49	HYDROCARBON TOTAL - C <sub>2</sub> +		161.90	11.692										

Form ML-11

\*\*Included in Reactor Effluent Total

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

THE TEXAS COMPANY — MONTEBELLO LABORATORY  
DATA SUMMARY

RUN NO. 59-CC  
HOURS 637-661

OPERATING CONDITIONS				PRODUCT TESTS				CATALYST DATA					
PRESSURES PSIG		RATES S.C.F.H.		OIL		WATER		INVENTORY DATA		PARTICLE SIZE			
Oxygen	432	Fresh Feed	14415	*API	51.9	10.8	In Reactor at Start of Period		Screen Analysis		Sedimentation		
Natural Gas	429	Recycle	14200	Neut. No.	37.9	36.0	Fresh Catalyst Added	39	Mesh	Microns	%	Microns	%
Generator Outlet	414	Combined Feed	28615	Sap. No.	49.0	36.5	Total		On 40	419+	56.6	80+	
Reactor Inlet	408	Wet Gas - Measured	4412	Hydrox. No.			Catalyst Recovered	61.5	100	150	31.8	40-80	
Condenser Inlet		Adjusted	4697	Bromine No.	93		In Reactor at End of Period		150	105	4.4	20-40	
Product Accumulator	360	Loss	285	Pour °F.	-30				200	74	3.4	10-20	
				Chemicals, % by K <sub>2</sub> CO <sub>3</sub>		12.0	REACTOR d-p, Inches H <sub>2</sub> O		250	62	0.6	0-20	
				No.			No.		325	44	2.0		
TEMPERATURES - °F.		Recycle/Fresh Feed	0.99	0	See Period A	51	<325	1.2					
Oxygen	294	Inlet Velocity - ft./sec.	0.90	1		74	CATALYST						
Natural Gas	324	Fresh Feed Rate - S.C.F.H.	13848	HEMPEL, DIST. %	*API	2	76	Bulk Density, Lbs./Cu.Ft.					
Generator		per Cu.Ft. Dense Bed	1082	205 °F.		3	75	Aerated				152	
Quench Accumulator	153	per Lb. Catalyst	7.26	400	74.8	54.6	4	Settled				153	
Reactor Inlet	315	per Sq. Ft.	20982	400-550	15.2	37.2	Total	556		Compacted		173	
Condenser Inlet	541			550+	10.0			Particle Density, gm./cc.				4.46	
Product Accumulator	98	Heat Transfer Calculations		CALCULATED FROM dp		NH <sub>3</sub> Value, ml./gm.							
Catalyst No.	Height	Steam Rate = 364#/hr		A. S. T. M. DIST. ON		Density, Lbs./Cu.Ft.		149	N <sub>2</sub> Surface, m <sup>2</sup> /gm.				
1	623	@ 705 psia & 507°F		Naphtha °F.		Inventory, Lbs.		1908					
2	657	1201 BTU		IBP		Bed Depth, Ft.		19.40	CHEMICAL ANALYSIS				
3	659	Water in @ 82°F = 50°F		10%		Vol., Cu. Ft.		12.80	Fe				
4	648	Net BTU/# Steam = 1151		50%					C			6.61	
5	663	1151 x 364 = 418964		90%					O				
6	661	Ave. Bed Temp = 657		EP					H				
7	652	dT = 657 - 507 = 150°F		Rec.		96.0			K <sub>2</sub> O, W+, % basis Fe				
8	641	Tube Area = 35.2 sq ft							X-Ray Analysis -				
9	650	K = (35.2)(150) = 79.3 BTU/°F/sq ft							Fe <sub>2</sub> O <sub>3</sub>				
10	625								Fe <sub>2</sub> O <sub>4</sub>				
11	601								Fe				





THE TEXAS COMPANY - MONTEBELLO LABORATORY
YIELD CALCULATIONS

RUN NO. 59-EE
HOURS 685-709
CATALYST Spent CM&S

Main process data table with columns for FRESH FEED, WET GAS, RECYCLE, COMBINED FEED, EFFLUENT, NET CHANGE, YIELD BASIS H2+CO FED, CONDENSATE, and various product yields and recovery rates.

Form ML-11

\*\*Included in Reactor Effluent Total

g/NGM = 16.91 X #/MCF

\*9488 MCFH H2 + CO, Bbl/Day = 5421.6 X gal/MCF

THE TEXAS COMPANY - MONTEBELLO LABORATORY
DATA SUMMARY

RUN NO. 59-EE
HOURS 685-709

Operating conditions and catalyst data table with columns for OPERATING CONDITIONS, PRODUCT TESTS, and CATALYST DATA. Includes parameters like PRESSURES PSIG, RATES S.C.F.H., TEMPERATURES - °F., and various catalyst analysis results.





THE TEXAS COMPANY — MONTEBELLO LABORATORY  
YIELD CALCULATIONS

RUN NO. 59-HH  
HOURS 757-781  
CATALYST Spent CM&S

Table with columns: FRESH FEED, WET GAS, RECYCLE, COMBINED FEED, EFFLUENT, NET CHANGE, YIELD BASIS H2 + CO FED. Includes rows for various chemical species like CO, H2, CO2, N2, CH4, C2H6, C3H8, and summary rows for TOTAL, H2+CO, and H2 CO.

Form ML-11

\*\* Included in Reactor Effluent Total

g/NCM = 16.91 X #/MCF

99488 MCFH H2 + CO, Bbl/Day = 3421.6 X gal/MCF

THE TEXAS COMPANY — MONTEBELLO LABORATORY  
DATA SUMMARY

RUN NO. 59-HH  
HOURS 757-781

Table with columns: OPERATING CONDITIONS, PRODUCT TESTS, CATALYST DATA. Includes rows for PRESSURES PSIG, TEMPERATURES -°F, and detailed catalyst analysis data.

THE TEXAS COMPANY — MONTEBELLO LABORATORY  
YIELD CALCULATIONS

RUN NO. 59-II  
HOURS 781-796  
CATALYST Spent CM&S

Table with multiple columns: FRESH FEED, WET GAS, RECYCLE, COMBINED FEED, EFFLUENT, NET CHANGE, YIELD BASIS H2 + CO FED, CONDENSATE, YIELDS BASIS BROWNSVILLE DESIGN FEED RATE. Includes rows for various chemical species like CO, H2, CO2, CH4, and a summary section for FRESH FEED CONVERSION and TOTAL FEED CONVERSION.

Form ML-11

\*\*Included in Reactor Effluent Total

g/NCM = 16.91 X #/MCF

\*9488 MCFH H2 + CO, Bbl/Day = 5421.6 X gal/MCF

THE TEXAS COMPANY — MONTEBELLO LABORATORY  
DATA SUMMARY

RUN NO. 59-II  
HOURS 781-796

Table with columns: OPERATING CONDITIONS, PRODUCT TESTS, CATALYST DATA. Includes rows for Pressures (PSIG), Temperatures (°F), Catalyst No. and Height, and various catalyst analysis results.









THE TEXAS COMPANY — MONTEBELLO LABORATORY

RATE CALCULATIONS

RUN NO. 59-A  
HOURS 0-14

Table with columns: GAS ANALYSES, GENERATOR BALANCE, WEIGHT BALANCE. Includes rows for FRESH FEED, CO, H2, CO2, N2, CH4, C2H6, C3H8, C4H10, C5H12, C6H14, C7H16, C8H18, C9H20, C10H22, C11H24, C12H26, C13H28, C14H30, C15H32, C16H34, C17H36, C18H38, C19H40, C20H42, M.W., H2O, and BALANCE. Includes sub-tables for WET GAS, GAS FLOW RATES, and LIQUID PRODUCT RATES.

THE TEXAS COMPANY — MONTEBELLO LABORATORY

RATE CALCULATIONS

RUN NO. 59-B  
HOURS 14-38

Table with columns: GAS ANALYSES, GENERATOR BALANCE, WEIGHT BALANCE. Includes rows for FRESH FEED, CO, H2, CO2, N2, CH4, C2H6, C3H8, C4H10, C5H12, C6H14, C7H16, C8H18, C9H20, C10H22, C11H24, C12H26, C13H28, C14H30, C15H32, C16H34, C17H36, C18H38, C19H40, C20H42, M.W., H2O, and BALANCE. Includes sub-tables for WET GAS, GAS FLOW RATES, and LIQUID PRODUCT RATES.

THE TEXAS COMPANY — MONTEBELLO LABORATORY

RUN NO. 59-C  
HOURS 38-62

RATE CALCULATIONS

Table with columns: GAS ANALYSES, GENERATOR BALANCE, WEIGHT BALANCE. Includes rows for Fresh Feed, CO, H2, CO2, N2, CH4, C2H6, C3H8, C4H10, C5H12, C6H14, C7H16, C8H18, C9H20, C10H22, C11H24, C12H26, C13H28, C14H30, C15H32, C16H34, C17H36, C18H38, C19H40, C20H42, M.W., H2O, O2, O3, O4, O5, O6, O7, O8, O9, O10, O11, O12, O13, O14, O15, O16, O17, O18, O19, O20, O21, O22, O23, O24, O25, O26, O27, O28, O29, O30, O31, O32, O33, O34, O35, O36, O37, O38, O39, O40, O41, O42, O43, O44, O45, O46, O47, O48, O49, O50, O51, O52, O53, O54, O55, O56, O57, O58, O59, O60, O61, O62, O63, O64, O65, O66, O67, O68, O69, O70, O71, O72, O73, O74, O75, O76, O77, O78, O79, O80, O81, O82, O83, O84, O85, O86, O87, O88, O89, O90, O91, O92, O93, O94, O95, O96, O97, O98, O99, O100.

THE TEXAS COMPANY — MONTEBELLO LABORATORY

RUN NO. 59-D  
HOURS 58-82

RATE CALCULATIONS

Table with columns: GAS ANALYSES, GENERATOR BALANCE, WEIGHT BALANCE. Includes rows for Fresh Feed, CO, H2, CO2, N2, CH4, C2H6, C3H8, C4H10, C5H12, C6H14, C7H16, C8H18, C9H20, C10H22, C11H24, C12H26, C13H28, C14H30, C15H32, C16H34, C17H36, C18H38, C19H40, C20H42, M.W., H2O, O2, O3, O4, O5, O6, O7, O8, O9, O10, O11, O12, O13, O14, O15, O16, O17, O18, O19, O20, O21, O22, O23, O24, O25, O26, O27, O28, O29, O30, O31, O32, O33, O34, O35, O36, O37, O38, O39, O40, O41, O42, O43, O44, O45, O46, O47, O48, O49, O50, O51, O52, O53, O54, O55, O56, O57, O58, O59, O60, O61, O62, O63, O64, O65, O66, O67, O68, O69, O70, O71, O72, O73, O74, O75, O76, O77, O78, O79, O80, O81, O82, O83, O84, O85, O86, O87, O88, O89, O90, O91, O92, O93, O94, O95, O96, O97, O98, O99, O100.





THE TEXAS COMPANY — MONTEBELLO LABORATORY  
RATE CALCULATIONS

RUN NO. 59-I  
HOURS 178-206

Table with columns: GAS ANALYSES, GENERATOR BALANCE, WEIGHT BALANCE. Includes rows for FRESH FEED, CO, H2, CO2, N2, CH4, C2H6, C2H4, C2H2, H2O, and BALANCE. Includes sub-tables for WET GAS, GAS FLOW RATES, and LIQUID PRODUCT RATES.

THE TEXAS COMPANY — MONTEBELLO LABORATORY  
RATE CALCULATIONS

RUN NO. 59-J  
HOURS 206-230

Table with columns: GAS ANALYSES, GENERATOR BALANCE, WEIGHT BALANCE. Includes rows for FRESH FEED, CO, H2, CO2, N2, CH4, C2H6, C2H4, C2H2, H2O, and BALANCE. Includes sub-tables for WET GAS, GAS FLOW RATES, and LIQUID PRODUCT RATES.

THE TEXAS COMPANY — MONTEBELLO LABORATORY  
RATE CALCULATIONS

RUN NO. 59-K  
HOURS 230-254

Table with columns: GAS ANALYSES (1400, 2200, 0600, AVERAGE), GENERATOR BALANCE (M/HR, C, H, O, Mol %, M/HR, C, H, O), WEIGHT BALANCE (#/hr Measured, At Wt. Balance), and LIQUID PRODUCT RATES (WET GAS, FRESH FEED, WET GAS, RECYCLE, BLEED, NATURAL GAS, OXYGEN, STEAM).

RATE CALCULATIONS

HOURS 254-267

Table with columns: GAS ANALYSES (1800, 2200, 0600, AVERAGE), GENERATOR BALANCE (M/HR, C, H, O, Mol %, M/HR, C, H, O), WEIGHT BALANCE (#/hr Measured, At Wt. Balance), and LIQUID PRODUCT RATES (WET GAS, FRESH FEED, WET GAS, RECYCLE, BLEED, NATURAL GAS, OXYGEN, STEAM).





THE TEXAS COMPANY — MONTEBELLO LABORATORY  
RATE CALCULATIONS

RUN NO. 59-0  
HOURS 315-339

Table with columns: GAS ANALYSES, GENERATOR BALANCE, WEIGHT BALANCE. Rows include FRESH FEED, CO, H2, N2, CH4, C2H6, C2H4, C2H2, H2O, BALANCE, WET GAS, GAS FLOW RATES, LIQUID PRODUCT RATES. Includes chemical formulas like O2, CO2, N2, CH4, C2H6, C2H4, C2H2, H2O and numerical values for flow rates and weights.

THE TEXAS COMPANY — MONTEBELLO LABORATORY  
RATE CALCULATIONS

RUN NO. 59-P  
HOURS 339-363

Table with columns: GAS ANALYSES, GENERATOR BALANCE, WEIGHT BALANCE. Rows include FRESH FEED, CO, H2, N2, CH4, C2H6, C2H4, C2H2, H2O, BALANCE, WET GAS, GAS FLOW RATES, LIQUID PRODUCT RATES. Includes chemical formulas like O2, CO2, N2, CH4, C2H6, C2H4, C2H2, H2O and numerical values for flow rates and weights.





THE TEXAS COMPANY — MONTEBELLO LABORATORY

RUN NO. 59-U  
HOURS 445-469

RATE CALCULATIONS

Table with columns for GAS ANALYSES, GENERATOR BALANCE, and WEIGHT BALANCE. Includes rows for FRESH FEED, CO, H2, CO2, N2, CH4, and H2O with various subscripts and units.

THE TEXAS COMPANY — MONTEBELLO LABORATORY

RUN NO. 59-V  
HOURS 469-493

RATE CALCULATIONS

Table with columns for GAS ANALYSES, GENERATOR BALANCE, and WEIGHT BALANCE. Includes rows for FRESH FEED, CO, H2, CO2, N2, CH4, and H2O with various subscripts and units.





THE TEXAS COMPANY — MONTEBELLO LABORATORY  
RATE CALCULATIONS

RUN NO. 59-AA  
HOURS 589-613

Table with columns: GAS ANALYSES, GENERATOR BALANCE, WEIGHT BALANCE. Rows include FRESH FEED, CO, H2, CO2, N2, CH4, H2O, M.W., BALANCE, WET GAS, GAS FLOW RATES, LIQUID PRODUCT RATES.

THE TEXAS COMPANY — MONTEBELLO LABORATORY  
RATE CALCULATIONS

RUN NO. 59-BB  
HOURS 613-637

Table with columns: GAS ANALYSES, GENERATOR BALANCE, WEIGHT BALANCE. Rows include FRESH FEED, CO, H2, CO2, N2, CH4, H2O, M.W., BALANCE, WET GAS, GAS FLOW RATES, LIQUID PRODUCT RATES.

THE TEXAS COMPANY — MONTEBELLO LABORATORY  
RATE CALCULATIONS

RUN NO. 59-CC  
HOURS 637-661

Table with columns for GAS ANALYSES, GENERATOR BALANCE, and WEIGHT BALANCE. Includes data for CO, H2, CO2, N2, CH4, C2H6, C3H8, C4H10, C5H12, C6H14, C7H16, C8H18, C9H20, C10H22, C11H24, C12H26, C13H28, C14H30, C15H32, C16H34, C17H36, C18H38, C19H40, C20H42, C21H44, C22H46, C23H48, C24H50, C25H52, C26H54, C27H56, C28H58, C29H60, C30H62, C31H64, C32H66, C33H68, C34H70, C35H72, C36H74, C37H76, C38H78, C39H80, C40H82, C41H84, C42H86, C43H88, C44H90, C45H92, C46H94, C47H96, C48H98, C49H100, C50H102, C51H104, C52H106, C53H108, C54H110, C55H112, C56H114, C57H116, C58H118, C59H120, C60H122, C61H124, C62H126, C63H128, C64H130, C65H132, C66H134, C67H136, C68H138, C69H140, C70H142, C71H144, C72H146, C73H148, C74H150, C75H152, C76H154, C77H156, C78H158, C79H160, C80H162, C81H164, C82H166, C83H168, C84H170, C85H172, C86H174, C87H176, C88H178, C89H180, C90H182, C91H184, C92H186, C93H188, C94H190, C95H192, C96H194, C97H196, C98H198, C99H200, C100H202.

THE TEXAS COMPANY — MONTEBELLO LABORATORY  
RATE CALCULATIONS

RUN NO. 59-DD  
HOURS 661-685

Table with columns for GAS ANALYSES, GENERATOR BALANCE, and WEIGHT BALANCE. Includes data for CO, H2, CO2, N2, CH4, C2H6, C3H8, C4H10, C5H12, C6H14, C7H16, C8H18, C9H20, C10H22, C11H24, C12H26, C13H28, C14H30, C15H32, C16H34, C17H36, C18H38, C19H40, C20H42, C21H44, C22H46, C23H48, C24H50, C25H52, C26H54, C27H56, C28H58, C29H60, C30H62, C31H64, C32H66, C33H68, C34H70, C35H72, C36H74, C37H76, C38H78, C39H80, C40H82, C41H84, C42H86, C43H88, C44H90, C45H92, C46H94, C47H96, C48H98, C49H100, C50H102, C51H104, C52H106, C53H108, C54H110, C55H112, C56H114, C57H116, C58H118, C59H120, C60H122, C61H124, C62H126, C63H128, C64H130, C65H132, C66H134, C67H136, C68H138, C69H140, C70H142, C71H144, C72H146, C73H148, C74H150, C75H152, C76H154, C77H156, C78H158, C79H160, C80H162, C81H164, C82H166, C83H168, C84H170, C85H172, C86H174, C87H176, C88H178, C89H180, C90H182, C91H184, C92H186, C93H188, C94H190, C95H192, C96H194, C97H196, C98H198, C99H200, C100H202.



