U.S. PETROLEUM REFINING

MEETING REQUIREMENTS FOR CLEANER FUELS AND REFINERIES

VOLUME IV, PART 1–SUPPLY, DEMAND AND LOGISTICS APPENDIX

NATIONAL PETROLEUM COUNCIL
AUGUST 1993

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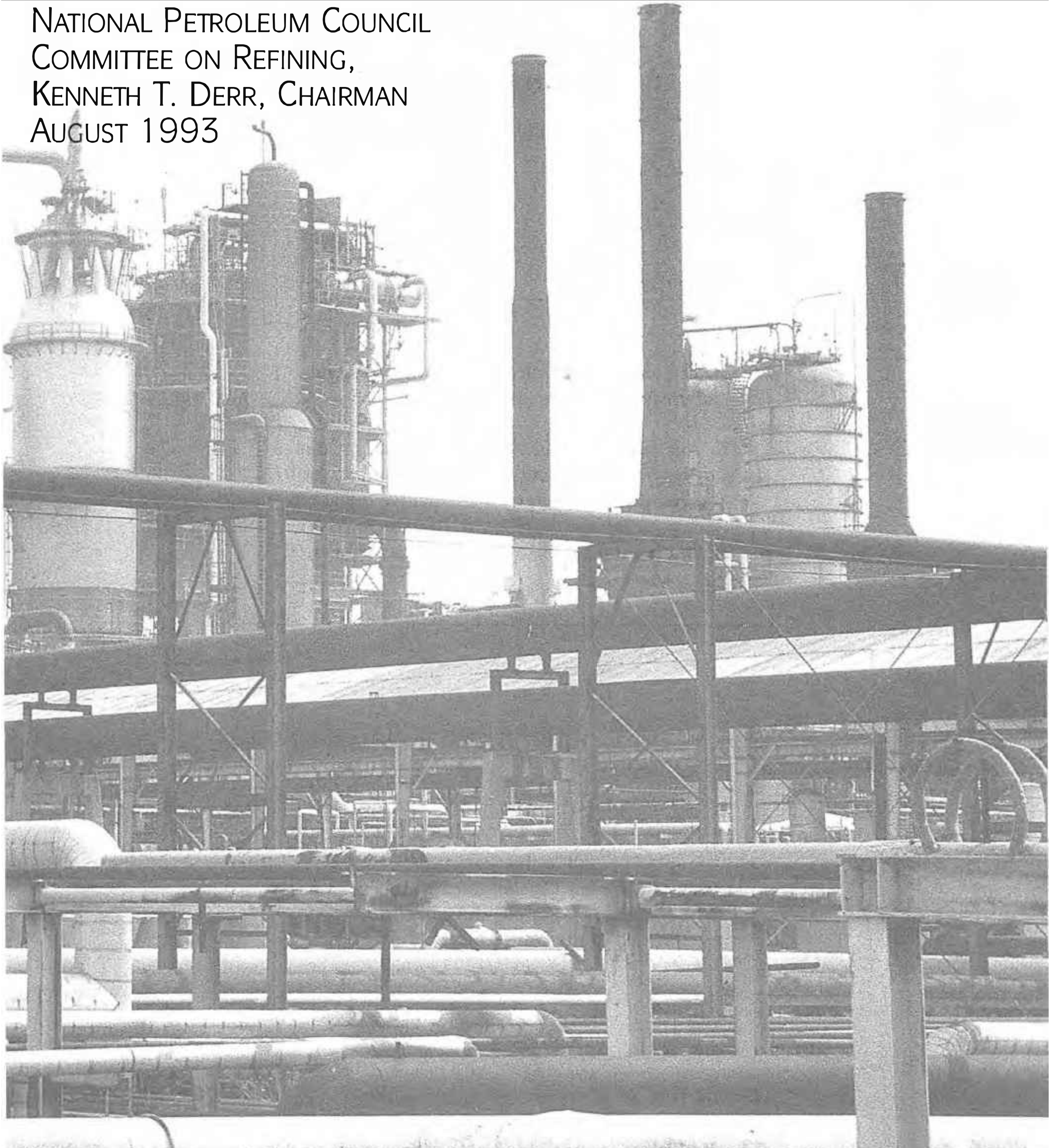
NATIONAL PETROLEUM COUNCIL
COMMITTEE ON REFINING,
KENNETH T. DERR, CHAIRMAN
AUGUST 1993



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APPENDIX L

SUPPLY, DEMAND, AND LOGISTICS

THIS APPENDIX CONTAINS SUPPORTING DATA FOR CHAPTER THREE, PRESENTED IN SECTIONS THAT CORRESPOND TO SECTION TITLES IN THE CHAPTER. THERE IS NO APPENDIX MATERIAL FOR SECTION II (GENERAL APPROACH) OF CHAPTER THREE.

NPC REFINING STUDY
WORLD OIL DEMANDS – REGIONS/COUNTRIES
(Thousands of Barrels per Day)

	1989	1995 Foundation Case			2000 Foundation Case			2010 Foundation Case		
		I	II	III	I	II	III	I	II	III
U.S.	17.3	17.3	17.1	17.0	18.5	17.1	16.1	20.2	17.1	14.7
Canada	1.7	1.8	1.8	1.8	1.9	1.8	1.7	1.9	1.8	1.6
Japan	5.0	5.9	5.3	5.3	6.3	5.4	5.3	6.3	5.7	5.4
Europe	12.8	13.7	13.0	13.0	13.8	13.1	12.9	14.0	13.3	12.9
Other OECD	0.9	1.1	1.0	1.0	1.2	1.1	1.0	1.3	1.2	1.0
Total OECD	**37.7**	**39.8**	**38.2**	**38.1**	**41.7**	**38.5**	**37.0**	**43.8**	**39.1**	**35.6**
OPEC	4.1	4.9	4.6	4.6	5.5	5.0	4.9	7.0	5.7	5.3
Other Developing Countries	11.3	13.5	12.7	12.7	15.3	13.2	12.8	18.4	14.0	13.1
CPE/Former CPE										
China	2.3	2.7	2.7	2.7	3.1	3.1	3.1	3.7	3.7	3.7
USSR (former)	8.7	6.5	6.5	6.5	7.5	7.5	7.5	8.9	8.9	8.9
Other CPE	1.5	1.7	1.7	1.7	2.0	2.0	2.0	2.7	2.7	2.7
World	**65.7**	**69.1**	**66.4**	**66.3**	**75.1**	**69.2**	**67.3**	**84.4**	**74.1**	**69.3**
Memo:										
World ex. U.S.	48.4	51.8	49.3	49.3	56.6	52.1	51.2	64.2	57.0	54.6
Non OECD	28.1	29.3	28.2	28.2	33.4	30.7	30.3	40.6	35.0	33.7

NOTE: Totals may not add due to rounding.

Appendix L, Section III-1

Foundation Case Regional & State Demands

EXXON COMPANY, U.S.A.
POST OFFICE BOX 2180 • HOUSTON, TEXAS 77252-2180

DOWNSTREAM PLANNING AND ANALYSIS

November 10, 1992

Members of the NPC Refining Study Supply/Demand/Logistics (SD&L) Task Group:

Attached are the regional volume demands for 1995, 2000, and 2010 for the three Foundation Cases under study--Increasing Demand (I), No Demand Increase (II), and Decreasing Demand (III). For completeness, the historic 1987 and 1989 demands, which you have seen earlier, are attached. The underlying state details for all the regional balances are also attached.

The bases for the demand volumetrics have been reviewed earlier. Our early January review of the Foundation Case demands for the total U.S. was followed by agreement from the Coordinating Subcommittee on January 29. A January 31 letter documented the numerics for the total U.S. We had agreed that the historic 1989 state shares would be maintained for the future. The gasoline grade splits (regular, mid-grade, and premium) by state were documented on February 25. Finally, a September 25 letter documents the bases for the gasoline types--CO non-attainment, reformulated (ozone non-attainment), CO-reformulated, gasohol, and conventional.

I do not plan to further review the attached regional demands. However, if you have questions, please bring this package to our Orlando Task Group meeting. I will review the resultant oxygenate demands for these balances at that meeting. See you there.

Respectfully,

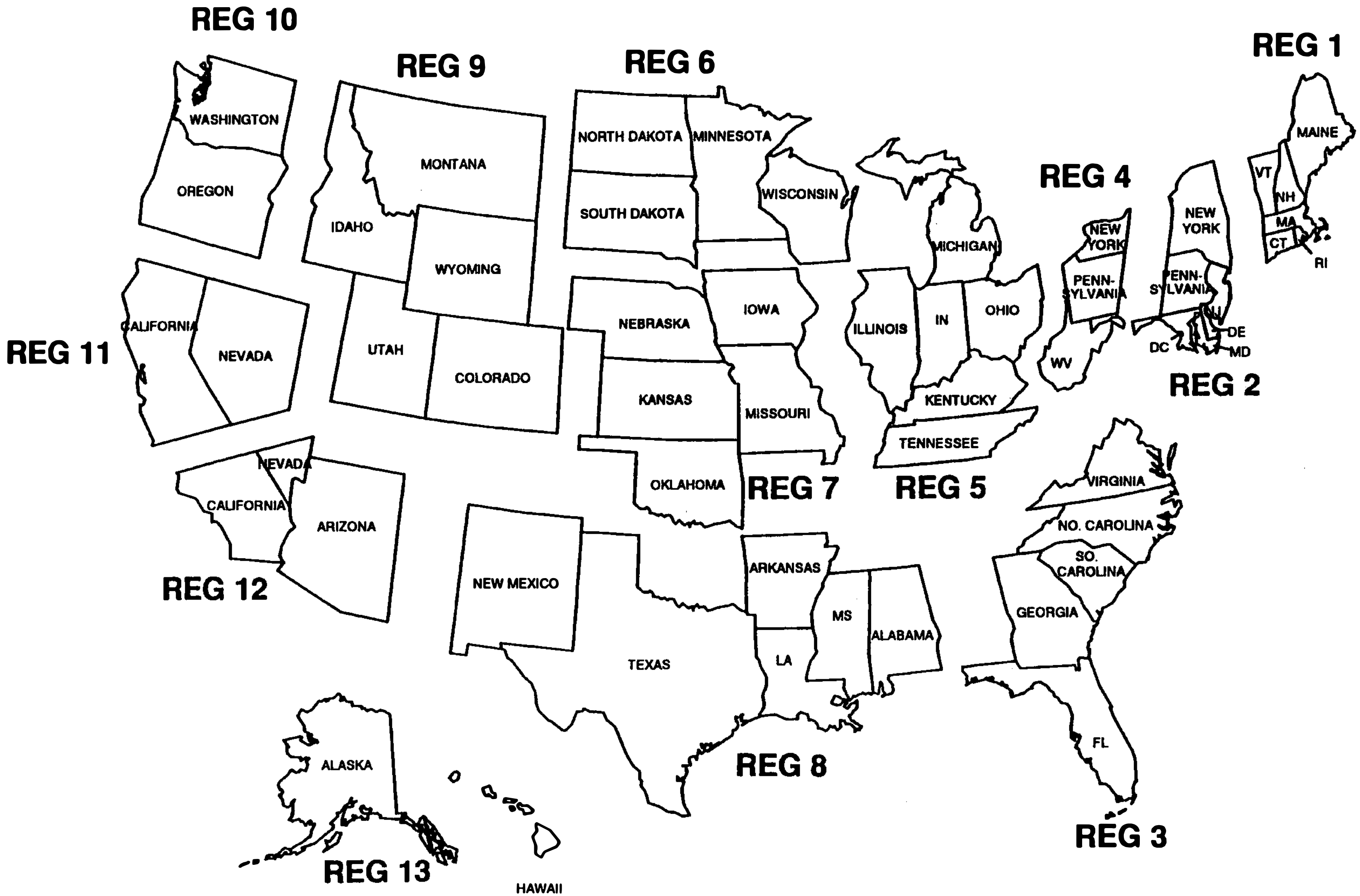
Graham

Graham K. Barnes

GKB:gps
Attachments

c - w/attachments:
R. B. Bruce – Conoco Inc.
J. H. Guy, IV – National Petroleum Council
P. W. Lashbrooke – Conoco Inc.
T. S. McGowin – Texaco Refining & Marketing, Inc.
R. B. Warden – Chevron Research & Technology Co.

U.S. REGIONS
NATIONAL PETROLEUM COUNCIL REFINING STUDY



APP L.III.1-2

APP L.III.1-3

1987 U.S. REGIONAL OIL DEMANDS -- THOUSAND BARRELS PER DAY

	U.S. REGIONS													
	1	2	3	4	5	6	7	8	9	10	11	12	13	TOTAL
* LEADED REGULAR	52	125	243	45	305	87	164	266	90	88	75	155	7	1702
* CONVENTIONAL	192	479	558	120	829	190	291	592	118	105	177	342	22	4015
* OZONE NON-ATTAINMENT	-	-	-	-	-	-	-	-	-	-	-	-	-	-
* CO NON-ATTAINMENT	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL UNLEADED REGULAR	192	479	558	120	829	190	291	592	118	105	177	342	22	4015
* CONVENTIONAL	-	-	-	-	-	-	-	-	-	-	-	-	-	-
* OZONE NON-ATTAINMENT	-	-	-	-	-	-	-	-	-	-	-	-	-	-
* CO NON-ATTAINMENT	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL UNLEADED MID-GRADE	-	-	-	-	-	-	-	-	-	-	-	-	-	-
* CONVENTIONAL	116	289	302	64	220	30	40	178	16	31	70	125	8	1489
* OZONE NON-ATTAINMENT	-	-	-	-	-	-	-	-	-	-	-	-	-	-
* CO NON-ATTAINMENT	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL UNLEADED PREMIUM	116	289	302	64	220	30	40	178	16	31	70	125	8	1489
TOTAL ALL GASOLINE GRADES	360	893	1103	229	1354	307	495	1036	224	224	322	622	37	7206
* NAPHTHA JET FUEL	5	14	14	4	14	3	5	77	7	11	17	31	2	204
* KEROSENE JET FUEL	29	143	155	10	127	19	47	293	37	52	75	133	61	1181
* KEROSENE / DISTILLATE 1	6	16	15	4	18	7	3	43	3	3	1	1	6	126
* LIGHT DIESEL - ON HIGHWAY	52	126	186	37	237	57	115	211	48	39	40	82	8	1238
* LIGHT DIESEL - OFF HIGHWAY	12	35	52	13	87	33	54	144	32	23	25	47	6	563
* DISTILLATE 2	160	244	70	56	70	38	14	55	6	16	4	7	11	751
HEAVY DIESEL	6	22	42	7	59	8	29	97	16	21	14	26	8	355
TOTAL DISTILLATE/KERO	236	443	365	117	471	143	215	550	105	102	84	163	39	3033
DISTILLATE 4	9	19	1	4	-	-	-	1	-	1	1	2	-	38
HFO <0.31 % SULFUR	-	69	-	12	-	-	-	-	-	-	5	7	-	93
HFO 0.31-1.0 % SULFUR	108	72	83	18	19	-	-	60	-	-	1	1	30	392
HFO >1.0 % SULFUR	94	133	67	25	29	8	6	205	10	43	58	94	8	780
TOTAL HEAVY FUEL OIL	211	293	151	59	48	8	6	266	10	44	65	104	38	1303
LIQUIFIED PETROLEUM GAS	23	52	84	13	237	41	93	888	21	11	21	38	1	1523
AVIATION GASOLINE	1	1	3	-	4	1	2	6	1	1	1	3	1	25
CHEM FEED NAPHTHA	-	8	1	2	29	4	9	121	-	1	2	4	1	182
CHEM FEED GASOIL	-	11	1	3	42	6	14	173	-	2	3	5	1	261
SPECIAL NAPHTHA	-	9	1	2	14	2	5	39	-	1	1	2	-	76
LUBRICANTS	6	15	20	4	20	5	8	64	1	3	5	10	-	161
WAX	-	2	-	1	1	-	1	8	1	-	1	1	-	16
ASPHALT & ROAD OIL	7	16	20	4	60	13	23	215	13	18	26	49	3	467
MISCELLANEOUS OIL	-	10	1	2	7	1	2	35	2	1	1	2	1	65
CRUDE OIL	-	-	-	-	-	-	-	-	-	-	13	21	-	34
STILL GAS	-	52	3	9	92	12	28	297	18	18	42	68	4	643
CATALYTIC COKE	-	24	1	4	31	4	10	93	6	5	11	17	1	207
MARKETABLE COKE	-	4	1	-	37	11	13	15	4	1	2	4	-	92
TOTAL OTHER PETROLEUM	37	204	136	44	574	100	208	1954	67	62	129	224	13	3752
TOTAL - ALL OIL	878	1990	1924	463	2588	580	976	4176	450	495	692	1277	190	16679

* = LOGISTICS FLOW MODELED IN NPC SUPPLY/DEMAND/LOGISTICS MODEL   NATIONAL PETROLEUM COUNCIL   MAY 1, 1992   TIME 16:54

1989 U.S. REGIONAL OIL DEMANDS -- THOUSAND BARRELS PER DAY

	U.S. REGIONS													
	1	2	3	4	5	6	7	8	9	10	11	12	13	TOTAL
* LEADED REGULAR	5	20	92	7	72	43	86	104	66	70	55	115	5	740
* CONVENTIONAL	197	463	595	125	899	227	347	659	129	126	197	380	23	4367
* OZONE NON-ATTAINMENT	-	-	-	-	-	-	-	-	-	-	-	-	-	-
* CO NON-ATTAINMENT	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL UNLEADED REGULAR	197	463	595	125	899	227	347	659	129	126	197	380	23	4367
* CONVENTIONAL	41	96	117	26	127	9	11	59	-	-	4	7	-	497
* OZONE NON-ATTAINMENT	-	-	-	-	-	-	-	-	-	-	-	-	-	-
* CO NON-ATTAINMENT	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL UNLEADED MID-GRADE	41	96	117	26	127	9	11	59	-	-	4	7	-	497
* CONVENTIONAL	120	303	338	69	266	37	58	211	29	39	87	157	10	1724
* OZONE NON-ATTAINMENT	-	-	-	-	-	-	-	-	-	-	-	-	-	-
* CO NON-ATTAINMENT	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL UNLEADED PREMIUM	120	303	338	69	266	37	58	211	29	39	87	157	10	1724
TOTAL ALL GASOLINE GRADES	363	882	1142	227	1364	316	502	1033	224	235	343	659	38	7328
* NAPHTHA JET FUEL	1	31	1	3	6	4	16	70	8	8	18	34	5	205
* KEROSENE JET FUEL	48	191	211	15	173	22	67	166	43	55	80	142	71	1284
* KEROSENE / DISTILLATE 1	5	14	13	4	22	8	3	33	3	4	1	2	2	114
* LIGHT DIESEL - ON HIGHWAY	55	140	211	41	288	63	124	239	49	45	57	111	12	1435
* LIGHT DIESEL - OFF HIGHWAY	12	36	49	14	74	34	48	114	32	20	23	46	6	508
* DISTILLATE 2	178	257	65	58	62	37	13	60	7	18	2	4	13	774
HEAVY DIESEL	6	22	33	8	68	13	32	107	21	18	11	18	14	371
TOTAL DISTILLATE/KERO	256	469	371	125	514	155	220	553	112	105	94	181	47	3202
DISTILLATE 4	9	20	1	4	1	-	-	-	-	1	1	1	1	39
HFO <0.31 % SULFUR	-	87	-	14	-	-	-	4	-	4	9	15	-	133
HFO 0.31-1.0 % SULFUR	97	122	95	27	19	-	-	33	-	-	1	2	42	438
HFO >1.0 % SULFUR	82	98	82	17	31	9	7	273	11	49	49	78	13	799
TOTAL HEAVY FUEL OIL	188	327	178	62	51	9	7	310	11	54	60	96	56	1409
LIQUIFIED PETROLEUM GAS	27	49	88	13	159	50	110	1014	24	13	26	46	1	1620
AVIATION GASOLINE	1	1	3	-	3	1	2	7	1	1	1	3	2	26
CHEM FEED NAPHTHA	-	11	1	3	18	3	6	152	-	1	3	4	1	203
CHEM FEED GASOIL	-	14	1	4	22	4	7	193	-	2	3	5	2	257
SPECIAL NAPHTHA	-	6	-	2	13	2	4	28	-	-	-	1	-	56
LUBRICANTS	8	20	26	5	20	4	8	52	1	3	4	8	-	159
WAX	-	3	-	1	1	-	1	8	1	-	1	1	-	17
ASPHALT & ROAD OIL	17	43	56	11	91	21	34	85	31	12	17	33	2	453
MISCELLANEOUS OIL	-	12	1	3	8	1	3	38	2	1	1	2	-	72
CRUDE OIL	-	-	-	-	-	-	-	-	-	-	11	17	-	28
STILL GAS	-	53	3	9	98	13	30	316	20	19	45	71	4	681
CATALYTIC COKE	-	25	1	4	32	4	10	96	6	5	11	17	1	212
MARKETABLE COKE	-	6	1	-	33	10	12	24	4	1	2	3	-	96
TOTAL OTHER PETROLEUM	53	243	181	55	498	113	227	2013	90	58	125	211	13	3880
TOTAL - ALL OIL	909	2143	2084	487	2606	619	1039	4145	488	515	720	1323	230	17308

* = LOGISTICS FLOW MODELED IN NPC SUPPLY/DEMAND/LOGISTICS MODEL   NATIONAL PETROLEUM COUNCIL   MAY 1, 1992   TIME 16:54

1995 U.S. REGIONAL OIL DEMANDS -- THOUSAND BARRELS PER DAY -- NPC FOUNDATION CASE I

	U.S. REGIONS 1	2	3	4	5	6	7	8	9	10	11	12	13	TOTAL
* CO NON-ATTAINMENT	40	13	26	2	33	29	-	12	35	51	99	62	3	405
* REFORMULATED	23	144	-	-	160	40	-	90	-	-	-	150	-	607
* CO-REFORMULATED	24	204	-	-	-	-	-	-	-	-	-	188	-	416
* GASOHOL	-	-	16	-	133	14	51	25	5	2	5	1	-	252
* CONVENTIONAL	127	124	623	132	637	178	363	609	125	136	134	68	21	3277
TOTAL UNLEADED REGULAR	214	485	665	134	963	261	414	736	165	189	238	469	24	4957
* CO NON-ATTAINMENT	8	6	7	1	7	2	-	1	7	2	9	4	-	54
* REFORMULATED	7	35	-	-	22	2	-	13	-	-	-	13	-	92
* CO-REFORMULATED	7	43	-	-	-	-	-	-	-	-	-	17	-	67
* GASOHOL	-	-	4	-	25	1	2	4	1	-	-	-	-	37
* CONVENTIONAL	26	33	173	30	112	11	26	95	19	7	12	4	3	551
TOTAL UNLEADED MID-GRADE	48	117	184	31	166	16	28	113	27	9	21	38	3	801
* CO NON-ATTAINMENT	18	9	10	2	7	4	-	2	7	9	33	13	-	114
* REFORMULATED	13	79	-	-	38	6	-	19	-	-	-	50	-	205
* CO-REFORMULATED	13	116	-	-	-	-	-	-	-	-	-	64	-	193
* GASOHOL	-	-	6	-	30	1	5	6	1	1	1	-	-	51
* CONVENTIONAL	51	62	260	56	140	23	49	142	21	23	45	15	10	897
TOTAL UNLEADED PREMIUM	95	266	276	58	215	34	54	169	29	33	79	142	10	1460
TOTAL ALL GASOLINE GRADES	357	868	1125	223	1344	311	496	1018	221	231	338	649	37	7218
* KEROSENE JET FUEL	52	240	229	19	193	28	91	256	55	68	106	190	82	1609
* KEROSENE / DISTILLATE 1	4	12	11	4	19	7	3	30	3	4	1	1	2	101
* LIGHT DIESEL - ON HIGHWAY	60	152	228	43	312	69	134	259	53	48	61	120	14	1553
* LIGHT DIESEL - OFF HIGHWAY	12	38	53	15	80	37	53	123	35	22	25	50	6	549
* DISTILLATE 2	157	226	59	52	56	34	13	63	7	15	2	4	11	699
* HEAVY DIESEL	7	24	35	9	74	13	34	116	22	20	12	20	15	401
TOTAL DISTILLATE/KERO	240	452	386	123	541	160	237	591	120	109	101	195	48	3303
DISTILLATE 4	8	17	1	3	1	-	-	-	-	1	1	1	1	34
HFO <0.31 % SULFUR	-	77	-	13	-	-	-	4	-	4	8	13	-	119
HFO 0.31-1.0 % SULFUR	86	107	83	24	18	-	-	33	-	-	1	2	37	391
HFO >1.0 % SULFUR	73	88	76	15	31	9	7	260	11	45	46	73	11	745
TOTAL HEAVY FUEL OIL	167	289	160	55	50	9	7	297	11	50	56	89	49	1289
LIQUIFIED PETROLEUM GAS	24	47	79	13	150	45	105	1058	23	12	25	45	1	1627
AVIATION GASOLINE	1	1	3	-	3	1	2	7	1	1	1	2	2	25
CHEM FEED NAPHTHA	-	13	1	3	20	3	7	174	-	2	3	5	1	232
CHEM FEED GASOIL	-	16	1	4	26	4	8	220	-	2	4	6	2	293
SPECIAL NAPHTHA	-	6	-	2	12	2	4	27	-	-	-	1	-	54
LUBRICANTS	8	19	26	5	19	4	7	51	1	3	4	7	-	154
WAX	-	2	-	1	1	-	1	8	1	-	1	1	-	16
ASPHALT & ROAD OIL	17	41	54	11	89	20	33	83	30	11	16	32	2	439
MISCELLANEOUS OIL	-	12	1	3	8	1	2	37	2	1	1	2	-	70
CRUDE OIL	-	-	-	-	-	-	-	-	-	-	10	17	-	27
STILL GAS	-	52	3	9	95	13	29	306	19	19	43	69	4	661
CATALYTIC COKE	-	24	1	4	31	4	10	93	6	5	10	16	1	205
MARKETABLE COKE	-	6	1	-	32	10	11	23	4	1	2	3	-	93
TOTAL OTHER PETROLEUM	50	239	170	55	486	107	219	2087	87	57	120	206	13	3896
TOTAL - ALL OIL	866	2088	2070	475	2614	615	1050	4249	494	515	721	1329	229	17315

* = LOGISTICS FLOW MODELED IN NPC SUPPLY/DEMAND/LOGISTICS MODEL   NATIONAL PETROLEUM COUNCIL   NOVEMBER 9, 1992   TIME 14:56

2000 U.S. REGIONAL OIL DEMANOS -- THOUSAND BARRELS PER OAY -- NPC FOUNDATION CASE I

	U.S. REGIONS													
	1	2	3	4	5	6	7	8	9	10	11	12	13	TOTAL
* CO NON-ATTAINMENT	-	-	-	-	-	31	-	5	27	8	-	23	3	97
* REFORMULATED	157	280	314	111	595	48	92	247	13	59	139	190	-	2245
* CO-REFORMULATED	65	224	26	3	34	-	-	7	9	44	103	239	-	754
* GASOHOL	-	-	6	-	68	14	47	21	6	2	-	1	-	165
* CONVENTIONAL	-	-	344	26	302	180	290	484	118	82	6	34	23	1889
TOTAL UNLEADED REGULAR	222	504	690	140	999	273	429	764	173	195	248	487	26	5150
* CO NON-ATTAINMENT	-	-	-	-	-	2	-	1	5	1	-	1	-	10
* REFORMULATED	34	71	92	26	99	3	11	37	2	3	13	16	-	407
* CO-REFORMULATED	16	50	8	-	7	-	-	1	2	2	9	20	-	115
* GASOHOL	-	-	1	-	12	1	2	3	1	-	-	-	-	20
* CONVENTIONAL	-	-	90	6	55	10	16	76	17	4	-	3	3	280
TOTAL UNLEADED MID-GRADE	50	121	191	32	173	16	29	118	27	10	22	40	3	832
* CO NON-ATTAINMENT	-	-	-	-	-	4	-	1	6	1	-	4	-	16
* REFORMULATED	67	147	139	50	131	7	17	54	3	11	46	61	-	733
* CO-REFORMULATED	32	129	10	2	7	-	-	1	2	8	34	75	-	300
* GASOHOL	-	-	2	-	16	1	4	5	1	-	-	-	-	29
* CONVENTIONAL	-	-	136	8	69	23	36	115	18	15	1	7	10	438
TOTAL UNLEADED PREMIUM	99	276	287	60	223	35	57	176	30	35	81	147	10	1516
TOTAL ALL GASOLINE GRADES	371	901	1168	232	1395	324	515	1058	230	240	351	674	39	7498
* KEROSENE JET FUEL	59	271	258	22	219	32	102	289	63	76	120	215	93	1819
* KEROSENE / DISTILLATE 1	4	10	9	3	16	6	3	28	3	3	1	1	1	88
* LIGHT DIESEL - ON HIGHWAY	63	165	250	49	340	75	146	282	58	54	66	132	14	1694
* LIGHT DIESEL - OFF HIGHWAY	14	42	59	17	92	42	60	141	40	25	28	56	7	623
* DISTILLATE 2	138	215	61	49	59	32	14	77	8	13	3	5	16	690
* HEAVY DIESEL	8	26	39	9	80	15	38	126	24	21	13	22	17	438
TOTAL DISTILLATE/KERO	227	458	418	127	587	170	261	654	133	116	111	216	55	3533
DISTILLATE 4	7	15	1	3	1	-	-	-	-	1	1	1	1	31
HFO <0.31 % SULFUR	-	102	-	17	-	-	-	4	-	4	11	17	-	155
HFO 0.31-1.0 % SULFUR	114	143	112	32	21	-	-	35	-	-	1	3	47	508
HFO >1.0 % SULFUR	93	104	90	17	34	9	8	278	12	49	50	79	12	835
TOTAL HEAVY FUEL OIL	214	364	203	69	56	9	8	317	12	54	63	100	60	1529
LIQUIFIED PETROLEUM GAS	23	47	75	13	150	42	107	1182	23	13	26	46	1	1748
AVIATION GASOLINE	1	1	3	-	3	1	2	7	1	1	1	3	2	26
CHEM FEED NAPHTHA	-	14	1	4	23	4	8	201	-	2	3	6	1	267
CHEM FEED GASOIL	-	18	1	5	29	5	10	254	-	3	4	7	2	338
SPECIAL NAPHTHA	-	6	-	2	13	2	4	28	-	-	-	1	-	56
LUBRICANTS	8	20	26	5	20	4	7	52	1	3	4	8	-	158
WAX	-	2	-	1	1	-	1	8	1	-	1	1	-	16
ASPHALT & ROAD OIL	17	42	56	11	91	20	34	85	30	12	17	32	2	449
MISCELLANEOUS OIL	-	12	1	3	8	1	3	38	2	1	1	2	-	72
CRUDE OIL	-	-	-	-	-	-	-	-	-	-	11	17	-	28
STILL GAS	-	53	3	9	97	13	30	313	20	19	44	71	4	676
CATALYTIC COKE	-	25	1	4	32	4	10	95	6	5	10	17	1	210
MARKETABLE COKE	-	6	1	-	33	10	11	24	4	1	2	3	-	95
TOTAL OTHER PETROLEUM	49	246	168	57	500	106	227	2287	88	60	124	214	13	4139
TOTAL - ALL OIL	920	2240	2215	507	2757	641	1113	4605	526	546	769	1419	260	18518

* = LOGISTICS FLOW MODELED IN NPC SUPPLY/DEMAND/LOGISTICS MODEL NATIONAL PETROLEUM COUNCIL NOVEMBER 9, 1992 TIME 14:56

2010 U.S. REGIONAL OIL DEMANDS -- THOUSAND BARRELS PER DAY -- NPC FOUNDATION CASE I

	U.S. REGIONS 1	2	3	4	5	6	7	8	9	10	11	12	13	TOTAL
* CO NON-ATTAINMENT	-	-	-	-	-	33	-	6	28	9	-	24	4	104
* REFORMULATED	170	301	338	120	641	51	99	266	14	64	150	205	-	2419
* CO-REFORMULATED	70	241	29	3	37	-	-	7	10	47	111	257	-	812
* GASOHOL	-	-	5	-	74	15	51	24	6	2	-	1	-	178
* CONVENTIONAL	-	-	371	27	325	195	312	520	127	90	5	38	24	2034
TOTAL UNLEADED REGULAR	240	542	743	150	1077	294	462	823	185	212	266	525	28	5547
* CO NON-ATTAINMENT	-	-	-	-	-	2	-	1	6	-	-	1	-	10
* REFORMULATED	36	77	99	28	107	3	12	40	2	3	14	17	-	438
* CO-REFORMULATED	17	54	8	1	7	-	-	1	2	2	10	22	-	124
* GASOHOL	-	-	2	-	13	1	2	3	1	-	-	-	-	22
* CONVENTIONAL	-	-	97	6	59	11	18	82	19	5	-	3	3	303
TOTAL UNLEADED MID-GRADE	53	131	206	35	186	17	32	127	30	10	24	43	3	897
* CO NON-ATTAINMENT	-	-	-	-	-	4	-	1	6	2	-	5	-	18
* REFORMULATED	72	159	150	54	141	8	18	58	3	12	50	65	-	790
* CO-REFORMULATED	34	139	11	2	8	-	-	1	2	9	37	81	-	324
* GASOHOL	-	-	2	-	17	2	4	5	1	-	-	-	-	31
* CONVENTIONAL	-	-	146	9	74	24	39	125	21	14	1	7	11	471
TOTAL UNLEADED PREMIUM	106	298	309	65	240	38	61	190	33	37	88	158	11	1634
TOTAL ALL GASOLINE GRADES	399	971	1258	250	1503	349	555	1140	248	259	378	726	42	8078
* KEROSENE JET FUEL	72	331	315	27	267	39	125	353	76	93	146	262	113	2219
* KEROSENE / DISTILLATE 1	3	8	6	2	12	5	2	23	2	3	-	1	1	68
* LIGHT DIESEL - ON HIGHWAY	76	195	296	57	403	89	174	335	68	63	81	154	16	2007
* LIGHT DIESEL - OFF HIGHWAY	15	47	68	20	107	49	71	164	47	29	32	66	8	723
* DISTILLATE 2	107	168	51	39	51	27	13	85	8	11	2	5	14	581
* HEAVY DIESEL	9	31	46	11	95	17	45	150	29	25	15	26	20	519
TOTAL DISTILLATE/KERO	210	449	467	129	668	187	305	757	154	131	130	252	59	3898
DISTILLATE 4	6	12	1	2	1	-	-	-	-	1	1	1	1	26
HFO <0.31 % SULFUR	-	85	-	14	-	-	-	4	-	4	9	15	-	131
HFO 0.31-1.0 % SULFUR	95	119	93	27	20	-	-	37	-	-	1	2	39	433
HFO >1.0 % SULFUR	80	100	88	16	36	9	8	308	13	58	58	92	13	879
TOTAL HEAVY FUEL OIL	181	316	182	59	57	9	8	349	13	63	69	110	53	1469
LIQUIFIED PETROLEUM GAS	22	49	69	13	154	38	112	1410	24	14	29	49	1	1984
AVIATION GASOLINE	1	1	4	-	3	1	2	7	1	1	1	3	2	27
CHEM FEED NAPHTHA	-	18	1	5	28	5	9	246	-	2	4	7	2	327
CHEM FEED GASOIL	-	22	2	6	36	6	12	311	-	3	5	9	2	414
SPECIAL NAPHTHA	-	6	-	2	13	2	4	29	-	-	-	1	-	57
LUBRICANTS	8	21	27	5	20	5	8	53	1	3	4	8	-	163
WAX	-	3	-	1	1	-	1	8	1	-	1	1	-	17
ASPHALT & ROAD OIL	18	44	58	11	94	21	35	88	31	12	17	33	2	464
MISCELLANEOUS OIL	-	13	1	3	8	1	3	39	2	1	1	2	-	74
CRUDE OIL	-	-	-	-	-	-	-	-	-	-	11	18	-	29
STILL GAS	-	55	3	9	100	13	31	324	21	20	46	73	4	699
CATALYTIC COKE	-	26	1	5	33	4	10	98	6	5	11	17	1	217
MARKETABLE COKE	-	6	1	-	34	10	12	24	5	1	2	3	-	98
TOTAL OTHER PETROLEUM	49	264	167	60	524	106	239	2637	92	62	132	224	14	4570
TOTAL - ALL OIL	911	2331	2389	525	3019	690	1232	5236	583	608	855	1574	281	20234

* = LOGISTICS FLOW MODELED IN NPC SUPPLY/DEMAND/LOGISTICS MODEL NATIONAL PETROLEUM COUNCIL NOVEMBER 9, 1992 TIME 14:56

1995 U.S. REGIONAL OIL DEMANDS -- THOUSAND BARRELS PER DAY -- NPC FOUNDATION CASE II

	U.S. REGIONS													
	1	2	3	4	5	6	7	8	9	10	11	12	13	TOTAL
* CO NON-ATTAINMENT	40	13	26	2	33	29	-	12	35	51	99	62	3	405
* REFORMULATED	23	144	-	-	160	40	-	90	-	-	-	150	-	607
* CO-REFORMULATED	24	204	-	-	-	-	-	-	-	-	-	188	-	416
* GASOHOL	-	-	16	-	133	14	51	25	5	2	5	1	-	252
* CONVENTIONAL	127	124	623	132	637	178	363	609	125	136	134	68	21	3277
TOTAL UNLEADED REGULAR	214	485	665	134	963	261	414	736	165	189	238	469	24	4957
* CO NON-ATTAINMENT	8	6	7	1	7	2	-	1	7	2	9	4	-	54
* REFORMULATED	7	35	-	-	22	2	-	13	-	-	-	13	-	92
* CO-REFORMULATED	7	43	-	-	-	-	-	-	-	-	-	17	-	67
* GASOHOL	-	-	4	-	25	1	2	4	1	-	-	-	-	37
* CONVENTIONAL	26	33	173	30	112	11	26	95	19	7	12	4	3	551
TOTAL UNLEADED MID-GRADE	48	117	184	31	166	16	28	113	27	9	21	38	3	801
* CO NON-ATTAINMENT	18	9	10	2	7	4	-	2	7	9	33	13	-	114
* REFORMULATED	13	79	-	-	38	6	-	19	-	-	-	50	-	205
* CO-REFORMULATED	13	116	-	-	-	-	-	-	-	-	-	64	-	193
* GASOHOL	-	-	6	-	30	1	5	6	1	1	1	-	-	51
* CONVENTIONAL	51	62	260	56	140	23	49	142	21	23	45	15	10	897
TOTAL UNLEADED PREMIUM	95	266	276	58	215	34	54	169	29	33	79	142	10	1460
TOTAL ALL GASOLINE GRADES	357	868	1125	223	1344	311	496	1018	221	231	338	649	37	7218
* KEROSENE JET FUEL	48	222	211	18	179	26	84	237	51	63	98	176	76	1489
* KEROSENE / DISTILLATE 1	4	12	11	4	19	7	3	30	3	4	1	1	1	100
* LIGHT DIESEL - ON HIGHWAY	57	146	220	42	302	66	130	250	50	48	58	117	13	1499
* LIGHT DIESEL - OFF HIGHWAY	12	37	51	15	77	36	50	119	34	21	24	48	6	530
* DISTILLATE 2	152	219	57	50	54	32	12	61	7	14	2	4	11	675
* HEAVY DIESEL	7	23	34	8	71	13	33	112	22	19	12	19	15	388
TOTAL DISTILLATE/KERO	232	437	373	119	523	154	228	572	116	106	97	189	46	3192
DISTILLATE 4	8	17	1	3	1	-	-	-	-	1	1	1	1	34
HFO <0.31 % SULFUR	-	77	-	13	-	-	-	4	-	4	8	13	-	119
HFO 0.31-1.0 % SULFUR	86	107	83	24	18	-	-	33	-	-	1	2	37	391
HFO >1.0 % SULFUR	73	88	76	15	31	9	7	260	11	45	46	73	11	745
TOTAL HEAVY FUEL OIL	167	289	160	55	50	9	7	297	11	50	56	89	49	1289
LIQUIFIED PETROLEUM GAS	24	47	79	13	149	44	105	1056	23	12	25	45	1	1623
AVIATION GASOLINE	1	1	3	-	3	1	2	7	1	1	1	2	2	25
CHEM FEED NAPHTHA	-	12	1	3	20	3	7	174	-	2	3	5	1	231
CHEM FEED GASOIL	-	16	1	4	26	4	8	220	-	2	4	6	2	293
SPECIAL NAPHTHA	-	6	-	2	12	2	4	27	-	-	-	1	-	54
LUBRICANTS	8	19	26	5	19	4	7	51	1	3	4	7	-	154
WAX	-	2	-	1	1	-	1	8	1	-	1	1	-	16
ASPHALT & ROAD OIL	17	41	54	11	88	20	33	83	30	11	16	32	2	438
MISCELLANEOUS OIL	-	12	1	3	8	1	2	37	2	1	1	2	-	70
CRUDE OIL	-	-	-	-	-	-	-	-	-	-	10	17	-	27
STILL GAS	-	52	3	9	94	13	29	306	19	18	43	69	4	659
CATALYTIC COKE	-	24	1	4	31	4	10	93	6	5	10	16	1	205
MARKETABLE COKE	-	6	1	-	32	10	11	23	4	1	2	3	-	93
TOTAL OTHER PETROLEUM	50	238	170	55	483	106	219	2085	87	56	120	206	13	3888
TOTAL - ALL OIL	854	2054	2039	470	2579	606	1034	4209	486	506	709	1309	221	17076

* = LOGISTICS FLOW MODELED IN NPC SUPPLY/DEMAND/LOGISTICS MODEL   NATIONAL PETROLEUM COUNCIL   NOVEMBER 9, 1992   TIME 14:56

2000 U.S. REGIONAL OIL DEMANDS -- THOUSAND BARRELS PER DAY -- NPC FOUNDATION CASE II

	U.S. REGIONS													
	1	2	3	4	5	6	7	8	9	10	11	12	13	TOTAL
* CO NON-ATTAINMENT	-	-	-	-	-	29	-	5	26	8	-	22	3	93
* REFORMULATED	150	270	303	108	572	46	89	237	12	57	134	184	-	2162
* CO-REFORMULATED	64	215	26	3	32	-	-	6	8	42	99	231	-	726
* GASOHOL	-	-	6	-	66	14	45	20	5	1	-	1	-	158
* CONVENTIONAL	-	-	330	23	292	173	279	468	114	81	5	32	21	1818
TOTAL UNLEADED REGULAR	214	485	665	134	962	262	413	736	165	189	238	470	24	4957
* CO NON-ATTAINMENT	-	-	-	-	-	2	-	1	5	-	-	1	-	9
* REFORMULATED	33	68	88	25	96	3	10	36	2	3	12	15	-	391
* CO-REFORMULATED	15	49	7	-	7	-	-	1	2	2	9	19	-	111
* GASOHOL	-	-	1	-	12	1	2	3	1	-	-	-	-	20
* CONVENTIONAL	-	-	88	6	51	10	16	72	17	4	-	3	3	270
TOTAL UNLEADED MID-GRADE	48	117	184	31	166	16	28	113	27	9	21	38	3	801
* CO NON-ATTAINMENT	-	-	-	-	-	4	-	1	5	2	-	4	-	16
* REFORMULATED	65	142	134	48	126	7	16	52	3	10	45	58	-	706
* CO-REFORMULATED	30	124	10	2	7	-	-	1	2	8	33	72	-	289
* GASOHOL	-	-	2	-	15	1	4	5	1	-	-	-	-	28
* CONVENTIONAL	-	-	130	8	67	22	35	110	18	13	1	7	10	421
TOTAL UNLEADED PREMIUM	95	266	276	58	215	34	55	169	29	33	79	141	10	1460
TOTAL ALL GASOLINE GRADES	357	868	1125	223	1343	312	496	1018	221	231	338	649	37	7218
* KEROSENE JET FUEL	48	222	211	18	179	26	84	237	51	63	98	176	76	1489
* KEROSENE / DISTILLATE 1	3	10	8	3	15	6	2	26	3	3	1	1	1	82
* LIGHT DIESEL - ON HIGHWAY	58	148	225	43	307	66	133	253	50	49	60	118	13	1523
* LIGHT DIESEL - OFF HIGHWAY	12	38	53	16	82	38	54	127	36	22	25	51	6	560
* DISTILLATE 2	124	193	55	44	53	29	12	69	8	12	2	5	14	620
* HEAVY DIESEL	7	24	35	8	72	13	34	114	22	19	12	19	15	394
TOTAL DISTILLATE/KERO	204	413	376	114	529	152	235	589	119	105	100	194	49	3179
DISTILLATE 4	6	13	1	2	1	-	-	-	-	1	1	1	-	26
HFO <0.31 % SULFUR	-	86	-	14	-	-	-	3	-	3	9	15	-	130
HFO 0.31-1.0 % SULFUR	96	120	95	27	18	-	-	29	-	-	1	2	40	428
HFO >1.0 % SULFUR	78	88	75	15	28	8	7	235	10	42	42	66	11	705
TOTAL HEAVY FUEL OIL	180	307	171	58	47	8	7	267	10	46	53	84	51	1289
LIQUIFIED PETROLEUM GAS	22	45	71	12	141	39	101	1115	22	12	25	43	1	1649
AVIATION GASOLINE	1	1	3	-	3	1	2	6	1	1	1	2	2	24
CHEM FEED NAPHTHA	-	14	1	4	22	4	7	189	-	2	3	5	1	252
CHEM FEED GASOIL	-	17	1	4	28	5	9	240	-	2	4	7	2	319
SPECIAL NAPHTHA	-	6	-	1	12	2	4	26	-	-	-	1	-	52
LUBRICANTS	8	19	25	5	19	4	7	49	-	2	4	7	-	149
WAX	-	2	-	1	1	-	1	7	1	-	1	1	-	15
ASPHALT & ROAD OIL	16	40	52	10	85	19	32	80	29	11	16	31	2	423
MISCELLANEOUS OIL	-	11	1	3	8	1	2	36	2	1	1	2	-	68
CRUDE OIL	-	-	-	-	-	-	-	-	-	-	10	16	-	26
STILL GAS	-	50	3	9	91	12	28	295	19	18	42	66	4	637
CATALYTIC COKE	-	24	1	4	30	4	9	89	6	4	10	16	1	198
MARKETABLE COKE	-	6	1	-	31	10	11	22	4	1	2	2	-	90
TOTAL OTHER PETROLEUM	47	235	159	53	471	101	213	2154	84	54	119	199	13	3902
TOTAL - ALL OIL	836	2045	2042	466	2569	599	1035	4265	485	499	708	1302	226	17077

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2010 U.S. REGIONAL OIL DEMANDS -- THOUSAND BARRELS PER DAY -- NPC FOUNDATION CASE II

	U.S. REGIONS													
	1	2	3	4	5	6	7	8	9	10	11	12	13	TOTAL
* CO NON-ATTAINMENT	-	-	-	-	-	29	-	5	26	8	-	22	3	93
* REFORMULATED	150	270	303	108	572	46	89	237	12	57	134	184	-	2162
* CO-REFORMULATED	64	214	26	3	33	-	-	6	8	42	99	231	-	726
* GASOHOL	-	-	6	-	66	14	45	20	5	1	-	1	-	158
* CONVENTIONAL	-	1	329	23	291	173	279	469	115	81	5	31	21	1818
TOTAL UNLEADED REGULAR	214	485	664	134	962	262	413	737	166	189	238	469	24	4957
* CO NON-ATTAINMENT	-	-	-	-	-	2	-	1	5	-	-	1	-	9
* REFORMULATED	33	68	88	25	96	3	10	36	2	3	12	15	-	391
* CO-REFORMULATED	15	49	7	-	7	-	-	1	2	2	9	19	-	111
* GASOHOL	-	-	1	-	12	1	2	3	1	-	-	-	-	20
* CONVENTIONAL	-	-	88	6	51	10	16	72	17	4	-	3	3	270
TOTAL UNLEADED MID-GRADE	48	117	184	31	166	16	28	113	27	9	21	38	3	801
* CO NON-ATTAINMENT	-	-	-	-	-	4	-	1	5	2	-	4	-	16
* REFORMULATED	65	142	134	48	126	7	16	52	3	10	45	58	-	706
* CO-REFORMULATED	30	124	10	2	7	-	-	1	2	8	33	72	-	289
* GASOHOL	-	-	2	-	15	1	4	5	1	-	-	-	-	28
* CONVENTIONAL	-	-	130	8	67	22	35	110	18	13	1	7	10	421
TOTAL UNLEADED PREMIUM	95	266	276	58	215	34	55	169	29	33	79	141	10	1460
TOTAL ALL GASOLINE GRADES	357	868	1124	223	1343	312	496	1019	222	231	338	648	37	7218
* KEROSENE JET FUEL	48	222	211	18	179	26	84	237	51	63	98	176	76	1489
* KEROSENE / DISTILLATE 1	2	7	5	2	10	4	2	20	2	2	-	1	1	58
* LIGHT DIESEL - ON HIGHWAY	62	157	240	47	327	71	140	271	55	51	64	126	14	1625
* LIGHT DIESEL - OFF HIGHWAY	12	39	55	16	87	40	58	133	38	23	26	53	6	586
* DISTILLATE 2	87	136	41	31	41	22	11	69	7	9	2	4	11	471
* HEAVY DIESEL	7	26	37	9	77	14	36	121	23	21	13	21	16	421
TOTAL DISTILLATE/KERO	170	365	378	105	542	151	247	614	125	106	105	205	48	3161
DISTILLATE 4	5	11	1	2	1	-	-	-	-	-	1	1	-	22
HFO <0.31 % SULFUR	-	74	-	12	-	-	-	4	-	4	8	13	-	115
HFO 0.31-1.0 % SULFUR	83	104	82	23	18	-	-	32	-	-	1	2	35	380
HFO >1.0 % SULFUR	71	88	77	15	32	9	7	270	11	51	50	80	11	772
TOTAL HEAVY FUEL OIL	159	277	160	52	51	9	7	306	11	55	60	96	46	1289
LIQUIFIED PETROLEUM GAS	19	42	59	11	132	33	96	1209	20	12	25	42	1	1701
AVIATION GASOLINE	1	1	3	-	3	1	2	6	1	1	1	2	1	23
CHEM FEED NAPHTHA	-	15	1	4	24	4	8	211	-	2	4	6	2	281
CHEM FEED GASOIL	-	19	1	5	31	5	10	267	-	3	5	7	2	355
SPECIAL NAPHTHA	-	5	-	1	11	2	4	25	-	-	-	1	-	49
LUBRICANTS	7	18	23	5	18	4	7	46	-	2	3	7	-	140
WAX	-	2	-	1	1	-	1	7	1	-	1	1	-	15
ASPHALT & ROAD OIL	15	38	49	10	80	18	30	75	27	10	15	29	2	398
MISCELLANEOUS OIL	-	11	1	3	7	1	2	33	2	1	1	2	-	64
CRUDE OIL	-	-	-	-	-	-	-	-	-	-	10	15	-	25
STILL GAS	-	47	3	8	86	11	27	278	18	17	39	62	3	599
CATALYTIC COKE	-	22	1	4	28	4	9	84	5	4	9	15	1	186
MARKETABLE COKE	-	6	1	-	29	9	10	21	4	1	1	2	-	84
TOTAL OTHER PETROLEUM	42	226	142	52	450	92	206	2262	78	53	114	191	12	3920
TOTAL - ALL OIL	776	1958	2015	450	2565	590	1040	4438	487	508	715	1316	219	17077

* = LOGISTICS FLOW MODELED IN NPC SUPPLY/DEMAND/LOGISTICS MODEL   NATIONAL PETROLEUM COUNCIL   NOVEMBER 9, 1992   TIME 14:56

1995 U.S. REGIONAL OIL DEMANDS -- THOUSAND BARRELS PER DAY -- NPC FOUNDATION CASE III

	U.S. REGIONS													
	1	2	3	4	5	6	7	8	9	10	11	12	13	TOTAL
* CO NON-ATTAINMENT	40	13	26	2	33	29	-	12	35	51	99	62	3	405
* REFORMULATED	23	144	-	-	160	40	-	90	-	-	-	150	-	607
* CO-REFORMULATED	24	204	-	-	-	-	-	-	-	-	-	188	-	416
* GASOHOL	-	-	16	-	133	14	51	25	5	2	5	1	-	252
* CONVENTIONAL	127	124	623	132	637	178	363	609	125	136	134	68	21	3277
TOTAL UNLEADED REGULAR	214	485	665	134	963	261	414	736	165	189	238	469	24	4957
* CO NON-ATTAINMENT	8	6	7	1	7	2	-	1	7	2	9	4	-	54
* REFORMULATED	7	35	-	-	22	2	-	13	-	-	-	13	-	92
* CO-REFORMULATED	7	43	-	-	-	-	-	-	-	-	-	17	-	67
* GASOHOL	-	-	4	-	25	1	2	4	1	-	-	-	-	37
* CONVENTIONAL	26	33	173	30	112	11	26	95	19	7	12	4	3	551
TOTAL UNLEADED MID-GRADE	48	117	184	31	166	16	28	113	27	9	21	38	3	801
* CO NON-ATTAINMENT	18	9	10	2	7	4	-	2	7	9	33	13	-	114
* REFORMULATED	13	79	-	-	38	6	-	19	-	-	-	50	-	205
* CO-REFORMULATED	13	116	-	-	-	-	-	-	-	-	-	64	-	193
* GASOHOL	-	-	6	-	30	1	5	6	1	1	1	-	-	51
* CONVENTIONAL	51	62	260	56	140	23	49	142	21	23	45	15	10	897
TOTAL UNLEADED PREMIUM	95	266	276	58	215	34	54	169	29	33	79	142	10	1460
TOTAL ALL GASOLINE GRADES	357	868	1125	223	1344	311	496	1018	221	231	338	649	37	7218
* KEROSENE JET FUEL	48	219	208	18	176	26	82	233	51	62	96	173	75	1467
* KEROSENE / DISTILLATE 1	4	12	11	4	18	7	3	30	3	4	1	1	2	100
* LIGHT DIESEL - ON HIGHWAY	57	144	217	42	296	65	127	247	50	46	59	115	11	1476
* LIGHT DIESEL - OFF HIGHWAY	12	36	50	15	77	35	50	117	33	21	23	47	6	522
* DISTILLATE 2	149	215	56	49	54	32	12	60	7	14	2	4	11	665
* HEAVY DIESEL	6	23	34	8	70	13	33	110	21	19	11	19	15	382
TOTAL DISTILLATE/KERO	228	430	368	118	515	152	225	564	114	104	96	186	45	3145
DISTILLATE 4	8	17	1	3	1	-	-	-	-	1	1	1	1	34
HFO <0.31 % SULFUR	-	77	-	13	-	-	-	4	-	4	8	13	-	119
HFO 0.31-1.0 % SULFUR	86	107	83	24	18	-	-	33	-	-	1	2	37	391
HFO >1.0 % SULFUR	73	88	76	15	31	9	7	260	11	45	46	73	11	745
TOTAL HEAVY FUEL OIL	167	289	160	55	50	9	7	297	11	50	56	89	49	1289
LIQUIFIED PETROLEUM GAS	24	47	79	13	149	44	105	1053	23	12	25	44	1	1619
AVIATION GASOLINE	1	1	3	-	3	1	2	7	1	1	1	2	2	25
CHEM FEED NAPHTHA	-	13	1	3	20	3	7	173	-	2	3	5	1	231
CHEM FEED GASOIL	-	16	1	4	25	4	9	219	-	2	4	6	2	292
SPECIAL NAPHTHA	-	6	-	2	12	2	4	27	-	-	-	1	-	54
LUBRICANTS	8	19	26	5	19	4	7	50	1	3	4	7	1	154
WAX	-	2	-	1	1	-	1	8	1	-	1	1	-	16
ASPHALT & ROAD OIL	17	41	54	11	88	20	33	82	30	11	16	32	2	437
MISCELLANEOUS OIL	-	12	1	3	8	1	2	37	2	1	1	2	-	70
CRUDE OIL	-	-	-	-	-	-	-	-	-	-	10	17	-	27
STILL GAS	-	52	3	9	94	13	29	305	19	18	43	69	4	658
CATALYTIC COKE	-	24	2	4	31	4	10	92	6	4	10	16	1	204
MARKETABLE COKE	-	6	1	-	32	10	11	23	4	1	2	2	-	92
TOTAL OTHER PETROLEUM	50	239	171	55	482	106	220	2076	87	55	120	204	14	3879
TOTAL - ALL OIL	850	2045	2032	469	2567	604	1030	4188	484	502	706	1301	220	16998

* = LOGISTICS FLOW MODELED IN NPC SUPPLY/DEMAND/LOGISTICS MODEL   NATIONAL PETROLEUM COUNCIL   NOVEMBER 9, 1992   TIME 14:56

2000 U.S. REGIONAL OIL DEMANDS -- THOUSAND BARRELS PER DAY -- NPC FOUNDATION CASE III

	U.S. REGIONS 1	2	3	4	5	6	7	8	9	10	11	12	13	TOTAL
* CO NON-ATTAINMENT	-	-	-	-	-	28	-	5	25	9	-	20	3	90
* REFORMULATED	145	260	290	102	551	44	86	228	12	55	129	176	-	2078
* CO-REFORMULATED	60	206	25	3	32	-	-	6	9	41	95	220	-	697
* GASOHOL	-	-	5	-	63	13	43	20	5	2	-	1	-	152
* CONVENTIONAL	-	-	318	24	279	167	269	448	108	74	5	34	22	1748
TOTAL UNLEADED REGULAR	205	466	638	129	925	252	398	707	159	181	229	451	25	4765
* CO NON-ATTAINMENT	-	-	-	-	-	2	-	1	5	-	-	1	-	9
* REFORMULATED	31	65	85	24	92	3	10	34	2	3	11	15	-	375
* CO-REFORMULATED	15	47	7	-	6	-	-	1	1	2	9	19	-	107
* GASOHOL	-	-	1	-	11	1	2	3	1	-	-	-	-	19
* CONVENTIONAL	-	-	84	6	51	9	15	70	17	4	-	2	2	260
TOTAL UNLEADED MID-GRADE	46	112	177	30	160	15	27	109	26	9	20	37	2	770
* CO NON-ATTAINMENT	-	-	-	-	-	4	-	1	5	1	-	4	-	15
* REFORMULATED	63	137	129	47	121	7	15	50	2	10	43	56	-	680
* CO-REFORMULATED	29	119	9	2	7	-	-	1	2	7	32	70	-	278
* GASOHOL	-	-	2	-	15	1	4	4	1	-	-	-	-	27
* CONVENTIONAL	-	-	126	6	63	20	33	107	18	14	1	6	9	403
TOTAL UNLEADED PREMIUM	92	256	266	55	206	32	52	163	28	32	76	136	9	1403
TOTAL ALL GASOLINE GRADES	343	834	1081	214	1291	299	477	979	213	222	325	624	36	6938
* KEROSENE JET FUEL	46	210	200	17	170	25	79	224	49	59	93	166	72	1410
* KEROSENE / DISTILLATE 1	3	9	8	3	14	5	2	25	2	3	1	1	1	77
* LIGHT DIESEL - ON HIGHWAY	56	141	213	40	290	63	125	239	49	45	57	113	12	1443
* LIGHT DIESEL - OFF HIGHWAY	11	36	50	15	78	36	51	120	34	21	24	48	6	530
* DISTILLATE 2	117	183	52	42	50	27	12	65	7	12	2	4	14	587
* HEAVY DIESEL	7	22	33	8	68	13	32	108	21	18	11	18	14	373
TOTAL OISTILLATE/KERD	194	391	356	108	500	144	222	557	113	99	95	184	47	3010
DISTILLATE 4	5	10	1	2	1	-	-	-	-	-	1	1	-	21
HFO <0.31 % SULFUR	-	70	-	11	-	-	-	3	-	3	7	12	-	106
HFO 0.31-1.0 % SULFUR	78	98	77	22	14	-	-	24	-	-	1	2	32	348
HFO >1.0 % SULFUR	64	72	61	13	23	6	6	190	8	34	34	54	9	574
TOTAL HEAVY FUEL OIL	147	250	139	48	38	6	6	217	8	37	43	69	41	1049
LIQUIFIED PETROLEUM GAS	20	42	66	11	133	37	95	1047	21	11	24	41	1	1549
AVIATION GASOLINE	1	1	3	-	3	1	2	6	1	1	1	2	1	23
CHEM FEED NAPHTHA	-	13	1	3	21	3	7	178	-	2	3	5	1	237
CHEM FEED GASOIL	-	16	1	4	26	4	9	225	-	2	4	6	2	299
SPECIAL NAPHTHA	-	5	-	1	11	2	4	25	-	-	-	1	-	49
LUBRICANTS	7	18	23	5	18	4	7	46	-	2	3	7	-	140
WAX	-	2	-	1	1	-	1	7	1	-	1	1	-	15
ASPHALT & ROAD OIL	15	37	49	10	80	18	30	75	27	10	15	29	2	397
MISCELLANEOUS OIL	-	11	1	3	7	1	2	33	2	1	1	2	-	64
CRUDE OIL	-	-	-	-	-	-	-	-	-	-	9	15	-	24
STILL GAS	-	47	3	8	86	11	27	277	18	17	39	62	3	598
CATALYTIC COKE	-	22	1	4	28	4	9	84	5	4	9	15	1	186
MARKETABLE COKE	-	6	1	-	29	9	10	21	4	1	1	2	-	84
TOTAL OTHER PETROLEUM	43	220	149	50	443	94	203	2024	79	51	110	188	11	3665
TOTAL - ALL OIL	773	1905	1925	437	2442	568	987	4001	462	468	666	1231	207	16072

* = LOGISTICS FLOW MODELED IN NPC SUPPLY/DEMAND/LOGISTICS MODEL   NATIONAL PETROLEUM COUNCIL   NOVEMBER 9, 1992   TIME 14:56

2010 U.S. REGIONAL OIL DEMANDS -- THOUSAND BARRELS PER DAY -- NPC FOUNDATION CASE III

	U.S. REGIONS													
	1	2	3	4	5	6	7	8	9	10	11	12	13	TOTAL
* CO NON-ATTAINMENT	-	-	-	-	-	26	-	5	22	8	-	18	3	82
* REFORMULATED	132	238	266	94	505	39	79	208	11	51	119	161	-	1903
* CO-REFORMULATED	56	189	22	3	29	-	-	5	8	37	87	202	-	638
* GASOHOL	-	-	5	-	59	12	41	18	4	1	-	1	-	141
* CONVENTIONAL	-	-	292	21	255	154	244	412	101	70	4	30	19	1602
TOTAL UNLEADED REGULAR	188	427	585	118	848	231	364	648	146	167	210	412	22	4366
* CO NON-ATTAINMENT	-	-	-	-	-	2	-	-	5	-	-	1	-	8
* REFORMULATED	29	60	78	22	84	3	9	32	2	2	10	14	-	345
* CO-REFORMULATED	13	43	7	-	6	-	-	1	1	2	8	17	-	98
* GASOHOL	-	-	1	-	10	1	1	3	1	-	-	-	-	17
* CONVENTIONAL	-	-	76	6	46	8	15	64	14	4	1	2	2	238
TOTAL UNLEADED MID-GRADE	42	103	162	28	146	14	25	100	23	8	19	34	2	706
* CO NON-ATTAINMENT	-	-	-	-	-	3	-	1	5	1	-	4	-	14
* REFORMULATED	57	125	118	43	111	7	14	46	2	9	39	51	-	622
* CO-REFORMULATED	27	109	9	1	6	-	-	1	2	7	29	64	-	255
* GASOHOL	-	-	2	-	13	1	3	4	1	-	-	-	-	24
* CONVENTIONAL	-	-	114	7	59	19	31	97	16	12	1	6	9	371
TOTAL UNLEADED PREMIUM	84	234	243	51	189	30	48	149	26	29	69	125	9	1286
TOTAL ALL GASOLINE GRADES	314	764	990	197	1183	275	437	897	195	204	298	571	33	6358
* KEROSENE JET FUEL	42	193	184	16	155	23	73	205	44	54	85	152	66	1292
* KEROSENE / DISTILLATE 1	2	6	4	2	8	3	1	17	2	2	-	1	1	49
* LIGHT DIESEL - ON HIGHWAY	54	137	208	40	284	62	122	235	48	45	55	109	12	1411
* LIGHT DIESEL - OFF HIGHWAY	11	33	48	14	75	35	50	115	33	20	23	46	5	508
* DISTILLATE 2	75	118	36	27	36	19	9	60	6	7	2	3	10	408
* HEAVY DIESEL	6	22	32	8	67	12	32	105	20	18	11	18	14	365
TOTAL DISTILLATE/KERO	148	316	328	91	470	131	214	532	109	92	91	177	42	2741
DISTILLATE 4	4	9	1	2	1	-	-	-	-	-	-	1	-	18
HFO <0.31 % SULFUR	-	60	-	10	-	-	-	3	-	3	7	11	-	94
HFO 0.31-1.0 % SULFUR	68	85	66	19	14	-	-	26	-	-	1	2	28	309
HFO >1.0 % SULFUR	57	71	63	12	26	7	6	220	9	42	41	64	10	628
TOTAL HEAVY FUEL OIL	129	225	130	43	41	7	6	249	9	45	49	78	38	1049
LIQUIFIED PETROLEUM GAS	15	35	50	9	110	27	80	1007	17	10	21	35	1	1417
AVIATION GASOLINE	1	1	3	-	2	1	1	5	1	-	1	2	1	19
CHEM FEED NAPHTHA	-	13	1	3	20	3	7	176	-	2	3	5	1	234
CHEM FEED GASOIL	-	16	1	4	26	4	9	222	-	2	4	6	2	296
SPECIAL NAPHTHA	-	5	-	1	9	2	3	20	-	-	-	1	-	41
LUBRICANTS	6	15	19	4	15	3	6	38	-	2	3	6	-	117
WAX	-	2	-	1	1	-	-	6	1	-	-	1	-	12
ASPHALT & ROAD OIL	13	31	41	8	67	15	25	63	23	9	12	24	1	332
MISCELLANEOUS OIL	-	9	1	2	6	1	2	28	2	-	1	1	-	53
CRUDE OIL	-	-	-	-	-	-	-	-	-	-	8	12	-	20
STILL GAS	-	39	2	7	72	10	22	231	15	14	33	52	3	500
CATALYTIC COKE	-	18	1	3	24	3	8	70	4	3	8	12	1	155
MARKETABLE COKE	-	5	1	-	24	7	9	17	3	1	1	2	-	70
TOTAL OTHER PETROLEUM	35	189	120	42	376	76	172	1883	66	43	95	159	10	3266
TOTAL - ALL OIL	668	1687	1752	389	2225	512	902	3766	423	438	618	1137	189	14706

* = LOGISTICS FLOW MODELED IN NPC SUPPLY/DEMAND/LOGISTICS MODEL NATIONAL PETROLEUM COUNCIL NOVEMBER 9, 1992 TIME 14:56

1987 STATE OIL DEMANDS -- THOUSAND BARRELS PER DAY

		UNLEADED REGULAR GASOLINE				UNLEADED MID-GRADE GASOLINE				UNLEADED PREMIUM GASOLINE				
	LD RG	CONV	OZONE	CO	TOTAL	CONV	OZONE	CO	TOTAL	CONV	OZONE	CO	TOTAL	TOTAL
MAINE	9	23	-	-	23	-	-	-	-	7	-	-	7	39
NEW HAMPSHIRE	4	19	-	-	19	-	-	-	-	10	-	-	10	32
VERMONT	4	10	-	-	10	-	-	-	-	5	-	-	5	18
MASSACHUSETTS	20	85	-	-	85	-	-	-	-	53	-	-	53	158
RHODE ISLANE	4	12	-	-	12	-	-	-	-	9	-	-	9	25
CONNECTICUT	12	44	-	-	44	-	-	-	-	33	-	-	33	89
NEW YORK	57	202	-	-	202	-	-	-	-	132	-	-	132	391
NEW JERSEY	23	123	-	-	123	-	-	-	-	77	-	-	77	222
PENNSYLVANIA	57	163	-	-	163	-	-	-	-	72	-	-	72	291
DELAWARE	3	13	-	-	13	-	-	-	-	6	-	-	6	22
MARYLAND	16	69	-	-	69	-	-	-	-	47	-	-	47	132
DIST COL	1	5	-	-	5	-	-	-	-	6	-	-	6	12
W VIRGINIA	14	25	-	-	25	-	-	-	-	13	-	-	13	53
VIRGINIA	37	103	-	-	103	-	-	-	-	52	-	-	52	191
N CAROLINA	54	105	-	-	105	-	-	-	-	50	-	-	50	210
S CAROLINA	29	55	-	-	55	-	-	-	-	23	-	-	23	107
GEORGIA	52	108	-	-	108	-	-	-	-	59	-	-	59	219
FLORIDA	71	187	-	-	187	-	-	-	-	119	-	-	119	377
MICHIGAN	54	179	-	-	179	-	-	-	-	38	-	-	38	271
OHIO	70	192	-	-	192	-	-	-	-	56	-	-	56	317
INDIANA	44	110	-	-	110	-	-	-	-	20	-	-	20	173
ILLINOIS	55	197	-	-	197	-	-	-	-	50	-	-	50	302
KENTUCKY	38	58	-	-	58	-	-	-	-	21	-	-	21	117
TENNESSEE	44	92	-	-	92	-	-	-	-	36	-	-	36	173
WISCONSIN	34	82	-	-	82	-	-	-	-	14	-	-	14	130
MINNESOTA	34	81	-	-	81	-	-	-	-	14	-	-	14	129
N DAKOTA	9	13	-	-	13	-	-	-	-	1	-	-	1	24
S DAKOTA	10	13	-	-	13	-	-	-	-	1	-	-	1	25
IOWA	31	50	-	-	50	-	-	-	-	6	-	-	6	87
NEBRASKA	18	29	-	-	29	-	-	-	-	2	-	-	2	49
MISSOURI	54	101	-	-	101	-	-	-	-	20	-	-	20	174
KANSAS	26	50	-	-	50	-	-	-	-	4	-	-	4	80
OKLAHOMA	36	63	-	-	63	-	-	-	-	8	-	-	8	106
ALABAMA	34	69	-	-	69	-	-	-	-	30	-	-	30	133
MISSISSIPPI	23	44	-	-	44	-	-	-	-	13	-	-	13	80
ARKANSAS	27	40	-	-	40	-	-	-	-	11	-	-	11	78
LOUISIANA	30	72	-	-	72	-	-	-	-	30	-	-	30	132
TEXAS	132	338	-	-	338	-	-	-	-	91	-	-	91	561
NEW MEXICO	20	28	-	-	28	-	-	-	-	3	-	-	3	52
MONTANA	14	13	-	-	13	-	-	-	-	1	-	-	1	28
IDAHO	14	14	-	-	14	-	-	-	-	1	-	-	1	29
WYOMING	9	10	-	-	10	-	-	-	-	1	-	-	1	20
COLORADO	35	55	-	-	55	-	-	-	-	9	-	-	9	99
UTAH	18	26	-	-	26	-	-	-	-	4	-	-	4	48
WASHINGTON	53	66	-	-	66	-	-	-	-	21	-	-	21	140
OREGON	35	39	-	-	39	-	-	-	-	10	-	-	10	84
CALIFORNIA	183	441	-	-	441	-	-	-	-	176	-	-	176	801
NEVADA	12	19	-	-	19	-	-	-	-	4	-	-	4	36
ARIZONA	35	59	-	-	59	-	-	-	-	14	-	-	14	107
ALASKA	5	9	-	-	9	-	-	-	-	1	-	-	1	14
HAWAII	3	12	-	-	12	-	-	-	-	7	-	-	7	22
TOTAL US	1702	4014	-	-	4014	-	-	-	-	1489	-	-	1489	7206

DUE TO INDEPENDENT ROUNDING, SUM OF STATES MAY NOT EQUAL REGIONAL TOTALS ELSEWHERE NATIONAL PETROLEUM COUNCIL MAY 1, 1992 TIME 16:54

1987 STATE OIL DEMANDS -- THOUSAND BARRELS PER DAY

	JET FUEL		DISTILLATE						HEAVY FUEL OIL				
	NAPH	KERD	1	ON HY	OFF	2	H OSL	TOTAL	DST 4	< 0.3	0.3-1	> 1.0	TOTAL
MAINE	-	2	1	10	2	19	1	33	-	-	13	7	21
NEW HAMPSHIRE	-	-	1	4	2	14	-	21	1	-	1	12	13
VERMONT	-	-	1	3	1	7	-	12	-	-	-	1	1
MASSACHUSETTS	2	21	1	19	4	71	4	98	4	-	37	69	111
RHODE ISLANE	-	1	1	4	-	11	-	16	1	-	3	2	6
CONNECTICUT	1	5	2	12	3	39	-	56	2	-	54	3	60
NEW YORK	7	4	8	41	10	126	5	190	15	58	35	95	204
NEW JERSEY	3	115	2	29	11	62	11	115	5	22	7	28	62
PENNSYLVANIA	5	28	6	58	16	74	7	160	2	1	33	16	51
DELAWARE	-	-	1	4	1	5	-	12	-	-	6	4	11
MARYLAND	2	7	2	19	4	21	3	51	1	-	8	14	22
DIST COL	-	-	-	2	-	5	-	7	-	-	1	1	2
W VIRGINIA	1	-	1	10	6	4	4	25	-	-	-	1	1
VIRGINIA	2	31	4	33	9	26	11	84	1	-	17	9	27
N CAROLINA	3	15	6	38	9	25	4	83	-	-	-	12	12
S CAROLINA	1	2	2	19	4	6	4	35	-	-	-	5	5
GEORGIA	3	50	-	51	10	4	6	71	-	-	-	6	6
FLORIDA	5	57	2	45	20	9	16	92	-	-	66	34	101
MICHIGAN	3	18	4	34	11	18	4	71	-	-	5	4	8
OHIO	3	27	5	50	14	18	9	95	-	-	-	6	6
INDIANA	2	50	3	46	14	12	13	88	-	-	-	10	11
ILLINOIS	4	4	2	47	24	13	9	95	-	-	14	6	20
KENTUCKY	1	12	2	24	13	6	14	58	-	-	-	2	2
TENNESSEE	1	15	2	37	11	3	11	63	-	-	-	1	1
WISCONSIN	1	3	3	25	9	18	3	58	-	-	-	3	3
MINNESOTA	1	15	3	21	11	13	3	50	-	-	-	3	4
N DAKOTA	-	1	1	6	6	3	2	19	-	-	-	1	1
S DAKOTA	-	-	1	6	7	2	-	16	-	-	-	-	-
IOWA	1	2	1	21	14	4	3	43	-	-	-	-	-
NEBRASKA	-	1	1	13	11	1	B	34	-	-	-	1	1
MISSOURI	2	20	1	32	11	4	5	53	-	-	-	3	3
KANSAS	1	10	-	23	11	2	10	46	-	-	-	1	1
OKLAHOMA	1	14	-	25	7	3	4	38	-	-	-	1	1
ALABAMA	10	8	6	27	14	2	9	58	-	-	-	30	30
MISSISSIPPI	6	18	3	23	14	4	5	49	-	-	-	7	7
ARKANSAS	6	2	2	21	13	1	2	39	-	-	-	7	7
LOUISIANA	11	46	3	26	24	18	32	104	-	-	34	87	120
TEXAS	40	215	26	100	67	29	46	268	-	-	26	73	100
NEW MEXICO	4	3	3	13	12	1	3	32	-	-	1	1	2
MONTANA	1	2	1	7	5	1	4	18	-	-	-	-	-
IDAHO	1	1	1	7	7	2	1	17	-	-	-	1	1
WYOMING	-	-	1	12	6	2	4	24	-	-	-	2	2
COLORADO	3	22	1	13	9	1	4	27	-	-	-	1	1
UTAH	2	11	-	9	5	2	2	19	-	-	-	6	6
WASHINGTON	7	45	2	21	14	10	12	58	1	-	-	31	31
OREGON	4	7	1	18	10	7	9	44	1	-	-	12	12
CALIFORNIA	41	184	1	97	59	8	35	201	2	12	1	152	167
NEVADA	2	11	-	8	5	1	3	18	-	-	1	-	1
ARIZONA	5	14	-	18	8	1	2	28	-	-	-	-	-
ALASKA	1	36	6	6	4	6	5	27	-	-	-	4	4
HAWAII	2	25	-	2	3	4	3	12	-	-	30	5	34
TOTAL US	204	1181	126	1238	563	750	355	3033	38	93	392	779	1303

DUE TO INDEPENDENT ROUNDING, SUM OF STATES MAY NOT EQUAL REGIONAL TOTALS ELSEWHERE NATIONAL PETROLEUM COUNCIL MAY 1, 1992 TIME 16:54

1987 STATE OIL DEMANDS -- THOUSAND BARRELS PER DAY

			-- CHEM FEED ---									---- COKE ------		--- TOTALS -----	
	LPG	AVGAS	NAPH	GSOIL	S NAP	LUBES	WAX	ASPH	MISC	CRUDE	STGAS	CAT	MKT	OTHER	ALL
MAINE	3	-	-	-	-	1	-	1	-	-	-	-	-	5	100
NEW HAMPSHIRE	5	-	-	-	-	1	-	1	-	-	-	-	-	7	73
VERMONT	3	-	-	-	-	-	-	-	-	-	-	-	-	4	35
MASSACHUSETTS	6	-	-	-	-	3	-	3	-	-	-	-	-	12	401
RHODE ISLANE	2	-	-	-	-	-	-	-	-	-	-	-	-	3	51
CONNECTICUT	4	-	-	-	-	2	-	2	-	-	-	-	-	7	218
NEW YORK	15	-	-	-	-	6	-	7	-	-	-	-	-	28	824
NEW JERSEY	20	-	3	5	4	4	1	4	4	-	27	13	1	85	603
PENNSYLVANIA	20	-	5	8	6	5	2	6	7	-	28	13	-	101	636
DELAWARE	2	-	1	2	1	-	-	-	1	-	7	3	3	21	65
MARYLAND	5	-	-	-	-	2	-	2	-	-	-	-	-	10	223
DIST COL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	21
W VIRGINIA	3	-	-	-	-	1	1	1	-	-	-	-	-	6	87
VIRGINIA	11	-	-	1	-	3	-	4	-	-	3	1	1	25	361
N CAROLINA	24	1	-	-	-	4	-	4	-	-	-	-	-	32	355
S CAROLINA	10	-	-	-	-	2	-	2	-	-	-	-	-	14	163
GEORGIA	17	1	-	-	-	4	-	4	-	-	-	-	-	27	376
FLORIDA	23	2	-	-	-	6	-	7	-	-	-	-	-	37	668
MICHIGAN	47	1	2	2	1	4	-	11	-	-	5	2	-	74	446
OHIO	42	1	6	9	3	5	-	14	2	-	19	6	5	111	561
INDIANA	16	1	5	8	3	3	-	8	1	-	18	6	6	75	399
ILLINOIS	107	-	12	17	6	5	-	13	3	-	36	12	26	238	662
KENTUCKY	18	-	3	4	1	2	-	5	1	-	11	4	-	49	241
TENNESSEE	7	1	1	1	-	3	-	8	-	-	3	1	-	24	277
WISCONSIN	15	-	-	1	-	2	-	6	-	-	1	-	-	26	222
MINNESOTA	15	1	3	4	1	2	-	5	1	-	8	3	11	54	252
N DAKOTA	4	-	1	1	-	-	-	1	-	-	3	1	-	12	57
S DAKOTA	6	-	-	-	-	-	-	1	-	-	-	-	-	8	50
IOWA	17	-	-	-	-	1	-	4	-	-	-	-	-	22	155
NEBRASKA	9	-	-	-	-	1	-	2	-	-	-	-	-	12	98
MISSOURI	17	-	-	-	-	3	-	8	-	-	-	-	-	28	279
KANSAS	37	-	5	6	2	1	-	4	1	-	14	5	9	84	221
OKLAHOMA	13	1	5	7	2	2	-	5	1	-	14	5	4	60	220
ALABAMA	13	-	2	3	1	8	-	28	1	-	-	-	-	56	295
MISSISSIPPI	10	-	6	9	2	5	-	17	2	-	9	3	2	65	226
ARKANSAS	10	-	1	2	-	5	-	18	-	-	2	1	-	39	172
LOUISIANA	129	-	39	56	13	8	2	27	11	-	95	30	7	416	828
TEXAS	723	4	71	102	23	34	6	114	21	-	188	59	6	1350	2535
NEW MEXICO	4	-	1	2	-	3	-	11	-	-	3	1	-	27	119
MONTANA	3	-	-	-	-	-	-	2	-	-	5	2	2	14	62
IDAHO	2	-	-	-	-	-	-	2	-	-	-	-	-	4	54
WYOMING	7	-	-	-	-	-	1	1	1	-	6	2	1	19	66
COLORADO	6	-	-	-	-	-	-	5	-	-	2	1	-	15	168
UTAH	3	-	-	-	-	-	-	3	1	-	5	2	1	15	101
WASHINGTON	7	1	1	2	1	2	-	11	1	-	18	4	1	47	329
OREGON	4	-	-	-	-	1	-	7	-	-	-	-	-	13	164
CALIFORNIA	51	3	6	9	3	12	2	63	3	34	110	28	6	330	1724
NEVADA	3	-	-	-	-	1	-	3	-	-	-	-	-	6	73
ARIZONA	5	1	-	-	-	2	-	9	-	-	-	-	-	16	171
ALASKA	1	1	1	1	-	-	-	1	-	-	-	-	-	5	86
HAWAII	-	1	-	-	-	-	-	2	-	-	4	1	-	9	104
TOTAL US	1523	25	182	261	76	161	16	467	65	34	643	207	92	3750	16676

DUE TO INDEPENDENT ROUNDING, SUM OF STATES MAY NOT EQUAL REGIONAL TOTALS ELSEWHERE NATIONAL PETROLEUM COUNCIL MAY 1, 1992 TIME 16:54

1989 STATE OIL DEMANDS -- THOUSAND BARRELS PER DAY

		----- UNLEADED REGULAR GASOLINE ------				---- UNLEADED MID-GRADE GASOLINE -----				----- UNLEADED PREMIUM GASOLINE ------				
	LD RG	CONV	OZONE	CO	TOTAL	CONV	OZONE	CO	TOTAL	CONV	OZONE	CO	TOTAL	TOTAL
MAINE	-	25	-	-	25	5	-	-	5	9	-	-	9	39
NEW HAMPSHIRE	-	18	-	-	18	5	-	-	5	10	-	-	10	34
VERMONT	1	10	-	-	10	1	-	-	1	6	-	-	6	18
MASSACHUSETTS	2	86	-	-	86	17	-	-	17	54	-	-	54	160
RHODE ISLANE	-	13	-	-	13	3	-	-	3	9	-	-	9	24
CONNECTICUT	1	44	-	-	44	11	-	-	11	32	-	-	32	88
NEW YORK	10	192	-	-	192	29	-	-	29	135	-	-	135	366
NEW JERSEY	3	123	-	-	123	17	-	-	17	80	-	-	80	223
PENNSYLVANIA	9	168	-	-	168	38	-	-	38	84	-	-	84	298
DELAWARE	-	12	-	-	12	4	-	-	4	7	-	-	7	22
MARYLAND	3	60	-	-	60	25	-	-	25	47	-	-	47	135
DIST COL	-	4	-	-	4	2	-	-	2	6	-	-	6	12
W VIRGINIA	3	30	-	-	30	7	-	-	7	13	-	-	13	53
VIRGINIA	11	99	-	-	99	27	-	-	27	58	-	-	58	194
N CAROLINA	22	116	-	-	116	20	-	-	20	56	-	-	56	213
S CAROLINA	12	68	-	-	68	10	-	-	10	27	-	-	27	117
GEORGIA	21	124	-	-	124	19	-	-	19	65	-	-	65	229
FLORIDA	26	189	-	-	189	42	-	-	42	132	-	-	132	389
MICHIGAN	15	193	-	-	193	20	-	-	20	49	-	-	49	277
OHIO	10	212	-	-	212	36	-	-	36	60	-	-	60	318
INDIANA	10	116	-	-	116	15	-	-	15	28	-	-	28	169
ILLINOIS	13	213	-	-	213	25	-	-	25	65	-	-	65	316
KENTUCKY	10	69	-	-	69	14	-	-	14	26	-	-	26	119
TENNESSEE	13	95	-	-	95	18	-	-	18	38	-	-	38	164
WISCONSIN	14	95	-	-	95	5	-	-	5	21	-	-	21	135
MINNESOTA	18	96	-	-	96	4	-	-	4	14	-	-	14	133
N DAKOTA	5	16	-	-	16	-	-	-	-	1	-	-	1	23
S DAKOTA	5	18	-	-	18	-	-	-	-	1	-	-	1	25
IOWA	17	65	-	-	65	1	-	-	1	7	-	-	7	89
NEBRASKA	11	37	-	-	37	-	-	-	-	2	-	-	2	50
MISSOURI	26	112	-	-	112	8	-	-	8	29	-	-	29	174
KANSAS	13	60	-	-	60	1	-	-	1	7	-	-	7	82
OKLAHOMA	19	74	-	-	74	1	-	-	1	12	-	-	12	106
ALABAMA	10	83	-	-	83	11	-	-	11	32	-	-	32	136
MISSISSIPPI	9	49	-	-	49	5	-	-	5	17	-	-	17	79
ARKANSAS	14	49	-	-	49	3	-	-	3	15	-	-	15	81
LOUISIANA	10	74	-	-	74	9	-	-	9	36	-	-	36	128
TEXAS	48	372	-	-	372	32	-	-	32	105	-	-	105	557
NEW MEXICO	15	32	-	-	32	-	-	-	-	5	-	-	5	52
MONTANA	10	15	-	-	15	-	-	-	-	3	-	-	3	28
IDAHO	12	17	-	-	17	-	-	-	-	2	-	-	2	31
WYOMING	6	12	-	-	12	-	-	-	-	2	-	-	2	21
COLORADO	24	57	-	-	57	-	-	-	-	15	-	-	15	97
UTAH	13	28	-	-	28	-	-	-	-	6	-	-	6	47
WASHINGTON	43	78	-	-	78	-	-	-	-	27	-	-	27	147
OREGON	28	48	-	-	48	-	-	-	-	12	-	-	12	87
CALIFORNIA	134	488	-	-	488	11	-	-	11	219	-	-	219	851
NEVADA	10	23	-	-	23	-	-	-	-	7	-	-	7	40
ARIZONA	26	67	-	-	67	-	-	-	-	18	-	-	18	111
ALASKA	3	9	-	-	9	-	-	-	-	1	-	-	1	14
HAWAII	1	13	-	-	13	-	-	-	-	9	-	-	9	24
TOTAL US	740	4367	-	-	4367	497	-	-	497	1724	-	-	1724	7328

DUE TO INDEPENDENT ROUNDING, SUM OF STATES MAY NOT EQUAL REGIONAL TOTALS ELSEWHERE   NATIONAL PETROLEUM COUNCIL   MAY 1, 1992   TIME 16:54

1989 STATE OIL DEMANDS -- THOUSAND BARRELS PER DAY

	JET FUEL		DISTILLATE						HEAVY FUEL OIL				
	NAPH	KERO	1	ON HY	OFF	2	H DSL	TOTAL	DST 4	< 0.3	0.3-1	> 1.0	TOTAL
MAINE	1	4	c	9	2	20	1	34	1	-	16	7	24
NEW HAMPSHIRE	-	1	1	4	2	14	-	21	1	-	-	15	16
VERMONT	-	1	1	3	1	8	-	13	-	-	-	-	-
MASSACHUSETTS	-	33	1	18	3	77	4	103	5	-	28	56	89
RHODE ISLANE	-	2	-	4	1	10	1	16	-	-	2	1	3
CONNECTICUT	-	7	1	17	3	48	1	69	2	-	51	2	55
NEW YORK	16	16	7	50	11	129	2	199	15	71	81	56	223
NEW JERSEY	-	146	2	30	9	64	12	118	5	30	8	23	66
PENNSYLVANIA	-	31	5	60	17	83	5	170	2	-	33	13	48
DELAWARE	-	-	-	5	1	5	-	12	-	-	9	5	15
MARYLAND	18	11	2	24	5	23	4	58	1	-	18	17	36
DIST COL	-	-	-	2	-	6	1	9	-	-	-	-	1
W VIRGINIA	-	1	1	10	6	5	6	29	-	-	-	1	1
VIRGINIA	-	41	4	36	9	25	9	83	1	-	10	15	25
N CAROLINA	-	18	5	41	8	21	3	78	-	-	-	8	8
S CAROLINA	-	3	2	20	6	6	2	36	-	-	-	4	4
GEORGIA	-	55	-	55	11	4	7	77	-	-	-	4	4
FLORIDA	-	94	1	60	15	9	11	96	-	-	85	51	136
MICHIGAN	-	28	4	35	12	17	3	71	-	-	9	4	13
OHIO	2	35	6	63	14	18	9	109	-	-	-	7	8
INDIANA	3	63	4	52	12	10	15	93	1	-	-	12	12
ILLINOIS	-	14	2	55	19	9	11	96	-	-	9	5	14
KENTUCKY	-	18	3	45	11	7	14	80	-	-	-	2	2
TENNESSEE	-	15	2	38	7	2	16	65	-	-	-	2	2
WISCONSIN	-	4	2	29	11	18	7	67	-	-	-	4	4
MINNESOTA	-	17	4	22	12	13	3	54	-	-	-	4	4
N DAKOTA	2	1	1	6	7	3	2	19	-	-	-	1	1
S DAKOTA	2	1	1	6	5	3	-	15	-	-	-	-	-
IOWA	-	2	1	23	11	4	2	41	-	-	-	1	1
NEBRASKA	2	2	1	14	11	1	8	34	-	-	-	1	1
MISSOURI	2	26	1	42	10	3	5	61	-	-	-	3	3
KANSAS	1	11	-	20	10	2	11	43	-	-	-	1	1
OKLAHOMA	11	26	-	26	6	3	5	41	-	-	-	1	1
ALABAMA	1	2	3	36	15	3	14	71	-	-	-	38	38
MISSISSIPPI	-	8	2	25	14	3	6	49	-	-	-	47	47
ARKANSAS	1	1	1	26	10	2	2	41	-	-	5	4	9
LOUISIANA	23	29	5	31	13	23	35	107	-	-	14	105	119
TEXAS	44	125	20	109	56	28	46	258	-	4	12	75	90
NEW MEXICO	1	2	2	13	7	1	3	27	-	-	3	3	6
MONTANA	1	2	1	8	7	1	4	21	-	-	-	4	4
IDAHO	3	2	1	8	7	2	1	19	-	-	-	1	1
WYOMING	-	1	1	12	5	2	7	27	-	-	-	1	1
COLORADO	1	21	1	13	8	2	6	28	-	-	-	-	-
UTAH	3	18	-	8	5	1	2	17	-	-	-	5	5
WASHINGTON	7	47	4	25	12	9	10	60	1	4	-	36	40
OREGON	1	8	1	20	8	7	8	45	-	-	-	13	14
CALIFORNIA	46	199	2	138	51	5	27	224	2	24	2	127	155
NEVADA	-	10	-	9	8	1	2	21	-	-	2	-	2
ARIZONA	6	13	-	21	9	-	1	31	-	-	-	-	-
ALASKA	5	42	2	9	3	7	9	30	-	-	-	-	1
HAWAII	-	29	-	4	2	5	5	16	-	-	42	13	55
TOTAL US	205	1284	114	1435	508	774	371	3202	39	133	438	798	1409

DUE TO INDEPENDENT ROUNDING, SUM OF STATES MAY NOT EQUAL REGIONAL TOTALS ELSEWHERE NATIONAL PETROLEUM COUNCIL MAY 1, 1992 TIME 16:54

1989 STATE OIL DEMANDS -- THOUSAND BARRELS PER DAY

	LPG	AVGAS	-- CHEM FEED --- NAPH	GSOIL	S NAP	LUBES	WAX	ASPH	MISC	CRUDE	STGAS	---- COKE ------ CAT	MKT	--- TOTALS ----- OTHER	ALL
MAINE	4	-	-	-	-	1	-	2	-	-	-	-	-	7	109
NEW HAMPSHIRE	7	-	-	-	-	1	-	2	-	-	-	-	-	9	80
VERMONT	4	-	-	-	-	-	-	1	-	-	-	-	-	5	37
MASSACHUSETTS	6	-	-	-	-	3	-	7	-	-	-	-	-	17	402
RHODE ISLANE	1	-	-	-	-	1	-	1	-	-	-	-	-	3	49
CONNECTICUT	4	-	-	-	-	2	-	4	-	-	-	-	-	11	230
NEW YORK	15	-	-	1	-	8	-	17	-	-	-	-	-	42	861
NEW JERSEY	17	-	4	6	2	5	1	11	5	-	28	13	2	94	647
PENNSYLVANIA	18	-	7	9	4	7	2	15	8	-	28	13	-	112	660
DELAWARE	3	-	1	2	1	1	-	1	1	-	7	3	4	24	73
MARYLAND	6	-	-	-	-	3	-	7	-	-	-	-	-	16	273
DIST COL	-	-	-	-	-	-	-	1	-	-	-	-	-	1	22
W VIRGINIA	4	-	-	-	-	1	1	3	-	-	-	-	-	10	94
VIRGINIA	12	-	-	1	-	5	-	10	1	-	3	1	1	34	378
N CAROLINA	25	-	-	-	-	5	-	11	-	-	-	-	-	41	358
S CAROLINA	10	-	-	-	-	3	-	6	-	-	-	-	-	18	178
GEORGIA	20	-	-	-	-	6	-	12	-	-	-	-	-	39	404
FLORIDA	21	2	-	-	-	9	-	18	-	-	-	-	-	50	766
MICHIGAN	50	1	1	1	1	4	-	17	-	-	5	2	-	82	470
OHIO	34	1	4	5	3	5	-	21	2	-	20	7	5	105	577
INDIANA	22	1	3	4	2	3	-	12	2	-	19	6	6	79	419
ILLINOIS	26	1	7	9	5	5	-	21	3	-	39	13	23	152	593
KENTUCKY	17	-	2	2	1	2	-	8	1	-	11	4	-	49	268
TENNESSEE	9	-	-	1	-	2	-	11	-	-	3	1	-	30	276
WISCONSIN	19	-	-	-	-	2	-	9	-	-	1	-	-	33	243
MINNESOTA	16	-	2	3	2	2	-	8	1	-	9	3	10	56	264
N DAKOTA	5	-	-	1	-	-	-	1	-	-	3	1	-	12	58
S DAKOTA	10	-	-	-	-	-	-	2	-	-	-	-	-	12	55
IOWA	20	-	-	-	-	1	-	6	-	-	-	-	-	27	161
NEBRASKA	10	-	-	-	-	1	-	3	-	-	-	-	-	14	104
MISSOURI	21	1	-	-	-	3	-	12	-	-	-	-	-	36	302
KANSAS	44	-	3	3	2	1	-	6	1	-	14	5	7	87	226
OKLAHOMA	16	-	3	4	2	2	1	7	1	-	16	5	4	61	247
ALABAMA	13	1	3	4	1	7	-	12	1	-	-	-	-	41	288
MISSISSIPPI	13	1	8	10	1	4	-	7	2	-	9	3	3	61	245
ARKANSAS	10	1	1	2	-	4	-	7	-	-	2	1	-	29	163
LOUISIANA	124	1	50	63	9	6	2	10	12	-	96	29	12	413	819
TEXAS	838	4	89	113	16	27	5	44	22	-	205	62	9	1435	2511
NEW MEXICO	16	-	2	2	-	3	-	5	-	-	3	1	-	33	120
MONTANA	4	-	-	-	-	-	-	4	1	-	5	2	2	18	74
IDAHO	2	-	-	-	-	-	-	4	-	-	-	-	-	7	62
WYOMING	4	-	-	-	-	-	1	4	1	-	7	2	-	18	67
COLORADO	10	-	-	-	-	-	-	13	-	-	2	1	1	27	175
UTAH	4	-	-	-	-	-	-	6	1	-	6	2	2	20	110
WASHINGTON	9	-	1	2	-	2	-	7	1	-	19	5	1	47	348
OREGON	4	-	-	-	-	1	-	5	-	-	-	-	-	10	165
CALIFORNIA	63	3	7	9	1	10	2	42	3	28	116	27	4	314	1788
NEVADA	5	-	-	-	-	-	-	2	-	-	-	-	-	8	80
ARIZONA	4	-	-	-	-	1	-	6	-	-	-	-	-	12	174
ALASKA	1	1	1	1	-	-	-	1	-	-	-	-	-	5	96
HAWAII	1	1	-	-	-	-	-	1	-	-	4	1	-	8	133
TOTAL US	1620	26	203	257	56	159	17	453	72	28	681	212	96	3878	17306