THE TEXAS COMPANY — MONTEBELLO LABORATORY

RATE CALCULATIONS

RUN NO. 59-EE  
HOURS 685-709

Table with columns: GAS ANALYSES, GENERATOR BALANCE, WEIGHT BALANCE, GAS FLOW RATES, LIQUID PRODUCT RATES. Includes data for CO, H2, CO2, N2, CH4, C2H6, C3H8, C4H10, C5H12, H2O, O2, and MW.

THE TEXAS COMPANY — MONTEBELLO LABORATORY

RATE CALCULATIONS

RUN NO. 59-FF  
HOURS 709-733

Table with columns: GAS ANALYSES, GENERATOR BALANCE, WEIGHT BALANCE, GAS FLOW RATES, LIQUID PRODUCT RATES. Includes data for CO, H2, CO2, N2, CH4, C2H6, C3H8, C4H10, C5H12, H2O, O2, and MW.

THE TEXAS COMPANY — MONTEBELLO LABORATORY  
RATE CALCULATIONS

RUN NO. 59-HH  
HOURS 757-781

Table with columns: GAS ANALYSES, GENERATOR BALANCE, WEIGHT BALANCE, WET GAS, GAS FLOW RATES, LIQUID PRODUCT RATES. Includes data for CO, H2, CO2, N2, CH4, C2H6, C3H8, C4H10, C5H12, C6H14, C7H16, C8H18, C9H20, C10H22, C11H24, C12H26, C13H28, C14H30, C15H32, C16H34, C17H36, C18H38, C19H40, C20H42, C21H44, C22H46, C23H48, C24H50, C25H52, C26H54, C27H56, C28H58, C29H60, C30H62, C31H64, C32H66, C33H68, C34H70, C35H72, C36H74, C37H76, C38H78, C39H80, C40H82, C41H84, C42H86, C43H88, C44H90, C45H92, C46H94, C47H96, C48H98, C49H100, C50H102, C51H104, C52H106, C53H108, C54H110, C55H112, C56H114, C57H116, C58H118, C59H120, C60H122, C61H124, C62H126, C63H128, C64H130, C65H132, C66H134, C67H136, C68H138, C69H140, C70H142, C71H144, C72H146, C73H148, C74H150, C75H152, C76H154, C77H156, C78H158, C79H160, C80H162, C81H164, C82H166, C83H168, C84H170, C85H172, C86H174, C87H176, C88H178, C89H180, C90H182, C91H184, C92H186, C93H188, C94H190, C95H192, C96H194, C97H196, C98H198, C99H200, C100H202.

THE TEXAS COMPANY — MONTEBELLO LABORATORY  
RATE CALCULATIONS

RUN NO. 59-GG  
HOURS 733-757

Table with columns: GAS ANALYSES, GENERATOR BALANCE, WEIGHT BALANCE, WET GAS, GAS FLOW RATES, LIQUID PRODUCT RATES. Includes data for CO, H2, CO2, N2, CH4, C2H6, C3H8, C4H10, C5H12, C6H14, C7H16, C8H18, C9H20, C10H22, C11H24, C12H26, C13H28, C14H30, C15H32, C16H34, C17H36, C18H38, C19H40, C20H42, C21H44, C22H46, C23H48, C24H50, C25H52, C26H54, C27H56, C28H58, C29H60, C30H62, C31H64, C32H66, C33H68, C34H70, C35H72, C36H74, C37H76, C38H78, C39H80, C40H82, C41H84, C42H86, C43H88, C44H90, C45H92, C46H94, C47H96, C48H98, C49H100, C50H102, C51H104, C52H106, C53H108, C54H110, C55H112, C56H114, C57H116, C58H118, C59H120, C60H122, C61H124, C62H126, C63H128, C64H130, C65H132, C66H134, C67H136, C68H138, C69H140, C70H142, C71H144, C72H146, C73H148, C74H150, C75H152, C76H154, C77H156, C78H158, C79H160, C80H162, C81H164, C82H166, C83H168, C84H170, C85H172, C86H174, C87H176, C88H178, C89H180, C90H182, C91H184, C92H186, C93H188, C94H190, C95H192, C96H194, C97H196, C98H198, C99H200, C100H202.







SUMMARY OF SYNTHESIS RUN NO. 60

Period	A		B		C		D		E		F		G											
Hours	0-25		25-40		40-64		64-88		88-112		112-136		136-160											
Press., Psig	403		406		405		406		406		406		403											
Temp. °F.	659		651		661		657		655		654		652											
Flow Rates-SCFH																								
Fresh Feed	10746		11361		11290		11286		11222		11214		11179											
Recycle	13789		17492		17875		17058		17038		16971		16844											
Wet Gas (Adj.)	2333		4972		5501		4796		4559		4607		4587											
Catalyst Data (by ΔP)																								
Weight, lbs.	1245		971		992		1177		1479		1441		1390											
Vol.-Cu. Ft.	11.02		6.61		6.44		7.22		8.91		8.90		8.91											
Depth.-Ft.	16.70		10.01		9.76		10.94		13.50		13.48		13.50											
Feed Rates-H <sub>2</sub> +CO																								
SCFH	10391		11042		10963		10967		10883		10900		10857											
SCFH/Sq.Ft.	15744		16730		16611		16617		16489		16515		16450											
SCFH/CF Cat.	943		1670		1702		1519		1221		1225		1219											
SCFH/# Cat.	8.35		11.37		11.05		9.32		7.36		7.56		7.81											
Recycle Ratio	1.28		1.54		1.58		1.51		1.52		1.51		1.51											
Inlet Vol.Ft./Sec.	0.77		0.91		0.93		0.90		0.89		0.89		0.89											
Ratio of H <sub>2</sub> /CO in																								
Fresh Feed	1.46		1.60		1.56		1.57		1.57		1.56		1.58											
Combined Feed	2.09		2.09		2.06		1.99		2.14		2.11		2.13											
Wet Gas	7.59		2.75		2.70		2.58		3.08		2.97		3.00											
Consumed	1.38		1.29		1.19		1.31		1.27		1.27		1.29											
Yields/WCF of CO+H <sub>2</sub> Fed	lbs.	gal.	lbs.	gal.	lbs.	gal.	lbs.	gal.	lbs.	gal.	lbs.	gal.	lbs.	gal.	lbs.	gal.	lbs.	gal.	lbs.	gal.	lbs.	gal.	lbs.	gal.
C <sub>3</sub>	0.88		0.94		1.07		0.79		1.05		0.91		1.00											
C <sub>4</sub>	1.22		0.99		1.15		0.94		1.03		0.92		1.08											
C <sub>5</sub>	0.63		0.48		0.48		0.48		0.38		0.42		0.45											
C <sub>6</sub>	0.21		0.14		0.08		0.17		0.15		0.19		0.14											
C <sub>3</sub> - C <sub>6</sub>	2.94	0.60	2.55	0.53	2.78	0.58	2.38	0.49	2.61	0.55	2.44	0.51	2.67	0.56										
400 EP	4.12	0.65	3.12	0.49	2.69	0.43	2.96	0.47	3.41	0.55	3.48	0.55	3.07	0.49										
C <sub>3</sub> - 400 EP	7.06	1.25	5.67	1.02	5.47	1.01	5.34	0.96	6.02	1.10	5.92	1.06	5.74	1.05										
400+	2.85	0.41	1.89	0.27	1.38	0.20	1.48	0.21	1.67	0.24	1.45	0.21	1.59	0.20										
WS Chem	0.66	0.08	0.68	0.08	0.66	0.08	0.71	0.09	0.73	0.09	0.75	0.09	0.76	0.09										
Total C <sub>3</sub> +	10.57	1.74	8.24	1.37	7.51	1.29	7.53	1.26	8.42	1.43	8.12	1.36	7.89	1.34										
C <sub>1</sub>	1.23		0.88		1.00		0.82		0.89		0.87		0.85											
C <sub>2</sub>	0.78		0.61		0.68		0.63		0.61		0.68		0.67											
C <sub>1</sub> + C <sub>2</sub>	2.01		1.49		1.68		1.45		1.50		1.55		1.52											
Total C <sub>1</sub> +	12.58		9.72		9.19		8.98		9.91		9.67		9.40											
CO <sub>2</sub>	7.20		7.87		7.55		8.89		8.49		8.87		9.02											
Net Water	11.78		6.70		6.72		6.97		7.44		7.26		7.27											
Shift (H <sub>2</sub> )(CO <sub>2</sub> )	18.55		7.90		7.00		7.73		8.87		8.80		9.04											
Ratio (H <sub>2</sub> )(CO)																								
Conv.Basis F.F.																								
CO %	98.2		79.0		75.8		79.6		83.5		82.8		82.9											
H <sub>2</sub> %	90.6		63.9		58.1		66.4		67.6		67.2		67.7											
H <sub>2</sub> + CO %	93.7		69.7		65.0		71.6		73.8		73.3		73.6											
Selectivity C <sub>3</sub> +																								
% C <sub>1</sub> +	84.0		84.7		81.7		83.8		84.9		84.0		83.9											
Weight Bal. %	92.7		94.4		92.5		95.2		95.8		96.6		90.4											







THE TEXAS COMPANY — MONTEBELLO LABORATORY  
YIELD CALCULATIONS

RUN NO. 60-C  
HOURS 40-54  
CATALYST AGE

	FRESH FEED				WET GAS				RECYCLE COMBINED FEED				EFFLUENT				NET CHANGE				YIELD BASIS H <sub>2</sub> +CO FED							
	%	m/hr	#/hr	%	At Wt. Balance m/hr	#/hr	m/hr	m/hr	m/hr	m/hr	m/hr	m/hr	m/hr	m/hr	#/MCF	#/gal	gal/hr	gal/MCF	YIELDS BASIS BROWNSVILLE DESIGN FEED RATE*	gal/hr	gal/hr	gal/hr	gal/hr	RVP				
CO	37.977	11.298	316.46	18.856	2.753	76.55	8.861	20.179	11.614	-8.565	-239.91								400 EP	69.0	4.753	98.0	4.658					
H <sub>2</sub>	59.126	17.590	35.46	50.876	7.375	14.87	23.963	41.553	31.338	-10.215	-20.85								400-550	17.4	1.199	91.4	1.096					
CO <sub>2</sub>	2.067	0.615	27.07	17.217	2.496	109.87	6.109	8.724	10.605	1.861	82.80	7.553							550 +	13.6	0.827	114.6	1.074					
N <sub>2</sub>	0.160	0.048	1.34	1.150	0.167	4.68	0.542	0.590	0.709																			
CH <sub>4</sub>	0.670	0.199	3.19	6.070	0.880	14.12	2.659	3.058	3.739	0.681	10.93	0.897																
C <sub>2</sub> H <sub>6</sub>				1.187	0.172	4.88	0.559	0.559	0.731	0.172	4.82	0.440							PROPYLENE	29.4	2.85							
C <sub>3</sub> H <sub>8</sub>				0.610	0.088	2.65	0.287	0.287	0.375	0.088	2.65	0.242							C <sub>3</sub> PROPANE	87.5	2.49	0.416						
C <sub>4</sub> +C <sub>5</sub>																												
C <sub>6</sub> H <sub>14</sub>				1.590	0.230	9.65	0.749	0.749	0.979	0.230	9.85	0.885	4.32	2.241	0.204				C <sub>6</sub> PROPANE	12.5	0.36	0.048						
C <sub>7</sub> H <sub>16</sub>				0.320	0.046	2.03	0.151	0.151	0.197	0.046	2.03	0.165	4.24	0.479	0.044													
C <sub>8</sub> H <sub>18</sub>				1.207	0.175	9.38	0.569	0.569	0.744	0.175	9.82	0.896	8.00	1.964	0.179													
C <sub>9</sub> H <sub>20</sub>				0.350	0.048	2.79	0.155	0.155	0.203	0.048	2.79	0.254	4.89	0.574	0.052													
C <sub>10</sub> H <sub>22</sub>				0.447	0.065	4.56	0.211	0.211	0.276	0.065	4.56	0.416	5.48	0.837	0.076													
C <sub>11</sub> H <sub>24</sub>				0.070	0.010	0.72	0.033	0.033	0.043	0.010	0.72	0.066	5.28	0.137	0.012													
C <sub>12</sub> H <sub>26</sub>				0.070	0.010	0.84	0.033	0.033	0.043	0.010	0.84	0.077	5.84	0.152	0.014													
C <sub>13</sub> +C <sub>14</sub>																												
TOTAL		29.750	353.52		14.495	256.00	47.101	76.851	66.139					30.44	2.777	6.364	0.581											
H <sub>2</sub> +CO	97.103	26.888	10962.929	SCFH	10.108		32.844	61.732	42.958	-16.750																		
H <sub>2</sub> /CO		1.58	Factor	9121.64	2.70		2.70	2.08	2.70	1.19																		

FORM ML-11 Kahlfit = 7.00 \*\*Included in Reactor Effluent Total g NCM = 16.91 X / MCF g H<sub>2</sub> + CO, Btu/Day = 5121.6 X gal MCF

OPERATING CONDITIONS				RATES S.C.F.H.				PRODUCT TESTS				CATALYST DATA													
Pressure, psig	Inlet Velocity, ft/sec	Recycle/Fresh Feed	Inlet Velocity—ft./sec.	Pressure, °F	Bed Depth, Ft	Weight, #	Volume, Cu Ft	Recycle Ratio	Bed Density, # CF	FRESH FEED CONVERSION - %	TOTAL FEED CONVERSION - %	SELECTIVITY	Connection	CO	H <sub>2</sub>	H <sub>2</sub> +CO	CO	H <sub>2</sub>	CO+H <sub>2</sub>	C <sub>2</sub>	C <sub>3</sub>	C <sub>4</sub>	C <sub>5</sub>	C <sub>6</sub>	
405	0.93	1.58	0.93	661	9.76	992	6.44	1.58	154	51.28	75.81	56.07	65.01	42.45	24.56	30.42	81.73								
TEMPERATURES - °F.				HEMPEL DIST. %				CATALYST				CHEMICAL ANALYSIS													
Oxygen	506	784	2500	137	515	642	82	1	2	3	4	5	6	7	8	9	10	11							

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	37.977	11.298	11.298	37.977	11.298	11.298	11.298	11.298	11.298	11.298	11.298	11.298	11.298	229.30	256.00				

WET GAS				GAS FLOW RATES												LIQUID PRODUCT RATES			
CO	H <sub>2</sub>	CO <sub>2</sub>	N <sub>2</sub>	Pressure	Temp.	M.W.	S.C.F.H.	M/HR	Hour	Gage	Gal	°F	Factor	Gal At 60	API #/Gal	#	#/HR GAL HR		
19.11	19.76	17.70	18.856	404.8	76.3	2245695	11.290	29.750	6:11	322.12	62	0.9990	322.80	46.7	2110.14				



THE TEXAS COMPANY — MONTEBELLO LABORATORY  
YIELD CALCULATIONS

RUN NO. 60-E  
HOURS 88-112  
CATALYST AGE

Table with columns: FRESH FEED, WET GAS, RECYCLE, COMBINED FEED, EFFLUENT, NET CHANGE, YIELD BASIS H2 + CO FED. Includes sub-tables for CONDENSATE, OPERATING DATA, and FRESH FEED CONVERSION.

Table with columns: OPERATING CONDITIONS, PRODUCT TESTS, CATALYST DATA. Includes detailed data for pressures, rates, temperatures, and catalyst characteristics.

Table with columns: GAS ANALYSES, GENERATOR BALANCE, WEIGHT BALANCE. Shows hourly gas analysis and overall process balances.

Table with columns: WET GAS, GAS FLOW RATES, LIQUID PRODUCT RATES. Provides detailed flow rates for various components and liquid products.



FRESH FEED	WET GAS		RECYCLE	COMBINED FEED	EFFLUENT	NET CHANGE	YIELD BASIS H <sub>2</sub> + CO FED											
	%	m/hr					#/hr	%	At Wt. Balance m/hr	#/hr	#/MCF	#/gal	gal/MCF	YIELDS BASIS BROWNSVILLE DESIGN FEED RATE*				
CO <sub>2</sub>	37.593	11.074	310.18	15.646	1.891	52.97	6.844	18.018	6.835	-9.183	-257.21							
H <sub>2</sub>	59.527	17.535	35.35	46.883	5.666	11.42	20.809	38.344	26.475	-11.869	-23.93	400 EP	71.5	5.349	98.0	6.242		
CO	2.057	0.606	26.67	23.420	2.831	124.68	10.395	11.001	13.226	2.225	97.91	400-550	17.0	1.272	91.4	1.163		
N <sub>2</sub>	0.263	0.077	2.16	1.293	0.166	4.87	0.874	0.651	0.730			550 +	11.5	0.860	114.6	0.285		
CH <sub>4</sub>	0.560	0.165	2.65	6.103	0.738	11.84	2.709	2.874	3.447	0.873	9.19							
C <sub>2</sub> H <sub>6</sub>				1.440	0.174	4.88	0.639	0.639	0.813	0.174	4.88							
C <sub>3</sub> H <sub>8</sub>				0.657	0.079	2.38	0.292	0.292	0.371	0.079	2.38							
C <sub>4</sub> +C <sub>5</sub>																		
C <sub>2</sub> H <sub>4</sub>				1.827	0.221	9.30	0.911	0.911	1.032	0.221	9.30							
C <sub>2</sub> H <sub>2</sub>				0.290	0.035	1.54	0.129	0.129	0.164	0.035	1.54							
C <sub>2</sub> H <sub>2</sub>				1.337	0.162	9.09	0.593	0.593	0.755	0.162	9.09							
C <sub>2</sub> H <sub>2</sub>				0.373	0.045	2.62	0.166	0.166	0.211	0.045	2.62							
C <sub>2</sub> H <sub>2</sub>				0.557	0.067	4.70	0.247	0.247	0.314	0.067	4.70							
C <sub>2</sub> H <sub>2</sub>				0.027	0.003	0.22	0.012	0.012	0.015	0.003	0.22							
C <sub>2</sub> H <sub>2</sub>				0.147	0.018	1.51	0.085	0.085	0.085	0.018	1.51							
C <sub>2</sub> +C <sub>3</sub>																		
TOTAL		29.457	377.01			12.086	241.42	44.385	73.042	61.353								
H <sub>2</sub> +CO	97.120	28.609	10857.0448	SCFH	7.557		27.753	56.362	35.310	-21.052								
H <sub>2</sub> /CO	1.58	Factor:	921060		3.00		3.00	2.13	3.00	1.29								

Form HL-11 K shift = 9.04 \*\*Included in Reactor Effluent Total

OPERATING CONDITIONS				PRODUCT TESTS				CATALYST DATA			
Press. psig	Inlet Velocity, Ft/sec	Catalyst	Fresh CM2S	Oil	Water	Inventory Data	Particle Size	Oil	Water	Inventory Data	Particle Size
403	0.89	0.89	1390	77.38	7.127	13.531	1.245	0.155	0.24	0.995	0.092
652	13.50	1390	156	85.62	7.896	14.526	1.327	4.332	78.95	9.478	0.273
1.51	156	6.91	85.62	78.95	9.478	0.273	87.19	8.031	10.473	0.265	

GAS ANALYSES				GENERATOR BALANCE								WEIGHT BALANCE					
Hour	1400	2200	0600	Average	M/hr	C	H	O	Mol %	M/hr	C	H	O	Wet Gas	Oil	Water	Total
CO	37.54	37.59	37.65	37.593	11.074	11.074	11.074	11.074	0.18	7.423	0.127	0.124	0.248	230.49	48.40	87.19	377.01
H <sub>2</sub>	59.56	59.62	59.61	59.527	17.535	17.535	17.535	17.535	1.32	0.127	0.127	0.127	0.127	366.08	377.01	377.01	377.01
CO <sub>2</sub>	2.00	2.11	2.06	2.057	0.606	0.606	0.606	0.606	81.42	7.855	7.855	31.420	31.420	366.08	377.01	377.01	377.01
N <sub>2</sub>	0.22	0.27	0.30	0.263	0.077	0.077	0.077	0.077	6.69	0.645	1.290	3.670	3.670	366.08	377.01	377.01	377.01
CH <sub>4</sub>	0.89	0.41	0.38	0.560	0.165	0.165	0.165	0.165	6.25	0.603	1.809	4.824	4.824	366.08	377.01	377.01	377.01
M.W.				12.798667					1.90	0.183	0.732	1.630	1.630	366.08	377.01	377.01	377.01
H <sub>2</sub> O					6.501	3.251	3.251	3.251	0.85	0.092	0.460	1.104	1.104	366.08	377.01	377.01	377.01
					11.646	42.431	15.537	15.537	11.646	42.431	15.537	15.537	15.537	366.08	377.01	377.01	377.01
BALANCE					96.54	98.10	102.70	102.70		12.270	43.048	15.128	15.128	366.08	377.01	377.01	377.01

WET GAS GAS FLOW RATES LIQUID PRODUCT RATES

THE TEXAS COMPANY — MONTEBELLO LABORATORY  
YIELD CALCULATIONS

RUN NO. 61-0 (A-D)  
HOURS 0-89  
CATALYST Fresh CM&S

Table with columns: FRESH FEED, WET GAS, RECYCLE, COMBINED FEED, EFFLUENT, NET CHANGE, YIELD BASIS H2+CO FED. Includes rows for CO, H2, CO2, N2, CH4, C2H4, C2H6, C3H8, C3H6, C4H10, C4H8, C4H6, C5-C6, and summary rows for H2+CO, H2/CO, and various recovery percentages.

Form ML-11 AI=(27.46)(1.0140)=27.84 R/NCM=16.91X#/MCF \*9488 MCFH H2+CO, Bbl/Day=5421.6X gal/MCF

THE TEXAS COMPANY — MONTEBELLO LABORATORY  
YIELD CALCULATIONS

RUN NO. 61-1 (E-K)  
HOURS 89-239  
CATALYST Fresh CM&S

Table with columns: FRESH FEED, WET GAS, RECYCLE, COMBINED FEED, EFFLUENT, NET CHANGE, YIELD BASIS H2+CO FED. Includes rows for CO, H2, CO2, N2, CH4, C2H4, C2H6, C3H8, C3H6, C4H10, C4H8, C4H6, C5-C6, and summary rows for H2+CO, H2/CO, and various recovery percentages.

Form ML-11 AI=(26.31)(0.8324)=21.90 Acidn = (0.117)(36.20)=4.24% R/NCM=16.91X#/MCF \*9488 MCFH H2+CO, Bbl/Day=5421.6X gal/MCF

THE TEXAS COMPANY - MONTEBELLO LABORATORY  
YIELD CALCULATIONS

RUN NO. 61-A  
HOURS 0-17  
CATALYST Fresh CMAS

Main process flow table with columns: FRESH FEED, WET GAS, RECYCLE, COMBINED FEED, EFFLUENT, NET CHANGE, CONDENSATE, YIELDS BASIS BROWNSVILLE DESIGN FEED RATE. Includes sub-tables for Weight Recovery, Pressure, Temperature, and Recycle Ratio.

Form ML-11  
\*Included in Reactor Effluent Total  
g/NCM = 16.91 x MCF  
\*9488 MCF H2 + CO. BN/Day = 5431.6 x gal/MCF

GAS ANALYSES, GENERATOR BALANCE, WEIGHT BALANCE. Includes sub-tables for FRESH FEED, CO2, N2, CH4, C2H4, C2H6, C3H8, C4H10, C4H8, C4H6, C4H2, C4H, C4, and TOTAL.

WET GAS, GAS FLOW RATES, LIQUID PRODUCT RATES. Includes sub-tables for CO, H2, CO2, N2, CH4, C2H4, C2H6, C3H8, C4H10, C4H8, C4H6, C4H2, C4H, C4, and TOTAL.

OPERATING CONDITIONS, PRODUCT TESTS, CATALYST DATA. Includes sub-tables for Pressures, Temperatures, Catalyst No. 1-11, and various catalyst analysis parameters.

YIELD CALCULATIONS

Main yield calculation table with columns for Fresh Feed, Wet Gas, Recycle, Combined Feed, Effluent, Net Change, and Condensate. Includes detailed component balances for CO, H2, N2, CH4, C2H6, C3H8, etc.

Form ML-11

g/NCM = 16.91 x MCF

g/NCM = 16.91 x MCF

g/NCM = 16.91 x MCF

Gas Analyses, Generator Balance, Weight Balance, Gas Flow Rates, and Liquid Product Rates. Contains multiple sub-tables for flow and balance data.

Operating Conditions, Product Tests, and Catalyst Data. Includes pressure, temperature, and catalyst performance metrics.







THE TEXAS COMPANY - MONTEBELLO LABORATORY

RUN NO. 61-E
HOURS 89-113
CATALYST Fresh CMAS

YIELD CALCULATIONS
Table with columns: FRESH FEED, WET GAS, RECYCLE, COMBINED FEED, EFFLUENT, NET CHANGE, YIELD BASIS H2+CO FED. Includes rows for CO, H2, CO2, N2, CH4, C2H6, C2H4, C2H2, C2H, C2, C, TOTAL, H2+CO, H2/CO, Weight Recovery, Pressure, Temperature, Recycle Ratio, and Conversion data.

Table with columns: GAS ANALYSES, GENERATOR BALANCE, WEIGHT BALANCE, WET GAS, GAS FLOW RATES, LIQUID PRODUCT RATES. Includes detailed flow and balance data for various components like CO, H2, CO2, CH4, C2H6, C2H4, C2H2, C2H, C2, C, and steam.

Table with columns: OPERATING CONDITIONS, PRODUCT TESTS, CATALYST DATA. Includes data for pressures (PSIG), temperatures (°F), catalyst inventory, and product analysis results.

THE TEXAS COMPANY - MONTEBELLO LABORATORY  
YIELD CALCULATIONS

61-P  
RUN NO. 1137135  
HOUSE  
CATALYST Fresh CM63

Table with columns: FRESH FEED, WET GAS, RECYCLE, COMBINED FEED, EFFLUENT, NET CHANGE, YIELD BASIS H2 + CO FED. Includes sub-tables for CONDENSATE, YIELDS BASIS BROWNSVILLE DESIGN FEED RATE, and various process parameters like pressure, temperature, and recycle ratio.

Table with columns: GAS ANALYSES, GENERATOR BALANCE, WEIGHT BALANCE. Includes sub-tables for FRESH FEED, CO, H2, N2, CH4, and H2O analyses, and weight balance for wet gas, oil, water, and fresh feed.

Table with columns: WET GAS, GAS FLOW RATES, LIQUID PRODUCT RATES. Includes sub-tables for CO, H2, N2, CH4, C2H6, C3H8, C4H10, and steam flow rates, and liquid product rates for oil, water, and gas.

Table with columns: OPERATING CONDITIONS, PRODUCT TESTS, CATALYST DATA. Includes sub-tables for pressures, temperatures, catalyst data, and product tests.



Table with columns: FRESH FEED, WET GAS, RECYCLE, COMBINED FEED, EFFLUENT, NET CHANGE, YIELD BASIS H2 + CO FED, CONDENSATE, YIELDS BASIS BROWNSVILLE DESIGN FEED RATE. Rows include CO, H2, CO2, N2, CH4, C2H6, C2H4, C2H2, C3H8, C3H6, C3H4, C4H10, C4H8, C4H6, C5H12, C5H10, C5H8, C5H6, C6H14, C6H12, C6H10, C6H8, C6H6, C7H16, C7H14, C7H12, C7H10, C7H8, C7H6, C8H18, C8H16, C8H14, C8H12, C8H10, C8H8, C8H6, C9H20, C9H18, C9H16, C9H14, C9H12, C9H10, C9H8, C9H6, C10H22, C10H20, C10H18, C10H16, C10H14, C10H12, C10H10, C10H8, C10H6, C11H24, C11H22, C11H20, C11H18, C11H16, C11H14, C11H12, C11H10, C11H8, C11H6, C12H26, C12H24, C12H22, C12H20, C12H18, C12H16, C12H14, C12H12, C12H10, C12H8, C12H6, C13H28, C13H26, C13H24, C13H22, C13H20, C13H18, C13H16, C13H14, C13H12, C13H10, C13H8, C13H6, C14H30, C14H28, C14H26, C14H24, C14H22, C14H20, C14H18, C14H16, C14H14, C14H12, C14H10, C14H8, C14H6, C15H34, C15H32, C15H30, C15H28, C15H26, C15H24, C15H22, C15H20, C15H18, C15H16, C15H14, C15H12, C15H10, C15H8, C15H6, C16H38, C16H36, C16H34, C16H32, C16H30, C16H28, C16H26, C16H24, C16H22, C16H20, C16H18, C16H16, C16H14, C16H12, C16H10, C16H8, C16H6, C17H42, C17H40, C17H38, C17H36, C17H34, C17H32, C17H30, C17H28, C17H26, C17H24, C17H22, C17H20, C17H18, C17H16, C17H14, C17H12, C17H10, C17H8, C17H6, C18H46, C18H44, C18H42, C18H40, C18H38, C18H36, C18H34, C18H32, C18H30, C18H28, C18H26, C18H24, C18H22, C18H20, C18H18, C18H16, C18H14, C18H12, C18H10, C18H8, C18H6, C19H50, C19H48, C19H46, C19H44, C19H42, C19H40, C19H38, C19H36, C19H34, C19H32, C19H30, C19H28, C19H26, C19H24, C19H22, C19H20, C19H18, C19H16, C19H14, C19H12, C19H10, C19H8, C19H6, C20H54, C20H52, C20H50, C20H48, C20H46, C20H44, C20H42, C20H40, C20H38, C20H36, C20H34, C20H32, C20H30, C20H28, C20H26, C20H24, C20H22, C20H20, C20H18, C20H16, C20H14, C20H12, C20H10, C20H8, C20H6. Includes sub-totals for H2+CO, H2/CO, Weight Recovery, Pressure, Temperature, Recycle Ratio, and Fresh Feed Conversion.

Form ML-11  
\*Included in Reactor Effluent Total  
MCM = 16.91X/MCF  
MCFH H2 + CO, BMD/Day = 5421.6X gal/MCF

Table with columns: GAS ANALYSES, GENERATOR BALANCE, WEIGHT BALANCE, GAS FLOW RATES, LIQUID PRODUCT RATES. Rows include CO, H2, CO2, N2, CH4, C2H6, C2H4, C2H2, C3H8, C3H6, C3H4, C4H10, C4H8, C4H6, C5H12, C5H10, C5H8, C5H6, C6H14, C6H12, C6H10, C6H8, C6H6, C7H16, C7H14, C7H12, C7H10, C7H8, C7H6, C8H18, C8H16, C8H14, C8H12, C8H10, C8H8, C8H6, C9H20, C9H18, C9H16, C9H14, C9H12, C9H10, C9H8, C9H6, C10H22, C10H20, C10H18, C10H16, C10H14, C10H12, C10H10, C10H8, C10H6, C11H24, C11H22, C11H20, C11H18, C11H16, C11H14, C11H12, C11H10, C11H8, C11H6, C12H26, C12H24, C12H22, C12H20, C12H18, C12H16, C12H14, C12H12, C12H10, C12H8, C12H6, C13H28, C13H26, C13H24, C13H22, C13H20, C13H18, C13H16, C13H14, C13H12, C13H10, C13H8, C13H6, C14H30, C14H28, C14H26, C14H24, C14H22, C14H20, C14H18, C14H16, C14H14, C14H12, C14H10, C14H8, C14H6, C15H34, C15H32, C15H30, C15H28, C15H26, C15H24, C15H22, C15H20, C15H18, C15H16, C15H14, C15H12, C15H10, C15H8, C15H6, C16H38, C16H36, C16H34, C16H32, C16H30, C16H28, C16H26, C16H24, C16H22, C16H20, C16H18, C16H16, C16H14, C16H12, C16H10, C16H8, C16H6, C17H42, C17H40, C17H38, C17H36, C17H34, C17H32, C17H30, C17H28, C17H26, C17H24, C17H22, C17H20, C17H18, C17H16, C17H14, C17H12, C17H10, C17H8, C17H6, C18H46, C18H44, C18H42, C18H40, C18H38, C18H36, C18H34, C18H32, C18H30, C18H28, C18H26, C18H24, C18H22, C18H20, C18H18, C18H16, C18H14, C18H12, C18H10, C18H8, C18H6, C19H50, C19H48, C19H46, C19H44, C19H42, C19H40, C19H38, C19H36, C19H34, C19H32, C19H30, C19H28, C19H26, C19H24, C19H22, C19H20, C19H18, C19H16, C19H14, C19H12, C19H10, C19H8, C19H6, C20H54, C20H52, C20H50, C20H48, C20H46, C20H44, C20H42, C20H40, C20H38, C20H36, C20H34, C20H32, C20H30, C20H28, C20H26, C20H24, C20H22, C20H20, C20H18, C20H16, C20H14, C20H12, C20H10, C20H8, C20H6.

Table with columns: OPERATING CONDITIONS, PRODUCT TESTS, CATALYST DATA. Rows include Pressures, Temperatures, Catalyst No., Height, Heat Transfer Calculations, and various catalyst test parameters.



THE TEXAS COMPANY — MONTEBELLO LABORATORY  
YIELD CALCULATIONS

RUN NO. 61-J  
HOURS 207-251  
CATALYST Fresh CMA8

Table with columns for FRESH FEED, WET GAS, RECYCLE, COMBINED FEED, EFFLUENT, NET CHANGE, and YIELD BASIS H2 + CO FED. Includes sub-tables for CONDENSATE and RECOVERY.

Form ML-11  
\*Included in Resinor Effluent Total  
g/NCM = 16.91 XCF/MCF 94488 MCF H2 + CO. BH/Day = 3431.6 X gf/MCF

Table with columns for GAS ANALYSES, GENERATOR BALANCE, and WEIGHT BALANCE. Includes sub-tables for WET GAS, GAS FLOW RATES, and LIQUID PRODUCT RATES.

Table with columns for OPERATING CONDITIONS, PRODUCT TESTS, and CATALYST DATA. Includes detailed operational parameters and catalyst characteristics.



THE TEXAS COMPANY - MONTEBELLO LABORATORY  
YIELD CALCULATIONS

Run No. 61-X  
Weight 271-239  
Catalyst Fresh DM2

Table with columns: FRESH FEED, WET GAS, RECYCLE, COMBINED FEED, EFFLUENT, NKT CHANGE, CONDENSATE, YIELD BASIS. Includes detailed chemical analysis and process parameters.

Table with columns: GAS ANALYSES, GENERATOR BALANCE, WEIGHT BALANCE. Includes flow rates, compositions, and balance calculations.

Table with columns: OPERATING CONDITIONS, PRODUCT TESTS, CATALYST DATA. Includes pressure, temperature, catalyst inventory, and analysis data.