DUE TO INDEPENDENT ROUNDING, SUM OF STATES MAY NOT EQUAL REGIONAL TOTALS ELSEWHERE   NATIONAL PETROLEUM COUNCIL   MAY 1, 1992   TIME 16:54

1995 STATE OIL DEMANDS -- THOUSAND BARRELS PER DAY -- FOUNDATION CASE I

	UNLEADED REGULAR GASOLINE						UNLEADED MID-GRADE GASOLINE					
	CO	REFORM	CO-REF	GASOHOL	CONVENT	TOTAL	CO	REFORM	CO-REF	GASOHOL	CONVENT	TOTAL
MAINE	-	-	-	-	27	27	-	-	-	-	5	5
NEW HAMPSHIRE	5	-	-	-	16	20	1	-	-	-	4	5
VERMONT	-	-	-	-	11	11	-	-	-	-	2	2
MASSACHUSETTS	35	-	-	-	60	95	7	-	-	-	12	20
RHODE ISLANE	-	-	-	-	14	14	-	-	-	-	3	3
CONNECTICUT	-	24	24	-	-	47	-	7	7	-	-	14
NEW YORK	3	43	B9	-	70	204	1	B	17	-	13	38
NEW JERSEY	-	44	72	-	5	122	-	8	13	-	1	22
PENNSYLVANIA	-	32	24	-	122	178	-	8	6	-	31	46
DELAWARE	1	6	4	-	1	12	-	2	2	-	-	4
MARYLAND	10	19	14	-	21	65	4	8	6	-	9	28
DIST COL	2	-	-	-	2	4	1	-	-	-	1	2
W VIRGINIA	-	-	-	-	34	34	-	-	-	-	8	8
VIRGINIA	11	-	-	8	88	108	4	-	-	3	29	35
N CAROLINA	14	-	-	-	119	133	4	-	-	-	30	34
S CAROLINA	-	-	-	3	72	76	-	-	-	1	17	17
GEORGIA	-	-	-	1	138	139	-	-	-	-	34	34
FLORIDA	-	-	-	3	206	208	-	-	-	1	63	64
MICHIGAN	-	-	-	19	187	207	-	-	-	2	23	25
OHIO	25	-	-	38	165	227	5	-	-	7	30	42
INDIANA	-	14	-	25	84	123	-	2	-	4	14	20
ILLINOIS	-	147	-	21	59	226	-	20	-	3	8	30
KENTUCKY	-	-	-	16	59	75	-	-	-	5	17	21
TENNESSEE	8	-	-	14	82	104	2	-	-	4	21	27
WISCONSIN	1	39	-	2	67	108	-	3	-	-	4	7
MINNESOTA	29	-	-	7	75	110	2	-	-	-	5	7
N DAKOTA	-	-	-	2	19	21	-	-	-	-	1	1
S DAKOTA	-	-	-	3	20	23	-	-	-	-	1	1
IOWA	-	-	-	22	57	79	-	-	-	-	1	2
NEBRASKA	-	-	-	16	30	46	-	-	-	1	1	2
MISSOURI	-	-	-	7	122	129	-	-	-	1	16	17
KANSAS	-	-	-	5	64	70	-	-	-	-	4	4
OKLAHOMA	-	-	-	-	89	89	-	-	-	-	4	4
ALABAMA	-	-	-	8	81	89	-	-	-	2	16	18
MISSISSIPPI	-	-	-	-	54	54	-	-	-	-	9	9
ARKANSAS	-	-	-	-	59	59	-	-	-	-	9	9
LOUISIANA	-	-	-	2	81	83	-	-	-	-	15	16
TEXAS	6	91	-	8	304	4D8	1	13	-	1	44	59
NEW MEXICO	6	-	-	8	29	42	1	-	-	1	3	4
MONTANA	1	-	-	-	21	22	-	-	-	-	3	3
IDAHO	-	-	-	4	23	26	-	-	-	-	2	2
WYOMING	-	-	-	-	16	16	-	-	-	-	2	2
COLORADO	23	-	-	2	43	67	5	-	-	-	9	14
UTAH	11	-	-	-	23	34	2	-	-	-	4	6
WASHINGTON	34	-	-	2	80	116	2	-	-	-	4	6
OREGON	16	-	-	-	56	72	1	-	-	-	3	4
CALIFORNIA	107	149	189	4	139	588	10	13	17	-	12	53
NEVADA	14	-	-	1	15	31	1	-	-	-	1	2
ARIZONA	41	-	-	-	48	89	2	-	-	-	2	4
ALASKA	3	-	-	-	9	12	-	-	-	-	-	-
HAWAII	-	-	-	-	13	13	-	-	-	-	2	2
TOTAL US	406	607	417	252	3275	4956	54	92	67	37	551	801

DUE TO INDEPENDENT ROUNDING, SUM OF STATES MAY NOT EQUAL REGIONAL TOTALS ELSEWHERE NATIONAL PETROLEUM COUNCIL NOVEMBER 9, 1992 TIME 14:56

1995 STATE OIL DEMANDS -- THOUSAND BARRELS PER DAY -- FOUNDATION CASE I

	UNLEADED PREMIUM GASOLINE						TOTAL GASOLINE					
	CO	REFORM	CO-REF	GASOHOL	CONVENT	TOTAL	CO	REFORM	CO-REF	GASOHOL	CONVENT	TOTAL
MAINE	-	-	-	-	7	7	-	-	-	-	38	38
NEW HAMPSHIRE	2	-	-	-	6	8	7	-	-	-	26	33
VERMONT	-	-	-	-	4	4	-	-	-	-	18	18
MASSACHUSETTS	16	-	-	-	27	43	58	-	-	-	99	157
RHODE ISLANDE	-	-	-	-	7	7	-	-	-	-	24	24
CONNECTICUT	-	13	13	-	-	26	-	43	44	-	-	87
NEW YORK	2	24	51	-	40	117	6	75	157	-	123	360
NEW JERSEY	-	27	45	-	3	75	-	80	130	-	10	219
PENNSYLVANIA	-	13	9	-	48	70	-	54	40	-	201	294
DELAWARE	-	3	2	-	-	5	2	11	8	-	2	22
MARYLAND	6	12	9	-	13	40	21	39	29	-	43	132
DIST COL	2	-	-	-	3	5	5	-	-	-	7	11
W VIRGINIA	-	-	-	-	11	11	-	-	-	-	53	53
VIRGINIA	5	-	-	4	40	48	20	-	-	14	157	191
N CAROLINA	5	-	-	-	38	43	23	-	-	-	187	210
S CAROLINA	-	-	-	1	21	22	-	-	-	5	110	115
GEORGIA	-	-	-	-	52	53	-	-	-	2	223	225
FLORIDA	-	-	-	1	110	111	-	-	-	5	378	383
MICHIGAN	-	-	-	4	37	41	-	-	-	25	247	273
OHIO	5	-	-	7	32	44	34	-	-	52	227	314
INDIANA	-	3	-	5	16	23	-	18	-	34	114	166
ILLINOIS	-	36	-	5	14	55	-	202	-	28	81	311
KENTUCKY	-	-	-	5	16	21	-	-	-	26	92	117
TENNESSEE	2	-	-	4	24	31	12	-	-	22	128	162
WISCONSIN	-	6	-	-	11	17	1	47	-	2	82	133
MINNESOTA	4	-	-	1	10	14	34	-	-	8	89	131
N DAKOTA	-	-	-	-	1	1	-	-	-	2	20	23
S DAKOTA	-	-	-	-	1	1	-	-	-	4	21	25
IOWA	-	-	-	2	5	7	-	-	-	24	64	88
NEBRASKA	-	-	-	1	2	2	-	-	-	17	33	50
MISSOURI	-	-	-	1	24	26	-	-	-	10	162	172
KANSAS	-	-	-	1	6	7	-	-	-	6	74	81
OKLAHOMA	-	-	-	-	12	12	-	-	-	-	105	105
ALABAMA	-	-	-	2	24	27	-	-	-	12	121	133
MISSISSIPPI	-	-	-	-	16	16	-	-	-	-	78	78
ARKANSAS	-	-	-	-	12	12	-	-	-	-	79	79
LOUISIANA	-	-	-	1	27	28	-	-	-	3	123	126
TEXAS	1	18	-	2	61	82	8	122	-	10	409	550
NEW MEXICO	1	-	-	1	3	5	7	-	-	9	35	51
MONTANA	-	-	-	-	3	3	1	-	-	-	27	28
IDAHO	-	-	-	-	2	2	-	-	-	4	27	31
WYOMING	-	-	-	-	2	2	-	-	-	-	20	21
COLORADO	5	-	-	-	9	14	32	-	-	3	61	96
UTAH	2	-	-	-	5	7	16	-	-	-	31	47
WASHINGTON	7	-	-	-	16	23	42	-	-	3	100	145
OREGON	2	-	-	-	8	10	20	-	-	-	66	86
CALIFORNIA	36	50	64	1	47	198	152	213	270	6	198	838
NEVADA	3	-	-	-	3	6	18	-	-	1	20	39
ARIZONA	7	-	-	-	9	16	50	-	-	-	59	110
ALASKA	-	-	-	-	1	1	3	-	-	-	10	14
HAWAII	-	-	-	-	9	9	-	-	-	-	24	24
TOTAL US	114	205	193	51	898	1460	573	904	676	340	4724	7218

DUE TO INDEPENDENT ROUNDING, SUM OF STATES MAY NOT EQUAL REGIONAL TOTALS ELSEWHERE NATIONAL PETROLEUM COUNCIL NOVEMBER 9, 1992 TIME 14:56

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		DISTILLATE						HEAVY FUEL OIL				
	KERO JT	KERO+1	ON HWY	OFF HWY	DIST 2	HVY DSL	TOTAL	DIST 4	< 0.3	0.3-1	> 1.0	TOTAL
MAINE	5	2	10	2	18	1	33	-	-	14	7	22
NEW HAMPSHIRE	1	1	4	2	13	-	19	1	-	-	14	14
VERMONT	1	-	3	1	7	-	12	-	-	-	-	-
MASSACHUSETTS	35	1	19	4	68	4	96	4	-	25	49	79
RHODE ISLANE	3	-	4	1	9	1	15	-	-	2	1	3
CONNECTICUT	8	1	18	3	42	1	65	2	-	44	2	49
NEW YORK	34	7	54	11	113	2	187	13	62	71	49	195
NEW JERSEY	158	2	32	10	56	13	114	5	27	7	21	59
PENNSYLVANIA	34	4	65	18	74	6	167	2	-	29	12	43
DELAWARE	-	-	5	1	5	-	12	-	-	8	5	13
MARYLAND	32	1	26	6	21	4	58	1	-	16	15	32
DIST COL	-	-	2	-	5	1	8	-	-	-	-	1
W VIRGINIA	1	1	11	7	4	6	30	-	-	-	1	1
VIRGINIA	45	3	39	10	23	10	84	1	-	9	14	23
N CAROLINA	19	4	44	9	19	3	80	-	-	-	8	8
S CAROLINA	3	2	22	6	6	3	37	-	-	-	4	4
GEORGIA	59	-	60	12	3	7	83	-	-	-	4	4
FLORIDA	102	1	65	16	8	12	102	-	-	75	46	121
MICHIGAN	30	4	38	12	15	3	72	-	-	8	4	12
OHIO	40	5	68	15	16	9	113	-	-	-	7	8
INDIANA	71	3	56	13	9	17	98	1	-	-	12	12
ILLINOIS	16	2	60	20	8	12	102	-	-	9	5	13
KENTUCKY	19	3	49	12	6	15	86	-	-	-	2	2
TENNESSEE	16	2	42	8	1	17	70	-	-	-	2	2
WISCONSIN	5	2	32	11	16	8	69	-	-	-	4	4
MINNESOTA	18	4	24	13	12	3	55	-	-	-	4	4
N DAKOTA	3	1	6	7	3	3	20	-	-	-	1	1
S DAKOTA	2	1	6	6	2	-	16	-	-	-	-	-
IOWA	3	1	25	12	4	3	44	-	-	-	1	1
NEBRASKA	4	-	15	12	1	9	37	-	-	-	1	1
MISSOURI	30	1	46	10	3	6	65	-	-	-	3	3
KANSAS	13	-	21	11	2	12	47	-	-	-	1	1
OKLAHOMA	40	-	28	7	3	6	44	-	-	-	1	1
ALABAMA	3	3	39	16	3	15	76	-	-	-	35	35
MISSISSIPPI	9	2	27	15	3	7	52	-	-	-	48	48
ARKANSAS	2	1	28	11	2	3	44	-	-	5	5	10
LOUISIANA	56	4	33	14	25	38	115	-	-	14	101	115
TEXAS	183	18	117	60	29	50	275	-	4	11	69	84
NEW MEXICO	3	2	15	7	1	4	29	-	-	3	3	6
MONTANA	3	1	8	8	1	4	23	-	-	-	4	4
IDAHO	5	1	8	8	2	1	20	-	-	-	1	1
WYOMING	1	1	13	6	2	8	29	-	-	-	1	1
COLORADO	24	1	14	8	2	6	31	-	-	-	-	-
UTAH	22	-	9	5	1	3	18	-	-	-	5	5
WASHINGTON	58	3	27	13	8	11	63	-	4	-	33	38
OREGON	10	1	22	9	6	9	47	-	-	-	12	13
CALIFORNIA	264	1	150	55	5	29	241	2	22	1	117	142
NEVADA	11	-	10	9	1	2	22	-	-	2	-	2
ARIZONA	21	-	22	10	-	1	34	-	-	-	-	-
ALASKA	51	2	9	4	7	10	31	-	-	-	-	1
HAWAII	31	-	4	2	4	6	17	-	-	37	12	49
TOTAL US	1609	101	1552	549	699	401	3303	34	119	391	745	1289

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			-- CHEM FEED ---									---- COKE ------		--- TOTALS -----	
	LPG	AVGAS	NAPHTHA	GASOIL	SPC NAP	LUBES	WAX	ASPHALT	MISC	CRUDE	STGAS	CAT CK	MKT CK	OTHER	ALL
MAINE	4	-	-	-	-	1	-	2	-	-	-	-	-	7	105
NEW HAMPSHIRE	6	-	-	-	-	1	-	2	-	-	-	-	-	8	76
VERMONT	4	-	-	-	-	-	-	1	-	-	-	-	-	5	36
MASSACHUSETTS	6	-	-	-	-	3	-	7	-	-	-	-	-	16	383
RHODE ISLANE	1	-	-	-	-	1	-	1	-	-	-	-	-	3	47
CONNECTICUT	4	-	-	-	-	2	-	4	-	-	-	-	-	10	218
NEW YORK	14	-	-	1	-	8	-	17	-	-	-	-	-	40	816
NEW JERSEY	17	-	5	6	2	5	1	10	5	-	27	13	2	93	644
PENNSYLVANIA	17	-	8	11	4	7	2	15	8	-	27	13	-	112	649
DELAWARE	2	-	2	2	1	-	-	1	1	-	7	3	4	24	71
MARYLAND	5	-	-	-	-	3	-	6	-	-	-	-	-	15	268
DIST COL	-	-	-	-	-	-	-	1	-	-	-	-	-	1	21
W VIRGINIA	4	-	-	-	-	1	1	3	-	-	-	-	-	10	95
VIRGINIA	11	-	1	1	-	4	-	9	1	-	3	1	1	33	376
N CAROLINA	23	-	-	-	-	5	-	10	-	-	-	-	-	38	355
S CAROLINA	9	-	-	-	-	3	-	5	-	-	-	-	-	17	177
GEORGIA	18	-	-	-	-	5	-	12	-	-	-	-	-	37	408
FLORIDA	18	2	-	-	-	8	-	18	-	-	-	-	-	47	755
MICHIGAN	48	1	1	1	1	4	-	17	-	-	5	2	-	79	467
OHIO	33	1	4	6	3	4	-	20	2	-	19	6	4	103	578
INDIANA	20	1	4	5	2	3	-	12	1	-	18	6	5	77	425
ILLINOIS	24	-	8	11	5	5	-	21	3	-	38	12	22	150	593
KENTUCKY	17	-	2	2	1	2	-	8	1	-	11	4	-	48	272
TENNESSEE	9	-	1	1	-	2	-	11	-	-	3	1	-	28	278
WISCONSIN	17	-	-	-	-	2	-	9	-	-	1	-	-	30	240
MINNESOTA	15	-	3	3	2	2	-	8	1	-	9	3	10	55	263
N DAKOTA	4	-	1	1	-	-	-	1	-	-	3	1	-	12	59
S DAKOTA	9	-	-	-	-	-	-	2	-	-	-	-	-	11	54
IOWA	17	-	-	-	-	1	-	6	-	-	-	-	-	25	160
NEBRASKA	9	-	-	-	-	1	-	3	-	-	-	-	-	13	105
MISSOURI	19	1	-	-	-	3	-	12	-	-	-	-	-	34	303
KANSAS	45	-	3	4	2	1	-	5	1	-	14	5	7	88	230
OKLAHOMA	15	-	3	4	2	2	1	7	1	-	16	5	4	61	251
ALABAMA	12	1	3	4	1	7	-	11	1	-	-	-	-	40	287
MISSISSIPPI	12	1	9	11	1	4	-	7	2	-	9	3	3	62	249
ARKANSAS	9	-	1	2	-	4	-	7	-	-	2	1	-	28	164
LOUISIANA	130	1	57	72	9	6	2	10	12	-	93	28	11	430	842
TEXAS	879	4	102	129	16	26	5	43	22	-	199	60	9	1494	2587
NEW MEXICO	16	-	2	2	-	3	-	4	-	-	3	1	-	33	121
MONTANA	4	-	-	-	-	-	-	4	1	-	5	2	2	18	75
IDAHO	2	-	-	-	-	-	-	4	-	-	-	-	-	6	63
WYOMING	4	-	-	-	-	-	1	3	1	-	6	2	-	18	69
COLORADO	9	-	-	-	-	-	-	12	-	-	2	1	-	26	176
UTAH	3	-	-	-	-	-	-	6	1	-	5	2	2	20	112
WASHINGTON	8	-	2	2	-	2	-	7	1	-	19	4	1	46	349
OREGON	4	-	-	-	-	1	-	4	-	-	-	-	-	10	165
CALIFORNIA	62	3	8	10	1	9	2	41	3	27	112	26	4	307	1793
NEVADA	4	-	-	-	-	-	-	2	-	-	-	-	-	7	81
ARIZONA	4	-	-	-	-	1	-	6	-	-	-	-	-	11	176
ALASKA	1	1	1	1	-	-	-	1	-	-	-	-	-	5	101
HAWAII	-	1	-	1	-	-	-	1	-	-	4	1	-	8	128
TOTAL US	1627	25	232	293	54	154	16	439	70	27	661	205	93	3898	17316

DUE TO INDEPENDENT ROUNDING, SUM OF STATES MAY NOT EQUAL REGIONAL TOTALS ELSEWHERE NATIONAL PETROLEUM COUNCIL NOVEMBER 9, 1992 TIME 14:56

2000 STATE OIL DEMANDS -- THOUSAND BARRELS PER DAY -- FOUNDATION CASE I

	UNLEADED REGULAR GASOLINE						UNLEADED MID-GRADE GASOLINE					
	CO	REFORM	CO-REF	GASOHOL	CONVENT	TOTAL	CO	REFORM	CO-REF	GASOHOL	CONVENT	TOTAL
MAINE	-	28	-	-	-	28	-	5	-	-	-	5
NEW HAMPSHIRE	-	16	5	-	-	21	-	4	1	-	-	5
VERMONT	-	12	-	-	-	12	-	2	-	-	-	2
MASSACHUSETTS	-	62	36	-	-	98	-	13	8	-	-	21
RHODE ISLAND	-	14	-	-	-	14	-	3	-	-	-	3
CONNECTICUT	-	24	25	-	-	49	-	7	7	-	-	14
NEW YORK	-	118	95	-	-	212	-	22	18	-	-	40
NEW JERSEY	-	52	74	-	-	127	-	9	13	-	-	23
PENNSYLVANIA	-	160	25	-	-	185	-	41	6	-	-	47
DELAWARE	-	7	5	-	-	13	-	3	2	-	-	5
MARYLAND	-	42	25	-	-	67	-	18	11	-	-	29
DIST COL	-	2	2	-	-	4	-	1	1	-	-	2
W VIRGINIA	-	10	-	-	25	35	-	3	-	-	6	9
VIRGINIA	-	100	12	-	-	112	-	33	4	-	-	37
N CAROLINA	-	43	15	-	80	138	-	11	4	-	20	35
S CAROLINA	-	4	-	3	71	79	-	1	-	1	16	18
GEORGIA	-	64	-	1	80	144	-	16	-	-	19	35
FLORIDA	-	103	-	1	111	216	-	32	-	-	34	66
MICHIGAN	-	129	-	8	78	215	-	16	-	1	10	26
OHIO	-	155	26	10	45	236	-	29	5	2	8	44
INDIANA	-	63	-	15	50	128	-	11	-	2	8	21
ILLINOIS	-	165	-	18	52	235	-	22	-	2	7	31
KENTUCKY	-	36	-	9	33	78	-	10	-	3	9	22
TENNESSEE	-	47	8	8	45	108	-	12	2	2	12	28
WISCONSIN	1	47	-	1	63	113	-	3	-	-	4	7
MINNESOTA	30	-	-	7	78	114	2	-	-	-	5	7
N DAKOTA	-	-	-	2	20	22	-	-	-	-	1	1
S DAKOTA	-	-	-	3	20	24	-	-	-	-	1	1
IOWA	-	-	-	23	60	83	-	-	-	1	1	2
NEBRASKA	-	-	-	16	31	47	-	-	-	1	1	2
MISSOURI	-	75	-	3	56	134	-	10	-	-	7	17
KANSAS	-	18	-	4	50	73	-	1	-	-	3	4
OKLAHOMA	-	-	-	-	92	92	-	-	-	-	4	4
ALABAMA	-	21	-	7	65	93	-	4	-	1	13	18
MISSISSIPPI	-	-	-	-	56	56	-	-	-	-	9	9
ARKANSAS	-	-	-	-	61	61	-	-	-	-	9	9
LOUISIANA	-	15	-	2	69	86	-	3	-	-	13	16
TEXAS	-	210	6	5	203	425	-	30	1	1	29	61
NEW MEXICO	6	-	-	8	30	44	1	-	-	1	3	4
MONTANA	1	-	-	-	22	23	-	-	-	-	3	3
IDAHO	-	-	-	4	24	27	-	-	-	-	2	2
WYOMING	-	-	-	-	17	17	-	-	-	-	2	2
COLORADO	23	-	-	2	44	70	5	-	-	-	9	14
UTAH	2	13	9	-	11	35	-	2	2	-	2	6
WASHINGTON	5	40	30	1	44	121	-	2	1	-	2	6
OREGON	3	19	14	-	39	75	-	1	1	-	2	4
CALIFORNIA	-	304	307	-	-	610	-	27	28	-	-	55
NEVADA	12	4	3	1	12	32	1	-	-	-	1	3
ARIZONA	10	22	32	-	28	93	-	1	2	-	1	4
ALASKA	3	-	-	-	10	13	-	-	-	-	-	-
HAWAII	-	-	-	-	13	13	-	-	-	-	2	2
TOTAL US	97	2245	754	165	1888	5149	10	407	115	20	280	832

DUE TO INDEPENDENT ROUNDING, SUM OF STATES MAY NOT EQUAL REGIONAL TOTALS ELSEWHERE NATIONAL PETROLEUM COUNCIL NOVEMBER 9, 1992 TIME 14:56

2000 STATE OIL DEMANDS -- THOUSAND BARRELS PER DAY -- FOUNDATION CASE I

	UNLEADED PREMIUM GASOLINE						TOTAL GASOLINE					
	CO	REFORM	CO-REF	GASOHOL	CONVENT	TOTAL	CO	REFORM	CO-REF	GASOHOL	CONVENT	TOTAL
MAINE	-	7	-	-	-	7	-	40	-	-	-	40
NEW HAMPSHIRE	-	7	2	-	-	8	-	27	8	-	-	34
VERMONT	-	5	-	-	-	5	-	18	-	-	-	18
MASSACHUSETTS	-	28	16	-	-	44	-	103	60	-	-	163
RHODE ISLANE	-	7	-	-	-	7	-	25	-	-	-	25
CONNECTICUT	-	14	14	-	-	27	-	45	45	-	-	90
NEW YORK	-	67	54	-	-	122	-	207	167	-	-	374
NEW JERSEY	-	32	46	-	-	78	-	94	134	-	-	228
PENNSYLVANIA	-	63	10	-	-	73	-	264	41	-	-	305
DELAWARE	-	3	2	-	-	5	-	13	10	-	-	23
MARYLAND	-	26	16	-	-	41	-	86	52	-	-	137
DIST COL	-	3	2	-	-	6	-	7	5	-	-	12
W VIRGINIA	-	3	-	-	8	11	-	16	-	-	39	55
VIRGINIA	-	45	5	-	-	50	-	178	21	-	-	199
N CAROLINA	-	14	5	-	26	44	-	68	24	-	127	218
S CAROLINA	-	1	-	1	20	23	-	6	-	5	108	120
GEORGIA	-	24	-	-	30	55	-	103	-	1	130	234
FLORIDA	-	55	-	1	59	115	-	190	-	3	205	398
MICHIGAN	-	25	-	2	15	42	-	170	-	11	103	283
OHIO	-	30	5	2	9	46	-	214	36	14	62	326
INDIANA	-	12	-	3	9	24	-	85	-	20	67	173
ILLINOIS	-	40	-	4	13	57	-	226	-	25	72	323
KENTUCKY	-	10	-	3	9	22	-	57	-	14	51	122
TENNESSEE	-	14	2	2	14	32	-	73	13	12	71	168
WISCONSIN	-	8	-	-	10	18	1	58	-	2	77	138
MINNESOTA	4	-	-	1	10	15	36	-	-	8	92	136
N DAKOTA	-	-	-	-	1	1	-	-	-	3	21	24
S DAKOTA	-	-	-	-	1	1	-	-	-	4	22	26
IOWA	-	-	-	2	5	7	-	-	-	25	66	92
NEBRASKA	-	-	-	1	2	3	-	-	-	18	34	52
MISSOURI	-	15	-	1	11	27	-	99	-	5	75	178
KANSAS	-	2	-	-	5	7	-	21	-	5	58	84
OKLAHOMA	-	-	-	-	13	13	-	-	-	-	109	109
ALABAMA	-	6	-	2	19	28	-	31	-	10	97	138
MISSISSIPPI	-	-	-	-	17	17	-	-	-	-	81	81
ARKANSAS	-	-	-	-	12	12	-	-	-	-	82	82
LOUISIANA	-	5	-	1	23	29	-	24	-	3	105	131
TEXAS	-	42	1	1	41	86	-	283	9	7	273	572
NEW MEXICO	1	-	-	1	4	5	7	-	-	10	36	53
MONTANA	-	-	-	-	3	3	1	-	-	-	28	29
IDAHO	-	-	-	-	2	2	-	-	-	4	28	32
WYOMING	-	-	-	-	2	2	-	-	-	-	21	21
COLORADO	5	-	-	-	9	15	33	-	-	3	63	99
UTAH	-	3	2	-	2	7	3	18	13	-	15	48
WASHINGTON	1	8	6	-	9	24	7	50	37	2	55	151
OREGON	-	3	2	-	5	11	4	23	17	-	46	89
CALIFORNIA	-	102	103	-	-	205	-	433	437	-	-	870
NEVADA	2	1	1	-	2	6	15	5	4	1	16	41
ARIZONA	2	4	6	-	5	17	12	27	40	-	35	114
ALASKA	-	-	-	-	1	1	3	-	-	-	11	14
HAWAII	-	-	-	-	9	9	-	-	-	-	25	25
TOTAL US	16	734	300	29	437	1516	123	3386	1169	214	2606	7498

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2000 STATE OIL DEMANDS -- THOUSAND BARRELS PER DAY -- FOUNDATION CASE I

		DISTILLATE						HEAVY FUEL OIL				
	KERO JT	KERO+1	ON HWY	OFF HWY	DIST 2	HVY DSL	TOTAL	DIST 4	< 0.3	0.3-1	> 1.0	TOTAL
MAINE	6	1	11	2	16	1	32	-	-	18	7	26
NEW HAMPSHIRE	1	1	5	2	11	-	18	1	-	-	18	19
VERMONT	1	-	4	2	6	-	12	-	-	-	-	-
MASSACHUSETTS	40	-	21	4	60	5	90	4	-	33	64	101
RHODE ISLANE	3	-	5	1	8	1	14	-	-	2	1	3
CONNECTICUT	9	1	20	3	36	1	61	2	-	60	2	64
NEW YORK	39	6	59	12	103	2	182	11	83	94	61	249
NEW JERSEY	179	2	35	11	52	14	114	4	35	9	23	71
PENNSYLVANIA	38	4	71	20	69	6	169	2	-	38	13	53
DELAWARE	-	-	6	1	5	-	13	-	-	11	6	17
MARYLAND	36	1	28	6	21	4	62	-	-	21	18	40
DIST COL	-	-	2	-	9	1	12	-	-	-	-	1
W VIRGINIA	1	1	12	8	5	7	33	-	-	-	1	1
VIRGINIA	51	3	42	11	22	11	88	1	-	11	17	29
N CAROLINA	22	3	48	10	19	4	84	-	-	-	8	8
S CAROLINA	3	1	23	7	6	3	40	-	-	-	4	5
GEORGIA	67	-	65	14	4	8	92	-	-	-	4	4
FLORIDA	116	1	71	18	11	13	114	-	-	101	57	157
MICHIGAN	34	3	41	14	16	4	77	-	-	10	4	15
OHIO	45	4	75	17	16	10	121	-	-	-	8	9
INDIANA	81	3	61	15	10	18	107	1	-	-	12	13
ILLINOIS	18	2	65	23	9	13	112	-	-	10	5	15
KENTUCKY	22	2	54	14	7	17	94	-	-	-	2	2
TENNESSEE	18	2	45	9	2	18	76	-	-	-	2	2
WISCONSIN	5	2	35	13	15	8	73	-	-	-	4	4
MINNESOTA	21	3	26	14	11	3	58	-	-	-	4	4
N DAKOTA	3	1	7	9	3	3	22	-	-	-	1	1
S DAKOTA	3	1	7	7	2	-	17	-	-	-	-	-
IOWA	3	1	27	14	4	3	48	-	-	-	1	1
NEBRASKA	5	-	16	14	1	9	41	-	-	-	1	1
MISSOURI	34	1	50	12	3	6	72	-	-	-	3	3
KANSAS	15	-	23	13	2	13	52	-	-	-	1	1
OKLAHOMA	46	-	30	8	3	6	48	-	-	-	1	1
ALABAMA	3	2	42	19	4	16	83	-	-	-	35	35
MISSISSIPPI	10	2	29	17	3	7	58	-	-	-	52	52
ARKANSAS	3	1	31	13	2	3	49	-	-	5	5	10
LOUISIANA	63	4	36	16	30	42	128	-	-	15	108	123
TEXAS	207	17	128	69	36	55	304	-	4	12	75	90
NEW MEXICO	3	2	16	8	2	4	32	-	-	3	3	6
MONTANA	4	1	9	9	1	5	25	-	-	-	4	4
IDAHO	6	-	9	9	1	2	22	-	-	-	1	1
WYOMING	1	1	14	6	2	8	32	-	-	-	1	1
COLORADO	27	1	15	9	2	7	34	-	-	-	-	-
UTAH	25	-	10	6	2	3	20	-	-	-	6	6
WASHINGTON	66	3	29	14	7	12	66	-	4	-	36	41
OREGON	11	1	24	10	6	9	50	-	-	-	13	14
CALIFORNIA	298	1	163	62	6	32	265	2	28	2	129	160
NEVADA	12	-	10	11	1	2	24	-	-	2	-	2
ARIZONA	24	-	24	11	1	1	37	-	-	-	-	-
ALASKA	58	1	10	4	8	11	34	-	-	-	-	1
HAWAII	35	-	4	3	8	6	21	-	-	47	12	59
TOTAL US	1819	88	1694	623	690	438	3533	31	155	508	835	1529

DUE TO INDEPENDENT ROUNDING, SUM OF STATES MAY NOT EQUAL REGIONAL TOTALS ELSEWHERE NATIONAL PETROLEUM COUNCIL NOVEMBER 9, 1992 TIME 14:56

2000 STATE OIL DEMANDS -- THOUSAND BARRELS PER DAY -- FOUNDATION CASE I

			-- CHEM FEED ---									---- COKE ------		--- TOTALS -----	
	LPG	AVGAS	NAPHTHA	GASOIL	SPC NAP	LUBES	WAX	ASPHALT	MISC	CRUDE	STGAS	CAT CK	MKT CK	OTHER	ALL
MAINE	4	-	-	-	-	1	-	2	-	-	-	-	-	7	110
NEW HAMPSHIRE	6	-	-	-	-	1	-	2	-	-	-	-	-	8	80
VERMONT	3	-	-	-	-	-	-	1	-	-	-	-	-	5	36
MASSACHUSETTS	5	-	-	-	-	3	-	7	-	-	-	-	-	16	410
RHODE ISLANE	1	-	-	-	-	1	-	1	-	-	-	-	-	3	48
CONNECTICUT	4	-	-	-	-	2	-	4	-	-	-	-	-	10	234
NEW YORK	13	-	1	1	-	8	-	17	-	-	-	-	-	40	884
NEW JERSEY	18	-	6	7	2	5	1	10	5	-	28	13	2	98	690
PENNSYLVANIA	17	-	10	12	4	7	2	15	8	-	27	13	-	116	682
DELAWARE	2	-	2	2	1	-	-	1	1	-	7	3	4	24	77
MARYLAND	5	-	-	-	-	3	-	7	-	-	-	-	-	15	290
DIST COL	-	-	-	-	-	-	-	1	-	-	-	-	-	1	25
W VIRGINIA	4	-	-	-	-	1	1	3	-	-	-	-	-	10	101
VIRGINIA	11	-	1	1	-	5	-	10	1	-	3	1	1	33	399
N CAROLINA	21	-	-	-	-	5	-	10	-	-	-	-	-	37	369
S CAROLINA	8	-	-	-	-	3	-	6	-	-	-	-	-	17	184
GEORGIA	17	-	-	1	-	6	-	12	-	-	-	-	-	36	433
FLORIDA	17	2	-	-	-	9	-	18	-	-	-	-	-	46	831
MICHIGAN	49	1	1	2	1	4	-	17	-	-	5	2	-	81	491
OHIO	33	1	5	6	3	5	-	21	2	-	20	7	4	106	608
INDIANA	19	1	4	6	2	3	-	12	2	-	18	6	6	78	451
ILLINOIS	24	-	10	12	5	5	-	21	3	-	39	13	23	155	624
KENTUCKY	17	-	2	3	1	2	-	8	1	-	11	4	-	50	290
TENNESSEE	8	-	1	1	-	2	-	11	-	-	3	1	-	29	293
WISCONSIN	16	-	-	-	-	2	-	9	-	-	1	-	-	30	249
MINNESOTA	14	-	3	4	2	2	-	8	1	-	9	3	10	55	274
N DAKOTA	4	-	1	1	-	-	-	1	-	-	3	1	-	12	62
S DAKOTA	8	-	-	-	-	-	-	2	-	-	-	-	-	10	56
IOWA	16	-	-	-	-	1	-	6	-	-	-	-	-	24	167
NEBRASKA	8	-	-	-	-	1	-	3	-	-	-	-	-	13	112
MISSOURI	18	1	-	-	-	3	-	12	-	-	-	-	-	33	320
KANSAS	49	-	4	5	2	1	-	6	1	-	14	5	7	94	246
OKLAHOMA	16	-	4	5	2	2	1	7	1	-	16	5	4	64	268
ALABAMA	11	1	4	5	1	7	-	12	1	-	-	-	-	41	300
MISSISSIPPI	12	1	10	13	1	4	-	7	2	-	9	3	3	66	267
ARKANSAS	9	1	2	2	-	4	-	7	-	-	2	1	-	28	173
LOUISIANA	146	1	65	82	9	6	2	10	12	-	95	29	12	469	914
TEXAS	988	4	117	148	16	27	5	44	22	-	204	62	9	1646	2819
NEW MEXICO	17	-	2	3	-	3	-	4	-	-	3	1	-	35	129
MONTANA	4	-	-	-	-	-	-	4	1	-	5	2	2	18	80
IDAHO	2	-	-	-	-	-	-	4	-	-	-	-	-	6	67
WYOMING	4	-	-	-	-	-	1	3	1	-	7	2	-	18	73
COLORADO	9	-	-	-	-	-	-	12	-	-	2	1	1	26	187
UTAH	4	-	-	-	-	-	-	6	1	-	6	2	2	20	119
WASHINGTON	9	-	2	2	-	2	-	7	1	-	19	4	1	47	371
OREGON	4	-	-	-	-	1	-	5	-	-	-	-	-	10	174
CALIFORNIA	64	3	9	11	1	10	2	41	3	28	115	27	4	318	1912
NEVADA	5	-	-	-	-	-	-	2	-	-	-	-	-	7	87
ARIZONA	4	-	-	-	-	1	-	6	-	-	-	-	-	11	187
ALASKA	1	1	1	1	-	-	-	1	-	-	-	-	-	5	111
HAWAII	-	1	1	1	-	-	-	1	-	-	4	1	-	8	149
TOTAL US	1748	26	267	338	56	158	16	449	72	28	676	210	95	4137	18516

DUE TO INDEPENDENT ROUNDING, SUM OF STATES MAY NOT EQUAL REGIONAL TOTALS ELSEWHERE NATIONAL PETROLEUM COUNCIL NOVEMBER 9, 1992 TIME 14:56

2010 STATE OIL DEMANDS -- THOUSAND BARRELS PER DAY -- FOUNDATION CASE I

	UNLEADED REGULAR GASOLINE						UNLEADED MID-GRADE GASOLINE					
	CO	REFORM	CO-REF	GASOHOL	CONVENT	TOTAL	CO	REFORM	CO-REF	GASOHOL	CONVENT	TOTAL
MAINE	-	30	-	-	-	30	-	5	-	-	-	5
NEW HAMPSHIRE	-	18	5	-	-	23	-	4	1	-	-	5
VERMONT	-	13	-	-	-	13	-	2	-	-	-	2
MASSACHUSETTS	-	67	39	-	-	106	-	14	8	-	-	22
RHODE ISLANE	-	15	-	-	-	15	-	3	-	-	-	3
CONNECTICUT	-	26	26	-	-	53	-	8	8	-	-	15
NEW YORK	-	127	102	-	-	229	-	24	19	-	-	43
NEW JERSEY	-	56	80	-	-	136	-	10	14	-	-	25
PENNSYLVANIA	-	172	27	-	-	199	-	44	7	-	-	51
DELAWARE	-	8	6	-	-	14	-	3	2	-	-	5
MARYLAND	-	45	27	-	-	73	-	19	12	-	-	31
DIST COL	-	2	2	-	-	4	-	1	1	-	-	2
W VIRGINIA	-	11	-	-	27	38	-	3	-	-	7	9
VIRGINIA	-	108	13	-	-	121	-	35	4	-	-	39
N CAROLINA	-	46	16	-	87	149	-	12	4	-	22	38
S CAROLINA	-	4	-	4	77	85	-	1	-	1	18	19
GEORGIA	-	69	-	1	86	156	-	17	-	-	21	38
FLORIDA	-	111	-	2	120	233	-	34	-	-	37	72
MICHIGAN	-	138	-	9	84	231	-	17	-	1	10	28
OHIO	-	168	28	11	48	255	-	31	5	2	9	47
INDIANA	-	68	-	16	53	138	-	11	-	3	9	23
ILLINOIS	-	177	-	20	56	253	-	24	-	3	8	34
KENTUCKY	-	39	-	10	35	84	-	11	-	3	10	24
TENNESSEE	-	50	9	8	49	117	-	13	2	2	13	30
WISCONSIN	1	51	-	2	68	121	-	3	-	-	4	8
MINNESOTA	32	-	-	7	84	123	2	-	-	-	5	8
N DAKOTA	-	-	-	3	21	24	-	-	-	-	1	1
S DAKOTA	-	-	-	4	22	26	-	-	-	-	1	1
IOWA	-	-	-	25	64	89	-	-	-	1	1	2
NEBRASKA	-	-	-	18	34	51	-	-	-	1	1	2
MISSOURI	-	80	-	4	61	145	-	10	-	-	8	19
KANSAS	-	19	-	5	54	78	-	1	-	-	3	4
OKLAHOMA	-	-	-	-	99	99	-	-	-	-	4	4
ALABAMA	-	23	-	7	70	100	-	5	-	1	14	20
MISSISSIPPI	-	-	-	-	60	60	-	-	-	-	10	10
ARKANSAS	-	-	-	-	66	66	-	-	-	-	10	10
LOUISIANA	-	17	-	2	74	93	-	3	-	-	14	18
TEXAS	-	226	7	6	219	458	-	33	1	1	32	66
NEW MEXICO	6	-	-	9	32	47	1	-	-	1	3	4
MONTANA	1	-	-	-	24	25	-	-	-	-	3	3
IDAHO	-	-	-	4	26	30	-	-	-	-	2	2
WYOMING	-	-	-	-	18	18	-	-	-	-	2	2
COLORADO	25	-	-	2	48	75	5	-	-	-	10	15
UTAH	2	14	10	-	12	38	-	2	2	-	2	7
WASHINGTON	6	43	32	1	47	130	-	2	2	-	2	6
OREGON	3	20	15	-	42	81	-	1	1	-	2	4
CALIFORNIA	-	327	330	-	-	657	-	29	30	-	-	59
NEVADA	13	4	3	1	13	34	1	-	-	-	1	3
ARIZONA	11	24	35	-	31	100	1	1	2	-	1	5
ALASKA	3	-	-	-	10	14	-	-	-	-	-	1
HAWAII	-	-	-	-	14	14	-	-	-	-	2	2
TOTAL US	104	2419	812	178	2035	5548	10	438	124	22	302	897

DUE TO INDEPENDENT ROUNDING, SUM OF STATES MAY NOT EQUAL REGIONAL TOTALS ELSEWHERE NATIONAL PETROLEUM COUNCIL NOVEMBER 9, 1992 TIME 14:56

2010 STATE OIL DEMANDS -- THOUSAND BARRELS PER DAY -- FOUNDATION CASE I

	UNLEADED PREMIUM GASOLINE						TOTAL GASOLINE					
	CO	REFORM	CO-REF	GASOHOL	CONVENT	TOTAL	CO	REFORM	CO-REF	GASOHOL	CONVENT	TOTAL
MAINE	-	8	-	-	-	8	-	43	-	-	-	43
NEW HAMPSHIRE	-	7	2	-	-	9	-	29	8	-	-	37
VERMONT	-	5	-	-	-	5	-	20	-	-	-	20
MASSACHUSETTS	-	30	17	-	-	48	-	111	64	-	-	176
RHODE ISLANE	-	8	-	-	-	8	-	27	-	-	-	27
CONNECTICUT	-	15	15	-	-	29	-	48	49	-	-	97
NEW YORK	-	73	59	-	-	131	-	223	180	-	-	403
NEW JERSEY	-	35	50	-	-	84	-	101	144	-	-	245
PENNSYLVANIA	-	68	10	-	-	78	-	285	44	-	-	328
DELAWARE	-	3	2	-	-	6	-	14	10	-	-	25
MARYLAND	-	28	17	-	-	44	-	92	56	-	-	148
DIST COL	-	3	3	-	-	6	-	7	5	-	-	13
W VIRGINIA	-	3	-	-	8	12	-	17	-	-	42	59
VIRGINIA	-	48	6	-	-	54	-	192	22	-	-	214
N CAROLINA	-	15	5	-	28	48	-	73	25	-	136	235
S CAROLINA	-	1	-	1	22	24	-	7	-	6	117	129
GEORGIA	-	26	-	-	33	59	-	111	-	1	140	252
FLORIDA	-	59	-	1	64	124	-	205	-	3	221	429
MICHIGAN	-	27	-	2	17	45	-	183	-	11	111	305
OHIO	-	33	5	2	9	50	-	231	38	15	67	351
INDIANA	-	13	-	3	10	26	-	92	-	22	72	186
ILLINOIS	-	43	-	5	14	61	-	244	-	27	77	348
KENTUCKY	-	11	-	3	10	24	-	61	-	15	55	131
TENNESSEE	-	15	3	2	15	35	-	78	14	13	76	181
WISCONSIN	-	8	-	-	11	19	1	62	-	2	83	148
MINNESOTA	4	-	-	1	11	16	38	-	-	9	100	147
N DAKOTA	-	-	-	-	1	1	-	-	-	3	23	26
S DAKOTA	-	-	-	-	1	2	-	-	-	4	24	28
IOWA	-	-	-	2	6	8	-	-	-	27	71	99
NEBRASKA	-	-	-	1	2	3	-	-	-	19	37	56
MISSOURI	-	16	-	1	12	29	-	107	-	5	80	192
KANSAS	-	2	-	-	5	8	-	22	-	5	63	90
OKLAHOMA	-	-	-	-	14	14	-	-	-	-	118	118
ALABAMA	-	7	-	2	21	30	-	34	-	11	105	149
MISSISSIPPI	-	-	-	-	18	18	-	-	-	-	88	88
ARKANSAS	-	-	-	-	13	13	-	-	-	-	89	89
LOUISIANA	-	6	-	1	25	31	-	25	-	3	113	141
TEXAS	-	46	1	1	44	92	-	305	9	8	295	616
NEW MEXICO	1	-	-	1	4	6	8	-	-	10	39	57
MONTANA	-	-	-	-	3	4	1	-	-	-	30	31
IDAHO	-	-	-	-	2	3	-	-	-	5	30	35
WYOMING	-	-	-	-	3	3	-	-	-	-	23	23
COLORADO	5	-	-	-	10	16	36	-	-	3	68	107
UTAH	1	3	2	-	2	8	3	19	14	-	16	52
WASHINGTON	1	9	6	-	9	26	7	54	40	2	59	162
OREGON	-	3	2	-	6	11	4	24	18	-	50	96
CALIFORNIA	-	110	111	-	-	221	-	466	471	-	-	937
NEVADA	3	1	1	-	3	7	16	5	4	1	17	44
ARIZONA	2	4	6	-	6	18	13	29	43	-	37	122
ALASKA	-	-	-	-	1	1	4	-	-	-	12	15
HAWAII	-	-	-	-	10	10	-	-	-	-	26	26
TOTAL US	18	790	324	31	471	1634	132	3647	1260	231	2808	8078

DUE TO INDEPENDENT ROUNDING, SUM OF STATES MAY NOT EQUAL REGIONAL TOTALS ELSEWHERE NATIONAL PETROLEUM COUNCIL NOVEMBER 9, 1992 TIME 14:56

2010 STATE OIL DEMANDS -- THOUSAND BARRELS PER DAY -- FOUNDATION CASE I

	KERO JT	DISTILLATE KERD+1	ON HWY	OFF HWY	DIST 2	HVY DSL	TOTAL	HEAVY FUEL OIL DIST 4	< 0.3	0.3-1	> 1.0	TOTAL
MAINE	7	1	13	2	13	2	31	-	-	16	7	24
NEW HAMPSHIRE	1	-	5	2	9	-	17	-	-	-	15	16
VERMONT	1	-	4	2	5	-	11	-	-	-	-	-
MASSACHUSETTS	49	-	25	4	47	5	82	3	-	28	54	85
RHODE ISLANE	3	-	5	1	6	1	13	-	-	2	1	3
CONNECTICUT	11	1	23	4	28	1	56	1	-	49	2	53
NEW YORK	47	4	69	14	79	3	170	9	68	78	51	206
NEW JERSEY	218	2	42	12	40	17	113	3	30	8	26	67
PENNSYLVANIA	47	3	84	23	55	7	171	1	-	33	15	49
DELAWARE	-	-	7	2	4	-	13	-	-	9	6	15
MARYLAND	44	1	33	8	17	5	64	-	-	17	17	35
DIST COL	-	-	2	-	7	1	11	-	-	-	-	-
W VIRGINIA	2	1	15	9	5	8	38	-	-	-	2	2
VIRGINIA	62	2	50	13	18	13	95	1	-	10	16	27
N CAROLINA	27	2	57	12	16	4	91	-	-	-	9	9
S CAROLINA	4	1	28	8	5	3	45	-	-	-	5	5
GEORGIA	82	-	77	16	4	9	107	-	-	-	5	5
FLORIDA	141	1	84	20	9	16	130	-	-	83	53	137
MICHIGAN	42	2	49	16	13	4	84	-	-	10	4	14
OHIO	55	3	88	19	13	12	136	-	-	-	9	10
INDIANA	99	2	72	18	8	22	122	1	-	-	14	14
ILLINOIS	22	1	77	27	8	16	130	-	-	10	5	15
KENTUCKY	27	2	64	16	7	20	108	-	-	-	2	2
TENNESSEE	22	1	54	11	1	22	89	-	-	-	2	2
WISCONSIN	6	1	41	14	12	10	79	-	-	-	4	4
MINNESOTA	25	3	30	17	9	4	63	-	-	-	4	4
N DAKOTA	4	-	8	10	3	3	25	-	-	-	1	1
S DAKOTA	3	1	8	8	2	-	19	-	-	-	-	-
IOWA	4	1	32	16	4	3	55	-	-	-	1	1
NEBRASKA	6	-	19	16	1	11	48	-	-	-	1	1
MISSOURI	41	1	59	14	3	7	83	-	-	-	3	3
KANSAS	19	-	28	15	2	16	61	-	-	-	1	1
OKLAHOMA	56	-	36	9	4	7	56	-	-	-	2	2
ALABAMA	4	2	50	22	4	19	96	-	-	-	34	34
MISSISSIPPI	12	1	34	20	3	9	67	-	-	-	57	57
ARKANSAS	3	1	36	15	2	3	57	-	-	6	6	11
LOUISIANA	77	4	43	19	35	49	149	-	-	16	122	138
TEXAS	253	14	152	80	40	65	350	-	4	12	85	101
NEW MEXICO	4	2	19	9	2	5	37	-	-	4	3	7
MONTANA	5	1	11	11	1	5	29	-	-	-	4	4
IDAHO	8	-	11	11	1	2	25	-	-	-	1	1
WYOMING	1	1	17	8	2	10	38	-	-	-	1	1
COLORADO	33	-	18	11	2	8	39	-	-	-	-	-
UTAH	31	-	12	6	2	3	23	-	-	-	6	6
WASHINGTON	80	2	35	17	6	14	74	-	4	-	42	47
OREGON	13	-	29	12	5	11	57	-	-	-	15	16
CALIFORNIA	364	1	193	72	6	38	310	2	24	2	148	176
NEVADA	15	-	12	12	1	2	28	-	-	2	-	2
ARIZONA	29	-	29	13	1	1	44	-	-	-	-	-
ALASKA	70	1	12	5	7	13	37	-	-	-	-	1
HAWAII	43	-	5	3	7	8	22	-	-	39	12	52
TOTAL US	2219	68	2007	723	581	519	3898	26	131	433	879	1469

DUE TO INDEPENDENT ROUNDING, SUM OF STATES MAY NOT EQUAL REGIONAL TOTALS ELSEWHERE NATIONAL PETROLEUM COUNCIL NOVEMBER 9, 1992 TIME 14:56

APP L.III.1-31

2010 STATE OIL DEMANDS -- THOUSAND BARRELS PER DAY -- FOUNDATION CASE I

			-- CHEM FEED ---									---- COKE ------		--- TOTALS -----	
	LPG	AVGAS	NAPHTHA	GASOIL	SPC NAP	LUBES	WAX	ASPHALT	MISC	CRUDE	STGAS	CAT CK	MKT CK	OTHER	ALL
MAINE	4	-	-	-	-	1	-	2	-	-	-	-	-	7	111
NEW HAMPSHIRE	6	-	-	-	-	1	-	2	-	-	-	-	-	8	78
VERMONT	3	-	-	-	-	-	-	1	-	-	-	-	-	4	37
MASSACHUSETTS	5	-	-	-	-	4	-	8	-	-	-	-	-	16	408
RHODE ISLANE	1	-	-	-	-	1	-	1	-	-	-	-	-	3	49
CONNECTICUT	4	-	-	-	-	2	-	4	-	-	-	-	-	10	228
NEW YORK	11	-	1	1	-	8	-	18	-	-	-	-	-	40	865
NEW JERSEY	21	-	7	9	2	5	1	11	5	-	29	13	2	106	748
PENNSYLVANIA	18	-	12	15	4	7	2	15	8	-	28	13	-	125	720
DELAWARE	2	-	2	3	1	1	-	1	2	-	7	3	4	26	79
MARYLAND	5	-	-	-	-	3	-	7	-	-	-	-	-	15	306
DIST COL	-	-	-	-	-	-	-	1	-	-	-	-	-	1	25
W VIRGINIA	5	-	-	-	-	1	1	3	-	-	-	-	-	11	110
VIRGINIA	10	-	1	1	-	5	-	10	1	-	3	1	2	34	431
N CAROLINA	19	-	-	-	-	5	-	11	-	-	-	-	-	36	397
S CAROLINA	8	-	-	-	-	3	-	6	-	-	-	-	-	17	199
GEORGIA	16	-	1	1	-	6	-	12	-	-	-	-	-	36	481
FLORIDA	16	2	-	-	-	9	-	19	-	-	-	-	-	46	882
MICHIGAN	52	1	2	2	1	4	-	18	-	-	5	2	-	86	531
OHIO	35	1	6	8	3	5	-	22	2	-	21	7	5	113	665
INDIANA	17	1	5	7	2	3	-	12	2	-	19	6	6	81	501
ILLINOIS	24	1	12	15	5	5	-	22	3	-	40	13	23	164	679
KENTUCKY	19	-	3	3	1	2	-	9	1	-	12	4	-	54	322
TENNESSEE	8	-	1	1	-	3	-	12	-	-	4	1	-	29	323
WISCONSIN	14	-	-	1	-	2	-	9	-	-	1	-	-	29	267
MINNESOTA	13	-	4	5	2	2	-	9	1	-	9	3	10	57	297
N DAKOTA	4	-	1	1	-	-	-	2	-	-	3	1	-	12	68
S DAKOTA	7	-	-	-	-	-	-	2	-	-	-	-	-	9	60
IOWA	14	-	-	-	-	1	-	6	-	-	-	-	-	22	181
NEBRASKA	7	-	-	-	-	1	-	4	-	-	-	-	-	12	123
MISSOURI	16	1	-	-	-	3	-	12	-	-	-	-	-	32	352
KANSAS	56	-	4	6	2	1	-	6	1	-	15	5	8	105	276
OKLAHOMA	18	-	5	6	2	2	1	7	1	-	16	5	4	69	300
ALABAMA	10	1	5	6	1	7	-	12	1	-	-	-	-	43	326
MISSISSIPPI	12	1	13	16	1	4	-	7	2	-	9	3	3	72	296
ARKANSAS	8	1	2	3	-	5	-	8	-	-	2	1	-	29	190
LOUISIANA	175	1	80	101	9	7	2	11	13	-	98	30	12	538	1043
TEXAS	1185	4	144	182	17	28	5	46	23	-	211	64	9	1917	3237
NEW MEXICO	19	-	3	3	-	3	-	5	-	-	4	1	-	39	144
MONTANA	4	-	-	-	-	-	-	4	1	-	5	2	2	18	88
IDAHO	2	-	-	-	-	-	-	4	-	-	-	-	-	7	75
WYOMING	5	-	-	-	-	-	1	4	1	-	7	2	-	19	82
COLORADO	10	-	-	-	-	-	-	13	-	-	3	1	1	27	207
UTAH	4	-	-	-	-	-	-	7	1	-	6	2	2	21	133
WASHINGTON	10	-	2	3	-	2	-	7	1	-	20	5	1	50	414
OREGON	4	-	-	-	-	1	-	5	-	-	-	-	-	10	192
CALIFORNIA	70	3	11	14	1	10	2	43	3	29	119	28	4	336	2124
NEVADA	5	-	-	-	-	-	-	2	-	-	-	-	-	8	97
ARIZONA	4	-	-	-	-	1	-	6	-	-	-	-	-	11	207
ALASKA	1	1	1	1	-	-	-	1	-	-	-	-	-	6	129
HAWAII	-	1	1	1	-	-	-	1	-	-	4	1	-	9	152
TOTAL US	1984	27	327	414	57	163	17	464	74	29	699	217	98	4572	20236

DUE TO INDEPENDENT ROUNDING, SUM OF STATES MAY NOT EQUAL REGIONAL TOTALS ELSEWHERE   NATIONAL PETROLEUM COUNCIL   NOVEMBER 9, 1992   TIME 14:56

APP L.III.1-32

1995 STATE OIL DEMANDS -- THOUSAND BARRELS PER DAY -- FOUNDATION CASE II

	UNLEADED REGULAR GASOLINE						UNLEADED MID-GRADE GASOLINE					
	CO	REFORM	CO-REF	GASOHOL	CONVENT	TOTAL	CO	REFORM	CO-REF	GASOHOL	CONVENT	TOTAL
MAINE	-	-	-	-	27	27	-	-	-	-	5	5
NEW HAMPSHIRE	5	-	-	-	16	20	1	-	-	-	4	5
VERMONT	-	-	-	-	11	11	-	-	-	-	2	2
MASSACHUSETTS	35	-	-	-	60	95	7	-	-	-	12	20
RHODE ISLANE	-	-	-	-	14	14	-	-	-	-	3	3
CONNECTICUT	-	24	24	-	-	47	-	7	7	-	-	14
NEW YORK	3	43	89	-	70	204	1	8	17	-	13	38
NEW JERSEY	-	44	72	-	5	122	-	8	13	-	1	22
PENNSYLVANIA	-	32	24	-	122	178	-	8	6	-	31	46
DELAWARE	1	6	4	-	1	12	-	2	2	-	-	4
MARYLAND	10	19	14	-	21	65	4	8	6	-	9	28
DIST COL	2	-	-	-	2	4	1	-	-	-	1	2
W VIRGINIA	-	-	-	-	34	34	-	-	-	-	8	8
VIRGINIA	11	-	-	8	88	108	4	-	-	3	29	35
N CAROLINA	14	-	-	-	119	133	4	-	-	-	30	34
S CAROLINA	-	-	-	3	72	76	-	-	-	1	17	17
GEORGIA	-	-	-	1	138	139	-	-	-	-	34	34
FLORIDA	-	-	-	3	206	208	-	-	-	1	63	64
MICHIGAN	-	-	-	19	187	207	-	-	-	2	23	25
OHIO	25	-	-	38	165	227	5	-	-	7	30	42
INDIANA	-	14	-	25	84	123	-	2	-	4	14	20
ILLINOIS	-	147	-	21	59	226	-	20	-	3	8	30
KENTUCKY	-	-	-	16	59	75	-	-	-	5	17	21
TENNESSEE	8	-	-	14	82	104	2	-	-	4	21	27
WISCONSIN	1	39	-	2	67	108	-	3	-	-	4	7
MINNESOTA	29	-	-	7	75	110	2	-	-	-	5	7
N DAKOTA	-	-	-	2	19	21	-	-	-	-	1	1
S DAKOTA	-	-	-	3	20	23	-	-	-	-	1	1
IOWA	-	-	-	22	57	79	-	-	-	-	1	2
NEBRASKA	-	-	-	16	30	46	-	-	-	1	1	2
MISSOURI	-	-	-	7	122	129	-	-	-	1	16	17
KANSAS	-	-	-	5	64	70	-	-	-	-	4	4
OKLAHOMA	-	-	-	-	89	89	-	-	-	-	4	4
ALABAMA	-	-	-	8	81	89	-	-	-	2	16	18
MISSISSIPPI	-	-	-	-	54	54	-	-	-	-	9	9
ARKANSAS	-	-	-	-	59	59	-	-	-	-	9	9
LOUISIANA	-	-	-	2	81	83	-	-	-	-	15	16
TEXAS	6	91	-	8	304	408	1	13	-	1	44	59
NEW MEXICO	6	-	-	8	29	42	1	-	-	1	3	4
MONTANA	1	-	-	-	21	22	-	-	-	-	3	3
IDAHO	-	-	-	4	23	26	-	-	-	-	2	2
WYOMING	-	-	-	-	16	16	-	-	-	-	2	2
COLORADO	23	-	-	2	43	67	5	-	-	-	9	14
UTAH	11	-	-	-	23	34	2	-	-	-	4	6
WASHINGTON	34	-	-	2	80	116	2	-	-	-	4	6
OREGON	16	-	-	-	56	72	1	-	-	-	3	4
CALIFORNIA	107	149	189	4	139	588	10	13	17	-	12	53
NEVADA	14	-	-	1	15	31	1	-	-	-	1	2
ARIZONA	41	-	-	-	48	89	2	-	-	-	2	4
ALASKA	3	-	-	-	9	12	-	-	-	-	-	-
HAWAII	-	-	-	-	13	13	-	-	-	-	2	2
TOTAL US	406	607	417	252	3275	4956	54	92	67	37	551	801

DUE TO INDEPENDENT ROUNDING, SUM OF STATES MAY NOT EQUAL REGIONAL TOTALS ELSEWHERE   NATIONAL PETROLEUM COUNCIL   NOVEMBER 9, 1992   TIME 14:56

1995 STATE OIL DEMANDS -- THOUSAND BARRELS PER DAY -- FOUNDATION CASE II

	UNLEADED PREMIUM GASOLINE						TOTAL GASOLINE					
	CO	REFORM	CO-REF	GASOHOL	CONVENT	TOTAL	CO	REFORM	CO-REF	GASOHOL	CONVENT	TOTAL
MAINE	-	-	-	-	7	7	-	-	-	-	38	38
NEW HAMPSHIRE	2	-	-	-	6	8	7	-	-	-	26	33
VERMONT	-	-	-	-	4	4	-	-	-	-	18	18
MASSACHUSETTS	16	-	-	-	27	43	58	-	-	-	99	157
RHODE ISLAND	-	-	-	-	7	7	-	-	-	-	24	24
CONNECTICUT	-	13	13	-	-	26	-	43	44	-	-	87
NEW YORK	2	24	51	-	40	117	6	75	157	-	123	360
NEW JERSEY	-	27	45	-	3	75	-	80	130	-	10	219
PENNSYLVANIA	-	13	9	-	48	70	-	54	40	-	201	294
DELAWARE	-	3	2	-	-	5	2	11	8	-	2	22
MARYLAND	6	12	9	-	13	40	21	39	29	-	43	132
DIST COL	2	-	-	-	3	5	5	-	-	-	7	11
W VIRGINIA	-	-	-	-	11	11	-	-	-	-	53	53
VIRGINIA	5	-	-	4	40	48	20	-	-	14	157	191
N CAROLINA	5	-	-	-	38	43	23	-	-	-	187	210
S CAROLINA	-	-	-	1	21	22	-	-	-	5	110	115
GEORGIA	-	-	-	-	52	53	-	-	-	2	223	225
FLORIDA	-	-	-	1	110	111	-	-	-	5	378	383
MICHIGAN	-	-	-	4	37	41	-	-	-	25	247	273
OHIO	5	-	-	7	32	44	34	-	-	52	227	314
INDIANA	-	3	-	5	16	23	-	18	-	34	114	166
ILLINOIS	-	36	-	5	14	55	-	202	-	28	81	311
KENTUCKY	-	-	-	5	16	21	-	-	-	26	92	117
TENNESSEE	2	-	-	4	24	31	12	-	-	22	128	162
WISCONSIN	-	6	-	-	11	17	1	47	-	2	82	133
MINNESOTA	4	-	-	1	10	14	34	-	-	8	89	131
N DAKOTA	-	-	-	-	1	1	-	-	-	2	20	23
S DAKOTA	-	-	-	-	1	1	-	-	-	4	21	25
IOWA	-	-	-	2	5	7	-	-	-	24	64	88
NEBRASKA	-	-	-	1	2	2	-	-	-	17	33	50
MISSOURI	-	-	-	1	24	26	-	-	-	10	162	172
KANSAS	-	-	-	1	6	7	-	-	-	6	74	81
OKLAHOMA	-	-	-	-	12	12	-	-	-	-	105	105
ALABAMA	-	-	-	2	24	27	-	-	-	12	121	133
MISSISSIPPI	-	-	-	-	16	16	-	-	-	-	78	78
ARKANSAS	-	-	-	-	12	12	-	-	-	-	79	79
LOUISIANA	-	-	-	1	27	28	-	-	-	3	123	126
TEXAS	1	18	-	2	61	82	8	122	-	10	409	550
NEW MEXICO	1	-	-	1	3	5	7	-	-	9	35	51
MONTANA	-	-	-	-	3	3	1	-	-	-	27	28
IDAHO	-	-	-	-	2	2	-	-	-	4	27	31
WYOMING	-	-	-	-	2	2	-	-	-	-	20	21
COLORADO	5	-	-	-	9	14	32	-	-	3	61	96
UTAH	2	-	-	-	5	7	16	-	-	-	31	47
WASHINGTON	7	-	-	-	16	23	42	-	-	3	100	145
OREGON	2	-	-	-	8	10	20	-	-	-	66	86
CALIFORNIA	36	50	64	1	47	198	152	213	270	6	198	838
NEVADA	3	-	-	-	3	6	18	-	-	1	20	39
ARIZONA	7	-	-	-	9	16	50	-	-	-	59	110
ALASKA	-	-	-	-	1	1	3	-	-	-	10	14
HAWAII	-	-	-	-	9	9	-	-	-	-	24	24
TOTAL US	114	205	193	51	898	1460	573	904	676	340	4724	7218

DUE TO INDEPENDENT ROUNDING, SUM OF STATES MAY NOT EQUAL REGIONAL TOTALS ELSEWHERE NATIONAL PETROLEUM COUNCIL NOVEMBER 9, 1992 TIME 14:56

1995 STATE OIL DEMANDS -- THOUSAND BARRELS PER DAY -- FOUNDATION CASE II

	KERO JT	DISTILLATE KERO+1	ON HWY	OFF HWY	DIST 2	HVY DSL	TOTAL	HEAVY FUEL OIL DIST 4	< 0.3	0.3-1	> 1.0	TOTAL
MAINE	5	2	10	2	18	1	32	-	-	14	7	22
NEW HAMPSHIRE	1	1	4	2	12	-	19	1	-	-	14	14
VERMONT	1	-	3	1	7	-	12	-	-	-	-	-
MASSACHUSETTS	33	1	19	3	66	4	93	4	-	25	49	79
RHODE ISLANE	2	-	4	1	9	1	14	-	-	2	1	3
CONNECTICUT	7	1	18	3	40	1	62	2	-	44	2	49
NEW YORK	32	7	52	11	109	2	181	13	62	71	49	195
NEW JERSEY	146	2	31	9	55	13	110	5	27	7	21	59
PENNSYLVANIA	31	4	63	18	71	5	161	2	-	29	12	43
DELAWARE	-	-	5	1	4	-	11	-	-	8	5	13
MARYLAND	29	1	25	5	20	4	56	1	-	16	15	32
DIST COL	-	-	2	-	5	1	8	-	-	-	-	1
W VIRGINIA	1	1	11	7	4	6	29	-	-	-	1	1
VIRGINIA	41	3	37	9	22	10	81	1	-	9	14	23
N CAROLINA	18	4	42	9	19	3	77	-	-	-	8	8
S CAROLINA	3	2	21	6	5	3	36	-	-	-	4	4
GEORGIA	55	-	58	12	3	7	80	-	-	-	4	4
FLORIDA	95	1	63	15	7	12	99	-	-	75	46	121
MICHIGAN	28	4	36	12	15	3	70	-	-	8	4	12
OHIO	37	5	66	14	15	9	109	-	-	-	7	8
INDIANA	66	3	54	13	9	16	95	1	-	-	12	12
ILLINOIS	15	2	58	20	8	12	99	-	-	9	5	13
KENTUCKY	18	3	47	12	6	15	83	-	-	-	2	2
TENNESSEE	15	2	40	8	1	16	68	-	-	-	2	2
WISCONSIN	4	2	31	11	15	7	67	-	-	-	4	4
MINNESOTA	17	4	23	12	11	3	53	-	-	-	4	4
N DAKOTA	3	1	6	7	3	2	20	-	-	-	1	1
S DAKOTA	2	1	6	5	2	-	15	-	-	-	-	-
IOWA	2	1	24	11	4	2	42	-	-	-	1	1
NEBRASKA	4	-	14	12	1	8	36	-	-	-	1	1
MISSOURI	28	1	44	10	3	5	63	-	-	-	3	3
KANSAS	12	-	21	11	2	12	45	-	-	-	1	1
OKLAHOMA	37	-	27	7	3	5	42	-	-	-	1	1
ALABAMA	2	3	38	16	3	14	73	-	-	-	35	35
MISSISSIPPI	8	2	26	14	3	6	51	-	-	-	48	48
ARKANSAS	2	1	27	11	2	2	43	-	-	5	5	10
LOUISIANA	52	4	32	13	24	37	111	-	-	14	101	115
TEXAS	170	18	113	58	28	49	266	-	4	11	69	84
NEW MEXICO	3	2	14	7	1	4	28	-	-	3	3	6
MONTANA	3	1	8	8	1	4	22	-	-	-	4	4
IDAHO	5	1	8	8	2	1	19	-	-	-	1	1
WYOMING	1	1	13	5	2	7	28	-	-	-	1	1
COLORADO	22	1	13	8	2	6	29	-	-	-	-	-
UTAH	21	-	9	5	1	3	18	-	-	-	5	5
WASHINGTON	54	3	26	12	8	11	61	-	4	-	33	38
OREGON	9	1	21	9	6	8	45	-	-	-	12	13
CALIFORNIA	244	1	144	53	5	28	232	2	22	1	117	142
NEVADA	10	-	9	9	1	2	21	-	-	2	-	2
ARIZONA	19	-	22	10	-	1	32	-	-	-	-	-
ALASKA	47	2	9	3	7	9	30	-	-	-	-	1
HAWAII	29	-	4	2	4	6	16	-	-	37	12	49
TOTAL US	1489	100	1499	530	675	388	3192	34	119	391	745	1289

DUE TO INDEPENDENT ROUNDING, SUM OF STATES MAY NOT EQUAL REGIONAL TOTALS ELSEWHERE   NATIONAL PETROLEUM COUNCIL   NOVEMBER 9, 1992   TIME 14:56

1995 STATE OIL DEMANDS -- THOUSAND BARRELS PER DAY -- FOUNDATION CASE II

	LPG	AVGAS	-- CHEM FEED --- NAPHTHA	GASOIL	SPC NAP	LUBES	WAX	ASPHALT	MISC	CRUDE	STGAS	---- COKE ------ CAT CK	MKT CK	--- TOTALS ----- OTHER	ALL
MAINE	4	-	-	-	-	1	-	2	-	-	-	-	-	7	103
NEW HAMPSHIRE	6	-	-	-	-	1	-	2	-	-	-	-	-	8	75
VERMONT	4	-	-	-	-	-	-	1	-	-	-	-	-	5	35
MASSACHUSETTS	6	-	-	-	-	3	-	7	-	-	-	-	-	16	377
RHODE ISLANE	1	-	-	-	-	1	-	1	-	-	-	-	-	3	47
CONNECTICUT	4	-	-	-	-	2	-	4	-	-	-	-	-	10	215
NEW YORK	13	-	-	1	-	8	-	17	-	-	-	-	-	40	807
NEW JERSEY	17	-	5	6	2	5	1	10	5	-	27	13	2	93	628
PENNSYLVANIA	17	-	8	11	4	7	2	15	8	-	27	13	-	111	641
DELAWARE	2	-	2	2	1	-	-	1	1	-	7	3	4	24	71
MARYLAND	5	-	-	-	-	3	-	6	-	-	-	-	-	15	264
DIST COL	-	-	-	-	-	-	-	1	-	-	-	-	-	1	21
W VIRGINIA	4	-	-	-	-	1	1	3	-	-	-	-	-	10	94
VIRGINIA	11	-	1	1	-	4	-	9	1	-	3	1	1	33	370
N CAROLINA	23	-	-	-	-	5	-	10	-	-	-	-	-	38	351
S CAROLINA	9	-	-	-	-	3	-	5	-	-	-	-	-	17	175
GEORGIA	18	-	-	-	-	5	-	11	-	-	-	-	-	37	401
FLORIDA	18	2	-	-	-	8	-	18	-	-	-	-	-	47	744
MICHIGAN	48	1	1	1	1	4	-	17	-	-	5	2	-	79	462
OHIO	33	1	4	6	3	4	-	20	2	-	19	6	4	103	571
INDIANA	20	1	4	5	2	3	-	12	1	-	18	6	5	76	416
ILLINOIS	24	-	8	11	5	5	-	21	3	-	38	12	22	149	588
KENTUCKY	17	-	2	2	1	2	-	8	1	-	11	4	-	48	268
TENNESSEE	8	-	1	1	-	2	-	11	-	-	3	1	-	28	275
WISCONSIN	17	-	-	-	-	2	-	9	-	-	1	-	-	30	237
MINNESOTA	15	-	3	3	2	2	-	8	1	-	9	3	10	54	259
N DAKOTA	4	-	1	1	-	-	-	1	-	-	3	1	-	12	58
S DAKOTA	9	-	-	-	-	-	-	2	-	-	-	-	-	11	53
IOWA	17	-	-	-	-	1	-	6	-	-	-	-	-	25	158
NEBRASKA	9	-	-	-	-	1	-	3	-	-	-	-	-	13	104
MISSOURI	19	1	-	-	-	3	-	12	-	-	-	-	-	34	299
KANSAS	44	-	3	4	2	1	-	5	1	-	14	5	7	88	227
OKLAHOMA	15	-	3	4	2	2	1	7	1	-	15	5	4	61	247
ALABAMA	12	1	3	4	1	7	-	11	1	-	-	-	-	40	284
MISSISSIPPI	12	1	9	11	1	4	-	7	2	-	9	3	3	62	247
ARKANSAS	9	-	1	2	-	4	-	7	-	-	2	1	-	28	162
LOUISIANA	130	1	56	71	9	6	2	10	12	-	92	28	11	429	833
TEXAS	877	4	102	128	16	26	5	43	22	-	199	60	9	1490	2560
NEW MEXICO	16	-	2	2	-	3	-	4	-	-	3	1	-	33	120
MONTANA	4	-	-	-	-	-	-	4	1	-	5	2	2	18	74
IDAHO	2	-	-	-	-	-	-	4	-	-	-	-	-	6	62
WYOMING	4	-	-	-	-	-	1	3	1	-	6	2	-	18	68
COLORADO	9	-	-	-	-	-	-	12	-	-	2	1	-	26	173
UTAH	3	-	-	-	-	-	-	6	1	-	5	2	2	20	110
WASHINGTON	8	-	2	2	-	2	-	7	1	-	19	4	1	46	343
OREGON	4	-	-	-	-	1	-	4	-	-	-	-	-	10	162
CALIFORNIA	62	3	8	10	1	9	2	40	3	27	112	26	4	307	1764
NEVADA	4	-	-	-	-	-	-	2	-	-	-	-	-	7	79
ARIZONA	4	-	-	-	-	1	-	5	-	-	-	-	-	11	173
ALASKA	1	1	1	1	-	-	-	1	-	-	-	-	-	5	96
HAWAII	-	1	-	1	-	-	-	1	-	-	4	1	-	8	126
TOTAL US	1623	25	231	293	54	154	16	438	70	27	659	205	93	3888	17076

DUE TO INDEPENDENT ROUNDING, SUM OF STATES MAY NOT EQUAL REGIONAL TOTALS ELSEWHERE   NATIONAL PETROLEUM COUNCIL   NOVEMBER 9, 1992   TIME 14:56

2000 STATE OIL DEMANDS -- THOUSAND BARRELS PER DAY -- FOUNDATION CASE II

	UNLEADED REGULAR GASOLINE						UNLEADED MID-GRADE GASOLINE					
	CO	REFORM	CO-REF	GASOHOL	CONVENT	TOTAL	CO	REFORM	CO-REF	GASOHOL	CONVENT	TOTAL
MAINE	-	27	-	-	-	27	-	5	-	-	-	5
NEW HAMPSHIRE	-	16	5	-	-	20	-	4	1	-	-	5
VERMONT	-	11	-	-	-	11	-	2	-	-	-	2
MASSACHUSETTS	-	60	35	-	-	95	-	13	7	-	-	20
RHODE ISLANE	-	14	-	-	-	14	-	3	-	-	-	3
CONNECTICUT	-	23	24	-	-	47	-	7	7	-	-	14
NEW YORK	-	113	91	-	-	204	-	21	17	-	-	38
NEW JERSEY	-	50	72	-	-	122	-	9	13	-	-	22
PENNSYLVANIA	-	154	24	-	-	178	-	39	6	-	-	45
DELAWARE	-	7	5	-	-	12	-	3	2	-	-	4
MARYLAND	-	40	24	-	-	65	-	17	10	-	-	28
DIST COL	-	2	2	-	-	4	-	1	1	-	-	2
W VIRGINIA	-	10	-	-	24	34	-	2	-	-	6	8
VIRGINIA	-	97	11	-	-	108	-	31	4	-	-	35
N CAROLINA	-	41	14	-	77	133	-	10	4	-	20	34
S CAROLINA	-	4	-	3	69	76	-	1	-	1	16	17
GEORGIA	-	61	-	1	77	139	-	15	-	-	19	34
FLORIDA	-	99	-	1	107	208	-	31	-	-	33	64
MICHIGAN	-	124	-	8	75	207	-	15	-	1	9	25
OHIO	-	150	25	10	43	227	-	28	5	2	8	42
INDIANA	-	61	-	14	48	123	-	10	-	2	8	20
ILLINOIS	-	158	-	18	50	226	-	21	-	2	7	30
KENTUCKY	-	35	-	9	31	75	-	10	-	2	9	21
TENNESSEE	-	45	8	7	44	104	-	12	2	2	11	27
WISCONSIN	1	46	-	1	60	108	-	3	-	-	4	7
MINNESOTA	29	-	-	7	75	110	2	-	-	-	5	7
N DAKOTA	-	-	-	2	19	21	-	-	-	-	1	1
S DAKOTA	-	-	-	3	20	23	-	-	-	-	1	1
IOWA	-	-	-	22	57	80	-	-	-	-	1	2
NEBRASKA	-	-	-	16	30	46	-	-	-	1	1	2
MISSOURI	-	72	-	3	54	129	-	9	-	-	7	17
KANSAS	-	17	-	4	49	70	-	1	-	-	3	4
OKLAHOMA	-	-	-	-	89	89	-	-	-	-	4	4
ALABAMA	-	20	-	6	62	89	-	4	-	1	12	18
MISSISSIPPI	-	-	-	-	54	54	-	-	-	-	9	9
ARKANSAS	-	-	-	-	59	59	-	-	-	-	9	9
LOUISIANA	-	15	-	2	66	83	-	3	-	-	13	16
TEXAS	-	202	6	5	195	409	-	29	1	1	28	59
NEW MEXICO	6	-	-	8	29	42	1	-	-	1	3	4
MONTANA	1	-	-	-	21	22	-	-	-	-	3	3
IDAHO	-	-	-	4	23	26	-	-	-	-	2	2
WYOMING	-	-	-	-	16	16	-	-	-	-	2	2
COLORADO	23	-	-	2	43	67	5	-	-	-	9	14
UTAH	2	12	9	-	10	34	-	2	2	-	2	6
WASHINGTON	5	39	29	1	42	116	-	2	1	-	2	6
OREGON	3	18	14	-	37	72	-	1	1	-	2	4
CALIFORNIA	-	292	295	-	-	587	-	26	27	-	-	53
NEVADA	11	4	3	1	12	31	1	-	-	-	1	2
ARIZONA	10	21	31	-	27	89	-	1	1	-	1	4
ALASKA	3	-	-	-	9	12	-	-	-	-	-	-
HAWAII	-	-	-	-	13	13	-	-	-	-	2	2
TOTAL US	93	2162	726	159	1818	4957	9	391	111	20	270	801

DUE TO INDEPENDENT ROUNDING, SUM OF STATES MAY NOT EQUAL REGIONAL TOTALS ELSEWHERE NATIONAL PETROLEUM COUNCIL NOVEMBER 9, 1992 TIME 14:56

2000 STATE OIL DEMANDS -- THOUSAND BARRELS PER DAY -- FOUNDATION CASE II

	UNLEADED PREMIUM GASOLINE					
	CO	REFORM	CO-REF	GASOHOL	CONVENT	TOTAL
MAINE	-	7	-	-	-	7
NEW HAMPSHIRE	-	6	2	-	-	8
VERMONT	-	4	-	-	-	4
MASSACHUSETTS	-	27	16	-	-	43
RHODE ISLANE	-	7	-	-	-	7
CONNECTICUT	-	13	13	-	-	26
NEW YORK	-	65	52	-	-	117
NEW JERSEY	-	31	44	-	-	75
PENNSYLVANIA	-	61	9	-	-	70
DELAWARE	-	3	2	-	-	5
MARYLAND	-	25	15	-	-	40
DIST COL	-	3	2	-	-	5
W VIRGINIA	-	3	-	-	8	11
VIRGINIA	-	43	5	-	-	48
N CAROLINA	-	13	5	-	25	43
S CAROLINA	-	1	-	1	20	22
GEORGIA	-	23	-	-	29	53
FLORIDA	-	53	-	1	57	111
MICHIGAN	-	24	-	2	15	41
OHIO	-	29	5	2	8	44
INDIANA	-	11	-	3	9	23
ILLINOIS	-	38	-	4	12	55
KENTUCKY	-	10	-	2	9	21
TENNESSEE	-	13	2	2	13	31
WISCONSIN	-	7	-	-	10	17
MINNESOTA	4	-	-	1	10	14
N DAKOTA	-	-	-	-	1	1
S DAKOTA	-	-	-	-	1	1
IOWA	-	-	-	2	5	7
NEBRASKA	-	-	-	1	2	2
MISSOURI	-	14	-	1	11	26
KANSAS	-	2	-	-	5	7
OKLAHOMA	-	-	-	-	13	13
ALABAMA	-	6	-	2	19	27
MISSISSIPPI	-	-	-	-	16	16
ARKANSAS	-	-	-	-	12	12
LOUISIANA	-	5	-	1	22	28
TEXAS	-	41	1	1	39	83
NEW MEXICO	1	-	-	1	3	5
MONTANA	-	-	-	-	3	3
IDAHO	-	-	-	-	2	2
WYOMING	-	-	-	-	2	2
COLORADO	5	-	-	-	9	14
UTAH	-	2	2	-	2	7
WASHINGTON	1	8	6	-	8	23
OREGON	-	3	2	-	5	10
CALIFORNIA	-	98	99	-	-	198
NEVADA	2	1	1	-	2	6
ARIZONA	2	4	6	-	5	16
ALASKA	-	-	-	-	1	1
HAWAII	-	-	-	-	9	9
TOTAL US	16	706	289	28	421	1460

	TOTAL GASOLINE					
	CO	REFORM	CO-REF	GASOHOL	CONVENT	TOTAL
MAINE	-	38	-	-	-	38
NEW HAMPSHIRE	-	26	7	-	-	33
VERMONT	-	18	-	-	-	18
MASSACHUSETTS	-	99	58	-	-	157
RHODE ISLANE	-	24	-	-	-	24
CONNECTICUT	-	43	44	-	-	87
NEW YORK	-	199	161	-	-	360
NEW JERSEY	-	91	129	-	-	219
PENNSYLVANIA	-	254	39	-	-	294
DELAWARE	-	13	9	-	-	22
MARYLAND	-	82	50	-	-	132
DIST COL	-	7	5	-	-	11
W VIRGINIA	-	15	-	-	37	53
VIRGINIA	-	171	20	-	-	191
N CAROLINA	-	65	23	-	122	210
S CAROLINA	-	6	-	5	104	115
GEORGIA	-	100	-	1	125	225
FLORIDA	-	183	-	3	197	383
MICHIGAN	-	163	-	10	99	273
OHIO	-	206	34	14	59	314
INDIANA	-	82	-	19	65	166
ILLINOIS	-	218	-	24	69	311
KENTUCKY	-	55	-	14	49	117
TENNESSEE	-	70	12	12	68	162
WISCONSIN	1	56	-	2	74	133
MINNESOTA	34	-	-	8	89	131
N DAKOTA	-	-	-	2	21	23
S DAKOTA	-	-	-	4	21	25
IOWA	-	-	-	24	64	88
NEBRASKA	-	-	-	17	33	50
MISSOURI	-	95	-	4	72	172
KANSAS	-	20	-	5	56	81
OKLAHOMA	-	-	-	-	105	105
ALABAMA	-	30	-	10	94	133
MISSISSIPPI	-	-	-	-	78	78
ARKANSAS	-	-	-	-	79	79
LOUISIANA	-	23	-	3	101	126
TEXAS	-	272	8	7	263	550
NEW MEXICO	7	-	-	9	35	51
MONTANA	1	-	-	-	27	28
IDAHO	-	-	-	4	27	31
WYOMING	-	-	-	-	20	21
COLORADO	32	-	-	3	61	95
UTAH	3	17	12	-	14	47
WASHINGTON	6	48	36	2	53	145
OREGON	4	22	16	-	45	86
CALIFORNIA	-	417	421	-	-	838
NEVADA	15	5	4	1	15	39
ARIZONA	12	26	38	-	33	109
ALASKA	3	-	-	-	10	14
HAWAII	-	-	-	-	24	24
TOTAL US	118	3259	1126	206	2509	7218

DUE TO INDEPENDENT ROUNDING, SUM OF STATES MAY NOT EQUAL REGIONAL TOTALS ELSEWHERE NATIONAL PETROLEUM COUNCIL NOVEMBER 9, 1992 TIME 14:56

2000 STATE OIL DEMANDS -- THOUSAND BARRELS PER DAY -- FOUNDATION CASE II

		DISTILLATE						HEAVY FUEL OIL				
	KERO JT	KERO+1	ON HWY	OFF HWY	DIST 2	HVY OSL	TOTAL	DIST 4	< 0.3	0.3-1	> 1.0	TOTAL
MAINE	5	1	10	2	14	1	29	-	-	16	6	22
NEW HAMPSHIRE	1	-	4	2	10	-	16	-	-	-	15	16
VERMONT	1	-	3	1	5	-	11	-	-	-	-	-
MASSACHUSETTS	33	-	19	4	54	4	81	3	-	28	54	85
RHODE ISLANE	2	-	4	1	7	1	13	-	-	2	1	3
CONNECTICUT	7	1	18	3	33	1	55	1	-	50	2	54
NEW YORK	32	5	53	11	93	2	164	10	70	80	51	210
NEW JERSEY	146	2	32	10	47	13	103	3	30	8	19	60
PENNSYLVANIA	31	3	64	18	62	5	152	1	-	32	11	45
DELAWARE	-	-	5	1	4	-	11	-	-	9	5	14
MARYLAND	29	1	25	6	19	4	55	-	-	18	15	34
DIST COL	-	-	2	-	8	1	11	-	-	-	-	-
W VIRGINIA	1	1	11	7	5	6	30	-	-	-	1	1
VIRGINIA	41	2	38	10	20	10	80	-	-	10	14	24
N CAROLINA	18	3	43	9	17	3	75	-	-	-	7	7
S CAROLINA	3	1	21	6	5	3	36	-	-	-	4	4
GEORGIA	55	-	59	13	4	7	82	-	-	-	3	4
FLORIDA	95	1	64	16	10	12	103	-	-	85	48	133
MICHIGAN	28	3	37	13	14	3	70	-	-	9	3	12
OHIO	37	4	67	15	14	9	109	-	-	-	7	8
INDIANA	66	3	55	13	9	16	96	1	-	-	10	11
ILLINOIS	15	2	58	21	8	12	101	-	-	9	4	13
KENTUCKY	18	2	48	12	7	15	84	-	-	-	2	2
TENNESSEE	15	2	41	8	1	16	68	-	-	-	2	2
WISCONSIN	4	2	31	11	13	8	65	-	-	-	3	3
MINNESOTA	17	3	23	13	10	3	52	-	-	-	3	3
N DAKOTA	3	-	6	8	3	3	20	-	-	-	1	1
S DAKOTA	2	1	6	6	2	-	15	-	-	-	-	-
IOWA	2	1	24	12	4	3	43	-	-	-	1	1
NEBRASKA	4	-	14	12	1	9	37	-	-	-	1	1
MISSOURI	28	1	45	11	3	6	64	-	-	-	3	3
KANSAS	12	-	21	12	2	12	47	-	-	-	1	1
OKLAHOMA	37	-	27	7	3	5	43	-	-	-	1	1
ALABAMA	2	2	38	17	3	14	75	-	-	-	29	29
MISSISSIPPI	8	2	26	15	3	6	52	-	-	-	44	44
ARKANSAS	2	1	28	11	2	2	44	-	-	5	4	9
LOUISIANA	52	4	32	14	27	37	115	-	-	12	91	104
TEXAS	170	16	115	62	32	49	274	-	3	10	63	76
NEW MEXICO	3	2	14	7	2	4	29	-	-	3	3	5
MONTANA	3	1	8	8	1	4	22	-	-	-	3	3
IDAHO	5	-	8	8	1	1	20	-	-	-	1	1
WYOMING	1	1	13	6	2	8	29	-	-	-	1	1
COLORADO	22	1	13	8	2	6	30	-	-	-	-	-
UTAH	21	-	9	5	1	3	18	-	-	-	5	5
WASHINGTON	54	3	26	13	7	11	60	-	3	-	31	34
OREGON	9	-	22	9	5	8	45	-	-	-	11	12
CALIFORNIA	244	1	147	56	5	29	238	2	24	2	108	135
NEVADA	10	-	9	10	1	2	22	-	-	2	-	2
ARIZONA	19	-	22	10	1	1	34	-	-	-	-	-
ALASKA	47	1	9	4	7	9	30	-	-	-	-	1
HAWAII	29	-	4	2	7	6	19	-	-	40	10	50
TOTAL US	1489	82	1523	560	620	394	3179	26	130	428	704	1289

DUE TO INDEPENDENT ROUNDING, SUM OF STATES MAY NOT EQUAL REGIONAL TOTALS ELSEWHERE   NATIONAL PETROLEUM COUNCIL   NOVEMBER 9, 1992   TIME 14:56

2000 STATE OIL DEMANDS -- THOUSAND BARRELS PER DAY -- FOUNDATION CASE II

			-- CHEM FEED ---									---- COKE ------		--- TOTALS -----	
	LPG	AVGAS	NAPHTHA	GASOIL	SPC NAP	LUBES	WAX	ASPHALT	MISC	CRUDE	STGAS	CAT CK	MKT CK	OTHER	ALL
MAINE	3	-	-	-	-	1	-	2	-	-	-	-	-	6	100
NEW HAMPSHIRE	5	-	-	-	-	1	-	1	-	-	-	-	-	8	74
VERMONT	3	-	-	-	-	-	-	1	-	-	-	-	-	4	34
MASSACHUSETTS	5	-	-	-	-	3	-	7	-	-	-	-	-	15	371
RHODE ISLANE	1	-	-	-	-	1	-	1	-	-	-	-	-	3	45
CONNECTICUT	3	-	-	-	-	2	-	4	-	-	-	-	-	10	212
NEW YORK	12	-	-	1	-	8	-	16	-	-	-	-	-	37	803
NEW JERSEY	17	-	5	7	2	5	1	10	5	-	26	12	2	92	621
PENNSYLVANIA	16	-	9	12	4	7	2	14	8	-	26	12	-	110	632
DELAWARE	2	-	2	2	1	-	-	1	1	-	7	3	4	23	71
MARYLAND	5	-	-	-	-	3	-	6	-	-	-	-	-	14	265
DIST COL	-	-	-	-	-	-	-	1	-	-	-	-	-	1	23
W VIRGINIA	4	-	-	-	-	1	1	3	-	-	-	-	-	9	94
VIRGINIA	10	-	1	1	-	4	-	9	-	-	3	1	1	31	367
N CAROLINA	20	-	-	-	-	5	-	10	-	-	-	-	-	35	345
S CAROLINA	8	-	-	-	-	2	-	5	-	-	-	-	-	16	174
GEORGIA	16	-	-	1	-	5	-	11	-	-	-	-	-	34	400
FLORIDA	16	2	-	-	-	8	-	17	-	-	-	-	-	44	757
MICHIGAN	46	1	1	2	1	4	-	16	-	-	5	2	-	77	459
OHIO	31	1	5	6	3	4	-	20	2	-	19	6	4	100	568
INDIANA	17	1	4	5	2	2	-	11	1	-	17	6	5	74	413
ILLINOIS	22	-	9	12	5	4	-	20	3	-	36	12	21	146	586
KENTUCKY	16	-	2	3	1	2	-	8	1	-	11	4	-	47	269
TENNESSEE	8	-	1	1	-	2	-	10	-	-	3	1	-	27	274
WISCONSIN	15	-	-	-	-	2	-	8	-	-	1	-	-	28	233
MINNESOTA	13	-	3	4	2	2	-	8	1	-	8	3	9	52	256
N DAKOTA	4	-	1	1	-	-	-	1	-	-	3	1	-	11	58
S DAKOTA	8	-	-	-	-	-	-	2	-	-	-	-	-	10	52
IOWA	15	-	-	-	-	1	-	6	-	-	-	-	-	22	157
NEBRASKA	8	-	-	-	-	1	-	3	-	-	-	-	-	12	104
MISSOURI	17	-	-	-	-	2	-	11	-	-	-	-	-	31	297
KANSAS	46	-	3	4	2	1	-	5	1	-	14	4	7	88	230
OKLAHOMA	15	-	4	5	2	1	1	7	1	-	15	5	4	60	247
ALABAMA	10	1	4	5	1	7	-	11	1	-	-	-	-	39	278
MISSISSIPPI	12	1	10	12	1	4	-	6	2	-	9	3	3	62	244
ARKANSAS	8	-	2	2	-	4	-	7	-	-	2	1	-	27	161
LOUISIANA	138	1	61	78	8	6	2	10	12	-	89	27	11	442	839
TEXAS	931	4	111	140	15	25	5	42	21	-	192	58	9	1552	2622
NEW MEXICO	16	-	2	3	-	3	-	4	-	-	3	1	-	33	121
MONTANA	4	-	-	-	-	-	-	4	1	-	5	1	2	17	74
IDAHO	2	-	-	-	-	-	-	4	-	-	-	-	-	6	62
WYOMING	4	-	-	-	-	-	1	3	1	-	6	2	-	17	68
COLORADO	9	-	-	-	-	-	-	12	-	-	2	1	-	25	173
UTAH	3	-	-	-	-	-	-	6	1	-	5	2	2	19	109
WASHINGTON	8	-	2	2	-	2	-	7	1	-	18	4	1	45	338
OREGON	4	-	-	-	-	1	-	4	-	-	-	-	-	9	161
CALIFORNIA	61	3	8	11	1	9	2	39	3	26	108	25	4	300	1755
NEVADA	4	-	-	-	-	-	-	2	-	-	-	-	-	7	80
ARIZONA	3	-	-	-	-	1	-	5	-	-	-	-	-	11	173
ALASKA	1	1	1	1	-	-	-	1	-	-	-	-	-	5	96
HAWAII	-	1	-	1	-	-	-	1	-	-	4	1	-	8	130
TOTAL US	1649	24	252	319	52	149	15	423	68	26	637	198	90	3901	17076

DUE TO INDEPENDENT ROUNDING, SUM OF STATES MAY NOT EQUAL REGIONAL TOTALS ELSEWHERE NATIONAL PETROLEUM COUNCIL NOVEMBER 9, 1992 TIME 14:56

2010 STATE OIL DEMANDS -- THOUSAND BARRELS PER DAY -- FOUNDATION CASE II

	UNLEADED REGULAR GASOLINE						UNLEADED MID-GRADE GASOLINE					
	CO	REFORM	CO-REF	GASOHOL	CONVENT	TOTAL	CO	REFORM	CO-REF	GASOHOL	CONVENT	TOTAL
MAINE	-	27	-	-	-	27	-	5	-	-	-	5
NEW HAMPSHIRE	-	16	4	-	-	20	-	4	1	-	-	5
VERMONT	-	11	-	-	-	11	-	2	-	-	-	2
MASSACHUSETTS	-	60	35	-	-	95	-	13	7	-	-	20
RHODE ISLANE	-	14	-	-	-	14	-	3	-	-	-	3
CONNECTICUT	-	23	24	-	-	47	-	7	7	-	-	14
NEW YORK	-	113	91	-	-	204	-	21	17	-	-	38
NEW JERSEY	-	50	72	-	-	122	-	9	13	-	-	22
PENNSYLVANIA	-	154	24	-	-	178	-	39	6	-	-	45
DELAWARE	-	7	5	-	-	12	-	3	2	-	-	4
MARYLAND	-	40	24	-	-	65	-	17	10	-	-	28
DIST COL	-	2	2	-	-	4	-	1	1	-	-	2
W VIRGINIA	-	10	-	-	24	34	-	2	-	-	6	8
VIRGINIA	-	97	11	-	-	108	-	31	4	-	-	35
N CAROLINA	-	41	14	-	77	133	-	10	4	-	20	34
S CAROLINA	-	4	-	3	69	76	-	1	-	1	16	17
GEORGIA	-	61	-	1	77	139	-	15	-	-	19	34
FLORIDA	-	99	-	1	107	208	-	31	-	-	33	64
MICHIGAN	-	124	-	8	75	207	-	15	-	1	9	25
OHIO	-	150	25	10	43	228	-	28	5	2	8	42
INDIANA	-	61	-	14	48	123	-	10	-	2	8	20
ILLINOIS	-	158	-	18	50	226	-	21	-	2	7	30
KENTUCKY	-	35	-	9	31	75	-	10	-	2	9	21
TENNESSEE	-	45	8	7	44	104	-	12	2	2	11	27
WISCONSIN	1	46	-	1	60	108	-	3	-	-	4	7
MINNESOTA	29	-	-	7	75	110	2	-	-	-	5	7
N DAKOTA	-	-	-	2	19	21	-	-	-	-	1	1
S DAKOTA	-	-	-	3	20	23	-	-	-	-	1	1
IOWA	-	-	-	22	58	80	-	-	-	-	1	2
NEBRASKA	-	-	-	16	30	46	-	-	-	1	1	2
MISSOURI	-	72	-	3	54	129	-	9	-	-	7	17
KANSAS	-	17	-	4	49	70	-	1	-	-	3	4
OKLAHOMA	-	-	-	-	89	89	-	-	-	-	4	4
ALABAMA	-	20	-	6	62	89	-	4	-	1	12	18
MISSISSIPPI	-	-	-	-	54	54	-	-	-	-	9	9
ARKANSAS	-	-	-	-	59	59	-	-	-	-	9	9
LOUISIANA	-	15	-	2	66	83	-	3	-	-	12	16
TEXAS	-	202	6	5	196	409	-	29	1	1	28	59
NEW MEXICO	6	-	-	8	29	42	1	-	-	1	3	4
MONTANA	1	-	-	-	21	22	-	-	-	-	3	3
IDAHO	-	-	-	4	23	26	-	-	-	-	2	2
WYOMING	-	-	-	-	16	16	-	-	-	-	2	2
COLORADO	23	-	-	2	43	67	5	-	-	-	9	14
UTAH	2	12	9	-	10	34	-	2	2	-	2	6
WASHINGTON	5	39	29	1	42	116	-	2	1	-	2	6
OREGON	3	18	14	-	37	72	-	1	1	-	2	4
CALIFORNIA	-	292	295	-	-	587	-	26	27	-	-	53
NEVADA	11	4	3	1	12	31	1	-	-	-	1	2
ARIZONA	10	21	31	-	27	89	-	1	1	-	1	4
ALASKA	3	-	-	-	9	12	-	-	-	-	-	-
HAWAII	-	-	-	-	13	13	-	-	-	-	2	2
TOTAL US	93	2161	725	159	1818	4957	9	391	111	20	270	801

DUE TO INDEPENDENT ROUNDING, SUM OF STATES MAY NOT EQUAL REGIONAL TOTALS ELSEWHERE   NATIONAL PETROLEUM COUNCIL   NOVEMBER 9, 1992   TIME 14:56

2010 STATE OIL DEMANDS -- THOUSAND BARRELS PER DAY -- FOUNDATION CASE II

	UNLEADED PREMIUM GASOLINE						TOTAL GASOLINE					
	CO	REFORM	CO-REF	GASOHOL	CONVENT	TOTAL	CO	REFORM	CO-REF	GASOHOL	CONVENT	TOTAL
MAINE	-	7	-	-	-	7	-	38	-	-	-	38
NEW HAMPSHIRE	-	6	2	-	-	8	-	26	7	-	-	33
VERMONT	-	4	-	-	-	4	-	18	-	-	-	18
MASSACHUSETTS	-	27	16	-	-	43	-	99	58	-	-	157
RHODE ISLANE	-	7	-	-	-	7	-	24	-	-	-	24
CONNECTICUT	-	13	13	-	-	26	-	43	44	-	-	87
NEW YORK	-	65	52	-	-	117	-	199	161	-	-	360
NEW JERSEY	-	31	44	-	-	75	-	91	129	-	-	219
PENNSYLVANIA	-	61	9	-	-	70	-	254	39	-	-	293
DELAWARE	-	3	2	-	-	5	-	13	9	-	-	22
MARYLAND	-	25	15	-	-	40	-	82	50	-	-	132
DIST COL	-	3	2	-	-	5	-	7	5	-	-	11
W VIRGINIA	-	3	-	-	8	11	-	15	-	-	38	53
VIRGINIA	-	43	5	-	-	48	-	171	20	-	-	191
N CAROLINA	-	13	5	-	25	43	-	65	23	-	122	210
S CAROLINA	-	1	-	1	20	22	-	6	-	5	104	115
GEORGIA	-	23	-	-	29	53	-	100	-	1	125	225
FLORIDA	-	53	-	1	57	111	-	183	-	3	197	383
MICHIGAN	-	24	-	2	15	41	-	163	-	10	99	273
OHIO	-	29	5	2	8	44	-	206	34	14	60	314
INDIANA	-	11	-	3	9	23	-	82	-	19	65	166
ILLINOIS	-	38	-	4	12	55	-	218	-	24	69	311
KENTUCKY	-	10	-	2	9	21	-	55	-	14	49	117
TENNESSEE	-	13	2	2	13	31	-	70	12	12	68	162
WISCONSIN	-	7	-	-	10	17	1	56	-	2	74	133
MINNESOTA	4	-	-	1	10	14	34	-	-	8	89	131
N DAKOTA	-	-	-	-	1	1	-	-	-	2	21	23
S DAKOTA	-	-	-	-	1	1	-	-	-	4	21	25
IOWA	-	-	-	2	5	7	-	-	-	25	64	88
NEBRASKA	-	-	-	1	2	2	-	-	-	17	33	50
MISSOURI	-	14	-	1	11	26	-	95	-	4	72	172
KANSAS	-	2	-	-	5	7	-	20	-	5	56	81
OKLAHOMA	-	-	-	-	13	13	-	-	-	-	105	105
ALABAMA	-	6	-	2	19	27	-	30	-	10	93	133
MISSISSIPPI	-	-	-	-	16	16	-	-	-	-	78	78
ARKANSAS	-	-	-	-	12	12	-	-	-	-	79	79
LOUISIANA	-	5	-	1	22	28	-	23	-	3	101	126
TEXAS	-	41	1	1	39	83	-	272	8	7	263	551
NEW MEXICO	1	-	-	1	3	5	7	-	-	9	35	51
MONTANA	-	-	-	-	3	3	1	-	-	-	27	28
IDAHO	-	-	-	-	2	2	-	-	-	4	27	31
WYOMING	-	-	-	-	2	2	-	-	-	-	20	21
COLORADO	5	-	-	-	9	14	32	-	-	3	61	95
UTAH	-	2	2	-	2	7	3	17	12	-	14	47
WASHINGTON	1	8	6	-	8	23	6	48	36	2	53	145
OREGON	-	3	2	-	5	10	4	22	16	-	45	86
CALIFORNIA	-	98	99	-	-	198	-	417	421	-	-	838
NEVADA	2	1	1	-	2	6	15	5	4	1	15	39
ARIZONA	2	4	6	-	5	16	12	26	38	-	33	109
ALASKA	-	-	-	-	1	1	3	-	-	-	10	14
HAWAII	-	-	-	-	9	9	-	-	-	-	24	24
TOTAL US	16	706	289	28	421	1460	118	3259	1126	206	2509	7218

DUE TO INDEPENDENT ROUNDING, SUM OF STATES MAY NOT EQUAL REGIONAL TOTALS ELSEWHERE   NATIONAL PETROLEUM COUNCIL   NOVEMBER 9, 1992   TIME 14:56

2010 STATE OIL DEMANDS -- THOUSAND BARRELS PER DAY -- FOUNDATION CASE II

	KERO JT	DISTILLATE: KERO+1	DISTILLATE: ON HWY	DISTILLATE: OFF HWY	DISTILLATE: DIST 2	DISTILLATE: HVY DSL	DISTILLATE: TOTAL	HEAVY FUEL OIL: DIST 4	HEAVY FUEL OIL: < 0.3	HEAVY FUEL OIL: 0.3-1	HEAVY FUEL OIL: > 1.0	HEAVY FUEL OIL: TOTAL
MAINE	5	1	11	2	10	1	25	-	-	14	6	21
NEW HAMPSHIRE	1	-	4	2	7	-	13	-	-	-	13	14
VERMONT	1	-	3	1	4	-	9	-	-	-	-	-
MASSACHUSETTS	33	-	20	3	38	4	66	3	-	24	48	75
RHODE ISLANE	2	-	4	1	5	1	11	-	-	2	1	3
CONNECTICUT	7	1	19	3	22	1	46	1	-	43	2	47
NEW YORK	32	4	56	11	64	2	138	8	60	68	45	181
NEW JERSEY	146	1	34	10	32	14	91	3	26	7	23	59
PENNSYLVANIA	31	2	68	18	44	6	139	1	-	29	13	43
DELAWARE	-	-	5	1	3	-	10	-	-	8	5	13
MARYLAND	29	1	27	6	14	4	52	-	-	15	15	31
DIST COL	-	-	2	-	6	1	9	-	-	-	-	-
W VIRGINIA	1	1	12	8	4	7	30	-	-	-	1	1
VIRGINIA	41	2	40	10	14	10	77	-	-	9	14	23
N CAROLINA	18	2	46	9	13	3	74	-	-	-	8	8
S CAROLINA	3	1	23	6	4	3	36	-	-	-	4	4
GEORGIA	55	-	63	13	3	7	87	-	-	-	4	4
FLORIDA	95	1	68	16	7	13	105	-	-	73	47	120
MICHIGAN	28	2	39	13	10	4	68	-	-	8	4	12
OHIO	37	3	72	16	11	10	110	-	-	-	8	8
INDIANA	66	2	58	14	7	17	99	1	-	-	12	13
ILLINOIS	15	1	62	22	7	13	105	-	-	9	5	13
KENTUCKY	18	2	52	13	6	16	88	-	-	-	2	2
TENNESSEE	15	1	44	9	1	18	72	-	-	-	2	2
WISCONSIN	4	1	33	12	10	8	64	-	-	-	3	3
MINNESOTA	17	2	25	14	8	3	51	-	-	-	4	4
N DAKOTA	3	-	7	8	2	3	21	-	-	-	1	1
S DAKOTA	2	-	7	6	2	-	15	-	-	-	-	-
IOWA	2	-	26	13	3	3	45	-	-	-	1	1
NEBRASKA	4	-	15	13	1	9	39	-	-	-	1	1
MISSOURI	28	1	48	11	2	6	68	-	-	-	3	3
KANSAS	12	-	23	12	2	13	50	-	-	-	1	1
OKLAHOMA	37	-	29	7	3	6	46	-	-	-	1	1
ALABAMA	2	1	41	17	3	15	78	-	-	-	30	30
MISSISSIPPI	8	1	28	16	3	7	55	-	-	-	50	50
ARKANSAS	2	1	29	12	2	3	46	-	-	5	5	10
LOUISIANA	52	3	35	15	28	40	121	-	-	14	107	121
TEXAS	170	12	123	65	32	53	285	-	3	10	75	88
NEW MEXICO	3	1	15	8	1	4	30	-	-	3	3	6
MONTANA	3	-	9	9	1	4	23	-	-	-	4	4
IDAHO	5	-	9	9	1	1	20	-	-	-	1	1
WYOMING	1	-	14	6	2	8	31	-	-	-	1	1
COLORADO	22	-	14	9	2	7	32	-	-	-	-	-
UTAH	21	-	9	5	1	3	19	-	-	-	6	6
WASHINGTON	54	2	28	13	5	12	60	-	4	-	37	41
OREGON	9	-	23	10	4	9	46	-	-	-	13	14
CALIFORNIA	244	1	157	59	5	31	251	2	21	1	130	154
NEVADA	10	-	10	10	1	2	23	-	-	2	-	2
ARIZONA	19	-	23	11	-	1	36	-	-	-	-	-
ALASKA	47	1	10	4	6	10	30	-	-	-	-	1
HAWAII	29	-	4	2	5	6	18	-	-	35	11	46
TOTAL US	1489	58	1626	586	471	421	3161	22	115	380	771	1289

DUE TO INDEPENDENT ROUNDING, SUM OF STATES MAY NOT EQUAL REGIONAL TOTALS ELSEWHERE NATIONAL PETROLEUM COUNCIL NOVEMBER 9, 1992 TIME 14:56

2010 STATE OIL DEMANDS -- THOUSAND BARRELS PER DAY -- FOUNDATION CASE II

			-- CHEM FEED ---									---- COKE ------		--- TOTALS -----	
	LPG	AVGAS	NAPHTHA	GASDIL	SPC NAP	LUBES	WAX	ASPHALT	MISC	CRUDE	STGAS	CAT CK	MKT CK	OTHER	ALL
MAINE	3	-	-	-	-	1	-	2	-	-	-	-	-	6	94
NEW HAMPSHIRE	5	-	-	-	-	1	-	1	-	-	-	-	-	7	68
VERMONT	3	-	-	-	-	-	-	1	-	-	-	-	-	4	32
MASSACHUSETTS	4	-	-	-	-	3	-	6	-	-	-	-	-	14	345
RHODE ISLANE	1	-	-	-	-	-	-	1	-	-	-	-	-	3	42
CONNECTICUT	3	-	-	-	-	2	-	4	-	-	-	-	-	9	195
NEW YORK	10	-	1	1	-	7	-	15	-	-	-	-	-	34	744
NEW JERSEY	18	-	6	8	2	4	1	9	4	-	25	12	2	91	606
PENNSYLVANIA	15	-	10	13	4	6	2	13	7	-	24	11	-	107	614
DELAWARE	2	-	2	2	1	-	-	1	1	-	6	3	4	22	68
MARYLAND	4	-	-	-	-	3	-	6	-	-	-	-	-	13	257
DIST COL	-	-	-	-	-	-	-	-	-	-	-	-	-	1	21
W VIRGINIA	4	-	-	-	-	1	1	2	-	-	-	-	-	9	95
VIRGINIA	9	-	1	1	-	4	-	9	-	-	3	1	1	29	362
N CAROLINA	17	-	-	-	-	4	-	9	-	-	-	-	-	31	340
S CAROLINA	7	-	-	-	-	2	-	5	-	-	-	-	-	14	173
GEORGIA	13	-	-	1	-	5	-	10	-	-	-	-	-	31	402
FLORIDA	14	2	-	-	-	8	-	16	-	-	-	-	-	39	742
MICHIGAN	44	1	1	2	1	3	-	15	-	-	5	2	-	73	455
OHIO	30	1	5	7	2	4	-	19	2	-	18	6	4	97	567
INDIANA	15	1	5	6	2	2	-	11	1	-	16	5	5	69	413
ILLINOIS	20	-	10	13	5	4	-	19	3	-	34	11	20	140	585
KENTUCKY	16	-	2	3	1	2	-	7	1	-	10	3	-	46	271
TENNESSEE	7	-	1	1	-	2	-	10	-	-	3	1	-	25	276
WISCONSIN	12	-	-	-	-	2	-	8	-	-	1	-	-	25	229
MINNESOTA	11	-	3	4	1	2	-	7	1	-	8	3	9	49	252
N DAKOTA	3	-	1	1	-	-	-	1	-	-	3	1	-	10	58
S DAKOTA	6	-	-	-	-	-	-	1	-	-	-	-	-	8	51
IOWA	12	-	-	-	-	1	-	5	-	-	-	-	-	19	156
NEBRASKA	6	-	-	-	-	1	-	3	-	-	-	-	-	10	105
MISSOURI	14	-	-	-	-	2	-	11	-	-	-	-	-	27	297
KANSAS	48	-	4	5	2	1	-	5	1	-	13	4	7	90	234
OKLAHOMA	15	-	4	5	2	1	-	6	1	-	14	5	4	59	249
ALABAMA	8	1	4	5	-	6	-	10	1	-	-	-	-	36	280
MISSISSIPPI	10	1	11	14	1	4	-	6	2	-	8	2	2	62	253
ARKANSAS	7	-	2	2	-	4	-	6	-	-	2	1	-	25	163
LOUISIANA	150	1	69	87	8	6	2	9	11	-	84	25	10	461	881
TEXAS	1016	4	123	156	14	24	5	39	20	-	181	55	8	1644	2737
NEW MEXICO	17	-	2	3	-	2	-	4	-	-	3	1	-	33	123
MONTANA	3	-	-	-	-	-	-	3	1	-	5	1	2	16	74
IDAHO	2	-	-	-	-	-	-	4	-	-	-	-	-	6	63
WYOMING	4	-	-	-	-	-	1	3	1	-	6	2	-	16	69
COLORADO	8	-	-	-	-	-	-	11	-	-	2	1	-	23	173
UTAH	3	-	-	-	-	-	-	6	1	-	5	1	2	18	109
WASHINGTON	8	-	2	3	-	1	-	6	1	-	17	4	1	43	344
OREGON	4	-	-	-	-	1	-	4	-	-	-	-	-	9	163
CALIFORNIA	60	3	9	12	1	8	2	37	2	25	102	24	4	288	1776
NEVADA	4	-	-	-	-	-	-	2	-	-	-	-	-	6	80
ARIZONA	3	-	-	-	-	1	-	5	-	-	-	-	-	10	175
ALASKA	-	1	1	1	-	-	-	1	-	-	-	-	-	5	96
HAWAII	-	1	1	1	-	-	-	1	-	-	3	1	-	8	124
TOTAL US	1701	23	281	355	49	140	15	398	64	25	599	186	84	3919	17076

DUE TO INDEPENDENT ROUNDING, SUM OF STATES MAY NOT EQUAL REGIONAL TOTALS ELSEWHERE   NATIONAL PETROLEUM COUNCIL   NOVEMBER 9, 1992   TIME 14:56

1995 STATE OIL DEMANDS -- THOUSAND BARRELS PER DAY -- FOUNDATION CASE III

	UNLEADED REGULAR GASOLINE						UNLEADED MID-GRADE GASOLINE					
	CO	REFORM	CO-REF	GASOHOL	CONVENT	TOTAL	CO	REFDRM	CO-REF	GASOHDL	CONVENT	TOTAL
MAINE	-	-	-	-	27	27	-	-	-	-	5	5
NEW HAMPSHIRE	5	-	-	-	16	20	1	-	-	-	4	5
VERMONT	-	-	-	-	11	11	-	-	-	-	2	2
MASSACHUSETTS	35	-	-	-	60	95	7	-	-	-	12	20
RHODE ISLANE	-	-	-	-	14	14	-	-	-	-	3	3
CONNECTICUT	-	24	24	-	-	47	-	7	7	-	-	14
NEW YORK	3	43	B9	-	70	204	1	B	17	-	13	38
NEW JERSEY	-	44	72	-	5	122	-	8	13	-	1	22
PENNSYLVANIA	-	32	24	-	122	178	-	8	6	-	31	46
DELAWARE	1	6	4	-	1	12	-	2	2	-	-	4
MARYLAND	10	19	14	-	21	65	4	8	6	-	9	28
DIST COL	2	-	-	-	2	4	1	-	-	-	1	2
W VIRGINIA	-	-	-	-	34	34	-	-	-	-	B	8
VIRGINIA	11	-	-	8	88	108	4	-	-	3	29	35
N CAROLINA	14	-	-	-	119	133	4	-	-	-	30	34
S CAROLINA	-	-	-	3	72	76	-	-	-	1	17	17
GEORGIA	-	-	-	1	138	139	-	-	-	-	34	34
FLORIDA	-	-	-	3	206	208	-	-	-	1	63	64
MICHIGAN	-	-	-	19	187	207	-	-	-	2	23	25
OHIO	25	-	-	38	165	227	5	-	-	7	30	42
INDIANA	-	14	-	25	84	123	-	2	-	4	14	20
ILLINOIS	-	147	-	21	59	226	-	20	-	3	8	30
KENTUCKY	-	-	-	16	59	75	-	-	-	5	17	21
TENNESSEE	8	-	-	14	82	104	2	-	-	4	21	27
WISCONSIN	1	39	-	2	67	108	-	3	-	-	4	7
MINNESOTA	29	-	-	7	75	110	2	-	-	-	5	7
N DAKOTA	-	-	-	2	19	21	-	-	-	-	1	1
S DAKOTA	-	-	-	3	20	23	-	-	-	-	1	1
IOWA	-	-	-	22	57	79	-	-	-	-	1	2
NEBRASKA	-	-	-	16	30	46	-	-	-	1	1	2
MISSOURI	-	-	-	7	122	129	-	-	-	1	16	17
KANSAS	-	-	-	5	64	70	-	-	-	-	4	4
OKLAHOMA	-	-	-	-	89	89	-	-	-	-	4	4
ALABAMA	-	-	-	B	81	89	-	-	-	2	16	18
MISSISSIPPI	-	-	-	-	54	54	-	-	-	-	9	9
ARKANSAS	-	-	-	-	59	59	-	-	-	-	9	9
LOUISIANA	-	-	-	2	81	83	-	-	-	-	15	16
TEXAS	6	91	-	8	304	408	1	13	-	1	44	59
NEW MEXICO	6	-	-	8	29	42	1	-	-	1	3	4
MONTANA	1	-	-	-	21	22	-	-	-	-	3	3
IDAHO	-	-	-	4	23	26	-	-	-	-	2	2
WYOMING	-	-	-	-	16	16	-	-	-	-	2	2
COLORADO	23	-	-	2	43	67	5	-	-	-	9	14
UTAH	11	-	-	-	23	34	2	-	-	-	4	6
WASHINGTON	34	-	-	2	80	116	2	-	-	-	4	6
OREGON	16	-	-	-	56	72	1	-	-	-	3	4
CALIFORNIA	107	149	189	4	139	588	10	13	17	-	12	53
NEVADA	14	-	-	1	15	31	1	-	-	-	1	2
ARIZONA	41	-	-	-	48	89	2	-	-	-	2	4
ALASKA	3	-	-	-	9	12	-	-	-	-	-	-
HAWAII	-	-	-	-	13	13	-	-	-	-	2	2
TOTAL US	406	607	417	252	3275	4956	54	92	67	37	551	801

DUE TO INDEPENDENT RDUNDING, SUM OF STATES MAY NOT EQUAL REGIONAL TOTALS ELSEWHERE NATIONAL PETROLEUM COUNCIL NOVEMBER 9, 1992 TIME 14:56

1995 STATE OIL DEMANDS -- THOUSAND BARRELS PER DAY -- FOUNDATION CASE III

	UNLEADED PREMIUM GASOLINE						TOTAL GASOLINE					
	CO	REFORM	CO-REF	GASOHOL	CONVENT	TOTAL	CO	REFORM	CO-REF	GASOHOL	CONVENT	TOTAL
MAINE	-	-	-	-	7	7	-	-	-	-	38	38
NEW HAMPSHIRE	2	-	-	-	6	8	7	-	-	-	26	33
VERMONT	-	-	-	-	4	4	-	-	-	-	18	18
MASSACHUSETTS	16	-	-	-	27	43	58	-	-	-	99	157
RHODE ISLANE	-	-	-	-	7	7	-	-	-	-	24	24
CONNECTICUT	-	13	13	-	-	26	-	43	44	-	-	87
NEW YORK	2	24	51	-	40	117	6	75	157	-	123	360
NEW JERSEY	-	27	45	-	3	75	-	80	130	-	10	219
PENNSYLVANIA	-	13	9	-	48	70	-	54	40	-	201	294
DELAWARE	-	3	2	-	-	5	2	11	8	-	2	22
MARYLAND	6	12	9	-	13	40	21	39	29	-	43	132
DIST COL	2	-	-	-	3	5	5	-	-	-	7	11
W VIRGINIA	-	-	-	-	11	11	-	-	-	-	53	53
VIRGINIA	5	-	-	4	40	48	20	-	-	14	157	191
N CAROLINA	5	-	-	-	38	43	23	-	-	-	187	210
S CAROLINA	-	-	-	1	21	22	-	-	-	5	110	115
GEORGIA	-	-	-	-	52	53	-	-	-	2	223	225
FLORIDA	-	-	-	1	110	111	-	-	-	5	378	383
MICHIGAN	-	-	-	4	37	41	-	-	-	25	247	273
OHIO	5	-	-	7	32	44	34	-	-	52	227	314
INDIANA	-	3	-	5	16	23	-	18	-	34	114	166
ILLINOIS	-	36	-	5	14	55	-	202	-	28	81	311
KENTUCKY	-	-	-	5	16	21	-	-	-	26	92	117
TENNESSEE	2	-	-	4	24	31	12	-	-	22	128	162
WISCONSIN	-	6	-	-	11	17	1	47	-	2	82	133
MINNESOTA	4	-	-	1	10	14	34	-	-	8	89	131
N DAKOTA	-	-	-	-	1	1	-	-	-	2	20	23
S DAKOTA	-	-	-	-	1	1	-	-	-	4	21	25
IOWA	-	-	-	2	5	7	-	-	-	24	64	88
NEBRASKA	-	-	-	1	2	2	-	-	-	17	33	50
MISSOURI	-	-	-	1	24	26	-	-	-	10	162	172
KANSAS	-	-	-	1	6	7	-	-	-	6	74	81
OKLAHOMA	-	-	-	-	12	12	-	-	-	-	105	105
ALABAMA	-	-	-	2	24	27	-	-	-	12	121	133
MISSISSIPPI	-	-	-	-	16	16	-	-	-	-	78	78
ARKANSAS	-	-	-	-	12	12	-	-	-	-	79	79
LOUISIANA	-	-	-	1	27	28	-	-	-	3	123	126
TEXAS	1	18	-	2	61	82	8	122	-	10	409	550
NEW MEXICO	1	-	-	1	3	5	7	-	-	9	35	51
MONTANA	-	-	-	-	3	3	1	-	-	-	27	28
IDAHO	-	-	-	-	2	2	-	-	-	4	27	31
WYOMING	-	-	-	-	2	2	-	-	-	-	20	21
COLORADO	5	-	-	-	9	14	32	-	-	3	61	96
UTAH	2	-	-	-	5	7	16	-	-	-	31	47
WASHINGTON	7	-	-	-	16	23	42	-	-	3	100	145
OREGON	2	-	-	-	8	10	20	-	-	-	66	86
CALIFORNIA	36	50	64	1	47	198	152	213	270	6	198	838
NEVADA	3	-	-	-	3	6	18	-	-	1	20	39
ARIZONA	7	-	-	-	9	16	50	-	-	-	59	110
ALASKA	-	-	-	-	1	1	3	-	-	-	10	14
HAWAII	-	-	-	-	9	9	-	-	-	-	24	24
TOTAL US	114	205	193	51	898	1460	573	904	676	340	4724	7218

DUE TO INOEPENOENT ROUNDING, SUM OF STATES MAY NOT EQUAL REGIONAL TOTALS ELSEWHERE NATIONAL PETROLEUM COUNCIL NOVEMBER 9, 1992 TIME 14:56

1995 STATE OIL OEMANOS -- THOUSAND BARRELS PER DAY -- FOUNDATION CASE III

	DISTILLATE							HEAVY FUEL OIL				
	KERO JT	KERO+1	ON HWY	OFF HWY	DIST 2	HVY OSL	TOTAL	OIST 4	< 0.3	0.3-1	> 1.0	TOTAL
MAINE	5	2	10	2	17	1	31	-	-	14	7	22
NEW HAMPSHIRE	1	1	4	2	12	-	1B	1	-	-	14	14
VERMONT	1	-	3	1	6	-	12	-	-	-	-	-
MASSACHUSETTS	32	1	18	3	65	4	91	4	-	25	49	79
RHODE ISLANE	2	-	4	1	9	1	14	-	-	2	1	3
CONNECTICUT	7	1	17	3	40	1	61	2	-	44	2	49
NEW YORK	31	7	51	11	107	2	178	13	62	71	49	195
NEW JERSEY	144	2	31	9	54	13	109	5	27	7	21	59
PENNSYLVANIA	31	4	62	17	70	5	159	2	-	29	12	43
DELAWARE	-	-	5	1	4	-	11	-	-	8	5	13
MARYLAND	29	1	25	5	20	4	55	1	-	16	15	32
DIST COL	-	-	2	-	5	1	8	-	-	-	-	1
W VIRGINIA	1	1	11	7	4	6	29	-	-	-	1	1
VIRGINIA	41	3	37	9	21	9	80	1	-	9	14	23
N CAROLINA	18	4	42	9	18	3	76	-	-	-	8	8
S CAROLINA	3	2	20	6	5	2	36	-	-	-	4	4
GEORGIA	54	-	57	12	3	7	79	-	-	-	4	4
FLORIDA	93	1	62	15	7	12	97	-	-	75	46	121
MICHIGAN	28	4	36	12	14	3	69	-	-	8	4	12
OHIO	37	5	65	14	15	9	108	-	-	-	7	8
INDIANA	65	3	53	12	9	16	93	1	-	-	12	12
ILLINOIS	14	2	57	19	8	12	97	-	-	9	5	13
KENTUCKY	18	3	47	11	6	14	82	-	-	-	2	2
TENNESSEE	15	2	40	8	1	16	67	-	-	-	2	2
WISCONSIN	4	2	30	11	15	7	66	-	-	-	4	4
MINNESOTA	17	4	22	12	11	3	52	-	-	-	4	4
N DAKOTA	3	1	6	7	3	2	19	-	-	-	1	1
S DAKOTA	2	1	6	5	2	-	15	-	-	-	-	-
IOWA	2	1	23	11	4	2	42	-	-	-	1	1
NEBRASKA	4	-	14	11	1	8	35	-	-	-	1	1
MISSOURI	27	1	43	10	3	5	62	-	-	-	3	3
KANSAS	12	-	20	11	2	11	45	-	-	-	1	1
OKLAHOMA	37	-	27	7	3	5	42	-	-	-	1	1
ALABAMA	2	3	37	15	3	14	72	-	-	-	35	35
MISSISSIPPI	8	2	25	14	3	6	50	-	-	-	48	48
ARKANSAS	2	1	27	11	2	2	42	-	-	5	5	10
LOUISIANA	51	4	31	13	24	36	109	-	-	14	101	115
TEXAS	167	18	112	57	28	48	263	-	4	11	69	84
NEW MEXICO	3	2	14	7	1	4	27	-	-	3	3	6
MONTANA	3	1	8	8	1	4	21	-	-	-	4	4
IDAHO	5	1	8	8	2	1	19	-	-	-	1	1
WYOMING	1	1	13	5	2	7	28	-	-	-	1	1
COLORADO	22	1	13	8	2	6	29	-	-	-	-	-
UTAH	20	-	9	5	1	2	17	-	-	-	5	5
WASHINGTON	53	3	26	12	8	11	60	-	4	-	33	38
OREGON	9	1	21	9	6	8	44	-	-	-	12	13
CALIFORNIA	241	1	142	52	5	28	229	2	22	1	117	142
NEVADA	10	-	9	9	1	2	21	-	-	2	-	2
ARIZONA	19	-	21	9	-	1	32	-	-	-	-	-
ALASKA	46	2	9	3	7	9	29	-	-	-	-	1
HAWAII	28	-	4	2	4	6	16	-	-	37	12	49
TOTAL US	1467	100	1476	522	665	382	3145	34	119	391	745	1289

DUE TO INDEPENDENT ROUNDING, SUM OF STATES MAY NOT EQUAL REGIONAL TOTALS ELSEWHERE NATIONAL PETROLEUM COUNCIL NOVEMBER 9, 1992 TIME 14:56

1995 STATE OIL DEMANDS -- THOUSAND BARRELS PER DAY -- FOUNDATION CASE III

	LPG	AVGAS	-- CHEM FEED --- NAPHTHA	GASOIL	SPC NAP	LUBES	WAX	ASPHALT	MISC	CRUDE	STGAS	---- COKE ------ CAT CK	MKT CK	--- TOTALS ----- OTHER	ALL
MAINE	4	-	-	-	-	1	-	2	-	-	-	-	-	7	102
NEW HAMPSHIRE	6	-	-	-	-	1	-	2	-	-	-	-	-	8	75
VERMONT	4	-	-	-	-	-	-	1	-	-	-	-	-	5	35
MASSACHUSETTS	6	-	-	-	-	3	-	7	-	-	-	-	-	16	375
RHODE ISLANE	1	-	-	-	-	1	-	1	-	-	-	-	-	3	46
CONNECTICUT	4	-	-	-	-	2	-	4	-	-	-	-	-	10	214
NEW YORK	13	-	-	1	-	8	-	17	-	-	-	-	-	40	804
NEW JERSEY	17	-	5	6	2	5	1	10	5	-	27	13	2	93	624
PENNSYLVANIA	17	-	8	11	4	7	2	15	8	-	27	13	-	111	637
DELAWARE	2	-	2	2	1	-	-	1	1	-	7	3	4	24	70
MARYLAND	5	-	-	-	-	3	-	6	-	-	-	-	-	15	262
DIST COL	-	-	-	-	-	-	-	1	-	-	-	-	-	1	21
W VIRGINIA	4	-	-	-	-	1	1	3	-	-	-	-	-	10	93
VIRGINIA	11	-	1	1	-	4	-	9	1	-	3	1	1	33	368
N CAROLINA	23	-	-	-	-	5	-	10	-	-	-	-	-	38	349
S CAROLINA	9	-	-	-	-	3	-	5	-	-	-	-	-	17	175
GEORGIA	18	-	-	-	-	5	-	11	-	-	-	-	-	37	399
FLORIDA	18	2	-	-	-	8	-	18	-	-	-	-	-	46	741
MICHIGAN	48	1	1	1	1	4	-	17	-	-	5	2	-	79	460
OHIO	33	1	4	5	3	4	-	20	2	-	19	6	4	103	569
INDIANA	19	1	4	5	2	3	-	12	1	-	18	6	5	76	413
ILLINOIS	24	-	8	11	5	5	-	21	3	-	38	12	22	149	586
KENTUCKY	17	-	2	2	1	2	-	8	1	-	11	4	-	48	266
TENNESSEE	8	-	1	1	-	2	-	11	-	-	3	1	-	28	273
WISCONSIN	17	-	-	-	-	2	-	9	-	-	1	-	-	30	236
MINNESOTA	15	-	3	3	2	2	-	8	1	-	9	3	10	54	258
N DAKOTA	4	-	1	1	-	-	-	1	-	-	3	1	-	12	58
S DAKOTA	9	-	-	-	-	-	-	2	-	-	-	-	-	11	53
IOWA	17	-	-	-	-	1	-	6	-	-	-	-	-	25	158
NEBRASKA	9	-	-	-	-	1	-	3	-	-	-	-	-	13	103
MISSOURI	19	1	-	-	-	3	-	12	-	-	-	-	-	34	297
KANSAS	44	-	3	4	2	1	-	5	1	-	14	5	7	87	226
OKLAHOMA	15	-	3	4	2	2	1	7	1	-	15	5	4	61	245
ALABAMA	12	1	3	4	1	7	-	11	1	-	-	-	-	40	283
MISSISSIPPI	12	1	9	11	1	4	-	7	2	-	9	3	3	62	246
ARKANSAS	9	-	1	2	-	4	-	7	-	-	2	1	-	28	161
LOUISIANA	129	1	56	71	9	6	2	10	12	-	92	28	11	428	829
TEXAS	875	4	101	128	16	26	5	43	21	-	198	60	9	1487	2550
NEW MEXICO	16	-	2	2	-	3	-	4	-	-	3	1	-	33	120
MONTANA	4	-	-	-	-	-	-	4	1	-	5	2	2	18	74
IDAHO	2	-	-	-	-	-	-	4	-	-	-	-	-	6	62
WYOMING	4	-	-	-	-	-	1	3	1	-	6	2	-	18	67
COLORADO	9	-	-	-	-	-	-	12	-	-	2	1	-	26	173
UTAH	3	-	-	-	-	-	-	6	1	-	5	2	2	19	109
WASHINGTON	8	-	2	2	-	2	-	7	1	-	19	4	1	46	341
OREGON	4	-	-	-	-	1	-	4	-	-	-	-	-	10	162
CALIFORNIA	61	3	8	10	1	9	2	40	3	27	112	26	4	306	1756
NEVADA	4	-	-	-	-	-	-	2	-	-	-	-	-	7	79
ARIZONA	4	-	-	-	-	1	-	5	-	-	-	-	-	11	172
ALASKA	1	1	1	1	-	-	-	1	-	-	-	-	-	5	95
HAWAII	-	1	-	1	-	-	-	1	-	-	4	1	-	8	125
TOTAL US	1619	25	231	292	54	154	16	437	70	27	658	204	92	3878	16997

DUE TO INDEPENDENT ROUNDING, SUM OF STATES MAY NOT EQUAL REGIONAL TOTALS ELSEWHERE NATIONAL PETROLEUM COUNCIL NOVEMBER 9, 1992 TIME 14:56

2000 STATE OIL DEMANDS -- THOUSAND BARRELS PER DAY -- FOUNDATION CASE III

	UNLEADED REGULAR GASOLINE						UNLEADED MID-GRADE GASOLINE					
	CO	REFORM	CO-REF	GASOHOL	CONVENT	TOTAL	CO	REFORM	CO-REF	GASOHOL	CONVENT	TOTAL
MAINE	-	26	-	-	-	26	-	4	-	-	-	4
NEW HAMPSHIRE	-	15	4	-	-	19	-	4	1	-	-	5
VERMONT	-	11	-	-	-	11	-	2	-	-	-	2
MASSACHUSETTS	-	58	33	-	-	91	-	12	7	-	-	19
RHODE ISLANE	-	13	-	-	-	13	-	3	-	-	-	3
CONNECTICUT	-	23	23	-	-	45	-	7	7	-	-	13
NEW YORK	-	109	88	-	-	197	-	20	16	-	-	37
NEW JERSEY	-	48	69	-	-	117	-	9	12	-	-	21
PENNSYLVANIA	-	148	23	-	-	171	-	38	6	-	-	44
DELAWARE	-	7	5	-	-	12	-	2	2	-	-	4
MARYLAND	-	39	24	-	-	62	-	17	10	-	-	27
DIST COL	-	2	2	-	-	4	-	1	1	-	-	2
W VIRGINIA	-	9	-	-	23	32	-	2	-	-	6	8
VIRGINIA	-	93	11	-	-	104	-	30	4	-	-	34
N CAROLINA	-	40	14	-	74	128	-	10	4	-	19	32
S CAROLINA	-	4	-	3	66	73	-	1	-	1	15	17
GEORGIA	-	59	-	1	74	134	-	14	-	-	18	32
FLORIDA	-	96	-	1	103	200	-	29	-	-	32	62
MICHIGAN	-	119	-	7	72	199	-	15	-	1	9	24
OHIO	-	144	24	10	41	219	-	27	4	2	8	40
INDIANA	-	58	-	14	46	118	-	10	-	2	8	20
ILLINOIS	-	152	-	17	48	218	-	20	-	2	6	29
KENTUCKY	-	34	-	8	30	72	-	10	-	2	9	20
TENNESSEE	-	43	8	7	42	100	-	11	2	2	11	26
WISCONSIN	1	44	-	1	58	104	-	3	-	-	4	7
MINNESOTA	28	-	-	6	72	106	2	-	-	-	5	7
N DAKOTA	-	-	-	2	18	20	-	-	-	-	1	1
S DAKOTA	-	-	-	3	19	22	-	-	-	-	-	1
IOWA	-	-	-	21	55	76	-	-	-	-	1	2
NEBRASKA	-	-	-	15	29	44	-	-	-	1	1	2
MISSOURI	-	69	-	3	52	124	-	9	-	-	7	16
KANSAS	-	17	-	4	47	67	-	1	-	-	3	4
OKLAHOMA	-	-	-	-	85	85	-	-	-	-	4	4
ALABAMA	-	19	-	6	60	86	-	4	-	1	12	17
MISSISSIPPI	-	-	-	-	52	52	-	-	-	-	8	8
ARKANSAS	-	-	-	-	56	56	-	-	-	-	8	8
LOUISIANA	-	14	-	2	64	80	-	3	-	-	12	15
TEXAS	-	194	6	5	188	393	-	28	1	1	27	57
NEW MEXICO	6	-	-	7	28	41	-	-	-	1	2	4
MONTANA	1	-	-	-	20	21	-	-	-	-	2	3
IDAHO	-	-	-	3	22	25	-	-	-	-	2	2
WYOMING	-	-	-	-	15	16	-	-	-	-	2	2
COLORADO	22	-	-	2	41	65	4	-	-	-	8	13
UTAH	2	12	9	-	10	33	-	2	1	-	2	6
WASHINGTON	5	37	28	1	41	112	-	2	1	-	2	5
OREGON	3	18	13	-	36	69	-	1	1	-	2	3
CALIFORNIA	-	281	284	-	-	565	-	25	25	-	-	51
NEVADA	11	4	3	1	12	30	1	-	-	-	1	2
ARIZONA	9	20	30	-	26	86	-	1	1	-	1	4
ALASKA	3	-	-	-	9	12	-	-	-	-	-	-
HAWAII	-	-	-	-	12	12	-	-	-	-	2	2
TOTAL US	90	2078	697	152	1747	4764	9	376	107	19	259	770

DUE TO INDEPENDENT ROUNDING, SUM OF STATES MAY NOT EQUAL REGIONAL TOTALS ELSEWHERE NATIONAL PETROLEUM COUNCIL NOVEMBER 9, 1992 TIME 14:56

2000 STATE OIL DEMANDS -- THOUSAND BARRELS PER DAY -- FOUNDATION CASE III

	UNLEADED PREMIUM GASOLINE						TOTAL GASOLINE					
	CO	REFORM	CO-REF	GASOHOL	CONVENT	TOTAL	CO	REFORM	CO-REF	GASOHOL	CONVENT	TOTAL
MAINE	-	7	-	-	-	7	-	37	-	-	-	37
NEW HAMPSHIRE	-	6	2	-	-	8	-	25	7	-	-	32
VERMONT	-	4	-	-	-	4	-	17	-	-	-	17
MASSACHUSETTS	-	26	15	-	-	41	-	95	55	-	-	151
RHODE ISLANE	-	7	-	-	-	7	-	23	-	-	-	23
CONNECTICUT	-	13	13	-	-	25	-	42	42	-	-	84
NEW YORK	-	62	50	-	-	113	-	191	155	-	-	346
NEW JERSEY	-	30	43	-	-	73	-	87	124	-	-	211
PENNSYLVANIA	-	58	9	-	-	67	-	245	38	-	-	282
DELAWARE	-	3	2	-	-	5	-	12	9	-	-	21
MARYLAND	-	24	14	-	-	38	-	79	48	-	-	127
DIST COL	-	3	2	-	-	5	-	6	5	-	-	11
W VIRGINIA	-	3	-	-	7	10	-	15	-	-	36	51
VIRGINIA	-	41	5	-	-	46	-	165	19	-	-	184
N CAROLINA	-	13	4	-	24	41	-	62	22	-	117	202
S CAROLINA	-	1	-	1	19	21	-	6	-	5	100	111
GEORGIA	-	22	-	-	28	50	-	96	-	1	120	217
FLORIDA	-	51	-	1	55	107	-	176	-	2	190	368
MICHIGAN	-	23	-	1	14	39	-	157	-	10	95	262
OHIO	-	28	5	2	8	43	-	198	33	13	57	302
INDIANA	-	11	-	3	9	22	-	79	-	19	62	160
ILLINOIS	-	37	-	4	12	53	-	209	-	23	67	299
KENTUCKY	-	9	-	2	8	20	-	53	-	13	47	113
TENNESSEE	-	13	2	2	12	30	-	67	12	11	65	156
WISCONSIN	-	7	-	-	9	17	1	54	-	2	71	127
MINNESOTA	4	-	-	1	9	13	33	-	-	8	86	126
N DAKOTA	-	-	-	-	1	1	-	-	-	2	20	22
S DAKOTA	-	-	-	-	1	1	-	-	-	3	20	24
IOWA	-	-	-	2	5	7	-	-	-	24	61	85
NEBRASKA	-	-	-	1	2	2	-	-	-	17	32	48
MISSOURI	-	14	-	1	10	25	-	92	-	4	69	165
KANSAS	-	2	-	-	5	7	-	19	-	5	54	78
OKLAHOMA	-	-	-	-	12	12	-	-	-	-	101	101
ALABAMA	-	6	-	2	18	26	-	29	-	9	90	128
MISSISSIPPI	-	-	-	-	15	15	-	-	-	-	75	75
ARKANSAS	-	-	-	-	11	11	-	-	-	-	76	76
LOUISIANA	-	5	-	1	21	27	-	22	-	3	97	121
TEXAS	-	39	1	1	38	79	-	262	8	6	253	529
NEW MEXICO	1	-	-	1	3	5	7	-	-	9	33	49
MONTANA	-	-	-	-	3	3	1	-	-	-	26	27
IDAHO	-	-	-	-	2	2	-	-	-	4	26	30
WYOMING	-	-	-	-	2	2	-	-	-	-	20	20
COLORADO	5	-	-	-	9	14	31	-	-	3	58	92
UTAH	-	2	2	-	2	7	3	16	12	-	14	45
WASHINGTON	1	7	5	-	8	22	6	47	34	1	51	139
OREGON	-	2	2	-	5	10	3	21	15	-	43	83
CALIFORNIA	-	95	96	-	-	190	-	401	405	-	-	805
NEVADA	2	1	1	-	2	6	14	5	3	1	15	38
ARIZONA	2	4	5	-	5	16	11	25	37	-	32	105
ALASKA	-	-	-	-	1	1	3	-	-	-	10	13
HAWAII	-	-	-	-	8	8	-	-	-	-	23	23
TOTAL US	15	679	278	27	405	1403	114	3133	1082	198	2411	6938

DUE TO INDEPENDENT ROUNDING, SUM OF STATES MAY NOT EQUAL REGIONAL TOTALS ELSEWHERE NATIONAL PETROLEUM COUNCIL NOVEMBER 9, 1992 TIME 14:56

2000 STATE OIL DEMANDS -- THOUSAND BARRELS PER DAY -- FOUNDATION CASE III

		DISTILLATE						HEAVY FUEL OIL				
	KERO JT	KERO+1	ON HWY	OFF HWY	DIST 2	HVY DSL	TOTAL	DIST 4	< 0.3	0.3-1	> 1.0	TOTAL
MAINE	5	1	9	2	14	1	27	-	-	13	5	18
NEW HAMPSHIRE	1	-	4	2	9	-	16	-	-	-	12	13
VERMONT	1	-	3	1	5	-	10	-	-	-	-	-
MASSACHUSETTS	31	-	18	3	51	4	77	3	-	23	44	69
RHODE ISLANE	2	-	4	1	7	1	12	-	-	2	1	2
CONNECTICUT	7	1	17	3	31	1	52	1	-	41	1	44
NEW YORK	30	5	50	11	88	2	155	8	57	65	42	171
NEW JERSEY	138	2	30	9	44	12	97	3	24	6	16	49
PENNSYLVANIA	30	3	60	17	58	5	144	1	-	26	9	37
DELAWARE	-	-	5	1	4	-	11	-	-	8	4	12
MARYLAND	28	1	24	5	18	4	52	-	-	14	13	28
DIST CDL	-	-	2	-	7	1	10	-	-	-	-	-
W VIRGINIA	1	1	10	7	5	6	28	-	-	-	1	1
VIRGINIA	39	2	36	9	19	9	75	-	-	8	11	20
N CAROLINA	17	3	41	9	16	3	71	-	-	-	6	6
S CAROLINA	3	1	20	6	5	2	34	-	-	-	3	3
GEORGIA	52	-	56	12	4	7	78	-	-	-	3	3
FLORIDA	90	1	60	15	10	11	97	-	-	69	39	108
MICHIGAN	27	3	35	12	13	3	66	-	-	7	3	10
OHIO	35	4	64	14	13	9	103	-	-	-	6	6
INDIANA	63	2	52	13	8	16	91	1	-	-	8	9
ILLINOIS	14	2	55	20	8	11	96	-	-	7	3	10
KENTUCKY	17	2	46	12	6	14	80	-	-	-	1	1
TENNESSEE	14	1	39	8	1	16	65	-	-	-	1	1
WISCONSIN	4	2	30	11	13	7	62	-	-	-	3	3
MINNESOTA	16	3	22	12	9	3	49	-	-	-	3	3
N DAKOTA	3	-	6	7	3	2	19	-	-	-	1	1
S DAKOTA	2	1	6	6	2	-	14	-	-	-	-	-
IOWA	2	1	23	12	3	2	41	-	-	-	-	-
NEBRASKA	4	-	14	12	1	8	35	-	-	-	1	1
MISSOURI	26	1	42	10	3	5	61	-	-	-	2	2
KANSAS	12	-	20	11	2	11	44	-	-	-	1	1
OKLAHOMA	35	-	26	7	3	5	41	-	-	-	1	1
ALABAMA	2	2	36	16	3	14	71	-	-	-	24	24
MISSISSIPPI	8	1	25	14	3	6	49	-	-	-	36	36
ARKANSAS	2	1	26	11	2	2	42	-	-	4	3	7
LOUISIANA	49	4	31	14	25	35	109	-	-	10	74	84
TEXAS	161	15	109	58	31	47	260	-	3	8	51	62
NEW MEXICO	3	2	14	7	1	3	27	-	-	2	2	4
MONTANA	3	1	8	8	1	4	21	-	-	-	3	3
IDAHO	5	-	8	8	1	1	19	-	-	-	1	1
WYOMING	1	1	12	6	2	7	27	-	-	-	-	-
COLORADO	21	1	13	8	2	6	29	-	-	-	-	-
UTAH	20	-	8	5	1	2	17	-	-	-	4	4
WASHINGTON	51	3	25	12	6	10	57	-	3	-	25	28
OREGON	8	-	20	9	5	8	43	-	-	-	9	9
CALIFORNIA	231	1	139	53	5	27	226	1	19	1	88	110
NEVADA	10	-	9	9	1	2	21	-	-	1	-	1
ARIZONA	18	-	21	10	1	1	32	-	-	-	-	-
ALASKA	45	1	9	3	7	9	29	-	-	-	-	-
HAWAII	27	-	4	2	7	5	18	-	-	32	8	41
TOTAL US	1410	77	1442	530	587	373	3010	21	106	348	573	1049

DUE TO INDEPENDENT ROUNDING, SUM OF STATES MAY NOT EQUAL REGIONAL TOTALS ELSEWHERE NATIONAL PETROLEUM COUNCIL NOVEMBER 9, 1992 TIME 14:56

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2000 STATE OIL DEMANDS -- THOUSAND BARRELS PER DAY -- FOUNDATION CASE III

			-- CHEM FEED ---									---- COKE ------		--- TOTALS -----	
	LPG	AVGAS	NAPHTHA	GASOIL	SPC NAP	LUBES	WAX	ASPHALT	MISC	CRUDE	STGAS	CAT CK	MKT CK	OTHER	ALL
MAINE	3	-	-	-	-	1	-	2	-	-	-	-	-	6	92
NEW HAMPSHIRE	5	-	-	-	-	1	-	1	-	-	-	-	-	7	68
VERMONT	3	-	-	-	-	-	-	1	-	-	-	-	-	4	32
MASSACHUSETTS	5	-	-	-	-	3	-	6	-	-	-	-	-	14	342
RHODE ISLANE	1	-	-	-	-	-	-	1	-	-	-	-	-	3	42
CONNECTICUT	3	-	-	-	-	2	-	4	-	-	-	-	-	9	195
NEW YORK	11	-	-	1	-	7	-	15	-	-	-	-	-	35	737
NEW JERSEY	16	-	5	7	2	4	1	9	4	-	24	11	2	87	582
PENNSYLVANIA	15	-	9	11	4	6	2	13	7	-	24	11	-	103	596
DELAWARE	2	-	2	2	1	-	-	1	1	-	6	3	4	22	65
MARYLAND	4	-	-	-	-	3	-	6	-	-	-	-	-	13	248
DIST COL	-	-	-	-	-	-	-	-	-	-	-	-	-	1	22
W VIRGINIA	4	-	-	-	-	1	1	2	-	-	-	-	-	9	90
VIRGINIA	10	-	1	1	-	4	-	9	-	-	3	1	1	29	347
N CAROLINA	19	-	-	-	-	4	-	9	-	-	-	-	-	33	329
S CAROLINA	7	-	-	-	-	2	-	5	-	-	-	-	-	15	165
GEORGIA	15	-	-	1	-	5	-	10	-	-	-	-	-	32	382
FLORIDA	15	2	-	-	-	8	-	16	-	-	-	-	-	41	704
MICHIGAN	43	1	1	1	1	3	-	15	-	-	5	2	-	72	436
OHIO	30	1	4	6	2	4	-	19	2	-	18	6	4	94	541
INDIANA	16	1	4	5	2	2	-	11	1	-	16	5	5	69	391
ILLINOIS	21	-	9	11	5	4	-	19	3	-	34	11	20	137	556
KENTUCKY	15	-	2	3	1	2	-	7	1	-	10	3	-	45	255
TENNESSEE	7	-	1	1	-	2	-	10	-	-	3	1	-	25	261
WISCONSIN	14	-	-	-	-	2	-	8	-	-	1	-	-	26	222
MINNESOTA	12	-	3	3	1	2	-	7	1	-	8	3	9	49	243
N DAKOTA	3	-	1	1	-	-	-	1	-	-	3	1	-	10	55
S DAKOTA	7	-	-	-	-	-	-	1	-	-	-	-	-	9	50
IOWA	14	-	-	-	-	1	-	5	-	-	-	-	-	21	150
NEBRASKA	7	-	-	-	-	1	-	3	-	-	-	-	-	11	99
MISSOURI	16	-	-	-	-	2	-	11	-	-	-	-	-	29	284
KANSAS	43	-	3	4	2	1	-	5	1	-	13	4	7	83	218
OKLAHOMA	14	-	4	5	2	1	-	6	1	-	14	5	4	56	235
ALABAMA	10	1	3	4	-	6	-	10	1	-	-	-	-	36	261
MISSISSIPPI	11	1	9	12	1	4	-	6	2	-	8	2	2	58	226
ARKANSAS	8	-	1	2	-	4	-	6	-	-	2	1	-	25	153
LOUISIANA	129	1	58	73	8	6	2	9	11	-	84	25	10	416	779
TEXAS	875	4	104	131	14	24	5	39	20	-	180	55	8	1458	2469
NEW MEXICO	15	-	2	2	-	2	-	4	-	-	3	1	-	31	114
MONTANA	3	-	-	-	-	-	-	3	1	-	5	1	2	16	70
IDAHO	2	-	-	-	-	-	-	4	-	-	-	-	-	6	59
WYOMING	4	-	-	-	-	-	1	3	1	-	6	2	-	16	65
COLORADO	8	-	-	-	-	-	-	11	-	-	2	1	-	23	165
UTAH	3	-	-	-	-	-	-	6	1	-	5	1	2	18	103
WASHINGTON	8	-	2	2	-	1	-	6	1	-	17	4	1	42	317
OREGON	4	-	-	-	-	1	-	4	-	-	-	-	-	9	152
CALIFORNIA	57	3	8	10	1	8	2	37	2	24	102	24	4	281	1654
NEVADA	4	-	-	-	-	-	-	2	-	-	-	-	-	7	76
ARIZONA	3	-	-	-	-	1	-	5	-	-	-	-	-	10	166
ALASKA	1	1	1	1	-	-	-	1	-	-	-	-	-	4	91
HAWAII	-	1	-	1	-	-	-	1	-	-	3	1	-	7	116
TOTAL US	1549	23	237	299	49	140	15	397	64	24	598	186	84	3665	16071

DUE TO INDEPENDENT ROUNDING, SUM OF STATES MAY NOT EQUAL REGIONAL TOTALS ELSEWHERE NATIONAL PETROLEUM COUNCIL NOVEMBER 9, 1992 TIME 14:56

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	UNLEADED REGULAR GASOLINE						UNLEADED MID-GRADE GASOLINE					
	CO	REFORM	CO-REF	GASOHOL	CONVENT	TOTAL	CO	REFORM	CO-REF	GASOHOL	CONVENT	TOTAL
MAINE	-	24	-	-	-	24	-	4	-	-	-	4
NEW HAMPSHIRE	-	14	4	-	-	18	-	3	1	-	-	4
VERMONT	-	10	-	-	-	10	-	2	-	-	-	2
MASSACHUSETTS	-	53	31	-	-	83	-	11	6	-	-	17
RHODE ISLANE	-	12	-	-	-	12	-	3	-	-	-	3
CONNECTICUT	-	21	21	-	-	41	-	6	6	-	-	12
NEW YORK	-	100	80	-	-	180	-	19	15	-	-	34
NEW JERSEY	-	44	63	-	-	107	-	8	11	-	-	19
PENNSYLVANIA	-	136	21	-	-	157	-	35	5	-	-	40
DELAWARE	-	6	5	-	-	11	-	2	2	-	-	4
MARYLAND	-	36	22	-	-	57	-	15	9	-	-	24
DIST COL	-	2	1	-	-	3	-	1	1	-	-	2
W VIRGINIA	-	9	-	-	21	30	-	2	-	-	5	7
VIRGINIA	-	85	10	-	-	95	-	28	3	-	-	31
N CAROLINA	-	36	13	-	68	117	-	9	3	-	17	30
S CAROLINA	-	3	-	3	61	67	-	1	-	1	14	15
GEORGIA	-	54	-	1	68	122	-	13	-	-	16	30
FLORIDA	-	88	-	1	94	183	-	27	-	-	29	56
MICHIGAN	-	109	-	7	66	182	-	13	-	1	8	22
OHIO	-	132	22	9	38	200	-	24	4	2	7	37
INDIANA	-	54	-	13	42	108	-	9	-	2	7	18
ILLINOIS	-	140	-	15	44	199	-	19	-	2	6	27
KENTUCKY	-	31	-	8	28	66	-	9	-	2	8	19
TENNESSEE	-	40	7	7	39	92	-	10	2	2	10	24
WISCONSIN	1	40	-	1	53	95	-	3	-	-	3	6
MINNESOTA	25	-	-	6	66	97	2	-	-	-	4	6
N DAKOTA	-	-	-	2	17	19	-	-	-	-	1	1
S DAKOTA	-	-	-	3	17	20	-	-	-	-	-	1
IOWA	-	-	-	19	51	70	-	-	-	-	1	2
NEBRASKA	-	-	-	14	26	40	-	-	-	1	1	2
MISSOURI	-	63	-	3	48	114	-	8	-	-	6	15
KANSAS	-	15	-	4	43	62	-	1	-	-	2	3
OKLAHOMA	-	-	-	-	78	78	-	-	-	-	4	4
ALABAMA	-	18	-	6	55	78	-	4	-	1	11	16
MISSISSIPPI	-	-	-	-	47	47	-	-	-	-	8	8
ARKANSAS	-	-	-	-	52	52	-	-	-	-	8	8
LOUISIANA	-	13	-	2	58	73	-	2	-	-	11	14
TEXAS	-	178	5	4	172	360	-	26	1	1	25	52
NEW MEXICO	5	-	-	7	25	37	-	-	-	1	2	3
MONTANA	1	-	-	-	19	20	-	-	-	-	2	2
IDAHO	-	-	-	3	20	23	-	-	-	-	2	2
WYOMING	-	-	-	-	14	14	-	-	-	-	2	2
COLORADO	20	-	-	2	38	59	4	-	-	-	8	12
UTAH	2	11	8	-	9	30	-	2	1	-	2	5
WASHINGTON	5	34	25	1	37	102	-	2	1	-	2	5
OREGON	3	16	12	-	33	64	-	1	1	-	2	3
CALIFORNIA	-	257	260	-	-	517	-	23	23	-	-	46
NEVADA	10	3	3	1	11	27	1	-	-	-	1	2
ARIZONA	9	19	27	-	24	78	-	1	1	-	1	4
ALASKA	3	-	-	-	8	11	-	-	-	-	-	-
HAWAII	-	-	-	-	11	11	-	-	-	-	2	2
TOTAL US	82	1904	639	140	1602	4366	8	345	98	17	238	706

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	UNLEADED PREMIUM GASOLINE						TOTAL GASOLINE					
	CO	REFORM	CO REF	GASOHOL	CONVENT	TOTAL	CO	REFORM	CO-REF	GASOHOL	CONVENT	TOTAL
MAINE	-	6	-	-	-	6	-	34	-	-	-	34
NEW HAMPSHIRE	-	6	2	-	-	7	-	23	6	-	-	29
VERMONT	-	4	-	-	-	4	-	16	-	-	-	16
MASSACHUSETTS	-	24	14	-	-	37	-	87	51	-	-	138
RHODE ISLANE	-	6	-	-	-	6	-	21	-	-	-	21
CONNECTICUT	-	11	12	-	-	23	-	38	38	-	-	77
NEW YORK	-	57	46	-	-	103	-	175	142	-	-	317
NEW JERSEY	-	27	39	-	-	66	-	80	113	-	-	193
PENNSYLVANIA	-	54	8	-	-	62	-	224	34	-	-	258
DELAWARE	-	3	2	-	-	5	-	11	8	-	-	19
MARYLAND	-	22	13	-	-	35	-	73	44	-	-	116
DIST COL	-	3	2	-	-	5	-	6	4	-	-	10
W VIRGINIA	-	3	-	-	7	9	-	13	-	-	33	46
VIRGINIA	-	38	4	-	-	42	-	151	18	-	-	168
N CAROLINA	-	12	4	-	22	38	-	57	20	-	107	185
S CAROLINA	-	1	-	1	17	19	-	5	-	4	92	101
GEORGIA	-	20	-	-	26	46	-	88	-	1	110	198
FLORIDA	-	47	-	1	50	98	-	161	-	2	174	337
MICHIGAN	-	21	-	1	13	36	-	144	-	9	87	240
OHIO	-	26	4	2	7	39	-	182	30	12	52	277
INDIANA	-	10	-	2	8	20	-	72	-	17	57	147
ILLINOIS	-	34	-	4	11	48	-	192	-	21	61	274
KENTUCKY	-	9	-	2	8	19	-	48	-	12	43	103
TENNESSEE	-	12	2	2	11	27	-	62	11	10	60	143
WISCONSIN	-	6	-	-	8	15	1	49	-	2	65	117
MINNESOTA	3	-	-	1	8	12	30	-	-	7	78	116
N DAKOTA	-	-	-	-	1	1	-	-	-	2	18	20
S DAKOTA	-	-	-	-	1	1	-	-	-	3	19	22
IOWA	-	-	-	2	4	6	-	-	-	22	56	78
NEBRASKA	-	-	-	1	1	2	-	-	-	15	29	44
MISSOURI	-	13	-	1	9	23	-	84	-	4	63	151
KANSAS	-	2	-	-	4	6	-	18	-	4	49	71
OKLAHOMA	-	-	-	-	11	11	-	-	-	-	93	93
ALABAMA	-	5	-	2	16	23	-	27	-	8	82	117
MISSISSIPPI	-	-	-	-	14	14	-	-	-	-	69	69
ARKANSAS	-	-	-	-	10	10	-	-	-	-	70	70
LOUISIANA	-	4	-	1	19	24	-	20	-	2	89	111
TEXAS	-	36	1	1	35	73	-	240	7	6	232	485
NEW MEXICO	1	-	-	1	3	4	6	-	-	8	31	45
MONTANA	-	-	-	-	3	3	1	-	-	-	24	25
IDAHO	-	-	-	-	2	2	-	-	-	4	24	27
WYOMING	-	-	-	-	2	2	-	-	-	-	18	18
COLORADO	4	-	-	-	8	13	28	-	-	3	53	84
UTAH	-	2	2	-	2	6	3	15	11	-	13	41
WASHINGTON	1	7	5	-	7	20	6	43	31	1	47	128
OREGON	-	2	2	-	5	9	3	19	14	-	39	76
CALIFORNIA	-	87	87	-	-	174	-	367	371	-	-	738
NEVADA	2	1	-	-	2	5	13	4	3	1	14	35
ARIZONA	2	3	5	-	4	14	11	23	34	-	29	96
ALASKA	-	-	-	-	1	1	3	-	-	-	9	12
HAWAII	-	-	-	-	8	8	-	-	-	-	21	21
TOTAL US	14	622	255	24	371	1286	104	2871	991	182	2210	6358

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		DISTILLATE						HEAVY FUEL OIL				
	KERO JT	KERO+1	ON HWY	OFF HWY	DIST 2	HVY DSL	TOTAL	DIST 4	< 0.3	0.3-1	> 1.0	TOTAL
MAINE	4	1	9	2	9	1	21	-	-	11	5	17
NEW HAMPSHIRE	1	-	4	1	6	-	12	-	-	-	11	11
VERMONT	-	-	3	1	3	-	8	-	-	-	-	-
MASSACHUSETTS	28	-	18	3	33	4	58	2	-	20	39	61
RHODE ISLANE	2	-	4	1	4	-	9	-	-	1	1	2
CONNECTICUT	6	-	17	3	20	1	40	1	-	35	2	38
NEW YORK	27	3	49	10	56	2	119	6	49	56	36	147
NEW JERSEY	127	1	29	8	28	12	79	2	21	6	19	48
PENNSYLVANIA	27	2	59	16	38	5	120	1	-	23	11	35
DELAWARE	-	-	5	1	3	-	9	-	-	7	4	11
MARYLAND	25	1	23	5	12	4	45	-	-	12	12	25
DIST COL	-	-	1	-	5	1	8	-	-	-	-	-
W VIRGINIA	1	-	10	7	3	6	26	-	-	-	1	1
VIRGINIA	36	1	35	9	12	9	67	-	-	7	12	19
N CAROLINA	16	2	40	8	11	3	64	-	-	-	6	7
S CAROLINA	2	1	20	5	3	2	31	-	-	-	4	4
GEORGIA	47	-	54	11	3	6	75	-	-	-	3	3
FLORIDA	82	-	59	14	6	11	91	-	-	59	38	98
MICHIGAN	24	2	34	11	9	3	59	-	-	7	3	10
OHIO	32	2	62	14	9	8	96	-	-	-	6	7
INDIANA	57	1	51	12	6	15	86	1	-	-	10	10
ILLINOIS	13	1	54	19	6	11	91	-	-	7	4	11
KENTUCKY	16	1	45	11	5	14	76	-	-	-	2	2
TENNESSEE	13	1	38	7	1	15	62	-	-	-	1	1
WISCONSIN	4	1	29	10	8	7	56	-	-	-	3	3
MINNESOTA	15	2	21	12	7	3	44	-	-	-	3	3
N DAKOTA	2	-	6	7	2	2	18	-	-	-	1	1
S DAKOTA	2	-	6	5	1	-	13	-	-	-	-	-
IOWA	2	-	22	11	2	2	39	-	-	-	1	1
NEBRASKA	3	-	13	12	1	8	34	-	-	-	1	1
MISSOURI	24	-	41	10	2	5	59	-	-	-	2	2
KANSAS	11	-	20	11	2	11	43	-	-	-	1	1
OKLAHOMA	32	-	25	6	3	5	40	-	-	-	1	1
ALABAMA	2	1	35	15	3	13	68	-	-	-	25	25
MISSISSIPPI	7	1	24	14	2	6	47	-	-	-	41	41
ARKANSAS	2	1	25	11	1	2	40	-	-	4	4	8
LOUISIANA	45	3	30	13	24	35	105	-	-	11	87	98
TEXAS	147	10	107	56	28	46	247	-	3	8	61	72
NEW MEXICO	2	1	13	7	1	3	26	-	-	3	2	5
MONTANA	3	-	8	8	1	4	20	-	-	-	3	3
IDAHO	4	-	8	8	1	1	18	-	-	-	1	1
WYOMING	1	-	12	5	2	7	26	-	-	-	1	1
COLORADO	19	-	12	8	2	6	28	-	-	-	-	-
UTAH	18	-	8	5	1	2	16	-	-	-	4	4
WASHINGTON	47	2	25	12	4	10	52	-	3	-	30	34
OREGON	8	-	20	8	3	8	40	-	-	-	11	11
CALIFORNIA	212	1	136	51	4	27	218	1	17	1	106	126
NEVADA	9	-	9	9	1	2	20	-	-	1	-	1
ARIZONA	17	-	20	9	-	1	31	-	-	-	-	-
ALASKA	41	1	8	3	5	9	26	-	-	-	-	-
HAWAII	25	-	4	2	5	5	16	-	-	28	9	37
TOTAL US	1292	49	1411	508	408	365	2741	18	94	309	628	1049

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			-- CHEM FEED ---									---- COKE ------		--- TOTALS -----	
	LPG	AVGAS	NAPHTHA	GASOIL	SPC NAP	LUBES	WAX	ASPHALT	MISC	CRUDE	STGAS	CAT CK	MKT CK	OTHER	ALL
MAINE	3	-	-	-	-	1	-	1	-	-	-	-	-	5	81
NEW HAMPSHIRE	4	-	-	-	-	1	-	1	-	-	-	-	-	6	58
VERMONT	2	-	-	-	-	-	-	1	-	-	-	-	-	3	27
MASSACHUSETTS	4	-	-	-	-	3	-	5	-	-	-	-	-	12	297
RHODE ISLANE	1	-	-	-	-	-	-	1	-	-	-	-	-	2	37
CONNECTICUT	3	-	-	-	-	2	-	3	-	-	-	-	-	7	168
NEW YORK	8	-	-	1	-	6	-	13	-	-	-	-	-	28	639
NEW JERSEY	15	-	5	6	2	4	1	8	4	-	20	10	1	76	522
PENNSYLVANIA	13	-	9	11	3	5	2	11	6	-	20	10	-	89	530
DELAWARE	1	-	2	2	1	-	-	1	1	-	5	2	3	18	58
MARYLAND	3	-	-	-	-	2	-	5	-	-	-	-	-	11	223
DIST COL	-	-	-	-	-	-	-	-	-	-	-	-	-	1	18
W VIRGINIA	3	-	-	-	-	1	-	2	-	-	-	-	-	8	83
VIRGINIA	7	-	1	1	-	3	-	7	-	-	2	1	1	24	314
N CAROLINA	14	-	-	-	-	4	-	8	-	-	-	-	-	26	296
S CAROLINA	6	-	-	-	-	2	-	4	-	-	-	-	-	12	151
GEORGIA	11	-	-	1	-	4	-	9	-	-	-	-	-	26	350
FLORIDA	11	2	-	-	-	6	-	13	-	-	-	-	-	33	641
MICHIGAN	37	1	1	1	1	3	-	13	-	-	4	1	-	61	395
OHIO	25	-	4	6	2	3	-	15	1	-	15	5	3	81	492
INDIANA	12	1	4	5	2	2	-	9	1	-	14	4	4	58	357
ILLINOIS	17	-	8	11	4	3	-	16	2	-	29	9	17	117	506
KENTUCKY	13	-	2	2	1	1	-	6	1	-	8	3	-	38	235
TENNESSEE	6	-	1	1	-	2	-	8	-	-	3	1	-	21	240
WISCONSIN	10	-	-	-	-	1	-	7	-	-	1	-	-	21	200
MINNESOTA	9	-	3	3	1	1	-	6	1	-	7	2	7	41	219
N DAKOTA	3	-	1	1	-	-	-	1	-	-	2	1	-	8	50
S DAKOTA	5	-	-	-	-	-	-	1	-	-	-	-	-	7	44
IOWA	10	-	-	-	-	1	-	4	-	-	-	-	-	16	135
NEBRASKA	5	-	-	-	-	1	-	3	-	-	-	-	-	9	91
MISSOURI	12	-	-	-	-	2	-	9	-	-	-	-	-	23	259
KANSAS	40	-	3	4	1	1	-	4	1	-	11	4	5	75	201
OKLAHOMA	13	-	4	4	2	1	-	5	1	-	12	4	3	49	215
ALABAMA	7	-	3	4	-	5	-	9	1	-	-	-	-	30	242
MISSISSIPPI	9	1	9	12	1	3	-	5	1	-	7	2	2	52	216
ARKANSAS	6	-	1	2	-	3	-	5	-	-	2	1	-	21	141
LOUISIANA	125	-	57	72	7	5	2	8	9	-	70	21	9	384	743
TEXAS	847	3	103	130	12	20	4	33	16	-	151	46	7	1370	2320
NEW MEXICO	14	-	2	2	-	2	-	3	-	-	3	1	-	28	106
MONTANA	3	-	-	-	-	-	-	3	-	-	4	1	2	13	64
IDAHO	1	-	-	-	-	-	-	3	-	-	-	-	-	5	55
WYOMING	3	-	-	-	-	-	1	3	1	-	5	1	-	14	59
COLORADO	7	-	-	-	-	-	-	9	-	-	2	1	-	20	151
UTAH	3	-	-	-	-	-	-	5	-	-	4	1	1	15	95
WASHINGTON	7	-	2	2	-	1	-	5	-	-	14	3	1	36	296
OREGON	3	-	-	-	-	1	-	3	-	-	-	-	-	7	142
CALIFORNIA	50	2	8	10	1	7	1	31	2	20	85	20	3	240	1534
NEVADA	3	-	-	-	-	-	-	2	-	-	-	-	-	5	70
ARIZONA	3	-	-	-	-	1	-	4	-	-	-	-	-	8	153
ALASKA	-	1	1	1	-	-	-	1	-	-	-	-	-	4	83
HAWAII	-	-	-	1	-	-	-	1	-	-	3	1	-	6	105
TOTAL US	1417	19	234	296	41	117	12	332	53	20	500	155	70	3266	14707

DUE TO INDEPENDENT ROUNDING, SUM OF STATES MAY NOT EQUAL REGIONAL TOTALS ELSEWHERE   NATIONAL PETROLEUM COUNCIL   NOVEMBER 9, 1992   TIME 14:56

Appendix L, Section III-2

Mid-Grade Projection Basis

EXXON COMPANY, U.S.A.
POST OFFICE BOX 2180 • HOUSTON, TEXAS 77252-2180

DOWNSTREAM PLANNING AND ANALYSIS

W.R. FINGER
COORDINATOR OF ENERGY ANALYSIS

February 25, 1992

Members of the NPC Refining Study Supply/Demand/Logistics Task Group:

Attached are the 1987, 1989, and 1990 motor gasoline volume data (by grade) which we discussed at our February 11-12 Task Group meeting in Albuquerque. You recall that as a proxy for 1995/2000/2010, we had agreed at the January 7-8 Task Group meeting in New Orleans to distribute the remaining 1989 leaded regular volume to unleaded regular/mid-grade using an 85/15 split. This ratio approximated the 1989 actual usage data (83 percent in New England, 83.3 percent in the mid-Atlantic, 87.6 percent in the Great Lakes) where the mid-grade was seemingly available. The Product Quality Task Group subsequently thought that the leaded grade should disappear into a higher mid-grade percentage (more like 50/50). Hence, I added the 1987 and recently available 1990 analyses as well as comparisons of the changes.

The attachments (we reviewed) contain two pages for each year--1987, 1989, and 1990. The volumetric data on the first page of each set is derived from the second page, which shows the reported data from the appropriate EIA Petroleum Marketing Annual (PMA)--the volumes are from the "first sales" tables. For 1989 and 1990, some of these state sales data have been withheld (not reported); the estimated missing data are shown. The sums of the reported and estimated data equal the PADD/region reported data in the PMA.

The next attachments show the disposition of the leaded regular from 1987 to 1989 and from 1987 to 1990. In reviewing these two attachments, we decided to use the 1990 data as the basis for the 1995, 2000, and 2010 grade splits. (The premium percentage of the total pool is relatively unchanged in 1990 versus 1987.) Furthermore, we agreed to "disappear" the remaining 1990 leaded regular, assuming the historic 1987-to-1990 trend to unleaded regular (with a maximum of 85 percent). The remaining leaded regular will go to the mid-grade demand. We recognize that setting grade splits for future customer satisfaction is highly subjective--other combinations are plausible. However, the preceding approach yields the "clinical" method we desire. The last attachment shows the final grade percentages with no leaded gasoline in the pool.

Respectfully,

Graham K. Barnes

GKB:yg
Attachments

c: Mr. John H. Guy, IV – National Petroleum Council

APP L.III.2-2

HISTORIC 1987 MOTOR GASOLINE BY GRADE -- THOUSAND GALLONS PER YEAR

		UNLEADED					THOUSAND BARRELS PER DAY			PERCENT			
	REGULAR	REGULAR	MID-GRADE	PREMIUM	TOTAL	DELTA	TOTAL	DOE (DOT)	DELTA	REGULAR	REG UNL	MID-GRADE	PREM UNL
MAINE	139467	365096	-	120539	625102	-	41	39	(2)	22.3	58.4	-	19.3
NEW HAMPSHIRE	40666	181064	-	93687	315417	-	21	32	12	12.9	57.4	-	29.7
VERMONT	22826	62195	-	30016	115037	-	8	18	10	19.8	54.1	-	26.1
MASSACHUSETTS	319075	1346067	-	845833	2510975	-	164	158	(6)	12.7	53.6	-	33.7
RHODE ISLANE	88283	273104	-	188325	549712	-	36	25	(11)	16.1	49.7	-	34.3
CONNECTICUT	177415	664142	-	493682	1335239	-	87	89	2	13.3	49.7	-	37.0
NEW YORK	719789	2567770	-	1682947	4970506	-	324	391	66	14.5	51.7	-	33.9
NEW JERSEY	440814	2390113	-	1498327	4329254	-	282	222	(60)	10.2	55.2	-	34.6
PENNSYLVANIA	944130	2730796	-	1196971	4871897	-	318	291	(26)	19.4	56.1	-	24.6
DELAWARE	40248	187398	-	86038	313684	-	20	22	1	12.8	59.7	-	27.4
MARYLAND	229007	973269	-	661271	1863547	-	122	132	10	12.3	52.2	-	35.5
DIST COL	9617	71027	-	87874	168518	-	11	12	1	5.7	42.1	-	52.1
W VIRGINIA	174406	306862	-	160439	641707	-	42	53	11	27.2	47.8	-	25.0
VIRGINIA	543149	1527537	-	764241	2834927	-	185	191	6	19.2	53.9	-	27.0
N CAROLINA	846241	1634109	-	783049	3263399	-	213	210	(3)	25.9	50.1	-	24.0
S CAROLINA	444922	840559	-	346179	1631660	-	106	107	-	27.3	51.5	-	21.2
GEORGIA	790454	1643570	-	897651	3331675	-	217	219	2	23.7	49.3	-	26.9
FLORIDA	1103093	2912439	-	1847337	5862869	-	382	377	(6)	18.8	49.7	-	31.5
MICHIGAN	817250	2718023	-	574894	4110167	-	268	271	3	19.9	66.1	-	14.0
OHIO	1058549	2901061	-	838514	4798124	-	313	317	4	22.1	60.5	-	17.5
INDIANA	620566	1557446	-	276450	2454462	-	160	173	13	25.3	63.5	-	11.3
ILLINOIS	742724	2659622	-	675718	4078064	-	266	302	36	18.2	65.2	-	16.6
KENTUCKY	577912	890220	-	326079	1794211	-	117	117	-	32.2	49.6	-	18.2
TENNESSEE	717309	1495069	-	576479	2788857	-	182	173	(9)	25.7	53.6	-	20.7
WISCONSIN	521607	1254584	-	221172	1997363	-	130	130	-	26.1	62.8	-	11.1
MINNESOTA	512818	1242929	-	207988	1963735	-	128	129	-	26.1	63.3	-	10.6
N DAKOTA	135433	190398	-	19761	345592	-	23	24	2	39.2	55.1	-	5.7
S DAKOTA	148565	195429	-	13736	357730	-	23	25	1	41.5	54.6	-	3.8
IOWA	460686	752607	-	90912	1304205	-	85	87	2	35.3	57.7	-	7.0
NEBRASKA	269812	428081	-	35351	733244	-	48	49	1	36.8	58.4	-	4.8
MISSOURI	746946	1404046	-	271743	2422735	-	158	174	16	30.8	58.0	-	11.2
KANSAS	541709	1034454	-	83533	1659696	-	108	80	(29)	32.6	62.3	-	5.0
OKLAHOMA	694780	1223760	-	146094	2064634	-	135	106	(29)	33.7	59.3	-	7.1
ALABAMA	492247	1012967	-	436372	1941586	-	127	133	6	25.4	52.2	-	22.5
MISSISSIPPI	472230	888690	-	255507	1616427	-	105	80	(25)	29.2	55.0	-	15.8
ARKANSAS	422415	619934	-	177626	1219975	-	80	78	(1)	34.6	50.8	-	14.6
LOUISIANA	541787	1320631	-	536708	2399126	-	156	132	(25)	22.6	55.0	-	22.4
TEXAS	2894730	7419424	-	1996856	12311010	-	803	561	(242)	23.5	60.3	-	16.2
NEW MEXICO	300106	427606	-	49695	777407	-	51	52	1	38.6	55.0	-	6.4
MONTANA	228419	214944	-	22901	466264	-	30	28	(2)	49.0	46.1	-	4.9
IDAHO	220864	208939	-	17567	447370	-	29	29	-	49.4	46.7	-	3.9
WYOMING	131660	151121	-	15299	298080	-	19	20	-	44.2	50.7	-	5.1
COLORADO	569402	904047	-	147334	1620783	-	106	99	(7)	35.1	55.8	-	9.1
UTAH	299512	429539	-	63341	792392	-	52	48	(4)	37.8	54.2	-	8.0
WASHINGTON	859461	1061266	-	338339	2259066	-	147	140	(7)	38.0	47.0	-	15.0
OREGON	544805	614166	-	162556	1321527	-	86	84	(2)	41.2	46.5	-	12.3
CALIFORNIA	3041577	7316439	-	2915253	13273269	-	866	801	(65)	22.9	55.1	-	22.0
NEVADA	201569	327319	-	71739	600627	-	39	36	(3)	33.6	54.5	-	11.9
ARIZONA	519157	867108	-	204346	1590611	-	104	107	4	32.6	54.5	-	12.8
ALASKA	80034	140463	-	13458	233955	-	15	14	(1)	34.2	60.0	-	5.8
HAWAII	40364	180192	-	109922	330478	-	22	22	1	12.2	54.5	-	33.3
TOTAL US	27500607	64729641	-	23677649	115907897	-	7561	7206	(355)	23.7	55.8	-	20.4

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HISTORIC 1987 MOTOR GASOLINE BY GRADE -- THOUSAND GALLONS PER YEAR

	RAW DATA						ADJUSTMENTS				
	REGULAR	REG UNL	MID-GRADE	PREM UNL	TOTAL	DELTA	REGULAR	REG UNL	MID-GRADE	PREM UNL	TOTAL
MAINE	139467	365096	-	120539	625102	-	-	-	-	-	-
NEW HAMPSHIRE	40666	181064	-	93687	315417	-	-	-	-	-	-
VERMONT	22826	62195	-	30016	115037	-	-	-	-	-	-
MASSACHUSETTS	319075	1346067	-	845833	2510975	-	-	-	-	-	-
RHODE ISLANE	88283	273104	-	188325	549712	-	-	-	-	-	-
CONNECTICUT	177415	664142	-	493682	1335239	-	-	-	-	-	-
NEW YORK	719789	2567770	-	1682947	4970506	-	-	-	-	-	-
NEW JERSEY	440814	2390113	-	1498327	4329254	-	-	-	-	-	-
PENNSYLVANIA	944130	2730796	-	1196971	4871897	-	-	-	-	-	-
DELAWARE	40248	187398	-	86038	313684	-	-	-	-	-	-
MARYLAND	229007	973269	-	661271	1863547	-	-	-	-	-	-
DIST COL	9617	71027	-	87874	168518	-	-	-	-	-	-
W VIRGINIA	174406	306862	-	160439	641707	-	-	-	-	-	-
VIRGINIA	543149	1527537	-	764241	2834927	-	-	-	-	-	-
N CAROLINA	846241	1634109	-	783049	3263399	-	-	-	-	-	-
S CAROLINA	444922	840559	-	346179	1631660	-	-	-	-	-	-
GEORGIA	790454	1643570	-	897651	3331675	-	-	-	-	-	-
FLORIDA	1103093	2912439	-	1847337	5862869	-	-	-	-	-	-
MICHIGAN	817250	2718023	-	574894	4110167	-	-	-	-	-	-
OHIO	1058549	2901061	-	838514	4798124	-	-	-	-	-	-
INDIANA	620566	1557446	-	276450	2454462	-	-	-	-	-	-
ILLINOIS	742724	2659622	-	675718	4078064	-	-	-	-	-	-
KENTUCKY	577912	890220	-	326079	1794211	-	-	-	-	-	-
TENNESSEE	717309	1495069	-	576479	2788857	-	-	-	-	-	-
WISCONSIN	521607	1254584	-	221172	1997363	-	-	-	-	-	-
MINNESOTA	512818	1242929	-	207988	1963735	-	-	-	-	-	-
N DAKOTA	135433	190398	-	19761	345592	-	-	-	-	-	-
S DAKOTA	148565	195429	-	13736	357730	-	-	-	-	-	-
IOWA	460686	752607	-	90912	1304205	-	-	-	-	-	-
NEBRASKA	269812	428081	-	35351	733244	-	-	-	-	-	-
MISSOURI	746946	1404046	-	271743	2422735	-	-	-	-	-	-
KANSAS	541709	1034454	-	83533	1659696	-	-	-	-	-	-
OKLAHOMA	694780	1223760	-	146094	2064634	-	-	-	-	-	-
ALABAMA	492247	1012967	-	436372	1941586	-	-	-	-	-	-
MISSISSIPPI	472230	888690	-	255507	1616427	-	-	-	-	-	-
ARKANSAS	422415	619934	-	177626	1219975	-	-	-	-	-	-
LOUISIANA	541787	1320631	-	536708	2399126	-	-	-	-	-	-
TEXAS	2894730	7419424	-	1996856	12311010	-	-	-	-	-	-
NEW MEXICO	300106	427606	-	49695	777407	-	-	-	-	-	-
MONTANA	228419	214944	-	22901	466264	-	-	-	-	-	-
IDAHO	220864	208939	-	17567	447370	-	-	-	-	-	-
WYOMING	131660	151121	-	15299	298080	-	-	-	-	-	-
COLORADO	569402	904047	-	147334	1620783	-	-	-	-	-	-
UTAH	299512	429539	-	63341	792392	-	-	-	-	-	-
WASHINGTON	859461	1061266	-	338339	2259066	-	-	-	-	-	-
OREGON	544805	614166	-	162556	1321527	-	-	-	-	-	-
CALIFORNIA	3041577	7316439	-	2915253	13273269	-	-	-	-	-	-
NEVADA	201569	327319	-	71739	600627	-	-	-	-	-	-
ARIZONA	519157	867108	-	204346	1590611	-	-	-	-	-	-
ALASKA	80034	140463	-	13458	233955	-	-	-	-	-	-
HAWAII	40364	180192	-	109922	330478	-	-	-	-	-	-
TOTAL US	27500607	64729641	-	23677649	115907897	-	-	-	-	-	-

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APP L.III.2-3

HISTORIC 1989 MOTOR GASOLINE BY GRADE -- THOUSAND GALLONS PER YEAR

		UNLEADED					THOUSAND BARRELS PER DAY			PERCENT			
	REGULAR	REGULAR	MID-GRADE	PREMIUM	TOTAL	DELTA	TOTAL	DOE (DOT)	DELTA	REGULAR	REG UNL	MID-GRADE	PREM UNL
MAINE	7404	461976	83274	163743	716397	-	47	39	(8)	1.0	64.5	11.6	22.9
NEW HAMPSHIRE	3110	191109	47448	108260	349927	-	23	34	11	0.9	54.6	13.6	30.9
VERMONT	5471	99794	12121	53926	171312	-	11	18	7	3.2	58.3	7.1	31.5
MASSACHUSETTS	34435	1362058	267443	860027	2523963	-	165	160	(5)	1.4	54.0	10.6	34.1
RHODE ISLANE	3275	319217	64074	214993	601559	-	39	24	(15)	0.5	53.1	10.7	35.7
CONNECTICUT	20660	674595	162511	484728	1342494	-	88	88	1	1.5	50.2	12.1	36.1
NEW YORK	150150	2770297	410346	1958818	5289611	-	345	366	20	2.8	52.4	7.8	37.0
NEW JERSEY	62793	2900965	412917	1886938	5263613	-	343	223	(120)	1.2	55.1	7.8	35.8
PENNSYLVANIA	147308	2824918	631222	1409642	5013090	-	327	298	(29)	2.9	56.4	12.6	28.1
DELAWARE	3483	203053	69157	113488	389181	-	25	22	(3)	0.9	52.2	17.8	29.2
MARYLAND	45844	876020	361892	685138	1968894	-	128	135	6	2.3	44.5	18.4	34.8
DIST COL	932	52594	28302	88699	170527	-	11	12	-	0.5	30.8	16.6	52.0
W VIRGINIA	27204	327544	77557	146180	578485	-	38	53	16	4.7	56.6	13.4	25.3
VIRGINIA	168462	1557488	427271	914200	3067421	-	200	194	(6)	5.5	50.8	13.9	29.8
N CAROLINA	339184	1829700	311683	884422	3364989	-	220	213	(7)	10.1	54.4	9.3	26.3
S CAROLINA	176072	991924	151676	395000	1714672	-	112	117	5	10.3	57.8	8.8	23.0
GEORGIA	312914	1854161	275957	978779	3421811	-	223	229	6	9.1	54.2	8.1	28.6
FLORIDA	415853	2967315	656812	2076531	6116511	-	399	389	(10)	6.8	48.5	10.7	33.9
MICHIGAN	231520	2968955	300080	747420	4247975	-	277	277	-	5.5	69.9	7.1	17.6
OHIO	163897	3514335	591768	1000098	5270098	-	344	318	(26)	3.1	66.7	11.2	19.0
INDIANA	166376	1840522	236571	447508	2690977	-	176	169	(7)	6.2	68.4	8.8	16.6
ILLINOIS	199597	3310457	393210	1005897	4909161	-	320	316	(4)	4.1	67.4	8.0	20.5
KENTUCKY	158698	1052966	205248	390639	1807551	-	118	119	1	8.8	58.3	11.4	21.6
TENNESSEE	235074	1653625	306073	668273	2863045	-	187	164	(22)	8.2	57.8	10.7	23.3
WISCONSIN	218610	1454065	70010	323802	2066487	-	135	135	-	10.6	70.4	3.4	15.7
MINNESOTA	277858	1459115	60283	216490	2013746	-	131	133	2	13.8	72.5	3.0	10.8
N DAKOTA	80250	242310	2726	13410	338696	-	22	23	1	23.7	71.5	0.8	4.0
S DAKOTA	77623	277843	3126	16928	375520	-	24	25	-	20.7	74.0	0.8	4.5
IOWA	260822	1019882	8540	113137	1402381	-	91	89	(2)	18.6	72.7	0.6	8.1
NEBRASKA	165511	545820	6142	37048	754521	-	49	50	1	21.9	72.3	0.8	4.9
MISSOURI	383428	1639215	110825	418062	2551530	-	166	174	8	15.0	64.2	4.3	16.4
KANSAS	254803	1150955	27038	136996	1569792	-	102	82	(21)	16.2	73.3	1.7	8.7
OKLAHOMA	358690	1424534	21053	239785	2044062	-	133	106	(27)	17.5	69.7	1.0	11.7
ALABAMA	140360	1178767	154105	463902	1937134	-	126	136	9	7.2	60.9	8.0	23.9
MISSISSIPPI	143830	825809	80124	288559	1338322	-	87	79	(8)	10.7	61.7	6.0	21.6
ARKANSAS	220967	797431	45026	246192	1309616	-	85	81	(5)	16.9	60.9	3.4	18.8
LOUISIANA	182947	1425984	175313	702146	2486390	-	162	128	(34)	7.4	57.4	7.1	28.2
TEXAS	1057606	8058154	695558	2293448	12104766	-	790	557	(232)	8.7	66.6	5.7	18.9
NEW MEXICO	210353	460104	1500	71281	743238	-	48	52	3	28.3	61.9	0.2	9.6
MONTANA	162216	245665	-	49766	457647	-	30	28	(2)	35.4	53.7	-	10.9
IDAHO	171698	255304	-	32785	459787	-	30	31	1	37.3	55.5	-	7.1
WYOMING	85921	159764	-	29402	275087	-	18	21	3	31.2	58.1	-	10.7
COLORADO	394294	926345	6045	240242	1566926	-	102	97	(5)	25.2	59.1	0.4	15.3
UTAH	227864	476567	100	112198	816729	-	53	47	(6)	27.9	58.4	-	13.7
WASHINGTON	707920	1294262	2000	443530	2447712	-	160	147	(12)	28.9	52.9	0.1	18.1
OREGON	429819	749887	100	185301	1365107	-	89	87	(2)	31.5	54.9	-	13.6
CALIFORNIA	2199446	8021347	176955	3601612	13999360	-	913	851	(62)	15.7	57.3	1.3	25.7
NEVADA	162585	388409	1395	110075	662464	-	43	40	(3)	24.5	58.6	0.2	16.6
ARIZONA	387592	984788	85	265553	1638018	-	107	111	4	23.7	60.1	-	16.2
ALASKA	58056	158511	100	18789	235456	-	15	14	(1)	24.7	67.3	-	8.0
HAWAII	21475	187351	5469	137026	351321	-	23	24	1	6.1	53.3	1.6	39.0
TOTAL US	12122258	72413776	8138231	28490812	121165077	-	7904	7328	(576)	10.0	59.8	6.7	23.5