THE TEXAS COMPANY — MONTEBELLO LABORATORY  
YIELD CALCULATIONS

RUN NO. 62-0 (A-D)  
HOURS 0-94  
CATALYST Fresh CM&S

FRESH FEED				WET GAS				RECYCLE	COMBINED FEED	EFFLUENT	NET CHANGE				YIELD BASIS H <sub>2</sub> + CO FED								
	%	m/hr	#/hr	%	At Wt. Balance		m/hr	m/hr	m/hr	m/hr	#/hr	CONDENSATE				YIELDS		BASIS BROWNSVILLE		DESIGN FEED RATE*			
CO		16.342			m/hr	#/hr						#/MCF	#/gal	gal/hr	gal/MCF		CORRECTED HEMPEL, %	gal/hr	TREATING RECOVERY, %	gal/hr			
H <sub>2</sub>		26.222					22.319										400 EP	72.6	8.263	98.0	8.098		
CO <sub>2</sub>							45.324										400-550	19.5	2.220	91.4	2.029		
N <sub>2</sub>																	550 +	7.9	0.899	114.6	1.030		
CH <sub>4</sub>																							
C <sub>2</sub> H <sub>6</sub>																							
C <sub>3</sub> H <sub>8</sub>																							
C <sub>4</sub> H <sub>10</sub>																							
C <sub>5</sub> +C <sub>6</sub>																							
C <sub>2</sub> H <sub>4</sub>																							
C <sub>3</sub> H <sub>6</sub>																							
C <sub>4</sub> H <sub>8</sub>																							
C <sub>5</sub> H <sub>12</sub>																							
C <sub>6</sub> H <sub>14</sub>																							
C <sub>7</sub> +C <sub>8</sub>																							
TOTAL																							
H <sub>2</sub> +CO		42.564		16153.2 SCFH																			
H <sub>2</sub> /CO				Factor 619072																			
Weight Recovery, %	93.62			Catalyst Age, hrs. Ave. = 44			Space Velocity, vhr 1385					RECOVERED OIL	74.33	4.602		11.382	0.705						
Pressure, psig	375			Inlet Velocity, Ft/sec 1.02			Catalyst Vol., CF = 11.74					TOTAL OIL	121.82	7.542		21.151	1.309						
Temperature, °F	658			Bed Depth, Ft 17.8			Weight, # 1733					WATER SOLUBLE CHEMICALS	6.03	0.373		0.749	0.046						
Recycle Ratio	1.00			Bed Density, #/CF 148			Effluent (H <sub>2</sub> )/CO <sub>2</sub> Shift Ratio (H <sub>2</sub> O)/CO = 7.22					TOTAL LIQUID PRODUCTS C <sub>2</sub> +	139.81	8.655		23.386	1.448						
FRESH FEED CONVERSION — %				TOTAL FEED CONVERSION — %				SELECTIVITY				NET WATER											
Contraction	CO	H <sub>2</sub>	H <sub>2</sub> +CO	CO	H <sub>2</sub>	CO+H <sub>2</sub>	C <sub>3</sub> +C <sub>4</sub>	GROSS WATER															
62.11	85.83	72.02	77.32	62.84	41.67	48.66	83.27	121.00	7.491	14.508	0.898	137.35	8.503	16.539	1.024	121.00	7.491	14.508	0.898	137.35	8.503	16.539	1.024
				Form ML-11 AI = (37.22)(0.6443) = 23.98				Acids = (0.117)(37.5) = 4.39				R/NCM = 16.91 X #/MCF				99488 MCFH H <sub>2</sub> + CO, Bbl/Day = 5421.6 X gal/MCF							

THE TEXAS COMPANY — MONTEBELLO LABORATORY  
YIELD CALCULATIONS

RUN NO. 62-1 (E-I)  
HOURS 94-206  
CATALYST

FRESH FEED				WET GAS				RECYCLE	COMBINED FEED	EFFLUENT	NET CHANGE				YIELD BASIS H <sub>2</sub> + CO FED								
	%	m/hr	#/hr	%	At Wt. Balance		m/hr	m/hr	m/hr	m/hr	#/hr	CONDENSATE				YIELDS		BASIS BROWNSVILLE		DESIGN FEED RATE*			
CO		15.331			m/hr	#/hr						#/MCF	#/gal	gal/hr	gal/MCF		CORRECTED HEMPEL, %	gal/hr	TREATING RECOVERY, %	gal/hr			
H <sub>2</sub>		24.584					21.865										400 EP	71.94	7.172	98.0	7.029		
CO <sub>2</sub>							44.459										400-550	18.56	1.851	91.4	1.692		
N <sub>2</sub>																	550 +	9.50	0.947	114.6	1.085		
CH <sub>4</sub>																							
C <sub>2</sub> H <sub>6</sub>																							
C <sub>3</sub> H <sub>8</sub>																							
C <sub>4</sub> +C <sub>5</sub>																							
C <sub>2</sub> H <sub>4</sub>																							
C <sub>3</sub> H <sub>6</sub>																							
C <sub>4</sub> H <sub>8</sub>																							
C <sub>5</sub> H <sub>12</sub>																							
C <sub>6</sub> H <sub>14</sub>																							
C <sub>7</sub> +C <sub>8</sub>																							
TOTAL																							
H <sub>2</sub> +CO		39.915		15147.653 SCFH																			
H <sub>2</sub> /CO				Factor 660168																			
Weight Recovery, %	93.66			Catalyst Age, hrs. Ave. 138			Space Velocity, vhr 1192					RECOVERED OIL	64.99	4.290		9.970	0.658						
Pressure, psig	373			Inlet Velocity, Ft/sec 0.98			Catalyst Vol., CF 12.71					TOTAL OIL	112.24	7.410		19.698	1.300						
Temperature, °F	658			Bed Depth, Ft 19.2			Weight, # 1716					WATER SOLUBLE CHEMICALS	5.53	0.365		0.689	0.045						
Recycle Ratio				Bed Density, #/CF 135			Effluent (H <sub>2</sub> )/CO <sub>2</sub> Shift Ratio (H <sub>2</sub> O)/CO = 6.98					TOTAL LIQUID PRODUCTS C <sub>2</sub> +	129.95	8.579		21.905	1.446						
FRESH FEED CONVERSION — %				TOTAL FEED CONVERSION — %				SELECTIVITY				NET WATER											
Contraction	CO	H <sub>2</sub>	H <sub>2</sub> +CO	CO	H <sub>2</sub>	CO+H <sub>2</sub>	C <sub>3</sub> +C <sub>4</sub>	GROSS WATER															
60.59	84.20	70.03	75.48	59.04	38.73	45.42	83.15	108.50	7.163	13.002	0.858	126.21	8.332	15.209	1.004	108.50	7.163	13.002	0.858	126.21	8.332	15.209	1.004
				Form ML-11 AI = (34.53)(0.6105) = 21.08				Acids = (0.117)(37.4) = 4.38%				R/NCM = 16.91 X #/MCF				99488 MCFH H <sub>2</sub> + CO, Bbl/Day = 5421.6 X gal/MCF							

THE TEXAS COMPANY — MONTEBELLO LABORATORY  
YIELD CALCULATIONS

RUN NO. 62-2 (J-M)  
HOURS 206-303  
CATALYST Fresh CM&S

Table with columns: FRESH FEED, WET GAS, RECYCLE, COMBINED FEED, EFFLUENT, NET CHANGE, YIELD BASIS H2+CO FED, CONDENSATE, YIELDS BASIS, BROWNSVILLE DESIGN FEED RATE. Includes rows for CO, H2, CO2, N2, CH4, C2H6, C3H8, C4-C6, and various hydrocarbon products. Summary statistics: Form ML-11 AI = (35.01)(0.5750)=20.13, Acids = (0.117)(37.28)=4.36%.

THE TEXAS COMPANY — MONTEBELLO LABORATORY  
YIELD CALCULATIONS

RUN NO. 62-3 (N-Q)  
HOURS 303-399  
CATALYST Fresh CM&S

Table with columns: FRESH FEED, WET GAS, RECYCLE, COMBINED FEED, EFFLUENT, NET CHANGE, YIELD BASIS H2+CO FED, CONDENSATE, YIELDS BASIS, BROWNSVILLE DESIGN FEED RATE. Includes rows for CO, H2, CO2, N2, CH4, C2H6, C3H8, C4-C6, and various hydrocarbon products. Summary statistics: Form ML-11 Activity Index = (36.18)(0.5054)=18.29, Acids = (0.117)(40.2)=4.70%.

THE TEXAS COMPANY — MONTEBELLO LABORATORY  
YIELD CALCULATIONS

RUN NO. 62-4 (R-W)  
HOURS 399-543  
CATALYST Fresh CM&S

FRESH FEED				WET GAS			RECYCLE	COMBINED FEED	EFFLUENT	NET CHANGE		CONDENSATE				YIELD BASIS H <sub>2</sub> + CO FED				
	%	m/hr	#/hr	%	At	Wt. Balance	m/hr	m/hr	m/hr	m/hr	#/hr	#/MCF	#/gal	gal/hr	gal/MCF	YIELDS	BASIS	BROWNSVILLE	DESIGN FEED RATE*	
					m/hr	#/hr										CONNECTED	TREATING			
																RECOVERY %	RECOVERY %	gal/hr	gal/hr	
CO		15.234						21.858		-12.567	-352.00									
H <sub>2</sub>		24.429						46.027		-15.720	-31.69					400 EP	69.95	6.431	98.0	6.302
CO <sub>2</sub>										3.263	143.60	9.543				400-550	18.78	1.726	91.4	1.578
N <sub>2</sub>																550 +	11.27	1.036	114.6	1.187
CH <sub>4</sub>										0.866	13.89	0.923								
C <sub>2</sub> H <sub>6</sub>										0.251	7.04	0.468								
C <sub>3</sub> H <sub>8</sub>										0.128	3.85	0.256				PROPYLENE	32.23	2.562		
C <sub>4</sub> +C <sub>5</sub>											24.78	1.647				C <sub>4</sub> POLY GASO.	87.5	2.242	0.375	
C <sub>2</sub> H <sub>4</sub>										0.189	7.95	0.528	4.32	1.840	0.122	C <sub>2</sub> POLY TAR	12.5	0.320	0.042	
C <sub>2</sub> H <sub>2</sub>										0.026	1.15	0.076	4.24	0.271	0.018					
C <sub>2</sub> H <sub>2</sub>										0.201	11.28	0.750	5.00	2.256	0.150		#/gal	#/hr	gal/hr	RVP
C <sub>2</sub> H <sub>2</sub>										0.084	4.88	0.324	4.86	1.004	0.067	C <sub>2</sub> H <sub>2</sub>	5.00	-	-	68.0
C <sub>2</sub> H <sub>2</sub>										0.126	8.84	0.587	5.45	1.622	0.108	C <sub>2</sub> POLY GASO.	5.98	9.87	1.651	1.5
C <sub>2</sub> H <sub>2</sub>										0.033	2.38	0.158	5.25	0.453	0.030	C <sub>2</sub> H <sub>2</sub>	4.86	4.53	0.933	68.0
C <sub>2</sub> H <sub>2</sub>										0.052	4.38	0.291	5.54	0.791	0.053	C <sub>2</sub> -FREE GASO.			9.543	5.8
C <sub>2</sub> -C <sub>6</sub>											40.86	2.715	8.237	0.547		C <sub>2</sub> POLY TAR	7.58	1.41	0.187	
TOTAL																				
H <sub>2</sub> +CO		39.663	15047	SCFH				67.885		-28.287										
H <sub>2</sub> /CO				Factor	664584											10 # RVP 400 TP GASOLINE	12.127	0.8059	4369	
Weight Recovery, %	92.68			Catalyst Age, hrs. Ave.	416			Space Velocity, v/v	1513	RECOVERED OIL	59.93	3.983	9.193	0.611		GAS OIL	1.578	0.1049	569	
Pressure, psig	370			Inlet Velocity, Ft/sec	1.01			Catalyst Vol., CF	9.98	TOTAL OIL	100.79	6.698	17.430	1.158		FUEL OIL	1.187	0.0789	428	
Temperature, °F	659			Bed Depth, Ft	15.1			Weight, #	1213	WATER SOLUBLE CHEMICALS	5.07	0.337	0.625	0.042		POLY TAR	0.229	0.0152	82	
Recycle Ratio	1.10			Bed Density, #/CF	122			Effluent (H <sub>2</sub> )(CO <sub>2</sub> ) Shift Ratio (H <sub>2</sub> O)(CO)		TOTAL LIQUID PRODUCTS C <sub>2</sub> +	116.39	7.735	19.353	1.286		TOTAL	15.121	1.0049	5448	
FRESH FEED CONVERSION — %				TOTAL FEED CONVERSION — %				SELECTIVITY		NET WATER		95.17	6.325	11.408	0.758	W. S. CHEM.	0.625	0.0415	225	
Contraction	CO	H <sub>2</sub>	H <sub>2</sub> +CO	CO	H <sub>2</sub>	CO+H <sub>2</sub>	C <sub>2</sub> +C <sub>3</sub> +	GROSS WATER		110.77	7.362	13.331	0.886		TOTAL	17.044	1.1327	6141		
55.92	82.49	64.35	71.32	57.49	34.15	41.67	82.45	HYDROCARBON TOTAL — C <sub>1</sub> +		141.17	9.382									

Form ML-11 Activity Index = (38.90)(0.5425) = 21.10      Acids = (0.117)(39.18) = 4.58%      g/NCM = 16.91 X #/MCF      99488 MCFH H<sub>2</sub> + CO, Bbl/Day = 3421.6 X gal/MCF



THE TEXAS COMPANY — MONTEBELLO LABORATORY  
YIELD CALCULATIONS

RUN NO. 62-B  
HOURS 22-46  
CATALYST Fresh CM&S

Table with columns: FRESH FEED, WET GAS, RECYCLE, COMBINED FEED, EFFLUENT, NET CHANGE, YIELD BASIS H2 + CO FED, CONDENSATE, YIELDS BASIS BROWNSVILLE DESIGN FEED RATE. Includes rows for various hydrocarbons (CO, H2, CO2, N2, CH4, C2H4, C2H6, C3H8, C4H10, C5H12) and summary rows for TOTAL, H2+CO, H2/CO, and various recovery percentages.

Form ML-11

g/NCM = 16.91 X #/MCF    #0488 MCFH H2 + CO, Bbl/Day = 5421.6 X gal/MCF

THE TEXAS COMPANY — MONTEBELLO LABORATORY  
DATA SUMMARY

RUN NO. 62-B  
HOURS 22-46

Table with columns: OPERATING CONDITIONS, PRODUCT TESTS, CATALYST DATA. Includes rows for Pressures (Oxygen, Natural Gas, Generator, Reactor Inlet, Condenser Inlet, Product Accumulator), Temperatures (Oxygen, Natural Gas, Generator, Quench Accumulator, Reactor Inlet, Condenser Inlet, Product Accumulator, Catalyst No.), and various catalyst and reactor parameters like rates, inventory, and analysis results.

THE TEXAS COMPANY — MONTEBELLO LABORATORY  
YIELD CALCULATIONS

RUN NO. 62-C  
HOURS 46-70  
CATALYST Fresh CM&S

Table with columns: FRESH FEED, WET GAS, RECYCLE, COMBINED FEED, EFFLUENT, NET CHANGE, CONDENSATE, YIELDS BASIS BROWNSVILLE DESIGN FEED RATE. Includes rows for CO, H2, CH4, C2H4, C2H6, C3H8, C4H10, C5H12, C6H14, C7H16, C8H18, C9H20, C10H22, C11H24, C12H26, C13H28, C14H30, C15H32, C16H34, C17H36, C18H38, C19H40, C20H42, C21H44, C22H46, C23H48, C24H50, C25H52, C26H54, C27H56, C28H58, C29H60, C30H62, C31H64, C32H66, C33H68, C34H70, C35H72, C36H74, C37H76, C38H78, C39H80, C40H82, C41H84, C42H86, C43H88, C44H90, C45H92, C46H94, C47H96, C48H98, C49H100, C50H102, C51H104, C52H106, C53H108, C54H110, C55H112, C56H114, C57H116, C58H118, C59H120, C60H122, C61H124, C62H126, C63H128, C64H130, C65H132, C66H134, C67H136, C68H138, C69H140, C70H142, C71H144, C72H146, C73H148, C74H150, C75H152, C76H154, C77H156, C78H158, C79H160, C80H162, C81H164, C82H166, C83H168, C84H170, C85H172, C86H174, C87H176, C88H178, C89H180, C90H182, C91H184, C92H186, C93H188, C94H190, C95H192, C96H194, C97H196, C98H198, C99H200, C100H202.

THE TEXAS COMPANY — MONTEBELLO LABORATORY  
DATA SUMMARY

RUN NO. 62-C  
HOURS 46-70

Table with columns: OPERATING CONDITIONS, PRODUCT TESTS, CATALYST DATA. Includes rows for Pressures (Oxygen, Natural Gas, Generator Outlet, Reactor Inlet, Condenser Inlet, Product Accumulator), Temperatures (Oxygen, Natural Gas, Generator, Quench Accumulator, Reactor Inlet, Condenser Inlet, Product Accumulator), and Catalyst Data (Catalyst No., Height, Inventory, Bed Depth, Vol., etc.).





THE TEXAS COMPANY — MONTEBELLO LABORATORY  
YIELD CALCULATIONS

RUN NO. 62-E  
HOURS 94-110  
CATALYST Fresh CM&S

Table with columns: FRESH FEED, WET GAS, RECYCLE, COMBINED FEED, EFFLUENT, NET CHANGE, CONDENSATE, YIELDS BASIS BROWNSVILLE DESIGN FEED RATE. Includes rows for CO, H2, CO2, N2, CH4, C2H6, C3H8, C4H10, C4H8, C4H6, C5H12, C5H10, C5H8, C5H6, C3-C4, and TOTAL. Also includes summary rows for H2+CO, H2/CO, Weight Recovery, Pressure, Temperature, Recycle Ratio, and Conversion.

Form ML-11

g/NCM = 16.91 X #/MCF      #9488 MCFH H2 + CO, Bbl/Day = 5421.6 X gal/MCF

THE TEXAS COMPANY — MONTEBELLO LABORATORY  
DATA SUMMARY

RUN NO. 62-E  
HOURS 94-110

Table with columns: OPERATING CONDITIONS, PRODUCT TESTS, CATALYST DATA. Includes rows for Pressures, Temperatures, Rates, and various catalyst and product parameters.

THE TEXAS COMPANY — MONTEBELLO LABORATORY  
YIELD CALCULATIONS

RUN NO. 62-F  
HOURS 110-134  
CATALYST Fresh CMS

Table with columns: FRESH FEED, WET GAS, RECYCLE, COMBINED FEED, EFFLUENT, NET CHANGE, YIELD BASIS H2 + CO FED, CONDENSATE, YIELDS BASIS BROWNSVILLE DESIGN FEED RATE\*. Rows include CO, H2, CO2, N2, CH4, C2H6, C2H4, C2H2, C2H6, C3H8, C3H6, C3H4, C4H10, C4H8, C4H6, C4H4, C4H2, C4H0, TOTAL, H2/CO, Weight Recovery, Pressure, Temperature, Recycle Ratio, FRESH FEED CONVERSION, TOTAL FEED CONVERSION, SELECTIVITY, NET WATER, GROSS WATER, HYDROCARBON TOTAL.

Form ML-11

g/NCM = 16.91 X # / MCF #9488 MCFH H2 + CO, Bbl/Day = 5421.6 X gal / MCF

THE TEXAS COMPANY — MONTEBELLO LABORATORY  
DATA SUMMARY

RUN NO. 62-F  
HOURS 110-134

Table with columns: OPERATING CONDITIONS, PRODUCT TESTS, CATALYST DATA. Rows include PRESSURES PSIG, RATES S.C.F.H., OIL, WATER, INVENTORY DATA, PARTICLE SIZE, TEMPERATURES - °F., Heat Transfer Calculations, CHEMICAL ANALYSIS.

THE TEXAS COMPANY — MONTEBELLO LABORATORY  
YIELD CALCULATIONS

RUN NO. 62-G  
HOURS 134-168  
CATALYST Fresh CM&S

Table with columns: FRESH FEED, WET GAS, RECYCLE, COMBINED FEED, EFFLUENT, NET CHANGE, YIELD BASIS H2+CO FED, CONDENSATE, YIELDS BASIS BROWNSVILLE DESIGN FEED RATE\*. Rows include CO, H2, CO2, N2, CH4, C2H6, C2H4, C3H8, C3H6, C4H10, C4H8, C4H6, C4H2, C5-C6, TOTAL, H2+CO, H2/CO, Weight Recovery, Pressure, Temperature, Recycle Ratio, FRESH FEED CONVERSION, and various hydrocarbon yields.

Form ML-11

g/NCM = 16.91 X #/MCF \*9488 MCFH H2 + CO, BN/Day = 5421.6 X gal/MCF

THE TEXAS COMPANY — MONTEBELLO LABORATORY  
DATA SUMMARY

RUN NO. 62-G  
HOURS 134-168

Table with columns: OPERATING CONDITIONS, PRODUCT TESTS, CATALYST DATA. Rows include Pressures (Oxygen, Natural Gas, Generator Outlet, Reactor Inlet, Condenser Inlet, Product Accumulator), Temperatures (Oxygen, Natural Gas, Generator, Quench Accumulator, Reactor Inlet, Condenser Inlet, Product Accumulator), and Catalyst Data (Catalyst No., Height, Steam Rate, Water in, Heat Trans, Ave Bed Temp, dT, Tube Area, K).

THE TEXAS COMPANY — MONTEBELLO LABORATORY  
YIELD CALCULATIONS

Table with columns: FRESH FEED, WET GAS, RECYCLE, COMBINED FEED, EFFLUENT, NET CHANGE, CONDENSATE, YIELDS BASIS BROWNSVILLE DESIGN FEED RATE. Rows include various hydrocarbons (CO, H2, CO2, N2, CH4, C2H4, C2H6, C3H8, C4H10, C5H12, C6H14, C7H16, C8H18, C9H20, C10H22) and summary rows for H2+CO, H2/CO, and Weight Recovery.

Form ML-11

R/NCM = 16.91 X #/MCF 99488 MCFH H2 + CO, Bbl/Day = 5421.6 X gal/MCF

THE TEXAS COMPANY — MONTEBELLO LABORATORY  
DATA SUMMARY

Table with columns: OPERATING CONDITIONS, PRODUCT TESTS, CATALYST DATA. Rows include: PRESSURES PSIG (Oxygen, Natural Gas, Generator Outlet, Reactor Inlet, Condenser Inlet, Product Accumulator); TEMPERATURES -°F (Oxygen, Natural Gas, Generator, Quench Accumulator, Reactor Inlet, Condenser Inlet, Product Accumulator); and various catalyst parameters like Inlet Velocity, Bed Depth, Weight, Effluent Shift Ratio, etc.

THE TEXAS COMPANY — MONTEBELLO LABORATORY  
YIELD CALCULATIONS

RUN NO. 62-I  
HOURS 182-206  
CATALYST Fresh CM&S

Table with columns: FRESH FEED, WET GAS, RECYCLE, COMBINED FRESH, EFFLUENT, NET CHANGE, YIELD BASIS H2 + CO FED. Rows include CO, H2, CO2, N2, CH4, C2H4, C2H6, C3H8, C4H10, C4H12, C5H12, C6H14, C7H16, C8H18, C9H20, C10H22, C11H24, C12H26, C13H28, C14H30, C15H32, C16H34, C17H36, C18H38, C19H40, C20H42, C21H44, C22H46, C23H48, C24H50, C25H52, C26H54, C27H56, C28H58, C29H60, C30H62, C31H64, C32H66, C33H68, C34H70, C35H72, C36H74, C37H76, C38H78, C39H80, C40H82, C41H84, C42H86, C43H88, C44H90, C45H92, C46H94, C47H96, C48H98, C49H100, C50H102, C51H104, C52H106, C53H108, C54H110, C55H112, C56H114, C57H116, C58H118, C59H120, C60H122, C61H124, C62H126, C63H128, C64H130, C65H132, C66H134, C67H136, C68H138, C69H140, C70H142, C71H144, C72H146, C73H148, C74H150, C75H152, C76H154, C77H156, C78H158, C79H160, C80H162, C81H164, C82H166, C83H168, C84H170, C85H172, C86H174, C87H176, C88H178, C89H180, C90H182, C91H184, C92H186, C93H188, C94H190, C95H192, C96H194, C97H196, C98H198, C99H200, C100H202.

Form ML-11

k/NCM = 16.91 X #/MCF \*9488 MCFH H2 + CO, Bbl/Day = 5421.6 X gal/MCF

THE TEXAS COMPANY — MONTEBELLO LABORATORY  
DATA SUMMARY

RUN NO. 62-I  
HOURS 182-206

Table with columns: OPERATING CONDITIONS, PRODUCT TESTS, CATALYST DATA. Rows include Pressures (Oxygen, Natural Gas, Generator Outlet, Reactor Inlet, Condenser Inlet, Product Accumulator), Temperatures (Oxygen, Natural Gas, Generator, Quench Accumulator, Reactor Inlet, Condenser Inlet, Product Accumulator, Catalyst No., Height), Rates (Fresh Feed, Recycle, Combined Feed, Wet Gas, Loss), Product Tests (API, Neut. No., Sap. No., Hydrox. No., Bromine No., Pour °F., Chemicals, H2O, H2S, NH3, HCN, CO, CO2, H2, CH4, C2H4, C2H6, C3H8, C4H10, C4H12, C5H12, C6H14, C7H16, C8H18, C9H20, C10H22, C11H24, C12H26, C13H28, C14H30, C15H32, C16H34, C17H36, C18H38, C19H40, C20H42, C21H44, C22H46, C23H48, C24H50, C25H52, C26H54, C27H56, C28H58, C29H60, C30H62, C31H64, C32H66, C33H68, C34H70, C35H72, C36H74, C37H76, C38H78, C39H80, C40H82, C41H84, C42H86, C43H88, C44H90, C45H92, C46H94, C47H96, C48H98, C49H100, C50H102, C51H104, C52H106, C53H108, C54H110, C55H112, C56H114, C57H116, C58H118, C59H120, C60H122, C61H124, C62H126, C63H128, C64H130, C65H132, C66H134, C67H136, C68H138, C69H140, C70H142, C71H144, C72H146, C73H148, C74H150, C75H152, C76H154, C77H156, C78H158, C79H160, C80H162, C81H164, C82H166, C83H168, C84H170, C85H172, C86H174, C87H176, C88H178, C89H180, C90H182, C91H184, C92H186, C93H188, C94H190, C95H192, C96H194, C97H196, C98H198, C99H200, C100H202), Catalyst Data (Inventory, Bed Depth, Vol., Fe, C, O, H, K2O, W+, X-Ray Analysis).

THE TEXAS COMPANY — MONTEBELLO LABORATORY  
YIELD CALCULATIONS

RUN NO. 62-J  
HOURS 206-230  
CATALYST Fresh CM4S

Table with columns: FRESH FEED, WET GAS, RECYCLE, COMBINED FEED, EFFLUENT, NET CHANGE, YIELD BASIS H2+CO FED. Includes rows for various hydrocarbons (CO, H2, CO2, N2, CH4, etc.), TOTAL, and various recovery rates.

Form ML-11

g/NCM = 16.91 x #/MCF \*9488 MCFH H2 + CO, Bbl/Day = 5421.6 x gal/MCF

THE TEXAS COMPANY — MONTEBELLO LABORATORY  
DATA SUMMARY

RUN NO. 62-J  
HOURS 206-230

Table with columns: OPERATING CONDITIONS, PRODUCT TESTS, CATALYST DATA. Includes rows for PRESSURES PSIG, RATES S.C.F.H., TEMPERATURES, and various catalyst and product analysis data.

THE TEXAS COMPANY - MONTEBELLO LABORATORY  
YIELD CALCULATIONS

RUN NO. 62-K  
HOURS 230-254  
CATALYST

Table with columns: FRESH FEED, WET GAS, RECYCLE, COMBINED FEED, EFFLUENT, NET CHANGE, YIELD BASIS H2+CO FED. Rows include CO, H2, CO2, N2, CH4, C2H4, C2H6, C3H8, C4H10, C4H8, C4H6, C4H2, C3-C4, TOTAL, H2+CO, H2/CO, Weight Recovery, Pressure, Temperature, Recycle Ratio, FRESH FEED CONVERSION, TOTAL FEED CONVERSION, SELECTIVITY, MET WATER, GROSS WATER, HYDROCARBON TOTAL.

Form ML-11

g/NCM = 16.91 x gal/MCF \*9488 MCFH H2 + CO, Bbl/Day = 5421.6 x gal/MCF

THE TEXAS COMPANY - MONTEBELLO LABORATORY  
DATA SUMMARY

RUN NO. 62-K  
HOURS 230-254

Table with columns: OPERATING CONDITIONS, PRODUCT TESTS, CATALYST DATA. Rows include Pressures (Oxygen, Natural Gas, Generator Outlet, Reactor Inlet, Condenser Inlet, Product Accumulator), Temperatures (Oxygen, Natural Gas, Generator, Quench Accumulator, Reactor Inlet, Condenser Inlet, Product Accumulator), Catalyst No., Height, and Chemical Analysis (HempeL Dist. %, API, Fe, C, O, H, K2O, W+, Fe2O3, Fe).

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

RUN NO. 62-L  
 HOURS 254-279  
 CATALYST Fresh CM&S

	FRESH FEED			WET GAS			RECYCLE	COMBINED FEED	EFFLUENT	NET CHANGE		YIELD BASIS H <sub>2</sub> + CO FED										
	%	m/hr	#/hr	%	At. Balance m/hr	Wt. Balance #/hr				m/hr	m/hr	m/hr	m/hr	#/hr	CONDENSATE			YIELDS BASIS BROWNSVILLE DESIGN FEED RATE*				
												#/MCF	#/gal	gal/hr	gal/MCF	CORRECTED HEMPEL, %	gal/hr		TREATING RECOVERY, %	gal/hr		
CO <sub>29.010</sub>	37.277	15.416	431.77	15.995	2.744	76.85	7.176	22.592	9.920	-12.872	-354.92											
H <sub>2</sub> <sub>2.016</sub>	60.267	24.922	50.24	48.235	8.274	16.68	21.640	46.562	29.914	-16.648	-35.56						400 EP	70.0	6.666	98.0	6.533	
CO <sub>2</sub> <sub>44.010</sub>	2.023	0.837	36.84	22.590	3.875	170.50	10.135	10.972	14.010	3.038	133.66	8.731					400-550	19.2	1.829	91.4	1.672	
N <sub>2</sub> <sub>29.016</sub>	0.150	0.062	1.74	1.005	0.172	4.82	0.451	0.513	0.623								550 +	10.8	1.029	114.6	1.179	
CH <sub>4</sub> <sub>16.042</sub>	0.285	0.117	1.88	5.610	0.962	15.43	2.517	2.634	3.479	0.845	13.55	0.885										
C <sub>2</sub> H <sub>6</sub> <sub>28.032</sub>				1.570	0.269	7.55	0.704	0.704	0.973	0.269	7.55	0.493						RECOVERY %	#/hr	gal/hr		
C <sub>3</sub> H <sub>8</sub> <sub>30.068</sub>				0.885	0.152	4.57	0.397	0.397	0.549	0.152	4.57	0.299						PROPYLENE	33.9	1.93		
C <sub>4</sub> + C <sub>5</sub>												25.67	1.677					C <sub>3</sub> POLY GASO.	87.5	1.69	0.283	
C <sub>3</sub> H <sub>6</sub> <sub>42.073</sub>				0.785	0.135	5.68	0.352	0.352	0.487	0.135	5.68	0.371	4.32	1.315	0.086			C <sub>3</sub> POLY TAR	12.5	0.24	0.32	
C <sub>4</sub> H <sub>6</sub> <sub>44.094</sub>				0.080	0.014	0.62	0.036	0.036	0.050	0.014	0.62	0.041	4.24	0.146	0.010							
C <sub>4</sub> H <sub>8</sub> <sub>56.104</sub>				1.210	0.208	11.67	0.543	0.543	0.751	0.208	11.67	0.762	5.00	2.334	0.152			#/gal	#/hr	gal/hr	RVP	
C <sub>4</sub> H <sub>10</sub> <sub>58.120</sub>				0.585	0.100	5.81	0.262	0.262	0.362	0.100	5.81	0.380	4.86	1.195	0.078			C <sub>4</sub> H <sub>8</sub>	5.00	--	--	68.0
C <sub>5</sub> H <sub>10</sub> <sub>70.130</sub>				0.795	0.136	9.54	0.357	0.357	0.493	0.136	9.54	0.623	5.48	1.750	0.114			C <sub>3</sub> POLY GASO.	5.98	10.21	1.708	1.5
C <sub>5</sub> H <sub>12</sub> <sub>72.146</sub>				0.290	0.050	3.61	0.130	0.130	0.180	0.050	3.61	0.236	5.25	0.688	0.045			C <sub>4</sub> H <sub>10</sub>	4.86	4.81	0.990	68.0
C <sub>5</sub> H <sub>14</sub> <sub>84.152</sub>				0.365	0.063	5.30	0.164	0.164	0.227	0.063	5.30	0.346	5.54	0.957	0.063			C <sub>4</sub> FREE GASO.			10.211	5.8
C <sub>7</sub> + C <sub>8</sub>												42.23	2.759		8.385	0.548		C <sub>4</sub> POLY TAR	7.53	1.46	0.194	
<b>TOTAL</b>		41.354	522.47		17.154	338.63	44.864	86.218	68.770													
H <sub>2</sub> + CO	97.544	40.338	15308.5554 SCFH	11.018			28.816	69.154	39.834	-29.320								gal/hr	gal/MCF	Bbl/Day		
H <sub>2</sub> /CO		1.62	Factor 653229	3.02			3.02	2.06	3.02	1.31								10 # RFP 400 EP GASOLINE	12.909	0.8433	4572	
Weight Recovery, %	94.64		Catalyst Age, hrs.		Space Velocity, vhw	120.4	RECOVERED OIL	0.443	62.17	4.061		9.524	0.622					GAS OIL	1.672	0.1092	592	
Pressure, psig	417		Inlet Velocity, Ft./sec	1.01	Catalyst Vol CF	12.71	TOTAL OIL	104.40	6.820		17.909	1.170						FUEL OIL	1.179	0.0770	417	
Temperature, °F	659		Bed Depth, Ft	19.26	Weight, #	1551	WATER SOLUBLE CHEMICALS	0.228	12.12	0.792		1.510	0.099					POLY TAR	0.226	0.0148	80	
Recycle Ratio	1.08		Bed Density, #/CF	122	Effluent (H <sub>2</sub> )(CO <sub>2</sub> ) = Shift Ratio (H <sub>2</sub> O)(CO)		TOTAL LIQUID PRODUCTS C <sub>4</sub> +		116.52	7.612		19.419	1.269					TOTAL	15.986	1.0443	5661	
FRESH FEED CONVERSION — %			TOTAL FEED CONVERSION — %				SELECTIVITY	NET WATER	6.081	109.55	7.156	13.151	0.859					W. S. CHEM.	1.510	0.0986	535	
Contraction	CO	H <sub>2</sub>	H <sub>2</sub> + CO	CO	H <sub>2</sub>	CO + H <sub>2</sub>	C <sub>3</sub> + C <sub>4</sub> +	GROSS WATER	121.67	7.948	14.661	0.958						TOTAL	17.496	1.1429	6196	
58.52	82.20	66.80	72.69	56.09	35.75	42.40	81.95	HYDROCARBON TOTAL — C <sub>4</sub> +	142.19	9.289												

Form ML-11

$\rho/NCM = 16.91 \times \#/MCF$   $99488 MCF H_2 + CO, Bbl/Day = 5421.6 \times gal/MCF$

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

RUN NO. 62-L  
 HOURS 254-279

OPERATING CONDITIONS				PRODUCT TESTS				CATALYST DATA								
PRESSURES PSIG		RATES S.C.F.H.		OIL	WATER	INVENTORY DATA				PARTICLE SIZE						
Oxygen	444	Fresh Feed	15694	* API	49.0	10.5	In Reactor at Start of Period				Screen Analysis		Sedimentation			
Natural Gas	440	Recycle	17026	Neut. No.	38.9	37.3	Fresh Catalyst Added				Mesh	Microns	%	Microns	%	
Generator Outlet	422	Combined Feed	32720	Sap. No.	49.0	42.3	Total				On 40	419+		80+		
Reactor Inlet	417	Wet Gas—Measured	5972	Hydrox. No.			Catalyst Recovered				55	100	150	40—80		
Condenser Inlet		Adjusted	6510	Bromine No.	86		In Reactor at End of Period				150	105		20—40		
Product Accumulator	372	Loss	538	Pour °F.			REACTOR d-p, Inches H <sub>2</sub> O				250	62		0—20		
				Chemicals, % by K <sub>2</sub> CO <sub>3</sub>		10.3	No. Height				325	44				
TEMPERATURES — °F.		Recycle/Fresh Feed	1.08				0 See Per. A				45	<325				
Oxygen	464	Inlet Velocity—ft./sec.	1.01				1				64			CATALYST		
Natural Gas	796	Fresh Feed Rate—S.C.F.H.	15309	HEMPEL DIST. %	°API		2				68		Bulk Density, Lbs./Cu.Ft.			
Generator	2383	per Cu. Ft. Dense Bed	1204	205 °F.			3				53		Aerated			
Quench Accumulator	154	per Lb. Catalyst	9.87	400	69.0	53.8	4				222		Settled			
Reactor Inlet	387	per Sq. Ft.	23195	400-550	19.2	37.9	Total				452		Compacted			
Condenser Inlet	588			550+	11.8								Particle Density, gm./cc.			
Product Accumulator	91						CALCULATED FROM dp						NH <sub>3</sub> Value, ml./gm.			
Catalyst No.	Height			A. S. T. M. DIST. ON			Density, Lbs./Cu.Ft.				122		N <sub>2</sub> Surface, m <sup>2</sup> /gm.			
1	See Per. A	662		Naphtha °F.			Inventory, Lbs.				1551					
2	669			IBP	118		Bed Depth, Ft.				19.26		CHEMICAL ANALYSIS			
3	649			10%	152		Vol., Cu. Ft.				12.71		Fe			
4	656			50%	244								C			
5	662			90%	362								O			
6	663			EP	410								H			
7	654			Rec.	97.0								K <sub>2</sub> O, W+. % basis Fe			
8	640												X-Ray Analysis—			
9	637												Fe <sub>3</sub> C <sub>2</sub>			
10	637												Fe <sub>3</sub> O <sub>4</sub>			
11	618												Fe			





THE TEXAS COMPANY — MONTEBELLO LABORATORY  
YIELD CALCULATIONS

RUN NO. 62-N  
HOURS 303-327  
CATALYST Fresh CM&S

Table with columns: FRESH FEED, WET GAS, RECYCLE, COMBINED FEED, EFFLUENT, NET CHANGE, CONDENSATE, YIELDS BASIS BROWNSVILLE DESIGN FEED RATE\*. Rows include CO, H2, CO2, N2, CH4, C2H6, C2H4, C2H2, C2H8, C2H10, C2H12, C3-C4, TOTAL, H2+CO, H2/CO, and various recovery percentages.