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HISTORIC 1989 MOTOR GASOLINE BY GRADE -- THOUSAND GALLONS PER YEAR

	RAW DATA					ADJUSTMENTS					
	REGULAR	REG UNL	MID-GRADE	PREM UNL	TOTAL	DELTA	REGULAR	REG UNL	MID-GRADE	PREM UNL	TOTAL
MAINE	7404	461976	83274	163743	716397	-	-	-	-	-	-
NEW HAMPSHIRE	3110	191109	47448	108260	349927	-	-	-	-	-	-
VERMONT	-	99794	-	53926	171312	17592	5471	-	12121	-	17592
MASSACHUSETTS	34435	1362058	267443	860027	2523963	-	-	-	-	-	-
RHODE ISLANE	-	319217	-	214993	601559	67349	3275	-	64074	-	67349
CONNECTICUT	20660	674595	162511	484728	1342494	-	-	-	-	-	-
NEW YORK	150150	2770297	410346	1958818	5289611	-	-	-	-	-	-
NEW JERSEY	62793	2900965	412917	1886938	5263613	-	-	-	-	-	-
PENNSYLVANIA	147308	2824918	631222	1409642	5013090	-	-	-	-	-	-
DELAWARE	-	203053	69157	-	389181	116971	3483	-	-	113488	116971
MARYLAND	-	876020	-	685138	1968894	407736	45844	-	361892	-	407736
DIST COL	932	52594	-	-	170527	117001	-	-	28302	88699	117001
W VIRGINIA	27204	327544	77557	146180	578485	-	-	-	-	-	-
VIRGINIA	168462	1557488	427271	914200	3067421	-	-	-	-	-	-
N CAROLINA	339184	1829700	311683	884422	3364989	-	-	-	-	-	-
S CAROLINA	176072	991924	151676	395000	1714672	-	-	-	-	-	-
GEORGIA	312914	1854161	275957	978779	3421811	-	-	-	-	-	-
FLORIDA	415853	2967315	656812	2076531	6116511	-	-	-	-	-	-
MICHIGAN	231520	2968955	300080	747420	4247975	-	-	-	-	-	-
OHIO	163897	3514335	591768	1000098	5270098	-	-	-	-	-	-
INDIANA	166376	1840522	236571	447508	2690977	-	-	-	-	-	-
ILLINOIS	199597	3310457	393210	1005897	4909161	-	-	-	-	-	-
KENTUCKY	158698	1052966	205248	390639	1807551	-	-	-	-	-	-
TENNESSEE	235074	1653625	306073	668273	2863045	-	-	-	-	-	-
WISCONSIN	218610	1454065	70010	323802	2066487	-	-	-	-	-	-
MINNESOTA	277858	1459115	60283	216490	2013746	-	-	-	-	-	-
N DAKOTA	-	242310	-	13410	338696	82976	80250	-	2726	-	82976
S DAKOTA	-	277843	-	16928	375520	80749	77623	-	3126	-	80749
IOWA	-	1019882	-	113137	1402381	269362	260822	-	8540	-	269362
NEBRASKA	-	545820	-	37048	754521	171653	165511	-	6142	-	171653
MISSOURI	383428	1639215	110825	418062	2551530	-	-	-	-	-	-
KANSAS	254803	1150955	27038	136996	1569792	-	-	-	-	-	-
OKLAHOMA	358690	1424534	21053	239785	2044062	-	-	-	-	-	-
ALABAMA	140360	1178767	154105	463902	1937134	-	-	-	-	-	-
MISSISSIPPI	-	825809	-	288559	1338322	223954	143830	-	80124	-	223954
ARKANSAS	220967	797431	45026	246192	1309616	-	-	-	-	-	-
LOUISIANA	182947	1425984	175313	702146	2486390	-	-	-	-	-	-
TEXAS	1057606	8058154	695558	2293448	12104766	-	-	-	-	-	-
NEW MEXICO	-	460104	-	71281	743238	211853	210353	-	1500	-	211853
MONTANA	162216	245665	-	49766	457647	-	-	-	-	-	-
IDAHO	-	255304	-	-	459787	204483	171698	-	-	32785	204483
WYOMING	-	159764	-	-	275087	115323	85921	-	-	29402	115323
COLORADO	394294	926345	6045	240242	1566926	-	-	-	-	-	-
UTAH	-	476567	-	112198	816729	227964	227864	-	100	-	227964
WASHINGTON	-	1294262	-	443530	2447712	709920	707920	-	2000	-	709920
OREGON	-	749887	-	185301	1365107	429919	429819	-	100	-	429919
CALIFORNIA	-	8021347	-	3601612	13999360	2376401	2199446	-	176955	-	2376401
NEVADA	162585	388409	1395	110075	662464	-	-	-	-	-	-
ARIZONA	387592	984788	85	265553	1638018	-	-	-	-	-	-
ALASKA	-	158511	-	18789	235456	58156	58056	-	100	-	58156
HAWAII	21475	187351	5469	137026	351321	-	-	-	-	-	-
TOTAL US	12122258	72413776	8138231	28490812	121165077	-	-	-	-	-	-

PRINTED DATA MAY NOT ADD DUE TO INDEPENDENT ROUNDING. NATIONAL PETROLEUM COUNCIL JANUARY 2, 1992 TIME 9:44

APP L.III.2-6

HISTORIC 1990 MOTOR GASOLINE BY GRADE -- THOUSAND GALLONS PER YEAR

		UNLEADED					THOUSAND BARRELS PER DAY			PERCENT			
	REGULAR	REGULAR	MID-GRADE	PREMIUM	TOTAL	DELTA	TOTAL	DOE (DOT)	DELTA	REGULAR	REG UNL	MID-GRADE	PREM UNL
MAINE	5813	548146	90869	141499	786327	-	51	38	(13)	0.7	69.7	11.6	18.0
NEW HAMPSHIRE	1200	236305	55839	94453	387797	-	25	32	7	0.3	60.9	14.4	24.4
VERMONT	365	137371	25473	53633	216842	-	14	18	4	0.2	63.4	11.7	24.7
MASSACHUSETTS	348	1578322	329451	708715	2616836	-	171	153	(18)	-	60.3	12.6	27.1
RHODE ISLANE	225	335559	73052	171855	580691	-	38	24	(14)	-	57.8	12.6	29.6
CONNECTICUT	-	732743	212461	407394	1352598	-	88	85	(3)	-	54.2	15.7	30.1
NEW YORK	11898	2928306	539086	1682418	5161708	-	337	379	42	0.2	56.7	10.4	32.6
NEW JERSEY	116	2753200	496185	1706664	4956165	-	323	213	(110)	-	55.6	10.0	34.4
PENNSYLVANIA	17784	2950821	740098	1164014	4872717	-	318	293	(25)	0.4	60.6	15.2	23.9
DELAWARE	10	211296	76696	88880	376882	-	25	22	(3)	-	56.1	20.4	23.6
MARYLAND	25	994416	424077	607174	2025692	-	132	129	(3)	-	49.1	20.9	30.0
DIST COL	5	54906	30596	76412	161919	-	11	11	-	-	33.9	18.9	47.2
W VIRGINIA	2760	382662	95101	121285	601808	-	39	54	14	0.5	63.6	15.8	20.2
VIRGINIA	12136	1769288	567303	792104	3140831	-	205	192	(13)	0.4	56.3	18.1	25.2
N CAROLINA	12389	2185355	549315	704509	3451568	-	225	211	(14)	0.4	63.3	15.9	20.4
S CAROLINA	6771	1189911	269822	342226	1808730	-	118	118	-	0.4	65.8	14.9	18.9
GEORGIA	9774	2173694	526656	821756	3531880	-	230	226	(4)	0.3	61.5	14.9	23.3
FLORIDA	17837	3384734	1028048	1809170	6239789	-	407	388	(19)	0.3	54.2	16.5	29.0
MICHIGAN	61680	3200533	365984	637454	4265651	-	278	272	(6)	1.4	75.0	8.6	14.9
OHIO	9615	3574727	655567	698314	4938223	-	322	301	(21)	0.2	72.4	13.3	14.1
INDIANA	54557	1936473	294876	366610	2652516	-	173	169	(4)	2.1	73.0	11.1	13.8
ILLINOIS	25181	3493269	452707	850311	4821468	-	315	330	15	0.5	72.5	9.4	17.6
KENTUCKY	7732	1150827	322703	323347	1804609	-	118	117	-	0.4	63.8	17.9	17.9
TENNESSEE	8497	1837447	470286	546419	2862649	-	187	158	(29)	0.3	64.2	16.4	19.1
WISCONSIN	85050	1671555	89503	277044	2123152	-	138	133	(6)	4.0	78.7	4.2	13.0
MINNESOTA	148017	1542116	73398	210887	1974418	-	129	130	1	7.5	78.1	3.7	10.7
N DAKOTA	45590	254259	5962	14110	319921	-	21	22	1	14.3	79.5	1.9	4.4
S DAKOTA	45719	308004	2090	20265	376078	-	25	24	-	12.2	81.9	0.6	5.4
IOWA	118328	1177207	11303	111898	1418736	-	93	86	(6)	8.3	83.0	0.8	7.9
NEBRASKA	95646	591577	13658	36108	736989	-	48	50	2	13.0	80.3	1.9	4.9
MISSOURI	158840	1816145	177477	376441	2528903	-	165	174	9	6.3	71.8	7.0	14.9
KANSAS	137022	1207997	37038	131264	1513321	-	99	78	(21)	9.1	79.8	2.4	8.7
OKLAHOMA	164828	1650655	37007	250280	2102770	-	137	107	(30)	7.8	78.5	1.8	11.9
ALABAMA	6800	1275821	251867	382030	1916518	-	125	134	9	0.4	66.6	13.1	19.9
MISSISSIPPI	6721	898233	141352	265780	1312086	-	86	79	(6)	0.5	68.5	10.8	20.3
ARKANSAS	33428	1007483	142563	208818	1392292	-	91	79	(12)	2.4	72.4	10.2	15.0
LOUISIANA	11687	1665101	308070	558129	2542987	-	166	120	(46)	0.5	65.5	12.1	21.9
TEXAS	245168	9222274	1250547	1886251	12604240	-	822	560	(263)	1.9	73.2	9.9	15.0
NEW MEXICO	167616	497649	8092	72984	746341	-	49	51	2	22.5	66.7	1.1	9.8
MONTANA	136498	278136	-	53565	468199	-	31	28	(2)	29.2	59.4	-	11.4
IDAHO	152569	293016	-	37287	482872	-	31	31	-	31.6	60.7	-	7.7
WYOMING	64975	165006	2044	30435	262460	-	17	19	2	24.8	62.9	0.8	11.6
COLORADO	263777	987362	72015	234670	1557824	-	102	97	(5)	16.9	63.4	4.6	15.1
UTAH	178529	512407	11888	121925	824749	-	54	46	(8)	21.6	62.1	1.4	14.8
WASHINGTON	631687	1450711	2916	397800	2483114	-	162	146	(16)	25.4	58.4	0.1	16.0
OREGON	389513	856807	1221	166529	1414070	-	92	86	(6)	27.5	60.6	0.1	11.8
CALIFORNIA	1764709	9252720	328887	3500230	14846546	-	968	833	(135)	11.9	62.3	2.2	23.6
NEVADA	150105	452268	417	111034	713824	-	47	41	(6)	21.0	63.4	0.1	15.6
ARIZONA	358590	1104087	1868	254853	1719398	-	112	107	(5)	20.9	64.2	0.1	14.8
ALASKA	40799	164556	751	17905	224011	-	15	16	1	18.2	73.5	0.3	8.0
HAWAII	-	192387	30748	129005	352140	-	23	24	1	-	54.6	8.7	36.6
TOTAL US	5868929	80235850	11694933	24774143	122573855	-	7996	7235	(761)	4.8	65.5	9.5	20.2

PRINTED DATA MAY NOT ADO DUE TO INDEPENDENT ROUNDING. NATIONAL PETROLEUM COUNCIL FEBRUARY 10, 1992 TIME 12:17

HISTORIC 1990 MOTOR GASOLINE BY GRADE -- THOUSAND GALLONS PER YEAR

	RAW DATA						ADJUSTMENTS				
	REGULAR	REG UNL	MID-GRADE	PREM UNL	TOTAL	DELTA	REGULAR	REG UNL	MID-GRADE	PREM UNL	TOTAL
MAINE	-	548146	-	141499	786327	96682	5813	-	90869	-	96682
NEW HAMPSHIRE	1200	236305	55839	94453	387797	-	-	-	-	-	-
VERMONT	365	137371	25473	53633	216842	-	-	-	-	-	-
MASSACHUSETTS	-	1578322	-	708715	2616836	329799	348	-	329451	-	329799
RHODE ISLANE	-	335559	-	171855	580691	73277	225	-	73052	-	73277
CONNECTICUT	-	732743	212461	407394	1352598	-	-	-	-	-	-
NEW YORK	11898	2928306	539086	1682418	5161708	-	-	-	-	-	-
NEW JERSEY	116	2753200	-	-	4956165	2202849	-	-	496185	1706664	2202849
PENNSYLVANIA	17784	2950821	740098	1164014	4872717	-	-	-	-	-	-
DELAWARE	-	211296	76696	-	376882	88890	10	-	-	88880	88890
MARYLAND	25	994416	424077	607174	2025692	-	-	-	-	-	-
DIST COL	-	54906	-	76412	161919	30601	5	-	30596	-	30601
W VIRGINIA	2760	382662	95101	121285	601808	-	-	-	-	-	-
VIRGINIA	12136	1769288	567303	792104	3140831	-	-	-	-	-	-
N CAROLINA	12389	2185355	549315	704509	3451568	-	-	-	-	-	-
S CAROLINA	6772	1189911	269822	342226	1808732	1	(1)	-	-	-	(1)
GEORGIA	9774	2173694	526656	821756	3531880	-	-	-	-	-	-
FLORIDA	17837	3384734	1028048	1809170	6239789	-	-	-	-	-	-
MICHIGAN	61680	3200533	365984	637454	4265651	-	-	-	-	-	-
OHIO	9615	3574727	655567	698314	4938223	-	-	-	-	-	-
INDIANA	54557	1936473	294876	366610	2652516	-	-	-	-	-	-
ILLINOIS	25181	3493269	452707	850311	4821468	-	-	-	-	-	-
KENTUCKY	7732	1150827	322703	323347	1804609	-	-	-	-	-	-
TENNESSEE	8497	1837447	470286	546419	2862649	-	-	-	-	-	-
WISCONSIN	85050	1671555	89503	277044	2123152	-	-	-	-	-	-
MINNESOTA	148017	1542116	73398	210887	1974418	-	-	-	-	-	-
N DAKOTA	-	254259	-	-	319921	65662	45590	-	5962	14110	65662
S DAKOTA	-	308004	-	20265	376078	47809	45719	-	2090	-	47809
IOWA	118328	1177207	11303	111898	1418736	-	-	-	-	-	-
NEBRASKA	95646	591577	-	-	736989	49766	-	-	13658	36108	49766
MISSOURI	158840	1816145	177477	376441	2528903	-	-	-	-	-	-
KANSAS	137022	1207997	37038	131264	1513321	-	-	-	-	-	-
OKLAHOMA	164828	1650655	37007	250280	2102770	-	-	-	-	-	-
ALABAMA	-	1275821	-	382030	1916518	258667	6800	-	251867	-	258667
MISSISSIPPI	6721	898233	141352	265780	1312086	-	-	-	-	-	-
ARKANSAS	33428	1007483	142563	208818	1392292	-	-	-	-	-	-
LOUISIANA	-	1665101	308070	-	2542987	569816	11687	-	-	558129	569816
TEXAS	245168	9222274	1250547	1886251	12604240	-	-	-	-	-	-
NEW MEXICO	-	497649	-	-	746342	248693	167616	-	8092	72984	248692
MONTANA	136498	278136	-	53565	468199	-	-	-	-	-	-
IDAHO	152569	293016	-	37287	482872	-	-	-	-	-	-
WYOMING	64975	165006	2044	30435	262460	-	-	-	-	-	-
COLORADO	263777	987362	72015	234670	1557824	-	-	-	-	-	-
UTAH	178529	512407	11888	121925	824749	-	-	-	-	-	-
WASHINGTON	631687	1450711	-	-	2483114	400716	-	-	2916	397800	400716
OREGON	389513	856807	-	-	1414070	167750	-	-	1221	166529	167750
CALIFORNIA	1764709	9252720	328887	3500230	14846546	-	-	-	-	-	-
NEVADA	150105	452268	417	111034	713823	(1)	-	-	-	-	-
ARIZONA	358590	1104087	-	-	1719398	256721	-	-	1868	254853	256721
ALASKA	-	164556	-	17905	224011	41550	40799	-	751	-	41550
HAWAII	-	192387	-	129005	352140	30748	-	-	30748	-	30748
TOTAL US	5868929	80235850	11694933	24774143	122573855	-	-	-	-	-	-

PRINTED DATA MAY NOT ADD DUE TO INDEPENDENT ROUNDING. NATIONAL PETROLEUM COUNCIL FEBRUARY 10, 1992 TIME 12:17

APP L.III.2-8

HISTORIC MOTOR GASOLINE BY GRADE -- PERCENT -- USING 1989 DOE STATE DATA

	1987 UNLEADED				1989 UNLEADED				CHANGE IN % FROM 1987 TO 1989			
	REG LEAD	REGULAR	MID-GRADE	PREMIUM	REG LEAD	REGULAR	MID-GRADE	PREMIUM	REG LEAD	REGULAR	MID-GRADE	PREMIUM
MAINE	22.3	58.4	-	19.3	1.0	64.5	11.6	22.9	(100.0)	28.6	54.6	16.8
NEW HAMPSHIRE	12.9	57.4	-	29.7	0.9	54.6	13.6	30.9	(100.0)	(23.2)	113.0	10.3
VERMONT	19.8	54.1	-	26.1	3.2	58.3	7.1	31.5	(100.0)	25.2	42.5	32.3
MASSACHUSETTS	12.7	53.6	-	33.7	1.4	54.0	10.6	34.1	(100.0)	3.2	93.4	3.4
RHODE ISLANE	16.1	49.7	-	34.3	0.5	53.1	10.7	35.7	(100.0)	21.8	68.6	9.5
CONNECTICUT	13.3	49.7	-	37.0	1.5	50.2	12.1	36.1	(100.0)	4.3	103.0	(7.4)
NEW YORK	14.5	51.7	-	33.9	2.8	52.4	7.8	37.0	(100.0)	6.1	66.6	27.3
NEW JERSEY	10.2	55.2	-	34.6	1.2	55.1	7.8	35.8	(100.0)	(1.1)	87.3	13.8
PENNSYLVANIA	19.4	56.1	-	24.6	2.9	56.4	12.6	28.1	(100.0)	1.8	76.6	21.6
DELAWARE	12.8	59.7	-	27.4	0.9	52.2	17.8	29.2	(100.0)	(63.4)	148.9	14.5
MARYLAND	12.3	52.2	-	35.5	2.3	44.5	18.4	34.8	(100.0)	(77.6)	184.5	(6.9)
DIST COL	5.7	42.1	-	52.1	0.5	30.8	16.6	52.0	(100.0)	(219.1)	321.6	(2.5)
W VIRGINIA	27.2	47.8	-	25.0	4.7	56.6	13.4	25.3	(100.0)	39.2	59.7	1.2
VIRGINIA	19.2	53.9	-	27.0	5.5	50.8	13.9	29.8	(100.0)	(22.7)	101.9	20.8
N CAROLINA	25.9	50.1	-	24.0	10.1	54.4	9.3	26.3	(100.0)	27.1	58.4	14.4
S CAROLINA	27.3	51.5	-	21.2	10.3	57.8	8.8	23.0	(100.0)	37.3	52.0	10.7
GEORGIA	23.7	49.3	-	26.9	9.1	54.2	8.1	28.6	(100.0)	33.3	55.3	11.4
FLORIDA	18.8	49.7	-	31.5	6.8	48.5	10.7	33.9	(100.0)	(9.7)	89.4	20.3
MICHIGAN	19.9	66.1	-	14.0	5.5	69.9	7.1	17.6	(100.0)	26.1	48.9	25.0
OHIO	22.1	60.5	-	17.5	3.1	66.7	11.2	19.0	(100.0)	32.8	59.2	7.9
INDIANA	25.3	63.5	-	11.3	6.2	68.4	8.8	16.6	(100.0)	25.9	46.0	28.1
ILLINOIS	18.2	65.2	-	16.6	4.1	67.4	8.0	20.5	(100.0)	15.7	56.6	27.7
KENTUCKY	32.2	49.6	-	18.2	8.8	58.3	11.4	21.6	(100.0)	36.9	48.5	14.7
TENNESSEE	25.7	53.6	-	20.7	8.2	57.8	10.7	23.3	(100.0)	23.7	61.1	15.3
WISCONSIN	26.1	62.8	-	11.1	10.6	70.4	3.4	15.7	(100.0)	48.6	21.8	29.6
MINNESOTA	26.1	63.3	-	10.6	13.8	72.5	3.0	10.8	(100.0)	74.4	24.3	1.3
N DAKOTA	39.2	55.1	-	5.7	23.7	71.5	0.8	4.0	(100.0)	106.2	5.2	(11.4)
S DAKOTA	41.5	54.6	-	3.8	20.7	74.0	0.8	4.5	(100.0)	92.8	4.0	3.2
IOWA	35.3	57.7	-	7.0	18.6	72.7	0.6	8.1	(100.0)	89.8	3.6	6.6
NEBRASKA	36.8	58.4	-	4.8	21.9	72.3	0.8	4.9	(100.0)	93.9	5.5	0.6
MISSOURI	30.8	58.0	-	11.2	15.0	64.2	4.3	16.4	(100.0)	39.8	27.5	32.7
KANSAS	32.6	62.3	-	5.0	16.2	73.3	1.7	8.7	(100.0)	67.0	10.5	22.5
OKLAHOMA	33.7	59.3	-	7.1	17.5	69.7	1.0	11.7	(100.0)	64.7	6.4	28.9
ALABAMA	25.4	52.2	-	22.5	7.2	60.9	8.0	23.9	(100.0)	47.9	43.9	8.1
MISSISSIPPI	29.2	55.0	-	15.8	10.7	61.7	6.0	21.6	(100.0)	36.4	32.4	31.2
ARKANSAS	34.6	50.8	-	14.6	16.9	60.9	3.4	18.8	(100.0)	56.8	19.4	23.9
LOUISIANA	22.6	55.0	-	22.4	7.4	57.4	7.1	28.2	(100.0)	15.1	46.3	38.5
TEXAS	23.5	60.3	-	16.2	8.7	66.6	5.7	18.9	(100.0)	42.7	38.9	18.5
NEW MEXICO	38.6	55.0	-	6.4	28.3	61.9	0.2	9.6	(100.0)	67.0	2.0	31.0
MONTANA	49.0	46.1	-	4.9	35.4	53.7	-	10.9	(100.0)	56.0	-	44.0
IDAHO	49.4	46.7	-	3.9	37.3	55.5	-	7.1	(100.0)	73.4	-	26.6
WYOMING	44.2	50.7	-	5.1	31.2	58.1	-	10.7	(100.0)	57.0	-	43.0
COLORADO	35.1	55.8	-	9.1	25.2	59.1	0.4	15.3	(100.0)	33.5	3.9	62.6
UTAH	37.8	54.2	-	8.0	27.9	58.4	-	13.7	(100.0)	41.9	0.1	58.0
WASHINGTON	38.0	47.0	-	15.0	28.9	52.9	0.1	18.1	(100.0)	64.7	0.9	34.5
OREGON	41.2	46.5	-	12.3	31.5	54.9	-	13.6	(100.0)	86.8	0.1	13.1
CALIFORNIA	22.9	55.1	-	22.0	15.7	57.3	1.3	25.7	(100.0)	30.2	17.5	52.2
NEVADA	33.6	54.5	-	11.9	24.5	58.6	0.2	16.6	(100.0)	45.9	2.3	51.8
ARIZONA	32.6	54.5	-	12.8	23.7	60.1	-	16.2	(100.0)	62.5	0.1	37.5
ALASKA	34.2	60.0	-	5.8	24.7	67.3	-	8.0	(100.0)	76.2	0.4	23.3
HAWAII	12.2	54.5	-	33.3	6.1	53.3	1.6	39.0	(100.0)	(19.6)	25.5	94.1
TOTAL US	23.7	55.8	-	20.4	10.0	59.8	6.7	23.5	(100.0)	28.6	48.9	22.5

PRINTED DATA MAY NOT ADD DUE TO INDEPENDENT ROUNDING. NATIONAL PETROLEUM COUNCIL JANUARY 2, 1992 TIME 9:44

HISTORIC MOTOR GASOLINE BY GRADE -- PERCENT -- USING 1989 DOE STATE DATA

		1987 UNLEADED				1990 UNLEADED			CHANGE IN % FROM 1987 TO 1990			
	REG LEAD	REGULAR	MID-GRADE	PREMIUM	REG LEAD	REGULAR	MID-GRADE	PREMIUM	REG LEAD	REGULAR	MID-GRADE	PREMIUM
MAINE	22.3	58.4	-	19.3	0.7	69.7	11.6	18.0	(100.0)	52.4	53.6	(6.0)
NEW HAMPSHIRE	12.9	57.4	-	29.7	0.3	60.9	14.4	24.4	(100.0)	28.1	114.4	(42.5)
VERMONT	19.8	54.1	-	26.1	0.2	63.4	11.7	24.7	(100.0)	47.2	59.7	(6.9)
MASSACHUSETTS	12.7	53.6	-	33.7	-	60.3	12.6	27.1	(100.0)	52.8	99.2	(52.0)
RHODE ISLANE	16.1	49.7	-	34.3	-	57.8	12.6	29.6	(100.0)	50.6	78.5	(29.1)
CONNECTICUT	13.3	49.7	-	37.0	-	54.2	15.7	30.1	(100.0)	33.4	118.2	(51.6)
NEW YORK	14.5	51.7	-	33.9	0.2	56.7	10.4	32.6	(100.0)	35.6	73.3	(8.9)
NEW JERSEY	10.2	55.2	-	34.6	-	55.6	10.0	34.4	(100.0)	3.4	98.3	(1.7)
PENNSYLVANIA	19.4	56.1	-	24.6	0.4	60.6	15.2	23.9	(100.0)	23.7	79.9	(3.6)
DELAWARE	12.8	59.7	-	27.4	-	56.1	20.4	23.6	(100.0)	(28.7)	158.6	(30.0)
MARYLAND	12.3	52.2	-	35.5	-	49.1	20.9	30.0	(100.0)	(25.5)	170.4	(44.8)
DIST COL	5.7	42.1	-	52.1	-	33.9	18.9	47.2	(100.0)	(144.4)	331.3	(86.8)
W VIRGINIA	27.2	47.8	-	25.0	0.5	63.6	15.8	20.2	(100.0)	59.0	59.1	(18.1)
VIRGINIA	19.2	53.9	-	27.0	0.4	56.3	18.1	25.2	(100.0)	13.0	96.2	(9.3)
N CAROLINA	25.9	50.1	-	24.0	0.4	63.3	15.9	20.4	(100.0)	51.8	62.2	(14.0)
S CAROLINA	27.3	51.5	-	21.2	0.4	65.8	14.9	18.9	(100.0)	53.1	55.5	(8.5)
GEORGIA	23.7	49.3	-	26.9	0.3	61.5	14.9	23.3	(100.0)	52.1	63.6	(15.7)
FLORIDA	18.8	49.7	-	31.5	0.3	54.2	16.5	29.0	(100.0)	24.7	88.9	(13.6)
MICHIGAN	19.9	66.1	-	14.0	1.4	75.0	8.6	14.9	(100.0)	48.3	46.5	5.2
OHIO	22.1	60.5	-	17.5	0.2	72.4	13.3	14.1	(100.0)	54.5	60.7	(15.3)
INDIANA	25.3	63.5	-	11.3	2.1	73.0	11.1	13.8	(100.0)	41.1	47.9	11.0
ILLINOIS	18.2	65.2	-	16.6	0.5	72.5	9.4	17.6	(100.0)	40.9	53.1	6.0
KENTUCKY	32.2	49.6	-	18.2	0.4	63.8	17.9	17.9	(100.0)	44.5	56.3	(0.8)
TENNESSEE	25.7	53.6	-	20.7	0.3	64.2	16.4	19.1	(100.0)	41.6	64.6	(6.2)
WISCONSIN	26.1	62.8	-	11.1	4.0	78.7	4.2	13.0	(100.0)	72.0	19.1	8.9
MINNESOTA	26.1	63.3	-	10.6	7.5	78.1	3.7	10.7	(100.0)	79.6	20.0	0.5
N DAKOTA	39.2	55.1	-	5.7	14.3	79.5	1.9	4.4	(100.0)	97.8	7.5	(5.2)
S DAKOTA	41.5	54.6	-	3.8	12.2	81.9	0.6	5.4	(100.0)	92.8	1.9	5.3
IOWA	35.3	57.7	-	7.0	8.3	83.0	0.8	7.9	(100.0)	93.7	3.0	3.4
NEBRASKA	36.8	58.4	-	4.8	13.0	80.3	1.9	4.9	(100.0)	91.9	7.8	0.3
MISSOURI	30.8	58.0	-	11.2	6.3	71.8	7.0	14.9	(100.0)	56.5	28.6	14.9
KANSAS	32.6	62.3	-	5.0	9.1	79.8	2.4	8.7	(100.0)	74.2	10.4	15.4
OKLAHOMA	33.7	59.3	-	7.1	7.8	78.5	1.8	11.9	(100.0)	74.5	6.8	18.7
ALABAMA	25.4	52.2	-	22.5	0.4	66.6	13.1	19.9	(100.0)	57.6	52.6	(10.2)
MISSISSIPPI	29.2	55.0	-	15.8	0.5	68.5	10.8	20.3	(100.0)	47.0	37.5	15.5
ARKANSAS	34.6	50.8	-	14.6	2.4	72.4	10.2	15.0	(100.0)	66.9	31.8	1.4
LOUISIANA	22.6	55.0	-	22.4	0.5	65.5	12.1	21.9	(100.0)	47.2	54.8	(1.9)
TEXAS	23.5	60.3	-	16.2	1.9	73.2	9.9	15.0	(100.0)	59.8	46.0	(5.8)
NEW MEXICO	38.6	55.0	-	6.4	22.5	66.7	1.1	9.8	(100.0)	72.3	6.7	21.0
MONTANA	49.0	46.1	-	4.9	29.2	59.4	-	11.4	(100.0)	67.1	-	32.9
IDAHO	49.4	46.7	-	3.9	31.6	60.7	-	7.7	(100.0)	78.6	-	21.4
WYOMING	44.2	50.7	-	5.1	24.8	62.9	0.8	11.6	(100.0)	62.7	4.0	33.3
COLORADO	35.1	55.8	-	9.1	16.9	63.4	4.6	15.1	(100.0)	41.8	25.4	32.8
UTAH	37.8	54.2	-	8.0	21.6	62.1	1.4	14.8	(100.0)	49.0	8.9	42.0
WASHINGTON	38.0	47.0	-	15.0	25.4	58.4	0.1	16.0	(100.0)	90.8	0.9	8.3
OREGON	41.2	46.5	-	12.3	27.5	60.6	0.1	11.8	(100.0)	103.2	0.6	(3.8)
CALIFORNIA	22.9	55.1	-	22.0	11.9	62.3	2.2	23.6	(100.0)	65.3	20.1	14.6
NEVADA	33.6	54.5	-	11.9	21.0	63.4	0.1	15.6	(100.0)	70.7	0.5	28.8
ARIZONA	32.6	54.5	-	12.8	20.9	64.2	0.1	14.8	(100.0)	82.3	0.9	16.8
ALASKA	34.2	60.0	-	5.8	18.2	73.5	0.3	8.0	(100.0)	83.9	2.1	14.0
HAWAII	12.2	54.5	-	33.3	-	54.6	8.7	36.6	(100.0)	0.9	71.5	27.6
TOTAL US	23.7	55.8	-	20.4	4.8	65.5	9.5	20.2	(100.0)	50.8	50.4	(1.1)

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MOTOR GASOLINE BY GRADE -- PERCENT

		1987 UNLEADED				1990 UNLEADED			1995/2000/2010			
	REG LEAD	REGULAR	MID-GRADE	PREMIUM	REG LEAD	REGULAR	MID-GRADE	PREMIUM	REG LEAD	REGULAR	MID-GRADE	PREMIUM
MAINE	22.3	58.4	-	19.3	0.7	69.7	11.6	18.0	-	70.1	11.9	18.0
NEW HAMPSHIRE	12.9	57.4	-	29.7	0.3	60.9	14.4	24.4	-	61.0	14.6	24.4
VERMONT	19.8	54.1	-	26.1	0.2	63.4	11.7	24.7	-	63.4	11.8	24.7
MASSACHUSETTS	12.7	53.6	-	33.7	-	60.3	12.6	27.1	-	60.3	12.6	27.1
RHODE ISLANE	16.1	49.7	-	34.3	-	57.8	12.6	29.6	-	57.8	12.6	29.6
CONNECTICUT	13.3	49.7	-	37.0	-	54.2	15.7	30.1	-	54.2	15.7	30.1
NEW YORK	14.5	51.7	-	33.9	0.2	56.7	10.4	32.6	-	56.8	10.6	32.6
NEW JERSEY	10.2	55.2	-	34.6	-	55.6	10.0	34.4	-	55.6	10.0	34.4
PENNSYLVANIA	19.4	56.1	-	24.6	0.4	60.6	15.2	23.9	-	60.6	15.5	23.9
DELAWARE	12.8	59.7	-	27.4	-	56.1	20.4	23.6	-	56.1	20.4	23.6
MARYLAND	12.3	52.2	-	35.5	-	49.1	20.9	30.0	-	49.1	20.9	30.0
DIST COL	5.7	42.1	-	52.1	-	33.9	18.9	47.2	-	33.9	18.9	47.2
W VIRGINIA	27.2	47.8	-	25.0	0.5	63.6	15.8	20.2	-	63.9	16.0	20.2
VIRGINIA	19.2	53.9	-	27.0	0.4	56.3	18.1	25.2	-	56.4	18.4	25.2
N CAROLINA	25.9	50.1	-	24.0	0.4	63.3	15.9	20.4	-	63.5	16.1	20.4
S CAROLINA	27.3	51.5	-	21.2	0.4	65.8	14.9	18.9	-	66.0	15.1	18.9
GEORGIA	23.7	49.3	-	26.9	0.3	61.5	14.9	23.3	-	61.7	15.0	23.3
FLORIDA	18.8	49.7	-	31.5	0.3	54.2	16.5	29.0	-	54.3	16.7	29.0
MICHIGAN	19.9	66.1	-	14.0	1.4	75.0	8.6	14.9	-	75.7	9.3	14.9
OHIO	22.1	60.5	-	17.5	0.2	72.4	13.3	14.1	-	72.5	13.4	14.1
INDIANA	25.3	63.5	-	11.3	2.1	73.0	11.1	13.8	-	73.9	12.3	13.8
ILLINOIS	18.2	65.2	-	16.6	0.5	72.5	9.4	17.6	-	72.7	9.7	17.6
KENTUCKY	32.2	49.6	-	18.2	0.4	63.8	17.9	17.9	-	64.0	18.1	17.9
TENNESSEE	25.7	53.6	-	20.7	0.3	64.2	16.4	19.1	-	64.3	16.6	19.1
WISCONSIN	26.1	62.8	-	11.1	4.0	78.7	4.2	13.0	-	81.6	5.3	13.0
MINNESOTA	26.1	63.3	-	10.6	7.5	78.1	3.7	10.7	-	84.1	5.3	10.7
N DAKOTA	39.2	55.1	-	5.7	14.3	79.5	1.9	4.4	-	91.6	4.0	4.4
S DAKOTA	41.5	54.6	-	3.8	12.2	81.9	0.6	5.4	-	92.2	2.4	5.4
IOWA	35.3	57.7	-	7.0	8.3	83.0	0.8	7.9	-	90.1	2.0	7.9
NEBRASKA	36.8	58.4	-	4.8	13.0	80.3	1.9	4.9	-	91.3	3.8	4.9
MISSOURI	30.8	58.0	-	11.2	6.3	71.8	7.0	14.9	-	75.4	9.8	14.9
KANSAS	32.6	62.3	-	5.0	9.1	79.8	2.4	8.7	-	86.5	4.8	8.7
OKLAHOMA	33.7	59.3	-	7.1	7.8	78.5	1.8	11.9	-	84.3	3.8	11.9
ALABAMA	25.4	52.2	-	22.5	0.4	66.6	13.1	19.9	-	66.8	13.3	19.9
MISSISSIPPI	29.2	55.0	-	15.8	0.5	68.5	10.8	20.3	-	68.7	11.0	20.3
ARKANSAS	34.6	50.8	-	14.6	2.4	72.4	10.2	15.0	-	74.0	11.0	15.0
LOUISIANA	22.6	55.0	-	22.4	0.5	65.5	12.1	21.9	-	65.7	12.4	21.9
TEXAS	23.5	60.3	-	16.2	1.9	73.2	9.9	15.0	-	74.3	10.7	15.0
NEW MEXICO	38.6	55.0	-	6.4	22.5	66.7	1.1	9.8	-	82.9	7.3	9.8
MONTANA	49.0	46.1	-	4.9	29.2	59.4	-	11.4	-	79.0	9.6	11.4
IDAHO	49.4	46.7	-	3.9	31.6	60.7	-	7.7	-	85.5	6.7	7.7
WYOMING	44.2	50.7	-	5.1	24.8	62.9	0.8	11.6	-	78.4	10.0	11.6
COLORADO	35.1	55.8	-	9.1	16.9	63.4	4.6	15.1	-	70.5	14.5	15.1
UTAH	37.8	54.2	-	8.0	21.6	62.1	1.4	14.8	-	72.7	12.5	14.8
WASHINGTON	38.0	47.0	-	15.0	25.4	58.4	0.1	16.0	-	80.0	3.9	16.0
OREGON	41.2	46.5	-	12.3	27.5	60.6	0.1	11.8	-	84.0	4.2	11.8
CALIFORNIA	22.9	55.1	-	22.0	11.9	62.3	2.2	23.6	-	70.1	6.3	23.6
NEVADA	33.6	54.5	-	11.9	21.0	63.4	0.1	15.6	-	78.2	6.2	15.6
ARIZONA	32.6	54.5	-	12.8	20.9	64.2	0.1	14.8	-	81.4	3.8	14.8
ALASKA	34.2	60.0	-	5.8	18.2	73.5	0.3	8.0	-	88.7	3.3	8.0
HAWAII	12.2	54.5	-	33.3	-	54.6	8.7	36.6	-	54.6	8.7	36.6
TOTAL US	23.7	55.8	-	20.4	4.8	65.5	9.5	20.2	-	67.9	11.9	20.2

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Appendix L, Section III-3

Foundation Case - U.S. Demands

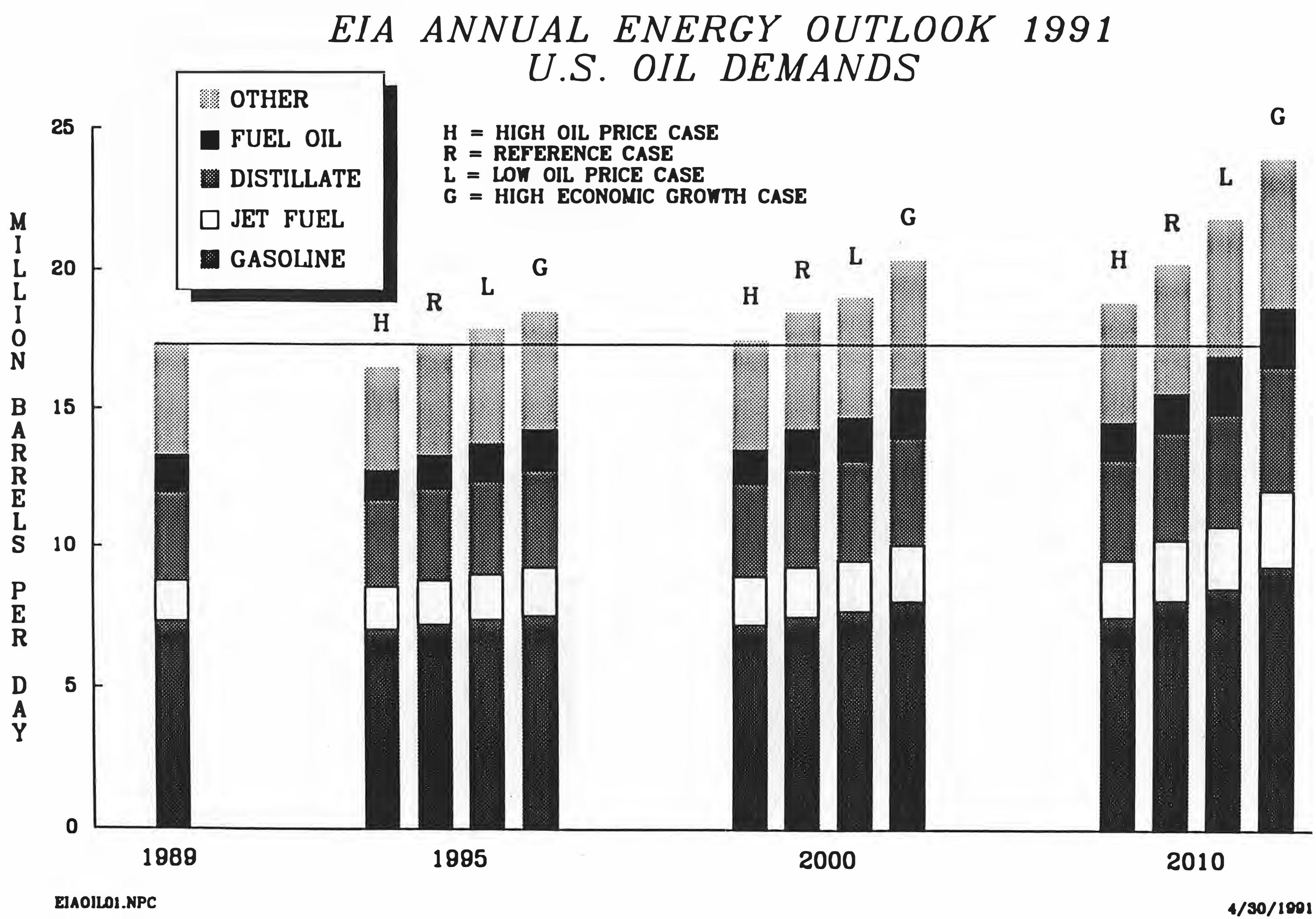
SUPPLY, DEMAND, AND LOGISTICS (SD&L) TASK GROUP
INTEGRATION MODEL
PROPOSED INITIAL SEQUENCE

- 1989: Calibration Year (EIA Historical Data)
- 1987: Validation Year (EIA Historical Data)
- 1995/2000/2010: EIA Annual Energy Outlook*
  - "Business as Usual" Case
    - + 1989 Environment Extrapolated into the Future
    - + No 1990 Clean Air Act (CAA), etc.
    - + No Crude Oil Slate Change Versus 1989
  - "Foundation Case I"
    - + Incorporate CAA, Safety, etc., Environment
    - + No Crude Oil Slate Change Versus 1989
- 1995/2000/2010: Constant Volume vs. 1989*
  - Major U.S. Products Unchanged from 1989
  - "Foundation Case II"
    - + Incorporate CAA, Safety, etc., Environment
    - + No Crude Oil Slate Change Versus 1989
- 1995/2000/2010: Declining Volume vs. 1989**
  - Major U.S. Products Decline from 1989 Levels
  - "Analysis Case"
    - + Incorporate CAA, Safety, etc., Environment
    - + No Crude Oil Slate Change Versus 1989

Notes:

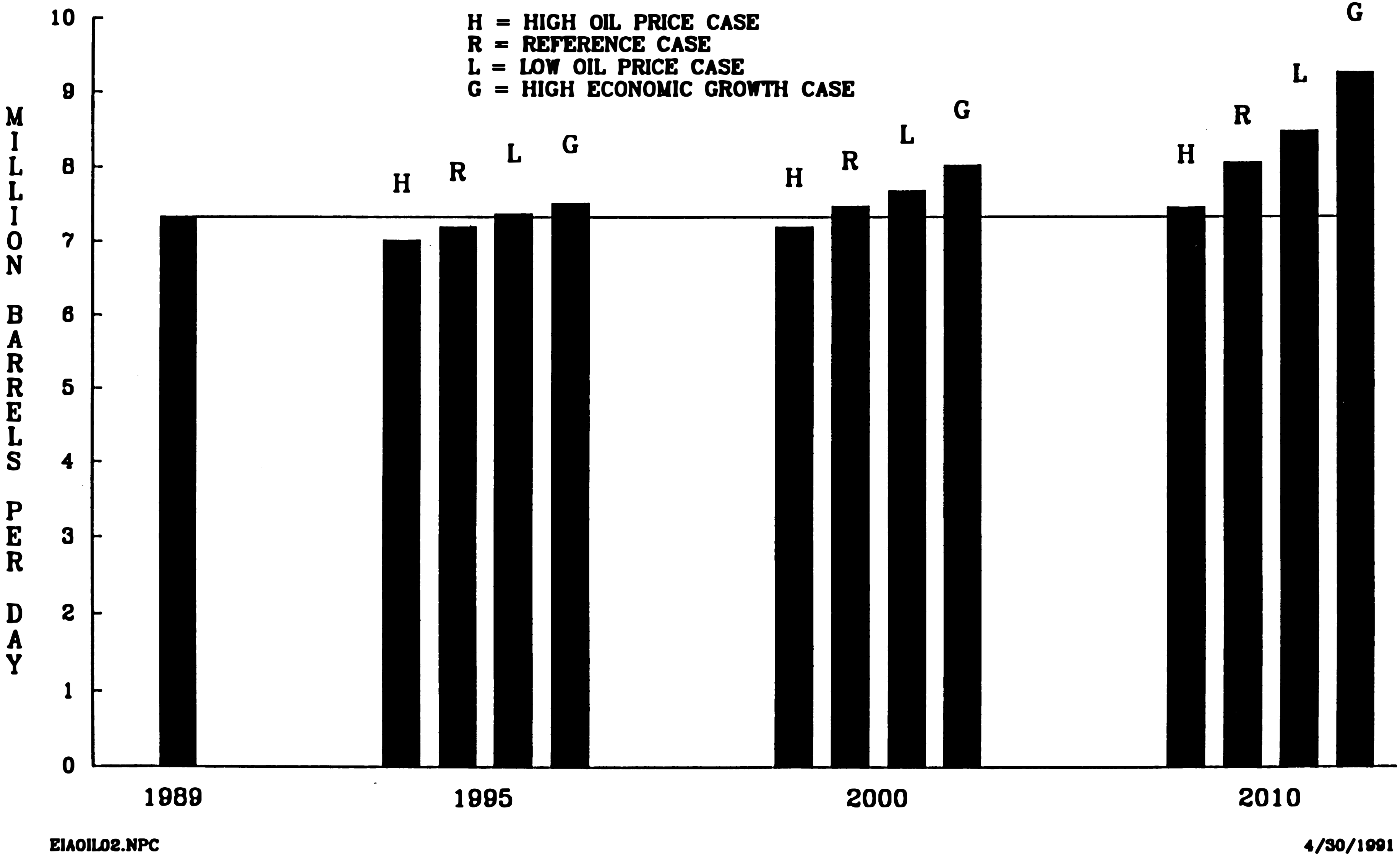
*Supported by Coordinating Subcommittee.
**Required to address Supply/Demand/Logistics issues.

GKB:yg
8/27/91


EIA ANNUAL ENERGY OUTLOOK 1991
U.S. OIL DEMANDS
OTHER
FUEL OIL
DISTILLATE
JET FUEL
GASOLINE
H = HIGH OIL PRICE CASE
R = REFERENCE CASE
L = LOW OIL PRICE CASE
G = HIGH ECONOMIC GROWTH CASE
MILLION BARRELS PER DAY
0
5
10
15
20
25
H
R
L
G
1989
1995
2000
2010
EIAOILO1.NPC
4/30/1991

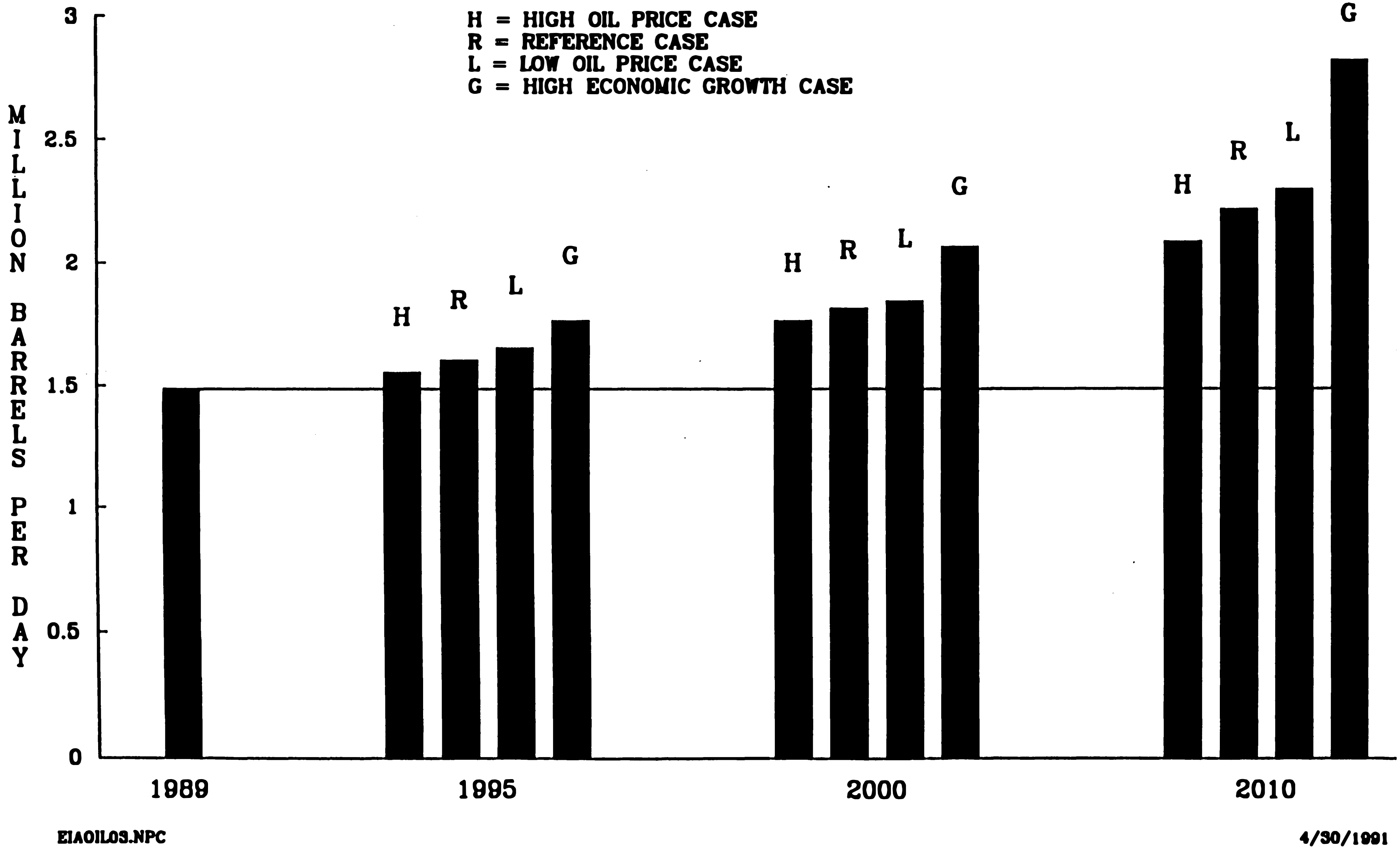
APP L.III.3-2

EIA ANNUAL ENERGY OUTLOOK 1991
U.S. MOTOR GASOLINE DEMANDS

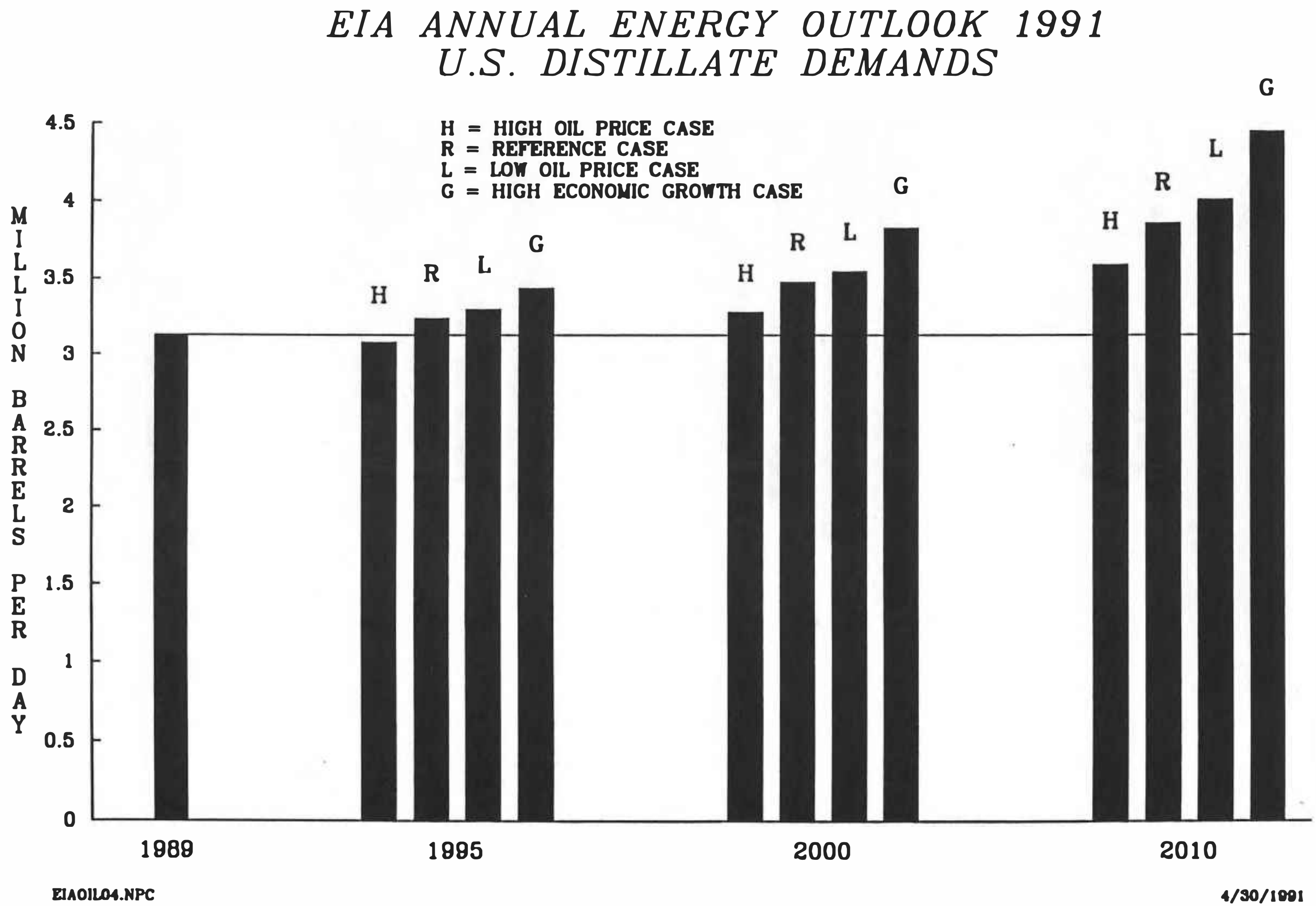


APP L.III.3-3

EIA ANNUAL ENERGY OUTLOOK 1991
U.S. JET FUEL DEMANDS



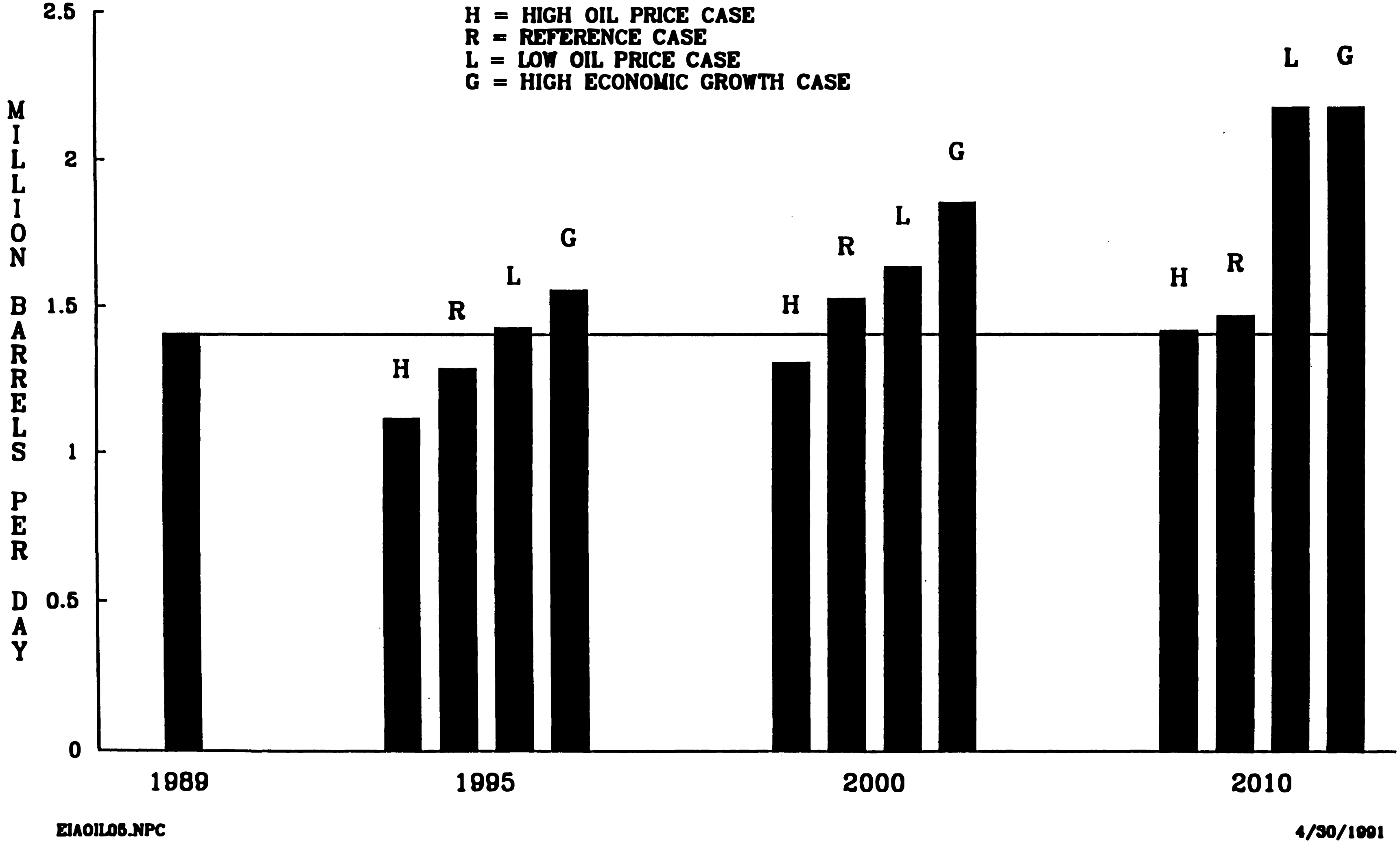
APP L.III.3-4



EIA ANNUAL ENERGY OUTLOOK 1991
U.S. DISTILLATE DEMANDS
H = HIGH OIL PRICE CASE
R = REFERENCE CASE
L = LOW OIL PRICE CASE
G = HIGH ECONOMIC GROWTH CASE
MILLION BARRELS PER DAY
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
H
R
L
G
1989
1995
2000
2010
EIAOILO4.NPC
4/30/1991

APP L.III.3-5

EIA ANNUAL ENERGY OUTLOOK 1991
U.S. RESIDUAL FUEL DEMANDS



APP L.III.3-6

PROPOSED VOLUMETRIC GUIDELINES FOR DEMAND SCENARIOS

- Increasing Demand Case: EIA 1991 Annual Energy Outlook (AEO), Reference Case

  - Note lower gasoline and heavy fuel oil volumes in 1995 relative to 1989.

  - The 1989 historic energy basis for the AEO.
    + EIA's State Energy Data System (SEDS) at the time of the AEO development.

  - NPC Basis: Use 1989 <u>state</u> volumetric data publicly available from EIA, DOT, etc., sources.
    + EIA's "Fuel Oil and Kerosene Sales, 1989", etc.
    + Allows determination of separate diesel and heating oil uses instead of "distillate" from AEO.
    + U. S. total volumetric data almost identical to that published in AEO.

- Flat Demand Case: Volumetric (not BTU or other) Basis

  - U.S. oil demand by major oil type same as in 1989.
    + But not to exceed Increasing Case--see 1995 comments above.

  - Residential and Commercial oil demands decline with time in Increasing Case.
    + Unchanged in Flat Case, as long as specific oil (i.e., commercial gasoline) did not increase in Increasing Case.

- Declining Demand Case:

  - Totals for gasoline and other decline from Flat Case by difference that Increasing Case grew.

  - Totals for jet fuel and distillates reflect negative growth equal to gasoline.

  - Totals for heavy fuel oil decline from Flat Case by difference that Increasing Case grew.
    + Not allowed to increase in 2010 above 2000 level.

APP L.III.3-8

EIA 1991 ANNUAL ENERGY OUTLOOK - REFERENCE CASE

	MILLION BARRELS PER DAY				DELTA VERSUS 1989			GROWTH VERSUS 1989, % PER YEAR		
	1989	1995	2000	2010	1995	2000	2010	1995	2000	2010
MOTOR GASOLINE	7.33	7.22	7.50	8.08	(0.11)	0.17	0.75	(0.3)	0.2	0.5
TOTAL JET FUEL	1.49	1.61	1.82	2.22	0.12	0.33	0.73	1.3	1.8	1.9
NAPHTHA JET FUEL	0.21	-	-	-	-	-	-	-	-	-
KEROSENE JET FUEL	1.28	1.61	1.82	2.22	-	-	-	-	-	-
TOTAL DISTILLATE	3.14	3.25	3.49	3.87	0.11	0.35	0.73	0.6	1.0	1.0
DISTILLATE 1	0.03	-	-	-	-	-	-	-	-	-
LIGHT DIESEL	1.94	-	-	-	-	-	-	-	-	-
HEAVY DIESEL	0.37	-	-	-	-	-	-	-	-	-
DISTILLATE 2 (HT OIL)	0.77	-	-	-	-	-	-	-	-	-
TOTAL HEAVY FUEL OIL	1.41	1.29	1.53	1.47	(0.12)	0.12	0.06	(1.5)	0.7	0.2
DISTILLATE 4	0.04	-	-	-	-	-	-	-	-	-
HEAVY FUEL OIL	1.37	-	-	-	-	-	-	-	-	-
TOTAL OTHER PETROLEUM	3.96	3.97	4.20	4.62	0.01	0.24	0.66	-	0.5	0.7
LIQUIFIED PETROLEUM GAS	1.62	-	-	-	-	-	-	-	-	-
AVIATION GASOLINE	0.03	-	-	-	-	-	-	-	-	-
KEROSENE	0.08	-	-	-	-	-	-	-	-	-
CHEM FEED NAPHTHA	0.20	-	-	-	-	-	-	-	-	-
CHEM FEED GASOIL	0.26	-	-	-	-	-	-	-	-	-
SPECIAL NAPHTHA	0.06	-	-	-	-	-	-	-	-	-
LUBRICANTS	0.16	-	-	-	-	-	-	-	-	-
WAX	0.02	-	-	-	-	-	-	-	-	-
ASPHALT & ROAD OIL	0.45	-	-	-	-	-	-	-	-	-
MISCELLANEOUS OIL	0.07	-	-	-	-	-	-	-	-	-
CRUDE OIL	0.03	-	-	-	-	-	-	-	-	-
STILL GAS	0.68	-	-	-	-	-	-	-	-	-
CATALYTIC COKE	0.21	-	-	-	-	-	-	-	-	-
MARKETABLE COKE	0.10	-	-	-	-	-	-	-	-	-
TOTAL - ALL OIL	17.33	17.34	18.53	20.27	0.01	1.20	2.94	-	0.6	0.7

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HISTORIC 1989 SECTOR ENERGY USAGE -- THOUSAND BARRELS PER DAY

	RESIDENTIAL	COMMERCIAL	TRANSPORTATION	INDUSTRIAL	ELECT UTILITY	TOTAL
LIQUIFIED PETROLEUM GAS	368	60	38	1154	-	1620
MOTOR GASOLINE	-	54	7168	105	-	7327
AVIATION GASOLINE	-	-	26	-	-	26
NAPHTHA JET FUEL	-	-	205	-	-	205
KEROSENE JET FUEL	-	-	1284	-	-	1284
TOTAL JET FUEL	-	-	1489	-	-	1489
KEROSENE	40	23	-	21	-	84
DISTILLATE 1	18	7	-	5	-	30
LIGHT DIESEL	-	93	1435	415	-	1943
HEAVY DIESEL	-	-	371	-	-	371
DISTILLATE 2 (HT OIL)	471	121	-	112	70	774
TOTAL DISTILLATE	489	221	1806	532	70	3118
DISTILLATE 4	-	30	-	9	-	39
HEAVY FUEL OIL	-	100	360	271	639	1370
TOTAL HEAVY FUEL OIL	-	130	360	280	639	1409
CHEM FEED NAPHTHA	-	-	-	203	-	203
CHEM FEED GASOIL	-	-	-	257	-	257
SPECIAL NAPHTHA	-	-	-	56	-	56
LUBRICANTS	-	-	-	159	-	159
WAX	-	-	-	17	-	17
ASPHALT & ROAD OIL	-	-	-	453	-	453
MISCELLANEOUS OIL	-	-	-	72	-	72
CRUDE OIL	-	-	-	28	-	28
STILL GAS	-	-	-	681	-	681
CATALYTIC COKE	-	-	-	212	-	212
MARKETABLE COKE	-	-	-	96	-	96
TOTAL - ALL OIL	897	488	10887	4326	709	17307

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HISTORIC 1989 SECTOR ENERGY USAGE -- QUADRILLION BTU PER YEAR

	RESIDENTIAL	COMMERCIAL	TRANSPORTATION	INDUSTRIAL	ELECT UTILITY	TOTAL
LIQUIFIED PETROLEUM GAS	0.515	0.084	0.053	1.616	-	2.268
MOTOR GASOLINE	-	0.104	13.744	0.201	-	14.048
AVIATION GASOLINE	-	-	0.048	-	-	0.048
NAPHTHA JET FUEL	-	-	0.401	-	-	0.401
KEROSENE JET FUEL	-	-	2.657	-	-	2.657
TOTAL JET FUEL	-	-	3.058	-	-	3.058
KEROSENE	0.083	0.048	-	0.043	-	0.174
DISTILLATE 1	0.038	0.015	-	0.011	-	0.064
LIGHT DIESEL	-	0.198	3.051	0.882	-	4.131
HEAVY DIESEL	-	-	0.789	-	-	0.789
DISTILLATE 2 (HT OIL)	1.001	0.257	-	0.238	0.149	1.646
TOTAL DISTILLATE	1.040	0.470	3.840	1.131	0.149	6.629
DISTILLATE 4	-	0.064	-	0.019	-	0.083
HEAVY FUEL OIL	-	0.229	0.826	0.622	1.466	3.144
TOTAL HEAVY FUEL OIL	-	0.293	0.826	0.641	1.466	3.227
CHEM FEED NAPHTHA	-	-	-	0.389	-	0.389
CHEM FEED GASOIL	-	-	-	0.546	-	0.546
SPECIAL NAPHTHA	-	-	-	0.107	-	0.107
LUBRICANTS	-	-	-	0.352	-	0.352
WAX	-	-	-	0.034	-	0.034
ASPHALT & ROAD OIL	-	-	-	1.097	-	1.097
MISCELLANEOUS OIL	-	-	-	0.152	-	0.152
CRUDE OIL	-	-	-	0.059	-	0.059
STILL GAS	-	-	-	1.491	-	1.491
CATALYTIC COKE	-	-	-	0.466	-	0.466
MARKETABLE COKE	-	-	-	0.211	-	0.211
TOTAL - ALL OIL	1.638	0.998	21.569	8.539	1.615	34.359

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FOUNDATION CASE I

NATIONAL PETROLEUM COUNCIL - REFINING STUDY
INCREASING DEMAND
TOTAL U.S.

	THOUSAND BARRELS PER DAY				DELTA VERSUS 1989			GROWTH VERSUS 1989, % PER YEAR		
	1989	1995	2000	2010	1995	2000	2010	1995	2000	2010
MOTOR GASOLINE	7328	7218	7498	8078	(110)	170	750	(0.3)	0.2	0.5
NAPHTHA JET FUEL	205	-	-	-	-	-	-	-	-	-
KEROSENE JET FUEL	1284	-	-	-	-	-	-	-	-	-
TOTAL JET FUEL	1489	1609	1819	2219	120	330	730	1.3	1.8	1.9
DISTILLATE 1	30	-	-	-	-	-	-	-	-	-
LIGHT DIESEL	1943	-	-	-	-	-	-	-	-	-
HEAVY DIESEL	371	-	-	-	-	-	-	-	-	-
DISTILLATE 2 (HT OIL)	774	-	-	-	-	-	-	-	-	-
TOTAL DISTILLATE	3118	3228	3468	3848	110	350	730	0.6	1.0	1.0
DISTILLATE 4	39	-	-	-	-	-	-	-	-	-
HEAVY FUEL OIL	1370	-	-	-	-	-	-	-	-	-
TOTAL HEAVY FUEL OIL	1409	1289	1529	1469	(120)	120	60	(1.5)	0.7	0.2
LIQUIFIED PETROLEUM GAS	1620	-	-	-	-	-	-	-	-	-
AVIATION GASOLINE	26	-	-	-	-	-	-	-	-	-
KEROSENE	84	-	-	-	-	-	-	-	-	-
CHEM FEED NAPHTHA	203	-	-	-	-	-	-	-	-	-
CHEM FEED GASOIL	257	-	-	-	-	-	-	-	-	-
SPECIAL NAPHTHA	56	-	-	-	-	-	-	-	-	-
LUBRICANTS	159	-	-	-	-	-	-	-	-	-
WAX	17	-	-	-	-	-	-	-	-	-
ASPHALT & ROAD OIL	453	-	-	-	-	-	-	-	-	-
MISCELLANEOUS OIL	72	-	-	-	-	-	-	-	-	-
CRUDE OIL	28	-	-	-	-	-	-	-	-	-
STILL GAS	681	-	-	-	-	-	-	-	-	-
CATALYTIC COKE	212	-	-	-	-	-	-	-	-	-
MARKETABLE COKE	96	-	-	-	-	-	-	-	-	-
TOTAL OTHER PETROLEUM	3962	3972	4202	4622	10	240	660	-	0.5	0.7
TOTAL - ALL OIL	17306	17316	18516	20236	10	1210	2930	-	0.6	0.7

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FOUNDATION CASE II

NATIONAL PETROLEUM COUNCIL - REFINING STUDY
NO DEMAND INCREASE
TOTAL U.S.

	THOUSAND BARRELS PER DAY				DELTA VERSUS 1989			GROWTH VERSUS 1989, % PER YEAR		
	1989	1995	2000	2010	1995	2000	2010	1995	2000	2010
MOTOR GASOLINE	7328	7218	7218	7218	(110)	(110)	(110)	(0.3)	(0.1)	(0.1)
NAPHTHA JET FUEL	205	-	-	-	-	-	-	-	-	-
KEROSENE JET FUEL	1284	-	-	-	-	-	-	-	-	-
TOTAL JET FUEL	1489	1489	1489	1489	-	-	-	-	-	-
DISTILLATE 1	30	-	-	-	-	-	-	-	-	-
LIGHT DIESEL	1943	-	-	-	-	-	-	-	-	-
HEAVY DIESEL	371	-	-	-	-	-	-	-	-	-
DISTILLATE 2 (HT OIL)	774	-	-	-	-	-	-	-	-	-
TOTAL DISTILLATE	3118	3118	3118	3118	-	-	-	-	-	-
DISTILLATE 4	39	-	-	-	-	-	-	-	-	-
HEAVY FUEL OIL	1370	-	-	-	-	-	-	-	-	-
TOTAL HEAVY FUEL OIL	1409	1289	1289	1289	(120)	(120)	(120)	(1.5)	(0.8)	(0.4)
LIQUIFIED PETROLEUM GAS	1620	-	-	-	-	-	-	-	-	-
AVIATION GASOLINE	26	-	-	-	-	-	-	-	-	-
KEROSENE	84	-	-	-	-	-	-	-	-	-
CHEM FEED NAPHTHA	203	-	-	-	-	-	-	-	-	-
CHEM FEED GASOIL	257	-	-	-	-	-	-	-	-	-
SPECIAL NAPHTHA	56	-	-	-	-	-	-	-	-	-
LUBRICANTS	159	-	-	-	-	-	-	-	-	-
WAX	17	-	-	-	-	-	-	-	-	-
ASPHALT & ROAD OIL	453	-	-	-	-	-	-	-	-	-
MISCELLANEOUS OIL	72	-	-	-	-	-	-	-	-	-
CRUDE OIL	28	-	-	-	-	-	-	-	-	-
STILL GAS	681	-	-	-	-	-	-	-	-	-
CATALYTIC COKE	212	-	-	-	-	-	-	-	-	-
MARKETABLE COKE	96	-	-	-	-	-	-	-	-	-
TOTAL OTHER PETROLEUM	3962	3962	3962	3962	-	-	-	-	-	-
TOTAL - ALL OIL	17306	17076	17076	17076	(230)	(230)	(230)	(0.2)	(0.1)	(0.1)

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FOUNDATION CASE III

NATIONAL PETROLEUM COUNCIL - REFINING STUDY
DECREASING DEMAND
TOTAL U.S.

	THOUSAND BARRELS PER DAY				DELTA VERSUS 1989			GROWTH VERSUS 1989, % PER YEAR		
	1989	1995	2000	2010	1995	2000	2010	1995	2000	2010
MOTOR GASOLINE	7328	7218	6938	6358	(110)	(390)	(970)	(0.3)	(0.5)	(0.7)
NAPHTHA JET FUEL	205	-	-	-	-	-	-	-	-	-
KEROSENE JET FUEL	1284	-	-	-	-	-	-	-	-	-
TOTAL JET FUEL	1489	1467	1410	1292	(22)	(79)	(197)	(0.3)	(0.5)	(0.7)
DISTILLATE 1	30	-	-	-	-	-	-	-	-	-
LIGHT DIESEL	1943	-	-	-	-	-	-	-	-	-
HEAVY DIESEL	371	-	-	-	-	-	-	-	-	-
DISTILLATE 2 (HT OIL)	774	-	-	-	-	-	-	-	-	-
TOTAL DISTILLATE	3118	3071	2952	2705	(47)	(166)	(413)	(0.3)	(0.5)	(0.7)
DISTILLATE 4	39	-	-	-	-	-	-	-	-	-
HEAVY FUEL OIL	1370	-	-	-	-	-	-	-	-	-
TOTAL HEAVY FUEL OIL	1409	1289	1049	1049	(120)	(360)	(360)	(1.5)	(2.6)	(1.4)
LIQUIFIED PETROLEUM GAS	1620	-	-	-	-	-	-	-	-	-
AVIATION GASOLINE	26	-	-	-	-	-	-	-	-	-
KEROSENE	84	-	-	-	-	-	-	-	-	-
CHEM FEED NAPHTHA	203	-	-	-	-	-	-	-	-	-
CHEM FEED GASOIL	257	-	-	-	-	-	-	-	-	-
SPECIAL NAPHTHA	56	-	-	-	-	-	-	-	-	-
LUBRICANTS	159	-	-	-	-	-	-	-	-	-
WAX	17	-	-	-	-	-	-	-	-	-
ASPHALT & ROAD OIL	453	-	-	-	-	-	-	-	-	-
MISCELLANEOUS OIL	72	-	-	-	-	-	-	-	-	-
CRUDE OIL	28	-	-	-	-	-	-	-	-	-
STILL GAS	681	-	-	-	-	-	-	-	-	-
CATALYTIC COKE	212	-	-	-	-	-	-	-	-	-
MARKETABLE COKE	96	-	-	-	-	-	-	-	-	-
TOTAL OTHER PETROLEUM	3962	3952	3722	3302	(10)	(240)	(660)	-	(0.6)	(0.9)
TOTAL - ALL OIL	17306	16997	16071	14707	(309)	(1235)	(2599)	(0.3)	(0.7)	(0.8)

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FOUNDATION CASE I

NATIONAL PETROLEUM COUNCIL - REFINING STUDY
INCREASING DEMAND
RESIDENTIAL

	THOUSAND BARRELS PER DAY				DELTA VERSUS 1989			GROWTH VERSUS 1989, % PER YEAR		
	1989	1995	2000	2010	1995	2000	2010	1995	2000	2010
MOTOR GASOLINE	-	-	-	-	-	-	-	-	-	-
NAPHTHA JET FUEL	-	-	-	-	-	-	-	-	-	-
KEROSENE JET FUEL	-	-	-	-	-	-	-	-	-	-
TOTAL JET FUEL	-	-	-	-	-	-	-	-	-	-
DISTILLATE 1	18	16	13	10	(2)	(5)	(8)	(2.2)	(2.7)	(2.7)
LIGHT DIESEL	-	-	-	-	-	-	-	-	-	-
HEAVY DIESEL	-	-	-	-	-	-	-	-	-	-
DISTILLATE 2 (HT OIL)	471	412	349	263	(59)	(122)	(208)	(2.2)	(2.7)	(2.7)
TOTAL DISTILLATE	489	428	362	273	(61)	(127)	(216)	(2.2)	(2.7)	(2.7)
DISTILLATE 4	-	-	-	-	-	-	-	-	-	-
HEAVY FUEL OIL	-	-	-	-	-	-	-	-	-	-
TOTAL HEAVY FUEL OIL	-	-	-	-	-	-	-	-	-	-
LIQUIFIED PETROLEUM GAS	368	325	297	247	(43)	(71)	(121)	(2.0)	(1.9)	(1.9)
AVIATION GASOLINE	-	-	-	-	-	-	-	-	-	-
KEROSENE	40	33	26	16	(7)	(14)	(24)	(3.1)	(4.0)	(4.3)
CHEM FEED NAPHTHA	-	-	-	-	-	-	-	-	-	-
CHEM FEED GASOIL	-	-	-	-	-	-	-	-	-	-
SPECIAL NAPHTHA	-	-	-	-	-	-	-	-	-	-
LUBRICANTS	-	-	-	-	-	-	-	-	-	-
WAX	-	-	-	-	-	-	-	-	-	-
ASPHALT & ROAD OIL	-	-	-	-	-	-	-	-	-	-
MISCELLANEOUS OIL	-	-	-	-	-	-	-	-	-	-
CRUDE OIL	-	-	-	-	-	-	-	-	-	-
STILL GAS	-	-	-	-	-	-	-	-	-	-
CATALYTIC COKE	-	-	-	-	-	-	-	-	-	-
MARKETABLE COKE	-	-	-	-	-	-	-	-	-	-
TOTAL OTHER PETROLEUM	408	359	323	263	(49)	(85)	(145)	(2.1)	(2.1)	(2.1)
TOTAL - ALL OIL	898	787	685	536	(111)	(213)	(362)	(2.2)	(2.4)	(2.4)

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FOUNDATION CASE I

NATIONAL PETROLEUM COUNCIL - REFINING STUDY
INCREASING DEMAND
COMMERCIAL

	THOUSAND BARRELS PER DAY				DELTA VERSUS 1989			GROWTH VERSUS 1989, % PER YEAR		
	1989	1995	2000	2010	1995	2000	2010	1995	2000	2010
MOTOR GASOLINE	54	60	65	75	6	11	21	1.8	1.7	1.6
NAPHTHA JET FUEL	-	-	-	-	-	-	-	-	-	-
KEROSENE JET FUEL	-	-	-	-	-	-	-	-	-	-
TOTAL JET FUEL	-	-	-	-	-	-	-	-	-	-
DISTILLATE 1	7	6	5	3	(1)	(2)	(4)	(2.6)	(3.1)	(3.7)
LIGHT DIESEL	93	93	93	93	-	-	-	-	-	-
HEAVY DIESEL	-	-	-	-	-	-	-	-	-	-
DISTILLATE 2 (HT OIL)	121	103	85	54	(18)	(36)	(67)	(2.6)	(3.1)	(3.7)
TOTAL DISTILLATE	222	203	184	151	(19)	(38)	(71)	(1.5)	(1.7)	(1.8)
DISTILLATE 4	30	25	22	17	(5)	(8)	(13)	(3.0)	(2.8)	(2.7)
HEAVY FUEL OIL	100	84	73	57	(16)	(27)	(43)	(3.0)	(2.8)	(2.7)
TOTAL HEAVY FUEL OIL	130	109	96	74	(21)	(34)	(56)	(3.0)	(2.8)	(2.7)
LIQUIFIED PETROLEUM GAS	60	51	47	47	(9)	(13)	(13)	(2.6)	(2.2)	(1.2)
AVIATION GASOLINE	-	-	-	-	-	-	-	-	-	-
KEROSENE	23	20	18	13	(3)	(5)	(10)	(2.1)	(2.3)	(2.6)
CHEM FEED NAPHTHA	-	-	-	-	-	-	-	-	-	-
CHEM FEED GASOIL	-	-	-	-	-	-	-	-	-	-
SPECIAL NAPHTHA	-	-	-	-	-	-	-	-	-	-
LUBRICANTS	-	-	-	-	-	-	-	-	-	-
WAX	-	-	-	-	-	-	-	-	-	-
ASPHALT & ROAD OIL	-	-	-	-	-	-	-	-	-	-
MISCELLANEOUS OIL	-	-	-	-	-	-	-	-	-	-
CRUDE OIL	-	-	-	-	-	-	-	-	-	-
STILL GAS	-	-	-	-	-	-	-	-	-	-
CATALYTIC COKE	-	-	-	-	-	-	-	-	-	-
MARKETABLE COKE	-	-	-	-	-	-	-	-	-	-
TOTAL OTHER PETROLEUM	83	71	65	60	(12)	(18)	(23)	(2.5)	(2.2)	(1.5)
TOTAL - ALL OIL	489	443	409	360	(46)	(80)	(129)	(1.6)	(1.6)	(1.5)

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FOUNDATION CASE I

NATIONAL PETROLEUM COUNCIL - REFINING STUDY
INCREASING DEMAND
TRANSPORTATION

	THOUSAND BARRELS PER DAY				DELTA VERSUS 1989			GROWTH VERSUS 1989, % PER YEAR		
	1989	1995	2000	2010	1995	2000	2010	1995	2000	2010
MOTOR GASOLINE	7168	7042	7307	7861	(126)	139	693	(0.3)	0.2	0.4
NAPHTHA JET FUEL	205	-	-	-	-	-	-	-	-	-
KEROSENE JET FUEL	1284	1609	1819	2219	325	535	935	3.8	3.2	2.6
TOTAL JET FUEL	1489	1609	1819	2219	120	330	730	1.3	1.8	1.9
DISTILLATE 1	-	-	-	-	-	-	-	-	-	-
LIGHT DIESEL	1435	1552	1694	2007	117	259	572	1.3	1.5	1.6
HEAVY DIESEL	371	401	438	519	30	67	148	1.3	1.5	1.6
DISTILLATE 2 (HT OIL)	-	-	-	-	-	-	-	-	-	-
TOTAL DISTILLATE	1806	1953	2132	2526	147	326	720	1.3	1.5	1.6
DISTILLATE 4	-	-	-	-	-	-	-	-	-	-
HEAVY FUEL OIL	360	331	362	424	(29)	2	64	(1.4)	0.1	0.8
TOTAL HEAVY FUEL OIL	360	331	362	424	(29)	2	64	(1.4)	0.1	0.8
LIQUIFIED PETROLEUM GAS	38	32	30	30	(6)	(8)	(8)	(2.6)	(2.2)	(1.2)
AVIATION GASOLINE	26	25	26	27	(1)	-	1	(0.5)	(0.1)	0.1
KEROSENE	-	-	-	-	-	-	-	-	-	-
CHEM FEED NAPHTHA	-	-	-	-	-	-	-	-	-	-
CHEM FEED GASOIL	-	-	-	-	-	-	-	-	-	-
SPECIAL NAPHTHA	-	-	-	-	-	-	-	-	-	-
LUBRICANTS	-	-	-	-	-	-	-	-	-	-
WAX	-	-	-	-	-	-	-	-	-	-
ASPHALT & ROAD OIL	-	-	-	-	-	-	-	-	-	-
MISCELLANEOUS OIL	-	-	-	-	-	-	-	-	-	-
CRUDE OIL	-	-	-	-	-	-	-	-	-	-
STILL GAS	-	-	-	-	-	-	-	-	-	-
CATALYTIC COKE	-	-	-	-	-	-	-	-	-	-
MARKETABLE COKE	-	-	-	-	-	-	-	-	-	-
TOTAL OTHER PETROLEUM	64	57	55	56	(7)	(9)	(8)	(1.7)	(1.3)	(0.6)
TOTAL - ALL OIL	10887	10993	11675	13087	106	788	2200	0.2	0.6	0.9

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FOUNDATION CASE I

NATIONAL PETROLEUM COUNCIL - REFINING STUDY
INCREASING DEMAND
INDUSTRIAL

	THOUSAND BARRELS PER DAY				DELTA VERSUS 1989			GROWTH VERSUS 1989, % PER YEAR		
	1989	1995	2000	2010	1995	2000	2010	1995	2000	2010
MOTOR GASOLINE	105	116	126	142	11	21	37	1.6	1.7	1.4
NAPHTHA JET FUEL	-	-	-	-	-	-	-	-	-	-
KEROSENE JET FUEL	-	-	-	-	-	-	-	-	-	-
TOTAL JET FUEL	-	-	-	-	-	-	-	-	-	-
DISTILLATE 1	5	5	5	5	-	-	-	-	-	-
LIGHT DIESEL	415	456	530	630	41	115	215	1.6	2.2	2.0
HEAVY DIESEL	-	-	-	-	-	-	-	-	-	-
DISTILLATE 2 (HT OIL)	112	123	143	170	11	31	58	1.6	2.2	2.0
TOTAL DISTILLATE	531	583	677	804	52	146	273	1.6	2.2	2.0
DISTILLATE 4	9	9	9	11	-	-	2	0.5	0.9	1.0
HEAVY FUEL OIL	271	279	300	334	8	29	63	0.5	0.9	1.0
TOTAL HEAVY FUEL OIL	279	288	310	345	9	31	66	0.5	0.9	1.0
LIQUIFIED PETROLEUM GAS	1154	1218	1375	1661	64	221	507	0.9	1.6	1.7
AVIATION GASOLINE	-	-	-	-	-	-	-	-	-	-
KEROSENE	21	21	21	21	-	-	-	0.1	0.1	-
CHEM FEED NAPHTHA	203	232	267	327	29	64	124	2.3	2.5	2.3
CHEM FEED GASOIL	257	293	338	414	36	81	157	2.3	2.5	2.3
SPECIAL NAPHTHA	56	54	56	57	(2)	-	1	(0.5)	(0.1)	0.1
LUBRICANTS	159	154	158	163	(5)	(1)	4	(0.5)	(0.1)	0.1
WAX	17	16	16	17	(1)	(1)	-	(0.5)	(0.1)	0.1
ASPHALT & ROAD OIL	453	439	449	464	(14)	(4)	11	(0.5)	(0.1)	0.1
MISCELLANEOUS OIL	72	70	72	74	(2)	-	2	(0.5)	(0.1)	0.1
CRUDE OIL	28	27	28	29	(1)	-	1	(0.5)	(0.1)	0.1
STILL GAS	681	661	676	699	(20)	(5)	18	(0.5)	(0.1)	0.1
CATALYTIC COKE	212	205	210	217	(7)	(2)	5	(0.5)	(0.1)	0.1
MARKETABLE COKE	96	93	95	98	(3)	(1)	2	(0.5)	(0.1)	0.1
TOTAL OTHER PETROLEUM	3407	3485	3760	4243	78	353	836	0.4	0.9	1.1
TOTAL - ALL OIL	4323	4472	4873	5534	149	550	1211	0.6	1.1	1.2

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FOUNDATION CASE I

NATIONAL PETROLEUM COUNCIL - REFINING STUDY
INCREASING DEMAND
ELECTRIC UTILITY

	THOUSAND BARRELS PER DAY				DELTA VERSUS 1989			GROWTH VERSUS 1989, % PER YEAR		
	1989	1995	2000	2010	1995	2000	2010	1995	2000	2010
MOTOR GASOLINE	-	-	-	-	-	-	-	-	-	-
NAPHTHA JET FUEL	-	-	-	-	-	-	-	-	-	-
KEROSENE JET FUEL	-	-	-	-	-	-	-	-	-	-
TOTAL JET FUEL	-	-	-	-	-	-	-	-	-	-
DISTILLATE 1	-	-	-	-	-	-	-	-	-	-
LIGHT DIESEL	-	-	-	-	-	-	-	-	-	-
HEAVY DIESEL	-	-	-	-	-	-	-	-	-	-
DISTILLATE 2 (HT OIL)	70	61	113	94	(9)	43	24	(2.4)	4.4	1.4
TOTAL DISTILLATE	70	61	113	94	(9)	43	24	(2.4)	4.4	1.4
DISTILLATE 4	-	-	-	-	-	-	-	-	-	-
HEAVY FUEL OIL	639	561	761	626	(78)	122	(13)	(2.2)	1.6	(0.1)
TOTAL HEAVY FUEL OIL	639	561	761	626	(78)	122	(13)	(2.2)	1.6	(0.1)
LIQUIFIED PETROLEUM GAS	-	-	-	-	-	-	-	-	-	-
AVIATION GASOLINE	-	-	-	-	-	-	-	-	-	-
KEROSENE	-	-	-	-	-	-	-	-	-	-
CHEM FEED NAPHTHA	-	-	-	-	-	-	-	-	-	-
CHEM FEED GASOIL	-	-	-	-	-	-	-	-	-	-
SPECIAL NAPHTHA	-	-	-	-	-	-	-	-	-	-
LUBRICANTS	-	-	-	-	-	-	-	-	-	-
WAX	-	-	-	-	-	-	-	-	-	-
ASPHALT & ROAD OIL	-	-	-	-	-	-	-	-	-	-
MISCELLANEOUS OIL	-	-	-	-	-	-	-	-	-	-
CRUDE OIL	-	-	-	-	-	-	-	-	-	-
STILL GAS	-	-	-	-	-	-	-	-	-	-
CATALYTIC COKE	-	-	-	-	-	-	-	-	-	-
MARKETABLE COKE	-	-	-	-	-	-	-	-	-	-
TOTAL OTHER PETROLEUM	-	-	-	-	-	-	-	-	-	-
TOTAL - ALL OIL	710	622	874	720	(88)	164	10	(2.2)	1.9	0.1

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FOUNDATION CASE I

NATIONAL PETROLEUM COUNCIL - REFINING STUDY
INCREASING DEMAND
TOTAL U.S.

	THOUSAND BARRELS PER DAY				DELTA VERSUS 1989			GROWTH VERSUS 1989, % PER YEAR		
	1989	1995	2000	2010	1995	2000	2010	1995	2000	2010
MOTOR GASOLINE	7328	7218	7498	8078	(110)	170	750	(0.3)	0.2	0.5
NAPHTHA JET FUEL	205	-	-	-	-	-	-	-	-	-
KEROSENE JET FUEL	1284	1609	1819	2219	325	535	935	3.8	3.2	2.6
TOTAL JET FUEL	1489	1609	1819	2219	120	330	730	1.3	1.8	1.9
DISTILLATE 1	30	27	23	18	(3)	(7)	(12)	(2.0)	(2.3)	(2.4)
LIGHT DIESEL	1943	2101	2317	2730	158	374	787	1.3	1.6	1.6
HEAVY DIESEL	371	401	438	519	30	67	148	1.3	1.5	1.6
DISTILLATE 2 (HT OIL)	774	699	690	581	(75)	(84)	(193)	(1.7)	(1.0)	(1.4)
TOTAL DISTILLATE	3118	3228	3468	3848	110	350	730	0.6	1.0	1.0
DISTILLATE 4	39	34	32	28	(5)	(7)	(11)	(2.2)	(1.8)	(1.6)
HEAVY FUEL OIL	1370	1255	1497	1441	(115)	127	71	(1.5)	0.8	0.2
TOTAL HEAVY FUEL OIL	1409	1289	1529	1469	(120)	120	60	(1.5)	0.7	0.2
LIQUIFIEO PETROLEUM GAS	1620	1627	1748	1984	7	128	364	0.1	0.7	1.0
AVIATION GASOLINE	26	25	26	27	(1)	-	1	(0.5)	(0.1)	0.1
KEROSENE	84	75	65	50	(9)	(19)	(34)	(2.0)	(2.3)	(2.4)
CHEM FEED NAPHTHA	203	232	267	327	29	64	124	2.3	2.5	2.3
CHEM FEED GASOIL	257	293	338	414	36	81	157	2.3	2.5	2.3
SPECIAL NAPHTHA	56	54	56	57	(2)	-	1	(0.5)	(0.1)	0.1
LUBRICANTS	159	154	158	163	(5)	(1)	4	(0.5)	(0.1)	0.1
WAX	17	16	16	17	(1)	(1)	-	(0.5)	(0.1)	0.1
ASPHALT & ROAD OIL	453	439	449	464	(14)	(4)	11	(0.5)	(0.1)	0.1
MISCELLANEOUS OIL	72	70	72	74	(2)	-	2	(0.5)	(0.1)	0.1
CRUDE OIL	28	27	28	29	(1)	-	1	(0.5)	(0.1)	0.1
STILL GAS	681	661	676	699	(20)	(5)	18	(0.5)	(0.1)	0.1
CATALYTIC COKE	212	205	210	217	(7)	(2)	5	(0.5)	(0.1)	0.1
MARKETABLE COKE	96	93	95	98	(3)	(1)	2	(0.5)	(0.1)	0.1
TOTAL OTHER PETROLEUM	3962	3972	4202	4622	10	240	660	-	0.5	0.7
TOTAL - ALL OIL	17306	17316	18516	20236	10	1210	2930	-	0.6	0.7

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DOWNSTREAM PLANNING AND ANALYSIS

W.R. FINGER
COORDINATOR OF ENERGY ANALYSIS

January 21, 1992

Members of the National Petroleum Council Refining Study Coordinating Subcommittee:

As part of the Supply/Demand/Logistics Task Group effort, we have developed the specifics for the three Refining Study Foundation Cases. As you may recall, the Coordinating Subcommittee has agreed to three scenarios for U.S. oil demand in which to evaluate refining issues. These projections are representative of U.S. oil demand futures that reflect increasing demand, no demand increase, and decreasing demand. Summary numerics associated with these scenarios are attached.

At the January 29 Coordinating Subcommittee meeting, Supply/Demand/Logistics will ask for endorsement of the specifics in order to allow us to move forward in the analytical phase. The following comments set forth the underlying assumptions used in developing the specific demand estimates.

- Foundation Case I (Increasing Demand)
  - Based on the Energy Information Administration 1991 Annual Energy Outlook, Reference Case.
- Foundation Case II (No Demand Increase)
  - Future demand by product equal to 1989.
  - Exceptions are motor gasoline and heavy fuel oil because Foundation Case I indicates a decline to 1995.
  - Motor gasoline and heavy fuel oil follow Foundation Case I to 1995 and stay at that level thereafter.
- Foundation Case III (Decreasing Demand)
  - Motor gasoline and other petroleum for a given year are below Foundation Case II by an amount equal to the amount Foundation Case I is above Foundation Case II.

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– Heavy fuel oil follows the same rules as used for motor gasoline and other petroleum except the 2000 minimum is also used for 2010.

– Jet fuel and distillate is established using the motor gasoline Foundation Case III decline rate.

Please be prepared to discuss the basic assumptions used for developing the numerics indicated on the attached at the January 29 meeting. If you are uncomfortable with the assumptions, please be prepared to offer an alternate set of assumptions.

Very truly yours,

Bill Finger
/yg

WRF:yg
Attachments

c - w/attachments:
Supply/Demand/Logistics Task Group

FOUNDATION CASE I

NATIONAL PETROLEUM COUNCIL - REFINING STUDY
INCREASING DEMAND
TOTAL U.S.

	THOUSAND BARRELS PER DAY				DELTA VERSUS 1989			GROWTH VERSUS 1989, % PER YEAR		
	1989	1995	2000	2010	1995	2000	2010	1995	2000	2010
MOTOR GASOLINE	7328	7218	7498	8078	(110)	170	750	(0.3)	0.2	0.5
NAPHTHA JET FUEL	205	-	-	-	-	-	-	-	-	-
KEROSENE JET FUEL	1284	-	-	-	-	-	-	-	-	-
TOTAL JET FUEL	1489	1609	1819	2219	120	330	730	1.3	1.8	1.9
DISTILLATE 1	30	-	-	-	-	-	-	-	-	-
LIGHT DIESEL	1943	-	-	-	-	-	-	-	-	-
HEAVY DIESEL	371	-	-	-	-	-	-	-	-	-
DISTILLATE 2 (HT OIL)	774	-	-	-	-	-	-	-	-	-
TOTAL DISTILLATE	3118	3228	3468	3848	110	350	730	0.6	1.0	1.0
DISTILLATE 4	39	-	-	-	-	-	-	-	-	-
HEAVY FUEL OIL	1370	-	-	-	-	-	-	-	-	-
TOTAL HEAVY FUEL OIL	1409	1289	1529	1469	(120)	120	60	(1.5)	0.7	0.2
LIQUIFIED PETROLEUM GAS	1620	-	-	-	-	-	-	-	-	-
AVIATION GASOLINE	26	-	-	-	-	-	-	-	-	-
KEROSENE	84	-	-	-	-	-	-	-	-	-
CHEM FEED NAPHTHA	203	-	-	-	-	-	-	-	-	-
CHEM FEED GASOIL	257	-	-	-	-	-	-	-	-	-
SPECIAL NAPHTHA	56	-	-	-	-	-	-	-	-	-
LUBRICANTS	159	-	-	-	-	-	-	-	-	-
WAX	17	-	-	-	-	-	-	-	-	-
ASPHALT & ROAD OIL	453	-	-	-	-	-	-	-	-	-
MISCELLANEOUS OIL	72	-	-	-	-	-	-	-	-	-
CRUDE OIL	28	-	-	-	-	-	-	-	-	-
STILL GAS	681	-	-	-	-	-	-	-	-	-
CATALYTIC COKE	212	-	-	-	-	-	-	-	-	-
MARKETABLE COKE	96	-	-	-	-	-	-	-	-	-
TOTAL OTHER PETROLEUM	3962	3972	4202	4622	10	240	660	-	0.5	0.7
TOTAL - ALL OIL	17306	17316	18516	20236	10	1210	2930	-	0.6	0.7

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FOUNDATION CASE II

NATIONAL PETROLEUM COUNCIL - REFINING STUDY
NO DEMAND INCREASE
TOTAL U.S.

	THOUSAND BARRELS PER DAY				DELTA VERSUS 1989			GROWTH VERSUS 1989, % PER YEAR		
	1989	1995	2000	2010	1995	2000	2010	1995	2000	2010
MOTOR GASOLINE	7328	7218	7218	7218	(110)	(110)	(110)	(0.3)	(0.1)	(0.1)
NAPHTHA JET FUEL	205	-	-	-	-	-	-	-	-	-
KEROSENE JET FUEL	1284	-	-	-	-	-	-	-	-	-
TOTAL JET FUEL	1489	1489	1489	1489	-	-	-	-	-	-
DISTILLATE 1	30	-	-	-	-	-	-	-	-	-
LIGHT DIESEL	1943	-	-	-	-	-	-	-	-	-
HEAVY DIESEL	371	-	-	-	-	-	-	-	-	-
DISTILLATE 2 (HT OIL)	774	-	-	-	-	-	-	-	-	-
TOTAL DISTILLATE	3118	3118	3118	3118	-	-	-	-	-	-
DISTILLATE 4	39	-	-	-	-	-	-	-	-	-
HEAVY FUEL OIL	1370	-	-	-	-	-	-	-	-	-
TOTAL HEAVY FUEL OIL	1409	1289	1289	1289	(120)	(120)	(120)	(1.5)	(0.8)	(0.4)
LIQUIFIED PETROLEUM GAS	1620	-	-	-	-	-	-	-	-	-
AVIATION GASOLINE	26	-	-	-	-	-	-	-	-	-
KEROSENE	84	-	-	-	-	-	-	-	-	-
CHEM FEED NAPHTHA	203	-	-	-	-	-	-	-	-	-
CHEM FEED GASOIL	257	-	-	-	-	-	-	-	-	-
SPECIAL NAPHTHA	56	-	-	-	-	-	-	-	-	-
LUBRICANTS	159	-	-	-	-	-	-	-	-	-
WAX	17	-	-	-	-	-	-	-	-	-
ASPHALT & ROAD OIL	453	-	-	-	-	-	-	-	-	-
MISCELLANEOUS OIL	72	-	-	-	-	-	-	-	-	-
CRUDE OIL	28	-	-	-	-	-	-	-	-	-
STILL GAS	681	-	-	-	-	-	-	-	-	-
CATALYTIC COKE	212	-	-	-	-	-	-	-	-	-
MARKETABLE COKE	96	-	-	-	-	-	-	-	-	-
TOTAL OTHER PETROLEUM	3962	3962	3962	3962	-	-	-	-	-	-
TOTAL - ALL OIL	17306	17076	17076	17076	(230)	(230)	(230)	(0.2)	(0.1)	(0.1)

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FOUNDATION CASE III

NATIONAL PETROLEUM COUNCIL - REFINING STUDY
DECREASING DEMAND
TOTAL U.S.

	THOUSAND BARRELS PER DAY				DELTA VERSUS 1989			GROWTH VERSUS 1989, % PER YEAR		
	1989	1995	2000	2010	1995	2000	2010	1995	2000	2010
MOTOR GASOLINE	7328	7218	6938	6358	(110)	(390)	(970)	(0.3)	(0.5)	(0.7)
NAPHTHA JET FUEL	205	-	-	-	-	-	-	-	-	-
KEROSENE JET FUEL	1284	-	-	-	-	-	-	-	-	-
TOTAL JET FUEL	1489	1467	1410	1292	(22)	(79)	(197)	(0.3)	(0.5)	(0.7)
DISTILLATE 1	30	-	-	-	-	-	-	-	-	-
LIGHT DIESEL	1943	-	-	-	-	-	-	-	-	-
HEAVY DIESEL	371	-	-	-	-	-	-	-	-	-
DISTILLATE 2 (HT OIL)	774	-	-	-	-	-	-	-	-	-
TOTAL DISTILLATE	3118	3071	2952	2705	(47)	(166)	(413)	(0.3)	(0.5)	(0.7)
DISTILLATE 4	39	-	-	-	-	-	-	-	-	-
HEAVY FUEL OIL	1370	-	-	-	-	-	-	-	-	-
TOTAL HEAVY FUEL OIL	1409	1289	1049	1049	(120)	(360)	(360)	(1.5)	(2.6)	(1.4)
LIQUIFIED PETROLEUM GAS	1620	-	-	-	-	-	-	-	-	-
AVIATION GASOLINE	26	-	-	-	-	-	-	-	-	-
KEROSENE	84	-	-	-	-	-	-	-	-	-
CHEM FEED NAPHTHA	203	-	-	-	-	-	-	-	-	-
CHEM FEED GASOIL	257	-	-	-	-	-	-	-	-	-
SPECIAL NAPHTHA	56	-	-	-	-	-	-	-	-	-
LUBRICANTS	159	-	-	-	-	-	-	-	-	-
WAX	17	-	-	-	-	-	-	-	-	-
ASPHALT & ROAD OIL	453	-	-	-	-	-	-	-	-	-
MISCELLANEOUS OIL	72	-	-	-	-	-	-	-	-	-
CRUDE OIL	28	-	-	-	-	-	-	-	-	-
STILL GAS	681	-	-	-	-	-	-	-	-	-
CATALYTIC COKE	212	-	-	-	-	-	-	-	-	-
MARKETABLE COKE	96	-	-	-	-	-	-	-	-	-
TOTAL OTHER PETROLEUM	3962	3952	3722	3302	(10)	(240)	(660)	-	(0.6)	(0.9)
TOTAL - ALL OIL	17306	16997	16071	14707	(309)	(1235)	(2599)	(0.3)	(0.7)	(0.8)

PRINTED DATA MAY NOT ADD DUE TO INDEPENDENT ROUNDING. NATIONAL PETROLEUM COUNCIL JANUARY 6, 1992 TIME 9:32

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DOWNSTREAM PLANNING AND ANALYSIS

W.R. FINGER
COORDINATOR OF ENERGY ANALYSIS

January 23, 1992

Members of the NPC Refining Study Supply/Demand/Logistics Task Group

Gentlemen:

At our January 7-8 Task Group meeting in New Orleans, we agreed to recommend the proposed Foundation Case methodologies (for total U.S. volumes) to the Coordinating Subcommittee (CSC). This has been done in a January 21 letter from Bill Finger to the CSC--you should have a copy. We also spent some time at our meeting reviewing the state data that supported the 1989 usage of each fuel type. These state data (on a preliminary basis) had been sent to you in a December 27 letter from me. At the time of our meeting, I committed to provide you with the "final" historic (1989) state data that would be used to allocate the U.S. fuel volumes to the states.

Attached are the state data that supported the 1989 historic U.S. totals reviewed in New Orleans. Please destroy the state data sent you earlier on December 27. (With the exception of some minor fuels, the data are the same as sent to you on December 27.) The first of these attachments provides additional detail on the sources for the data. As we agreed in New Orleans, these state data, by fuel type, will be used to create a state share of the total U.S. We propose to assume the state share is constant regardless of either the particular Foundation Case or the future year.

If you have any concerns or suggestions about the attached data, I would appreciate it if you will let me know as soon as possible.

Thank you in advance.

Sincerely,

Graham K. Barnes

Graham K. Barnes

GKB:yg
Attachments

c - w/attachments:
Mr. John H. Guy, IV – National Petroleum Council

1989 HISTORIC STATE OIL DEMAND DATA

The attachments contain the numerics for the 1989 historic state oil demand data to be used in the National Petroleum Council's Refining Study. The data are in thousand barrels per calendar day (kB/D). This page summarizes the sources of the data. For reference in the discussion that follows, the attachments have been "numbered" in the upper right-hand corner. The sheet numbers appear parenthetically with the fuel discussions below. The state data by fuel (sheets 1-10) are subsequently combined to sector demands (sheets 1118) to approximate the aggregations used in the EIA's 1991 Annual Energy Outlook. The sector designations (R = residential, C = commercial, T = transportation, I = industrial, and U = electric utility) are shown on the raw data sheets (1-10) for the fuels.

Motor Gasoline (1-2): Much of the data shown is from the U.S. Department of Transportation's (DOT) "1989 Highway Statistics." The DOT state data for motor gasoline are those totals reported minus the sum of aviation, special (largely diesel fuel and LPG), and loss. Note the U.S. total of 7458 kB/D of motor gasoline exceeds the EIA reported 7328 kB/D in the EIA's "1989 Petroleum Supply Annual (PSA), Volume 1," Table 3. The adjusted DOT state data (state shares) are applied to the EIA U.S. total for motor gasoline. The DOT state aviation fuel data are used as shares for the EIA's reported total in the PSA. Finally, note the DOT's reported state gasohol data (sheet 2), hence, the implied ethanol use by state.

Naphtha Jet (3): The "First Sales" volumes by state from the EIA's "1989 Petroleum Marketing Annual" (PMA) are used to distribute the volumes by PADD from the PSA (Tables 5, 7, 9, 11, and 13) to the states.

Kerojet (3): Same methodology as Naphtha Jet

Kerosene (3):
Distillate 1(5):
Light Diesel (4):
Distillate 2 (6):
Heavy Diesel (4):
Distillate 4 (5):
Heavy Fuel Oil (7):

1989 state demand data from EIA's "1989 Fuel Oil and Kerosene Sales," Tables 16-24

Ethane (8):
Propane (8):
Butane (9):
Total LPG (10):

1989 state demand data from American Petroleum Institute's "Sales of Natural Gas Liquids and Liquefied Refinery Gases, 1990"

Other Oil Products (17): These are fuels that will not be included in the Logistics Model; therefore, state demand data are not required. However, estimated state demands are included here using methodologies similar to that for Naphtha Jet. For example, the PSA data by PADD for Still Gas are distributed to the states using state catalytic cracking capacities. Separately (and later), regional supply/demand balances will be created for each of these fuels in order to provide the Product Quality Task Group with estimates of the required refining production.

APP L.III.3-29

HISTORIC 1989 GASOLINE USAGE -- THOUSAND BARRELS PER DAY

		C	I	DEPT OF TRANSPORTATION	I	I		C	
	HIGHWAY USE	GOVT NON-HY	AGRICULTURE	AVIATION	INDUST/COMM	CONSTRUCT	MARINE	MISCELL	SPECIAL
MAINE	46	-	-	-	-	-	1	-	8
NEW HAMPSHIRE	37	-	-	-	-	-	-	-	4
VERMONT	21	-	-	-	-	-	-	-	3
MASSACHUSETTS	175	1	-	-	-	1	3	-	17
RHODE ISLANE	27	-	-	-	-	-	1	-	3
CONNECTICUT	104	-	-	-	-	-	1	-	16
NEW YORK	408	2	2	-	1	1	3	2	47
NEW JERSEY	251	2	-	-	-	1	2	-	30
PENNSYLVANIA	358	1	1	-	2	1	1	-	60
DELAWARE	25	-	-	-	-	-	-	-	3
MARYLAND	158	-	-	-	-	-	3	-	25
DIST COL	13	-	-	-	-	-	-	-	2
W VIRGINIA	64	1	-	-	-	-	-	-	12
VIRGINIA	230	1	1	-	1	1	2	-	38
N CAROLINA	250	2	1	1	-	1	3	-	41
S CAROLINA	133	1	1	-	1	-	3	-	20
GEORGIA	281	1	1	1	2	1	2	-	55
FLORIDA	436	3	-	2	1	1	10	-	56
MICHIGAN	308	2	2	1	1	1	4	-	35
OHIO	379	2	1	1	1	1	2	4	65
INDIANA	216	1	1	1	-	-	1	-	48
ILLINOIS	385	1	3	-	-	1	1	-	70
KENTUCKY	151	1	1	-	1	-	1	-	34
TENNESSEE	201	1	1	-	-	-	1	1	38
WISCONSIN	161	1	2	-	-	-	2	-	30
MINNESOTA	149	1	3	-	-	-	4	-	22
N DAKOTA	27	-	2	-	-	-	-	-	6
S DAKOTA	30	-	1	-	-	-	-	-	6
IOWA	109	1	3	-	1	-	1	-	23
NEBRASKA	62	-	3	-	-	-	-	-	14
MISSOURI	216	-	2	-	-	-	1	-	42
KANSAS	100	-	2	-	-	-	-	-	20
OKLAHOMA	129	1	1	-	1	-	1	-	26
ALABAMA	170	1	1	-	-	-	2	-	36
MISSISSIPPI	99	-	1	-	1	-	1	-	21
ARKANSAS	105	-	1	-	-	-	1	-	25
LOUISIANA	149	1	-	-	-	-	4	-	24
TEXAS	637	6	5	2	7	1	5	1	93
NEW MEXICO	65	-	-	-	1	-	-	-	14
MONTANA	35	-	1	-	-	-	-	-	8
IDAHO	37	-	1	-	-	-	-	1	8
WYOMING	31	-	1	-	-	-	-	-	11
COLORADO	109	-	1	-	-	-	-	-	12
UTAH	55	-	-	-	-	-	-	-	8
WASHINGTON	170	1	1	-	1	-	1	-	24
OREGON	107	1	1	-	-	-	1	-	21
CALIFORNIA	973	5	3	3	3	3	6	-	127
NEVADA	48	-	-	-	-	-	-	-	8
ARIZONA	132	-	-	1	-	-	1	-	21
ALASKA	17	-	-	1	-	-	1	-	4
HAWAII	25	-	-	1	-	-	-	-	2
TOTAL US	8602	44	54	23	32	19	82	10	1385

HISTORIC 1989 GASOLINE USAGE -- THOUSAND BARRELS PER DAY

	----- DEPT OF TRANSPORTATION -------		----- MOTOR GASOLINE TO USER -------		T	----- DEPT OF TRANSPORTATION -------	
	LOSS AT 2*	TOTAL	TOTAL DOT	TOTAL DOE	DOE AVGAS	GASOHOL	EST ETHANOL
MAINE	1	49	40	39	-	-	-
NEW HAMPSHIRE	-	38	34	34	-	-	-
VERMONT	-	22	18	18	-	-	-
MASSACHUSETTS	2	181	162	160	-	-	-
RHODE ISLANE	-	29	25	24	-	-	-
CONNECTICUT	-	106	90	88	-	-	-
NEW YORK	4	423	372	366	-	-	-
NEW JERSEY	-	257	227	223	-	-	-
PENNSYLVANIA	2	367	304	298	-	-	-
DELAWARE	-	26	23	22	-	-	-
MARYLAND	4	166	137	135	-	-	-
DIST COL	-	13	12	12	-	-	-
W VIRGINIA	-	66	54	53	-	-	-
VIRGINIA	-	236	198	194	-	16	2
N CAROLINA	2	260	217	213	-	-	-
S CAROLINA	-	139	119	117	-	5	1
GEORGIA	-	288	233	229	-	2	-
FLORIDA	4	459	396	389	2	5	1
MICHIGAN	3	320	282	277	1	26	3
OHIO	3	393	324	318	1	61	6
INDIANA	2	222	172	169	1	40	4
ILLINOIS	3	395	322	316	1	83	8
KENTUCKY	-	155	121	119	-	26	3
TENNESSEE	2	208	167	164	-	24	2
WISCONSIN	1	168	137	135	-	3	-
MINNESOTA	1	159	135	133	-	11	1
N DAKOTA	-	30	23	23	-	2	-
S DAKOTA	-	32	25	25	-	4	-
IOWA	1	115	91	89	-	25	3
NEBRASKA	1	66	51	50	-	18	2
MISSOURI	2	222	178	174	1	10	1
KANSAS	1	105	83	82	-	6	1
OKLAHOMA	1	135	108	106	-	-	-
ALABAMA	-	174	138	136	1	13	1
MISSISSIPPI	1	103	81	79	1	-	-
ARKANSAS	1	108	82	81	1	-	-
LOUISIANA	-	156	131	128	1	3	-
TEXAS	-	663	567	557	4	14	1
NEW MEXICO	1	67	53	52	-	11	1
MONTANA	-	37	29	28	-	-	-
IDAHO	-	40	31	31	-	4	-
WYOMING	-	32	21	21	-	-	-
COLORADO	1	112	99	97	-	5	-
UTAH	-	57	48	47	-	-	-
WASHINGTON	-	175	150	147	-	4	-
OREGON	-	110	89	87	-	-	-
CALIFORNIA	-	997	867	851	3	24	2
NEVADA	-	50	41	40	-	2	-
ARIZONA	-	135	113	111	-	-	-
ALASKA	-	19	14	14	1	-	-
HAWAII	-	27	24	24	1	-	-
TOTAL US	46	8912	7458	7328	26	451	45

HISTORIC 1989 JET FUEL AND KEROSENE USAGE -- THOUSAND BARRELS PER DAY

	T	T	R	C	I	I	I	
			KEROSENE					
	NAPHTHA JET	KERO JET	RESIDENTIAL	COMMERCIAL	INDUSTRIAL	FARM	OTHER	TOTAL
MAINE	1	4	1	-	-	-	-	1
NEW HAMPSHIRE	-	1	1	-	-	-	-	1
VERMONT	-	1	-	-	-	-	-	-
MASSACHUSETTS	-	33	-	-	-	-	-	1
RHODE ISLANE	-	2	-	-	-	-	-	-
CONNECTICUT	-	7	-	-	-	-	-	1
NEW YORK	16	16	4	1	1	-	1	6
NEW JERSEY	-	146	1	-	1	-	-	2
PENNSYLVANIA	-	31	3	-	-	-	-	4
DELAWARE	-	-	-	-	-	-	-	-
MARYLAND	18	11	1	-	-	-	-	1
DIST COL	-	-	-	-	-	-	-	-
W VIRGINIA	-	1	-	-	-	-	-	1
VIRGINIA	-	41	3	-	-	-	-	4
N CAROLINA	-	18	4	-	-	-	-	5
S CAROLINA	-	3	2	-	-	-	-	2
GEORGIA	-	55	-	-	-	-	-	-
FLORIDA	-	94	1	-	-	-	-	1
MICHIGAN	-	28	1	-	-	-	-	2
OHIO	2	35	3	1	-	-	-	4
INDIANA	3	63	2	-	-	-	-	2
ILLINOIS	-	14	1	-	-	-	-	1
KENTUCKY	-	18	2	-	-	-	-	3
TENNESSEE	-	15	2	-	-	-	-	2
WISCONSIN	-	4	-	-	-	-	-	-
MINNESOTA	-	17	1	-	-	-	-	1
N DAKOTA	2	1	-	-	-	-	-	-
S DAKOTA	2	1	-	-	-	-	-	-
IOWA	-	2	-	-	-	-	-	-
NEBRASKA	2	2	-	-	-	-	-	-
MISSOURI	2	26	-	-	-	-	-	-
KANSAS	1	11	-	-	-	-	-	-
OKLAHOMA	11	26	-	-	-	-	-	-
ALABAMA	1	2	2	-	-	-	-	3
MISSISSIPPI	-	8	1	-	-	-	-	2
ARKANSAS	1	1	1	-	-	-	-	1
LOUISIANA	23	29	1	1	1	-	1	5
TEXAS	44	125	1	11	3	-	3	20
NEW MEXICO	1	2	-	-	1	-	-	2
MONTANA	1	2	-	-	-	-	-	-
IDAHO	3	2	-	-	-	-	-	-
WYOMING	-	1	-	-	-	-	-	-
COLORADO	1	21	-	-	-	-	-	-
UTAH	3	18	-	-	-	-	-	-
WASHINGTON	7	47	-	3	-	-	-	3
OREGON	1	8	-	-	-	-	-	-
CALIFORNIA	46	199	-	-	-	-	-	1
NEVADA	-	10	-	-	-	-	-	-
ARIZONA	6	13	-	-	-	-	-	-
ALASKA	5	42	-	-	-	-	-	-
HAWAII	-	29	-	-	-	-	-	-
TOTAL US	205	1284	40	23	11	2	8	84

HISTORIC 1989 DIESEL USAGE -- THOUSAND BARRELS PER DAY

	LIGHT DIESEL								HEAVY DIESEL			
	T	C	I	I	I	T	I		T	T	T	
	ON HIGHWAY	COMMERCIAL	INDUSTRIAL	FARM	CONSTRUCT	MILITARY	OTHER	TOTAL	RAILROAD	BUNKERING	MILITARY	TOTAL
MAINE	9	-	-	-	1	-	-	11	-	1	-	1
NEW HAMPSHIRE	4	1	-	-	-	-	-	6	-	-	-	-
VERMONT	3	1	-	-	-	-	-	4	-	-	-	-
MASSACHUSETTS	18	2	-	-	1	-	-	21	1	2	-	4
RHODE ISLANE	3	-	-	-	-	-	-	5	-	-	-	1
CONNECTICUT	17	1	-	-	1	-	-	20	-	-	-	1
NEW YORK	49	5	1	2	2	-	-	60	1	1	-	2
NEW JERSEY	30	4	1	1	3	-	-	39	4	8	-	12
PENNSYLVANIA	60	7	5	2	3	-	-	77	3	2	1	5
DELAWARE	5	-	-	-	-	-	-	6	-	-	-	-
MARYLAND	23	1	1	1	2	1	-	29	3	1	-	4
DIST COL	2	-	-	-	-	-	-	2	1	-	-	1
W VIRGINIA	10	-	4	-	1	-	-	17	2	4	-	6
VIRGINIA	35	2	2	2	2	1	-	45	6	2	1	9
N CAROLINA	40	2	2	2	2	-	-	49	2	1	-	3
S CAROLINA	20	1	1	2	1	-	1	25	2	-	-	2
GEORGIA	55	2	2	5	2	1	-	67	4	2	-	7
FLORIDA	59	5	2	3	4	1	-	75	6	6	-	11
MICHIGAN	35	3	2	4	3	-	-	46	3	-	-	3
OHIO	63	2	5	4	2	1	-	77	8	1	-	9
INDIANA	51	2	4	5	2	-	-	64	15	1	-	15
ILLINOIS	55	2	3	10	2	-	-	74	9	2	-	11
KENTUCKY	45	1	6	2	1	-	-	56	8	6	-	14
TENNESSEE	38	1	2	3	2	-	-	46	4	11	-	16
WISCONSIN	29	3	1	5	2	-	-	40	7	-	-	7
MINNESOTA	22	1	-	8	2	-	-	33	3	-	-	3
N DAKOTA	6	-	1	6	-	-	-	13	2	-	-	2
S DAKOTA	6	-	-	4	-	-	-	11	-	-	-	-
IOWA	23	1	-	9	1	-	-	34	2	-	-	2
NEBRASKA	14	-	-	9	1	-	-	25	8	-	-	8
MISSOURI	42	2	1	5	1	-	-	52	2	3	-	5
KANSAS	20	1	-	8	1	-	-	30	11	-	-	11
OKLAHOMA	26	1	1	3	1	-	-	32	5	-	-	5
ALABAMA	36	2	5	4	3	-	1	51	4	9	-	14
MISSISSIPPI	20	2	1	9	2	5	-	38	1	5	-	6
ARKANSAS	26	1	1	6	1	-	1	36	2	-	-	2
LOUISIANA	25	2	1	6	3	5	-	43	5	30	-	35
TEXAS	90	9	14	22	10	18	1	164	25	21	-	46
NEW MEXICO	13	1	3	1	1	-	-	20	3	-	-	3
MONTANA	8	-	3	3	1	-	-	15	4	-	-	4
IDAHO	8	1	1	4	1	-	-	15	1	-	-	1
WYOMING	12	1	3	1	1	-	-	17	7	-	-	7
COLORADO	12	1	1	4	2	1	-	20	6	-	-	6
UTAH	8	1	2	1	1	-	-	13	2	-	-	2
WASHINGTON	25	3	2	4	2	-	1	37	5	5	-	10
OREGON	20	1	1	3	1	-	2	29	6	2	-	8
CALIFORNIA	125	10	9	20	11	13	2	189	14	13	-	27
NEVADA	9	1	6	-	2	-	-	17	2	-	-	2
ARIZONA	21	1	4	2	2	-	-	30	1	-	-	1
ALASKA	6	1	2	-	1	2	-	12	-	9	-	9
HAWAII	2	1	-	1	-	2	-	6	-	5	-	5
TOTAL US	1378	93	109	199	95	56	12	1943	213	154	4	371

APP L.III.3-32

HISTORIC 1989 DISTILLATE 1 AND 4 USAGE -- THOUSAND BARRELS PER DAY

	DISTILLATE 1				DISTILLATE 4		
	R	C	I		C	I	
	RESIDENTIAL	COMMERCIAL	INDUSTRIAL	TOTAL	COMMERCIAL	INDUSTRIAL	TOTAL
MAINE	-	-	-	1	-	-	1
NEW HAMPSHIRE	-	-	-	-	1	-	1
VERMONT	-	-	-	-	-	-	-
MASSACHUSETTS	-	-	-	-	5	1	5
RHODE ISLANE	-	-	-	-	-	-	-
CONNECTICUT	-	-	-	-	1	1	2
NEW YORK	1	1	-	1	15	1	15
NEW JERSEY	-	-	-	-	4	1	5
PENNSYLVANIA	-	1	-	1	1	1	2
DELAWARE	-	-	-	-	-	-	-
MARYLAND	-	-	-	-	1	-	1
DIST COL	-	-	-	-	-	-	-
W VIRGINIA	-	-	-	-	-	-	-
VIRGINIA	-	-	-	-	-	-	1
N CAROLINA	-	-	-	1	-	-	-
S CAROLINA	-	-	-	-	-	-	-
GEORGIA	-	-	-	-	-	-	-
FLORIDA	-	-	-	-	-	-	-
MICHIGAN	2	1	-	3	-	-	-
OHIO	1	-	-	2	-	-	-
INDIANA	1	-	-	2	-	1	1
ILLINOIS	1	-	-	1	-	-	-
KENTUCKY	-	-	-	1	-	-	-
TENNESSEE	-	-	-	-	-	-	-
WISCONSIN	2	-	-	2	-	-	-
MINNESOTA	3	-	-	4	-	-	-
N DAKOTA	-	-	-	1	-	-	-
S DAKOTA	1	-	-	1	-	-	-
IOWA	1	-	-	1	-	-	-
NEBRASKA	-	-	-	-	-	-	-
MISSOURI	-	-	-	1	-	-	-
KANSAS	-	-	-	-	-	-	-
OKLAHOMA	-	-	-	-	-	-	-
ALABAMA	-	-	-	-	-	-	-
MISSISSIPPI	-	-	-	-	-	-	-
ARKANSAS	-	-	-	-	-	-	-
LOUISIANA	-	-	-	-	-	-	-
TEXAS	-	-	-	-	-	-	-
NEW MEXICO	-	-	-	-	-	-	-
MONTANA	-	-	-	1	-	-	-
IDAHO	-	-	-	1	-	-	-
WYOMING	-	-	1	1	-	-	-
COLORADO	-	-	-	-	-	-	-
UTAH	-	-	-	-	-	-	-
WASHINGTON	-	-	-	1	-	-	1
OREGON	-	-	-	-	-	-	-
CALIFORNIA	-	-	-	1	-	1	2
NEVADA	-	-	-	-	-	-	-
ARIZONA	-	-	-	-	-	-	-
ALASKA	1	-	-	2	-	-	-
HAWAII	-	-	-	-	-	-	-
TOTAL US	18	7	5	30	30	9	39

APP L.III.3-33

HISTORIC 1989 DISTILLATE 2 AND/OR HEATING OIL -- THOUSAND BARRELS PER DAY

	R	C	I	I	U	I	I	
	DISTILLATE 2 AND/OR HEATING OIL							
	RESIDENTIAL	COMMERCIAL	INDUST (EX OIL)	OIL COMPANY	UTILITY	FARM	MISCELLANEOUS	TOTAL
MAINE	15	4	1	-	-	-	-	20
NEW HAMPSHIRE	12	2	1	-	-	-	-	14
VERMONT	6	1	-	-	-	-	-	8
MASSACHUSETTS	56	15	4	-	2	-	-	77
RHODE ISLANE	9	1	-	-	-	-	-	10
CONNECTICUT	39	7	2	-	-	-	-	48
NEW YORK	95	22	2	1	7	1	-	129
NEW JERSEY	44	14	2	-	4	-	-	64
PENNSYLVANIA	60	12	4	1	5	1	-	83
DELAWARE	4	-	-	-	1	-	-	5
MARYLAND	14	4	1	-	4	-	-	23
DIST COL	-	1	-	-	5	-	-	6
W VIRGINIA	2	1	1	-	1	-	-	5
VIRGINIA	17	4	2	-	2	-	-	25
N CAROLINA	12	4	3	-	1	-	-	21
S CAROLINA	3	1	1	-	1	-	-	6
GEORGIA	1	1	1	-	1	-	-	4
FLORIDA	1	2	-	-	5	-	-	9
MICHIGAN	11	2	1	-	2	-	-	17
OHIO	11	2	2	-	1	-	-	18
INDIANA	5	1	1	-	2	1	-	10
ILLINOIS	4	1	1	-	2	1	-	9
KENTUCKY	2	1	3	-	1	-	-	7
TENNESSEE	1	-	-	-	-	-	-	2
WISCONSIN	13	2	1	-	1	1	-	18
MINNESOTA	10	1	1	-	-	-	-	13
N DAKOTA	2	-	-	-	-	-	-	3
S DAKOTA	2	-	-	-	-	1	-	3
IOWA	2	-	-	-	-	1	-	4
NEBRASKA	-	-	-	-	-	-	-	1
MISSOURI	1	1	1	-	1	-	-	3
KANSAS	-	-	-	1	-	-	-	2
OKLAHOMA	-	1	-	2	-	-	-	3
ALABAMA	-	1	1	1	1	-	-	3
MISSISSIPPI	-	1	-	1	-	-	-	3
ARKANSAS	-	-	-	-	1	-	-	2
LOUISIANA	-	-	-	21	1	-	-	23
TEXAS	-	2	2	20	4	1	-	28
NEW MEXICO	-	-	-	1	-	-	-	1
MONTANA	1	-	-	-	-	-	-	1
IDAHO	1	-	-	-	-	-	-	2
WYOMING	-	-	-	1	-	-	-	2
COLORADO	-	-	1	-	-	-	-	2
UTAH	-	-	-	-	-	-	-	1
WASHINGTON	7	1	1	-	-	-	-	9
OREGON	5	1	1	-	-	-	-	7
CALIFORNIA	-	2	1	1	1	-	-	5
NEVADA	1	-	-	-	-	-	-	1
ARIZONA	-	-	-	-	-	-	-	-
ALASKA	3	1	-	2	1	-	-	7
HAWAII	-	-	-	-	5	-	-	5
TOTAL US	471	121	45	55	70	10	2	774

HISTORIC 1989 HEAVY FUEL OIL -- THOUSAND BARRELS PER DAY

	C	I	I	T	T	T	U	I	
	COMMERCIAL	INDUST (EX OIL)	OIL COMPANY	RAILROAD	HEAVY FUEL OIL VESSEL BUNKERS	MILITARY	ELECT UTILITY	OTHER	TOTAL
MAINE	2	6	-	-	-	-	14	-	23
NEW HAMPSHIRE	1	1	-	-	-	-	14	-	15
VERMONT	-	-	-	-	-	-	-	-	-
MASSACHUSETTS	5	4	-	-	2	1	72	-	84
RHODE ISLANE	1	1	-	-	-	-	1	-	3
CONNECTICUT	2	2	-	-	-	-	49	-	53
NEW YORK	20	5	-	-	1	1	182	-	208
NEW JERSEY	2	5	-	-	19	-	34	-	61
PENNSYLVANIA	1	4	3	-	9	-	29	-	46
DELAWARE	-	1	-	-	2	-	11	-	15
MARYLAND	2	1	-	-	4	2	26	-	35
DIST COL	-	-	-	-	-	-	-	-	-
W VIRGINIA	-	1	-	-	-	-	-	-	1
VIRGINIA	-	4	-	-	5	-	15	-	25
N CAROLINA	-	6	-	-	1	-	-	-	8
S CAROLINA	-	2	-	-	1	-	-	-	4
GEORGIA	-	2	-	-	1	-	-	-	4
FLORIDA	2	4	-	-	17	-	113	-	136
MICHIGAN	-	6	1	-	-	-	6	-	13
OHIO	-	6	-	-	-	-	1	-	8
INDIANA	1	6	3	-	1	-	-	-	12
ILLINOIS	1	4	4	-	-	-	5	-	14
KENTUCKY	-	1	1	-	-	-	-	-	2
TENNESSEE	-	1	-	-	-	-	-	-	2
WISCONSIN	1	2	-	-	-	-	-	-	4
MINNESOTA	1	2	1	-	-	-	-	-	4
N DAKOTA	-	-	1	-	-	-	-	-	1
S DAKOTA	-	-	-	-	-	-	-	-	-
IOWA	-	1	-	-	-	-	-	-	1
NEBRASKA	-	1	-	-	-	-	-	-	1
MISSOURI	-	2	-	-	-	-	1	-	3
KANSAS	-	1	-	-	-	-	-	-	1
OKLAHOMA	-	1	-	-	-	-	-	-	1
ALABAMA	19	13	-	-	6	-	-	-	38
MISSISSIPPI	-	41	-	-	3	-	3	-	47
ARKANSAS	-	9	-	-	-	-	-	-	9
LOUISIANA	10	54	-	-	55	-	1	-	119
TEXAS	11	19	1	-	59	-	1	-	90
NEW MEXICO	-	6	-	-	-	-	-	-	6
MONTANA	-	-	3	-	-	-	-	-	4
IDAHO	1	-	-	-	-	-	-	-	1
WYOMING	-	-	-	-	-	-	-	-	1
COLORADO	-	-	-	-	-	-	-	-	-
UTAH	-	2	2	-	-	-	-	-	5
WASHINGTON	-	6	1	-	32	-	-	-	39
OREGON	1	1	-	-	11	-	-	-	13
CALIFORNIA	3	8	1	-	117	-	24	-	153
NEVADA	-	-	-	-	-	-	2	-	2
ARIZONA	-	-	-	-	-	-	-	-	-
ALASKA	-	-	-	-	-	-	-	-	-
HAWAII	11	-	2	-	5	-	34	2	55
TOTAL US	100	242	26	-	353	7	639	2	1370

HISTORIC 1989 ETHANE/PROPANE/BUTANE (LPG) USAGE -- THOUSAND BARRELS PER DAY

	ETHANE					PROPANE						
	INDUSTRIAL	GAS UTILITY	REFORMER	CHEM FEED	TOTAL	RESID/COMM	INT COMB	INDUSTRIAL	GAS UTILITY	REFORMER	CHEM FEED	TOTAL
MAINE					-	3		1	-	-		4
NEW HAMPSHIRE						5	-	1	-	1		7
VERMONT						4	-	-	-		-	4
MASSACHUSETTS						5	-	1	1		-	7
RHODE ISLANE						1	-	-			-	1
CONNECTICUT						3	-	1			-	4
NEW YORK						13	1	1				15
NEW JERSEY	-					4	1	1			9	16
PENNSYLVANIA	-				-	10	1	5	-	1	-	16
DELAWARE	-					2		-				3
MARYLAND						4		1				6
DIST COL		-	-			-					-	-
W VIRGINIA						1		-	-	-	2	4
VIRGINIA						9	1	2	-	1		12
N CAROLINA						22	1	2	-	-	-	25
S CAROLINA						8	1	1	-	-	-	10
GEORGIA					-	17	1	2	-	-	-	20
FLORIDA						17	1	2	1	1	-	22
MICHIGAN			4		4	25	2	5	1	7	2	43
OHIO					-	17	2	10	-	-	-	30
INDIANA			-		1	18	1	2	-	-	-	21
ILLINOIS		8		3	11	16	2	2	-	-	-	20
KENTUCKY		-			-	8	-	8	-			17
TENNESSEE					-	7	1	1	-	-	-	9
WISCONSIN					-	16	1	1	-	1		19
MINNESOTA			-			13	-	2	-	-		16
N DAKOTA						4	-	-	-	-	-	5
S DAKOTA					-	9	-	-	-	-	-	10
IOWA	-					18	-	1	-	-	-	20
NEBRASKA	-					9	-	1	-	-	-	10
MISSOURI	-					18	1	2	1	-		22
KANSAS	-	5		15	20	7	1	3	1	5	6	24
OKLAHOMA	-			5	5	6	1	4	-	-	-	10
ALABAMA	-					11	1	1	-	-		13
MISSISSIPPI	-					8	1	2	-		2	13
ARKANSAS	-				-	9	-	-	-	-	-	10
LOUISIANA			5	49	54	3	-	1	-	-	47	52
TEXAS			25	332	357	24	3	4	-	34	292	357
NEW MEXICO			1	9	10	4	1	-	-	-	-	5
MONTANA		-	-		-	3	-	1	-	-	-	4
IDAHO			-		-	1	-	-	-	-	-	2
WYOMING			-		-	2	-	1	-	-	-	4
COLORADO				2	2	6	-	1	-			7
UTAH			-	-	-	2		1	-		1	3
WASHINGTON						2	2	2	-			6
OREGON						2	1	1	-	-		4
CALIFORNIA					-	23	6	14	-	3	1	46
NEVADA						3	-	1	-	-	1	5
ARIZONA			-		-	3	-	1	-	-	-	4
ALASKA					-	1		-	-	-		1
HAWAII					-	-		-	-	-	-	1
TOTAL US	-	13	34	417	465	428	38	94	7	59	364	990

HISTORIC 1989 ETHANE/PROPANE/BUTANE (LPG) USAGE -- THOUSAND BARRELS PER DAY

	BUTANE						
	RESID/COMM	INDUSTRIAL	GAS UTILITY	REFORMER	CHEM FEED	INT COMB	TOTAL
MAINE	-	-	-	-	-	-	-
NEW HAMPSHIRE	-	-	-	-	-	-	-
VERMONT	-	-	-	-	-	-	-
MASSACHUSETTS	-	-	-	-	-	-	-
RHODE ISLANE	-	-	-	-	-	-	-
CONNECTICUT	-	-	-	-	-	-	-
NEW YORK	-	-	-	-	-	-	-
NEW JERSEY	-	-	-	-	1	-	1
PENNSYLVANIA	-	2	-	-	-	-	2
DELAWARE	-	-	-	-	-	-	-
MARYLAND	-	-	-	-	-	-	-
DIST COL	-	-	-	-	-	-	-
W VIRGINIA	-	-	-	-	-	-	-
VIRGINIA	-	-	-	-	-	-	-
N CAROLINA	-	-	-	-	-	-	-
S CAROLINA	-	-	-	-	-	-	-
GEORGIA	-	-	-	-	-	-	-
FLORIDA	-	-	-	-	-	-	-
MICHIGAN	-	1	-	3	-	-	4
OHIO	-	4	-	-	-	-	4
INDIANA	-	-	-	-	-	-	-
ILLINOIS	-	1	-	-	1	-	2
KENTUCKY	-	1	-	-	-	-	1
TENNESSEE	-	-	-	-	-	-	-
WISCONSIN	-	-	-	-	-	-	-
MINNESOTA	-	-	-	-	-	-	-
N DAKOTA	-	-	-	-	-	-	-
S DAKOTA	-	-	-	-	-	-	-
IOWA	-	-	-	-	-	-	-
NEBRASKA	-	-	-	-	-	-	-
MISSOURI	-	-	-	-	-	-	-
KANSAS	-	-	-	4	2	-	6
OKLAHOMA	-	-	-	-	-	-	-
ALABAMA	-	-	-	-	-	-	-
MISSISSIPPI	-	-	-	-	-	-	-
ARKANSAS	-	-	-	-	-	-	-
LOUISIANA	-	15	-	-	3	-	18
TEXAS	-	1	-	1	121	-	124
NEW MEXICO	-	-	-	-	1	-	1
MONTANA	-	-	-	-	-	-	-
IDAHO	-	-	-	-	-	-	-
WYOMING	-	-	-	-	-	-	-
COLORADO	-	-	-	-	-	-	1
UTAH	-	-	-	-	-	-	-
WASHINGTON	-	2	-	-	-	-	2
OREGON	-	-	-	-	-	-	-
CALIFORNIA	-	17	-	-	-	-	18
NEVADA	-	-	-	-	-	-	-
ARIZONA	-	-	-	-	-	-	-
ALASKA	-	-	-	-	-	-	-
HAWAII	-	-	-	-	-	-	-
TOTAL US	-	46	-	10	129	-	185

HISTORIC 1989 ETHANE/PROPANE/BUTANE (LPG) USAGE -- THOUSAND BARRELS PER DAY

	R	C	T	LPG		I	I	
	RESIDENTIAL	COMMERCIAL	TRANSPORT	INJECTION	REFORMER	INDUSTRIAL	CHEM FEED	TOTAL
MAINE	3	-	-	-	-	1	-	4
NEW HAMPSHIRE	4	1	-	-	1	1	-	7
VERMONT	3	1	-	-	-	-	-	4
MASSACHUSETTS	4	1	-	1	-	1	-	7
RHODE ISLANE	1	-	-	-	-	-	-	1
CONNECTICUT	2	-	-	-	-	1	-	4
NEW YORK	11	2	1	-	-	1	-	15
NEW JERSEY	4	1	1	-	-	1	11	17
PENNSYLVANIA	8	1	1	-	1	7	-	18
DELAWARE	2	-	-	-	-	-	-	3
MARYLAND	4	1	-	-	-	1	-	6
DIST COL	-	-	-	-	-	-	-	-
W VIRGINIA	1	-	-	-	-	-	2	4
VIRGINIA	8	1	1	-	1	2	-	12
N CAROLINA	19	3	1	-	-	2	-	25
S CAROLINA	7	1	1	-	-	1	-	10
GEORGIA	14	2	1	-	-	2	-	20
FLORIDA	14	2	1	1	1	2	-	22
MICHIGAN	22	4	2	1	14	6	2	51
OHIO	15	2	2	-	-	14	-	35
INDIANA	15	2	1	-	1	2	1	22
ILLINOIS	14	2	2	8	-	3	4	34
KENTUCKY	7	1	-	-	-	9	-	18
TENNESSEE	6	1	1	-	-	1	-	9
WISCONSIN	14	2	1	-	1	1	-	19
MINNESOTA	12	2	-	-	-	2	-	16
N DAKOTA	4	1	-	-	-	-	-	5
S DAKOTA	8	1	-	-	-	-	-	10
IOWA	15	3	-	-	-	1	-	20
NEBRASKA	7	1	-	-	-	1	-	10
MISSOURI	15	3	1	1	-	2	-	22
KANSAS	6	1	1	6	10	3	22	50
OKLAHOMA	5	1	1	-	-	4	5	16
ALABAMA	10	2	1	-	-	1	-	13
MISSISSIPPI	7	1	1	-	-	2	2	13
ARKANSAS	8	1	-	-	-	-	-	10
LOUISIANA	3	-	-	-	5	16	98	124
TEXAS	21	3	3	-	60	5	745	838
NEW MEXICO	4	1	1	-	1	-	10	16
MONTANA	2	-	-	-	-	1	-	4
IDAHO	1	-	-	-	-	-	-	2
WYOMING	2	-	-	-	-	1	1	4
COLORADO	5	1	-	-	-	1	2	10
UTAH	1	-	-	-	-	1	1	4
WASHINGTON	2	-	2	-	-	4	-	9
OREGON	1	-	1	-	-	1	-	4
CALIFORNIA	20	3	6	-	3	31	1	63
NEVADA	2	-	-	-	-	1	1	5
ARIZONA	3	-	-	-	-	1	-	4
ALASKA	1	-	-	-	-	-	-	1
HAWAII	-	-	-	-	-	-	-	1
TOTAL US	368	60	38	20	103	140	911	1640

HISTORIC 1989 RESIDENTIAL ENERGY USAGE -- THOUSAND BARRELS PER DAY

	LPG	KEROSENE	DISTILLATE DIST 1	DISTILLATE HEAT OIL	DISTILLATE DIST 4	DISTILLATE TOTAL	FUEL OIL	TOTAL OIL
MAINE	3	1	-	15	-	16	-	19
NEW HAMPSHIRE	4	1	-	12	-	12	-	17
VERMONT	3	-	-	6	-	6	-	10
MASSACHUSETTS	4	-	-	56	-	56	-	61
RHODE ISLANE	1	-	-	9	-	9	-	10
CONNECTICUT	2	-	-	39	-	39	-	42
NEW YORK	11	4	1	95	-	95	-	110
NEW JERSEY	4	1	-	44	-	44	-	48
PENNSYLVANIA	8	3	-	60	-	60	-	72
DELAWARE	2	-	-	4	-	4	-	6
MARYLAND	4	1	-	14	-	14	-	19
DIST COL	-	-	-	-	-	-	-	-
W VIRGINIA	1	-	-	2	-	2	-	3
VIRGINIA	8	3	-	17	-	17	-	28
N CAROLINA	19	4	-	12	-	13	-	35
S CAROLINA	7	2	-	3	-	4	-	12
GEORGIA	14	-	-	1	-	1	-	15
FLORIDA	14	1	-	1	-	1	-	16
MICHIGAN	22	1	2	11	-	13	-	36
OHIO	15	3	1	11	-	13	-	30
INDIANA	15	2	1	5	-	6	-	23
ILLINOIS	14	1	1	4	-	4	-	19
KENTUCKY	7	2	-	2	-	2	-	11
TENNESSEE	6	2	-	1	-	1	-	8
WISCONSIN	14	-	2	13	-	15	-	29
MINNESOTA	12	1	3	10	-	12	-	25
N DAKOTA	4	-	-	2	-	3	-	6
S DAKOTA	8	-	1	2	-	2	-	10
IOWA	15	-	1	2	-	3	-	19
NEBRASKA	7	-	-	-	-	1	-	8
MISSOURI	15	-	-	1	-	1	-	17
KANSAS	6	-	-	-	-	-	-	7
OKLAHOMA	5	-	-	-	-	-	-	5
ALABAMA	10	2	-	-	-	-	-	12
MISSISSIPPI	7	1	-	-	-	-	-	8
ARKANSAS	8	1	-	-	-	-	-	9
LOUISIANA	3	1	-	-	-	-	-	4
TEXAS	21	1	-	-	-	-	-	22
NEW MEXICO	4	-	-	-	-	-	-	4
MONTANA	2	-	-	1	-	1	-	3
IDAHO	1	-	-	1	-	2	-	3
WYOMING	2	-	-	-	-	-	-	2
COLORADO	5	-	-	-	-	-	-	5
UTAH	1	-	-	-	-	1	-	2
WASHINGTON	2	-	-	7	-	8	-	10
OREGON	1	-	-	5	-	5	-	7
CALIFORNIA	20	-	-	-	-	1	-	21
NEVADA	2	-	-	1	-	1	-	3
ARIZONA	3	-	-	-	-	-	-	3
ALASKA	1	-	1	3	-	4	-	5
HAWAII	-	-	-	-	-	-	-	-
TOTAL US	368	40	18	471	-	489	-	898

PRINTED DATA MAY NOT ADD DUE TO INDEPENDENT ROUNDING. NATIONAL PETROLEUM COUNCIL JANUARY 2, 1992 TIME 9:44

HISTORIC 1989 COMMERCIAL ENERGY USAGE -- THOUSAND BARRELS PER DAY

		MOTOR GASOLINE				DISTILLATE						
	LPG	GOVT NON-HY	MISCELL	TOTAL	KEROSENE	DIST 1	DIESEL	HEAT OIL	DIST 4	TOTAL	FUEL OIL	TOTAL OIL
MAINE	-	-	-	-	-	-	-	4	-	4	2	8
NEW HAMPSHIRE	1	-	-	-	-	-	1	2	1	3	1	5
VERMONT	1	-	-	-	-	-	1	1	-	2	-	3
MASSACHUSETTS	1	1	-	1	-	-	2	15	5	21	5	27
RHODE ISLANE	-	-	-	-	-	-	-	1	-	2	1	3
CONNECTICUT	-	-	-	1	-	-	1	7	1	9	2	12
NEW YORK	2	2	2	4	1	1	5	22	15	42	20	68
NEW JERSEY	1	2	-	2	-	-	4	14	4	22	2	27
PENNSYLVANIA	1	1	-	1	-	1	7	12	1	20	1	24
DELAWARE	-	-	-	-	-	-	-	-	-	1	-	2
MARYLAND	1	-	-	1	-	-	1	4	1	5	2	8
DIST COL	-	-	-	-	-	-	-	1	-	1	-	2
W VIRGINIA	-	1	-	1	-	-	-	1	-	1	-	3
VIRGINIA	1	1	-	1	-	-	2	4	-	6	-	10
N CAROLINA	3	2	-	2	-	-	2	4	-	6	-	12
S CAROLINA	1	1	-	1	-	-	1	1	-	3	-	4
GEORGIA	2	1	-	1	-	-	2	1	-	3	-	7
FLORIDA	2	3	-	3	-	-	5	2	-	8	2	16
MICHIGAN	4	2	-	2	-	1	3	2	-	6	-	12
OHIO	2	2	4	6	1	-	2	2	-	5	-	14
INDIANA	2	1	-	1	-	-	2	1	-	3	1	8
ILLINOIS	2	1	-	1	-	-	2	1	-	4	1	8
KENTUCKY	1	1	-	1	-	-	1	1	-	2	-	5
TENNESSEE	1	1	1	1	-	-	1	-	-	2	-	5
WISCONSIN	2	1	-	1	-	-	3	2	-	6	1	10
MINNESOTA	2	1	-	1	-	-	1	1	-	3	1	6
N DAKOTA	1	-	-	-	-	-	-	-	-	1	-	1
S DAKOTA	1	-	-	-	-	-	-	-	-	1	-	2
IOWA	3	1	-	1	-	-	1	-	-	1	-	5
NEBRASKA	1	-	-	-	-	-	-	-	-	1	-	2
MISSOURI	3	-	-	1	-	-	2	1	-	3	-	6
KANSAS	1	-	-	-	-	-	1	-	-	1	-	2
OKLAHOMA	1	1	-	1	-	-	1	1	-	2	-	4
ALABAMA	2	1	-	1	-	-	2	1	-	3	19	25
MISSISSIPPI	1	-	-	-	-	-	2	1	-	2	-	5
ARKANSAS	1	-	-	-	-	-	1	-	-	1	-	3
LOUISIANA	-	1	-	1	1	-	2	-	-	2	10	14
TEXAS	3	6	1	7	11	-	9	2	-	11	11	43
NEW MEXICO	1	-	-	-	-	-	1	-	-	1	-	3
MONTANA	-	-	-	-	-	-	-	-	-	1	-	1
IDAHO	-	-	1	1	-	-	1	-	-	1	1	3
WYOMING	-	-	-	-	-	-	1	-	-	1	-	1
COLORADO	1	-	-	-	-	-	1	-	-	1	-	3
UTAH	-	-	-	-	-	-	1	-	-	1	-	2
WASHINGTON	-	1	-	1	3	-	3	1	-	5	-	9
OREGON	-	1	-	1	-	-	1	1	-	3	1	5
CALIFORNIA	3	5	-	5	-	-	10	2	-	13	3	24
NEVADA	-	-	-	-	-	-	1	-	-	1	-	2
ARIZONA	-	-	-	-	-	-	1	-	-	1	-	2
ALASKA	-	-	-	-	-	-	1	1	-	2	-	3
HAWAII	-	-	-	-	-	-	1	-	-	1	11	12
TOTAL US	60	44	10	54	23	7	93	121	30	252	100	489

PRINTED DATA MAY NOT ADD DUE TO INDEPENDENT ROUNDING. NATIONAL PETROLEUM COUNCIL JANUARY 2, 1992 TIME 9:44

APP L.III.3-40

HISTORIC 1989 TRANSPORTATION ENERGY USAGE -- THOUSAND BARRELS PER DAY

	LPG	MOTOR GASOLINE TOTAL-DOE	COMMERCIAL	INDUSTRIAL	NET	AVGAS	NAPH JET	KERO JET
MAINE	-	39	-	-	38	-	-	3
NEW HAMPSHIRE	-	34	-	-	33	-	-	1
VERMONT	-	18	-	-	17	-	-	-
MASSACHUSETTS	-	160	1	1	158	-	2	26
RHODE ISLANE	-	24	-	-	24	-	-	2
CONNECTICUT	-	88	1	1	87	-	1	6
NEW YORK	1	366	4	4	358	-	7	13
NEW JERSEY	1	223	2	1	220	-	3	118
PENNSYLVANIA	1	298	1	4	293	-	5	25
DELAWARE	-	22	-	-	22	-	-	-
MARYLAND	-	135	1	1	133	-	2	9
DIST COL	-	12	-	-	11	-	-	-
W VIRGINIA	-	53	1	1	52	-	1	1
VIRGINIA	1	194	1	2	191	-	2	33
N CAROLINA	1	213	2	2	209	-	3	14
S CAROLINA	1	117	1	2	114	-	1	2
GEORGIA	1	229	1	4	224	-	2	44
FLORIDA	1	389	3	3	383	2	5	76
MICHIGAN	2	277	2	3	272	1	3	21
OHIO	2	318	6	3	310	1	4	26
INDIANA	1	169	1	2	166	1	2	46
ILLINOIS	2	316	1	4	311	1	4	11
KENTUCKY	-	119	1	2	115	-	1	13
TENNESSEE	1	164	1	2	161	-	2	11
WISCONSIN	1	135	1	2	131	-	2	3
MINNESOTA	-	133	1	3	129	-	2	12
N DAKOTA	-	23	-	2	21	-	-	1
S DAKOTA	-	25	-	2	23	-	-	-
IOWA	-	89	1	4	85	-	1	2
NEBRASKA	-	50	-	3	47	-	1	2
MISSOURI	1	174	1	2	172	1	2	19
KANSAS	1	82	-	2	79	-	1	8
OKLAHOMA	1	106	1	3	103	-	1	19
ALABAMA	1	136	1	1	134	1	9	4
MISSISSIPPI	1	79	-	2	77	1	6	15
ARKANSAS	-	81	-	1	79	1	5	2
LOUISIANA	-	128	1	1	127	1	10	55
TEXAS	3	557	7	13	538	4	37	239
NEW MEXICO	1	52	-	1	50	-	3	3
MONTANA	-	28	-	2	26	-	1	1
IDAHO	-	31	1	1	29	-	1	1
WYOMING	-	21	-	1	19	-	1	-
COLORADO	-	97	-	1	95	-	4	14
UTAH	-	47	-	1	47	-	2	12
WASHINGTON	2	147	1	2	145	-	7	50
OREGON	1	87	1	1	85	-	4	9
CALIFORNIA	6	851	5	9	837	3	43	211
NEVADA	-	40	-	-	39	-	2	11
ARIZONA	-	111	-	1	110	-	5	14
ALASKA	-	14	-	-	14	1	1	45
HAWAII	-	24	-	-	23	1	2	31
TOTAL US	38	7328	54	105	7168	26	205	1284

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APP L.III.3-42

HISTORIC 1989 TRANSPORTATION ENERGY USAGE -- THOUSAND BARRELS PER DAY

	LIGHT DIESEL			HEAVY DIESEL				HEAVY FUEL OIL				
	ON HIGHWAY	MILITARY	TOTAL	RAILROAD	BUNKERS	MILITARY	TOTAL	RAILROAD	BUNKERS	MILITARY	TOTAL	TOTAL OIL
MAINE	9	-	9	-	1	-	1	-	-	-	1	53
NEW HAMPSHIRE	4	-	4	-	-	-	-	-	-	-	-	38
VERMONT	3	-	3	-	-	-	-	-	-	-	-	22
MASSACHUSETTS	18	-	18	1	2	-	4	-	2	1	3	212
RHODE ISLAND	3	-	4	-	-	-	1	-	-	-	-	31
CONNECTICUT	17	-	17	-	-	-	1	-	-	-	-	112
NEW YORK	49	-	50	1	1	-	2	-	1	1	1	432
NEW JERSEY	30	-	30	4	8	-	12	-	19	-	19	402
PENNSYLVANIA	60	-	60	3	2	1	5	-	9	-	9	398
DELAWARE	5	-	5	-	-	-	-	-	2	-	2	30
MARYLAND	23	1	24	3	1	-	4	-	4	2	6	178
DIST COL	2	-	2	1	-	-	1	-	-	-	-	14
W VIRGINIA	10	-	10	2	4	-	6	-	-	-	-	70
VIRGINIA	35	1	36	6	2	1	9	-	5	-	6	278
N CAROLINA	40	-	41	2	1	-	3	-	1	-	2	272
S CAROLINA	20	-	20	2	-	-	2	-	1	-	2	142
GEORGIA	55	1	55	4	2	-	7	-	1	-	1	335
FLORIDA	59	1	60	6	6	-	11	-	17	-	17	556
MICHIGAN	35	-	35	3	-	-	3	-	-	-	-	337
OHIO	63	1	63	8	1	-	9	-	-	-	-	415
INDIANA	51	-	52	15	1	-	15	-	1	-	1	283
ILLINOIS	55	-	55	9	2	-	11	-	-	-	-	395
KENTUCKY	45	-	45	8	6	-	14	-	-	-	-	190
TENNESSEE	38	-	38	4	11	-	16	-	-	-	-	230
WISCONSIN	29	-	29	7	-	-	7	-	-	-	-	174
MINNESOTA	22	-	22	3	-	-	3	-	-	-	-	168
N DAKOTA	6	-	6	2	-	-	2	-	-	-	-	30
S DAKOTA	6	-	6	-	-	-	-	-	-	-	-	30
IOWA	23	-	23	2	-	-	2	-	-	-	-	113
NEBRASKA	14	-	14	8	-	-	8	-	-	-	-	72
MISSOURI	42	-	42	2	3	-	5	-	-	-	-	242
KANSAS	20	-	20	11	-	-	11	-	-	-	-	121
OKLAHOMA	26	-	26	5	-	-	5	-	-	-	-	155
ALABAMA	36	-	36	4	9	-	14	-	6	-	6	203
MISSISSIPPI	20	5	25	1	5	-	6	-	3	-	3	133
ARKANSAS	26	-	26	2	-	-	2	-	-	-	-	116
LOUISIANA	25	5	31	5	30	-	35	-	55	-	55	313
TEXAS	90	18	109	25	21	-	46	-	59	-	59	1036
NEW MEXICO	13	-	13	3	-	-	3	-	-	-	-	75
MONTANA	8	-	8	4	-	-	4	-	-	-	-	41
IDAHO	8	-	8	1	-	-	1	-	-	-	-	41
WYOMING	12	-	12	7	-	-	7	-	-	-	-	40
COLORADO	12	1	13	6	-	-	6	-	-	-	-	132
UTAH	8	-	8	2	-	-	2	-	-	-	-	72
WASHINGTON	25	-	25	5	5	-	10	-	32	-	32	271
OREGON	20	-	20	6	2	-	8	-	11	-	11	139
CALIFORNIA	125	13	138	14	13	-	27	-	117	-	117	1383
NEVADA	9	-	9	2	-	-	2	-	-	-	-	62
ARIZONA	21	-	21	1	-	-	1	-	-	-	-	151
ALASKA	6	2	9	-	9	-	9	-	-	-	-	78
HAWAII	2	2	4	-	5	-	5	-	5	-	5	71
TOTAL US	1378	56	1435	213	154	4	371	-	353	7	360	10887

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HISTORIC 1989 INDUSTRIAL ENERGY USAGE -- THOUSAND BARRELS PER DAY

	LPG			MOTOR GASOLINE				KEROSENE				
	INDUSTRIAL	CHEM FEED	TOTAL	AGRICULTURE	INDUST/COMM	CONSTRUCT	TOTAL	INDUSTRIAL	FARM	OTHER	TOTAL	DIST 1
MAINE	1	-	1	-	-	-	-	-	-	-	-	-
NEW HAMPSHIRE	1	1	1	-	-	-	-	-	-	-	-	-
VERMONT	-	-	-	-	-	-	-	-	-	-	-	-
MASSACHUSETTS	1	-	1	-	-	1	1	-	-	-	-	-
RHODE ISLANE	-	-	-	-	-	-	-	-	-	-	-	-
CONNECTICUT	1	-	1	-	-	-	1	-	-	-	-	-
NEW YORK	1	-	1	2	1	1	4	1	-	1	2	-
NEW JERSEY	1	11	12	-	-	1	1	1	-	-	1	-
PENNSYLVANIA	7	1	7	1	2	1	4	-	-	-	-	-
DELAWARE	-	-	-	-	-	-	-	-	-	-	-	-
MARYLAND	1	-	1	-	-	-	1	-	-	-	-	-
DIST COL	-	-	-	-	-	-	-	-	-	-	-	-
W VIRGINIA	-	2	3	-	-	-	1	-	-	-	-	-
VIRGINIA	2	1	3	1	1	1	2	-	-	-	-	-
N CAROLINA	2	-	3	1	-	1	2	-	-	-	-	-
S CAROLINA	1	-	1	1	1	-	2	-	-	-	-	-
GEORGIA	2	-	3	1	2	1	4	-	-	-	-	-
FLORIDA	2	1	2	-	1	1	3	-	-	-	-	-
MICHIGAN	6	17	23	2	1	1	3	-	-	-	-	-
OHIO	14	-	15	1	1	1	3	-	-	-	1	-
INDIANA	2	1	3	1	-	-	2	-	-	-	-	-
ILLINOIS	3	5	8	3	-	1	4	-	-	-	-	-
KENTUCKY	9	-	9	1	1	-	2	-	-	-	1	-
TENNESSEE	1	-	2	1	-	-	2	-	-	-	-	-
WISCONSIN	1	1	2	2	-	-	2	-	-	-	-	-
MINNESOTA	2	-	2	3	-	-	3	-	-	-	-	-
N DAKOTA	-	-	-	2	-	-	2	-	-	-	-	-
S DAKOTA	-	-	-	1	-	-	2	-	-	-	-	-
IOWA	1	-	1	3	1	-	4	-	-	-	-	-
NEBRASKA	1	-	1	3	-	-	3	-	-	-	-	-
MISSOURI	2	-	2	2	-	-	2	-	-	-	-	-
KANSAS	3	32	35	2	-	-	2	-	-	-	-	-
OKLAHOMA	4	6	9	1	1	-	3	-	-	-	-	-
ALABAMA	1	-	1	1	-	-	1	-	-	-	-	-
MISSISSIPPI	2	2	4	1	1	-	2	-	-	-	1	-
ARKANSAS	-	1	1	1	-	-	1	-	-	-	-	-
LOUISIANA	16	104	120	-	-	-	1	1	-	1	3	-
TEXAS	5	805	810	5	7	1	13	3	-	3	7	-
NEW MEXICO	-	11	11	-	1	-	1	1	-	-	1	-
MONTANA	1	-	1	1	-	-	2	-	-	-	-	-
IDAHO	-	-	1	1	-	-	1	-	-	-	-	-
WYOMING	1	1	2	1	-	-	1	-	-	-	-	1
COLORADO	1	2	4	1	-	-	1	-	-	-	-	-
UTAH	1	1	2	-	-	-	1	-	-	-	-	-
WASHINGTON	4	-	5	1	1	-	2	-	-	-	-	-
OREGON	1	-	1	1	-	-	1	-	-	-	-	-
CALIFORNIA	31	3	35	3	3	3	9	-	-	-	-	-
NEVADA	1	1	2	-	-	-	-	-	-	-	-	-
ARIZONA	1	-	1	-	-	-	1	-	-	-	-	-
ALASKA	-	-	-	-	-	-	-	-	-	-	-	-
HAWAII	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL US	140	1014	1154	54	32	19	105	11	2	8	21	5

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HISTORIC 1989 INDUSTRIAL ENERGY USAGE -- THOUSAND BARRELS PER DAY

	DIESEL					DISTILLATE 2 (HEATING OIL)						
	INDUSTRIAL	FARM	CONSTRUCT	OTHER	TOTAL	INDUSTRIAL	OIL CO	FARM	OTHER	TOTAL	DIST 4	TOTAL HFO
MAINE	-	-	1	-	1	1	-	-	-	2	-	6
NEW HAMPSHIRE	-	-	-	-	1	1	-	-	-	1	-	1
VERMONT	-	-	-	-	1	-	-	-	-	1	-	-
MASSACHUSETTS	-	-	1	-	2	4	-	-	-	5	1	4
RHODE ISLANE	-	-	-	-	1	-	-	-	-	-	-	1
CONNECTICUT	-	-	1	-	2	2	-	-	-	2	1	2
NEW YORK	1	2	2	-	6	2	1	1	-	4	1	5
NEW JERSEY	1	1	3	-	5	2	-	-	-	3	1	5
PENNSYLVANIA	5	2	3	-	11	4	1	1	-	6	1	7
DELAWARE	-	-	-	-	1	-	-	-	-	-	-	1
MARYLAND	1	1	2	-	4	1	-	-	-	1	-	1
DIST COL	-	-	-	-	-	-	-	-	-	-	-	-
W VIRGINIA	4	-	1	-	6	1	-	-	-	1	-	1
VIRGINIA	2	2	2	-	7	2	-	-	-	2	-	4
N CAROLINA	2	2	2	-	6	3	-	-	-	4	-	6
S CAROLINA	1	2	1	1	4	1	-	-	-	1	-	2
GEORGIA	2	5	2	-	10	1	-	-	-	1	-	2
FLORIDA	2	3	4	-	10	-	-	-	-	-	-	4
MICHIGAN	2	4	3	-	9	1	-	-	-	2	-	6
OHIO	5	4	2	-	11	2	-	-	-	3	-	6
INDIANA	4	5	2	-	11	1	-	1	-	2	1	10
ILLINOIS	3	10	2	-	16	1	-	1	-	2	-	8
KENTUCKY	6	2	1	-	10	3	-	-	-	3	-	2
TENNESSEE	2	3	2	-	6	-	-	-	-	-	-	1
WISCONSIN	1	5	2	-	7	1	-	1	-	2	-	3
MINNESOTA	-	8	2	-	10	1	-	-	-	2	-	3
N DAKOTA	1	6	-	-	7	-	-	-	-	1	-	1
S DAKOTA	-	4	-	-	5	-	-	1	-	1	-	-
IOWA	-	9	1	-	10	-	-	1	-	1	-	1
NEBRASKA	-	9	1	-	11	-	-	-	-	-	-	1
MISSOURI	1	5	1	-	8	1	-	-	-	1	-	2
KANSAS	-	8	1	-	10	-	1	-	-	1	-	1
OKLAHOMA	1	3	1	-	5	-	2	-	-	2	-	1
ALABAMA	5	4	3	1	13	1	1	-	-	1	-	13
MISSISSIPPI	1	9	2	-	12	-	1	-	-	2	-	41
ARKANSAS	1	6	1	1	9	-	-	-	-	1	-	9
LOUISIANA	1	6	3	-	11	-	21	-	-	22	-	54
TEXAS	14	22	10	1	47	2	20	1	-	22	-	19
NEW MEXICO	3	1	1	-	5	-	1	-	-	1	-	6
MONTANA	3	3	1	-	7	-	-	-	-	-	-	3
IDAHO	1	4	1	-	7	-	-	-	-	-	-	-
WYOMING	3	1	1	-	5	-	1	-	-	1	-	1
COLORADO	1	4	2	-	6	1	-	-	-	1	-	-
UTAH	2	1	1	-	4	-	-	-	-	1	-	5
WASHINGTON	2	4	2	1	9	1	-	-	-	1	-	7
OREGON	1	3	1	2	7	1	-	-	-	1	-	1
CALIFORNIA	9	20	11	2	41	1	1	-	-	2	1	9
NEVADA	6	-	2	-	8	-	-	-	-	-	-	-
ARIZONA	4	2	2	-	8	-	-	-	-	-	-	-
ALASKA	2	-	1	-	3	-	2	-	-	2	-	-
HAWAII	-	1	-	-	1	-	-	-	-	-	-	5
TOTAL US	109	199	95	12	415	45	55	10	2	112	9	271

PRINTED DATA MAY NOT ADD DUE TO INDEPENDENT ROUNDING. NATIONAL PETROLEUM COUNCIL JANUARY 2, 1992 TIME 9:44

HISTORIC 1989 INDUSTRIAL ENERGY USAGE -- THOUSAND BARRELS PER DAY

	OTHER OIL PRODUCTS											
	CHEM NAPH	CHEM GASOIL	SPEC NAPH	LUBES	WAX	ASPHALT	MISC OIL	CRUDE OIL	STILL GAS	CAT COKE	MARKET COKE	TOTAL OIL
MAINE	-	-	-	1	-	2	-	-	-	-	-	13
NEW HAMPSHIRE	-	-	-	1	-	2	-	-	-	-	-	6
VERMONT	-	-	-	-	-	1	-	-	-	-	-	3
MASSACHUSETTS	-	-	-	3	-	7	-	-	-	-	-	24
RHODE ISLANE	-	-	-	1	-	1	-	-	-	-	-	4
CONNECTICUT	-	-	-	2	-	4	-	-	-	-	-	15
NEW YORK	-	1	-	8	-	17	-	-	-	-	-	50
NEW JERSEY	4	6	2	5	1	11	5	-	28	13	2	106
PENNSYLVANIA	7	9	4	7	2	15	8	-	28	13	-	130
DELAWARE	1	2	1	1	-	1	1	-	7	3	4	24
MARYLAND	-	-	-	3	-	7	-	-	-	-	-	19
DIST COL	-	-	-	-	-	1	-	-	-	-	-	1
W VIRGINIA	-	-	-	1	1	3	-	-	-	-	-	17
VIRGINIA	-	1	-	5	-	10	1	-	3	1	1	40
N CAROLINA	-	-	-	5	-	11	-	-	-	-	-	36
S CAROLINA	-	-	-	3	-	6	-	-	-	-	-	20
GEORGIA	-	-	-	6	-	12	-	-	-	-	-	38
FLORIDA	-	-	-	9	-	18	-	-	-	-	-	46
MICHIGAN	1	1	1	4	-	17	-	-	5	2	-	74
OHIO	4	5	3	5	-	21	2	-	20	7	5	109
INDIANA	3	4	2	3	-	12	2	-	19	6	6	85
ILLINOIS	7	9	5	5	-	21	3	-	39	13	23	165
KENTUCKY	2	2	1	2	-	8	1	-	11	4	-	58
TENNESSEE	-	1	-	2	-	11	-	-	3	1	-	31
WISCONSIN	-	-	-	2	-	9	-	-	1	-	-	30
MINNESOTA	2	3	2	2	-	8	1	-	9	3	10	61
N DAKOTA	-	1	-	-	-	1	-	-	3	1	-	19
S DAKOTA	-	-	-	-	-	2	-	-	-	-	-	10
IOWA	-	-	-	1	-	6	-	-	-	-	-	24
NEBRASKA	-	-	-	1	-	3	-	-	-	-	-	20
MISSOURI	-	-	-	3	-	12	-	-	-	-	-	30
KANSAS	3	3	2	1	-	6	1	-	14	5	7	92
OKLAHOMA	3	4	2	2	1	7	1	-	16	5	4	66
ALABAMA	3	4	1	7	-	12	1	-	-	-	-	57
MISSISSIPPI	8	10	1	4	-	7	2	-	9	3	3	108
ARKANSAS	1	2	-	4	-	7	-	-	2	1	-	40
LOUISIANA	50	63	9	6	2	10	12	-	96	29	12	498
TEXAS	89	113	16	27	5	44	22	-	205	62	9	1511
NEW MEXICO	2	2	-	3	-	5	-	-	3	1	-	41
MONTANA	-	-	-	-	-	4	1	-	5	2	2	28
IDAHO	-	-	-	-	-	4	-	-	-	-	-	14
WYOMING	-	-	-	-	1	4	1	-	7	2	-	24
COLORADO	-	-	-	-	-	13	-	-	2	1	1	30
UTAH	-	-	-	-	-	6	1	-	6	2	2	28
WASHINGTON	1	2	-	2	-	7	1	-	19	5	1	61
OREGON	-	-	-	1	-	5	-	-	-	-	-	18
CALIFORNIA	7	9	1	10	2	42	3	28	116	27	4	345
NEVADA	-	-	-	-	-	2	-	-	-	-	-	13
ARIZONA	-	-	-	1	-	6	-	-	-	-	-	18
ALASKA	1	1	-	-	-	1	-	-	-	-	-	8
HAWAII	-	-	-	-	-	1	-	-	4	1	-	14
TOTAL US	203	257	56	159	17	453	72	28	681	212	96	4323

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HISTORIC 1989 ELECTRIC UTILITY ENERGY USAGE -- THOUSAND BARRELS PER DAY

	DIST 2	FUEL OIL	TOTAL OIL
MAINE	-	14	15
NEW HAMPSHIRE	-	14	14
VERMONT	-	-	-
MASSACHUSETTS	2	72	74
RHODE ISLANE	-	1	2
CONNECTICUT	-	49	49
NEW YORK	7	182	189
NEW JERSEY	4	34	38
PENNSYLVANIA	5	29	34
DELAWARE	1	11	12
MARYLAND	4	26	31
DIST COL	5	-	5
W VIRGINIA	1	-	1
VIRGINIA	2	15	17
N CAROLINA	1	-	1
S CAROLINA	1	-	1
GEORGIA	1	-	1
FLORIDA	5	113	118
MICHIGAN	2	6	8
OHIO	1	1	3
INDIANA	2	-	2
ILLINOIS	2	5	6
KENTUCKY	1	-	1
TENNESSEE	-	-	-
WISCONSIN	1	-	1
MINNESOTA	-	-	-
N DAKOTA	-	-	-
S DAKOTA	-	-	-
IOWA	-	-	-
NEBRASKA	-	-	-
MISSOURI	1	1	2
KANSAS	-	-	-
OKLAHOMA	-	-	-
ALABAMA	1	-	1
MISSISSIPPI	-	3	4
ARKANSAS	1	-	1
LOUISIANA	1	1	2
TEXAS	4	1	5
NEW MEXICO	-	-	1
MONTANA	-	-	-
IDAHO	-	-	-
WYOMING	-	-	-
COLORADO	-	-	-
UTAH	-	-	-
WASHINGTON	-	-	-
OREGON	-	-	-
CALIFORNIA	1	24	26
NEVADA	-	2	2
ARIZONA	-	-	1
ALASKA	1	-	1
HAWAII	5	34	39
TOTAL US	70	639	710

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DOWNSTREAM PLANNING AND ANALYSIS

W.R. FINGER
COORDINATOR OF ENERGY ANALYSIS

January 31, 1992

Members of the NPC Refining Study Supply/Demand/Logistics Task Group

Gentlemen:

On January 21, Bill Finger sent a letter to the members of Coordinating Subcommittee (CSC) for the NPC Refining Study that requested adoption of the Foundation Case numerics which we had reviewed at our New Orleans Task Group meeting. The numerics for the three Foundation Cases were approved (without change) at the January 29 CSC meeting.

Attached are numerics that break the total U.S. oil demand projections down to the sector level. Each Foundation Case is comprised of six attachments--Residential, Commercial, Transportation, Industrial, Electric Utility, and Total. Details for the development of these numerics appear on the first attachment.

I plan to review these data at our next Task Group meeting (Albuquerque, February 11-12). You may note some subtle differences in the demand changes over time. For example, the attached methodology leads to shifts among the distillate grades (diesel, heating oil, etc.) even in the No Demand Increase Case.

If you have any concerns or suggestions about the attached, I would appreciate it if you let me know as soon as possible.

Sincerely,

Graham K. Barnes

G. K. Barnes

GKB:yg
Attachment

c - w/attachment:
Mr. John H. Guy, IV – National Petroleum Council

A DIVISION OF EXXON CORPORATION

SECTOR OIL DEMANDS FOR NPC FOUNDATION CASES

Foundation Case I (Increasing Demand)

The bases for the 1989 historic data were documented in an earlier letter (January 23). This earlier letter also laid out the splits of the historic oil demand among the sectors. For the increasing demand case, the sector oil demand changes versus 1989 are consistent with the data in the EIA's "1991 Annual Energy Outlook," Table A2 (AEO).

The changes (vs. 1989) in the major Residential Sector oil products are specified in the AEO; the distillate 1 and heating oil volumes are assumed to decline at the same rate as that for the composite distillate pool. For the Commercial Sector, the AEO provides volume change guidance for gasoline, kerosene, total distillate, and residual. Commercial LPG is by difference as discussed subsequently. Within the total distillate, Commercial light diesel was arbitrarily held constant at the 1989 level; all the decline for the composite distillate pool was proportionately split between distillate 1 and heating oil. A light diesel decline does not seem reasonable considering the growth in Transportation light diesel.

While not attached in this order, the next logical sector to consider is Electric Utilities. The volume changes for both the distillate and residual oils are specified in the AEO. Next is the Industrial Sector, where the AEO lays out the changes in the oil demands for LPG, gasoline, distillate, residual, petrochemical feedstocks, and other petroleum. Arbitrarily, both distillate 1 and 4 (in the Industrial Sector) have been held at the 1989 consumption levels; historically, the demands for both oils have been flat to declining. The other distillates and fuel oil demands are adjusted to achieve the AEO specified distillate and residual increases. Industrial kerosene is by difference from the total changes (for all sectors) specified in the AEO. The changes for the other oils are then by difference excluding the kerosene.

Finally, the changes in the Transportation Sector oil demands are either those specified in AEO or by difference from the totals, also specified in the AEO. Note, naphtha jet is assumed to disappear by 1995; the total jet fuel demand post-1994 is kerojet. Commercial and Transportation LPG decline consistently and are by difference from the total.

Foundation Case II (No Demand Increase)

Factors are created to represent the decrease in the totals for the major products, i.e., gasoline, jet, distillate, fuel oils, and other. The same factor is then applied to each of the applicable fuels in each sector.

Foundation Case III (Decreasing Demand)

Same methodology versus Foundation Case I as outlined for the No Demand Increase Case.

FOUNDATION CASE I

NATIONAL PETROLEUM COUNCIL - REFINING STUDY
INCREASING DEMAND
RESIDENTIAL

	THOUSAND BARRELS PER DAY				DELTA VERSUS 1989			GROWTH VERSUS 1989, % PER YEAR		
	1989	1995	2000	2010	1995	2000	2010	1995	2000	2010
MOTOR GASOLINE	-	-	-	-	-	-	-	-	-	-
NAPHTHA JET FUEL	-	-	-	-	-	-	-	-	-	-
KEROSENE JET FUEL	-	-	-	-	-	-	-	-	-	-
TOTAL JET FUEL	-	-	-	-	-	-	-	-	-	-
DISTILLATE 1	18	16	13	10	(2)	(5)	(8)	(2.2)	(2.7)	(2.7)
LIGHT DIESEL	-	-	-	-	-	-	-	-	-	-
HEAVY DIESEL	-	-	-	-	-	-	-	-	-	-
DISTILLATE 2 (HT OIL)	471	412	349	263	(59)	(122)	(208)	(2.2)	(2.7)	(2.7)
TOTAL DISTILLATE	489	428	362	273	(61)	(127)	(216)	(2.2)	(2.7)	(2.7)
DISTILLATE 4	-	-	-	-	-	-	-	-	-	-
HEAVY FUEL OIL	-	-	-	-	-	-	-	-	-	-
TOTAL HEAVY FUEL OIL	-	-	-	-	-	-	-	-	-	-
LIQUIFIED PETROLEUM GAS	368	325	297	247	(43)	(71)	(121)	(2.0)	(1.9)	(1.9)
AVIATION GASOLINE	-	-	-	-	-	-	-	-	-	-
KEROSENE	40	33	26	16	(7)	(14)	(24)	(3.1)	(4.0)	(4.3)
CHEM FEED NAPHTHA	-	-	-	-	-	-	-	-	-	-
CHEM FEED GASDIL	-	-	-	-	-	-	-	-	-	-
SPECIAL NAPHTHA	-	-	-	-	-	-	-	-	-	-
LUBRICANTS	-	-	-	-	-	-	-	-	-	-
WAX	-	-	-	-	-	-	-	-	-	-
ASPHALT & ROAD OIL	-	-	-	-	-	-	-	-	-	-
MISCELLANEOUS OIL	-	-	-	-	-	-	-	-	-	-
CRUDE OIL	-	-	-	-	-	-	-	-	-	-
STILL GAS	-	-	-	-	-	-	-	-	-	-
CATALYTIC COKE	-	-	-	-	-	-	-	-	-	-
MARKETABLE COKE	-	-	-	-	-	-	-	-	-	-
TOTAL OTHER PETROLEUM	408	359	323	263	(49)	(85)	(145)	(2.1)	(2.1)	(2.1)
TOTAL - ALL OIL	898	787	685	536	(111)	(213)	(362)	(2.2)	(2.4)	(2.4)

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FOUNDATION CASE I

NATIONAL PETROLEUM COUNCIL - REFINING STUDY
INCREASING DEMAND
COMMERCIAL

	THOUSAND BARRELS PER DAY				DELTA VERSUS 1989			GROWTH VERSUS 1989, % PER YEAR		
	1989	1995	2000	2010	1995	2000	2010	1995	2000	2010
MOTOR GASOLINE	54	60	65	75	6	11	21	1.8	1.7	1.6
NAPHTHA JET FUEL	-	-	-	-	-	-	-	-	-	-
KEROSENE JET FUEL	-	-	-	-	-	-	-	-	-	-
TOTAL JET FUEL	-	-	-	-	-	-	-	-	-	-
DISTILLATE 1	7	6	5	3	(1)	(2)	(4)	(2.6)	(3.1)	(3.7)
LIGHT DIESEL	93	93	93	93	-	-	-	-	-	-
HEAVY DIESEL	-	-	-	-	-	-	-	-	-	-
DISTILLATE 2 (HT OIL)	121	103	85	54	(18)	(36)	(67)	(2.6)	(3.1)	(3.7)
TOTAL DISTILLATE	222	203	184	151	(19)	(38)	(71)	(1.5)	(1.7)	(1.8)
DISTILLATE 4	30	25	22	17	(5)	(8)	(13)	(3.0)	(2.8)	(2.7)
HEAVY FUEL OIL	100	84	73	57	(16)	(27)	(43)	(3.0)	(2.8)	(2.7)
TOTAL HEAVY FUEL OIL	130	109	96	74	(21)	(34)	(56)	(3.0)	(2.8)	(2.7)
LIQUIFIED PETROLEUM GAS	60	51	47	47	(9)	(13)	(13)	(2.6)	(2.2)	(1.2)
AVIATION GASOLINE	-	-	-	-	-	-	-	-	-	-
KEROSENE	23	20	18	13	(3)	(5)	(10)	(2.1)	(2.3)	(2.6)
CHEM FEED NAPHTHA	-	-	-	-	-	-	-	-	-	-
CHEM FEED GASOIL	-	-	-	-	-	-	-	-	-	-
SPECIAL NAPHTHA	-	-	-	-	-	-	-	-	-	-
LUBRICANTS	-	-	-	-	-	-	-	-	-	-
WAX	-	-	-	-	-	-	-	-	-	-
ASPHALT & ROAD OIL	-	-	-	-	-	-	-	-	-	-
MISCELLANEOUS OIL	-	-	-	-	-	-	-	-	-	-
CRUDE OIL	-	-	-	-	-	-	-	-	-	-
STILL GAS	-	-	-	-	-	-	-	-	-	-
CATALYTIC COKE	-	-	-	-	-	-	-	-	-	-
MARKETABLE COKE	-	-	-	-	-	-	-	-	-	-
TOTAL OTHER PETROLEUM	83	71	65	60	(12)	(18)	(23)	(2.5)	(2.2)	(1.5)
TOTAL - ALL OIL	489	443	409	360	(46)	(80)	(129)	(1.6)	(1.6)	(1.5)

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FOUNDATION CASE I

NATIONAL PETROLEUM COUNCIL - REFINING STUDY
INCREASING DEMAND
TRANSPORTATION

	THOUSAND BARRELS PER DAY				DELTA VERSUS 1989			GROWTH VERSUS 1989, % PER YEAR		
	1989	1995	2000	2010	1995	2000	2010	1995	2000	2010
MOTOR GASOLINE	7168	7042	7307	7861	(126)	139	693	(0.3)	0.2	0.4
NAPHTHA JET FUEL	205	-	-	-	-	-	-	-	-	-
KEROSENE JET FUEL	1284	1609	1819	2219	325	535	935	3.8	3.2	2.6
TOTAL JET FUEL	1489	1609	1819	2219	120	330	730	1.3	1.8	1.9
DISTILLATE 1	-	-	-	-	-	-	-	-	-	-
LIGHT DIESEL	1435	1552	1694	2007	117	259	572	1.3	1.5	1.6
HEAVY DIESEL	371	401	438	519	30	67	148	1.3	1.5	1.6
DISTILLATE 2 (HT OIL)	-	-	-	-	-	-	-	-	-	-
TOTAL DISTILLATE	1806	1953	2132	2526	147	326	720	1.3	1.5	1.6
DISTILLATE 4	-	-	-	-	-	-	-	-	-	-
HEAVY FUEL OIL	360	331	362	424	(29)	2	64	(1.4)	0.1	0.8
TOTAL HEAVY FUEL OIL	360	331	362	424	(29)	2	64	(1.4)	0.1	0.8
LIQUIFIED PETROLEUM GAS	38	32	30	30	(6)	(8)	(8)	(2.6)	(2.2)	(1.2)
AVIATION GASOLINE	26	25	26	27	(1)	-	1	(0.5)	(0.1)	0.1
KEROSENE	-	-	-	-	-	-	-	-	-	-
CHEM FEED NAPHTHA	-	-	-	-	-	-	-	-	-	-
CHEM FEED GASOIL	-	-	-	-	-	-	-	-	-	-
SPECIAL NAPHTHA	-	-	-	-	-	-	-	-	-	-
LUBRICANTS	-	-	-	-	-	-	-	-	-	-
WAX	-	-	-	-	-	-	-	-	-	-
ASPHALT & ROAD OIL	-	-	-	-	-	-	-	-	-	-
MISCELLANEOUS OIL	-	-	-	-	-	-	-	-	-	-
CRUDE OIL	-	-	-	-	-	-	-	-	-	-
STILL GAS	-	-	-	-	-	-	-	-	-	-
CATALYTIC COKE	-	-	-	-	-	-	-	-	-	-
MARKETABLE COKE	-	-	-	-	-	-	-	-	-	-
TOTAL OTHER PETROLEUM	64	57	55	56	(7)	(9)	(8)	(1.7)	(1.3)	(0.6)
TOTAL - ALL OIL	10887	10993	11675	13087	106	788	2200	0.2	0.6	0.9

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FOUNDATION CASE I

NATIONAL PETROLEUM COUNCIL - REFINING STUDY
INCREASING DEMAND
INDUSTRIAL

	THOUSAND BARRELS PER DAY				DELTA VERSUS 1989			GROWTH VERSUS 1989, % PER YEAR		
	1989	1995	2000	2010	1995	2000	2010	1995	2000	2010
MOTOR GASOLINE	105	116	126	142	11	21	37	1.6	1.7	1.4
NAPHTHA JET FUEL	-	-	-	-	-	-	-	-	-	-
KEROSENE JET FUEL	-	-	-	-	-	-	-	-	-	-
TOTAL JET FUEL	-	-	-	-	-	-	-	-	-	-
DISTILLATE 1	5	5	5	5	-	-	-	-	-	-
LIGHT DIESEL	415	456	530	630	41	115	215	1.6	2.2	2.0
HEAVY DIESEL	-	-	-	-	-	-	-	-	-	-
DISTILLATE 2 (HT OIL)	112	123	143	170	11	31	58	1.6	2.2	2.0
TOTAL DISTILLATE	531	583	677	804	52	146	273	1.6	2.2	2.0
DISTILLATE 4	9	9	9	9	-	-	-	-	-	-
HEAVY FUEL OIL	271	280	301	336	9	30	65	0.5	1.0	1.0
TOTAL HEAVY FUEL OIL	279	288	310	345	9	31	66	0.5	0.9	1.0
LIQUIFIED PETROLEUM GAS	1154	1218	1375	1661	64	221	507	0.9	1.6	1.7
AVIATION GASOLINE	-	-	-	-	-	-	-	-	-	-
KEROSENE	21	21	21	21	-	-	-	0.1	0.1	-
CHEM FEED NAPHTHA	203	232	267	327	29	64	124	2.3	2.5	2.3
CHEM FEED GASOIL	257	293	338	414	36	81	157	2.3	2.5	2.3
SPECIAL NAPHTHA	56	54	56	57	(2)	-	1	(0.5)	(0.1)	0.1
LUBRICANTS	159	154	158	163	(5)	(1)	4	(0.5)	(0.1)	0.1
WAX	17	16	16	17	(1)	(1)	-	(0.5)	(0.1)	0.1
ASPHALT & ROAD OIL	453	439	449	464	(14)	(4)	11	(0.5)	(0.1)	0.1
MISCELLANEOUS OIL	72	70	72	74	(2)	-	2	(0.5)	(0.1)	0.1
CRUDE OIL	28	27	28	29	(1)	-	1	(0.5)	(0.1)	0.1
STILL GAS	681	661	676	699	(20)	(5)	18	(0.5)	(0.1)	0.1
CATALYTIC COKE	212	205	210	217	(7)	(2)	5	(0.5)	(0.1)	0.1
MARKETABLE COKE	96	93	95	98	(3)	(1)	2	(0.5)	(0.1)	0.1
TOTAL OTHER PETROLEUM	3407	3485	3760	4243	78	353	836	0.4	0.9	1.1
TOTAL - ALL OIL	4323	4472	4873	5534	149	550	1211	0.6	1.1	1.2

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FOUNDATION CASE I

NATIONAL PETROLEUM COUNCIL - REFINING STUDY
INCREASING DEMAND
ELECTRIC UTILITY

	THOUSAND BARRELS PER DAY				DELTA VERSUS 1989			GROWTH VERSUS 1989, % PER YEAR		
	1989	1995	2000	2010	1995	2000	2010	1995	2000	2010
MOTOR GASOLINE	-	-	-	-	-	-	-	-	-	-
NAPHTHA JET FUEL	-	-	-	-	-	-	-	-	-	-
KEROSENE JET FUEL	-	-	-	-	-	-	-	-	-	-
TOTAL JET FUEL	-	-	-	-	-	-	-	-	-	-
DISTILLATE 1	-	-	-	-	-	-	-	-	-	-
LIGHT DIESEL	-	-	-	-	-	-	-	-	-	-
HEAVY DIESEL	-	-	-	-	-	-	-	-	-	-
DISTILLATE 2 (HT OIL)	70	61	113	94	(9)	43	24	(2.4)	4.4	1.4
TOTAL DISTILLATE	70	61	113	94	(9)	43	24	(2.4)	4.4	1.4
DISTILLATE 4	-	-	-	-	-	-	-	-	-	-
HEAVY FUEL OIL	639	561	761	626	(78)	122	(13)	(2.2)	1.6	(0.1)
TOTAL HEAVY FUEL OIL	639	561	761	626	(78)	122	(13)	(2.2)	1.6	(0.1)
LIQUIFIED PETROLEUM GAS	-	-	-	-	-	-	-	-	-	-
AVIATION GASOLINE	-	-	-	-	-	-	-	-	-	-
KEROSENE	-	-	-	-	-	-	-	-	-	-
CHEM FEED NAPHTHA	-	-	-	-	-	-	-	-	-	-
CHEM FEED GASOIL	-	-	-	-	-	-	-	-	-	-
SPECIAL NAPHTHA	-	-	-	-	-	-	-	-	-	-
LUBRICANTS	-	-	-	-	-	-	-	-	-	-
WAX	-	-	-	-	-	-	-	-	-	-
ASPHALT & ROAD OIL	-	-	-	-	-	-	-	-	-	-
MISCELLANEOUS OIL	-	-	-	-	-	-	-	-	-	-
CRUDE OIL	-	-	-	-	-	-	-	-	-	-
STILL GAS	-	-	-	-	-	-	-	-	-	-
CATALYTIC COKE	-	-	-	-	-	-	-	-	-	-
MARKETABLE COKE	-	-	-	-	-	-	-	-	-	-
TOTAL OTHER PETROLEUM	-	-	-	-	-	-	-	-	-	-
TOTAL - ALL OIL	710	622	874	720	(88)	164	10	(2.2)	1.9	0.1

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FOUNDATION CASE I

NATIONAL PETROLEUM COUNCIL - REFINING STUDY
INCREASING DEMAND
TOTAL U.S.