Form ML-11

g/NCM = 16.91 x # / MCF \*9488 MCFH H2 + CO, Bbl/Day = 5421.6 x gal / MCF

THE TEXAS COMPANY — MONTEBELLO LABORATORY  
DATA SUMMARY

RUN NO. 62-N  
HOURS 303-327

Table with columns: OPERATING CONDITIONS, PRODUCT TESTS, CATALYST DATA. Rows include PRESSURES PSIG, RATES S.C.F.H., TEMPERATURES -°F., and various catalyst and product test data points.

THE TEXAS COMPANY — MONTEBELLO LABORATORY  
YIELD CALCULATIONS

RUN NO. 62-0  
HOURS 327-351  
CATALYST

Table with columns: FRESH FEED, WET GAS, RECYCLE, COMBINED FEED, EFFLUENT, NET CHANGE, YIELD BASIS H2+CO FED, CONDENSATE, YIELDS BASIS BROWNSVILLE DESIGN FEED RATE\*. Rows include CO, H2, CO2, N2, CH4, C2H6, C2H4, C2H2, C2H8, C3H8, C3H6, C3H4, C4H10, C4H8, C4H6, C4H4, C4H2, C5H12, C5H10, C5H8, C5H6, C5H4, C5H2, C6H14, C6H12, C6H10, C6H8, C6H6, C6H4, C6H2, C7H16, C7H14, C7H12, C7H10, C7H8, C7H6, C7H4, C7H2, C8H18, C8H16, C8H14, C8H12, C8H10, C8H8, C8H6, C8H4, C8H2, C9H20, C9H18, C9H16, C9H14, C9H12, C9H10, C9H8, C9H6, C9H4, C9H2, C10H22, C10H20, C10H18, C10H16, C10H14, C10H12, C10H10, C10H8, C10H6, C10H4, C10H2, C11H24, C11H22, C11H20, C11H18, C11H16, C11H14, C11H12, C11H10, C11H8, C11H6, C11H4, C11H2, C12H26, C12H24, C12H22, C12H20, C12H18, C12H16, C12H14, C12H12, C12H10, C12H8, C12H6, C12H4, C12H2, C13H28, C13H26, C13H24, C13H22, C13H20, C13H18, C13H16, C13H14, C13H12, C13H10, C13H8, C13H6, C13H4, C13H2, C14H30, C14H28, C14H26, C14H24, C14H22, C14H20, C14H18, C14H16, C14H14, C14H12, C14H10, C14H8, C14H6, C14H4, C14H2, C15H32, C15H30, C15H28, C15H26, C15H24, C15H22, C15H20, C15H18, C15H16, C15H14, C15H12, C15H10, C15H8, C15H6, C15H4, C15H2, C16H34, C16H32, C16H30, C16H28, C16H26, C16H24, C16H22, C16H20, C16H18, C16H16, C16H14, C16H12, C16H10, C16H8, C16H6, C16H4, C16H2, C17H36, C17H34, C17H32, C17H30, C17H28, C17H26, C17H24, C17H22, C17H20, C17H18, C17H16, C17H14, C17H12, C17H10, C17H8, C17H6, C17H4, C17H2, C18H38, C18H36, C18H34, C18H32, C18H30, C18H28, C18H26, C18H24, C18H22, C18H20, C18H18, C18H16, C18H14, C18H12, C18H10, C18H8, C18H6, C18H4, C18H2, C19H40, C19H38, C19H36, C19H34, C19H32, C19H30, C19H28, C19H26, C19H24, C19H22, C19H20, C19H18, C19H16, C19H14, C19H12, C19H10, C19H8, C19H6, C19H4, C19H2, C20H42, C20H40, C20H38, C20H36, C20H34, C20H32, C20H30, C20H28, C20H26, C20H24, C20H22, C20H20, C20H18, C20H16, C20H14, C20H12, C20H10, C20H8, C20H6, C20H4, C20H2. Includes summary rows for H2+CO, H2/CO, Weight Recovery, Pressure, Temperature, Recycle Ratio, Fresh Feed Conversion, and various chemical products.

Form ML-11 g/NCM = 16.91X#/MCF \*9488 MCFH H2 + CO, Bbl/Day = 5421.6 X gal/MCF

THE TEXAS COMPANY — MONTEBELLO LABORATORY  
DATA SUMMARY

RUN NO. 62-0  
HOURS 327-351

Table with columns: OPERATING CONDITIONS, PRODUCT TESTS, CATALYST DATA. Rows include Pressures (Oxygen, Natural Gas, Generator Outlet, Reactor Inlet, Condenser Inlet, Product Accumulator), Temperatures (Oxygen, Natural Gas, Generator, Quench Accumulator, Reactor Inlet, Condenser Inlet, Product Accumulator, Catalyst No.), and Catalyst Data (Inventory, Bed Depth, Vol., Fe, Fe2O3, Fe3O4, Fe).

THE TEXAS COMPANY — MONTEBELLO LABORATORY  
YIELD CALCULATIONS

RUN NO. 62-P  
HOURS 351-375  
CATALYST Fresh CM&S

Table with columns: FRESH FEED, WET GAS, RECYCLE, COMBINED FEED, EFFLUENT, NET CHANGE, YIELD BASIS H2 + CO FED. Rows include CO, H2, CO2, N2, CH4, C2H2, C2H4, C2H6, C3H8, C4H10, C4H12, C5H12, C6H14, C7H16, C8H18, C9H20, C10H22, C11H24, C12H26, C13H28, C14H30, C15H32, C16H34, C17H36, C18H38, C19H40, C20H42, C21H44, C22H46, C23H48, C24H50, C25H52, C26H54, C27H56, C28H58, C29H60, C30H62, C31H64, C32H66, C33H68, C34H70, C35H72, C36H74, C37H76, C38H78, C39H80, C40H82, C41H84, C42H86, C43H88, C44H90, C45H92, C46H94, C47H96, C48H98, C49H100, C50H102, C51H104, C52H106, C53H108, C54H110, C55H112, C56H114, C57H116, C58H118, C59H120, C60H122, C61H124, C62H126, C63H128, C64H130, C65H132, C66H134, C67H136, C68H138, C69H140, C70H142, C71H144, C72H146, C73H148, C74H150, C75H152, C76H154, C77H156, C78H158, C79H160, C80H162, C81H164, C82H166, C83H168, C84H170, C85H172, C86H174, C87H176, C88H178, C89H180, C90H182, C91H184, C92H186, C93H188, C94H190, C95H192, C96H194, C97H196, C98H198, C99H200, C100H202.

Form ML-11

g/NCM = 16.91 X #/MCF \*9488 MCF H2 + CO. Bbl/Day = 5421.6 X gal/MCF

THE TEXAS COMPANY — MONTEBELLO LABORATORY  
DATA SUMMARY

RUN NO. 62-P  
HOURS 351-375

Table with columns: OPERATING CONDITIONS, PRODUCT TESTS, CATALYST DATA. Rows include Pressures (PSIG), Temperatures (-°F), Catalyst No., Height, etc.

THE TEXAS COMPANY — MONTEBELLO LABORATORY  
YIELD CALCULATIONS

RUN NO. 62-Q  
HOURS 375-399  
CATALYST Fresh CM&S

Table with columns: FRESH FEED, WET GAS, RECYCLE, COMBINED FEED, EFFLUENT, NET CHANGE, CONDENSATE, YIELD BASIS BROWNSVILLE DESIGN FEED RATE\*. Includes rows for CO, H2, CO2, N2, CH4, C2H6, C2H4, C2H2, C2H6, C3H8, C3H6, C3H4, C4H10, C4H8, C4H6, C4H4, C4H2, C4H0, TOTAL, H2+CO, H2/CO, Weight Recovery, Pressure, Temperature, Recycle Ratio, FRESH FEED CONVERSION, and various chemical species.

Form ML-11

g/NCM = 16.91 X # / MCF \*9488 MCFH H2 + CO, Bbl/Day = 5421.6 X gal/MCF

THE TEXAS COMPANY — MONTEBELLO LABORATORY  
DATA SUMMARY

RUN NO. 62-Q  
HOURS 375-399

Table with columns: OPERATING CONDITIONS, PRODUCT TESTS, CATALYST DATA. Includes rows for Pressures, Temperatures, Recycle/Fresh Feed, Inlet Velocity, Fresh Feed Rate, Heat Transfer Calculations, Steam Rate, Tube Area, and various catalyst and product data.

THE TEXAS COMPANY — MONTEBELLO LABORATORY  
YIELD CALCULATIONS

RUN NO. 62-R  
HOURS 399-423  
CATALYST Fresh CM&S

Table with columns: FRESH FEED, WET GAS, RECYCLE, COMBINED FEED, EFFLUENT, NET CHANGE, CONDENSATE, YIELDS BASIS BROWNSVILLE DESIGN FEED RATE\*. Rows include CO, H2, CO2, N2, CH4, C2H2, C2H4, C2H6, C2H8, C2H10, C2H12, C2H14, C2H16, C2H18, C2H20, C2H22, C2H24, C2H26, C2H28, C2H30, TOTAL, H2+CO, H2/CO, Weight Recovery, Pressure, Temperature, Recycle Ratio, FRESH FEED CONVERSION, TOTAL FEED CONVERSION, SELECTIVITY, NET WATER, GROSS WATER, HYDROCARBON TOTAL.

Form ML-11

g/NCM = 16.91 X #/MCF \*9488 MCFH2 + CO, Bbl/Day = 5421.6 X gal/MCF

THE TEXAS COMPANY — MONTEBELLO LABORATORY  
DATA SUMMARY

RUN NO. 62-R  
HOURS 399-423

Table with columns: OPERATING CONDITIONS, PRODUCT TESTS, CATALYST DATA. Rows include Pressures, Temperatures, Catalyst No., Height, Inlet Velocity, Fresh Feed Rate, per Cu. Ft. Dense Bed, per Lb. Catalyst, per Sq. Ft., 205 °F., 400, 400-550, 550+, A. S. T. M. DIST. ON, Naphtha °F., IBP, 10%, 50%, 90%, EP, Rec., Density, Inventory, Bed Depth, Vol., Fe, C, O, H, K2O.W+, X-Ray Analysis, Fe2O3, Fe.







THE TEXAS COMPANY — MONTEBELLO LABORATORY  
YIELD CALCULATIONS

RUN NO. 62-U  
HOURS 471-495  
CATALYST Fresh CM&S

FRESH FEED				WET GAS			RECYCLE	COMBINED FEED	EFFLUENT	NET CHANGE		YIELD BASIS H <sub>2</sub> + CO FED									
%	m/hr	#/hr	%	At Wt. Balance	m/hr	m/hr	m/hr	m/hr	m/hr	#/hr	CONDENSATE				YIELDS BASIS BROWNSVILLE DESIGN FEED RATE*						
				m/hr	#/hr						#/MCF	#/gal	gal/hr	gal/MCF	CORRECTED HEMPFL. %	gal/hr	TREATING RECOVERY, %	gal/hr			
CO 28.010	38.267	15.594	431.18	15.815	3.089	86.52	7.238	22.632	10.327	-12.505	344.66										
H <sub>2</sub> 2.016	58.150	23.393	47.16	50.335	9.832	19.82	23.036	46.429	32.868	-13.561	27.34				400 EP	67.9	5.893	98.0	5.775		
CO <sub>2</sub> 44.010	2.553	1.027	45.20	22.240	4.345	191.22	10.178	11.205	14.522	3.318	146.02	9.939			400-550	22.4	1.944	91.4	1.777		
N <sub>2</sub> 29.016	0.317	0.128	3.59	1.145	0.224	6.28	0.524	0.652	0.748						550 +	9.7	0.842	114.6	0.965		
CH <sub>4</sub> 16.042	0.713	0.287	4.60	5.160	1.008	16.17	2.361	2.648	3.369	0.721	11.57	0.788									
C <sub>2</sub> H <sub>6</sub> 28.032				1.125	0.220	6.17	0.515	0.515	0.735	0.220	6.17	0.420									
C <sub>3</sub> H <sub>8</sub> 30.068				0.630	0.123	3.70	0.288	0.288	0.411	0.123	3.70	0.252			PROPYLENE	29.5	2.46				
C <sub>4</sub> +C <sub>5</sub>											21.44	1.460			C <sub>3</sub> POLY GASO.	87.5	2.15	0.360			
C <sub>2</sub> H <sub>4</sub> 42.078				1.015	0.198	8.33	0.465	0.465	0.663	0.198	8.33	0.567	4.32	1.928	0.131	C <sub>3</sub> POLY TAR	12.5	0.31	0.041		
C <sub>2</sub> H <sub>2</sub> 44.094				0.150	0.029	1.28	0.069	0.069	0.098	0.029	1.28	0.097	4.24	0.302	0.021						
C <sub>2</sub> H <sub>2</sub> 50.054				1.010	0.197	11.05	0.462	0.462	0.659	0.197	11.05	0.752	5.00	2.210	0.150						
C <sub>4</sub> H <sub>10</sub> 58.020				0.420	0.082	4.77	0.192	0.192	0.274	0.082	4.77	0.325	4.86	0.981	0.067	C <sub>4</sub> H <sub>6</sub>	5.00	--	--	68.0	
C <sub>4</sub> H <sub>10</sub> 70.030				0.580	0.113	7.92	0.265	0.265	0.378	0.113	7.92	0.539	5.45	1.453	0.099	C <sub>4</sub> POLY GASO.	5.98	9.67	1.617	1.5	
C <sub>4</sub> H <sub>10</sub> 72.042				0.160	0.031	2.24	0.073	0.073	0.104	0.031	2.24	0.152	5.25	0.427	0.029	C <sub>4</sub> H <sub>6</sub>	4.86	(4.77) 4.20	(0.981) 0.864	68.0	
C <sub>4</sub> H <sub>10</sub> 84.052				0.215	0.042	3.53	0.098	0.098	0.140	0.042	3.53	0.240	5.54	0.637	0.043	C <sub>4</sub> FREE GASO.				8.652	5.8
C <sub>4</sub> +C <sub>5</sub>											39.12	2.662	7.938	0.540	C <sub>4</sub> POLY TAR	7.58	1.38	0.183			
TOTAL		40.229	531.73		19.532	369.03	45.765	85.994	71.236												
H <sub>2</sub> +CO	96.417	38.787	14691	SCFH	12.921		30.274	69.061	43.195	-25.866						gal/hr	gal/MCF	Bbl/Day			
H <sub>2</sub> /CO		1.52	Factor	680688	3.18		3.18	2.05	3.18	1.10						10 # RVP 400 EP GASOLINE	11.133	0.7578	4108		
Weight Recovery, %	90.53	Catalyst Age, hrs.			Space Velocity, vhr			1482	RECOVERED OIL		0.404	56.61	3.853	8.679	0.591	GAS OIL	1.777	0.1210	656		
Pressure, psig	415	Inlet Velocity, Ft/sec			1.00	Catalyst Vol CF			9.91	TOTAL OIL		95.73	6.515	16.617	1.131	FUEL OIL	0.965	0.0657	356		
Temperature, °F	652	Bed Depth, Ft			15.02	Weight, #			1249	WATER SOLUBLE CHEMICALS		0.182	9.65	0.657	1.187	0.081	POLY TAR	0.224	0.0152	82	
Recycle Ratio	1.14	Bed Density, #/CF			126	Effluent (H <sub>2</sub> )(CO) Shift Ratio (H <sub>2</sub> O)(CO)				TOTAL LIQUID PRODUCTS C <sub>3</sub> +		105.38	7.172	17.804	1.212	TOTAL	14.099	0.9597	5202		
FRESH FEED CONVERSION — %				TOTAL FEED CONVERSION — %				SELECTIVITY		NET WATER		5.353	96.44	6.565	8.331	1.578	0.788	W.S. CHEM.	1.187	0.0808	438
Contraction	CO	H <sub>2</sub>	H <sub>2</sub> +CO	CO	H <sub>2</sub>	CO+H <sub>2</sub>	C <sub>3</sub> + / C <sub>4</sub> +	GROSS WATER		106.09	7.222	12.765	0.869	TOTAL	15.286	1.0405	5640				
51.45	79.93	57.97	66.69	54.37	29.21	37.45	83.09	HYDROCARBON TOTAL—C <sub>3</sub> +		126.82	8.632										

Form ML-11

g/NCM = 16.91 X # / MCF 80488 MCFH H<sub>2</sub> + CO, Bbl/Day = 5421.6 X gal / MCF