	THOUSAND BARRELS PER DAY				DELTA VERSUS 1989			GROWTH VERSUS 1989, % PER YEAR		
	1989	1995	2000	2010	1995	2000	2010	1995	2000	2010
MOTOR GASOLINE	7328	7218	7498	8078	(110)	170	750	(0.3)	0.2	0.5
NAPHTHA JET FUEL	205	-	-	-	-	-	-	-	-	-
KEROSENE JET FUEL	1284	1609	1819	2219	325	535	935	3.8	3.2	2.6
TOTAL JET FUEL	1489	1609	1819	2219	120	330	730	1.3	1.8	1.9
DISTILLATE 1	30	27	23	18	(3)	(7)	(12)	(2.0)	(2.3)	(2.4)
LIGHT DIESEL	1943	2101	2317	2730	158	374	787	1.3	1.6	1.6
HEAVY DIESEL	371	401	438	519	30	67	148	1.3	1.5	1.6
DISTILLATE 2 (HT OIL)	774	699	690	581	(75)	(84)	(193)	(1.7)	(1.0)	(1.4)
TOTAL DISTILLATE	3118	3228	3468	3848	110	350	730	0.6	1.0	1.0
DISTILLATE 4	39	34	31	26	(5)	(8)	(13)	(2.3)	(2.1)	(2.0)
HEAVY FUEL OIL	1370	1255	1498	1443	(115)	128	73	(1.5)	0.8	0.2
TOTAL HEAVY FUEL OIL	1409	1289	1529	1469	(120)	120	60	(1.5)	0.7	0.2
LIQUIFIED PETROLEUM GAS	1620	1627	1748	1984	7	128	364	0.1	0.7	1.0
AVIATION GASOLINE	26	25	26	27	(1)	-	1	(0.5)	(0.1)	0.1
KEROSENE	84	75	65	50	(9)	(19)	(34)	(2.0)	(2.3)	(2.4)
CHEM FEED NAPHTHA	203	232	267	327	29	64	124	2.3	2.5	2.3
CHEM FEED GASOIL	257	293	338	414	36	81	157	2.3	2.5	2.3
SPECIAL NAPHTHA	56	54	56	57	(2)	-	1	(0.5)	(0.1)	0.1
LUBRICANTS	159	154	158	163	(5)	(1)	4	(0.5)	(0.1)	0.1
WAX	17	16	16	17	(1)	(1)	-	(0.5)	(0.1)	0.1
ASPHALT & ROAD OIL	453	439	449	464	(14)	(4)	11	(0.5)	(0.1)	0.1
MISCELLANEOUS OIL	72	70	72	74	(2)	-	2	(0.5)	(0.1)	0.1
CRUDE OIL	28	27	28	29	(1)	-	1	(0.5)	(0.1)	0.1
STILL GAS	681	661	676	699	(20)	(5)	18	(0.5)	(0.1)	0.1
CATALYTIC COKE	212	205	210	217	(7)	(2)	5	(0.5)	(0.1)	0.1
MARKETABLE COKE	96	93	95	98	(3)	(1)	2	(0.5)	(0.1)	0.1
TOTAL OTHER PETROLEUM	3962	3972	4202	4622	10	240	660	-	0.5	0.7
TOTAL - ALL OIL	17306	17316	18516	20236	10	1210	2930	-	0.6	0.7

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FOUNDATION CASE II

NATIONAL PETROLEUM COUNCIL - REFINING STUDY
NO DEMAND INCREASE
RESIDENTIAL

	THOUSAND BARRELS PER DAY				DELTA VERSUS 1989			GROWTH VERSUS 1989, % PER YEAR		
	1989	1995	2000	2010	1995	2000	2010	1995	2000	2010
MOTOR GASOLINE	-	-	-	-	-	-	-	-	-	-
NAPHTHA JET FUEL	-	-	-	-	-	-	-	-	-	-
KEROSENE JET FUEL	-	-	-	-	-	-	-	-	-	-
TOTAL JET FUEL	-	-	-	-	-	-	-	-	-	-
DISTILLATE 1	18	15	12	8	(3)	(6)	(10)	(2.8)	(3.6)	(3.7)
LIGHT DIESEL	-	-	-	-	-	-	-	-	-	-
HEAVY DIESEL	-	-	-	-	-	-	-	-	-	-
DISTILLATE 2 (HT OIL)	471	398	314	213	(73)	(157)	(258)	(2.8)	(3.6)	(3.7)
TOTAL DISTILLATE	489	414	326	221	(75)	(163)	(268)	(2.8)	(3.6)	(3.7)
DISTILLATE 4	-	-	-	-	-	-	-	-	-	-
HEAVY FUEL OIL	-	-	-	-	-	-	-	-	-	-
TOTAL HEAVY FUEL OIL	-	-	-	-	-	-	-	-	-	-
LIQUIFIED PETROLEUM GAS	368	324	280	212	(44)	(88)	(156)	(2.1)	(2.5)	(2.6)
AVIATION GASOLINE	-	-	-	-	-	-	-	-	-	-
KEROSENE	40	33	24	14	(7)	(16)	(26)	(3.2)	(4.5)	(5.0)
CHEM FEED NAPHTHA	-	-	-	-	-	-	-	-	-	-
CHEM FEED GASOIL	-	-	-	-	-	-	-	-	-	-
SPECIAL NAPHTHA	-	-	-	-	-	-	-	-	-	-
LUBRICANTS	-	-	-	-	-	-	-	-	-	-
WAX	-	-	-	-	-	-	-	-	-	-
ASPHALT & ROAD OIL	-	-	-	-	-	-	-	-	-	-
MISCELLANEOUS OIL	-	-	-	-	-	-	-	-	-	-
CRUDE OIL	-	-	-	-	-	-	-	-	-	-
STILL GAS	-	-	-	-	-	-	-	-	-	-
CATALYTIC COKE	-	-	-	-	-	-	-	-	-	-
MARKETABLE COKE	-	-	-	-	-	-	-	-	-	-
TOTAL OTHER PETROLEUM	408	358	304	225	(50)	(104)	(183)	(2.2)	(2.6)	(2.8)
TOTAL - ALL OIL	898	771	630	447	(127)	(268)	(451)	(2.5)	(3.2)	(3.3)

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FOUNDATION CASE II

NATIONAL PETROLEUM COUNCIL - REFINING STUDY
NO DEMAND INCREASE
COMMERCIAL

	THOUSAND BARRELS PER DAY				DELTA VERSUS 1989			GROWTH VERSUS 1989, % PER YEAR		
	1989	1995	2000	2010	1995	2000	2010	1995	2000	2010
MOTOR GASOLINE	54	60	63	67	6	9	13	1.8	1.3	1.0
NAPHTHA JET FUEL	-	-	-	-	-	-	-	-	-	-
KEROSENE JET FUEL	-	-	-	-	-	-	-	-	-	-
TOTAL JET FUEL	-	-	-	-	-	-	-	-	-	-
DISTILLATE 1	7	6	5	3	(1)	(2)	(4)	(3.2)	(4.0)	(4.7)
LIGHT DIESEL	93	90	84	76	(3)	(9)	(17)	(0.6)	(1.0)	(1.0)
HEAVY DIESEL	-	-	-	-	-	-	-	-	-	-
DISTILLATE 2 (HT OIL)	121	100	77	44	(21)	(44)	(77)	(3.2)	(4.0)	(4.7)
TOTAL DISTILLATE	222	196	165	122	(26)	(57)	(100)	(2.0)	(2.6)	(2.8)
DISTILLATE 4	30	25	19	15	(5)	(11)	(15)	(3.0)	(4.3)	(3.3)
HEAVY FUEL OIL	100	84	62	50	(16)	(38)	(50)	(3.0)	(4.3)	(3.3)
TOTAL HEAVY FUEL OIL	130	109	81	65	(21)	(49)	(65)	(3.0)	(4.3)	(3.3)
LIQUIFIED PETROLEUM GAS	60	51	44	40	(9)	(16)	(20)	(2.6)	(2.7)	(1.9)
AVIATION GASOLINE	-	-	-	-	-	-	-	-	-	-
KEROSENE	23	20	17	11	(3)	(6)	(12)	(2.2)	(2.8)	(3.3)
CHEM FEED NAPHTHA	-	-	-	-	-	-	-	-	-	-
CHEM FEED GASOIL	-	-	-	-	-	-	-	-	-	-
SPECIAL NAPHTHA	-	-	-	-	-	-	-	-	-	-
LUBRICANTS	-	-	-	-	-	-	-	-	-	-
WAX	-	-	-	-	-	-	-	-	-	-
ASPHALT & ROAD OIL	-	-	-	-	-	-	-	-	-	-
MISCELLANEOUS OIL	-	-	-	-	-	-	-	-	-	-
CRUDE OIL	-	-	-	-	-	-	-	-	-	-
STILL GAS	-	-	-	-	-	-	-	-	-	-
CATALYTIC COKE	-	-	-	-	-	-	-	-	-	-
MARKETABLE COKE	-	-	-	-	-	-	-	-	-	-
TOTAL OTHER PETROLEUM	83	71	61	51	(12)	(22)	(32)	(2.5)	(2.8)	(2.2)
TOTAL - ALL OIL	489	436	369	305	(53)	(120)	(184)	(1.9)	(2.5)	(2.2)

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FOUNDATION CASE II

NATIONAL PETROLEUM COUNCIL - REFINING STUDY
NO DEMAND INCREASE
TRANSPORTATION

	THOUSAND BARRELS PER DAY				DELTA VERSUS 1989			GROWTH VERSUS 1989, % PER YEAR		
	1989	1995	2000	2010	1995	2000	2010	1995	2000	2010
MOTOR GASOLINE	7168	7042	7034	7024	(126)	(134)	(144)	(0.3)	(0.2)	(0.1)
NAPHTHA JET FUEL	205	-	-	-	-	-	-	-	-	-
KEROSENE JET FUEL	1284	1489	1489	1489	205	205	205	2.5	1.4	0.7
TOTAL JET FUEL	1489	1489	1489	1489	-	-	-	-	-	-
DISTILLATE 1	-	-	-	-	-	-	-	-	-	-
LIGHT DIESEL	1435	1499	1523	1626	64	88	191	0.7	0.5	0.6
HEAVY DIESEL	371	388	394	421	17	23	50	0.7	0.5	0.6
DISTILLATE 2 (HT OIL)	-	-	-	-	-	-	-	-	-	-
TOTAL DISTILLATE	1806	1887	1917	2047	81	111	241	0.7	0.5	0.6
DISTILLATE 4	-	-	-	-	-	-	-	-	-	-
HEAVY FUEL OIL	360	331	305	372	(29)	(55)	12	(1.4)	(1.5)	0.2
TOTAL HEAVY FUEL OIL	360	331	305	372	(29)	(55)	12	(1.4)	(1.5)	0.2
LIQUIFIED PETROLEUM GAS	38	32	28	25	(6)	(10)	(13)	(2.6)	(2.7)	(1.9)
AVIATION GASOLINE	26	25	24	23	(1)	(2)	(3)	(0.5)	(0.6)	(0.6)
KEROSENE	-	-	-	-	-	-	-	-	-	-
CHEM FEED NAPHTHA	-	-	-	-	-	-	-	-	-	-
CHEM FEED GASOIL	-	-	-	-	-	-	-	-	-	-
SPECIAL NAPHTHA	-	-	-	-	-	-	-	-	-	-
LUBRICANTS	-	-	-	-	-	-	-	-	-	-
WAX	-	-	-	-	-	-	-	-	-	-
ASPHALT & ROAD OIL	-	-	-	-	-	-	-	-	-	-
MISCELLANEOUS OIL	-	-	-	-	-	-	-	-	-	-
CRUDE OIL	-	-	-	-	-	-	-	-	-	-
STILL GAS	-	-	-	-	-	-	-	-	-	-
CATALYTIC COKE	-	-	-	-	-	-	-	-	-	-
MARKETABLE COKE	-	-	-	-	-	-	-	-	-	-
TOTAL OTHER PETROLEUM	64	57	52	48	(7)	(12)	(16)	(1.8)	(1.8)	(1.3)
TOTAL - ALL OIL	10887	10807	10797	10981	(80)	(90)	94	(0.1)	(0.1)	-

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FOUNDATION CASE II

NATIONAL PETROLEUM COUNCIL - REFINING STUDY
NO DEMAND INCREASE
INDUSTRIAL

	THOUSAND BARRELS PER DAY				DELTA VERSUS 1989			GROWTH VERSUS 1989, % PER YEAR		
	1989	1995	2000	2010	1995	2000	2010	1995	2000	2010
MOTOR GASOLINE	105	116	122	127	11	17	22	1.6	1.3	0.9
NAPHTHA JET FUEL	-	-	-	-	-	-	-	-	-	-
KEROSENE JET FUEL	-	-	-	-	-	-	-	-	-	-
TOTAL JET FUEL	-	-	-	-	-	-	-	-	-	-
DISTILLATE 1	5	4	4	4	(1)	(1)	(1)	(0.6)	(1.0)	(1.0)
LIGHT DIESEL	415	440	476	510	25	61	95	1.0	1.3	1.0
HEAVY DIESEL	-	-	-	-	-	-	-	-	-	-
DISTILLATE 2 (HT OIL)	112	119	128	138	7	16	26	1.0	1.3	1.0
TOTAL DISTILLATE	531	563	609	651	32	78	120	1.0	1.2	1.0
DISTILLATE 4	9	9	7	7	-	(2)	(2)	-	(1.5)	(0.6)
HEAVY FUEL OIL	271	280	254	295	9	(17)	24	0.5	(0.6)	0.4
TOTAL HEAVY FUEL OIL	279	288	261	302	9	(18)	23	0.5	(0.6)	0.4
LIQUIFIED PETROLEUM GAS	1154	1215	1297	1424	61	143	270	0.9	1.1	1.0
AVIATION GASOLINE	-	-	-	-	-	-	-	-	-	-
KEROSENE	21	21	20	18	-	(1)	(3)	-	(0.4)	(0.7)
CHEM FEED NAPHTHA	203	231	252	281	28	49	78	2.2	2.0	1.6
CHEM FEED GASOIL	257	293	319	355	36	62	98	2.2	2.0	1.6
SPECIAL NAPHTHA	56	54	52	49	(2)	(4)	(7)	(0.5)	(0.6)	(0.6)
LUBRICANTS	159	154	149	140	(5)	(10)	(19)	(0.5)	(0.6)	(0.6)
WAX	17	16	15	15	(1)	(2)	(2)	(0.5)	(0.6)	(0.6)
ASPHALT & ROAD OIL	453	438	423	398	(15)	(30)	(55)	(0.5)	(0.6)	(0.6)
MISCELLANEOUS OIL	72	70	68	64	(2)	(4)	(8)	(0.5)	(0.6)	(0.6)
CRUDE OIL	28	27	26	25	(1)	(2)	(3)	(0.5)	(0.6)	(0.6)
STILL GAS	681	659	637	599	(22)	(44)	(82)	(0.5)	(0.6)	(0.6)
CATALYTIC COKE	212	205	198	186	(7)	(14)	(26)	(0.5)	(0.6)	(0.6)
MARKETABLE COKE	96	93	90	84	(3)	(6)	(12)	(0.5)	(0.6)	(0.6)
TOTAL OTHER PETROLEUM	3407	3476	3545	3637	69	138	230	0.3	0.4	0.3
TOTAL - ALL OIL	4323	4443	4537	4718	120	214	395	0.5	0.4	0.4

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APP L.III.3-59

FOUNDATION CASE II

NATIONAL PETROLEUM COUNCIL - REFINING STUDY
NO DEMAND INCREASE
ELECTRIC UTILITY

	THOUSAND BARRELS PER DAY				DELTA VERSUS 1989			GROWTH VERSUS 1989, % PER YEAR		
	1989	1995	2000	2010	1995	2000	2010	1995	2000	2010
MOTOR GASOLINE	-	-	-	-	-	-	-	-	-	-
NAPHTHA JET FUEL	-	-	-	-	-	-	-	-	-	-
KEROSENE JET FUEL	-	-	-	-	-	-	-	-	-	-
TOTAL JET FUEL	-	-	-	-	-	-	-	-	-	-
DISTILLATE 1	-	-	-	-	-	-	-	-	-	-
LIGHT DIESEL	-	-	-	-	-	-	-	-	-	-
HEAVY DIESEL	-	-	-	-	-	-	-	-	-	-
DISTILLATE 2 (HT OIL)	70	59	101	76	(11)	31	6	(2.9)	3.4	0.4
TOTAL DISTILLATE	70	59	101	76	(11)	31	6	(2.9)	3.4	0.4
DISTILLATE 4	-	-	-	-	-	-	-	-	-	-
HEAVY FUEL OIL	639	561	642	549	(78)	3	(90)	(2.2)	-	(0.7)
TOTAL HEAVY FUEL OIL	639	561	642	549	(78)	3	(90)	(2.2)	-	(0.7)
LIQUIFIED PETROLEUM GAS	-	-	-	-	-	-	-	-	-	-
AVIATION GASOLINE	-	-	-	-	-	-	-	-	-	-
KEROSENE	-	-	-	-	-	-	-	-	-	-
CHEM FEED NAPHTHA	-	-	-	-	-	-	-	-	-	-
CHEM FEED GASOIL	-	-	-	-	-	-	-	-	-	-
SPECIAL NAPHTHA	-	-	-	-	-	-	-	-	-	-
LUBRICANTS	-	-	-	-	-	-	-	-	-	-
WAX	-	-	-	-	-	-	-	-	-	-
ASPHALT & ROAD OIL	-	-	-	-	-	-	-	-	-	-
MISCELLANEOUS OIL	-	-	-	-	-	-	-	-	-	-
CRUDE OIL	-	-	-	-	-	-	-	-	-	-
STILL GAS	-	-	-	-	-	-	-	-	-	-
CATALYTIC COKE	-	-	-	-	-	-	-	-	-	-
MARKETABLE COKE	-	-	-	-	-	-	-	-	-	-
TOTAL OTHER PETROLEUM	-	-	-	-	-	-	-	-	-	-
TOTAL - ALL OIL	710	620	743	625	(90)	33	(85)	(2.2)	0.4	(0.6)

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FOUNDATION CASE II

NATIONAL PETROLEUM COUNCIL - REFINING STUDY
NO DEMAND INCREASE
TOTAL U.S.

	THOUSAND BARRELS PER DAY				DELTA VERSUS 1989			GROWTH VERSUS 1989, % PER YEAR		
	1989	1995	2000	2010	1995	2000	2010	1995	2000	2010
MOTOR GASOLINE	7328	7218	7218	7218	(110)	(110)	(110)	(0.3)	(0.1)	(0.1)
NAPHTHA JET FUEL	205	-	-	-	-	-	-	-	-	-
KEROSENE JET FUEL	1284	1489	1489	1489	205	205	205	2.5	1.4	0.7
TOTAL JET FUEL	1489	1489	1489	1489	-	-	-	-	-	-
DISTILLATE 1	30	26	21	15	(4)	(9)	(15)	(2.5)	(3.3)	(3.4)
LIGHT DIESEL	1943	2029	2083	2212	86	140	269	0.7	0.6	0.6
HEAVY DIESEL	371	388	394	421	17	23	50	0.7	0.5	0.6
DISTILLATE 2 (HT OIL)	774	675	620	471	(99)	(154)	(303)	(2.3)	(2.0)	(2.3)
TOTAL DISTILLATE	3118	3118	3118	3118	-	-	-	-	-	-
DISTILLATE 4	39	34	26	22	(5)	(13)	(17)	(2.3)	(3.6)	(2.6)
HEAVY FUEL OIL	1370	1255	1263	1266	(115)	(107)	(104)	(1.5)	(0.7)	(0.4)
TOTAL HEAVY FUEL OIL	1409	1289	1289	1289	(120)	(120)	(120)	(1.5)	(0.8)	(0.4)
LIQUIFIED PETROLEUM GAS	1620	1623	1649	1701	3	29	81	-	0.2	0.2
AVIATION GASOLINE	26	25	24	23	(1)	(2)	(3)	(0.5)	(0.6)	(0.6)
KEROSENE	84	74	61	43	(10)	(23)	(41)	(2.1)	(2.9)	(3.1)
CHEM FEED NAPHTHA	203	231	252	281	28	49	78	2.2	2.0	1.6
CHEM FEED GASOIL	257	293	319	355	36	62	98	2.2	2.0	1.6
SPECIAL NAPHTHA	56	54	52	49	(2)	(4)	(7)	(0.5)	(0.6)	(0.6)
LUBRICANTS	159	154	149	140	(5)	(10)	(19)	(0.5)	(0.6)	(0.6)
WAX	17	16	15	15	(1)	(2)	(2)	(0.5)	(0.6)	(0.6)
ASPHALT & ROAD OIL	453	438	423	398	(15)	(30)	(55)	(0.5)	(0.6)	(0.6)
MISCELLANEOUS OIL	72	70	68	64	(2)	(4)	(8)	(0.5)	(0.6)	(0.6)
CRUDE OIL	28	27	26	25	(1)	(2)	(3)	(0.5)	(0.6)	(0.6)
STILL GAS	681	659	637	599	(22)	(44)	(82)	(0.5)	(0.6)	(0.6)
CATALYTIC COKE	212	205	198	186	(7)	(14)	(26)	(0.5)	(0.6)	(0.6)
MARKETABLE COKE	96	93	90	84	(3)	(6)	(12)	(0.5)	(0.6)	(0.6)
TOTAL OTHER PETROLEUM	3962	3962	3962	3962	-	-	-	-	-	-
TOTAL - ALL OIL	17306	17076	17076	17076	(230)	(230)	(230)	(0.2)	(0.1)	(0.1)

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APP L.III.3-60

FOUNDATION CASE III

NATIONAL PETROLEUM COUNCIL - REFINING STUDY
DECREASING DEMAND
RESIDENTIAL

	THOUSAND BARRELS PER DAY				DELTA VERSUS 1989			GROWTH VERSUS 1989, % PER YEAR		
	1989	1995	2000	2010	1995	2000	2010	1995	2000	2010
MOTOR GASOLINE	-	-	-	-	-	-	-	-	-	-
NAPHTHA JET FUEL	-	-	-	-	-	-	-	-	-	-
KEROSENE JET FUEL	-	-	-	-	-	-	-	-	-	-
TOTAL JET FUEL	-	-	-	-	-	-	-	-	-	-
DISTILLATE 1	18	15	11	7	(3)	(7)	(11)	(3.0)	(4.1)	(4.4)
LIGHT DIESEL	-	-	-	-	-	-	-	-	-	-
HEAVY DIESEL	-	-	-	-	-	-	-	-	-	-
DISTILLATE 2 (HT OIL)	471	392	297	185	(79)	(174)	(286)	(3.0)	(4.1)	(4.4)
TOTAL DISTILLATE	489	407	308	192	(82)	(181)	(297)	(3.0)	(4.1)	(4.4)
DISTILLATE 4	-	-	-	-	-	-	-	-	-	-
HEAVY FUEL OIL	-	-	-	-	-	-	-	-	-	-
TOTAL HEAVY FUEL OIL	-	-	-	-	-	-	-	-	-	-
LIQUIFIED PETROLEUM GAS	368	324	263	176	(44)	(105)	(192)	(2.1)	(3.0)	(3.4)
AVIATION GASOLINE	-	-	-	-	-	-	-	-	-	-
KEROSENE	40	33	23	12	(7)	(17)	(28)	(3.2)	(5.0)	(5.8)
CHEM FEED NAPHTHA	-	-	-	-	-	-	-	-	-	-
CHEM FEED GASOIL	-	-	-	-	-	-	-	-	-	-
SPECIAL NAPHTHA	-	-	-	-	-	-	-	-	-	-
LUBRICANTS	-	-	-	-	-	-	-	-	-	-
WAX	-	-	-	-	-	-	-	-	-	-
ASPHALT & ROAD OIL	-	-	-	-	-	-	-	-	-	-
MISCELLANEOUS OIL	-	-	-	-	-	-	-	-	-	-
CRUDE OIL	-	-	-	-	-	-	-	-	-	-
STILL GAS	-	-	-	-	-	-	-	-	-	-
CATALYTIC COKE	-	-	-	-	-	-	-	-	-	-
MARKETABLE COKE	-	-	-	-	-	-	-	-	-	-
TOTAL OTHER PETROLEUM	408	357	286	188	(51)	(122)	(220)	(2.2)	(3.2)	(3.6)
TOTAL - ALL OIL	898	764	594	380	(134)	(304)	(518)	(2.6)	(3.7)	(4.0)

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FOUNDATION CASE III

NATIONAL PETROLEUM COUNCIL - REFINING STUDY
DECREASING DEMAND
COMMERCIAL

	THOUSAND BARRELS PER DAY				DELTA VERSUS 1989			GROWTH VERSUS 1989, % PER YEAR		
	1989	1995	2000	2010	1995	2000	2010	1995	2000	2010
MOTOR GASOLINE	54	60	60	59	6	6	5	1.8	1.0	0.4
NAPHTHA JET FUEL	-	-	-	-	-	-	-	-	-	-
KEROSENE JET FUEL	-	-	-	-	-	-	-	-	-	-
TOTAL JET FUEL	-	-	-	-	-	-	-	-	-	-
DISTILLATE 1	7	6	4	2	(1)	(3)	(5)	(3.4)	(4.5)	(5.3)
LIGHT DIESEL	93	89	79	66	(4)	(14)	(27)	(0.8)	(1.5)	(1.7)
HEAVY DIESEL	-	-	-	-	-	-	-	-	-	-
DISTILLATE 2 (HT OIL)	121	98	73	38	(23)	(48)	(83)	(3.4)	(4.5)	(5.3)
TOTAL DISTILLATE	222	193	157	106	(29)	(65)	(116)	(2.3)	(3.1)	(3.4)
DISTILLATE 4	30	25	15	12	(5)	(15)	(18)	(3.0)	(6.1)	(4.2)
HEAVY FUEL OIL	100	84	50	41	(16)	(50)	(59)	(3.0)	(6.1)	(4.2)
TOTAL HEAVY FUEL OIL	130	109	66	53	(21)	(64)	(77)	(3.0)	(6.1)	(4.2)
LIQUIFIED PETROLEUM GAS	60	51	41	33	(9)	(19)	(27)	(2.7)	(3.3)	(2.7)
AVIATION GASOLINE	-	-	-	-	-	-	-	-	-	-
KEROSENE	23	20	16	9	(3)	(7)	(14)	(2.2)	(3.3)	(4.1)
CHEM FEED NAPHTHA	-	-	-	-	-	-	-	-	-	-
CHEM FEED GASOIL	-	-	-	-	-	-	-	-	-	-
SPECIAL NAPHTHA	-	-	-	-	-	-	-	-	-	-
LUBRICANTS	-	-	-	-	-	-	-	-	-	-
WAX	-	-	-	-	-	-	-	-	-	-
ASPHALT & ROAD OIL	-	-	-	-	-	-	-	-	-	-
MISCELLANEOUS OIL	-	-	-	-	-	-	-	-	-	-
CRUDE OIL	-	-	-	-	-	-	-	-	-	-
STILL GAS	-	-	-	-	-	-	-	-	-	-
CATALYTIC COKE	-	-	-	-	-	-	-	-	-	-
MARKETABLE COKE	-	-	-	-	-	-	-	-	-	-
TOTAL OTHER PETROLEUM	83	71	57	43	(12)	(26)	(40)	(2.5)	(3.3)	(3.1)
TOTAL - ALL OIL	489	432	339	261	(57)	(150)	(228)	(2.0)	(3.3)	(2.9)

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APP L.III.3-63

FOUNDATION CASE III

NATIONAL PETROLEUM COUNCIL - REFINING STUDY
DECREASING DEMAND
TRANSPORTATION

	THOUSAND BARRELS PER DAY				DELTA VERSUS 1989			GROWTH VERSUS 1989, % PER YEAR		
	1989	1995	2000	2010	1995	2000	2010	1995	2000	2010
MOTOR GASOLINE	7168	7042	6761	6187	(126)	(407)	(981)	(0.3)	(0.5)	(0.7)
NAPHTHA JET FUEL	205	-	-	-	-	-	-	-	-	-
KEROSENE JET FUEL	1284	1467	1410	1292	183	126	8	2.2	0.9	-
TOTAL JET FUEL	1489	1467	1410	1292	(22)	(79)	(197)	(0.3)	(0.5)	(0.7)
DISTILLATE 1	-	-	-	-	-	-	-	-	-	-
LIGHT DIESEL	1435	1476	1442	1411	41	7	(24)	0.5	-	(0.1)
HEAVY DIESEL	371	382	373	365	11	2	(6)	0.5	-	(0.1)
DISTILLATE 2 (HT OIL)	-	-	-	-	-	-	-	-	-	-
TOTAL DISTILLATE	1806	1858	1815	1776	52	9	(30)	0.5	-	(0.1)
DISTILLATE 4	-	-	-	-	-	-	-	-	-	-
HEAVY FUEL OIL	360	331	248	303	(29)	(112)	(57)	(1.4)	(3.3)	(0.8)
TOTAL HEAVY FUEL OIL	360	331	248	303	(29)	(112)	(57)	(1.4)	(3.3)	(0.8)
LIQUIFIED PETROLEUM GAS	38	32	26	21	(6)	(12)	(17)	(2.7)	(3.3)	(2.7)
AVIATION GASOLINE	26	25	23	19	(1)	(3)	(7)	(0.6)	(1.2)	(1.5)
KEROSENE	-	-	-	-	-	-	-	-	-	-
CHEM FEED NAPHTHA	-	-	-	-	-	-	-	-	-	-
CHEM FEED GASOIL	-	-	-	-	-	-	-	-	-	-
SPECIAL NAPHTHA	-	-	-	-	-	-	-	-	-	-
LUBRICANTS	-	-	-	-	-	-	-	-	-	-
WAX	-	-	-	-	-	-	-	-	-	-
ASPHALT & ROAD OIL	-	-	-	-	-	-	-	-	-	-
MISCELLANEOUS OIL	-	-	-	-	-	-	-	-	-	-
CRUDE OIL	-	-	-	-	-	-	-	-	-	-
STILL GAS	-	-	-	-	-	-	-	-	-	-
CATALYTIC COKE	-	-	-	-	-	-	-	-	-	-
MARKETABLE COKE	-	-	-	-	-	-	-	-	-	-
TOTAL OTHER PETROLEUM	64	57	49	40	(7)	(15)	(24)	(1.8)	(2.4)	(2.2)
TOTAL - ALL OIL	10887	10756	10283	9598	(131)	(604)	(1289)	(0.2)	(0.5)	(0.6)

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FOUNDATION CASE III

NATIONAL PETROLEUM COUNCIL - REFINING STUDY
DECREASING DEMAND
INDUSTRIAL

	THOUSAND BARRELS PER DAY				DELTA VERSUS 1989			GROWTH VERSUS 1989, % PER YEAR		
	1989	1995	2000	2010	1995	2000	2010	1995	2000	2010
MOTOR GASOLINE	105	116	117	112	11	12	7	1.6	0.9	0.3
NAPHTHA JET FUEL	-	-	-	-	-	-	-	-	-	-
KEROSENE JET FUEL	-	-	-	-	-	-	-	-	-	-
TOTAL JET FUEL	-	-	-	-	-	-	-	-	-	-
DISTILLATE 1	5	4	4	3	(1)	(1)	(2)	(0.8)	(1.5)	(1.7)
LIGHT DIESEL	415	433	451	443	18	36	28	0.7	0.8	0.3
HEAVY DIESEL	-	-	-	-	-	-	-	-	-	-
DISTILLATE 2 (HT OIL)	112	117	122	119	5	10	7	0.7	0.8	0.3
TOTAL DISTILLATE	531	555	576	565	24	45	34	0.7	0.7	0.3
DISTILLATE 4	9	9	6	6	-	(3)	(3)	-	(3.4)	(1.6)
HEAVY FUEL OIL	271	280	207	240	9	(64)	(31)	0.5	(2.4)	(0.6)
TOTAL HEAVY FUEL OIL	279	288	213	246	9	(66)	(33)	0.5	(2.5)	(0.6)
LIQUIFIED PETROLEUM GAS	1154	1212	1218	1187	58	64	33	0.8	0.5	0.1
AVIATION GASOLINE	-	-	-	-	-	-	-	-	-	-
KEROSENE	21	21	19	15	-	(2)	(6)	-	(1.0)	(1.6)
CHEM FEED NAPHTHA	203	231	237	234	28	34	31	2.2	1.4	0.7
CHEM FEED GASOIL	257	292	299	296	35	42	39	2.2	1.4	0.7
SPECIAL NAPHTHA	56	54	49	41	(2)	(7)	(15)	(0.6)	(1.2)	(1.5)
LUBRICANTS	159	154	140	117	(5)	(19)	(42)	(0.6)	(1.2)	(1.5)
WAX	17	16	15	12	(1)	(2)	(5)	(0.6)	(1.2)	(1.5)
ASPHALT & ROAD OIL	453	437	397	332	(16)	(56)	(121)	(0.6)	(1.2)	(1.5)
MISCELLANEOUS OIL	72	70	64	53	(2)	(8)	(19)	(0.6)	(1.2)	(1.5)
CRUDE OIL	28	27	24	20	(1)	(4)	(8)	(0.6)	(1.2)	(1.5)
STILL GAS	681	658	598	500	(23)	(83)	(181)	(0.6)	(1.2)	(1.5)
CATALYTIC COKE	212	204	186	155	(8)	(26)	(57)	(0.6)	(1.2)	(1.5)
MARKETABLE COKE	96	92	84	70	(4)	(12)	(26)	(0.6)	(1.2)	(1.5)
TOTAL OTHER PETROLEUM	3407	3467	3330	3032	60	(77)	(375)	0.3	(0.2)	(0.6)
TOTAL - ALL OIL	4323	4426	4236	3955	103	(87)	(368)	0.4	(0.2)	(0.4)

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FOUNDATION CASE III

NATIONAL PETROLEUM COUNCIL - REFINING STUDY
DECREASING DEMAND
ELECTRIC UTILITY

	THOUSAND BARRELS PER DAY				DELTA VERSUS 1989			GROWTH VERSUS 1989, % PER YEAR		
	1989	1995	2000	2010	1995	2000	2010	1995	2000	2010
MOTOR GASOLINE	-	-	-	-	-	-	-	-	-	-
NAPHTHA JET FUEL	-	-	-	-	-	-	-	-	-	-
KEROSENE JET FUEL	-	-	-	-	-	-	-	-	-	-
TOTAL JET FUEL	-	-	-	-	-	-	-	-	-	-
DISTILLATE 1	-	-	-	-	-	-	-	-	-	-
LIGHT DIESEL	-	-	-	-	-	-	-	-	-	-
HEAVY DIESEL	-	-	-	-	-	-	-	-	-	-
DISTILLATE 2 (HT OIL)	70	58	96	66	(12)	26	(4)	(3.2)	2.9	(0.3)
TOTAL DISTILLATE	70	58	96	66	(12)	26	(4)	(3.2)	2.9	(0.3)
DISTILLATE 4	-	-	-	-	-	-	-	-	-	-
HEAVY FUEL OIL	639	561	522	447	(78)	(117)	(192)	(2.2)	(1.8)	(1.7)
TOTAL HEAVY FUEL OIL	639	561	522	447	(78)	(117)	(192)	(2.2)	(1.8)	(1.7)
LIQUIFIED PETROLEUM GAS	-	-	-	-	-	-	-	-	-	-
AVIATION GASOLINE	-	-	-	-	-	-	-	-	-	-
KEROSENE	-	-	-	-	-	-	-	-	-	-
CHEM FEED NAPHTHA	-	-	-	-	-	-	-	-	-	-
CHEM FEED GASOIL	-	-	-	-	-	-	-	-	-	-
SPECIAL NAPHTHA	-	-	-	-	-	-	-	-	-	-
LUBRICANTS	-	-	-	-	-	-	-	-	-	-
WAX	-	-	-	-	-	-	-	-	-	-
ASPHALT & ROAD OIL	-	-	-	-	-	-	-	-	-	-
MISCELLANEOUS OIL	-	-	-	-	-	-	-	-	-	-
CRUDE OIL	-	-	-	-	-	-	-	-	-	-
STILL GAS	-	-	-	-	-	-	-	-	-	-
CATALYTIC COKE	-	-	-	-	-	-	-	-	-	-
MARKETABLE COKE	-	-	-	-	-	-	-	-	-	-
TOTAL OTHER PETROLEUM	-	-	-	-	-	-	-	-	-	-
TOTAL - ALL OIL	710	619	618	513	(91)	(92)	(197)	(2.3)	(1.2)	(1.5)

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FOUNDATION CASE III

NATIONAL PETROLEUM COUNCIL - REFINING STUDY
DECREASING DEMAND
TOTAL U.S.

	THOUSAND BARRELS PER DAY				DELTA VERSUS 1989			GROWTH VERSUS 1989, % PER YEAR		
	1989	1995	2000	2010	1995	2000	2010	1995	2000	2010
MOTOR GASOLINE	7328	7218	6938	6358	(110)	(390)	(970)	(0.3)	(0.5)	(0.7)
NAPHTHA JET FUEL	205	-	-	-	-	-	-	-	-	-
KEROSENE JET FUEL	1284	1467	1410	1292	183	126	8	2.2	0.9	-
TOTAL JET FUEL	1489	1467	1410	1292	(22)	(79)	(197)	(0.3)	(0.5)	(0.7)
DISTILLATE 1	30	25	20	13	(5)	(10)	(17)	(2.8)	(3.8)	(4.0)
LIGHT DIESEL	1943	1999	1972	1919	56	29	(24)	0.5	0.1	(0.1)
HEAVY DIESEL	371	382	373	365	11	2	(6)	0.5	-	(0.1)
DISTILLATE 2 (HT OIL)	774	665	587	408	(109)	(187)	(366)	(2.5)	(2.5)	(3.0)
TOTAL DISTILLATE	3118	3071	2952	2705	(47)	(166)	(413)	(0.3)	(0.5)	(0.7)
DISTILLATE 4	39	34	21	18	(5)	(18)	(21)	(2.3)	(5.4)	(3.5)
HEAVY FUEL OIL	1370	1255	1028	1030	(115)	(342)	(340)	(1.5)	(2.6)	(1.3)
TOTAL HEAVY FUEL OIL	1409	1289	1049	1049	(120)	(360)	(360)	(1.5)	(2.6)	(1.4)
LIQUIFIED PETROLEUM GAS	1620	1619	1549	1417	(1)	(71)	(203)	-	(0.4)	(0.6)
AVIATION GASOLINE	26	25	23	19	(1)	(3)	(7)	(0.6)	(1.2)	(1.5)
KEROSENE	84	74	58	36	(10)	(26)	(48)	(2.1)	(3.4)	(4.0)
CHEM FEED NAPHTHA	203	231	237	234	28	34	31	2.2	1.4	0.7
CHEM FEED GASOIL	257	292	299	296	35	42	39	2.2	1.4	0.7
SPECIAL NAPHTHA	56	54	49	41	(2)	(7)	(15)	(0.6)	(1.2)	(1.5)
LUBRICANTS	159	154	140	117	(5)	(19)	(42)	(0.6)	(1.2)	(1.5)
WAX	17	16	15	12	(1)	(2)	(5)	(0.6)	(1.2)	(1.5)
ASPHALT & ROAD OIL	453	437	397	332	(16)	(56)	(121)	(0.6)	(1.2)	(1.5)
MISCELLANEOUS OIL	72	70	64	53	(2)	(8)	(19)	(0.6)	(1.2)	(1.5)
CRUDE OIL	28	27	24	20	(1)	(4)	(8)	(0.6)	(1.2)	(1.5)
STILL GAS	681	658	598	500	(23)	(83)	(181)	(0.6)	(1.2)	(1.5)
CATALYTIC COKE	212	204	186	155	(8)	(26)	(57)	(0.6)	(1.2)	(1.5)
MARKETABLE COKE	96	92	84	70	(4)	(12)	(26)	(0.6)	(1.2)	(1.5)
TOTAL OTHER PETROLEUM	3962	3952	3722	3302	(10)	(240)	(660)	-	(0.6)	(0.9)
TOTAL - ALL OIL	17306	16997	16071	14707	(309)	(1235)	(2599)	(0.3)	(0.7)	(0.8)

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EXXON COMPANY, U.S.A.

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DOWNSTREAM PLANNING AND ANALYSIS

W.R. FINGER
COORDINATOR OF ENERGY ANALYSIS

February 5,1992

Members of the NPC Refining Study Supply/Demand/Logistics Task Group

Gentlemen:

On January 31, I sent you the proposed sector oil demands for all three of the Foundation Cases (and all study years). Earlier, you received the historic (1989) state oil uses by sector and type of fuel. As you may remember, we agreed at our last Task Group meeting in New Orleans that the state shares by fuel would be held constant regardless of either the particular Foundation Case or the future year.

Attached are four sheets that describe the state gasoline demands for Foundation Case I (Increasing Demand)--1989, 1995, 2000, and 2010. It takes 147 pages to table all of these data for all the oils in the three Foundation Cases and covering 1989, 1995, 2000, and 2010. At our February 11-12 Task Group meeting in Albuquerque, I will have a complete set and a second one for the NPC office. If you want a complete set, please request it of the NPC thereafter.

I look forward to seeing you in Albuquerque.

Sincerely,

Graham K. Barnes

Graham K. Barnes

GKB:yg
Attachments

c - w/attachments:
Mr. John H. Guy, IV – National Petroleum Council

A DIVISION OF EXXON CORPORATION

FOUNDATION CASE I -- INCREASING DEMAND -- MOTOR GASOLINE -- 1989

THOUSAND BARRELS PER DAY

	RESIDENTIAL	COMMERCIAL	TRANSPORTATION	INDUSTRIAL	ELECT UTILITY	TOTAL U.S.
MAINE	-	-	38	-	-	39
NEW HAMPSHIRE	-	-	33	-	-	34
VERMONT	-	-	17	-	-	18
MASSACHUSETTS	-	1	158	1	-	160
RHODE ISLANE	-	-	24	-	-	24
CONNECTICUT	-	1	87	1	-	88
NEW YORK	-	4	358	4	-	366
NEW JERSEY	-	2	220	1	-	223
PENNSYLVANIA	-	1	293	4	-	298
DELAWARE	-	-	22	-	-	22
MARYLAND	-	1	133	1	-	135
DIST COL	-	-	11	-	-	12
W VIRGINIA	-	1	52	1	-	53
VIRGINIA	-	1	191	2	-	194
N CAROLINA	-	2	209	2	-	213
S CAROLINA	-	1	114	2	-	117
GEORGIA	-	1	224	4	-	229
FLORIDA	-	3	383	3	-	389
MICHIGAN	-	2	272	3	-	277
OHIO	-	6	310	3	-	318
INDIANA	-	1	166	2	-	169
ILLINOIS	-	1	311	4	-	316
KENTUCKY	-	1	115	2	-	119
TENNESSEE	-	1	161	2	-	164
WISCONSIN	-	1	131	2	-	135
MINNESOTA	-	1	129	3	-	133
N DAKOTA	-	-	21	2	-	23
S DAKOTA	-	-	23	2	-	25
IOWA	-	1	85	4	-	89
NEBRASKA	-	-	47	3	-	50
MISSOURI	-	1	172	2	-	174
KANSAS	-	-	79	2	-	82
OKLAHOMA	-	1	103	3	-	106
ALABAMA	-	1	134	1	-	136
MISSISSIPPI	-	-	77	2	-	79
ARKANSAS	-	-	79	1	-	81
LOUISIANA	-	1	127	1	-	128
TEXAS	-	7	538	13	-	557
NEW MEXICO	-	-	50	1	-	52
MONTANA	-	-	26	2	-	28
IDAHO	-	1	29	1	-	31
WYOMING	-	-	19	1	-	21
COLORADO	-	-	95	1	-	97
UTAH	-	-	47	1	-	47
WASHINGTON	-	1	145	2	-	147
OREGON	-	1	85	1	-	87
CALIFORNIA	-	5	837	9	-	851
NEVADA	-	-	39	-	-	40
ARIZONA	-	-	110	1	-	111
ALASKA	-	-	14	-	-	14
HAWAII	-	-	23	-	-	24
TOTAL US	-	54	7168	105	-	7328

SHEET 1 PRINTED DATA MAY NOT ADD DUE TO INDEPENDENT ROUNDING. NATIONAL PETROLEUM COUNCIL JANUARY 30, 1992 TIME 8:31

APP L.III.3-69

FOUNDATION CASE I -- INCREASING DEMAND -- MOTOR GASOLINE -- 1995

	THOUSAND BARRELS PER DAY					
	RESIDENTIAL	COMMERCIAL	TRANSPORTATION	INDUSTRIAL	ELECT UTILITY	TOTAL U.S.
MAINE	-	-	37	-	-	38
NEW HAMPSHIRE	-	-	32	-	-	33
VERMONT	-	-	17	-	-	18
MASSACHUSETTS	-	1	155	1	-	157
RHODE ISLANE	-	-	24	-	-	24
CONNECTICUT	-	1	86	1	-	87
NEW YORK	-	4	352	4	-	360
NEW JERSEY	-	2	216	2	-	219
PENNSYLVANIA	-	1	288	4	-	294
DELAWARE	-	-	22	-	-	22
MARYLAND	-	1	131	1	-	132
DIST COL	-	-	11	-	-	11
W VIRGINIA	-	1	51	1	-	53
VIRGINIA	-	2	187	2	-	191
N CAROLINA	-	2	205	3	-	210
S CAROLINA	-	1	112	2	-	115
GEORGIA	-	1	220	4	-	225
FLORIDA	-	4	376	3	-	383
MICHIGAN	-	2	267	3	-	273
OHIO	-	6	304	3	-	314
INDIANA	-	1	163	2	-	166
ILLINOIS	-	1	306	4	-	311
KENTUCKY	-	1	113	3	-	117
TENNESSEE	-	2	158	2	-	162
WISCONSIN	-	1	129	3	-	133
MINNESOTA	-	1	127	4	-	131
N DAKOTA	-	-	20	3	-	23
S DAKOTA	-	-	23	2	-	25
IOWA	-	1	83	4	-	88
NEBRASKA	-	-	46	3	-	50
MISSOURI	-	1	169	2	-	172
KANSAS	-	-	78	3	-	81
OKLAHOMA	-	1	101	3	-	105
ALABAMA	-	1	131	2	-	133
MISSISSIPPI	-	-	76	2	-	78
ARKANSAS	-	-	78	1	-	79
LOUISIANA	-	1	125	1	-	126
TEXAS	-	7	529	14	-	550
NEW MEXICO	-	-	50	1	-	51
MONTANA	-	-	26	2	-	28
IDAHO	-	1	28	1	-	31
WYOMING	-	-	19	1	-	21
COLORADO	-	1	93	2	-	96
UTAH	-	-	46	1	-	47
WASHINGTON	-	1	142	2	-	145
OREGON	-	1	84	1	-	86
CALIFORNIA	-	6	823	10	-	838
NEVADA	-	-	39	-	-	39
ARIZONA	-	-	108	1	-	110
ALASKA	-	-	13	-	-	14
HAWAII	-	-	23	-	-	24
TOTAL US	-	60	7042	116	-	7218

SHEET 2 PRINTED DATA MAY NOT ADD DUE TO INDEPENDENT ROUNDING. NATIONAL PETROLEUM COUNCIL JANUARY 30, 1992 TIME 8:31

FOUNDATION CASE I -- INCREASING DEMAND -- MOTOR GASOLINE -- 2000

THOUSAND BARRELS PER DAY

	RESIDENTIAL	COMMERCIAL	TRANSPORTATION	INDUSTRIAL	ELECT UTILITY	TOTAL U.S.
MAINE	-	-	39	-	-	40
NEW HAMPSHIRE	-	-	34	-	-	34
VERMONT	-	-	18	-	-	18
MASSACHUSETTS	-	1	161	2	-	163
RHODE ISLANE	-	-	25	-	-	25
CONNECTICUT	-	1	89	1	-	90
NEW YORK	-	5	365	5	-	374
NEW JERSEY	-	2	224	2	-	228
PENNSYLVANIA	-	2	299	4	-	305
DELAWARE	-	-	22	-	-	23
MARYLAND	-	1	136	1	-	137
DIST COL	-	-	11	-	-	12
W VIRGINIA	-	1	53	1	-	55
VIRGINIA	-	2	194	3	-	199
N CAROLINA	-	2	213	3	-	218
S CAROLINA	-	1	116	2	-	120
GEORGIA	-	1	228	4	-	234
FLORIDA	-	4	391	3	-	398
MICHIGAN	-	2	277	4	-	283
OHIO	-	7	316	3	-	326
INDIANA	-	1	169	3	-	173
ILLINOIS	-	2	317	5	-	323
KENTUCKY	-	1	118	3	-	122
TENNESSEE	-	2	164	2	-	168
WISCONSIN	-	1	134	3	-	138
MINNESOTA	-	1	131	4	-	136
N DAKOTA	-	-	21	3	-	24
S DAKOTA	-	-	24	2	-	26
IOWA	-	1	87	4	-	92
NEBRASKA	-	-	48	4	-	52
MISSOURI	-	1	175	3	-	178
KANSAS	-	1	81	3	-	84
OKLAHOMA	-	1	105	3	-	109
ALABAMA	-	1	136	2	-	138
MISSISSIPPI	-	1	79	2	-	81
ARKANSAS	-	-	81	1	-	82
LOUISIANA	-	1	129	1	-	131
TEXAS	-	8	549	15	-	572
NEW MEXICO	-	-	51	1	-	53
MONTANA	-	-	27	2	-	29
IDAHO	-	1	29	1	-	32
WYOMING	-	-	20	2	-	21
COLORADO	-	1	97	2	-	99
UTAH	-	-	48	1	-	48
WASHINGTON	-	1	147	2	-	151
OREGON	-	1	87	2	-	89
CALIFORNIA	-	6	854	11	-	870
NEVADA	-	-	40	-	-	41
ARIZONA	-	-	112	1	-	114
ALASKA	-	-	14	-	-	14
HAWAII	-	-	24	-	-	25
TOTAL US	-	65	7307	126	-	7498

SHEET 3 PRINTED DATA MAY NOT ADD DUE TO INDEPENDENT ROUNDING. NATIONAL PETROLEUM COUNCIL JANUARY 30, 1992 TIME 8:31

APP L.III.3-71

FOUNDATION CASE I -- INCREASING DEMAND -- MOTOR GASOLINE -- 2010

	THOUSAND BARRELS PER DAY					
	RESIDENTIAL	COMMERCIAL	TRANSPORTATION	INDUSTRIAL	ELECT UTILITY	TOTAL U.S.
MAINE	-	-	42	1	-	43
NEW HAMPSHIRE	-	-	36	-	-	37
VERMONT	-	-	19	-	-	20
MASSACHUSETTS	-	1	173	2	-	176
RHODE ISLANE	-	-	26	-	-	27
CONNECTICUT	-	1	95	1	-	97
NEW YORK	-	5	392	5	-	403
NEW JERSEY	-	3	241	2	-	245
PENNSYLVANIA	-	2	322	5	-	328
DELAWARE	-	-	24	-	-	25
MARYLAND	-	1	146	1	-	148
DIST CDL	-	-	12	-	-	13
W VIRGINIA	-	1	57	1	-	59
VIRGINIA	-	2	209	3	-	214
N CAROLINA	-	2	229	3	-	235
S CAROLINA	-	1	125	3	-	129
GEORGIA	-	2	246	5	-	252
FLORIDA	-	5	420	4	-	429
MICHIGAN	-	3	298	4	-	305
OHIO	-	8	340	4	-	351
INDIANA	-	2	182	3	-	186
ILLINOIS	-	2	341	5	-	348
KENTUCKY	-	2	127	3	-	131
TENNESSEE	-	2	177	2	-	181
WISCONSIN	-	1	144	3	-	148
MINNESOTA	-	1	141	5	-	147
N DAKOTA	-	-	23	3	-	26
S DAKOTA	-	-	25	2	-	28
IOWA	-	1	93	5	-	99
NEBRASKA	-	-	52	4	-	56
MISSOURI	-	1	188	3	-	192
KANSAS	-	1	87	3	-	90
OKLAHOMA	-	1	113	3	-	118
ALABAMA	-	1	146	2	-	149
MISSISSIPPI	-	1	85	2	-	88
ARKANSAS	-	-	87	1	-	89
LOUISIANA	-	1	139	1	-	141
TEXAS	-	9	590	17	-	616
NEW MEXICO	-	-	55	1	-	57
MONTANA	-	-	29	2	-	31
IDAHO	-	1	32	2	-	35
WYOMING	-	-	21	2	-	23
COLORADO	-	1	104	2	-	107
UTAH	-	-	51	1	-	52
WASHINGTON	-	1	159	3	-	162
OREGON	-	1	94	2	-	96
CALIFORNIA	-	7	918	12	-	937
NEVADA	-	-	43	1	-	44
ARIZONA	-	-	120	2	-	122
ALASKA	-	-	15	-	-	15
HAWAII	-	-	26	-	-	26
TOTAL US	-	75	7861	142	-	8078

SHEET 4 PRINTED DATA MAY NOT ADD DUE TO INDEPENDENT ROUNDING. NATIONAL PETROLEUM COUNCIL JANUARY 30, 1992 TIME 8:31

PROPOSED VOLUMETRIC GUIDELINES FOR DEMAND SCENARIOS

- Overview Guidelines for Foundation Cases -- Increasing, No Increase, Decreasing
  - Approved SD&L Task Group: January 7
  - Approved Coordinating Subcommittee: January 29
- January 31 Letter: Provided U.S. Oil Demands by Sector
  - Numerics Approval
- February 5 Letter: State Oil Demands by Sector for Each Case
  - January 23 Letter Documented 1989 Historic Bases
  - Numerics Approval
- February 10 Letter: 1989 Naphtha and Kerosene Jet Fuel
  - Procedure After Naphtha Jet Disappears (pre-1995)
  - Numerics Approval
- Gasoline Grade Ratios for Leaded Regular Disappearance
  - Numerics Approval
- Methodology to Partition Some States for Regions --- Population

Appendix L, Section III-4

State Maps Showing
CO and Ozone Nonattainment Areas

MAP OVERVIEW

Attached are a group of maps that outline CO and ozone nonattainment areas.

- Geographic spillover will be limited to 1.0% maximum.

- Time spillover (early delivery, etc.) will require 21 days to "clear" the terminal to service station leg. An additional 14 days will be required for any pipeline deliveries from refineries to terminals. For CO type gasoline, this will be an annual event.

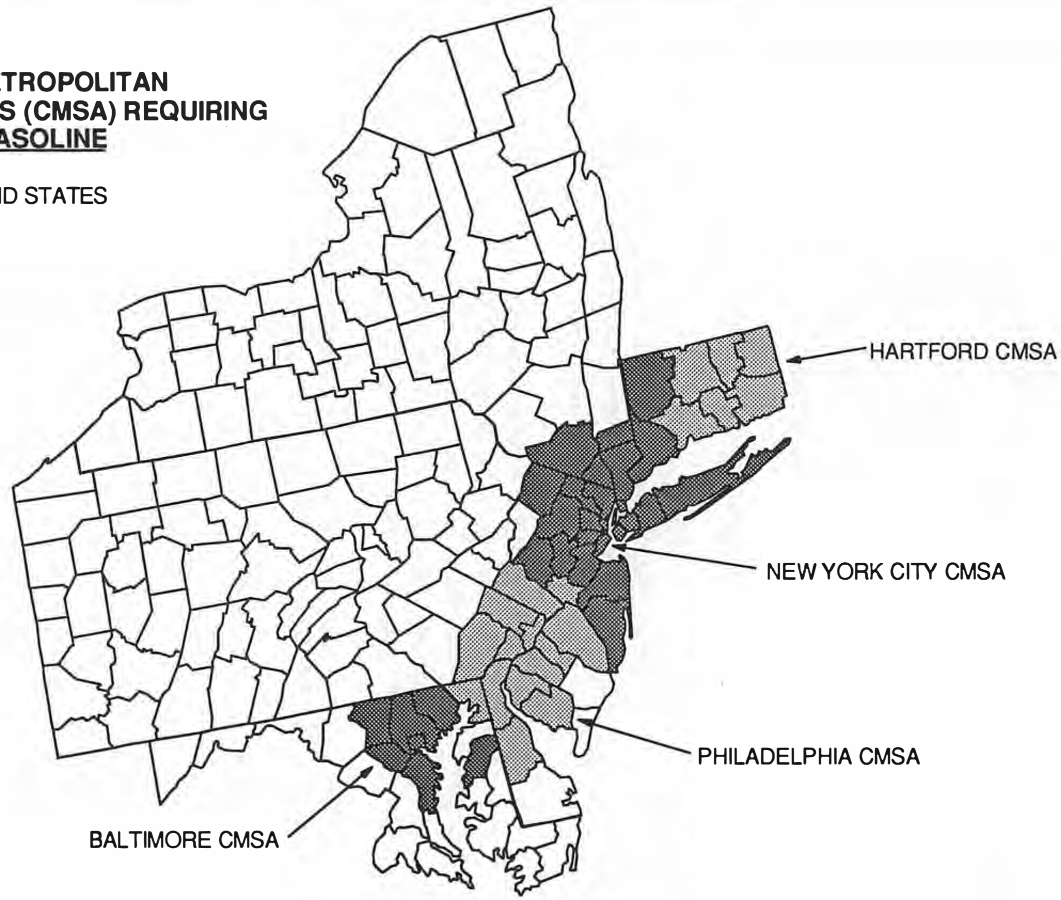
The first map ("Central Atlantic") shows the relationship of a couple of East Coast CMSAs where reformulated gasoline will be required. (CMSA = Consolidated Metropolitan Statistical Area). This map is followed by enlarged maps of the CMSAs. Finally, detailed state maps are attached; these state maps have the detail for the CO nonattainment areas.

States not in the attached are in CO attainment and ozone compliance for all time periods. State/county listings can also be found in Appendix L, Section III-5.

CENTRAL ATLANTIC

CONSOLIDATED METROPOLITAN STATISTICAL AREAS (CMSA) REQUIRING REFORMULATED GASOLINE

SEE SPECIFIC CMSA AND STATES FOR COMMENTS.



APP L.III.4-2

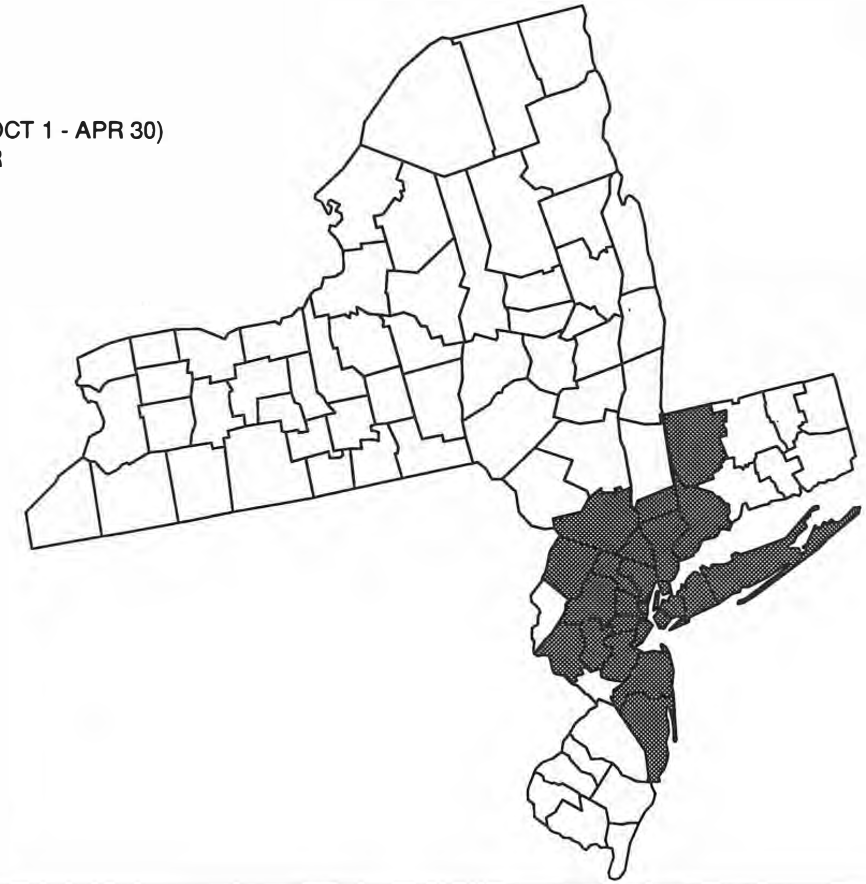
NEW YORK CITY CMSA

1995

SHADED AREA:
CO NON-ATTAINMENT: 7 MONTHS (OCT 1 - APR 30)
OZONE NON-ATTAINMENT: ALL YEAR

2000-2010

SEE 1995 NOTES



APP L.III.4-3

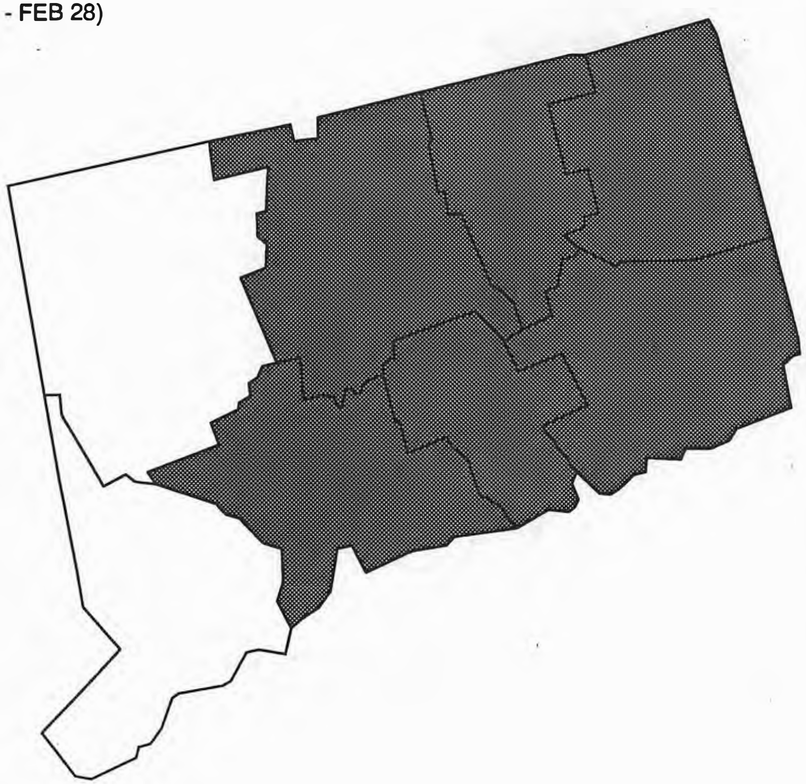
HARTFORD CMSA

1995

SHADED AREA:
CO NON-ATTAINMENT: 4 MONTHS (NOV 1 - FEB 28)
OZONE NON-ATTAINMENT: ALL YEAR

2000-2010

SEE 1995 NOTES



APP L.III.4-4

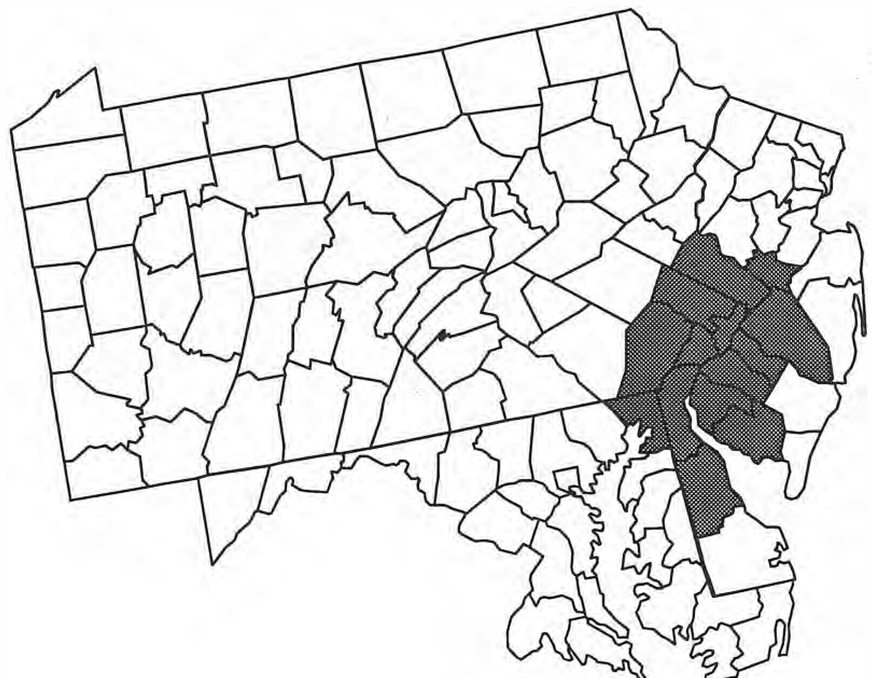
PHILADELPHIA CMSA

1995

SHADED AREA:
CO NON-ATTAINMENT: 4 MONTHS (NOV 1 - FEB 28)
OZONE NON-ATTAINMENT: ALL YEAR

2000-2010

SEE 1995 NOTES



APP L.III.4-5

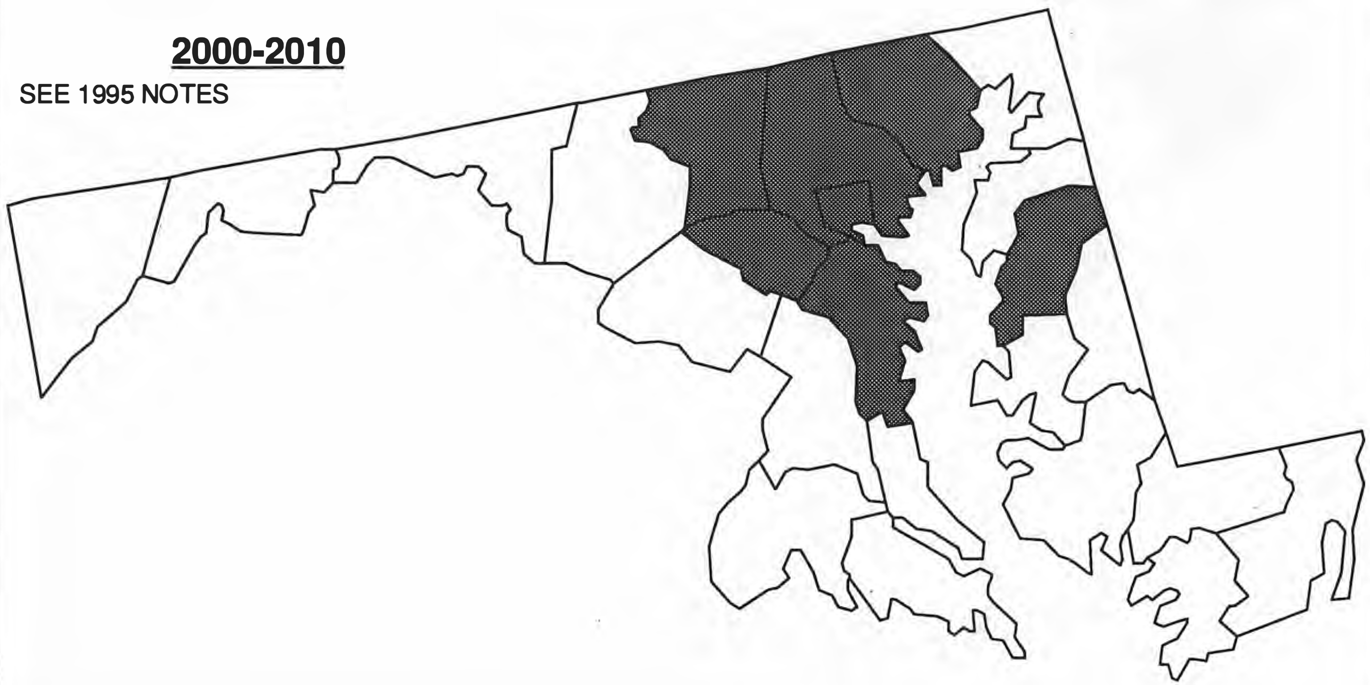
BALTIMORE CMSA

1995

SHADED AREA:
CO NON-ATTAINMENT: 4 MONTHS (NOV 1 - FEB 28)
OZONE NON-ATTAINMENT: ALL YEAR

2000-2010

SEE 1995 NOTES



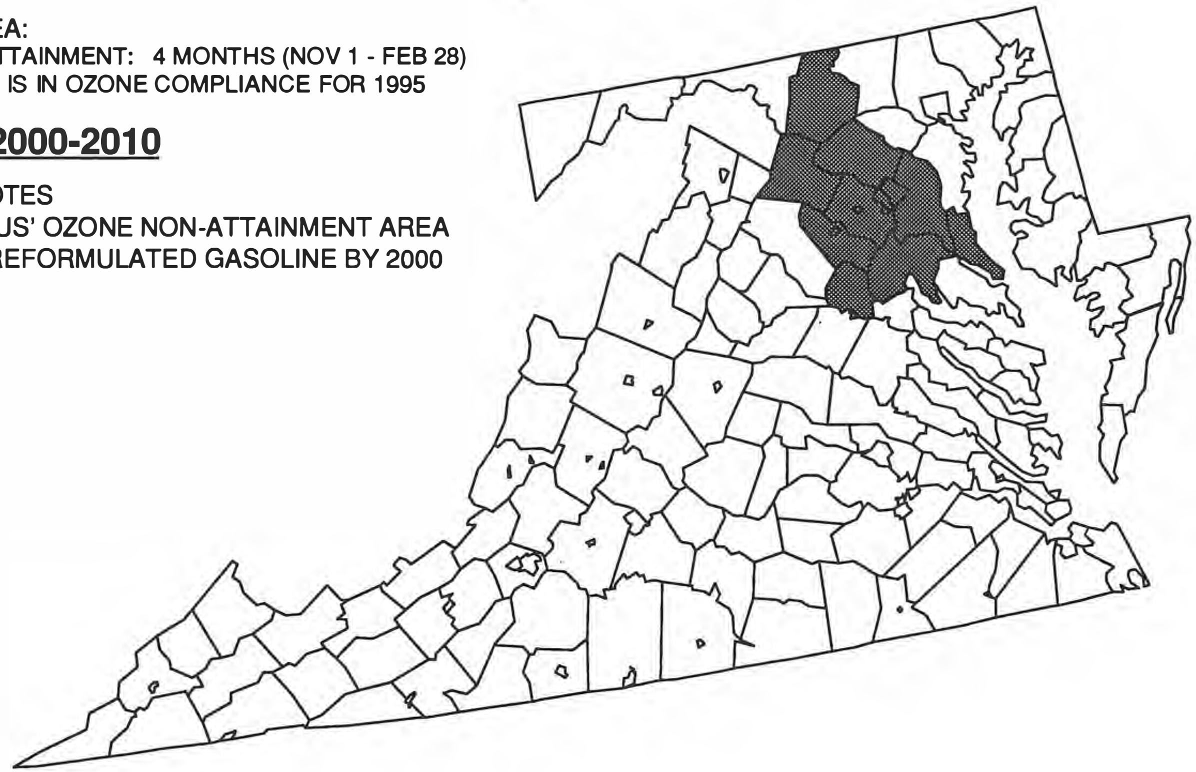
WASHINGTON DC CMSA

1995

SHADED AREA:
CO NON-ATTAINMENT: 4 MONTHS (NOV 1 - FEB 28)
THIS AREA IS IN OZONE COMPLIANCE FOR 1995

2000-2010

SEE 1995 NOTES
THIS 'SERIOUS' OZONE NON-ATTAINMENT AREA
REQUIRES REFORMULATED GASOLINE BY 2000



APP L.III.4-7

CHICAGO CMSA

1995

SHADED AREA:
THIS AREA IS IN CO COMPLIANCE
OZONE NON-ATTAINMENT: ALL YEAR

2000-2010

SEE 1995 NOTES

APP L.III.4-8

MILWAUKEE CMSA

1995

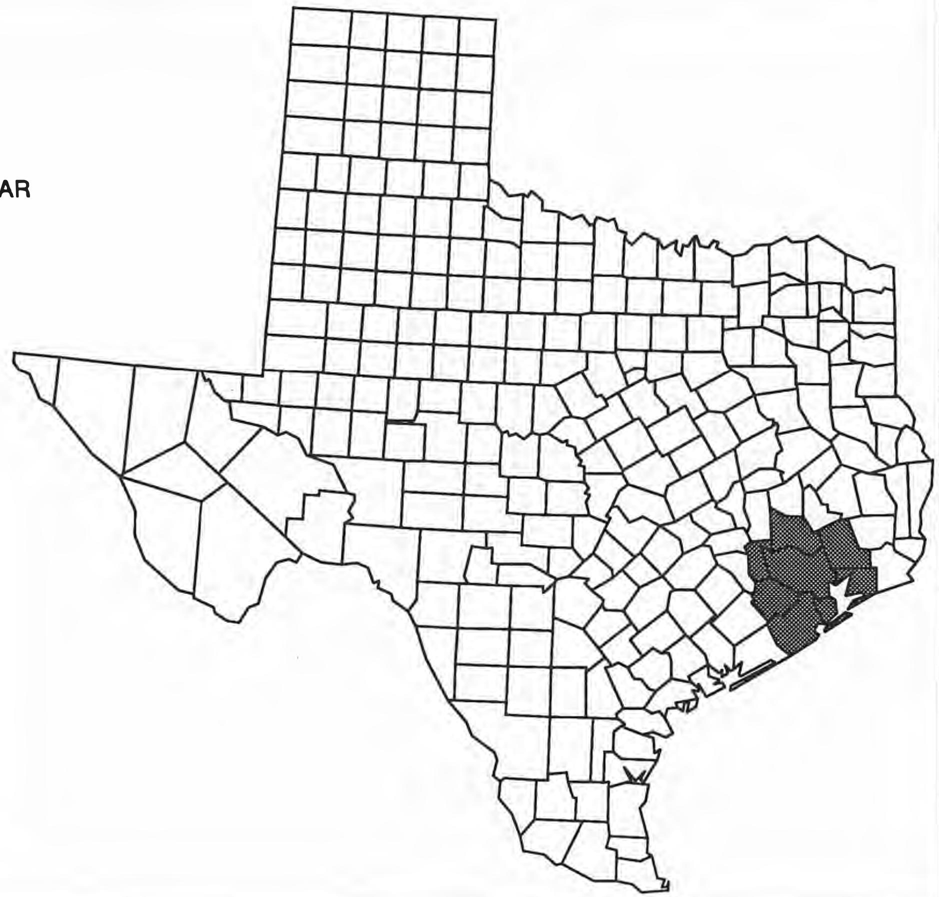
SHADED AREA:
THIS AREA IS IN CO COMPLIANCE
OZONE NON-ATTAINMENT: ALL YEAR

2000-2010

SEE 1995 NOTES

APP L.III.4-9

HOUSTON CMSA



1995

SHADED AREA:
THIS AREA IS IN CO COMPLIANCE
OZONE NON-ATTAINMENT: ALL YEAR

2000-2010

SEE 1995 NOTES

APP L.III.4-10

LOS ANGELES CMSA

(INCLUDING SAN DIEGO AND VENTURA COUNTIES)

1995

SHADED AREA:

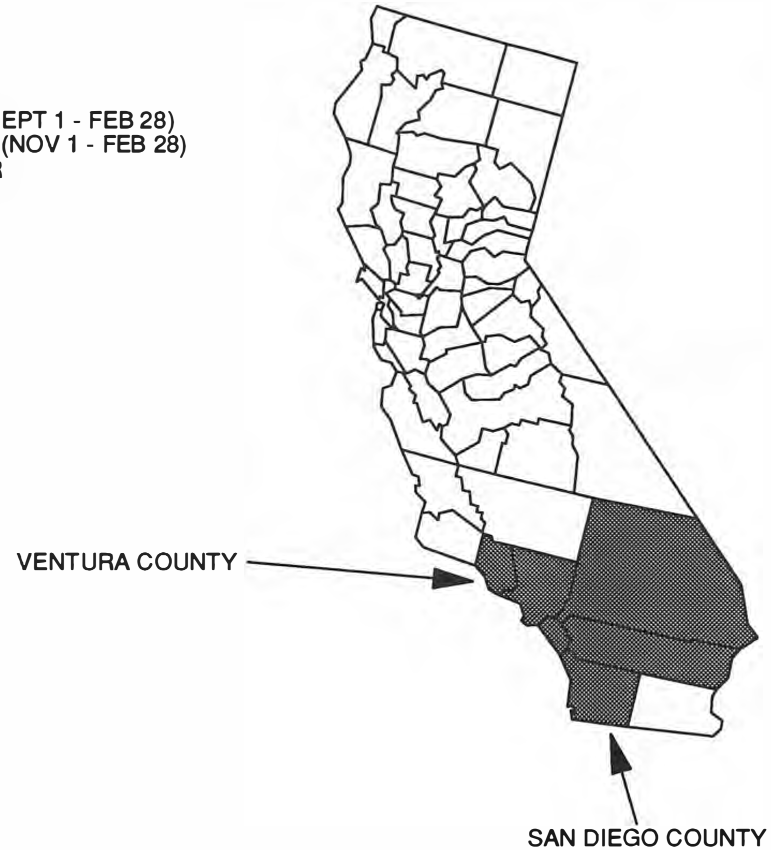
CO NON-ATTAINMENT: 6 MONTHS (SEPT 1 - FEB 28)

SAN DIEGO CO ONLY: 4 MONTHS (NOV 1 - FEB 28)

OZONE NON-ATTAINMENT: ALL YEAR

2000-2010

SEE 1995 NOTES



ALABAMA

1995

THIS STATE IS IN CO ATTAINMENT.
THIS STATE IS IN OZONE COMPLIANCE FOR 1995.

2000-2010

SEE 1995 NOTES.
SHADED COUNTIES REQUIRE REFORMULATED GASOLINE.

ALASKA

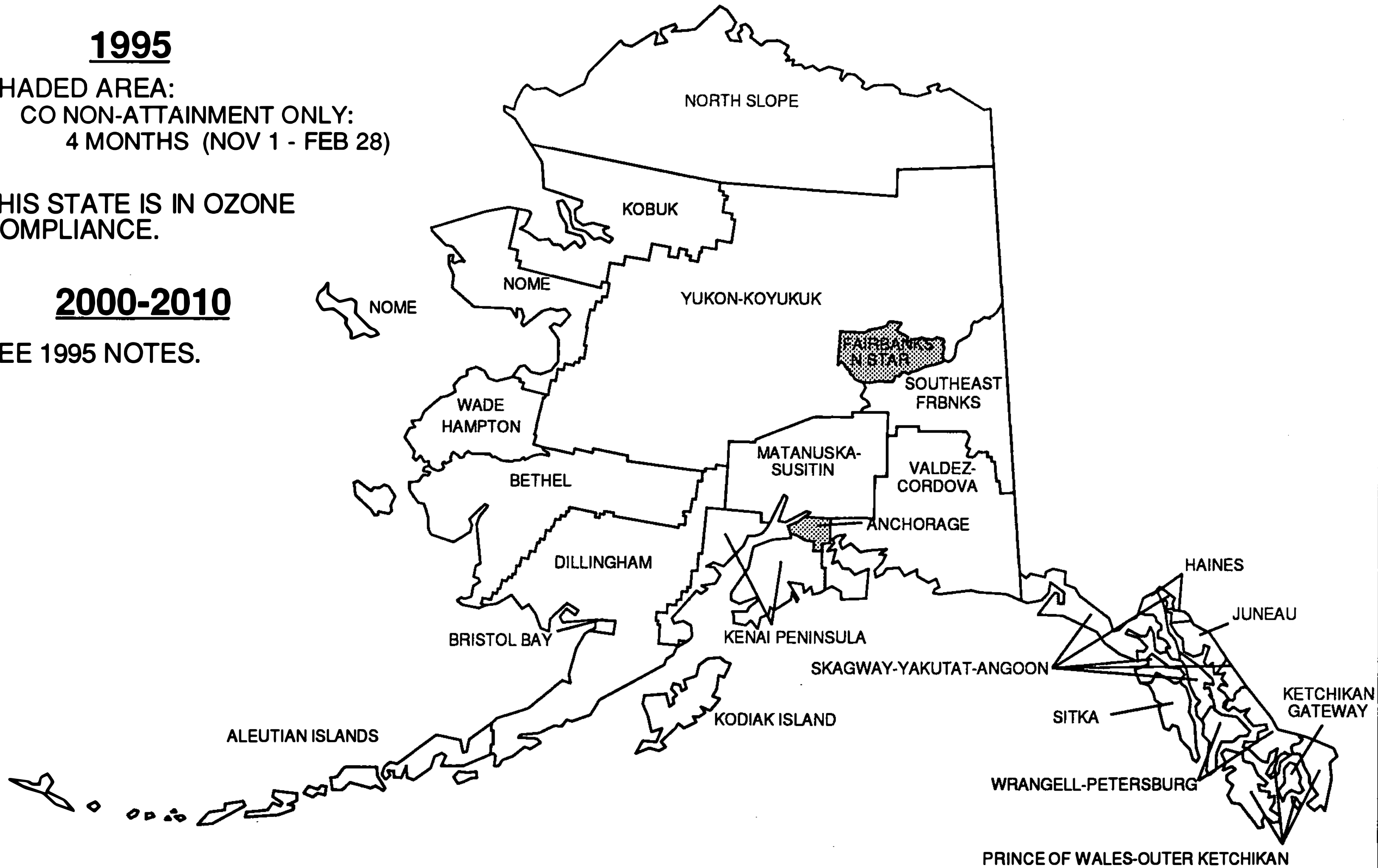
1995

SHADED AREA:
CO NON-ATTAINMENT ONLY:
4 MONTHS (NOV 1 - FEB 28)

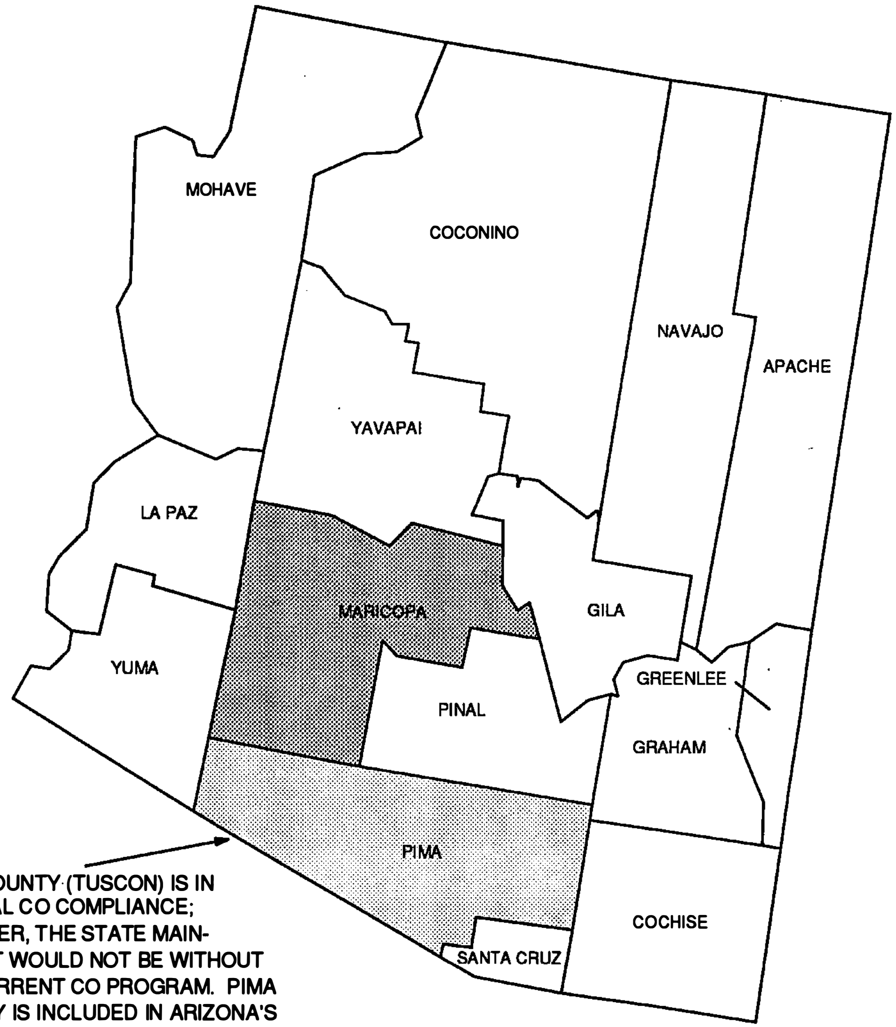
THIS STATE IS IN OZONE COMPLIANCE.

2000-2010

SEE 1995 NOTES.



ARIZONA



PIMA COUNTY (TUSCON) IS IN FEDERAL CO COMPLIANCE; HOWEVER, THE STATE MAINTAINS IT WOULD NOT BE WITHOUT THE CURRENT CO PROGRAM. PIMA COUNTY IS INCLUDED IN ARIZONA'S STATE IMPLEMENTATION PLAN (SIP).

1995

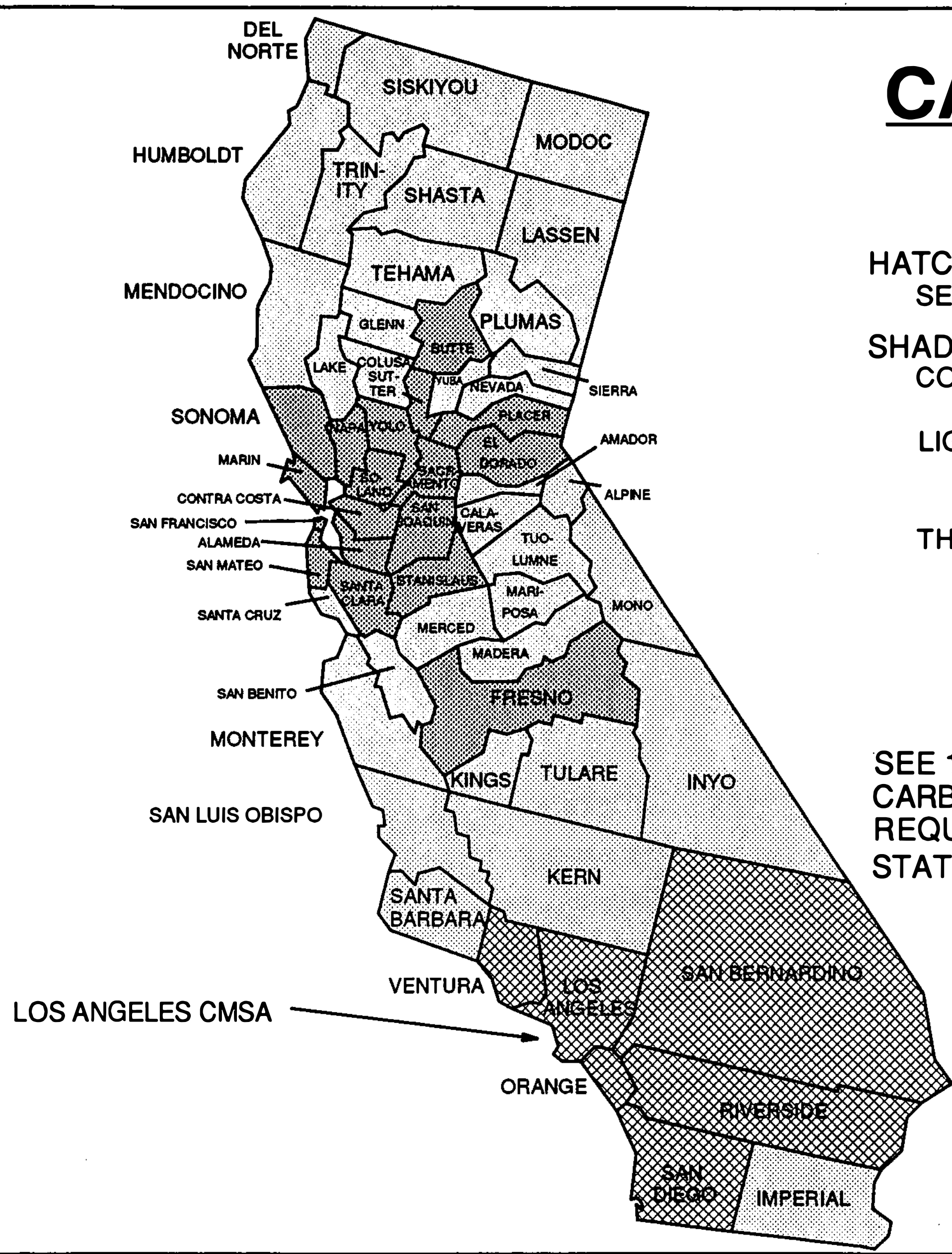
SHADED AREA:
CO NON-ATTAINMENT ONLY:
(INCLUDING PIMA COUNTY)
5 MONTHS (OCT 1 - FEB 28)
LIGHTER AREA:
REQUIRED BY STATE IMPLEMENTATION PLAN

THIS STATE IS IN OZONE COMPLIANCE FOR 1995.

2000-2010

SEE 1995 NOTES.
MARICOPA COUNTY REQUIRES REFORMULATED GASOLINE.

APP L.III.4-15



CALIFORNIA

1995

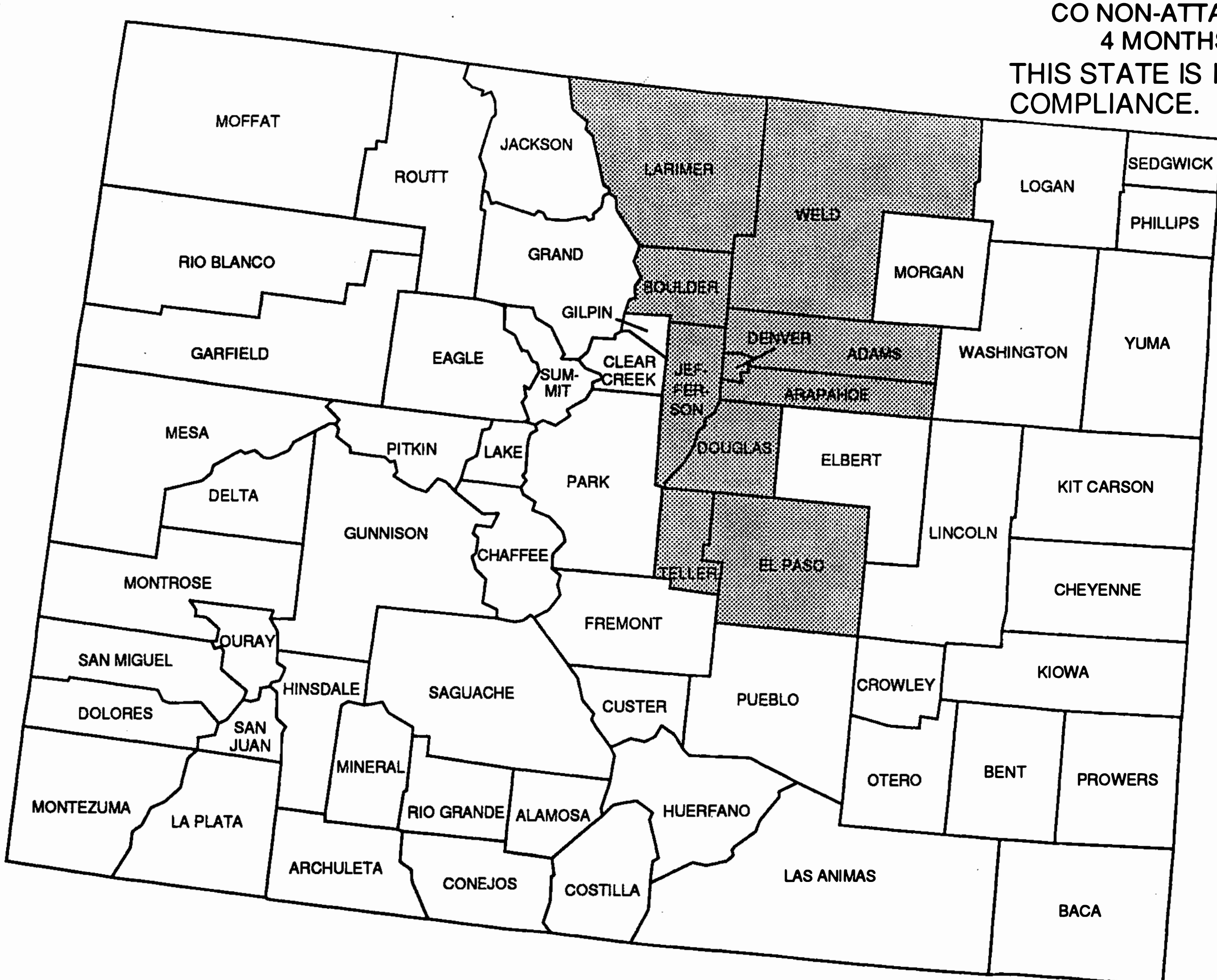
HATCHED AREA:
SEE CMSA PLOT FOR DETAILS

SHADED AREA:
CO NON-ATTAINMENT ONLY:
4 MONTHS (OCT 1 - JAN 31)
LIGHTER AREA:
ALL OTHER COUNTIES REQUIRED BY STATE IMPLEMENTATION PLAN
THE STATE IMPLEMENTAITON PLAN WILL LIMIT OXYGEN CONTENT TO 2.0 PERCENT MAXIMUM

2000-2010

SEE 1995 NOTES.
CARB REFORMULATED GASOLINE REQUIRED THROUGHOUT THE STATE (1996).

COLORADO



1995

SHADED AREA:
CO NON-ATTAINMENT ONLY:
4 MONTHS (NOV 1 - FEB 28)
THIS STATE IS IN OZONE COMPLIANCE.

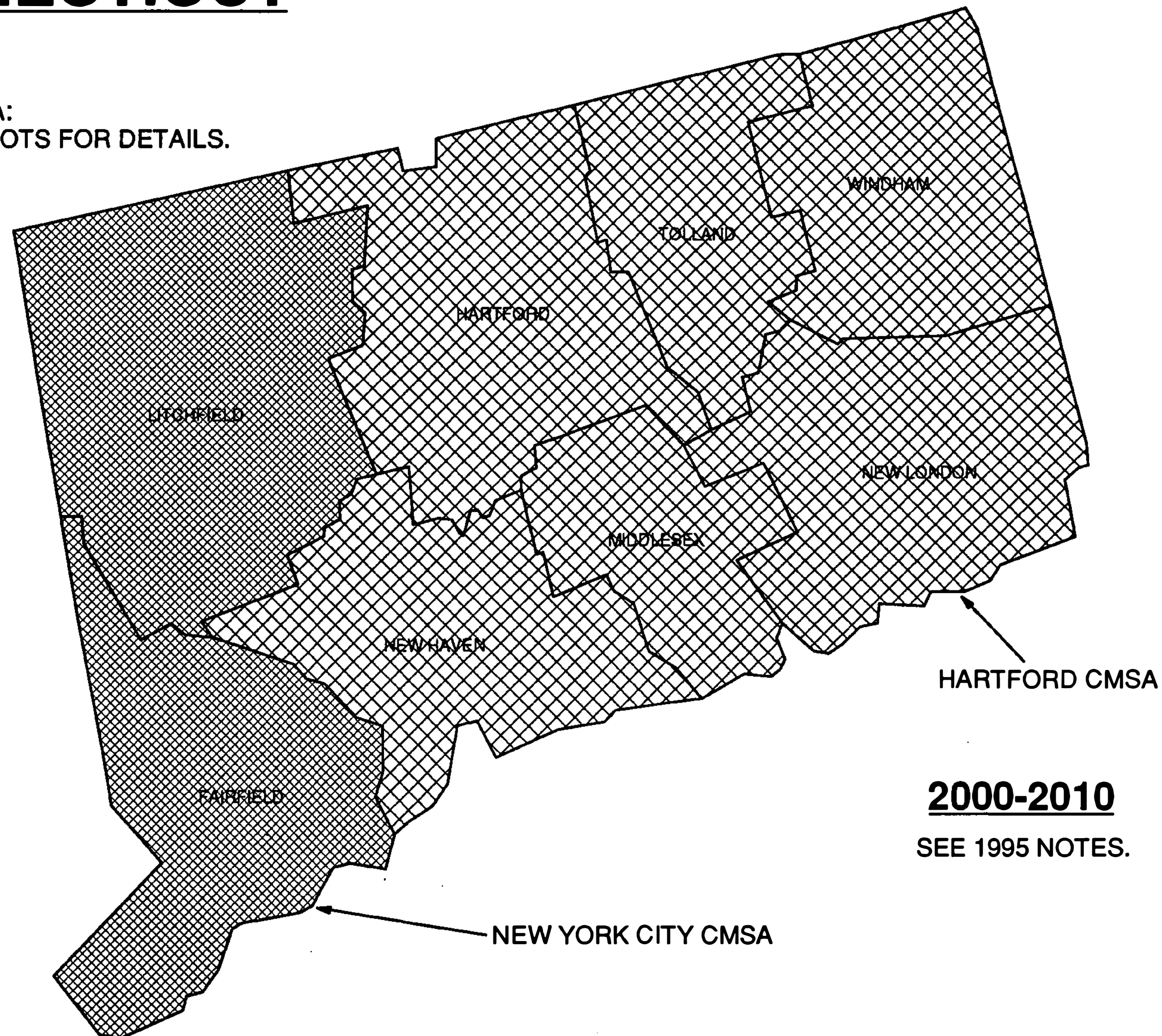
2000-2010

SEE 1995 NOTES.

CONNECTICUT

1995

HATCHED AREA:
SEE CMSA PLOTS FOR DETAILS.



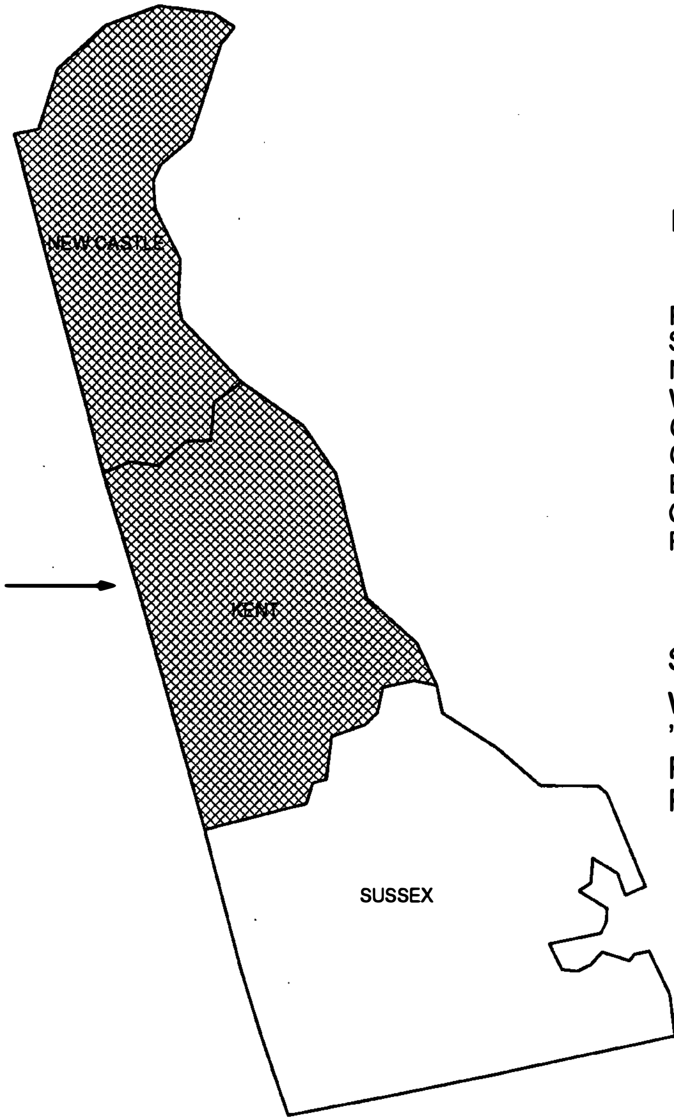
2000-2010

SEE 1995 NOTES.

APP L.III.4-17

APP L.III.4-18

PHILADELPHIA CMSA



DELAWARE

1995

HATCHED AREA:
SEE CMSA PLOT FOR DETAILS.

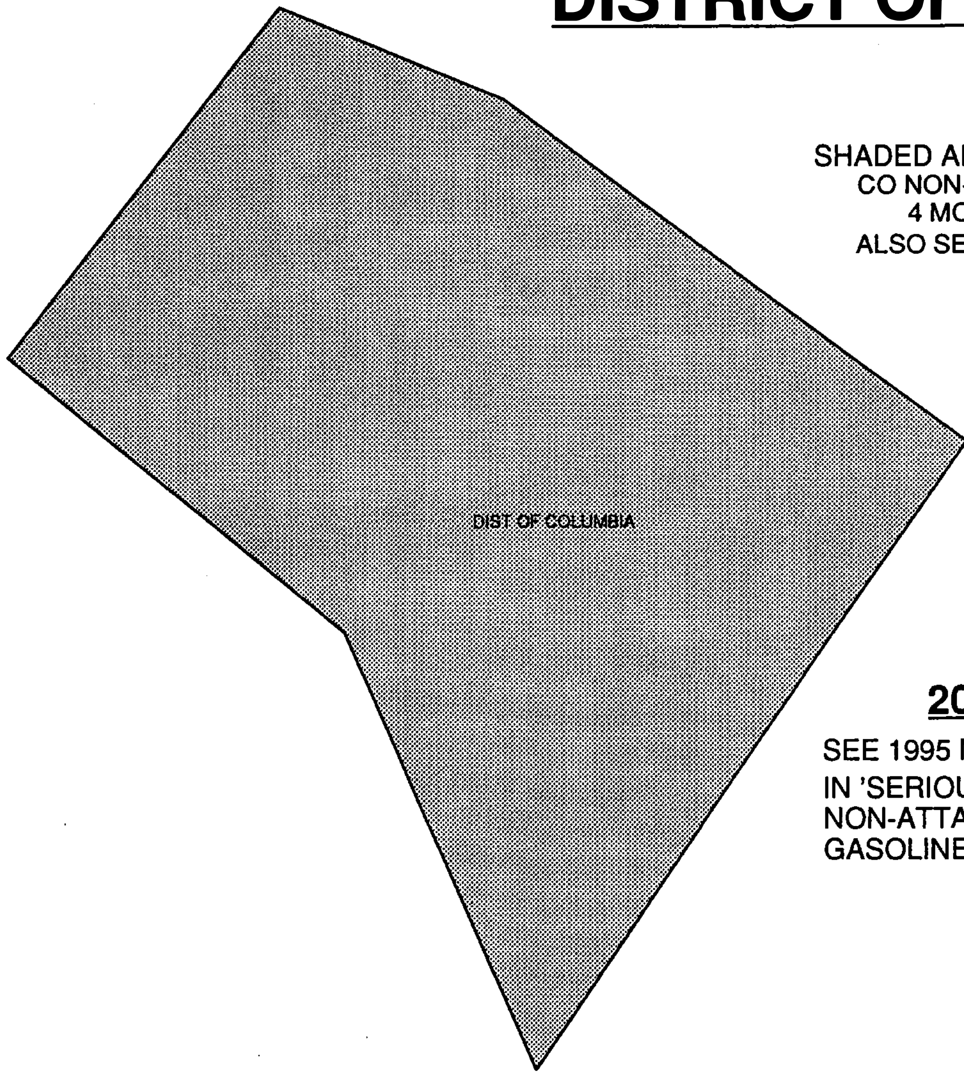
PRIOR TO 1995 (1992-94), THE DELAWARE STATE IMPLEMENTATION PLAN (SIP) DOES NOT INCLUDE A REQUIREMENT FOR A HIGHER WINTER OXYGENATE CONTENT DUE TO THE CO NON-ATTAINMENT OF THE PHILADELPHIA CMSA. FOR 1995 AND AFTER, THE DELAWARE BASIS WILL BE THE HIGHER WINTER OXYGENATE CONTENT CONSISTENT WITH THE REST OF THE PHILADELPHIA CMSA.

2000-2010

SEE 1995 NOTES.

WHILE SUSSEX COUNTY IS ONLY IN 'MARGINAL' OZONE NON-ATTAINMENT, REFORMULATED GASOLINE WILL BE REQUIRED.

DISTRICT OF COLUMBIA



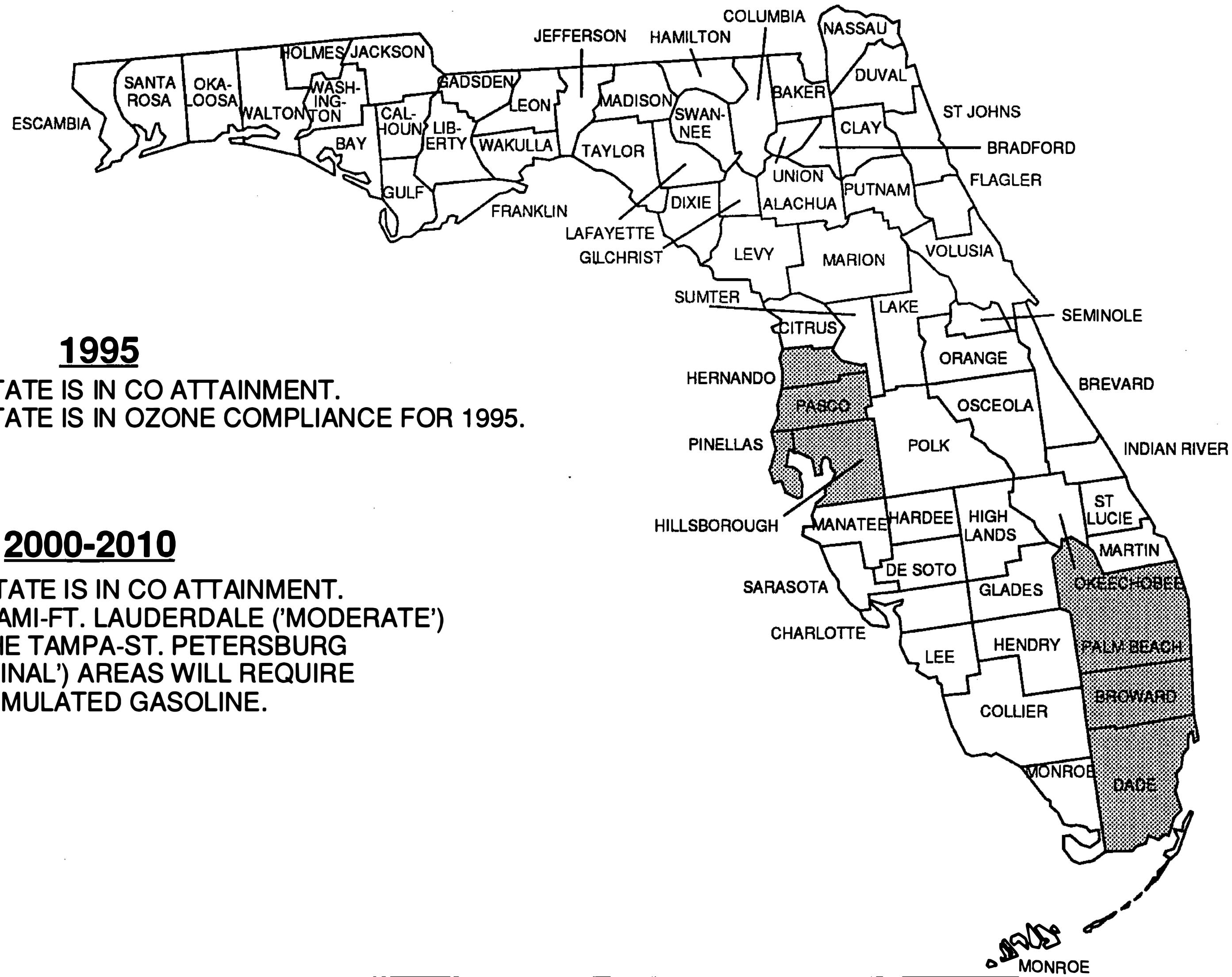
1995

SHADED AREA:
CO NON-ATTAINMENT ONLY:
4 MONTHS (NOV 1 - FEB 28)
ALSO SEE WASHINGTON DC CMSA

2000-2010

SEE 1995 NOTES.
IN 'SERIOUS' OZONE NON-ATTAINMENT; REFORMULATED GASOLINE WILL BE REQUIRED.

FLORIDA



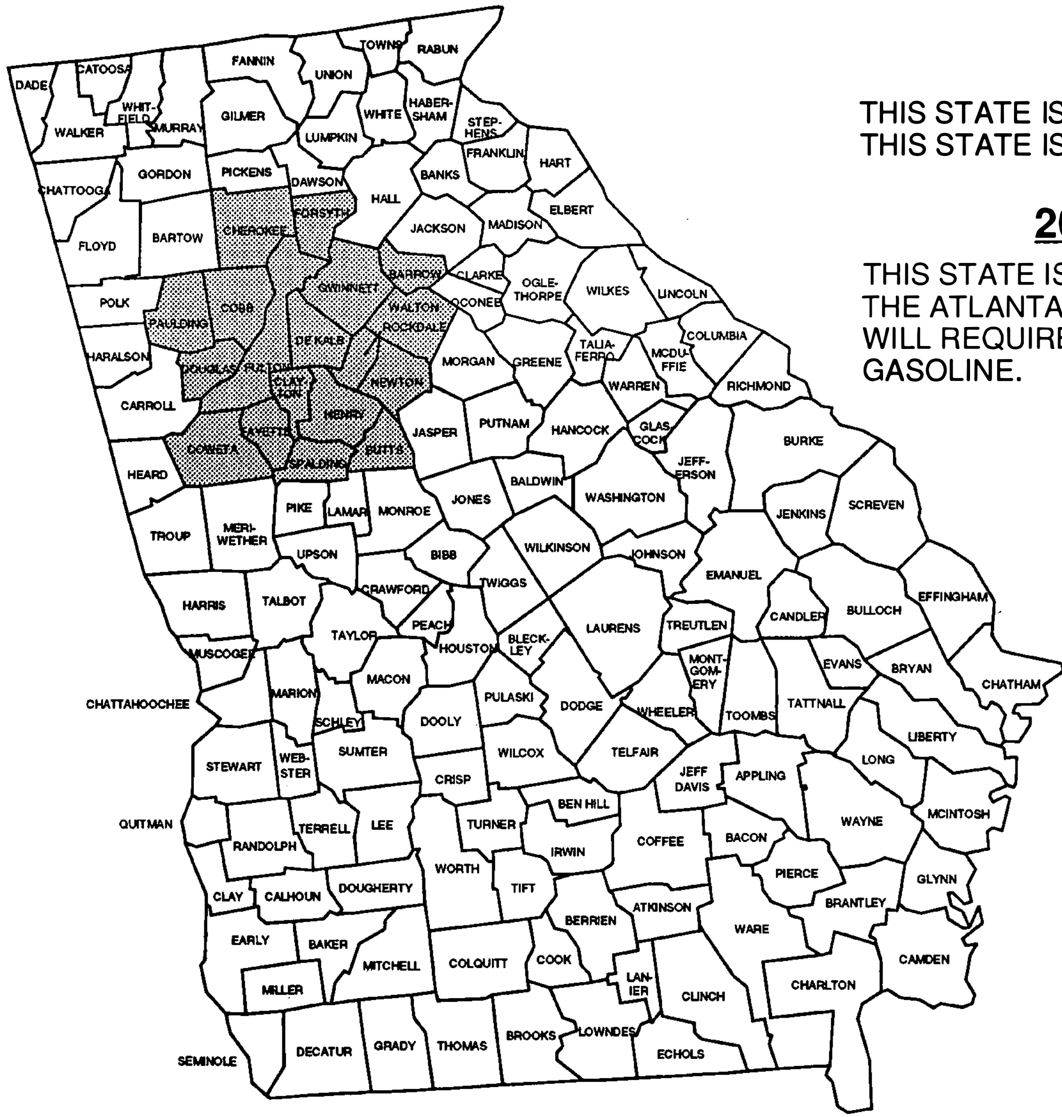
1995

THIS STATE IS IN CO ATTAINMENT.
THIS STATE IS IN OZONE COMPLIANCE FOR 1995.

2000-2010

THIS STATE IS IN CO ATTAINMENT.
THE MIAMI-FT. LAUDERDALE ('MODERATE') AND THE TAMPA-ST. PETERSBURG ('MARGINAL') AREAS WILL REQUIRE REFORMULATED GASOLINE.

GEORGIA



1995

THIS STATE IS IN CO ATTAINMENT.
THIS STATE IS IN OZONE COMPLIANCE FOR 1995.

2000-2010

THIS STATE IS IN CO ATTAINMENT.
THE ATLANTA AREA ('SERIOUS') WILL REQUIRE REFORMULATED GASOLINE.

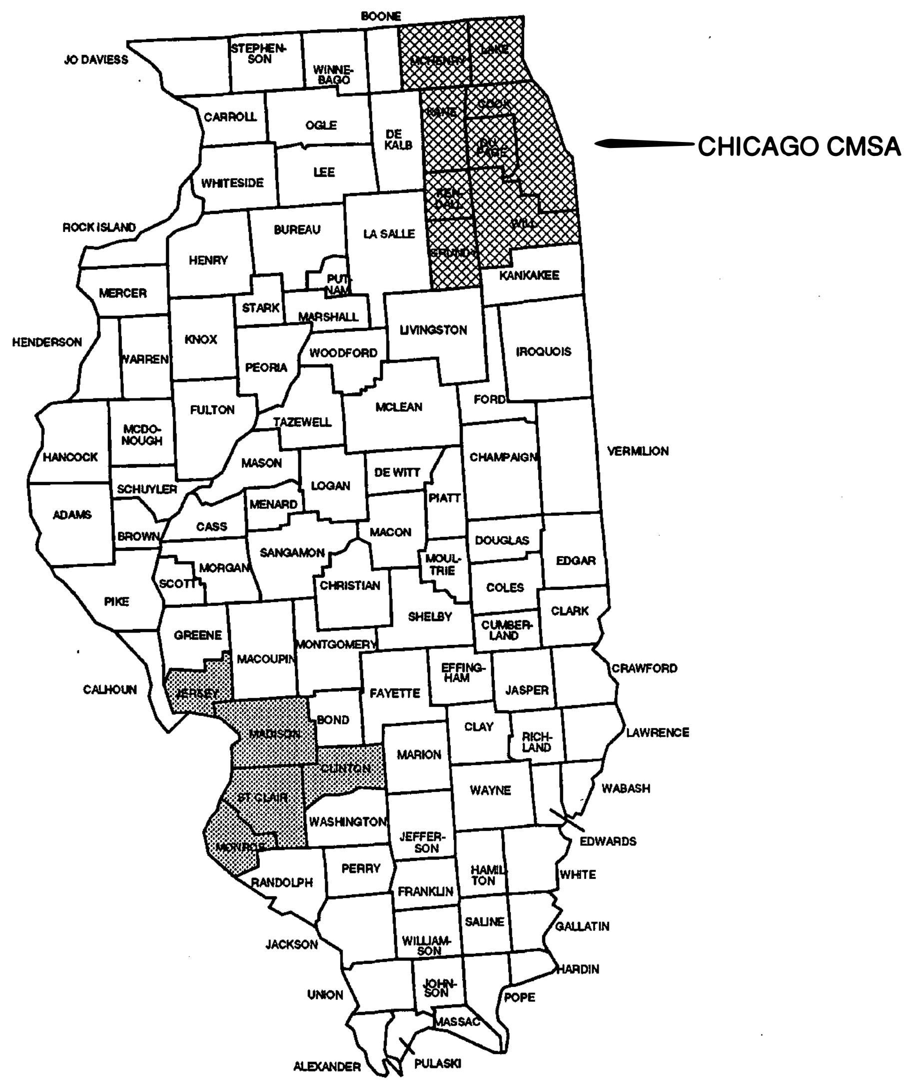
ILLINOIS

1995

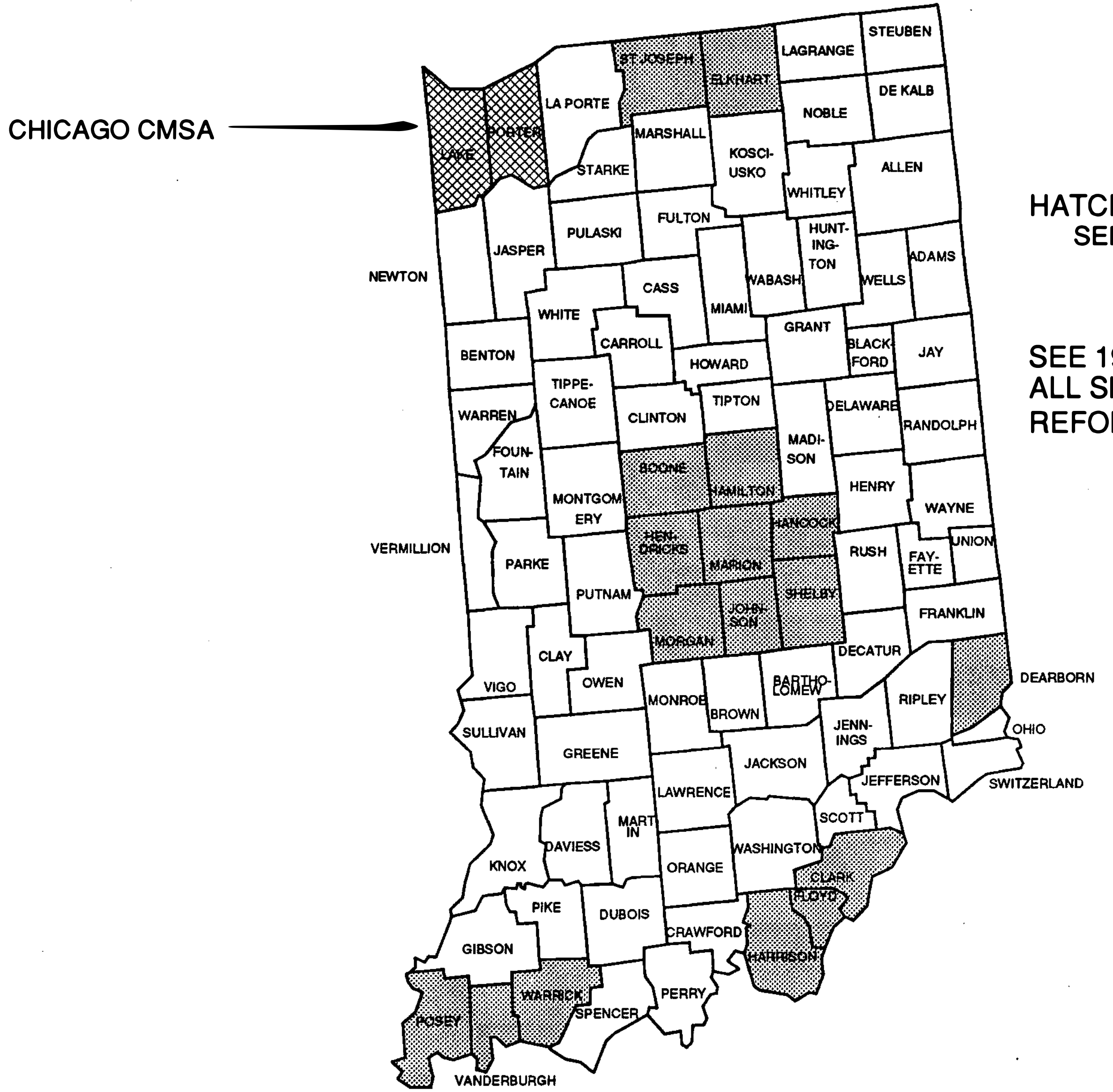
HATCHED AREA:
SEE CMSA PLOT FOR DETAILS.

2000-2010

SEE 1995 NOTES.
ALL SHADED COUNTIES REQUIRE REFORMULATED GASOLINE.



APP L.III.4-23



INDIANA

1995

HATCHED AREA:
SEE CMSA PLOT FOR DETAILS.

2000-2010

SEE 1995 NOTES.
ALL SHADED COUNTIES REQUIRE REFORMULATED GASOLINE.

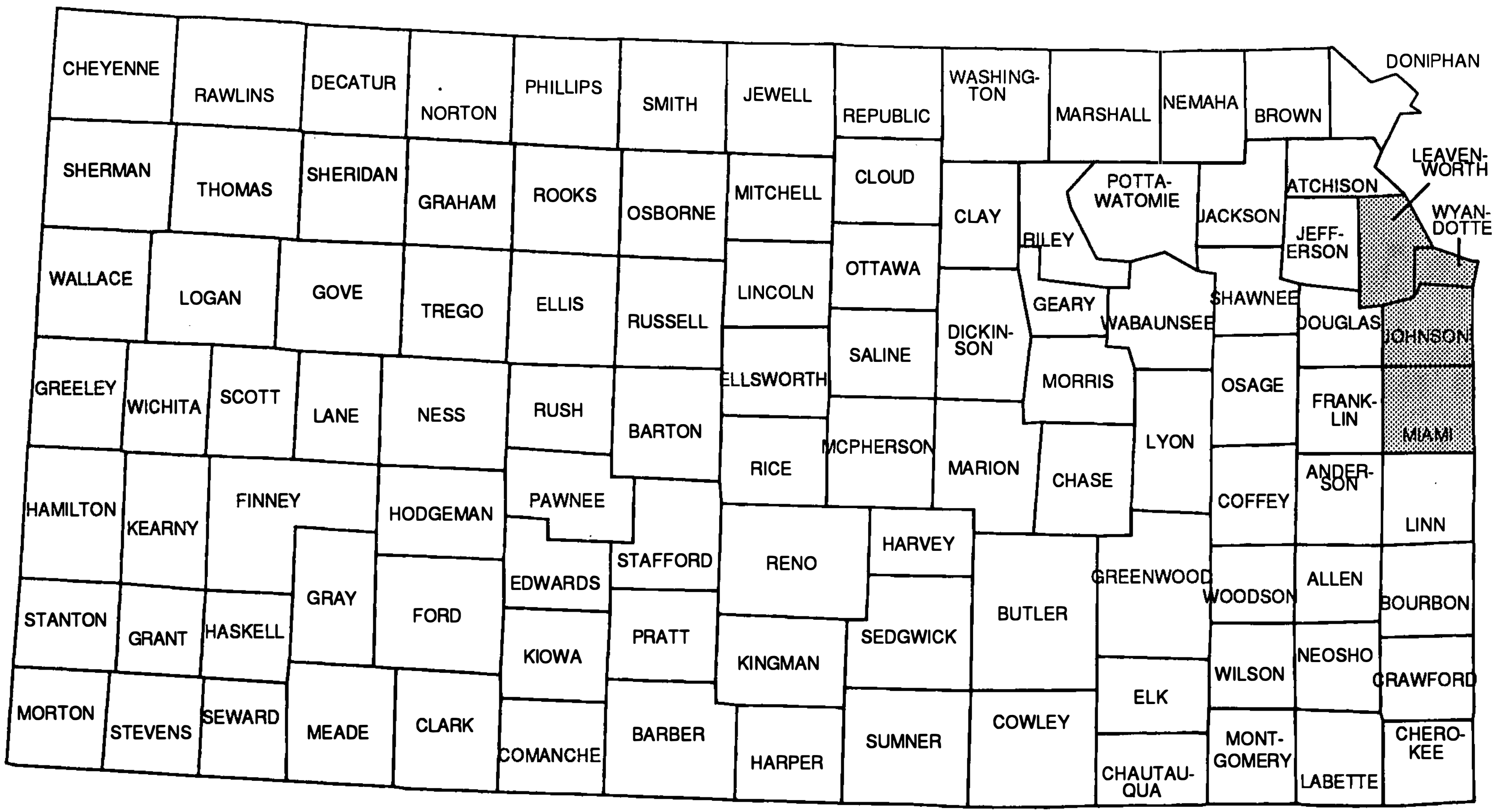
KANSAS

1995

THIS STATE IS IN CO ATTAINMENT.
THIS STATE IS IN OZONE COMPLIANCE FOR 1995.

2000-2010

SEE 1995 NOTES.
SHADED COUNTIES REQUIRE REFORMULATED GASOLINE.



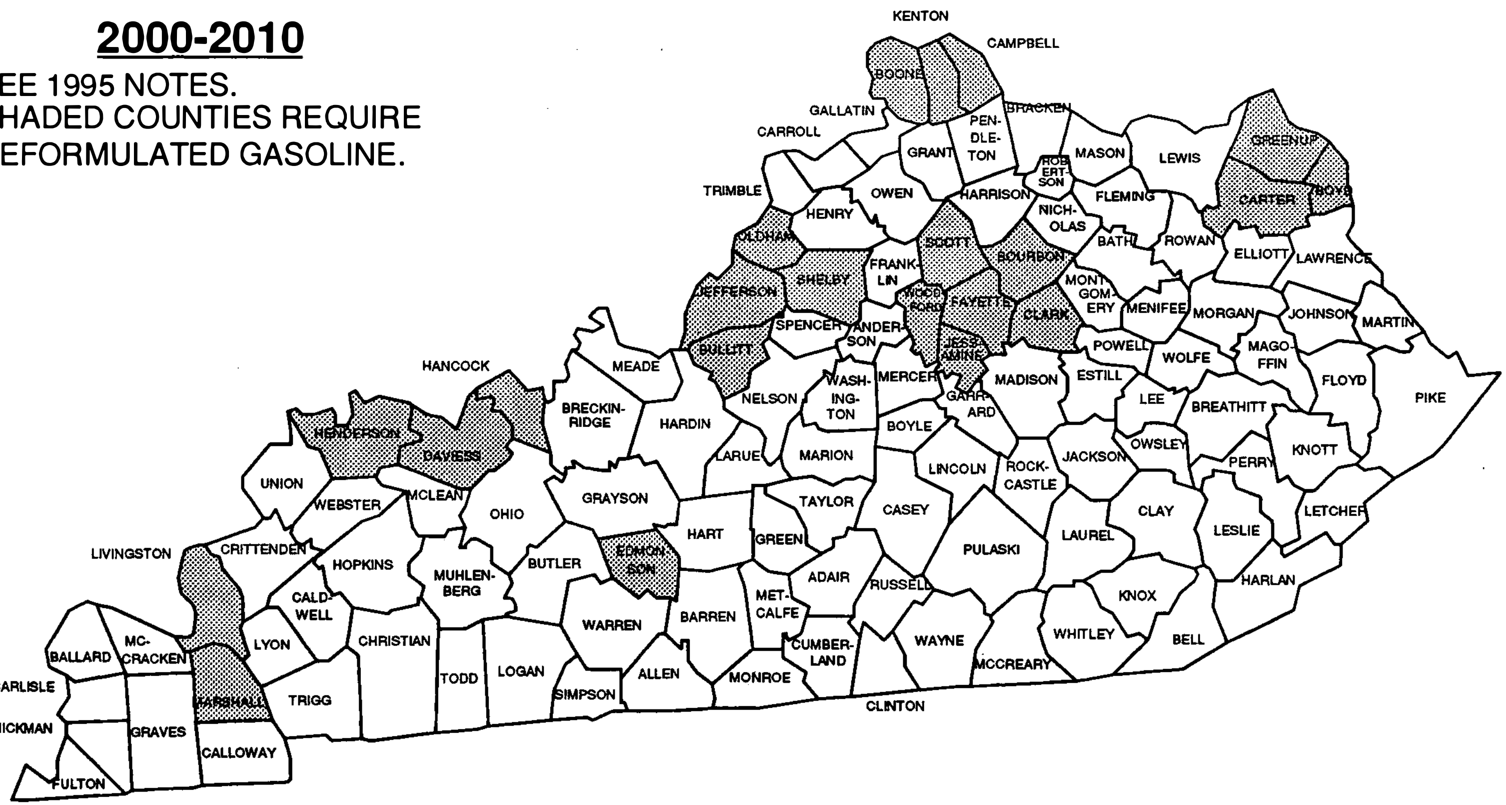
KENTUCKY

1995

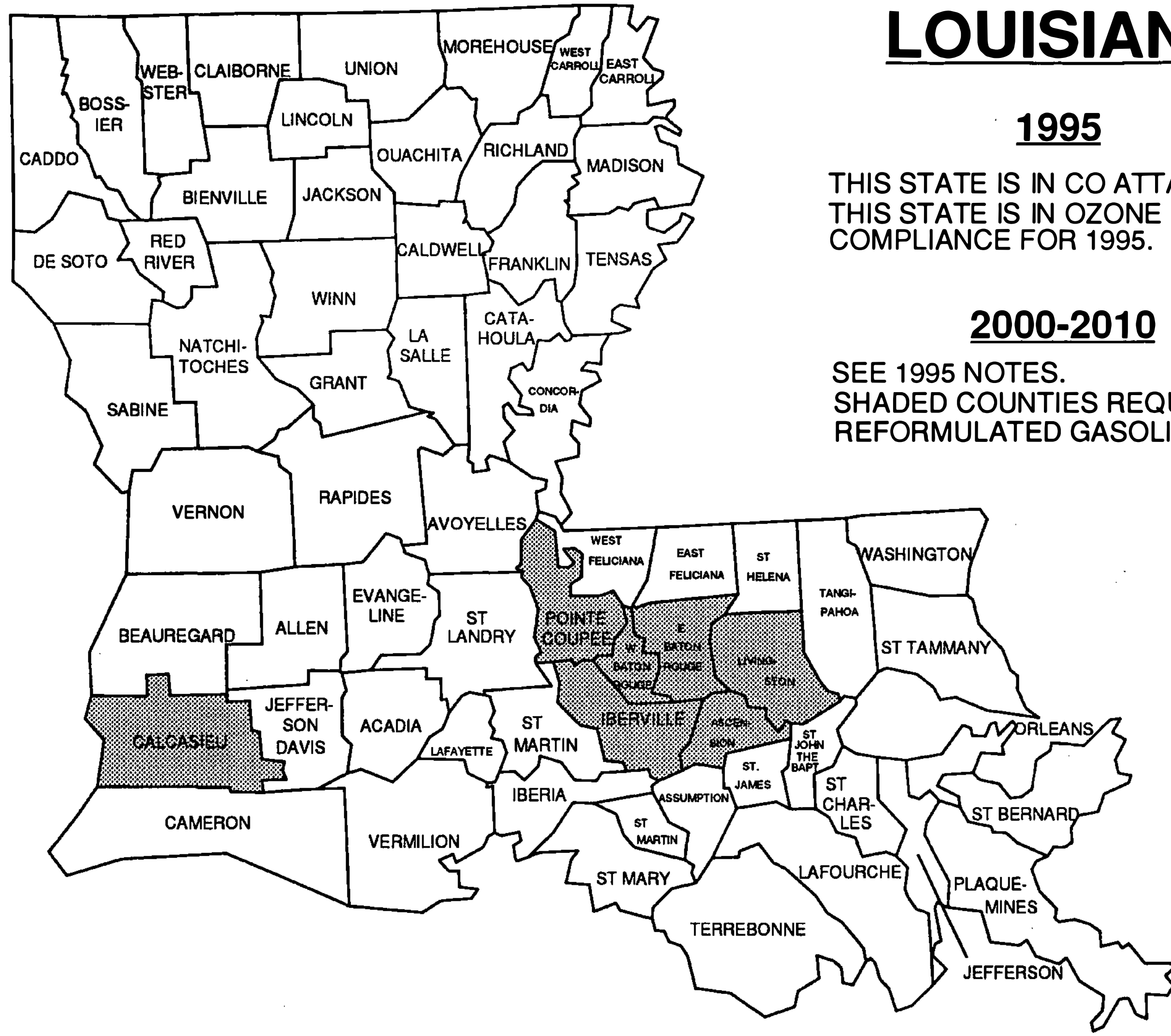
THIS STATE IS IN CO ATTAINMENT.
THIS STATE IS IN OZONE COMPLIANCE FOR 1995.

2000-2010

SEE 1995 NOTES.
SHADED COUNTIES REQUIRE
REFORMULATED GASOLINE.



APP L.III.4-25



LOUISIANA

1995

THIS STATE IS IN CO ATTAINMENT.
THIS STATE IS IN OZONE COMPLIANCE FOR 1995.

2000-2010

SEE 1995 NOTES.
SHADED COUNTIES REQUIRE REFORMULATED GASOLINE.

MAINE

1995

THIS AREA IS IN CO ATTAINMENT.
THIS AREA IS IN OZONE COMPLIANCE FOR 1995.

2000-2010

DARKER SHADED AREAS:
'MODERATE' OZONE NON-ATTAINMENT
LIGHTER SHADED AREAS:
'MARGINAL' OZONE NON-ATTAINMENT

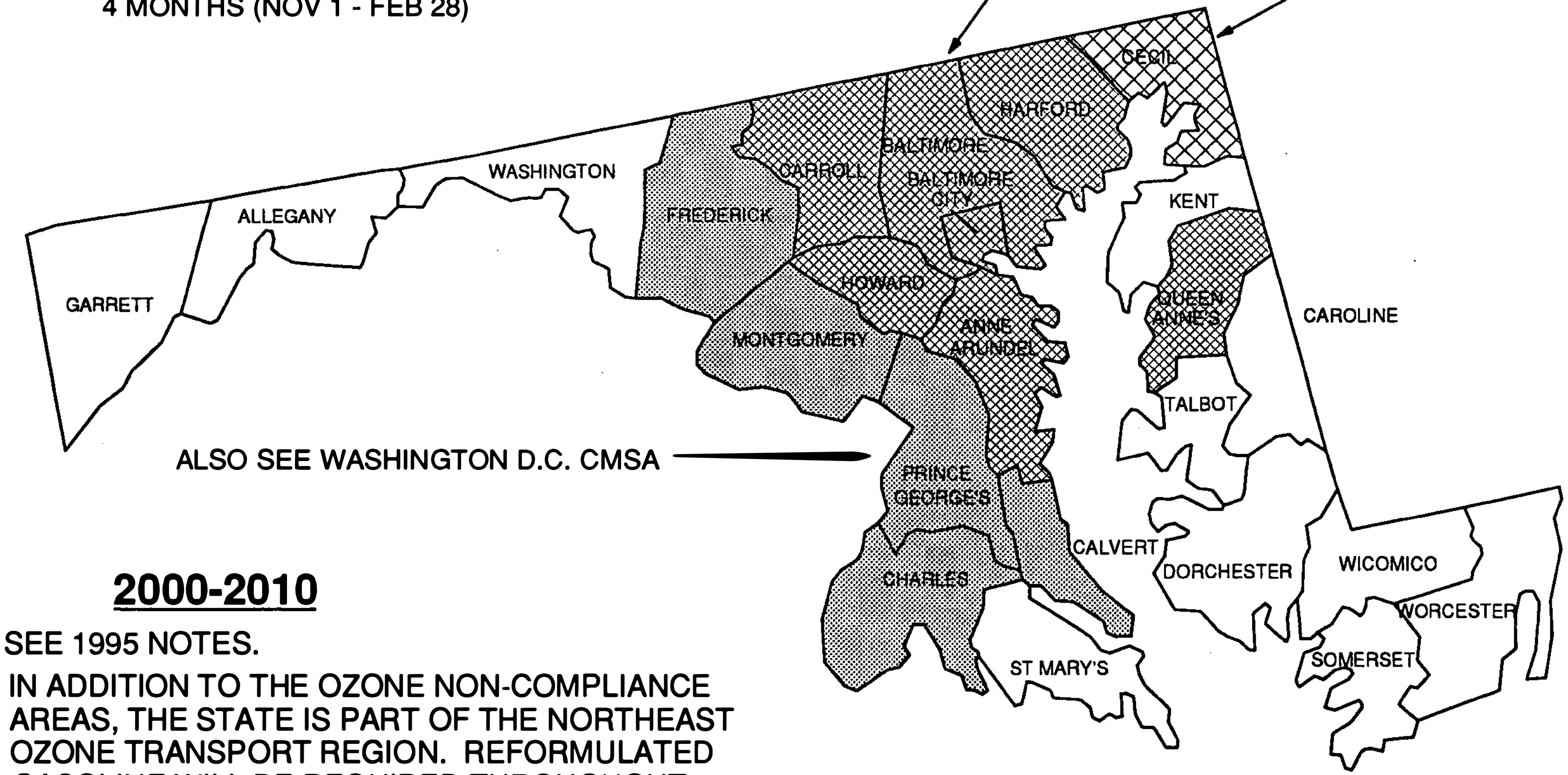
ALL COUNTIES WILL BE SUPPLIED REFORMULATED GASOLINE --- THE UNSHADED AREAS ARE INCLUDED IN THE NORTHEAST OZONE TRANSPORT REGION.

MARYLAND

1995

HATCHED AREA:
SEE CMSA PLOT FOR DETAILS

SHADED AREA:
CO NON-ATTAINMENT ONLY:
4 MONTHS (NOV 1 - FEB 28)



2000-2010

SEE 1995 NOTES.

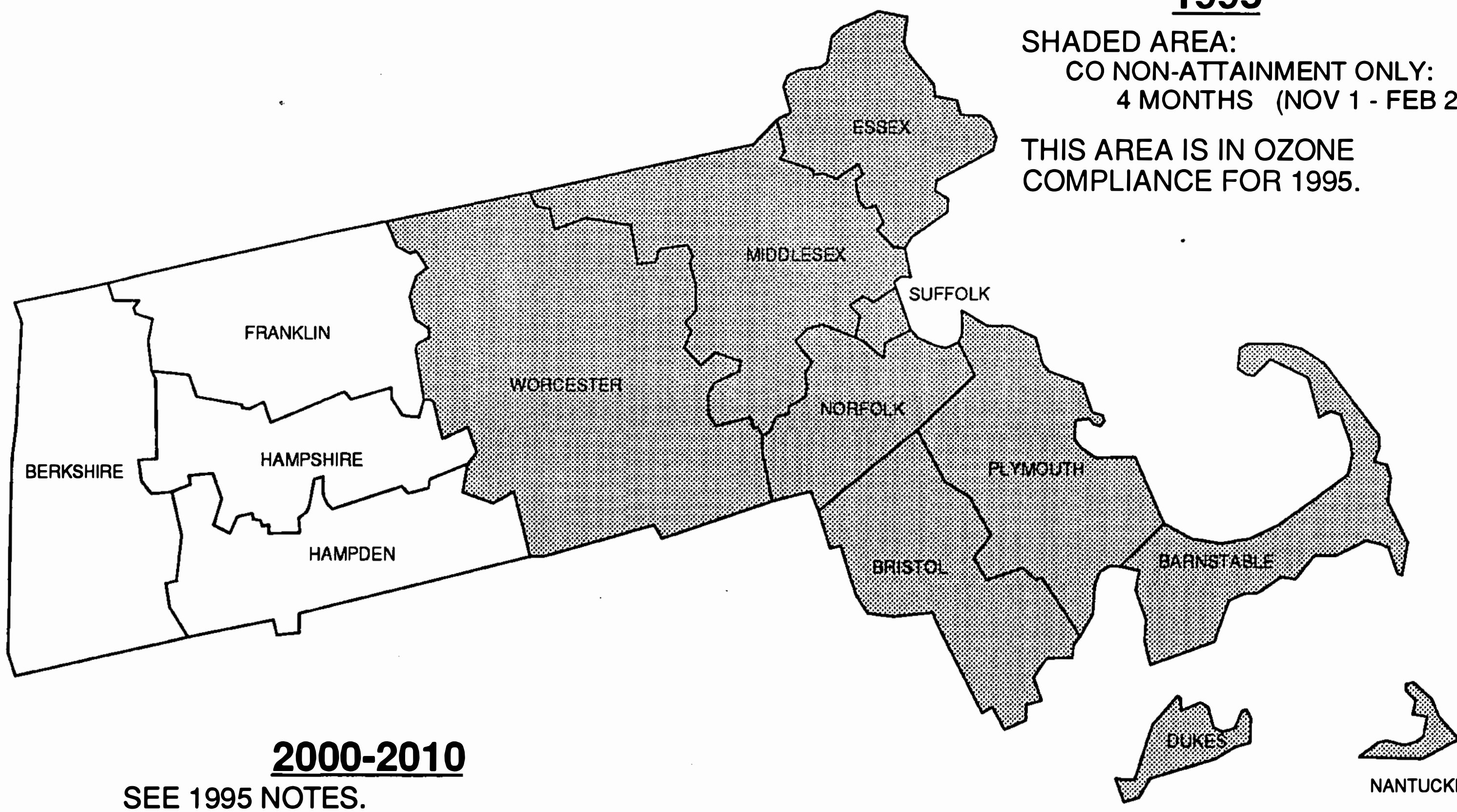
IN ADDITION TO THE OZONE NON-COMPLIANCE AREAS, THE STATE IS PART OF THE NORTHEAST OZONE TRANSPORT REGION. REFORMULATED GASOLINE WILL BE REQUIRED THROUGHOUT THE STATE.

MASSACHUSETTS

1995

SHADED AREA:
CO NON-ATTAINMENT ONLY:
4 MONTHS (NOV 1 - FEB 28)

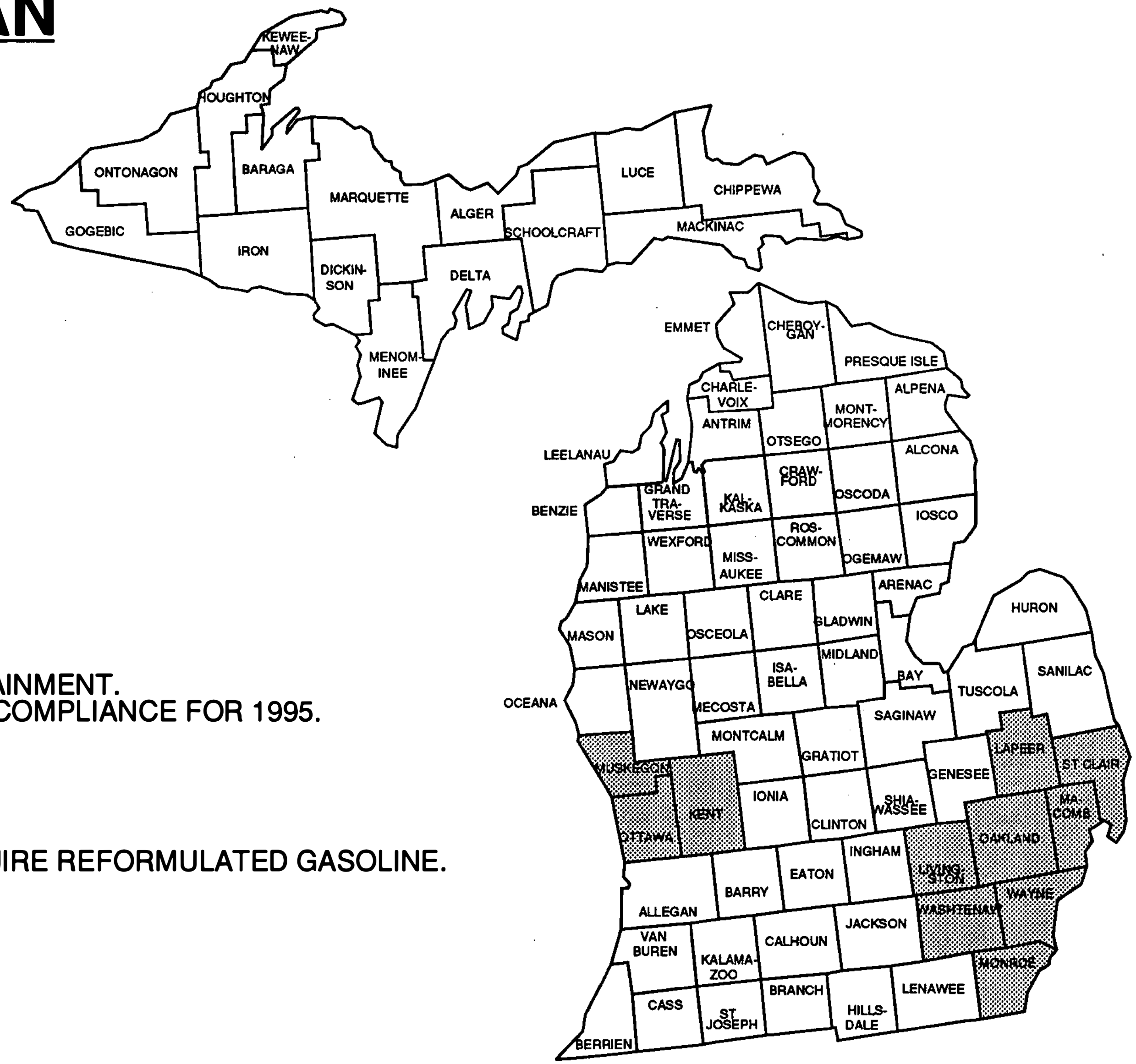
THIS AREA IS IN OZONE COMPLIANCE FOR 1995.



2000-2010

SEE 1995 NOTES.
ALL THE STATE IS IN 'SERIOUS' OZONE NON-ATTAINMENT. REFORMULATED GASOLINE WILL BE REQUIRED BY 2000.

MICHIGAN



1995

THIS STATE IS IN CO ATTAINMENT.
THIS STATE IS IN OZONE COMPLIANCE FOR 1995.

2000-2010

SEE 1995 NOTES.
SHADED COUNTIES REQUIRE REFORMULATED GASOLINE.

APP L.III.4-30

MINNESOTA

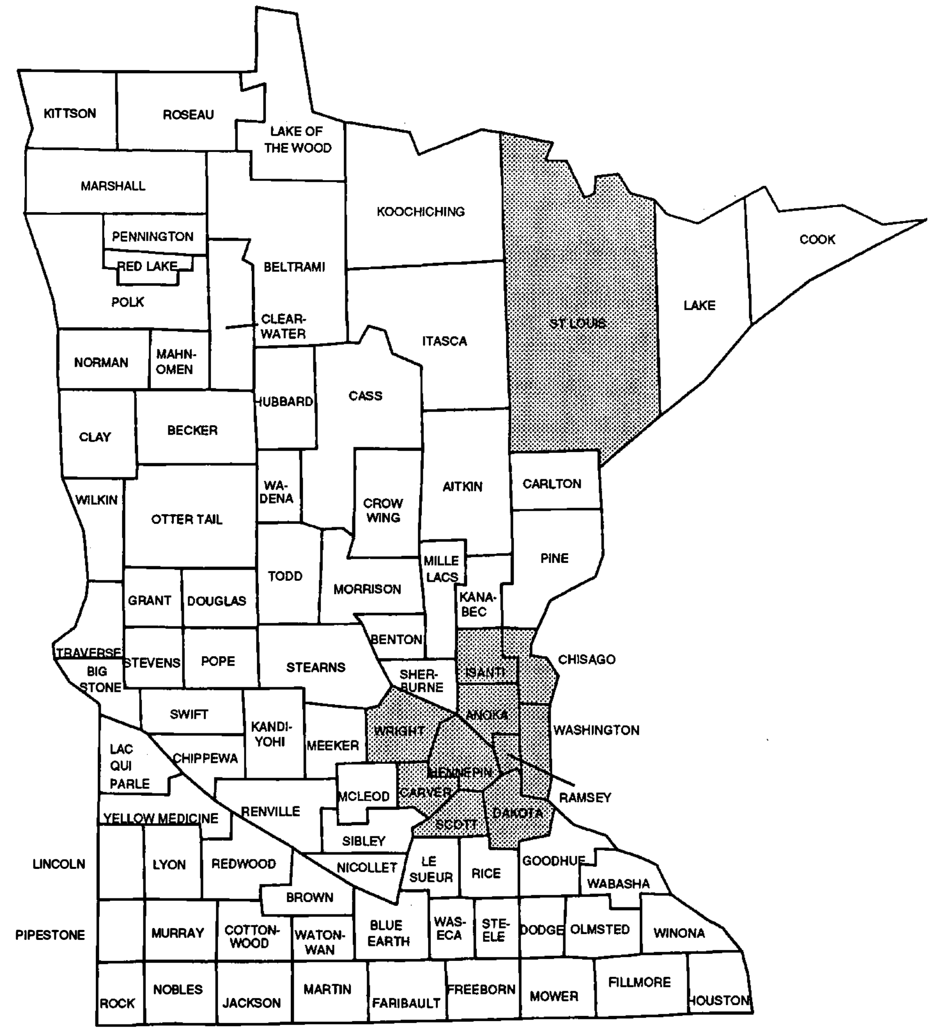
1995

SHADED AREA:
CO NON-ATTAINMENT ONLY:
4 MONTHS (OCT 1 - JAN 31)

THIS STATE IS IN OZONE COMPLIANCE.

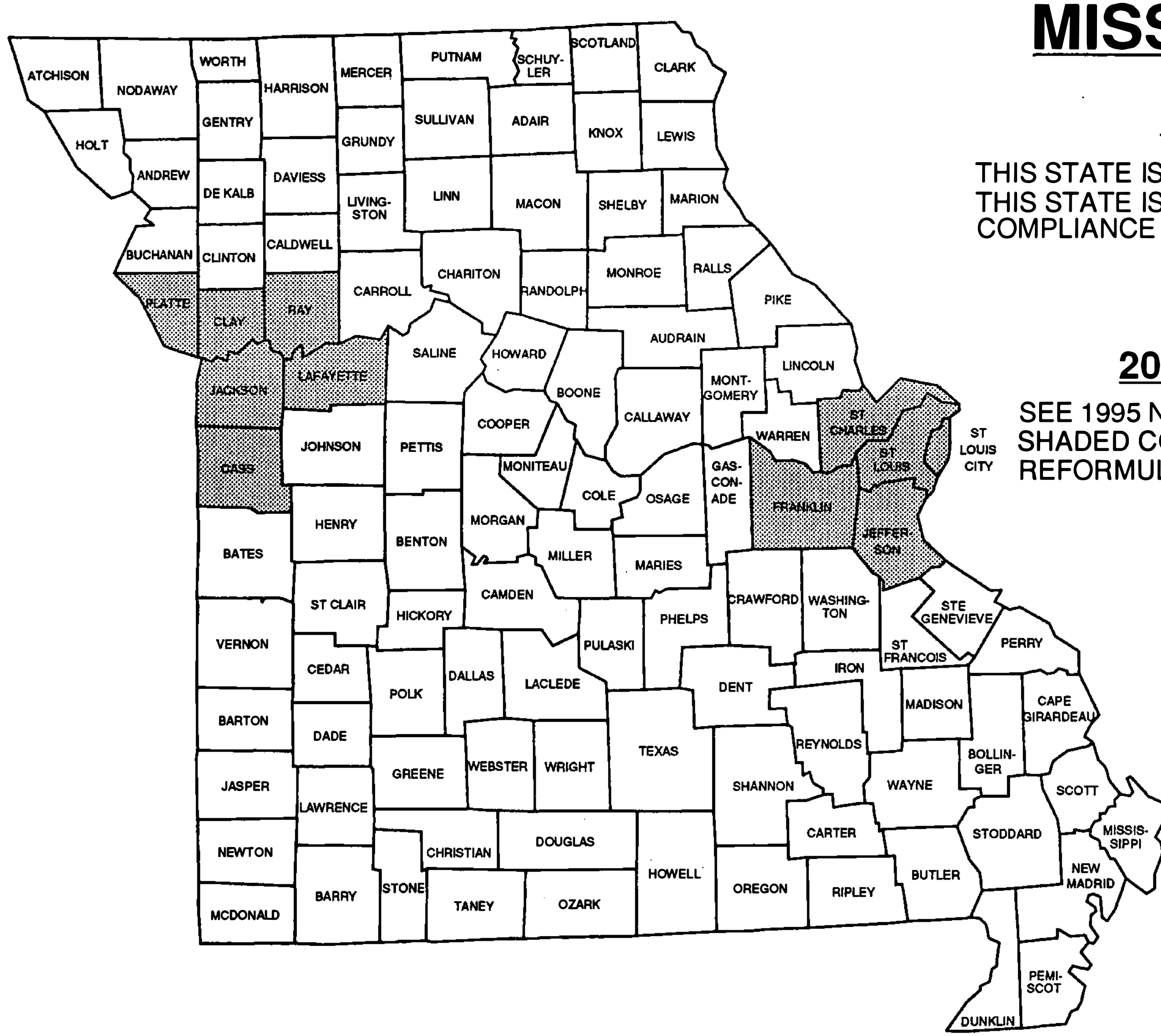
2000-2010

SEE 1995 NOTES.



APP L.III.4-31

MISSOURI



1995

THIS STATE IS IN CO ATTAINMENT.
THIS STATE IS IN OZONE COMPLIANCE FOR 1995.

2000-2010

SEE 1995 NOTES.
SHADED COUNTIES REQUIRE REFORMULATED GASOLINE.

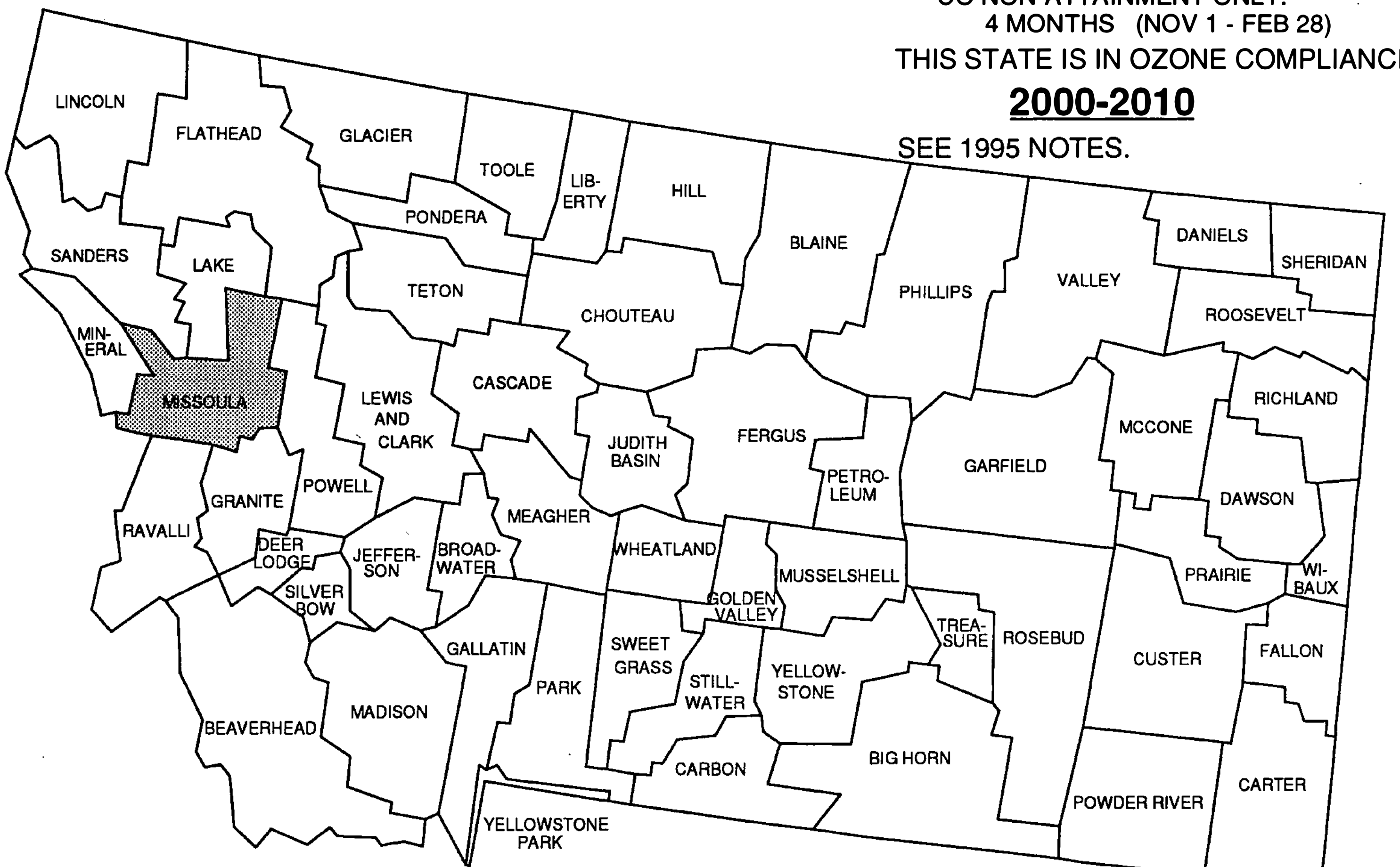
MONTANA

1995

SHADED AREA:
CO NON-ATTAINMENT ONLY:
4 MONTHS (NOV 1 - FEB 28)
THIS STATE IS IN OZONE COMPLIANCE.

2000-2010

SEE 1995 NOTES.



NEVADA

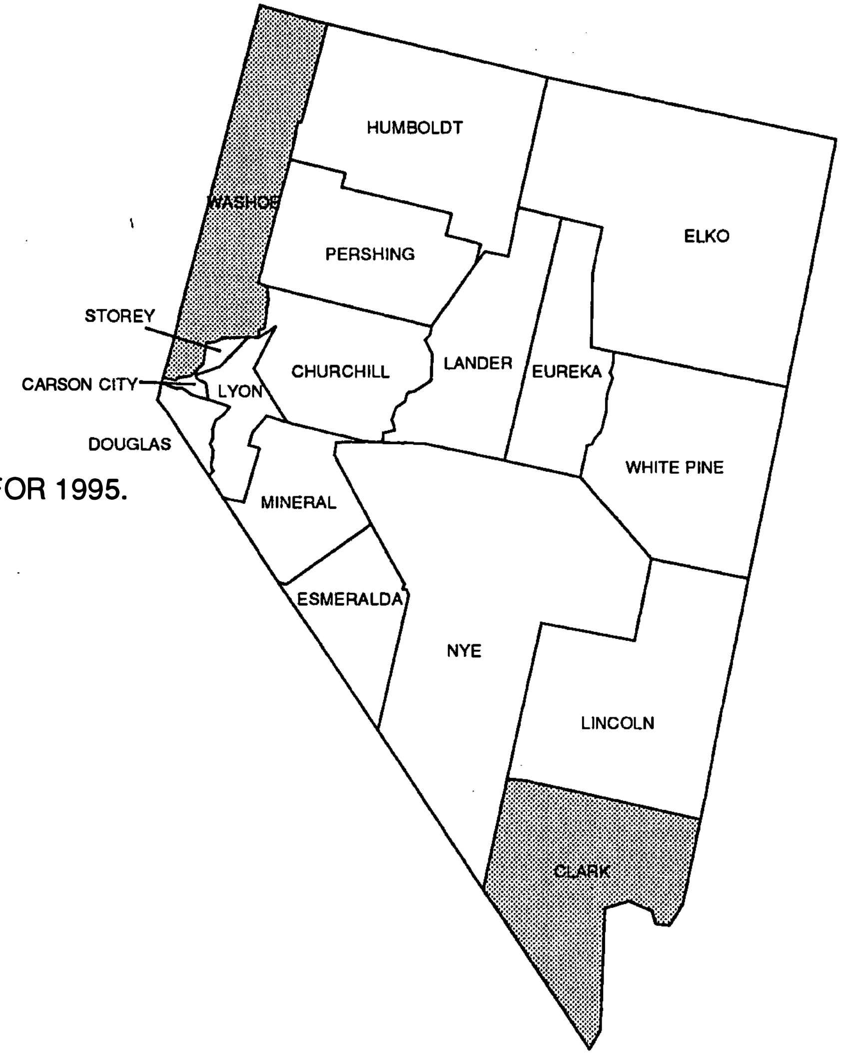
1995

SHADED AREA:

CO NON-ATTAINMENT ONLY:

5 MONTHS (OCT 1 - FEB 28)
FOR CLARK CO (LAS VEGAS)

4 MONTHS (OCT 1 - JAN 31)
FOR WASHOE CO (RENO)

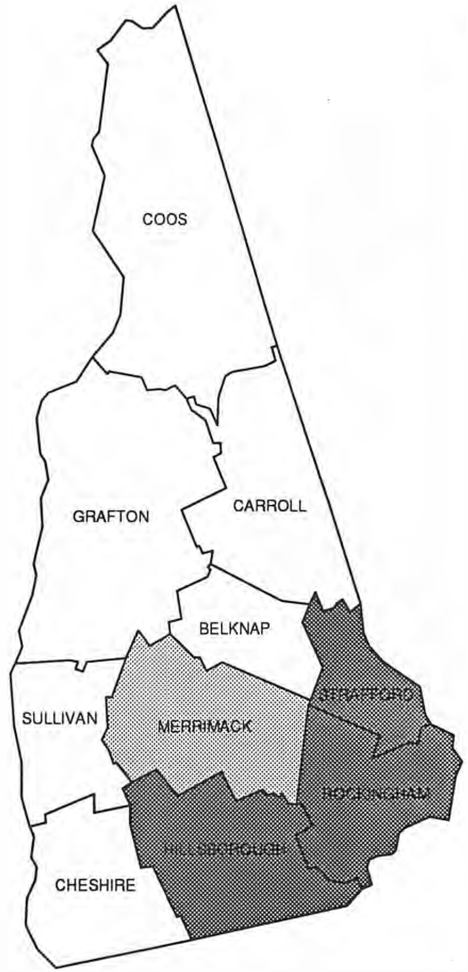


THIS STATE IS IN OZONE COMPLIANCE FOR 1995.

2000-2010

SEE 1995 NOTES.
ONLY WASHOE COUNTY REQUIRES REFORMULATED GASOLINE.

APP L.III.4-35



NEW HAMPSHIRE

1995

SHADED AREA:
CO NON-ATTAINMENT ONLY:
4 MONTHS (NOV 1 - FEB 28)
THIS AREA IS IN OZONE COMPLIANCE IN 1995.

2000-2010

DARKER SHADED AREAS:
'SERIOUS' OZONE NON-ATTAINMENT
LIGHTER SHADED AREAS:
'MARGINAL' OZONE NON-ATTAINMENT

ALL COUNTIES WILL BE SUPPLIED REFORMULATED GASOLINE --- THE UNSHADED AREAS ARE INCLUDED IN THE NORTHEAST OZONE TRANSPORT REGION.

NEW JERSEY

1995

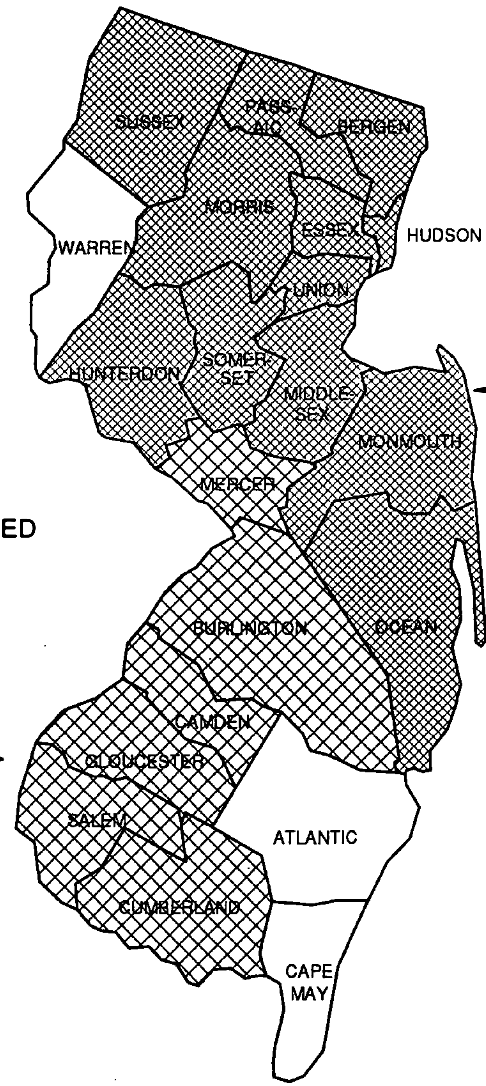
HATCHED AREA:
SEE CMSA PLOT FOR DETAILS

UN-HATCHED AREA:
IN CO ATTAINMENT
IN OZONE COMPLIANCE FOR 1995

2000-2010

SEE 1995 NOTES

UN-HATCHED AREA:
'MODERATE' OR 'MARGINAL' (WARREN)
OZONE NON-ATTAINMENT. REFORMULATED
GASOLINE WILL BE REQUIRED BY 2000.



APP L.III.4-36

NEW MEXICO

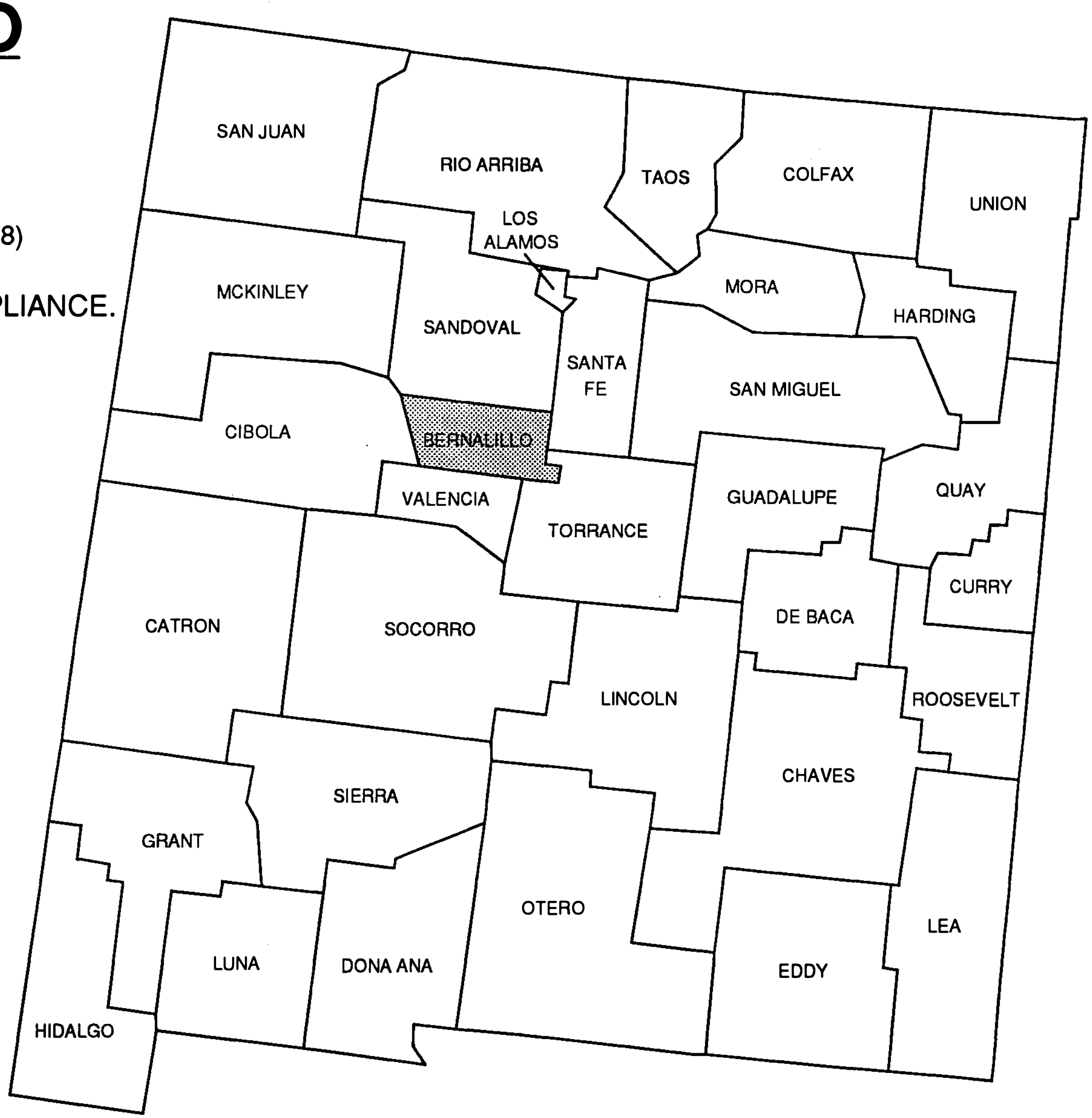
1995

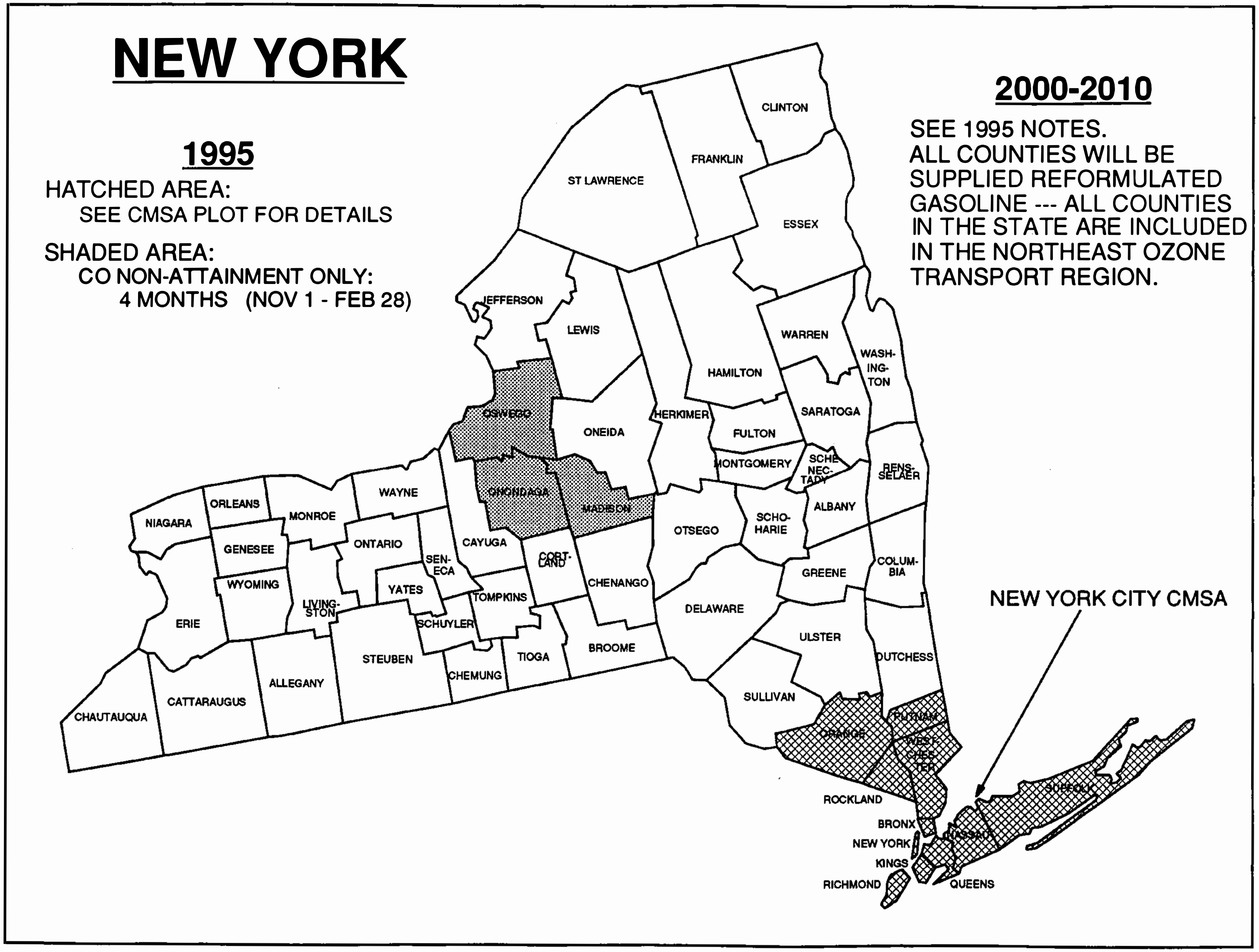
SHADED AREA:
CO NON-ATTAINMENT ONLY:
4 MONTHS (NOV 1 - FEB 28)

THIS STATE IS IN OZONE COMPLIANCE.

2000-2010

SEE 1995 NOTES.



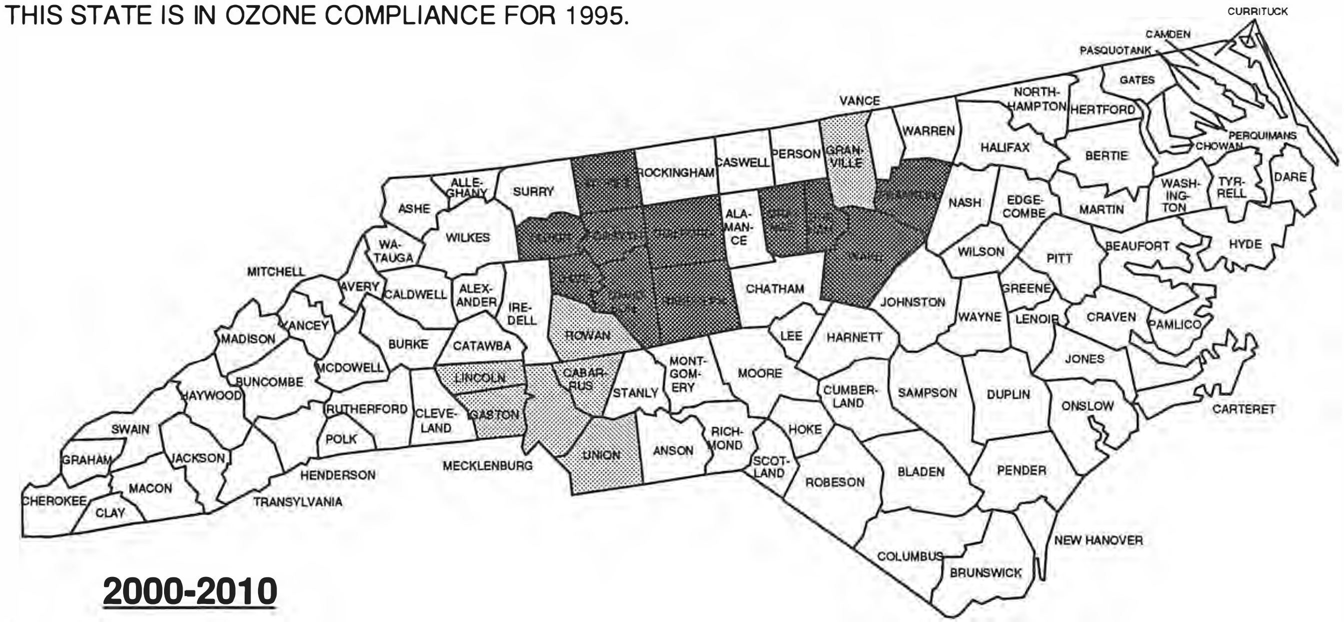

NEW YORK
1995
HATCHED AREA:
SEE CMSA PLOT FOR DETAILS
SHADED AREA:
CO NON-ATTAINMENT ONLY:
4 MONTHS (NOV 1 - FEB 28)
2000-2010
SEE 1995 NOTES.
ALL COUNTIES WILL BE
SUPPLIED REFORMULATED
GASOLINE --- ALL COUNTIES
IN THE STATE ARE INCLUDED
IN THE NORTHEAST OZONE
TRANSPORT REGION.
NEW YORK CITY CMSA
CLINTON
FRANKLIN
ST LAWRENCE
ESSEX
JEFFERSON
LEWIS
WARREN
HAMILTON
WASH-
ING-
TON
OSWEGO
ONEIDA
HERKIMER
FULTON
SARATOGA
MONTGOMERY
SCHE-
NEC-
TADY
RENS-
SELAER
ONONDAGA
MADISON
ALBANY
NIAGARA
ORLEANS
MONROE
WAYNE
GENESEE
ONTARIO
CAYUGA
OTSEGO
SCHO-
HARIE
SEN-
ECA
CORT-
LAND
GREENE
COLUM-
BIA
WYOMING
YATES
TOMPKINS
CHENANGO
LIVING-
STON
ERIE
SCHUYLER
DELAWARE
ULSTER
STEUBEN
TIOGA
BROOME
DUTCHESS
ALLEGANY
CHEMUNG
CATTARAUGUS
SULLIVAN
CHAUTAUQUA
PUTNAM
ORANGE
WEST-
CHES-
TER
SUFFOLK
ROCKLAND
BRONX
NASSAU
NEW YORK
KINGS
RICHMOND
QUEENS

NORTH CAROLINA

1995

DARKER SHADED AREA:
CO NON-ATTAINMENT ONLY:
4 MONTHS (NOV 1 - FEB 28)

THIS STATE IS IN OZONE COMPLIANCE FOR 1995.



2000-2010

SEE 1995 NOTES.

ALL SHADED AREAS REQUIRE REFORMULATED GASOLINE.

OHIO

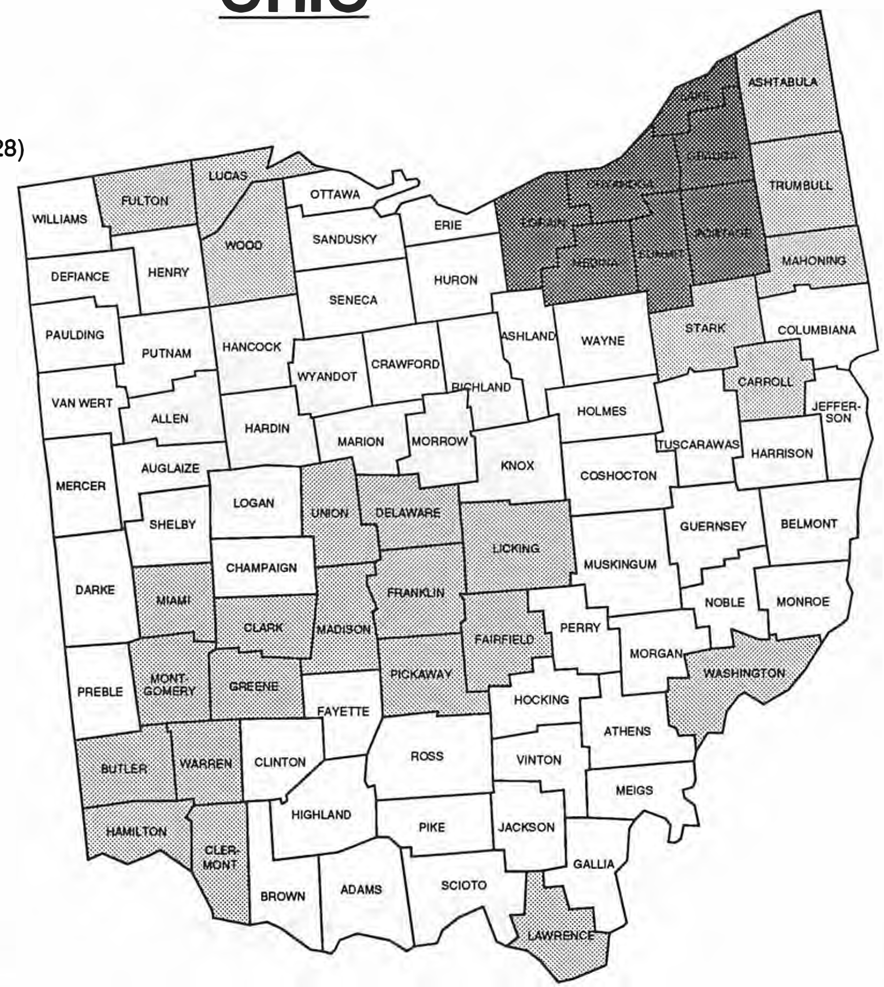
1995

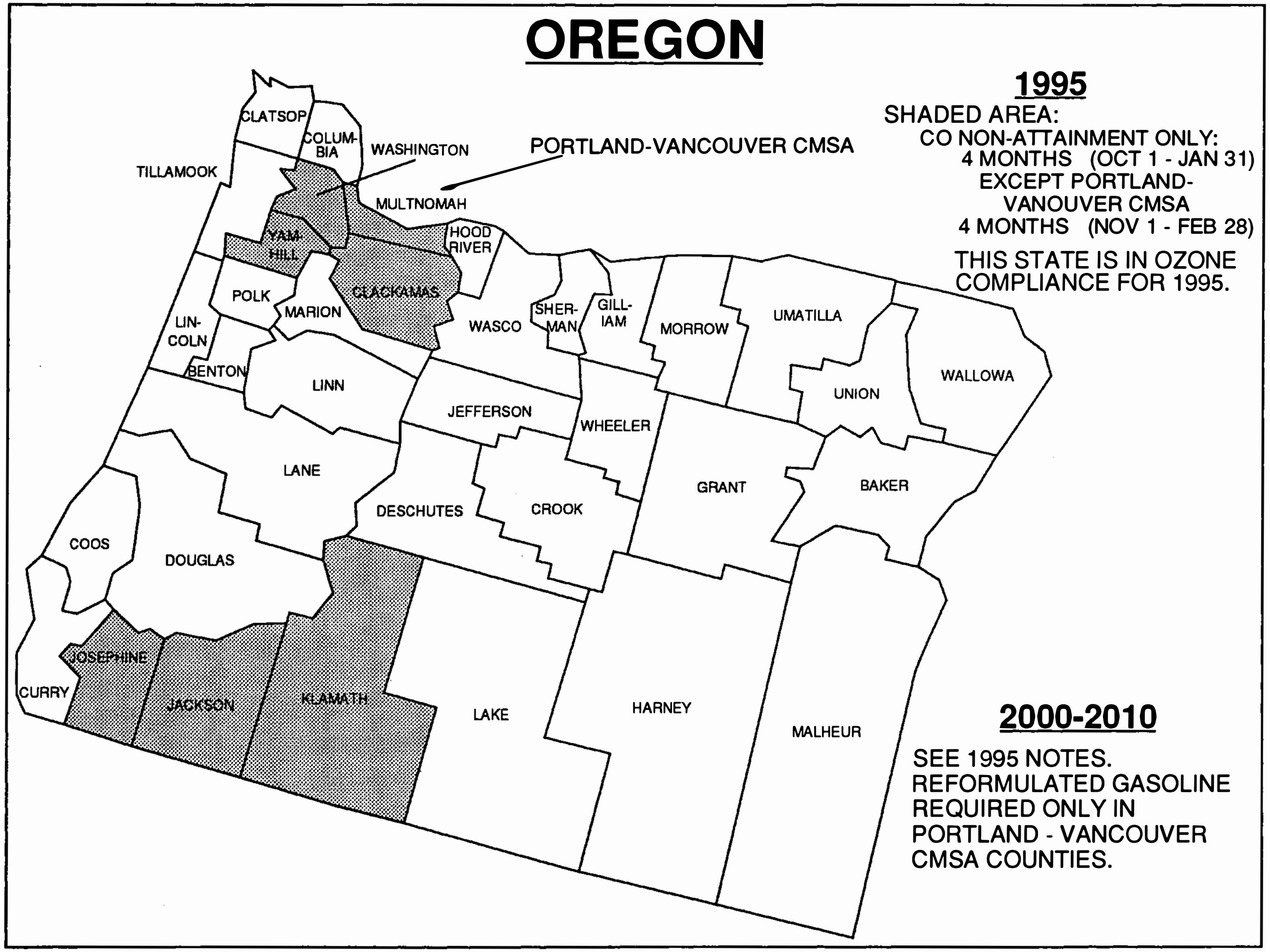
DARKER SHADED AREA:
CO NON-ATTAINMENT ONLY:
4 MONTHS (NOV 1 - FEB 28)

THIS STATE IS IN OZONE COMPLIANCE FOR 1995.

2000-2010

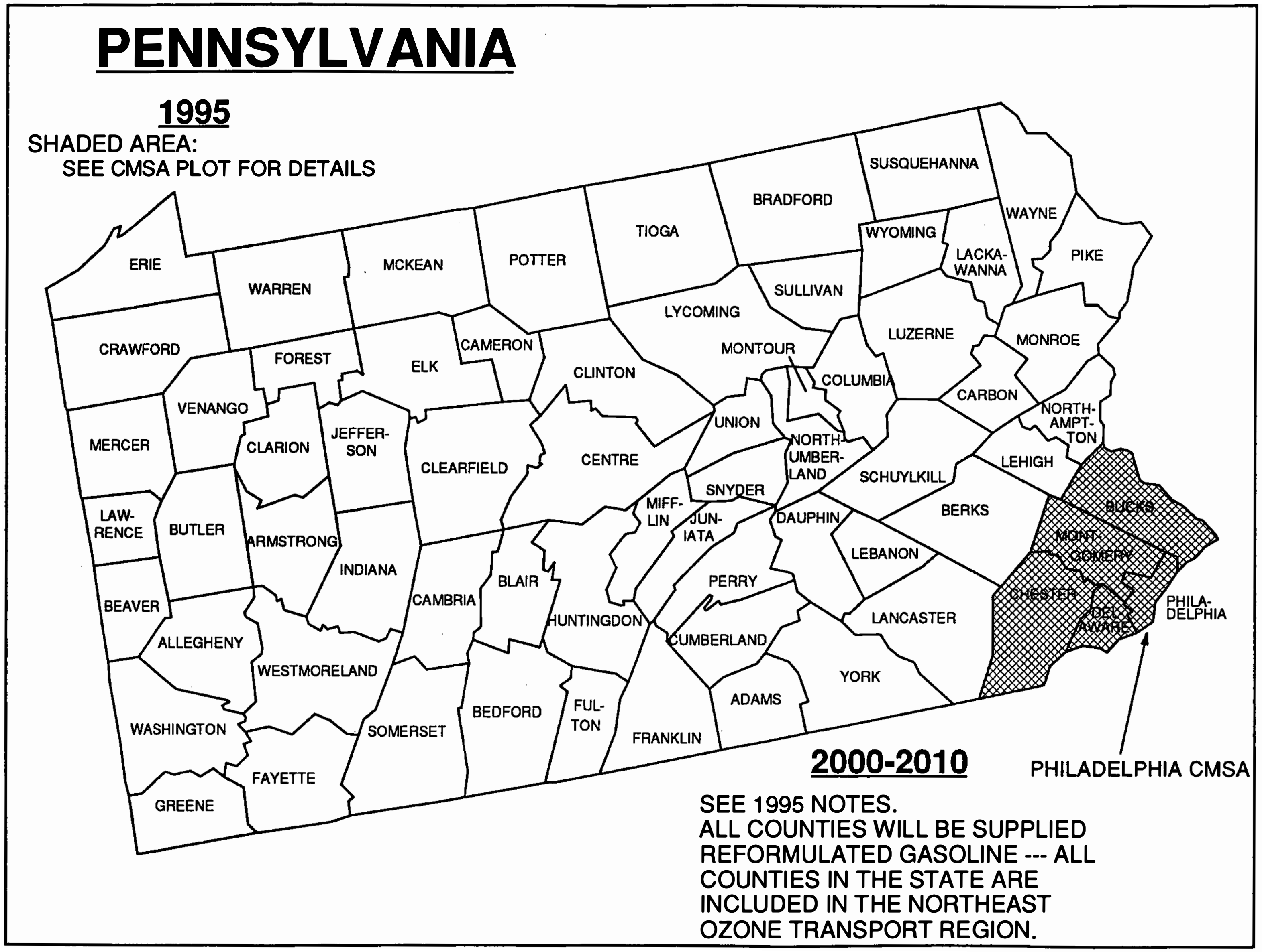
SEE 1995 NOTES.
ALL SHADED AREAS REQUIRE REFORMULATED GASOLINE.




OREGON
1995
SHADED AREA:
CO NON-ATTAINMENT ONLY:
4 MONTHS (OCT 1 - JAN 31)
EXCEPT PORTLAND-
VANOUVER CMSA
4 MONTHS (NOV 1 - FEB 28)
THIS STATE IS IN OZONE
COMPLIANCE FOR 1995.
PORTLAND-VANCOUVER CMSA
CLATSOP
COLUM-BIA
WASHINGTON
TILLAMOOK
MULTNOMAH
HOOD RIVER
YAM-HILL
CLACKAMAS
POLK
MARION
WASCO
SHER-MAN
GILL-IAM
MORROW
UMATILLA
LIN-COLN
BENTON
LINN
WALLOWA
UNION
JEFFERSON
WHEELER
LANE
GRANT
BAKER
DESCHUTES
CROOK
COOS
DOUGLAS
JOSEPHINE
CURRY
JACKSON
KLAMATH
LAKE
HARNEY
MALHEUR
2000-2010
SEE 1995 NOTES.
REFORMULATED GASOLINE
REQUIRED ONLY IN
PORTLAND - VANCOUVER
CMSA COUNTIES.

APP L.III.4-41

APP L.III.4-42


PENNSYLVANIA
1995
SHADED AREA:
SEE CMSA PLOT FOR DETAILS
ERIE
WARREN
MCKEAN
POTTER
TIOGA
BRADFORD
SUSQUEHANNA
WAYNE
PIKE
WYOMING
LACKA-WANNA
SULLIVAN
LYCOMING
CRAWFORD
FOREST
ELK
CAMERON
CLINTON
MONTOUR
COLUMBIA
LUZERNE
MONROE
CARBON
VENANGO
MERCER
CLARION
JEFFER-SON
CLEARFIELD
CENTRE
UNION
NORTH-UMBER-LAND
SCHUYLKILL
NORTH-AMPT-TON
LEHIGH
BUCKS
LAW-RENCE
BUTLER
ARMSTRONG
INDIANA
SNYDER
MIFF-LIN
JUN-IATA
DAUPHIN
BERKS
LEBANON
MONT-GOMERY
BEAVER
ALLEGHENY
CAMBRIA
BLAIR
HUNTINGDON
PERRY
CUMBERLAND
LANCASTER
CHESTER
DEL-AWARE
PHILA-DELPHIA
WESTMORELAND
WASHINGTON
SOMERSET
BEDFORD
FUL-TON
FRANKLIN
ADAMS
YORK
FAYETTE
GREENE
2000-2010
PHILADELPHIA CMSA
SEE 1995 NOTES.
ALL COUNTIES WILL BE SUPPLIED REFORMULATED GASOLINE --- ALL COUNTIES IN THE STATE ARE INCLUDED IN THE NORTHEAST OZONE TRANSPORT REGION.

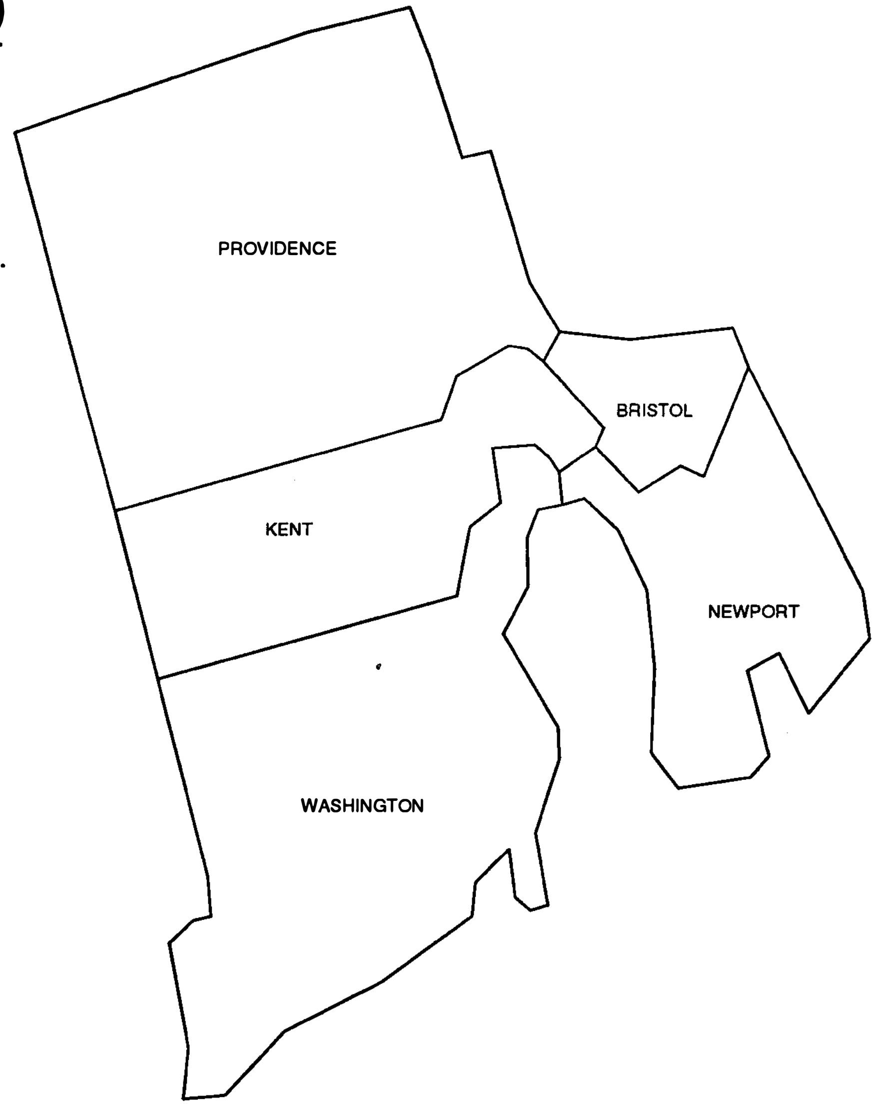
RHODE ISLAND

1995

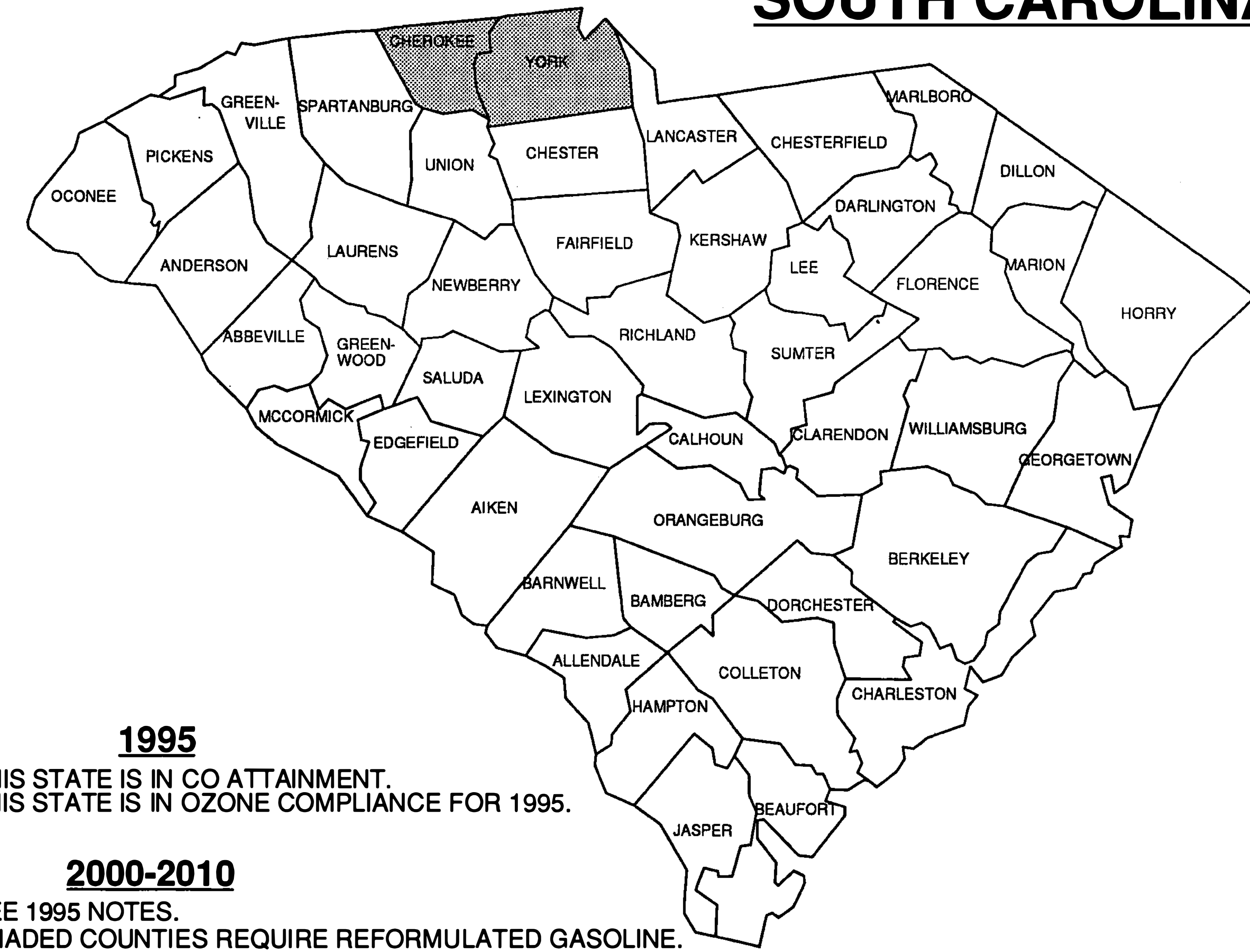
THIS AREA IS IN CO ATTAINMENT.
THIS AREA IS IN OZONE COMPLIANCE FOR 1995.