THE TEXAS COMPANY — MONTEBELLO LABORATORY  
DATA SUMMARY

RUN NO. 62-U  
HOURS 471-495

OPERATING CONDITIONS				PRODUCT TESTS				CATALYST DATA						
PRESSURES PSIG		RATES S.C.F.H.		OIL		WATER		INVENTORY DATA			PARTICLE SIZE			
Oxygen	441	Fresh Feed	15267	* API	49.1	10.3		In Reactor at Start of Period			Screen Analysis			
Natural Gas	438	Recycle	17368	Neut. No.	37.2	37.2		Fresh Catalyst Added			154	Mesh	Microns	%
Generator Outlet	421	Combined Feed	32635	Sap. No.	46.5	42.5		Total				On 40	419+	80+
Reactor Inlet	415	Wet Gas—Measured	6401	Hydrox. No.				Catalyst Recovered			119	100	150	40—80
Condenser Inlet		Adjusted	7413	Bromine No.	73			In Reactor at End of Period				150	105	20—40
Product Accumulator	369	Loss	1012	Pour °F.								200	74	10—20
				Chemicals, % by K <sub>2</sub> CO <sub>3</sub>		9.3		REACTOR d-p, Inches H <sub>2</sub> O				250	62	0—20
								No. Height				325	44	
TEMPERATURES—°F.		Recycle / Fresh Feed	1.14					0 See Per. A			43	<325		
Oxygen	453	Inlet Velocity—ft./sec.	1.00					1			63	CATALYST		
Natural Gas	799	Fresh Feed Rate—S.C.F.H.	14691	HEMPFL. DIST. %		*API		2			68	Bulk Density, Lbs./Cu.Ft.		
Generator	2346	per Cu.Ft. Dense Bed	1482	205 °F.				3			60	Aerated		
Quench Accumulator	150	per Lb. Catalyst	11.76	400	66.9	53.6		4			130	Settled		
Reactor Inlet	370	per Sq. Ft.	22259	400-550	22.4	34.1		Total			364	Compacted		
Condenser Inlet	630			550+	10.7							Particle Density, gm./cc.		
Product Accumulator	89							CALCULATED FROM dp				NH <sub>3</sub> Value, ml./gm.		
Catalyst No.	Height			A. S. T. M. DIST. ON				Density, Lbs./Cu.Ft.			126	N <sub>2</sub> Surface, m <sup>2</sup> /gm.		
1	See Per. A	576		Naphtha °F.				Inventory, Lbs.			1249			
2	655			IBP	126			Bed Depth, Ft.			15.02	CHEMICAL ANALYSIS		
3	645			10%	150			Vol., Cu. Ft.			9.91	Fe		
4	648			50%	260							C		
5	654			90%	382							O		
6	656			EP	430							H		
7	641			Rec.	97.0							K <sub>2</sub> O. W+, % basis Fe		
8	661											X-Ray Analysis—		
9	667											Fe <sub>2</sub> O <sub>3</sub>		
10	661											Fe <sub>3</sub> O <sub>4</sub>		
11	631											Fe		

THE TEXAS COMPANY — MONTEBELLO LABORATORY  
YIELD CALCULATIONS

RUN NO. 62-V  
HOURS 495-519  
CATALYST Fresh CM&S

	FRESH FEED				WET GAS			RECYCLE	COMBINED FEED	EFFLUENT	NET CHANGE		YIELD BASIS H <sub>2</sub> + CO FED				YIELDS	BASIS	BROWNSVILLE	DESIGN FEED RATE*
	%	m/hr	#/hr	%	At Wt. Balance m/hr	#/hr	m/hr				m/hr	m/hr	#/hr	#/MCF	#/gal	gal/hr				
CO	36.756	15.208	425.96	13.216	2.315	64.84	5.923	21.131	8.238	-12.893	-361.12									
H <sub>2</sub>	60.080	24.857	50.11	48.363	8.473	17.08	21.676	46.533	30.149	-16.384	-33.03				400 EP	72.0	7.012	98.0	6.872	
CO <sub>2</sub>	2.250	0.931	40.97	24.290	4.256	187.33	10.987	11.818	15.143	3.325	146.36	9.626			400-550	16.8	1.536	91.4	1.495	
N <sub>2</sub>	0.197	0.082	2.30	1.267	0.222	6.22	0.568	0.650	0.790						550 +	11.2	1.091	114.6	1.250	
CH <sub>4</sub>	0.717	0.297	4.76	6.600	1.156	18.54	2.958	3.255	4.114	0.359	13.78	0.906								
C <sub>2</sub> H <sub>6</sub>				1.377	0.241	6.76	0.617	0.617	0.858	0.241	6.76	0.445				RECOVERY %	#/hr	gal/hr		
C <sub>3</sub> H <sub>8</sub>				0.723	0.127	3.82	0.324	0.324	0.451	0.127	3.82	0.251				PROPYLENE	33.2	2.50		
C <sub>4</sub> +C <sub>5</sub>													24.36	1.602		C <sub>4</sub> POLY GASO.	87.5	2.19	0.566	
C <sub>2</sub> H <sub>4</sub>				1.023	0.179	7.53	0.458	0.458	0.637	0.179	7.53	0.495	4.32	1.743	0.115					
C <sub>2</sub> H <sub>2</sub>				0.100	0.018	0.79	0.045	0.045	0.063	0.018	0.79	0.052	4.24	0.186	0.012					
C <sub>2</sub> H <sub>2</sub>				1.217	0.213	11.95	0.545	0.545	0.758	0.213	11.95	0.786	5.00	2.390	0.157		#/gal	#/hr	gal/hr	RVP
C <sub>2</sub> H <sub>2</sub>				0.517	0.091	5.29	0.232	0.232	0.323	0.091	5.29	0.348	4.86	1.088	0.072	C <sub>4</sub> H <sub>6</sub>	5.00	--	--	68.0
C <sub>2</sub> H <sub>2</sub>				0.767	0.134	9.40	0.344	0.344	0.478	0.134	9.40	0.618	5.48	1.725	0.113	C <sub>4</sub> POLY GASO.	5.98	10.46	1.749	1.5
C <sub>2</sub> H <sub>2</sub>				0.213	0.037	2.67	0.095	0.095	0.132	0.037	2.67	0.176	5.25	0.509	0.033	C <sub>4</sub> H <sub>10</sub>	4.86	(5.29)	(1.088)	68.0
C <sub>2</sub> H <sub>2</sub>				0.327	0.057	4.80	0.147	0.147	0.204	0.057	4.80	0.316	5.54	0.966	0.057	C <sub>4</sub> FREE GASO.			10.358	5.8
C <sub>3</sub> -C <sub>6</sub>													42.43	2.791	8.507	0.559	C <sub>4</sub> POLY TAR	7.53	1.49	0.198
TOTAL		41.375	524.10		17.519	347.02	44.919	86.194	68.689											
H <sub>2</sub> +CO	96.836	40.065	15205	SCFH	10.788		27.599	67.664	38.387	-29.277							gal/hr	gal/MCF	Bbl/Day	
H <sub>2</sub> /CO		1.63	Factor	657678	3.66		3.66	2.20	3.66	1.27							10 # RVP 400 EP GASOLINE	13.092	0.9610	4668
Weight Recovery, %	94.05		Catalyst Age, hrs.		Space Velocity, whv	1536	RECOVERED OIL	0.452	63.46	4.174	9.739	0.641				GAS OIL	1.495	0.0983	533	
Pressure, psig	419		Inlet Velocity, Ft/sec	1.00	Catalyst Vol CF	9.90	TOTAL OIL	105.89	6.965	18.246	1.200					FUEL OIL	1.250	0.0822	446	
Temperature, °F	657		Bed Depth, Ft	15.0	Weight, #	1342	WATER SOLUBLE CHEMICALS	0.210	11.15	0.732	1.367	0.090				POLY TAR	0.239	0.0157	85	
Recycle Ratio	1.08		Bed Density, #/CF	134	Effluent (H <sub>2</sub> )/(CO)		TOTAL LIQUID PRODUCTS C <sub>4</sub> +		117.02	7.697	19.683	1.290				TOTAL	16.076	1.0572	5732	
FRESH FEED CONVERSION — %			TOTAL FEED CONVERSION — %		SELECTIVITY		NET WATER	5.689	102.49	6.741	12.304	0.809				W. S. CHEM.	1.367	0.0899	487	
Contraction	CO	H <sub>2</sub>	H <sub>2</sub> +CO	CO	H <sub>2</sub>	CO+H <sub>2</sub>	C <sub>3</sub> +C <sub>4</sub> +	GROSS WATER								TOTAL	17.443	1.1471	6219	
57.66	84.78	65.91	73.07	61.01	35.21	43.27	82.77	HYDROCARBON TOTAL—C <sub>1</sub> +	113.62	7.473	13.671	0.999								
									141.38	9.299										

Form ML-11

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

THE TEXAS COMPANY — MONTEBELLO LABORATORY  
DATA SUMMARY

RUN NO. 62-V  
HOURS 495-519

OPERATING CONDITIONS				PRODUCT TESTS				CATALYST DATA			
PRESSURES PSIG		RATES S.C.F.H.		OIL		WATER		INVENTORY DATA		PARTICLE SIZE	
Oxygen	445	Fresh Feed	15702	°API	49.2	10.3		In Reactor at Start of Period		Screen Analysis	Sedimentation
Natural Gas	442	Recycle	17009	Neut. No.	37.2	37.3		Fresh Catalyst Added		Mesh	Microns
Generator Outlet	424	Combined Feed	32711	Sap. No.	46.2	40.6		Total		On 40	419+
Reactor Inlet	419	Wet Gas—Measured	6051	Hydrox. No.				Catalyst Recovered	163	100	150
Condenser Inlet		Adjusted	6648	Bromine No.				In Reactor at End of Period		150	105
Product Accumulator	370	Loss	597	Pour °F.						200	74
				Chemicals, % by K <sub>2</sub> CO <sub>3</sub>	10.0			REACTOR d-p, Inches H <sub>2</sub> O		250	62
				No.				No.	Height	325	44
TEMPERATURES — °F.		Recycle/Fresh Feed	1.08	0	See Per. A	45	<325				
Oxygen	469	Inlet Velocity—ft./sec.	1.00	1		67		CATALYST			
Natural Gas	790	Fresh Feed Rate—S.C.F.H.	15205	HEMPEL DIST. %			2	Bulk Density, Lbs./Cu.Ft.			
Generator	2349	per Cu.Ft. Dense Bed	1536	205 °F.			3	Aerated			
Quench Accumulator	156	per Lb. Catalyst	11.33	400	71.0	54.4	4	Settled			
Reactor Inlet	380	per Sq. Ft.	23038	400-550	16.8	39.6	Total	301			
Condenser Inlet	644			550+	13.2			Particle Density, gm./cc.			
Product Accumulator	85							CALCULATED FROM dp			
Catalyst No.	Height			A. S. T. M. DIST. ON			Density, Lbs./Cu.Ft.	134	NH <sub>3</sub> Value, ml./gm.		
1	See Per. A	527		Naphtha °F.			Inventory, Lbs.	1342	N <sub>2</sub> Surface, m <sup>2</sup> /gm.		
2		663		IBP			Bed Depth, Ft.	15.0	CHEMICAL ANALYSIS		
3		652		10%	155		Vol., Cu. Ft.	9.90	Fe		
4		653		50%	262				C		
5		658		90%	390				O		
6		659		EP	228				H		
7		646		Rec.	95				K <sub>2</sub> O, Wt.-% basis Fe		
8		662							X-Ray Analysis—		
9		674							Fe <sub>2</sub> O <sub>3</sub>		
10		671							Fe <sub>3</sub> O <sub>4</sub>		
11		642							Fe		

THE TEXAS COMPANY — MONTEBELLO LABORATORY  
YIELD CALCULATIONS

RUN NO. 62-W  
HOURS 519-543  
CATALYST Fresh CM&S

Table with columns: FRESH FEED, WET GAS, RECYCLE, COMBINED FEED, EFFLUENT, NET CHANGE, YIELD BASIS H2 + CO FED. Rows include CO, H2, CO2, N2, CH4, C2H4, C2H6, C3H8, C3H10, C4H10, C4H12, C4H14, C3-C4, TOTAL, H2+CO, H2/CO, Weight Recovery, Pressure, Temperature, Recycle Ratio, FRESH FEED CONVERSION, TOTAL FEED CONVERSION, SELECTIVITY, NET WATER, GROSS WATER, HYDROCARBON TOTAL.

Form ML-11

g/NCM = 16.91 X #/MCF    99488 MCFH H2 + CO, Bbl/Day = 5421.6 X gal/MCF

THE TEXAS COMPANY — MONTEBELLO LABORATORY  
DATA SUMMARY

RUN NO. 62-W  
HOURS 519-543

Table with columns: OPERATING CONDITIONS, PRODUCT TESTS, CATALYST DATA. Rows include PRESSURES PSIG, RATES S.C.F.H., OIL, WATER, INVENTORY DATA, PARTICLE SIZE, TEMPERATURES -°F., HEMPEL DIST. %, CATALYST, CHEMICAL ANALYSIS.

THE TEXAS COMPANY — MONTEBELLO LABORATORY

RUN NO. 62-A  
HOURS 0-22

RATE CALCULATIONS

Table with columns: GAS ANALYSES, GENERATOR BALANCE, WEIGHT BALANCE. Includes rows for FRESH FEED, CO, H2, CO2, N2, CH4, H2O, MW, BALANCE, WET GAS, GAS FLOW RATES, LIQUID PRODUCT RATES.

THE TEXAS COMPANY — MONTEBELLO LABORATORY

RUN NO. 62-B  
HOURS 22-46

RATE CALCULATIONS

Table with columns: GAS ANALYSES, GENERATOR BALANCE, WEIGHT BALANCE. Includes rows for FRESH FEED, CO, H2, CO2, N2, CH4, H2O, MW, BALANCE, WET GAS, GAS FLOW RATES, LIQUID PRODUCT RATES.

THE TEXAS COMPANY — MONTEBELLO LABORATORY  
RATE CALCULATIONS

RUN NO. 62-C  
HOURS 46-70

Table with columns: GAS ANALYSES (1400, 2200, 0600, AVERAGE), GENERATOR BALANCE (M/HR, C, H, O, Mol %, M/Hr, C, H, O), WEIGHT BALANCE (#/hr Measured, At. Wt. Balance). Rows include FRESH FEED, CO, H2, CO2, N2, CH4, H2O, and various hydrocarbons (C2H6, C3H8, C4H10, C5H12, C6H14, C7H16, C8H18, C9H20, C10H22). Includes sub-sections for WET GAS, GAS FLOW RATES, and LIQUID PRODUCT RATES.

THE TEXAS COMPANY — MONTEBELLO LABORATORY  
RATE CALCULATIONS

RUN NO. 62-D  
HOURS 70-84

Table with columns: GAS ANALYSES (1400, 2200, 0600, AVERAGE), GENERATOR BALANCE (M/HR, C, H, O, Mol %, M/Hr, C, H, O), WEIGHT BALANCE (#/hr Measured, At. Wt. Balance). Rows include FRESH FEED, CO, H2, CO2, N2, CH4, H2O, and various hydrocarbons (C2H6, C3H8, C4H10, C5H12, C6H14, C7H16, C8H18, C9H20, C10H22). Includes sub-sections for WET GAS, GAS FLOW RATES, and LIQUID PRODUCT RATES.



THE TEXAS COMPANY — MONTEBELLO LABORATORY  
RATE CALCULATIONS

RUN NO. 62-G  
HOURS 134-158

Table with columns: GAS ANALYSES, GENERATOR BALANCE, WEIGHT BALANCE. Rows include FRESH FEED, CO, H2, CO2, N2, CH4, C2H6, C3H8, C4H10, C4H8, C4H6, C4H4, C4H2, M.W., H2O, BALANCE, WET GAS, GAS FLOW RATES, LIQUID PRODUCT RATES.

THE TEXAS COMPANY — MONTEBELLO LABORATORY  
RATE CALCULATIONS

RUN NO. 62-H  
HOURS 158-182

Table with columns: GAS ANALYSES, GENERATOR BALANCE, WEIGHT BALANCE. Rows include FRESH FEED, CO, H2, CO2, N2, CH4, C2H6, C3H8, C4H10, C4H8, C4H6, C4H4, C4H2, M.W., H2O, BALANCE, WET GAS, GAS FLOW RATES, LIQUID PRODUCT RATES.









THE TEXAS COMPANY — MONTEBELLO LABORATORY

RATE CALCULATIONS

RUN NO. 62-0  
HOURS 327-351

Table with columns: GAS ANALYSES, GENERATOR BALANCE, and WEIGHT BALANCE. Includes rows for FRESH FEED, CO, H2, CO2, N2, CH4, H2O, and various hydrocarbon species. Contains sub-tables for GAS FLOW RATES and LIQUID PRODUCT RATES.

THE TEXAS COMPANY — MONTEBELLO LABORATORY

RATE CALCULATIONS

RUN NO. 62-P  
HOURS 351-375

Table with columns: GAS ANALYSES, GENERATOR BALANCE, and WEIGHT BALANCE. Includes rows for FRESH FEED, CO, H2, CO2, N2, CH4, H2O, and various hydrocarbon species. Contains sub-tables for GAS FLOW RATES and LIQUID PRODUCT RATES.

THE TEXAS COMPANY — MONTEBELLO LABORATORY

RATE CALCULATIONS

RUN NO. 62-Q  
HOURS 375-399

GAS ANALYSES				GENERATOR BALANCE										WEIGHT BALANCE						
HR	1400	2200	AVERAGE	M/HR	C	H	O	Mol %	M/HR	C	H	O	WET GAS	#/hr Measured	At Wt. Balance					
FRESH FEED								O <sub>2</sub> <sub>28.010</sub> 0.28	10.116 0.037				20.306	WET GAS	319.27	358.91				
CO <sub>28.010</sub>	37.48	37.91	36.87	37.420	15.297	15.297	15.297	CO <sub>44.010</sub> 1.93	0.252	0.252			0.504	OIL	55.74	55.74				
H <sub>2</sub> <sub>2.016</sub>	59.29	59.31	59.77	59.456	24.306		48.612	N <sub>2</sub> <sub>28.016</sub> 1.05	0.137					WATER	109.24	109.24				
CO <sub>44.010</sub>	2.00	2.20	2.13	2.110	0.863	0.863	1.726	CH <sub>4</sub> <sub>16.042</sub> 82.89	10.838	10.838	43.352		TOTAL	484.25	523.89					
N <sub>2</sub> <sub>28.016</sub>	0.26	0.21	0.63	0.367	0.150			C <sub>2</sub> H <sub>6</sub> <sub>30.068</sub> 7.39	0.966	1.932	5.796		FRESH FEED	523.89						
CH <sub>4</sub> <sub>16.042</sub>	0.97	0.37	0.60	0.647	0.264	0.264	1.056	C <sub>2</sub> H <sub>4</sub> <sub>28.056</sub> 4.16	0.544	1.632	4.352		WEIGHT BALANCE	192.43						
			M. W.	12.815196				CH <sub>4</sub> <sub>16.042</sub> 1.61	0.211	0.844	2.110									
			H <sub>2</sub> O <sub>18.016</sub>					C <sub>2</sub> H <sub>2</sub> <sub>26.042</sub> 0.69	0.090	0.450	1.080		WET GAS FACTOR	1124158						
								MW	20.02025					INDICATED LOSS—S.C.F.H.	779					
					16.424	56.966	20.672	TOTAL												
			BALANCE		102.98	100.49	99.34					15.948	56.690		20.810	7050				
WET GAS 1400				2200	GAS FLOW RATES										LIQUID PRODUCT RATES					
CO <sub>28.010</sub>	16.27	16.28	16.275		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
H <sub>2</sub> <sub>2.016</sub>	48.94	47.82	48.380					415.3	75.6	2259036										
CO <sub>44.010</sub>	21.27	22.46	21.965	FRESH FEED	79.31	6.358	20.736	0.9872	1.5030	15514	40.980									
N <sub>2</sub> <sub>28.016</sub>	1.18	1.26	1.220					1.93	77.8	1498336										
CH <sub>4</sub> <sub>16.042</sub>	6.92	6.06	6.490	WET GAS	158.44	8.063	4.078	0.9835	1.2241	6271	16.524									
C <sub>2</sub> H <sub>6</sub> <sub>28.052</sub>	1.09	1.33	1.210					416.1	127.0											
C <sub>2</sub> H <sub>4</sub> <sub>30.068</sub>	0.75	0.90	0.775	RECYCLE	79.31	8.508	20.756	0.9412	1.2241	16136	42.519									
C <sub>2</sub> H <sub>2</sub> <sub>26.042</sub>	0.79	1.00	0.895																	
C <sub>2</sub> H <sub>2</sub> <sub>42.074</sub>	0.05	0.20	0.125	BLEED	5.02	8.567	20.756	1.0000	1.2241	1093	2.880	WATER	7'14"	388.59	85	0.99674	387.32	10.4	8.305	3216.59
C <sub>2</sub> H <sub>2</sub> <sub>34.074</sub>	1.03	1.09	1.060					438.1	202.7	1446035										
C <sub>2</sub> H <sub>2</sub> <sub>50.120</sub>	0.56	0.44	0.500	NATURAL GAS	28.43	7.700	21.279	0.9858	1.2025	4962	13.075									
C <sub>2</sub> H <sub>2</sub> <sub>70.130</sub>	0.65	0.71	0.680					441.8	76.5											
C <sub>2</sub> H <sub>2</sub> <sub>72.146</sub>	0.24	0.20	0.220	OXYGEN	27.07	6.742	21.366	0.9845	--	3839	10.116									
C <sub>2</sub> H <sub>2</sub> <sub>84.156</sub>	0.26	0.35	0.306					27.1												
			M. W.	19.321451	215.7	6.125	0.2799			370#/hr										

THE TEXAS COMPANY — MONTEBELLO LABORATORY

RATE CALCULATIONS

RUN NO. 62-R  
HOURS 399-423

GAS ANALYSES				GENERATOR BALANCE										WEIGHT BALANCE						
HR	1400	0600	AVERAGE	M/HR	C	H	O	Mol %	M/HR	C	H	O	WET GAS	#/hr Measured	At Wt. Balance					
FRESH FEED								O <sub>2</sub> <sub>28.010</sub> 0.28	10.113 0.056				20.298	WET GAS	305.86	351.61				
CO <sub>28.010</sub>	37.94	35.57	36.755	15.059	15.059		15.059	CO <sub>44.010</sub> 1.93	0.249	0.249			0.498	OIL	61.05	61.05				
H <sub>2</sub> <sub>2.016</sub>	59.41	60.02	59.715	24.465		48.930		N <sub>2</sub> <sub>28.016</sub> 1.05	0.136					WATER	113.60	113.60				
CO <sub>44.010</sub>	1.90	3.30	2.600	1.065	1.065	2.130		CH <sub>4</sub> <sub>16.042</sub> 82.89	10.711	10.711	42.844		TOTAL	460.51	526.26					
N <sub>2</sub> <sub>28.016</sub>	0.26	0.62	0.440	0.180				C <sub>2</sub> H <sub>6</sub> <sub>30.068</sub> 7.39	0.955	1.910	5.730		FRESH FEED	526.26						
CH <sub>4</sub> <sub>16.042</sub>	0.49	0.49	0.490	0.201	0.201	0.804		C <sub>2</sub> H <sub>4</sub> <sub>28.056</sub> 4.16	0.538	1.614	4.304		WEIGHT BALANCE	91.31						
			M. W.	12.845066				C <sub>2</sub> H <sub>2</sub> <sub>26.042</sub> 1.61	0.208	0.832	2.080									
			H <sub>2</sub> O <sub>18.016</sub>					C <sub>2</sub> H <sub>2</sub> <sub>26.042</sub> 0.69	0.089	0.445	1.068		WET GAS FACTOR	1149578						
								MW	20.02025					INDICATED LOSS—S.C.F.H.	904					
					16.325	56.487	20.566	TOTAL												
			BALANCE		103.58	100.82	98.99					15.761	56.026	20.796	6951					
WET GAS				GAS FLOW RATES										LIQUID PRODUCT RATES						
CO <sub>28.010</sub>	15.10		15.10		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
H <sub>2</sub> <sub>2.016</sub>	49.15		49.15					415.8	77.0	2253783										
CO <sub>44.010</sub>	22.22		22.29	FRESH FEED	79.31	6.596	20.748	0.9840	1.5013	15548	40.970									
N <sub>2</sub> <sub>28.016</sub>	1.13		1.13					1.88	76.0	1508182										
CH <sub>4</sub> <sub>16.042</sub>	6.36		6.36	WET GAS	158.44	7.746	4.073	0.9850	1.2281	6047	15.934									
C <sub>2</sub> H <sub>6</sub> <sub>28.052</sub>	1.67		1.67					416.8	128.0											
C <sub>2</sub> H <sub>4</sub> <sub>30.068</sub>	0.74		0.74	RECYCLE	79.31	8.504	20.773	0.9404	1.2281	16181	42.638									
C <sub>2</sub> H <sub>2</sub> <sub>26.042</sub>	0.58		0.58																	
C <sub>2</sub> H <sub>2</sub> <sub>42.074</sub>	0.15		0.15	BLEED	5.02	8.217	20.773	1.0000	1.2281	1052	2.772	WATER	7'12-3/4"	383.14	87	0.99638	381.75	10.4	8.305	3170.43
C <sub>2</sub> H <sub>2</sub> <sub>34.074</sub>	1.10		1.10					438.1	205.8	1446035										
C <sub>2</sub> H <sub>2</sub> <sub>50.120</sub>	0.48		0.48	NATURAL GAS	28.43	7.629	21.279	0.9837	1.2025	4904	12.922									
C <sub>2</sub> H <sub>2</sub> <sub>70.130</sub>	0.70		0.70					442.1	80.4											
C <sub>2</sub> H <sub>2</sub> <sub>72.146</sub>	0.19		0.19	OXYGEN	27.07	6.763	21.373	0.9809	--	3838	10.113									
C <sub>2</sub> H <sub>2</sub> <sub>84.156</sub>	0.36		0.36					27.7												
			M. W.	19.195249	215.7	6.238	0.2824			380#/hr										

THE TEXAS COMPANY — MONTEBELLO LABORATORY

RUN NO. 62-S  
HOURS 423-447

RATE CALCULATIONS

HOUR	GAS ANALYSES				GENERATOR BALANCE										WEIGHT BALANCE		
	1400	2200	0600	AVERAGE	M/HR	C	H	O		Mol %	M/Hr	C	H	O	WET GAS	#hr Measured	At Wt. Balance
<b>FRESH FEED</b>																	
CO	37.69	37.65	37.47	37.804	15.435	16.455		15.435		0	10.050				20.100	512.24	555.92
H <sub>2</sub>	58.99	59.45	59.48	59.310	24.344			48.688		1.93	0.251	0.251			0.502	59.34	59.34
CO <sub>2</sub>	2.08	2.10	2.09	2.090	0.858	0.858		1.716		82.81	10.775	10.775	43.100			111.76	111.76
N <sub>2</sub>	0.16	0.24	0.33	0.243	0.100					7.19	0.936	1.972	5.616			483.54	526.92
CH <sub>4</sub>	1.08	0.56	0.83	0.753	0.309	0.309	1.236			4.27	0.556	1.668	4.448			526.92	91.73
				M. W.	12.8372					C <sub>2</sub> H <sub>6</sub>	1.70	0.221	0.884	2.210			
				H <sub>2</sub> O						C <sub>2</sub> H <sub>4</sub>	0.78	0.101	0.505	1.212			1139572
						16.602	56.706	20.542		MW	20.099066						820
																	5695
				BALANCE		104.06	100.21	99.71	TOTAL		15.955	56.886	20.602				5695

  

WET GAS				GAS FLOW RATES							LIQUID PRODUCT RATES														
CO	H <sub>2</sub>	CO <sub>2</sub>	N <sub>2</sub>	CH <sub>4</sub>	C <sub>2</sub> H <sub>6</sub>	C <sub>2</sub> H <sub>4</sub>	C <sub>2</sub> H <sub>2</sub>	H <sub>2</sub> O	STEAM	VR	PRESSURE	TEMP.	M. W.	S. C. F. H.	M/HR	HOUR	GAGE	GAL.	°F	FACTOR	GAL. AT 60°	API° #/GAL	#	# HR GAL HR	
14.06	48.36	23.04	1.09	7.41	1.33	0.74	1.31	0.21	1.14		416	81	2255155				7'3"	384.23	82	0.9891	580.04	48.9	2491.66		
15.08	43.53	26.96	1.63	6.50	1.79	0.36	1.14	0.09	1.14	FRESH FEED	416	81	2255155	15577	41046		7'3"	384.23	82	0.9891	580.04	48.9	2491.66		
13.38	48.99	24.27	1.24	6.457	1.33	0.74	1.27	0.193	1.157	79.31	6.428	20.753	0.9804	1.5017	15577		7'3"	384.23	82	0.9891	580.04	48.9	2491.66		
14.340	46.960	24.757	1.320	6.457	1.33	0.74	1.240	0.193	1.157	79.31	6.428	20.753	0.9804	1.5017	15577		7'3"	384.23	82	0.9891	580.04	48.9	2491.66		
										158.44	7.745	4.064	0.8831	1.1981	5875	15.451		3'3"	175.82	82	0.9990	175.64	48.9	1146.93	
										158.44	7.745	4.064	0.8831	1.1981	5875	15.451		3'3"	175.82	82	0.9990	175.64	48.9	1146.93	
										158.44	7.745	4.064	0.8831	1.1981	5875	15.451		3'3"	175.82	82	0.9990	175.64	48.9	1146.93	
										158.44	7.745	4.064	0.8831	1.1981	5875	15.451		3'3"	175.82	82	0.9990	175.64	48.9	1146.93	
										158.44	7.745	4.064	0.8831	1.1981	5875	15.451		3'3"	175.82	82	0.9990	175.64	48.9	1146.93	
										158.44	7.745	4.064	0.8831	1.1981	5875	15.451		3'3"	175.82	82	0.9990	175.64	48.9	1146.93	
										158.44	7.745	4.064	0.8831	1.1981	5875	15.451		3'3"	175.82	82	0.9990	175.64	48.9	1146.93	
										158.44	7.745	4.064	0.8831	1.1981	5875	15.451		3'3"	175.82	82	0.9990	175.64	48.9	1146.93	
										158.44	7.745	4.064	0.8831	1.1981	5875	15.451		3'3"	175.82	82	0.9990	175.64	48.9	1146.93	
										158.44	7.745	4.064	0.8831	1.1981	5875	15.451		3'3"	175.82	82	0.9990	175.64	48.9	1146.93	
										158.44	7.745	4.064	0.8831	1.1981	5875	15.451		3'3"	175.82	82	0.9990	175.64	48.9	1146.93	
										158.44	7.745	4.064	0.8831	1.1981	5875	15.451		3'3"	175.82	82	0.9990	175.64	48.9	1146.93	

THE TEXAS COMPANY — MONTEBELLO LABORATORY

RUN NO. 62-T  
HOURS 447-471

RATE CALCULATIONS

HOUR	GAS ANALYSES				GENERATOR BALANCE										WEIGHT BALANCE		
	2200	0600		AVERAGE	M/HR	C	H	O		Mol %	M/Hr	C	H	O	WET GAS	#hr Measured	At Wt. Balance
<b>FRESH FEED</b>																	
CO	36.90	36.87		36.885	15.147	15.147		15.147		0.27	10.092				20.254	510.48	558.53
H <sub>2</sub>	60.00	60.05		60.025	24.649			49.298		2.12	0.275	0.275			0.550	57.43	57.43
CO <sub>2</sub>	2.43	2.41		2.420	0.994	0.994		1.988		82.55	10.722	10.722	42.888			107.96	107.96
N <sub>2</sub>	0.43	0.31		0.370	0.152					7.16	0.930	1.860	5.580			475.87	523.92
CH <sub>4</sub>	0.24	0.36		0.300	0.123	0.123	0.492			4.20	0.545	1.635	4.360			523.92	90.83
				M. W.	12.7584					C <sub>2</sub> H <sub>6</sub>	1.76	0.229	0.916	2.290			
				H <sub>2</sub> O						C <sub>2</sub> H <sub>4</sub>	0.86	0.112	0.560	1.344			1154760
						16.264	56.795	20.638		MW	20.21284						978
																	7300
				BALANCE		101.85	100.59	99.20	TOTAL		15.968	56.462	20.804				7300

  

WET GAS 1400				GAS FLOW RATES							LIQUID PRODUCT RATES														
CO	H <sub>2</sub>	CO <sub>2</sub>	N <sub>2</sub>	CH <sub>4</sub>	C <sub>2</sub> H <sub>6</sub>	C <sub>2</sub> H <sub>4</sub>	C <sub>2</sub> H <sub>2</sub>	H <sub>2</sub> O	STEAM	VR	PRESSURE	TEMP.	M. W.	S. C. F. H.	M/HR	HOUR	GAGE	GAL.	°F	FACTOR	GAL. AT 60°	API° #/GAL	#	# HR GAL HR	
14.67	49.51	22.35	1.70	6.27	1.26	0.69	1.04	0.10	1.09		415	80	2289089				7'3"	385.32	84	.9986	383.97	48.6	4249.72		
14.90	53.04	17.90	1.23	6.03	1.41	0.80	1.04	0.24	1.35	FRESH FEED	415	80	2289089	15584	41.065		7'3"	385.32	84	.9986	383.97	48.6	4249.72		
14.38	49.57	24.09	1.21	5.72	1.287	0.91	1.03	0.130	1.35	79.31	6.413	20.729	0.9813	15063	15584		7'3"	385.32	84	.9986	383.97	48.6	4249.72		
14.650	50.706	21.446	1.380	6.007	1.287	0.91	1.160	0.130	1.35	79.31	6.413	20.729	0.9813	15063	15584		7'3"	385.32	84	.9986	383.97	48.6	4249.72		
										158.44	7.996	4.080	0.9813	1.2463	6322	16.659		3'3"	175.82	82	0.9990	175.64	48.9	-1146.93	
										158.44	7.996	4.080	0.9813	1.2463	6322	16.659		3'3"	175.82	82	0.9990	175.64	48.9	-1146.93	
										158.44	7.996	4.080	0.9813	1.2463	6322	16.659		3'3"	175.82	82	0.9990	175.64	48.9	-1146.93	
										158.44	7.996	4.080	0.9813	1.2463	6322	16.659		3'3"	175.82	82	0.9990	175.64	48.9	-1146.93	
										158.44	7.996	4.080	0.9813	1.2463	6322	16.659		3'3"	175.82	82	0.9990	175.64	48.9	-1146.93	
										158.44	7.996	4.080	0.9813	1.2463	6322	16.659		3'3"	175.82	82	0.9990	175.64	48.9	-1146.93	
										158.44	7.996	4.080	0.9813	1.2463	6322	16.659		3'3"	175.82	82	0.9990	175.64	48.9	-1146.93	
										158.44	7.996	4.080	0.9813	1.2463	6322	16.659		3'3"	175.82	82	0.9990	175.64	48.9	-1146.93	
										158.44	7.996	4.080	0.9813	1.2463	6322	16.659		3'3"	175.82	82	0.9990	175.64	48.9	-1146.93	
										158.44	7.996	4.080	0.9813	1.2463	6322	16.659		3'3"	175.82	82	0.9990	175.64	48.9	-1146.93	
										158.44	7.996	4.080	0.9813	1.2463	6322	16.659		3'3"	175.82	82	0.9990	175.64	48.9	-1146.93	
										158.44	7.996	4.080	0.9813	1.2463	6322	16.659		3'3"	175.82	82	0.9990	175.64	48.9	-1146.93	
										158.44	7.996	4.080	0.9813	1.2463	6322	16.659		3'3"	175.82	82	0.9990	175.64	48.9	-1146.93	

THE TEXAS COMPANY — MONTEBELLO LABORATORY  
RATE CALCULATIONS

RUN NO. 62-U  
HOURS 471-495

Table with columns: GAS ANALYSES, GENERATOR BALANCE, WEIGHT BALANCE. Includes rows for FRESH FEED, CO, H2, CO2, N2, CH4, M.W., H2O, BALANCE, WET GAS, GAS FLOW RATES, LIQUID PRODUCT RATES.

THE TEXAS COMPANY — MONTEBELLO LABORATORY  
RATE CALCULATIONS

RUN NO. 62-V  
HOURS 495-519

Table with columns: GAS ANALYSES, GENERATOR BALANCE, WEIGHT BALANCE. Includes rows for FRESH FEED, CO, H2, CO2, N2, CH4, M.W., H2O, BALANCE, WET GAS, GAS FLOW RATES, LIQUID PRODUCT RATES.