2000-2010

ALL COUNTIES ARE IN 'SERIOUS' OZONE NON-ATTAINMENT. REFORMULATED GASOLINE WILL BE REQUIRED BY 2000.



SOUTH CAROLINA



1995

THIS STATE IS IN CO ATTAINMENT.
THIS STATE IS IN OZONE COMPLIANCE FOR 1995.

2000-2010

SEE 1995 NOTES.
SHADED COUNTIES REQUIRE REFORMULATED GASOLINE.

TENNESSEE

1995

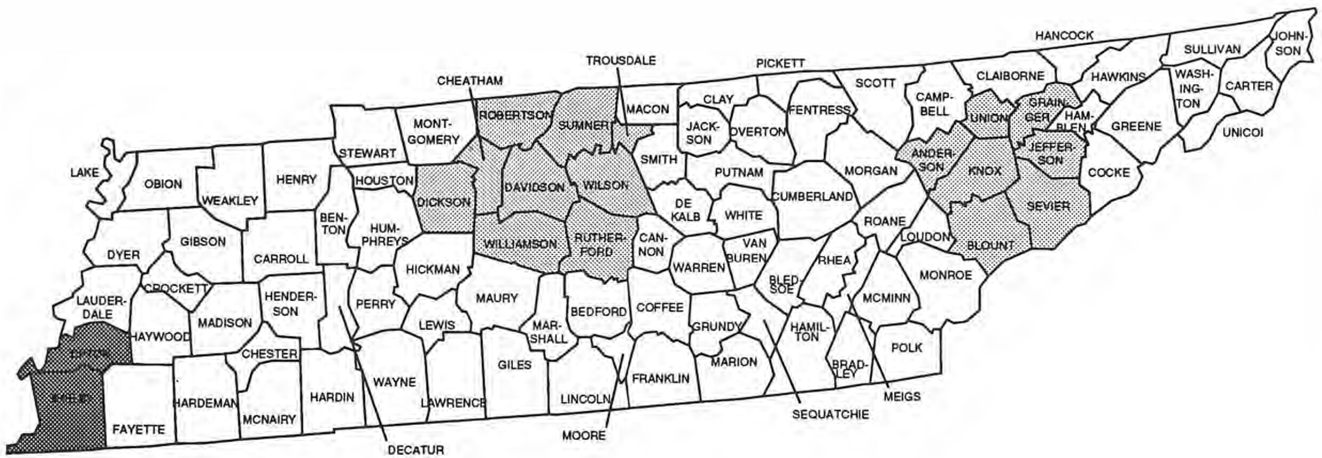
DARKER SHADED AREA:
CO NON-ATTAINMENT ONLY:
4 MONTHS (NOV 1 - FEB 28)

THIS STATE IS IN OZONE COMPLIANCE FOR 1995.

2000-2010

SEE 1995 NOTES.
ALL SHADED COUNTIES REQUIRE REFORMULATED GASOLINE.

AT THIS POINT, THE STATE IMPLEMENTATION PLANS (SIP) FOR ARKANSAS AND MISSISSIPPI ARE EXPECTED TO EXCLUDE STEPS REQUIRING THEIR MEMPHIS CMSA COUNTIES TO HAVE A CO NON-ATTAINMENT PROGRAM.
ARKANSAS: CRITTENDEN
MISSISSIPPI: DE SOTO



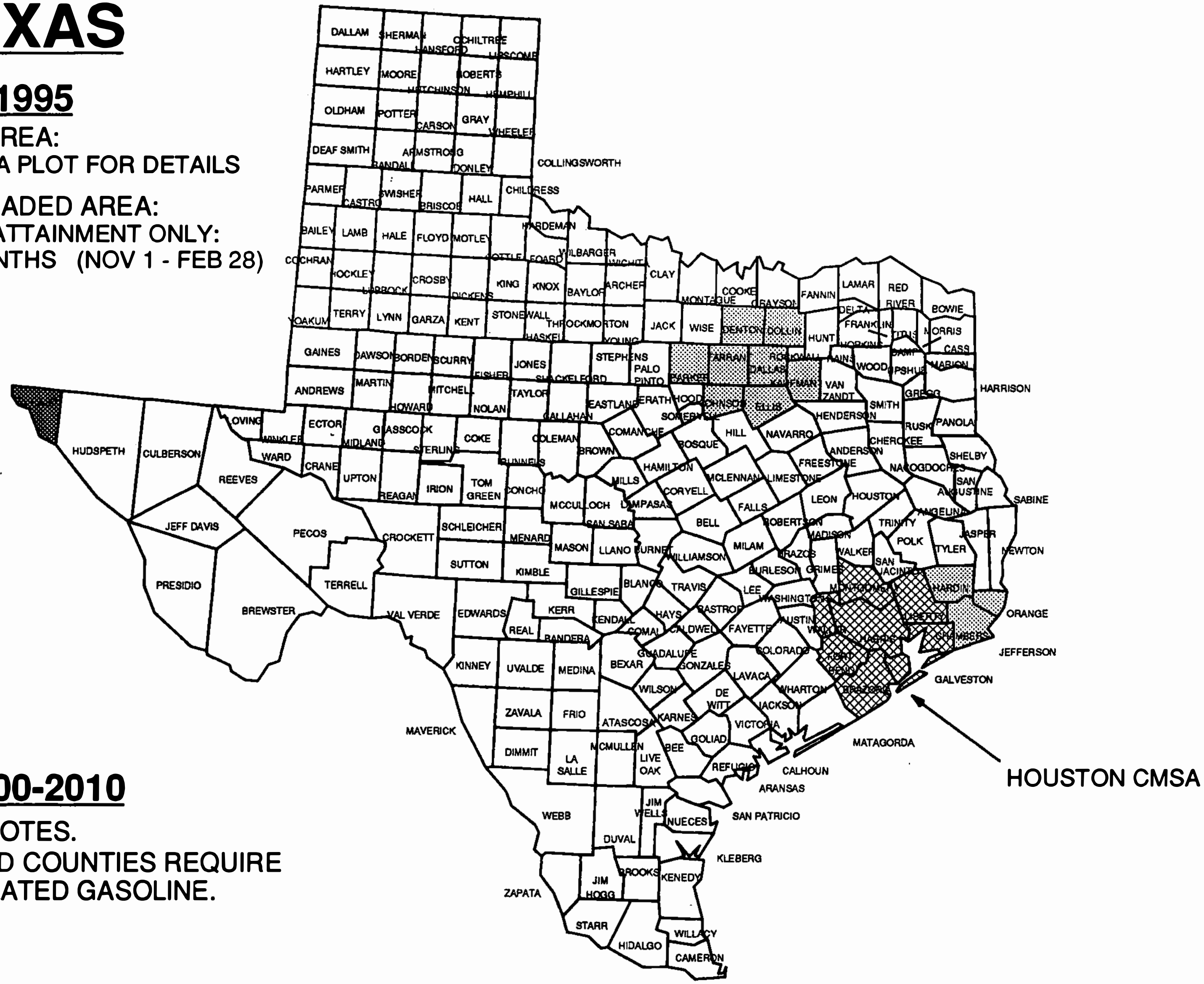
APP L.III.4-45

TEXAS

1995

HATCHED AREA:
SEE CMSA PLOT FOR DETAILS

DARKER SHADED AREA:
CO NON-ATTAINMENT ONLY:
4 MONTHS (NOV 1 - FEB 28)



2000-2010

SEE 1995 NOTES.
ALL SHADED COUNTIES REQUIRE
REFORMULATED GASOLINE.

UTAH

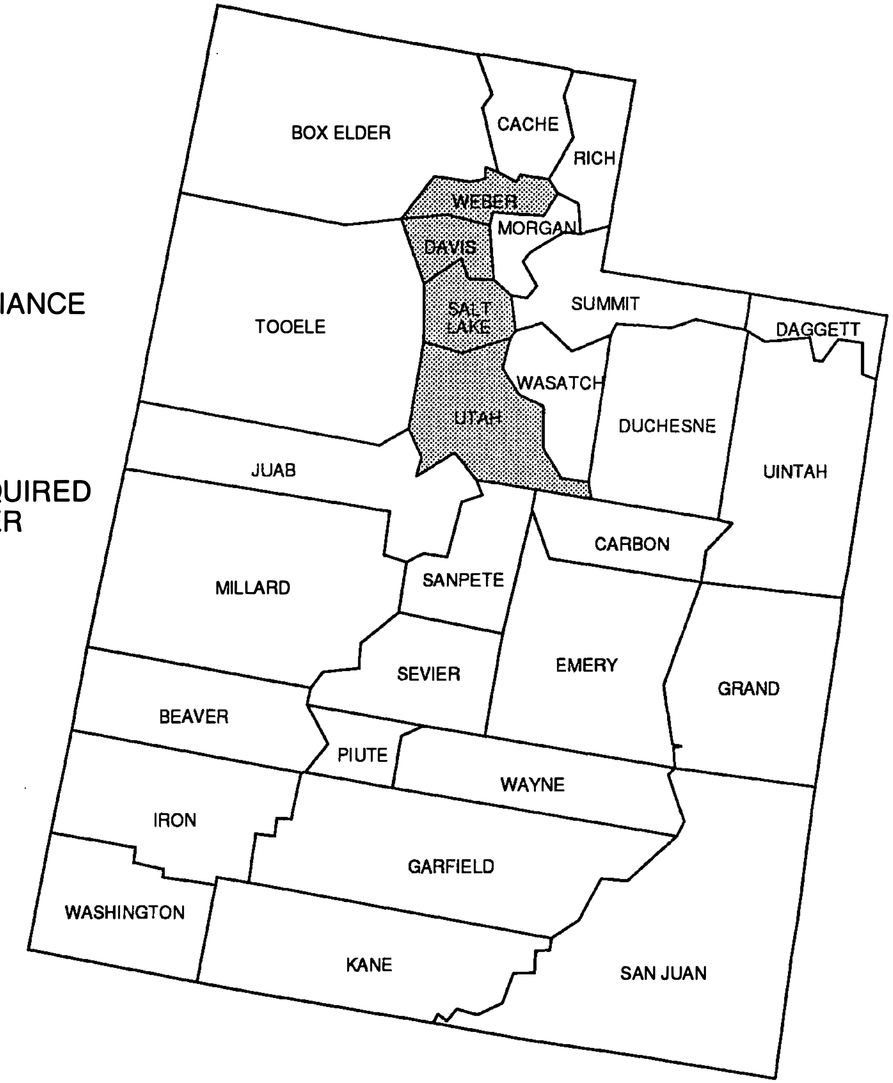
1995

SHADED AREA:
CO NON-ATTAINMENT ONLY:
4 MONTHS (NOV 1 - FEB 28)

THIS STATE IS IN OZONE COMPLIANCE FOR 1995.

2000-2010

SEE 1995 NOTES.
REFORMULATED GASOLINE REQUIRED IN DAVIS, SALT LAKE, AND WEBER COUNTIES.



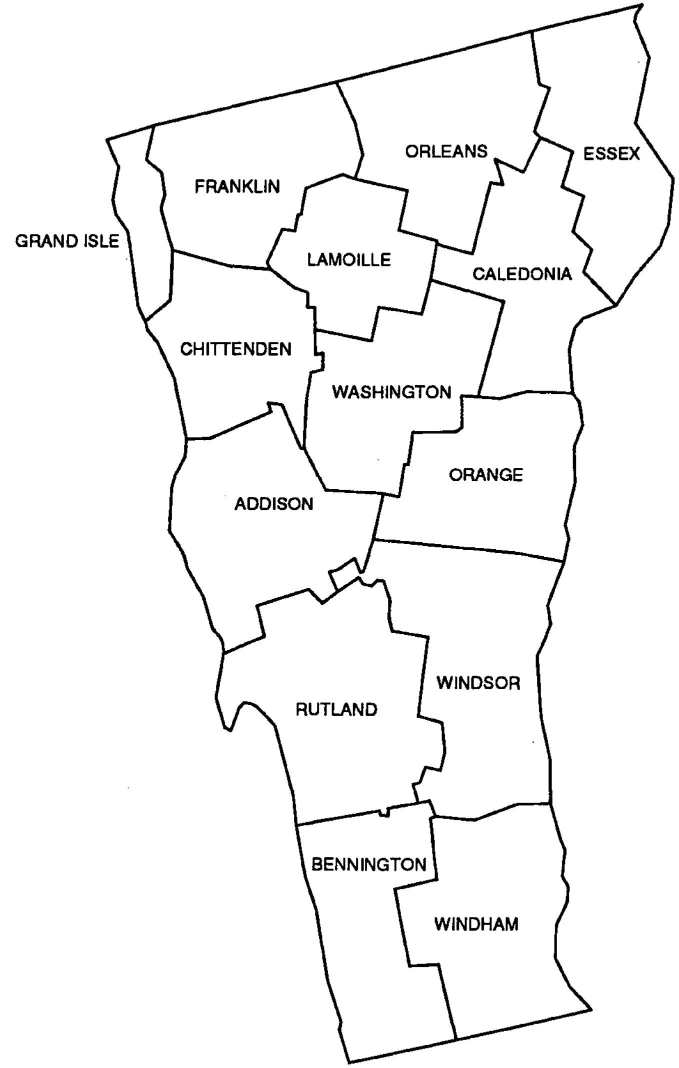
VERMONT

1995

THIS AREA IS IN CO ATTAINMENT.
THIS AREA IS IN OZONE COMPLIANCE FOR 1995.

2000-2010

COMPLIANCE CONTINUES. HOWEVER, ALL COUNTIES WILL BE SUPPLIED REFORMULATED GASOLINE --- THE UNSHADED AREAS ARE INCLUDED IN THE NORTHEAST OZONE TRANSPORT REGION.



VIRGINIA

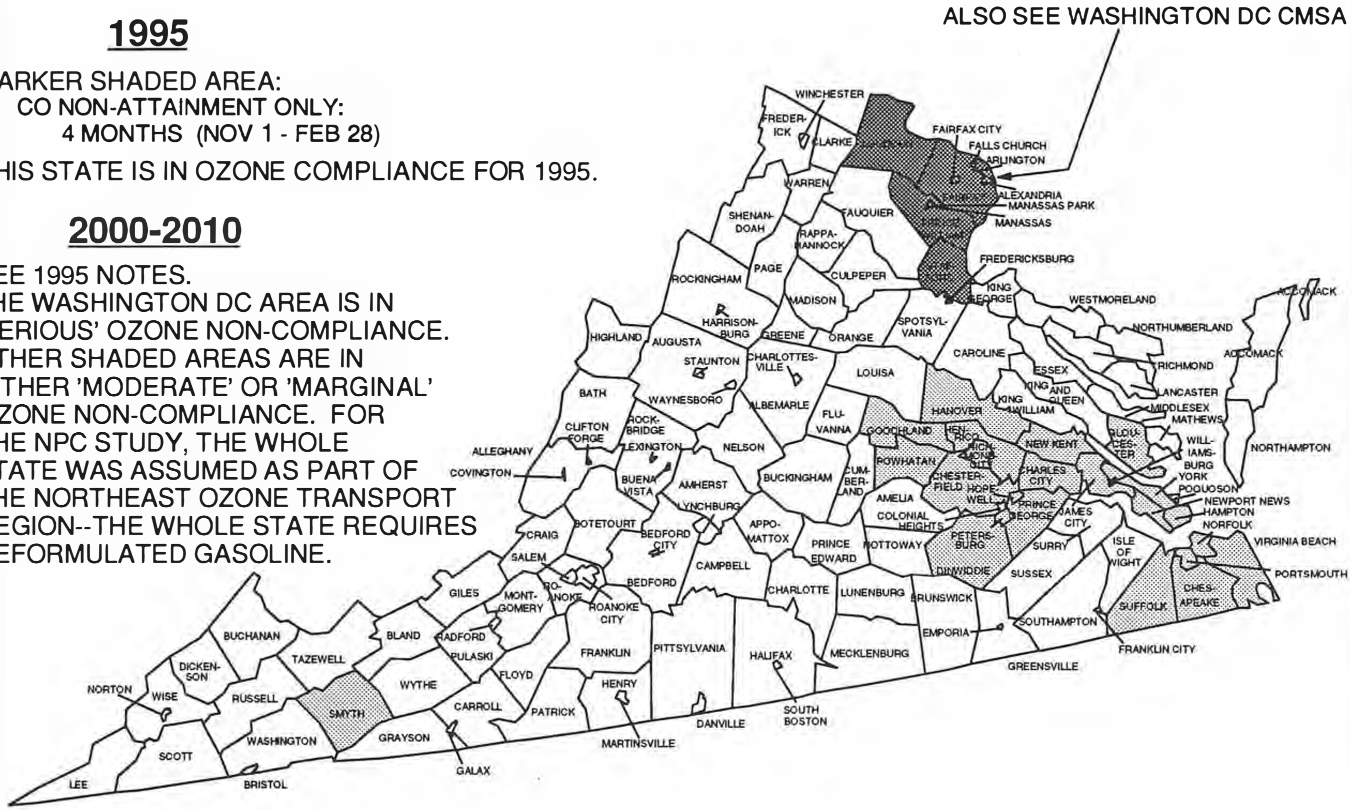
1995

DARKER SHADED AREA:
CO NON-ATTAINMENT ONLY:
4 MONTHS (NOV 1 - FEB 28)

THIS STATE IS IN OZONE COMPLIANCE FOR 1995.

2000-2010

SEE 1995 NOTES.
THE WASHINGTON DC AREA IS IN 'SERIOUS' OZONE NON-COMPLIANCE. OTHER SHADED AREAS ARE IN EITHER 'MODERATE' OR 'MARGINAL' OZONE NON-COMPLIANCE. FOR THE NPC STUDY, THE WHOLE STATE WAS ASSUMED AS PART OF THE NORTHEAST OZONE TRANSPORT REGION--THE WHOLE STATE REQUIRES REFORMULATED GASOLINE.

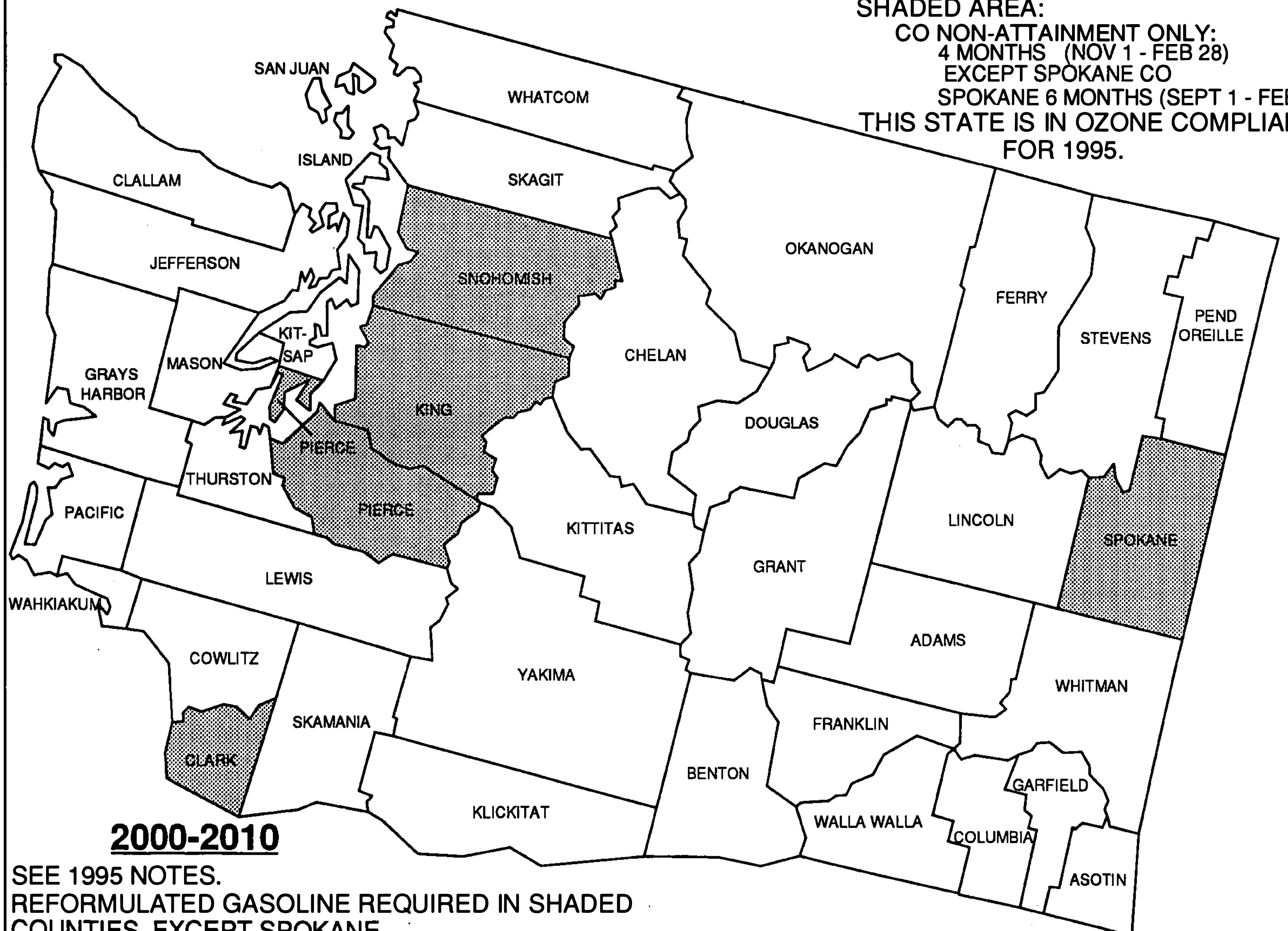


APP L.III.4-49

WASHINGTON

1995

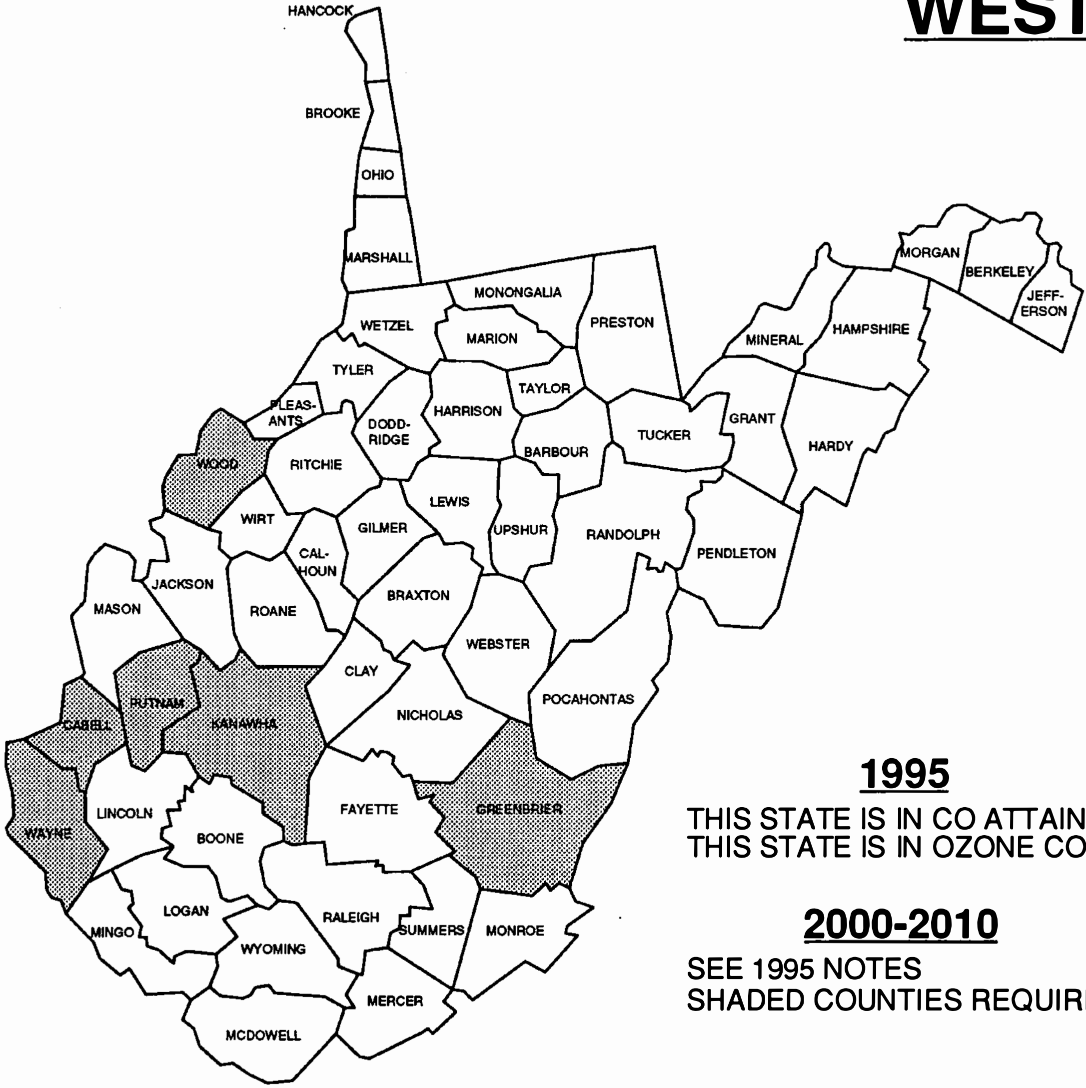
SHADED AREA:
CO NON-ATTAINMENT ONLY:
4 MONTHS (NOV 1 - FEB 28)
EXCEPT SPOKANE CO
SPOKANE 6 MONTHS (SEPT 1 - FEB 28)
THIS STATE IS IN OZONE COMPLIANCE FOR 1995.



2000-2010

SEE 1995 NOTES.
REFORMULATED GASOLINE REQUIRED IN SHADED COUNTIES, EXCEPT SPOKANE.

WEST VIRGINIA



1995

THIS STATE IS IN CO ATTAINMENT
THIS STATE IS IN OZONE COMPLIANCE FOR 1995

2000-2010

SEE 1995 NOTES
SHADED COUNTIES REQUIRE REFORMULATED GASOLINE

WISCONSIN

1995

HATCHED AREA:
SEE CMSA PLOT FOR DETAILS

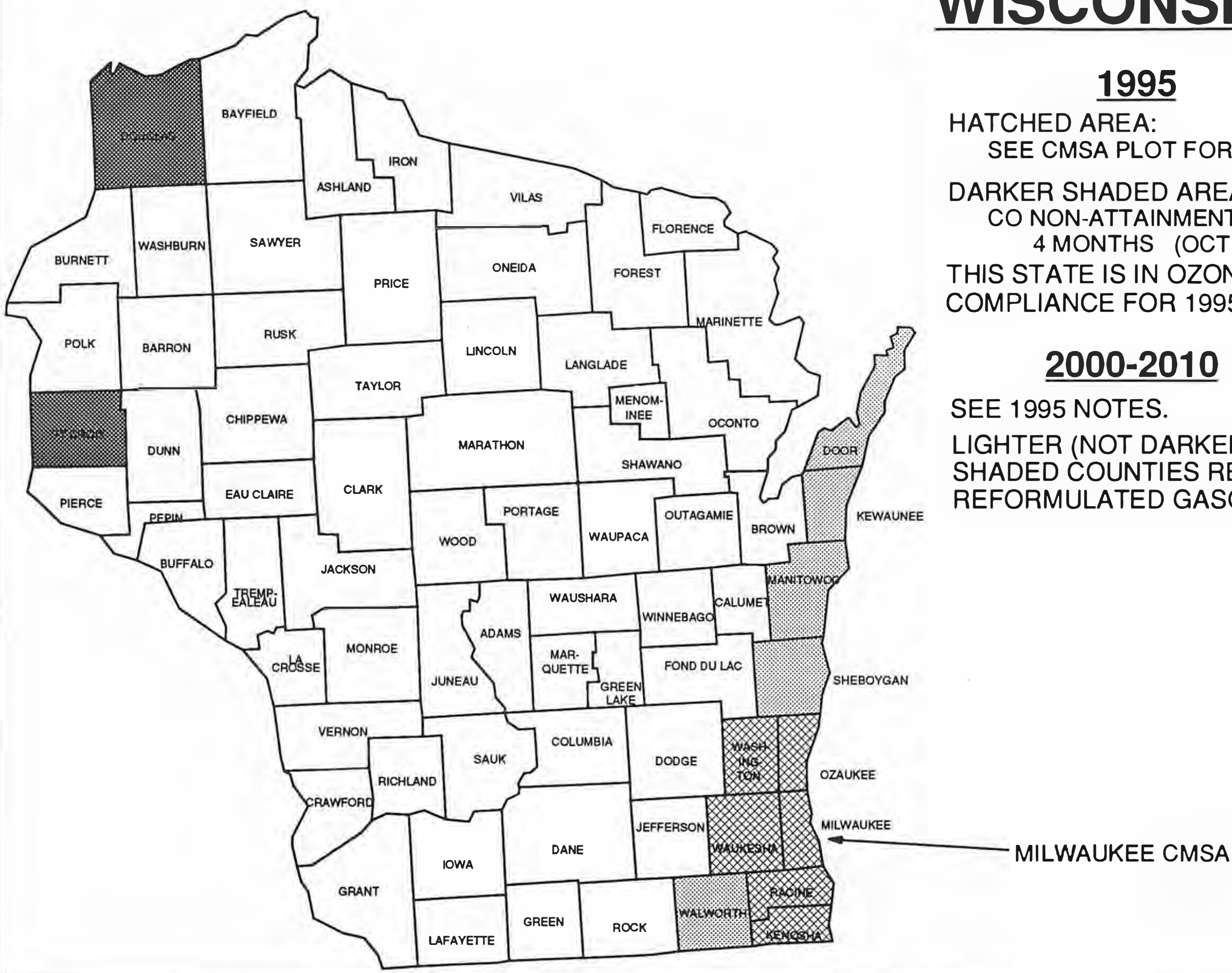
DARKER SHADED AREA:
CO NON-ATTAINMENT ONLY:
4 MONTHS (OCT 1 - JAN 31)

THIS STATE IS IN OZONE COMPLIANCE FOR 1995.

2000-2010

SEE 1995 NOTES.

LIGHTER (NOT DARKER) SHADED COUNTIES REQUIRE REFORMULATED GASOLINE.



Appendix L, Section III-5

Computer Listings – County Attainment and Nonattainment

EXXON COMPANY, U.S.A.
POST OFFICE BOX 2180 • HOUSTON, TEXAS 77252-2180

DOWNSTREAM PLANNING AND ANALYSIS

September 25, 1992

Members of the NPC Refining Study Supply/Demand/Logistics (SD&L) Task Group:

Attached are the "regulatory" bases I propose be used to develop the U.S. reformulated, CO, and CO-reformulated area gasoline demands. I appreciate your review and will ask for your concurrence at our Boston Task Group Meeting.

You have earlier seen the first five attachments--U.S. regional map followed by the state maps for New York, Pennsylvania, California, and Nevada. These four states are split between two regions. The subsequent attachments table county population data sorted by the level of ozone non-attainment (requiring reformulated gasoline). The far right columns on the tables outline "CO gasoline" bases for the appropriate counties. At our June 24-25 Task Group meeting in Los Angeles, we agreed that the 'extreme' and 'severe' categories would require reformulated gasoline by 1995. At a subsequent July 9 meeting, the Coordinating Subcommittee agreed that all non-attainment areas should have reformulated gasoline by 2000. Further, all attainment counties in the Northeast Ozone Transport Region should be included (see Maine southward through Virginia, e.g., Vermont). Finally, California attainment counties are to have 2% oxygenated gasoline in 1995 prior to the implementation of "California reformulated gasoline" in 1996. These bases were outlined in W. R. Finger's letter of July 13.

The population data will be converted to state shares to develop shares of the various gasolines required in each state. I will briefly review the methodology at our Boston meeting.

In your review, please consider if I have either omitted or included too many counties in the various areas. Any comments prior to our meeting are appreciated. The state maps are being revised to include the 2000-10 bases; they will be forwarded as soon as possible.

See you in Boston.

Respectfully,

Graham

Graham K. Barnes

GKB:gps
Attachment

c- w/attachment:
R. B. Bruce, Conoco Inc.
J. H. Guy, IV, National Petroleum Council
P. W. Lashbrooke, Conoco Inc.
T. S. McGowin, Texaco Refining & Marketing, Inc.
R. B. Warden, Chevron Research & Technology Co.

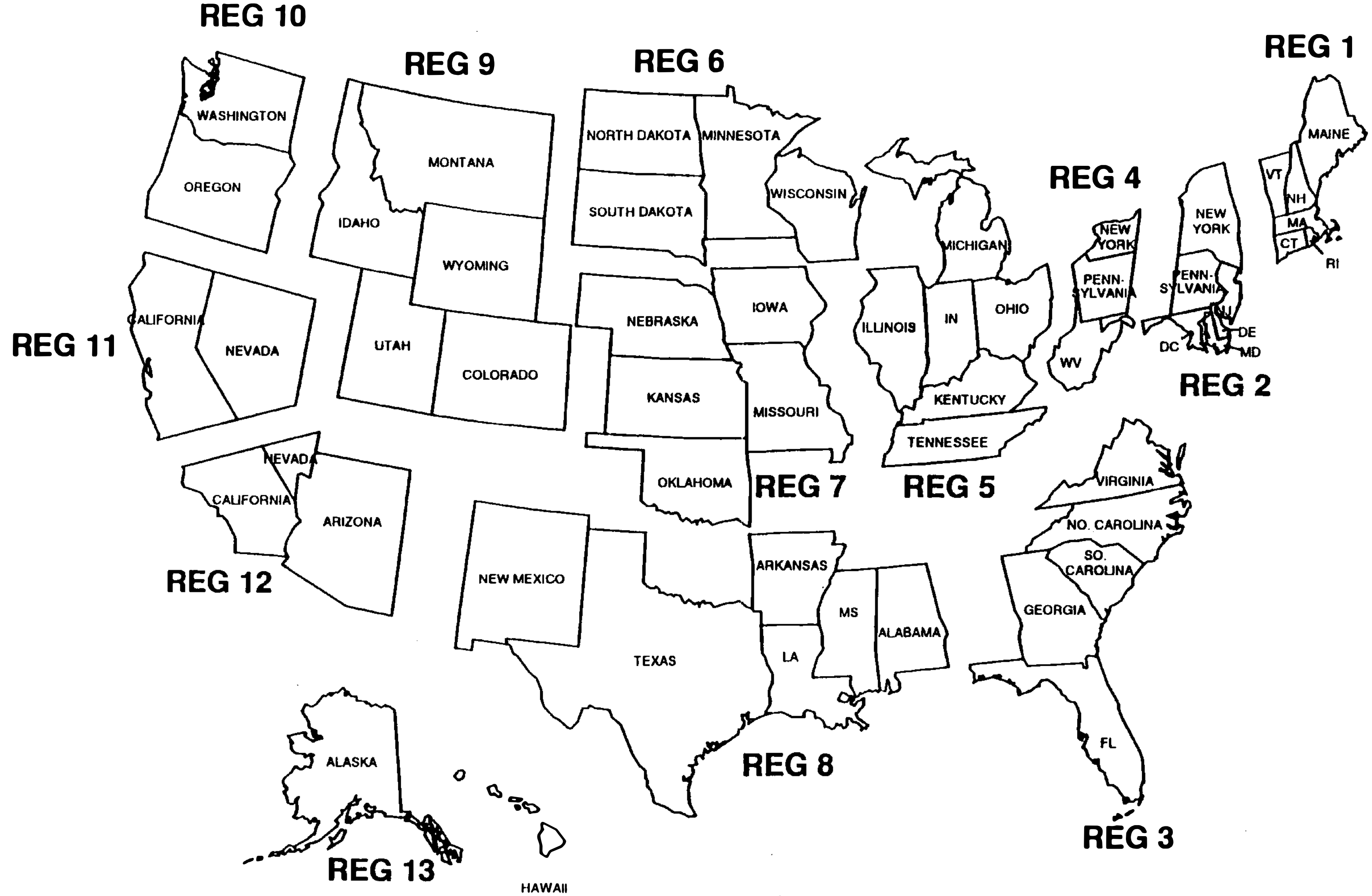
NPC REFINING STUDY
SUPPLY, DEMAND, AND LOGISTICS TASK GROUP

Revisions to September 25, 1992 Non-Attainment Bases Letter

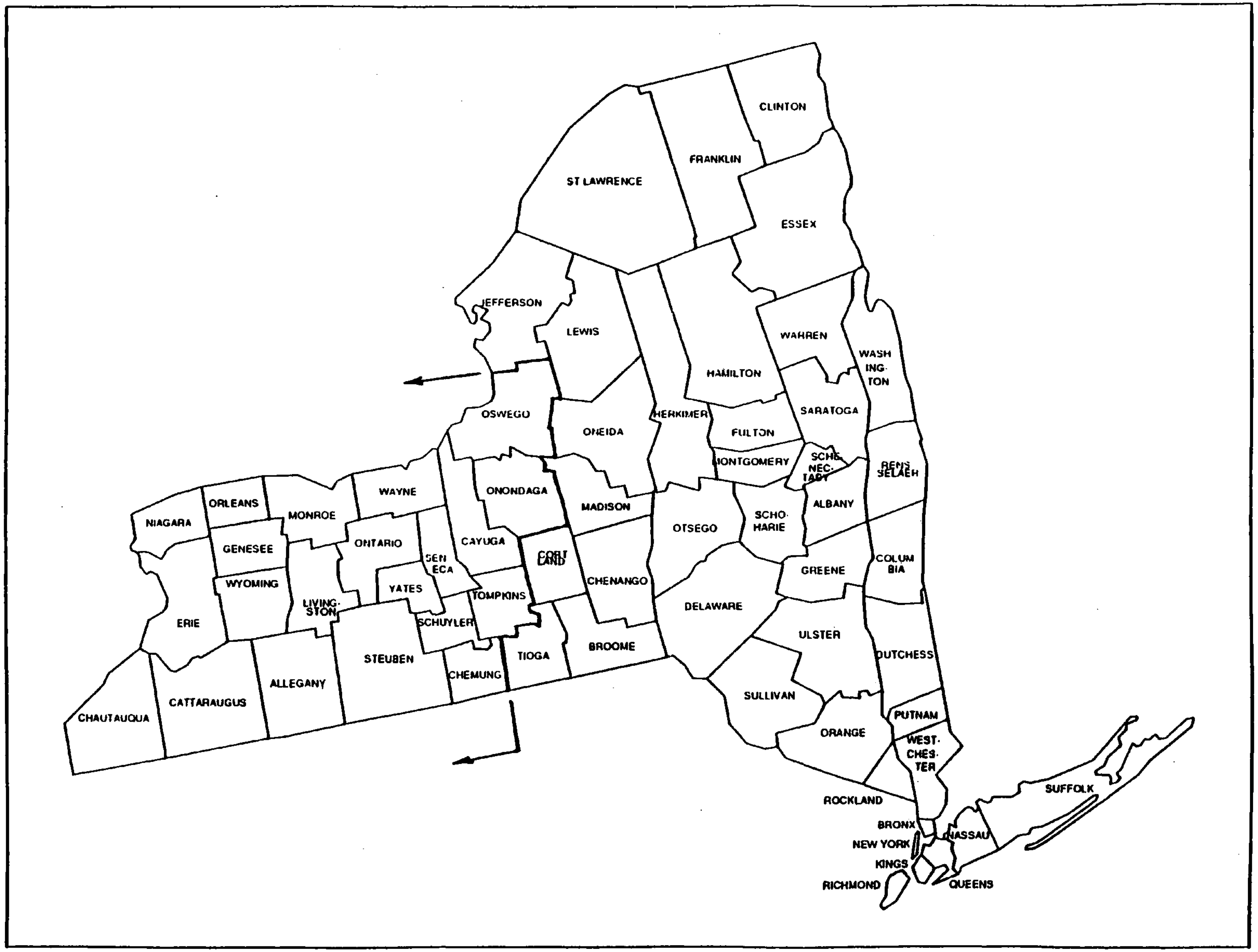
APP L.III.5-2

Nevada:	Clark County CO non-attainment 6 months (October 1 - March 31) not 4 months
Arizona:	Maricopa and Pima Counties CO non-attainment 6 months (October 1 - March 31) not 4 months
North Carolina:	Granville County Delete from CO non-attainment
Ohio:	Ashtabula County Delete from CO non-attainment

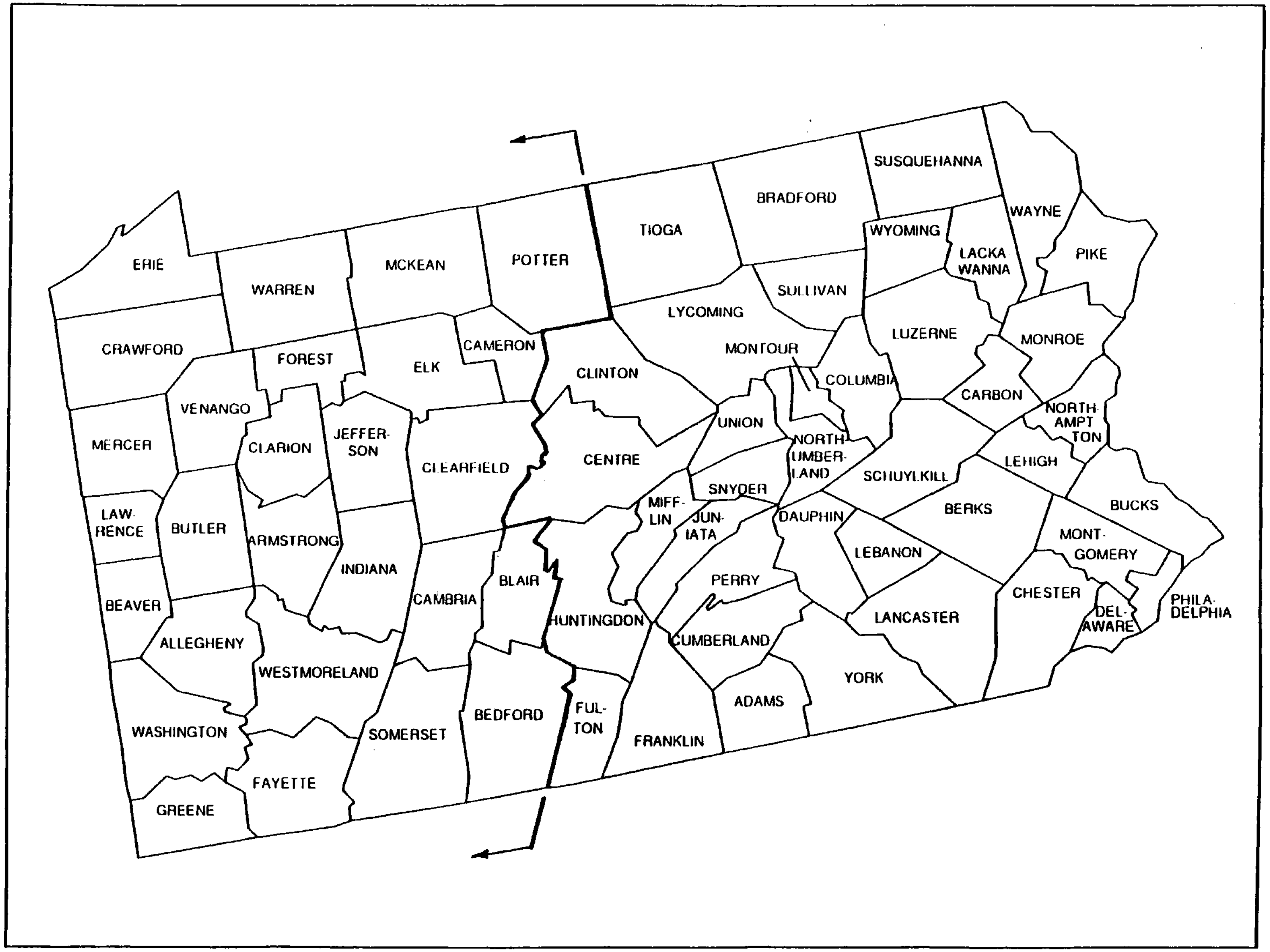
U.S. REGIONS
NATIONAL PETROLEUM COUNCIL REFINING STUDY



APP L.III.5-3


CLINTON
FRANKLIN
ST LAWRENCE
ESSEX
JEFFERSON
LEWIS
WARREN
WASH ING TON
HAMILTON
OSWEGO
ONEIDA
HERKIMER
FULTON
SARATOGA
MONTGOMERY
SCHE NEC TADY
RENS SELAER
NIAGARA
ORLEANS
MONROE
WAYNE
ONONDAGA
MADISON
OTSEGO
SCHO HARIE
ALBANY
GENESEE
ONTARIO
CAYUGA
CORT LAND
SEN ECA
CHENANGO
GREENE
COLUM BIA
WYOMING
YATES
LIVING STON
TOMPKINS
DELAWARE
ERIE
SCHUYLER
ULSTER
DUTCHESS
STEUBEN
TIOGA
BROOME
CHEMUNG
ALLEGANY
CATTARAUGUS
SULLIVAN
CHAUTAUQUA
PUTNAM
ORANGE
WEST CHES TER
ROCKLAND
SUFFOLK
BRONX
NASSAU
NEW YORK
KINGS
RICHMOND
QUEENS

APP L.III.5-5


SUSQUEHANNA
BRADFORD
TIOGA
POTTER
MCKEAN
WARREN
ERIE
WAYNE
WYOMING
LACKA WANNA
PIKE
SULLIVAN
LYCOMING
CRAWFORD
FOREST
ELK
CAMERON
CLINTON
MONTOUR
LUZERNE
MONROE
COLUMBIA
CARBON
VENANGO
MERCER
CLARION
JEFFER-SON
CLEARFIELD
CENTRE
UNION
NORTH-UMBER-LAND
NORTH AMPT TON
LEHIGH
SCHUYLKILL
SNYDER
LAW-RENCE
BUTLER
ARMSTRONG
MIFF-LIN
JUN-IATA
DAUPHIN
BERKS
BUCKS
MONT-GOMERY
LEBANON
INDIANA
BLAIR
PERRY
BEAVER
CAMBRIA
CHESTER
PHILA-DELPHIA
DEL-AWARE
HUNTINGDON
LANCASTER
ALLEGHENY
CUMBERLAND
WESTMORELAND
YORK
ADAMS
FUL-TON
BEDFORD
WASHINGTON
SOMERSET
FRANKLIN
FAYETTE
GREENE


DEL NORTE
SISKIYOU
MODOC
HUMBOLDT
TRIN-ITY
SHASTA
LASSEN
TEHAMA
MENDOCINO
GLENN
PLUMAS
BUTTE
LAKE
COLUSA
SUT-TER
NEVADA
SIERRA
SONOMA
NAPA
YOLO
PLACER
AMADOR
EL DORADO
MARIN
SO-LANO
SACR-AMENTO
ALPINE
CONTRA COSTA
SAN JOAQUIN
CALA-VERAS
SAN FRANCISCO
ALAMEDA
TUO-LUMNE
SAN MATEO
STANISLAUS
SANTA CLARA
MARI-POSA
MONO
SANTA CRUZ
MERCED
MADERA
SAN BENITO
FRESNO
MONTEREY
KINGS
TULARE
INYO
SAN LUIS OBISPO
KERN
SANTA BARBARA
VENTURA
LOS ANGELES
SAN BERNARDINO
ORANGE
RIVERSIDE
SAN DIEGO
IMPERIAL


HUMBOLDT
ELKO
WASHOE
PERSHING
STOREY
CARSON CITY
LYON
CHURCHILL
LANDER
EUREKA
DOUGLAS
WHITE PINE
MINERAL
ESMERALDA
NYE
LINCOLN
CLARK

STATE AND COUNTY OXYGENATE BASES AND POPULATIONS -- NPC REGION 1

			COUNTY OZONE NON-ATTAINMENT BASIS AND POPULATION							EFFECT YEAR		CO DATA		
			EXTREME	SEVERE	SERIOUS	MODERATE	MARGINAL	OTHER	ATTAIN	OZONE	CO	MIN O2 %	MONTHS	DAYS
MAINE	KNOX-LINCOLN	KNOX	-	-	-	36310	-	-	-	2000	-	-	-	-
		LINCOLN	-	-	-	30357	-	-	-	2000	-	-	-	-
	LEWISTON-AUBURN	ANDROSCOGGIN	-	-	-	105259	-	-	-	2000	-	-	-	-
		KENNEBEC	-	-	-	115904	-	-	-	2000	-	-	-	-
	PORTLAND CMSA	CUMBERLAND	-	-	-	243135	-	-	-	2000	-	-	-	-
		SAGADAHOC	-	-	-	33535	-	-	-	2000	-	-	-	-
		YORK	-	-	-	164587	-	-	-	2000	-	-	-	-
	HANCOCK-WALDO	HANCOCK	-	-	-	-	46948	-	-	2000	-	-	-	-
		WALDO	-	-	-	-	33018	-	-	2000	-	-	-	-
	NORTHEAST OZONE	AROOSTOOK	-	-	-	-	-	86936	-	2000	-	-	-	-
		FRANKLIN	-	-	-	-	-	29008	-	2000	-	-	-	-
		OXFORD	-	-	-	-	-	52602	-	2000	-	-	-	-
		PENOBSCOT	-	-	-	-	-	146601	-	2000	-	-	-	-
		PISCATAQUIS	-	-	-	-	-	18653	-	2000	-	-	-	-
		SOMERSET	-	-	-	-	-	49767	-	2000	-	-	-	-
		WASHINGTON	-	-	-	-	-	35308	-	2000	-	-	-	-
	OTHER COUNTIES		-	-	-	-	-	-	-	-	-	-	-	-
	TOTALS	1227928	-	-	-	729087	79966	418875	-	-	-	-	-	-
NEW HAMPSHIRE	BOSTON CMSA	HILLSBOROUGH	-	-	336073	-	-	-	-	2000	1993	2.7	4	14
		ROCKINGHAM	-	-	245845	-	-	-	-	2000	1993	2.7	4	14
	PORTSMOUTH	STRAFFORD	-	-	104233	-	-	-	-	2000	-	-	-	-
	MANCHESTER CMSA	MERRIMACK	-	-	-	-	120005	-	-	2000	-	-	-	-
	NORTHEAST OZONE	BELKNAP	-	-	-	-	-	49216	-	2000	-	-	-	-
		CARROLL	-	-	-	-	-	35410	-	2000	-	-	-	-
		CHESHIRE	-	-	-	-	-	70121	-	2000	-	-	-	-
		COOS	-	-	-	-	-	34828	-	2000	-	-	-	-
		GRAFTON	-	-	-	-	-	74929	-	2000	-	-	-	-
		SULLIVAN	-	-	-	-	-	38592	-	2000	-	-	-	-
	OTHER COUNTIES		-	-	-	-	-	-	-	-	-	-	-	-
	TOTALS	1109252	-	-	686151	-	120005	303096	-	-	-	-	-	-
VERMONT	NORTHEAST OZONE	ADDISON	-	-	-	-	-	32953	-	2000	-	-	-	-
		BENNINGTON	-	-	-	-	-	35845	-	2000	-	-	-	-
		CALEDONIA	-	-	-	-	-	27846	-	2000	-	-	-	-
		CHITTENDEN	-	-	-	-	-	131761	-	2000	-	-	-	-
		ESSEX	-	-	-	-	-	6405	-	2000	-	-	-	-
		FRANKLIN	-	-	-	-	-	39980	-	2000	-	-	-	-
		GRAND ISLE	-	-	-	-	-	5318	-	2000	-	-	-	-
		LAMOILLE	-	-	-	-	-	19735	-	2000	-	-	-	-
		ORANGE	-	-	-	-	-	26149	-	2000	-	-	-	-
		ORLEANS	-	-	-	-	-	24053	-	2000	-	-	-	-
		RUTLAND	-	-	-	-	-	62142	-	2000	-	-	-	-
		WASHINGTON	-	-	-	-	-	54928	-	2000	-	-	-	-
		WINDHAM	-	-	-	-	-	41588	-	2000	-	-	-	-
		WINDSOR	-	-	-	-	-	54055	-	2000	-	-	-	-
	OTHER COUNTIES		-	-	-	-	-	-	-	-	-	-	-	-
	TOTALS	562758	-	-	-	-	-	562758	-	-	-	-	-	-

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COUNTY POPULATIONS FROM US BUREAU OF THE CENSUS, MARCH 1991   NATIONAL PETROLEUM COUNCIL   OCTOBER 19, 1992   TIME 9:41

APP L.III.5-9

STATE AND COUNTY OXYGENATE BASES AND POPULATIONS -- NPC REGION 1

			COUNTY OZONE NON-ATTAINMENT BASIS AND POPULATION							EFFECT YEAR		CO DATA		
			EXTREME	SEVERE	SERIOUS	MODERATE	MARGINAL	OTHER	ATTAIN	OZONE	CO	MIN O2 %	MONTHS	DAYS
MASSACHUSETTS	BOSTON CMSA	BARNSTABLE	-	-	186605	-	-	-	-	2000	1993	2.7	4	14
		BRISTOL	-	-	506325	-	-	-	-	2000	1993	2.7	4	14
		DUKES	-	-	11639	-	-	-	-	2000	1993	2.7	4	14
		ESSEX	-	-	670080	-	-	-	-	2000	1993	2.7	4	14
		MIDDLESEX	-	-	1398468	-	-	-	-	2000	1993	2.7	4	14
		NANTUCKET	-	-	6012	-	-	-	-	2000	1993	2.7	4	14
		NORFOLK	-	-	616087	-	-	-	-	2000	1993	2.7	4	14
		PLYMOUTH	-	-	435276	-	-	-	-	2000	1993	2.7	4	14
		SUFFOLK	-	-	663906	-	-	-	-	2000	1993	2.7	4	14
		WORCESTER	-	-	709705	-	-	-	-	2000	1993	2.7	4	14
	SPRINGFIELD CMSA	BERKSHIRE	-	-	139352	-	-	-	-	2000	-	-	-	-
		FRANKLIN	-	-	70092	-	-	-	-	2000	-	-	-	-
		HAMPDEN	-	-	456310	-	-	-	-	2000	-	-	-	-
		HAMPSHIRE	-	-	146568	-	-	-	-	2000	-	-	-	-
	OTHER COUNTIES		-	-	-	-	-	-	-	-	-	-	-	-
	TOTALS	6016425	-	-	6016425	-	-	-	-	-	-	-	-	-
RHODE ISLANE	PROVIDENCE CMSA	BRISTOL	-	-	48859	-	-	-	-	2000	-	-	-	-
		KENT	-	-	161135	-	-	-	-	2000	-	-	-	-
		NEWPORT	-	-	87194	-	-	-	-	2000	-	-	-	-
		PROVIDENCE	-	-	596270	-	-	-	-	2000	-	-	-	-
		WASHINGTON	-	-	110006	-	-	-	-	2000	-	-	-	-
	OTHER COUNTIES		-	-	-	-	-	-	-	-	-	-	-	-
	TOTALS	1003464	-	-	1003464	-	-	-	-	-	-	-	-	-
CONNECTICUT	NEW YORK CITY CMSA	FAIRFIELD	-	827645	-	-	-	-	-	1995	1993	2.7	7	14
		LITCHFIELD	-	174092	-	-	-	-	-	1995	1993	2.7	7	14
	HARTFORD CMSA	HARTFORD	-	-	851783	-	-	-	-	1995	1993	2.7	4	14
		MIDDLESEX	-	-	143196	-	-	-	-	1995	1993	2.7	4	14
		NEW HAVEN	-	-	804219	-	-	-	-	1995	1993	2.7	4	14
		NEW LONDON	-	-	254957	-	-	-	-	1995	1993	2.7	4	14
		TOLLAND	-	-	128699	-	-	-	-	1995	1993	2.7	4	14
		WINDHAM	-	-	102525	-	-	-	-	1995	1993	2.7	4	14
	OTHER COUNTIES		-	-	-	-	-	-	-	-	-	-	-	-
	TOTALS	3287116	-	1001737	2285379	-	-	-	-	-	-	-	-	-

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COUNTY POPULATIONS FROM US BUREAU OF THE CENSUS, MARCH 1991 NATIONAL PETROLEUM COUNCIL OCTOBER 19, 1992 TIME 9:41

STATE AND COUNTY OXYGENATE BASES AND POPULATIONS -- NPC REGION 2

			COUNTY OZONE NON-ATTAINMENT BASIS AND POPULATION							EFFECT YEAR		CO DATA		
			EXTREME	SEVERE	SERIOUS	MODERATE	MARGINAL	OTHER	ATTAIN	OZONE	CO	MIN 02 %	MONTHS	DAYS
NEW YORK	NEW YORK CITY CMSA	BRONX	-	1203789	-	-	-	-	-	1995	1993	2.7	7	14
		KINGS	-	2300664	-	-	-	-	-	1995	1993	2.7	7	14
		NASSAU	-	1287348	-	-	-	-	-	1995	1993	2.7	7	14
		NY (MANHATTEN)	-	1487536	-	-	-	-	-	1995	1993	2.7	7	14
		ORANGE	-	307647	-	-	-	-	-	1995	1993	2.7	7	14
		PUTNAM	-	83941	-	-	-	-	-	1995	1993	2.7	7	14
		QUEENS	-	1951598	-	-	-	-	-	1995	1993	2.7	7	14
		RICHMOND	-	378977	-	-	-	-	-	1995	1993	2.7	7	14
		ROCKLAND	-	265475	-	-	-	-	-	1995	1993	2.7	7	14
		SUFFOLK	-	1321864	-	-	-	-	-	1995	1993	2.7	7	14
		WESTCHESTER	-	874866	-	-	-	-	-	1995	1993	2.7	7	14
	ALBANY CMSA	ALBANY	-	-	-	-	292594	-	-	2000	-	-	-	-
		GREENE	-	-	-	-	44739	-	-	2000	-	-	-	-
		MONTGOMERY	-	-	-	-	51981	-	-	2000	-	-	-	-
		RENSSELAER	-	-	-	-	154429	-	-	2000	-	-	-	-
		SARATOGA	-	-	-	-	181276	-	-	2000	-	-	-	-
		SCHENECTADY	-	-	-	-	149285	-	-	2000	-	-	-	-
	ESSEX	ESSEX	-	-	-	-	37152	-	-	2000	-	-	-	-
	JEFFERSON	JEFFERSON	-	-	-	-	110943	-	-	2000	-	-	-	-
	POUGHKEEPSIE	DUTCHESS	-	-	-	-	259462	-	-	2000	-	-	-	-
	NORTHEAST OZONE	BROOME	-	-	-	-	-	212160	-	2000	-	-	-	-
		CHENANGO	-	-	-	-	-	51768	-	2000	-	-	-	-
		CLINTON	-	-	-	-	-	85969	-	2000	-	-	-	-
		COLUMBIA	-	-	-	-	-	62982	-	2000	-	-	-	-
		CORTLAND	-	-	-	-	-	48963	-	2000	-	-	-	-
		DELAWARE	-	-	-	-	-	47225	-	2000	-	-	-	-
		FRANKLIN	-	-	-	-	-	46540	-	2000	-	-	-	-
		FULTON	-	-	-	-	-	54191	-	2000	-	-	-	-
		HAMILTON	-	-	-	-	-	5279	-	2000	-	-	-	-
		HERKIMER	-	-	-	-	-	65797	-	2000	-	-	-	-
		LEWIS	-	-	-	-	-	26796	-	2000	-	-	-	-
		MADISON	-	-	-	-	-	69120	-	2000	1993	2.7	4	14
		ONEIDA	-	-	-	-	-	250836	-	2000	-	-	-	-
		OTSEGO	-	-	-	-	-	60517	-	2000	-	-	-	-
		ST LAWRENCE	-	-	-	-	-	111974	-	2000	-	-	-	-
		SCHOHARIE	-	-	-	-	-	31859	-	2000	-	-	-	-
		SULLIVAN	-	-	-	-	-	69277	-	2000	-	-	-	-
		TIOGA	-	-	-	-	-	52337	-	2000	-	-	-	-
		ULSTER	-	-	-	-	-	165304	-	2000	-	-	-	-
		WARREN	-	-	-	-	-	59209	-	2000	-	-	-	-
		WASHINGTON	-	-	-	-	-	59330	-	2000	-	-	-	-
	OTHER COUNTIES		-	-	-	-	-	-	-	-	-	-	-	-
	TOTALS	14382999	-	11463705	-	-	1281861	1637433	-	-	-	-	-	-

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STATE AND COUNTY OXYGENATE BASES AND POPULATIONS -- NPC REGION 2

			COUNTY OZONE NON-ATTAINMENT BASIS AND POPULATION							EFFECT YEAR		CO DATA		
			EXTREME	SEVERE	SERIOUS	MODERATE	MARGINAL	OTHER	ATTAIN	OZONE	CO	MIN 02 %	MONTHS	DAYS
NEW JERSEY	NEW YORK CITY CMSA	BERGEN	-	825380	-	-	-	-	-	1995	1993	2.7	7	14
		ESSEX	-	778206	-	-	-	-	-	1995	1993	2.7	7	14
		HUDSON	-	553099	-	-	-	-	-	1995	1993	2.7	7	14
		HUNTERDON	-	107776	-	-	-	-	-	1995	1993	2.7	7	14
		MIDDLESEX	-	671780	-	-	-	-	-	1995	1993	2.7	7	14
		MONMOUTH	-	553124	-	-	-	-	-	1995	1993	2.7	7	14
		MORRIS	-	421353	-	-	-	-	-	1995	1993	2.7	7	14
		OCEAN	-	433203	-	-	-	-	-	1995	1993	2.7	7	14
		PASSAIC	-	453060	-	-	-	-	-	1995	1993	2.7	7	14
		SOMERSET	-	240279	-	-	-	-	-	1995	1993	2.7	7	14
		SUSSEX	-	130943	-	-	-	-	-	1995	1993	2.7	7	14
		UNION	-	493819	-	-	-	-	-	1995	1993	2.7	7	14
	PHILADELPHIA CMSA	BURLINGTON	-	395066	-	-	-	-	-	1995	1993	2.7	4	14
		CAMDEN	-	502824	-	-	-	-	-	1995	1993	2.7	4	14
		CUMBERLAND	-	138053	-	-	-	-	-	1995	1993	2.7	4	14
		GLOUCESTER	-	230082	-	-	-	-	-	1995	1993	2.7	4	14
		MERCER	-	325824	-	-	-	-	-	1995	1993	2.7	4	14
		SALEM	-	65294	-	-	-	-	-	1995	1993	2.7	4	14
	ATLANTIC CITY	ATLANTIC	-	-	-	224327	-	-	-	2000	-	-	-	-
		CAPE MAY	-	-	-	95089	-	-	-	2000	-	-	-	-
	ALLENTOWN-BETHLEHEM	WARREN	-	-	-	-	91607	-	-	2000	-	-	-	-
	OTHER COUNTIES		-	-	-	-	-	-	-	-	-	-	-	-
	TOTALS	7730188	-	7319165	-	319416	91607	-	-	-	-	-	-	-

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			COUNTY OZONE NON-ATTAINMENT BASIS AND POPULATION							EFFECT YEAR		CO DATA		
			EXTREME	SEVERE	SERIOUS	MODERATE	MARGINAL	OTHER	ATTAIN	OZONE	CO	MIN O2 %	MONTHS	DAYS
PENNSYLVANIA	PHILADELPHIA CMSA	BUCKS	-	541174	-	-	-	-	-	1995	1993	2.7	4	14
		CHESTER	-	376396	-	-	-	-	-	1995	1993	2.7	4	14
		DELAWARE	-	547651	-	-	-	-	-	1995	1993	2.7	4	14
		MONTGOMERY	-	678111	-	-	-	-	-	1995	1993	2.7	4	14
		PHILADELPHIA	-	1585577	-	-	-	-	-	1995	1993	2.7	4	14
	READING	BERKS	-	-	-	336523	-	-	-	2000	-	-	-	-
	ALLENTOWN-BETHLEHEM	CARBON	-	-	-	-	56846	-	-	2000	-	-	-	-
		LEHIGH	-	-	-	-	291130	-	-	2000	-	-	-	-
		NORTHAMPTON	-	-	-	-	247105	-	-	2000	-	-	-	-
	HARRISBURG CMSA	CUMBERLAND	-	-	-	-	195257	-	-	2000	-	-	-	-
		DAUPHINE	-	-	-	-	237813	-	-	2000	-	-	-	-
		LEBANON	-	-	-	-	113744	-	-	2000	-	-	-	-
		PERRY	-	-	-	-	41172	-	-	2000	-	-	-	-
	LANCASTER	LANCASTER	-	-	-	-	422822	-	-	2000	-	-	-	-
	SCRANTON CMSA	COLUMBIA	-	-	-	-	63202	-	-	2000	-	-	-	-
		LACKAWANNA	-	-	-	-	219039	-	-	2000	-	-	-	-
		LUZERNE	-	-	-	-	328149	-	-	2000	-	-	-	-
		MONROE	-	-	-	-	95709	-	-	2000	-	-	-	-
		WYOMING	-	-	-	-	28076	-	-	2000	-	-	-	-
	YORK	ADAMS	-	-	-	-	78274	-	-	2000	-	-	-	-
		YORK	-	-	-	-	339574	-	-	2000	-	-	-	-
	NORTHEAST OZONE	BRADFORD	-	-	-	-	-	60967	-	2000	-	-	-	-
		CENTRE	-	-	-	-	-	123786	-	2000	-	-	-	-
		CLINTON	-	-	-	-	-	37182	-	2000	-	-	-	-
		FRANKLIN	-	-	-	-	-	121082	-	2000	-	-	-	-
		FULTON	-	-	-	-	-	13837	-	2000	-	-	-	-
		HUNTINGDON	-	-	-	-	-	44164	-	2000	-	-	-	-
		JUNIATA	-	-	-	-	-	20625	-	2000	-	-	-	-
		LYCOMING	-	-	-	-	-	118710	-	2000	-	-	-	-
		MIFFLIN	-	-	-	-	-	46197	-	2000	-	-	-	-
		MONTOUR	-	-	-	-	-	17735	-	2000	-	-	-	-
		NORTHUMBERLAND	-	-	-	-	-	96771	-	2000	-	-	-	-
		PIKE	-	-	-	-	-	27966	-	2000	-	-	-	-
		SCHUYLKILL	-	-	-	-	-	152585	-	2000	-	-	-	-
		SNYDER	-	-	-	-	-	36680	-	2000	-	-	-	-
		SULLIVAN	-	-	-	-	-	6104	-	2000	-	-	-	-
		SUSQUEHANNA	-	-	-	-	-	40380	-	2000	-	-	-	-
		TIOGA	-	-	-	-	-	41126	-	2000	-	-	-	-
		UNION	-	-	-	-	-	36176	-	2000	-	-	-	-
		WAYNE	-	-	-	-	-	39944	-	2000	-	-	-	-
	OTHER COUNTIES		-	-	-	-	-	-	-	-	-	-	-	-
	TOTALS	7905361	-	3728909	-	336523	2757912	1082017	-	-	-	-	-	-
DELAWARE	PHILADELPHIA CMSA	NEW CASTLE	-	441946	-	-	-	-	-	1995	1993	2.7	4	14
		KENT	-	110993	-	-	-	-	-	1995	1993	2.7	4	14
	SUSSEX	SUSSEX	-	-	-	-	113229	-	-	2000	1993	2.7	4	14
	OTHER COUNTIES		-	-	-	-	-	-	-	-	-	-	-	-
	TOTALS	666168	-	552939	-	-	113229	-	-	-	-	-	-	-

DAYS TO CLEAR REFINERY TO TERMINAL LEG SHOWN IN RIGHT-HAND COLUMN. AN ADDITIONAL 21 DAYS ARE REQUIRED TO CLEAR THE LEG TO THE GASOLINE SERVICE STATION.
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COUNTY POPULATIONS FROM US BUREAU OF THE CENSUS, MARCH 1991   NATIONAL PETROLEUM COUNCIL   OCTOBER 19, 1992   TIME 9:41

APP L.III.5-13

STATE AND COUNTY OXYGENATE BASES AND POPULATIONS -- NPC REGION 2

			COUNTY OZONE NON-ATTAINMENT BASIS AND POPULATION							EFFECT YEAR		CO DATA		
			EXTREME	SEVERE	SERIOUS	MODERATE	MARGINAL	OTHER	ATTAIN	OZONE	CO	MIN O2 %	MONTHS	DAYS
MARYLAND	BALTIMORE CMSA	ANNE ARUNDEL	-	427239	-	-	-	-	-	1995	1993	2.7	4	14
		BALTIMORE	-	692134	-	-	-	-	-	1995	1993	2.7	4	14
		CARROLL	-	123372	-	-	-	-	-	1995	1993	2.7	4	14
		HARFORD	-	182132	-	-	-	-	-	1995	1993	2.7	4	14
		HOWARD	-	187328	-	-	-	-	-	1995	1993	2.7	4	14
		QUEEN ANNE	-	33953	-	-	-	-	-	1995	1993	2.7	4	14
		BALTIMORE-CITY	-	736014	-	-	-	-	-	1995	1993	2.7	4	14
	PHILADELPHIA CMSA	CECIL	-	71347	-	-	-	-	-	1995	1993	2.7	4	14
	WASHINGTON CMSA	CALVERT	-	-	51372	-	-	-	-	2000	1993	2.7	4	14
		CHARLES	-	-	101154	-	-	-	-	2000	1993	2.7	4	14
		FREDERICK	-	-	150208	-	-	-	-	2000	1993	2.7	4	14
		MONTGOMERY	-	-	757027	-	-	-	-	2000	1993	2.7	4	14
		PRINCE GEORGE	-	-	729268	-	-	-	-	2000	1993	2.7	4	14
	KENT	KENT	-	-	-	-	17842	-	-	2000	-	-	-	-
	NORTHEAST OZONE	ALLEGANY	-	-	-	-	-	74946	-	2000	-	-	-	-
		CAROLINE	-	-	-	-	-	27035	-	2000	-	-	-	-
		DORCHESTER	-	-	-	-	-	30236	-	2000	-	-	-	-
		GARRETT	-	-	-	-	-	28138	-	2000	-	-	-	-
		ST MARY	-	-	-	-	-	75974	-	2000	-	-	-	-
		SOMERSET	-	-	-	-	-	23440	-	2000	-	-	-	-
		TALBOT	-	-	-	-	-	30549	-	2000	-	-	-	-
		WASHINGTON	-	-	-	-	-	121393	-	2000	-	-	-	-
		WICOMICO	-	-	-	-	-	74339	-	2000	-	-	-	-
		WORCESTER	-	-	-	-	-	35028	-	2000	-	-	-	-
	OTHER COUNTIES		-	-	-	-	-	-	-	-	-	-	-	-
	TOTALS	4781468	-	2453519	1789029	-	17842	521078	-	-	-	-	-	-
DIST COL	WASHINGTON CMSA	ENTIRE DISTRICT	-	-	606900	-	-	-	-	2000	1993	2.7	4	14
	OTHER COUNTIES		-	-	-	-	-	-	-	-	-	-	-	-
	TOTALS	606900	-	-	606900	-	-	-	-	-	-	-	-	-

DAYS TO CLEAR REFINERY TO TERMINAL LEG SHOWN IN RIGHT-HAND COLUMN. AN ADDITIONAL 21 DAYS ARE REQUIRED TO CLEAR THE LEG TO THE GASOLINE SERVICE STATION.
EFFECTIVE DATES FOR REFORMULATED GASOLINE BETWEEN 1995 AND 2000 ARE IRRELEVANT SINCE THE INTERVENING YEARS WERE NOT STUDIED.
COUNTY POPULATIONS FROM US BUREAU OF THE CENSUS, MARCH 1991 NATIONAL PETROLEUM COUNCIL OCTOBER 19, 1992 TIME 9:41

STATE AND COUNTY OXYGENATE BASES AND POPULATIONS -- NPC REGION 3

			-------- COUNTY OZONE NON-ATTAINMENT BASIS AND POPULATION ----------							-- EFFECT YEAR ---		--------- CO DATA ----------		
			EXTREME	SEVERE	SERIOUS	MODERATE	MARGINAL	OTHER	ATTAIN	OZONE	CO	MIN O2 %	MONTHS	DAYS
VIRGINIA	WASHINGTON CMSA	ARLINGTON	-	-	170936	-	-	-	-	2000	1993	2.7	4	14
		FAIRFAX	-	-	818584	-	-	-	-	2000	1993	2.7	4	14
		LOUDOUN	-	-	86129	-	-	-	-	2000	1993	2.7	4	14
		PRINCE WILLIAM	-	-	215686	-	-	-	-	2000	1993	2.7	4	14
		STAFFORD	-	-	61236	-	-	-	-	2000	1993	2.7	4	14
		ALEXANDRIA-CITY	-	-	111183	-	-	-	-	2000	1993	2.7	4	14
		FAIRFAX-CITY	-	-	19622	-	-	-	-	2000	1993	2.7	4	14
		FALLS CHURCH-CIY	-	-	9578	-	-	-	-	2000	1993	2.7	4	14
		MANASSAS-CITY	-	-	27957	-	-	-	-	2000	1993	2.7	4	14
		MANASSAS PARK-CI	-	-	6734	-	-	-	-	2000	1993	2.7	4	14
	RICHMOND-PETERSBURG	CHARLES CITY	-	-	-	6282	-	-	-	2000	-	-	-	-
		CHESTERFIELD	-	-	-	209274	-	-	-	2000	-	-	-	-
		DINWIDDIE	-	-	-	20960	-	-	-	2000	-	-	-	-
		GOOCHLAND	-	-	-	14163	-	-	-	2000	-	-	-	-
		HANOVER	-	-	-	63306	-	-	-	2000	-	-	-	-
		HENRICO	-	-	-	217881	-	-	-	2000	-	-	-	-
		NEW KENT	-	-	-	10445	-	-	-	2000	-	-	-	-
		POWHATAN	-	-	-	15328	-	-	-	2000	-	-	-	-
		PRINCE GEORGE	-	-	-	27394	-	-	-	2000	-	-	-	-
		COLON HEIGHTS-CI	-	-	-	16064	-	-	-	2000	-	-	-	-
		HOPEWELL-CITY	-	-	-	23101	-	-	-	2000	-	-	-	-
		PETERSBURG-CITY	-	-	-	38386	-	-	-	2000	-	-	-	-
		RICHMOND-CITY	-	-	-	203056	-	-	-	2000	-	-	-	-
	NORFOLK CMSA	GLOUCESTER	-	-	-	-	30131	-	-	2000	-	-	-	-
		JAMES CITY	-	-	-	-	34859	-	-	2000	-	-	-	-
		YORK	-	-	-	-	42422	-	-	2000	-	-	-	-
		CHESAPEAKE-CITY	-	-	-	-	151976	-	-	2000	-	-	-	-
		HAMPTON-CITY	-	-	-	-	133793	-	-	2000	-	-	-	-
		NEWPORT NEWS-CIY	-	-	-	-	170045	-	-	2000	-	-	-	-
		NORFOLK-CITY	-	-	-	-	261229	-	-	2000	-	-	-	-
		POQUOSON-CITY	-	-	-	-	11005	-	-	2000	-	-	-	-
		PORTSMOUTH-CITY	-	-	-	-	103907	-	-	2000	-	-	-	-
		SUFFOLK-CITY	-	-	-	-	52141	-	-	2000	-	-	-	-
		VIRG BEACH-CITY	-	-	-	-	393069	-	-	2000	-	-	-	-
		WILLIAMSBURG-CIY	-	-	-	-	11530	-	-	2000	-	-	-	-
	SMYTH	SMYTH	-	-	-	-	32370	-	-	2000	-	-	-	-
	NORTHEAST OZONE	OTHER COUNTIES	-	-	-	-	-	2365596	-	2000	-	-	-	-
	OTHER COUNTIES		-	-	-	-	-	-	-	-	-	-	-	-
			========	========	========	========	========	========	========	========	========	========	========	========
	TOTALS	6187358	-	-	1527645	865640	1428477	2365596	-	-	-	-	-	-

DAYS TO CLEAR REFINERY TO TERMINAL LEG SHOWN IN RIGHT-HAND COLUMN. AN ADDITIONAL 21 DAYS ARE REQUIRED TO CLEAR THE LEG TO THE GASOLINE SERVICE STATION.
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COUNTY POPULATIONS FROM US BUREAU OF THE CENSUS, MARCH 1991   NATIONAL PETROLEUM COUNCIL   OCTOBER 19, 1992   TIME 9:41

STATE AND COUNTY OXYGENATE BASES AND POPULATIONS -- NPC REGION 3

			COUNTY OZONE NON-ATTAINMENT BASIS AND POPULATION							EFFECT YEAR		CO DATA		
			EXTREME	SEVERE	SERIOUS	MODERATE	MARGINAL	OTHER	ATTAIN	OZONE	CO	MIN O2 %	MONTHS	DAYS
N CAROLINA	CHARLOTTE CMSA	CABARRUS	-	-	-	98935	-	-	-	2000	-	-	-	-
		GASTON	-	-	-	175093	-	-	-	2000	-	-	-	-
		LINCOLN	-	-	-	50319	-	-	-	2000	-	-	-	-
		MECKLENBURG	-	-	-	511433	-	-	-	2000	-	-	-	-
		ROWAN	-	-	-	110605	-	-	-	2000	-	-	-	-
		UNION	-	-	-	84211	-	-	-	2000	-	-	-	-
	GREENSBORO-WINSTON	DAVIDSON	-	-	-	126677	-	-	-	2000	1993	2.7	4	14
		DAVIE	-	-	-	27859	-	-	-	2000	1993	2.7	4	14
		FORSYTH	-	-	-	265878	-	-	-	2000	1993	2.7	4	14
		GUILFORD	-	-	-	347420	-	-	-	2000	1993	2.7	4	14
		RANDOLPH	-	-	-	106546	-	-	-	2000	1993	2.7	4	14
		STOKES	-	-	-	37223	-	-	-	2000	1993	2.7	4	14
		YADKIN	-	-	-	30488	-	-	-	2000	1993	2.7	4	14
	RALEIGH-DURHAM	DURHAM	-	-	-	181835	-	-	-	2000	1993	2.7	4	14
		FRANKLIN	-	-	-	36414	-	-	-	2000	1993	2.7	4	14
		GRANVILLE	-	-	-	38345	-	-	-	2000	-	-	-	-
		ORANGE	-	-	-	93851	-	-	-	2000	1993	2.7	4	14
		WAKE	-	-	-	423380	-	-	-	2000	1993	2.7	4	14
	OTHER COUNTIES		-	-	-	-	-	-	3882125	-	-	-	-	-
	TOTALS	6628637	-	-	-	2746512	-	-	3882125	-	-	-	-	-
S CAROLINA	CHARLOTTE CMSA	YORK	-	-	-	131497	-	-	-	2000	-	-	-	-
	CHEROKEE	CHEROKEE	-	-	-	-	44506	-	-	2000	-	-	-	-
	OTHER COUNTIES		-	-	-	-	-	-	3310700	-	-	-	-	-
	TOTALS	3486703	-	-	-	131497	44506	-	3310700	-	-	-	-	-
GEORGIA	ATLANTA CMSA	BARROW	-	-	29721	-	-	-	-	2000	-	-	-	-
		BUTTS	-	-	15326	-	-	-	-	2000	-	-	-	-
		CHEROKEE	-	-	90204	-	-	-	-	2000	-	-	-	-
		CLAYTON	-	-	182052	-	-	-	-	2000	-	-	-	-
		COBB	-	-	447745	-	-	-	-	2000	-	-	-	-
		COWETA	-	-	53853	-	-	-	-	2000	-	-	-	-
		DE KALB	-	-	545837	-	-	-	-	2000	-	-	-	-
		DOUGLAS	-	-	71120	-	-	-	-	2000	-	-	-	-
		FAYETTE	-	-	62415	-	-	-	-	2000	-	-	-	-
		FORSYTH	-	-	44083	-	-	-	-	2000	-	-	-	-
		FULTON	-	-	648951	-	-	-	-	2000	-	-	-	-
		GWINNETT	-	-	352910	-	-	-	-	2000	-	-	-	-
		HENRY	-	-	58741	-	-	-	-	2000	-	-	-	-
		NEWTON	-	-	41808	-	-	-	-	2000	-	-	-	-
		PAULDING	-	-	41611	-	-	-	-	2000	-	-	-	-
		ROCKDALE	-	-	54091	-	-	-	-	2000	-	-	-	-
		SPALDING	-	-	54457	-	-	-	-	2000	-	-	-	-
		WALTON	-	-	38586	-	-	-	-	2000	-	-	-	-
	OTHER COUNTIES		-	-	-	-	-	-	3644705	-	-	-	-	-
	TOTALS	6478216	-	-	2833511	-	-	-	3644705	-	-	-	-	-

DAYS TO CLEAR REFINERY TO TERMINAL LEG SHOWN IN RIGHT-HAND COLUMN. AN ADDITIONAL 21 DAYS ARE REQUIRED TO CLEAR THE LEG TO THE GASOLINE SERVICE STATION.
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COUNTY POPULATIONS FROM US BUREAU OF THE CENSUS, MARCH 1991 NATIONAL PETROLEUM COUNCIL OCTOBER 19, 1992 TIME 9:41

APP L.III.5-16

STATE AND COUNTY OXYGENATE BASES AND POPULATIONS -- NPC REGION 3

			COUNTY OZONE NON-ATTAINMENT BASIS AND POPULATION							EFFECT YEAR		CO DATA		
			EXTREME	SEVERE	SERIOUS	MODERATE	MARGINAL	OTHER	ATTAIN	OZONE	CO	MIN O2 %	MONTHS	DAYS
FLORIDA	MIAMI-FT LAUDERDAL	BROWARD	-	-	-	1255488	-	-	-	2000	-	-	-	-
		DADE	-	-	-	1937094	-	-	-	2000	-	-	-	-
		PALM BEACH	-	-	-	863518	-	-	-	2000	-	-	-	-
	TAMPA-ST PETERSBURG	HERNANDO	-	-	-	-	101115	-	-	2000	-	-	-	-
		HILLSBOROUGH	-	-	-	-	834054	-	-	2000	-	-	-	-
		PASCO	-	-	-	-	281131	-	-	2000	-	-	-	-
		PINELLAS	-	-	-	-	851659	-	-	2000	-	-	-	-
	OTHER COUNTIES		-	-	-	-	-	-	6813867	-	-	-	-	-
	TOTALS	12937926	-	-	-	4056100	2067959	-	6813867	-	-	-	-	-

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COUNTY POPULATIONS FROM US BUREAU OF THE CENSUS, MARCH 1991 NATIONAL PETROLEUM COUNCIL OCTOBER 19, 1992 TIME 9:41

STATE AND COUNTY OXYGENATE BASES AND POPULATIONS -- NPC REGION 4

			COUNTY OZONE NON-ATTAINMENT BASIS AND POPULATION							EFFECT YEAR		CO DATA		
			EXTREME	SEVERE	SERIOUS	MODERATE	MARGINAL	OTHER	ATTAIN	OZONE	CO	MIN O2 %	MONTHS	DAYS
NEW YORK	BUFFALO CMSA	ERIE	-	-	-	-	968532	-	-	2000	-	-	-	-
		NIAGARA	-	-	-	-	220756	-	-	2000	-	-	-	-
	NORTHEAST OZONE	ALLEGANY	-	-	-	-	-	50470	-	2000	-	-	-	-
		CATTARAUGUS	-	-	-	-	-	84234	-	2000	-	-	-	-
		CAYUGA	-	-	-	-	-	82313	-	2000	-	-	-	-
		CHAUTAUQUA	-	-	-	-	-	141895	-	2000	-	-	-	-
		CHEMUNG	-	-	-	-	-	95195	-	2000	-	-	-	-
		GENESEE	-	-	-	-	-	60060	-	2000	-	-	-	-
		LIVINGSTON	-	-	-	-	-	62372	-	2000	-	-	-	-
		MONROE	-	-	-	-	-	713968	-	2000	-	-	-	-
		ONONDAGA	-	-	-	-	-	468973	-	2000	1993	2.7	4	14
		ONTARIO	-	-	-	-	-	95101	-	2000	-	-	-	-
		ORLEANS	-	-	-	-	-	41846	-	2000	-	-	-	-
		OSWEGO	-	-	-	-	-	121771	-	2000	1993	2.7	4	14
		SCHUYLER	-	-	-	-	-	18662	-	2000	-	-	-	-
		SENECA	-	-	-	-	-	33683	-	2000	-	-	-	-
		STEUBEN	-	-	-	-	-	99088	-	2000	-	-	-	-
		TOMPKINS	-	-	-	-	-	94097	-	2000	-	-	-	-
		WAYNE	-	-	-	-	-	89123	-	2000	-	-	-	-
		WYOMING	-	-	-	-	-	42507	-	2000	-	-	-	-
		YATES	-	-	-	-	-	22810	-	2000	-	-	-	-
	OTHER COUNTIES		-	-	-	-	-	-	-	-	-	-	-	-
	TOTALS	3607456	-	-	-	-	1189288	2418168	-	-	-	-	-	-

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COUNTY POPULATIONS FROM US BUREAU OF THE CENSUS, MARCH 1991 NATIONAL PETROLEUM COUNCIL OCTOBER 19, 1992 TIME 9:41

STATE AND COUNTY OXYGENATE BASES AND POPULATIONS -- NPC REGION 4

			COUNTY OZONE NON-ATTAINMENT BASIS AND POPULATION							EFFECT YEAR		CO DATA		
			EXTREME	SEVERE	SERIOUS	MODERATE	MARGINAL	OTHER	ATTAIN	OZONE	CO	MIN O2 %	MONTHS	DAYS
PENNSYLVANIA	PITTSBURG CMSA	ALLEGHENY	-	-	-	1336449	-	-	-	2000	-	-	-	-
		BEAVER	-	-	-	186093	-	-	-	2000	-	-	-	-
		FAYETTE	-	-	-	145351	-	-	-	2000	-	-	-	-
		WASHINGTON	-	-	-	204584	-	-	-	2000	-	-	-	-
		WESTMORELAND	-	-	-	370321	-	-	-	2000	-	-	-	-
		ARMSTRONG	-	-	-	73478	-	-	-	2000	-	-	-	-
		BUTLER	-	-	-	152013	-	-	-	2000	-	-	-	-
	ALTOONA	BLAIR	-	-	-	-	130542	-	-	2000	-	-	-	-
	ERIE	ERIE	-	-	-	-	275572	-	-	2000	-	-	-	-
	JOHNSTOWN	CAMBRIA	-	-	-	-	163029	-	-	2000	-	-	-	-
		SOMERSET	-	-	-	-	78218	-	-	2000	-	-	-	-
	YOUNGSTOWN CMSA	MERCER	-	-	-	-	121003	-	-	2000	-	-	-	-
	NORTHEAST OZONE	BEDFORD	-	-	-	-	-	47919	-	2000	-	-	-	-
		CAMERON	-	-	-	-	-	5913	-	2000	-	-	-	-
		CLARION	-	-	-	-	-	41699	-	2000	-	-	-	-
		CLEARFIELD	-	-	-	-	-	78097	-	2000	-	-	-	-
		CRAWFORD	-	-	-	-	-	86169	-	2000	-	-	-	-
		ELK	-	-	-	-	-	34878	-	2000	-	-	-	-
		FOREST	-	-	-	-	-	4802	-	2000	-	-	-	-
		GREENE	-	-	-	-	-	39550	-	2000	-	-	-	-
		INDIANA	-	-	-	-	-	89994	-	2000	-	-	-	-
		JEFFERSON	-	-	-	-	-	46083	-	2000	-	-	-	-
		LAWRENCE	-	-	-	-	-	96246	-	2000	-	-	-	-
		MC KEAN	-	-	-	-	-	47131	-	2000	-	-	-	-
		POTTER	-	-	-	-	-	16717	-	2000	-	-	-	-
		VENANGO	-	-	-	-	-	59381	-	2000	-	-	-	-
		WARREN	-	-	-	-	-	45050	-	2000	-	-	-	-
	OTHER COUNTIES		-	-	-	-	-	-	-	-	-	-	-	-
	TOTALS	3976282	-	-	-	2468289	768364	739629	-	-	-	-	-	-
W VIRGINIA	CHARLESTON CMSA	KANAWHA	-	-	-	207619	-	-	-	2000	-	-	-	-
		PUTNAM	-	-	-	42835	-	-	-	2000	-	-	-	-
	HUNTINGTON-ASHLAND	CABELL	-	-	-	96827	-	-	-	2000	-	-	-	-
		WAYNE	-	-	-	41636	-	-	-	2000	-	-	-	-
	PARKERSBURG CMSA	WOOD	-	-	-	86915	-	-	-	2000	-	-	-	-
	GREENBRIAR	GREENBRIER	-	-	-	-	34693	-	-	2000	-	-	-	-
	OTHER COUNTIES		-	-	-	-	-	-	1282952	-	-	-	-	-
	TOTALS	1793477	-	-	-	475832	34693	-	1282952	-	-	-	-	-

DAYS TO CLEAR REFINERY TO TERMINAL LEG SHOWN IN RIGHT-HAND COLUMN. AN ADDITIONAL 21 DAYS ARE REQUIRED TO CLEAR THE LEG TO THE GASOLINE SERVICE STATION.
EFFECTIVE DATES FOR REFORMULATED GASOLINE BETWEEN 1995 AND 2000 ARE IRRELEVANT SINCE THE INTERVENING YEARS WERE NOT STUDIED.
COUNTY POPULATIONS FROM US BUREAU OF THE CENSUS, MARCH 1991 NATIONAL PETROLEUM COUNCIL OCTOBER 19, 1992 TIME 9:41

STATE AND COUNTY OXYGENATE BASES AND POPULATIONS -- NPC REGION 5

			-------- COUNTY OZONE NON-ATTAINMENT BASIS AND POPULATION ----------							-- EFFECT YEAR ---		--------- CO DATA ----------		
			EXTREME	SEVERE	SERIOUS	MODERATE	MARGINAL	OTHER	ATTAIN	OZONE	CO	MIN O2 %	MONTHS	DAYS
MICHIGAN	MUSKEGON	MUSKEGON	-	-	158983	-	-	-	-	2000	-	-	-	-
	DETROIT CMSA	LAPEER	-	-	-	74768	-	-	-	2000	-	-	-	-
		LIVINGSTON	-	-	-	115645	-	-	-	2000	-	-	-	-
		MACOMB	-	-	-	717400	-	-	-	2000	-	-	-	-
		MONROE	-	-	-	133600	-	-	-	2000	-	-	-	-
		OAKLAND	-	-	-	1083592	-	-	-	2000	-	-	-	-
		ST CLAIR	-	-	-	145607	-	-	-	2000	-	-	-	-
		WASHTENAW	-	-	-	282937	-	-	-	2000	-	-	-	-
		WAYNE	-	-	-	2111687	-	-	-	2000	-	-	-	-
	GRAND RAPIDS	KENT	-	-	-	500631	-	-	-	2000	-	-	-	-
		OTTAWA	-	-	-	187768	-	-	-	2000	-	-	-	-
	OTHER COUNTIES		-	-	-	-	-	-	3782679	-	-	-	-	-
	TOTALS	9295297	-	-	158983	5353635	-	-	3782679	-	-	-	-	-
OHIO	CINCINNATI CMSA	BUTLER	-	-	-	291479	-	-	-	2000	-	-	-	-
		CLERMONT	-	-	-	150187	-	-	-	2000	-	-	-	-
		HAMILTON	-	-	-	866228	-	-	-	2000	-	-	-	-
		WARREN	-	-	-	113909	-	-	-	2000	-	-	-	-
	CLEVELAND CMSA	CUYAHOGA	-	-	-	1412140	-	-	-	2000	1993	2.7	4	14
		GEAUGA	-	-	-	81129	-	-	-	2000	1993	2.7	4	14
		LAKE	-	-	-	215499	-	-	-	2000	1993	2.7	4	14
		LORAIN	-	-	-	271126	-	-	-	2000	1993	2.7	4	14
		MEDINA	-	-	-	122354	-	-	-	2000	1993	2.7	4	14
		PORTAGE	-	-	-	142585	-	-	-	2000	1993	2.7	4	14
		SUMMIT	-	-	-	514990	-	-	-	2000	1993	2.7	4	14
		ASHTABULA	-	-	-	99821	-	-	-	2000	-	-	-	-
	DAYTON-SPRINGFIELD	CLARK	-	-	-	147548	-	-	-	2000	-	-	-	-
		GREENE	-	-	-	136731	-	-	-	2000	-	-	-	-
		MIAMI	-	-	-	93182	-	-	-	2000	-	-	-	-
		MONTGOMERY	-	-	-	573809	-	-	-	2000	-	-	-	-
	HUNTINGTON-ASHLAND	LAWRENCE	-	-	-	61834	-	-	-	2000	-	-	-	-
	PARKERSBURG CMSA	WASHINGTON	-	-	-	62254	-	-	-	2000	-	-	-	-
	TOLEDO CMSA	FULTON	-	-	-	38498	-	-	-	2000	-	-	-	-
		LUCAS	-	-	-	462361	-	-	-	2000	-	-	-	-
		WOOD	-	-	-	113269	-	-	-	2000	-	-	-	-
	CANTON	CARROLL	-	-	-	-	26521	-	-	2000	-	-	-	-
		STARK	-	-	-	-	367585	-	-	2000	-	-	-	-
	COLUMBUS	DELAWARE	-	-	-	-	66929	-	-	2000	-	-	-	-
		FAIRFIELD	-	-	-	-	103461	-	-	2000	-	-	-	-
		FRANKLIN	-	-	-	-	961437	-	-	2000	-	-	-	-
		LICKING	-	-	-	-	128300	-	-	2000	-	-	-	-
		MADISON	-	-	-	-	37068	-	-	2000	-	-	-	-
		PICKAWAY	-	-	-	-	48255	-	-	2000	-	-	-	-
		UNION	-	-	-	-	31969	-	-	2000	-	-	-	-
	YOUNGSTOWN CMSA	MAHONING	-	-	-	-	264806	-	-	2000	-	-	-	-
		TRUMBULL	-	-	-	-	227813	-	-	2000	-	-	-	-
	OTHER COUNTIES		-	-	-	-	-	-	2612038	-	-	-	-	-
	TOTALS	10847115	-	-	-	5970933	2264144	-	2612038	-	-	-	-	-

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COUNTY POPULATIONS FROM US BUREAU OF THE CENSUS, MARCH 1991 NATIONAL PETROLEUM COUNCIL OCTOBER 19, 1992 TIME 9:41

STATE AND COUNTY OXYGENATE BASES AND POPULATIONS -- NPC REGION 5

			COUNTY OZONE NON-ATTAINMENT BASIS AND POPULATION							EFFECT YEAR		CO DATA		
			EXTREME	SEVERE	SERIOUS	MODERATE	MARGINAL	OTHER	ATTAIN	OZONE	CO	MIN O2 %	MONTHS	DAYS
INDIANA	CHICAGO CMSA	LAKE	-	475594	-	-	-	-	-	1995	-	-	-	-
		PORTER	-	12B932	-	-	-	-	-	1995	-	-	-	-
	CINCINNATI CMSA	DEARBORN	-	-	-	38835	-	-	-	2000	-	-	-	-
	LOUISVILLE CMSA	CLARK	-	-	-	87777	-	-	-	2000	-	-	-	-
		FLOYD	-	-	-	64404	-	-	-	2000	-	-	-	-
		HARRISON	-	-	-	29890	-	-	-	2000	-	-	-	-
	EVANSVILLE CMSA	POSEY	-	-	-	-	25968	-	-	2000	-	-	-	-
		VANDERBURGH	-	-	-	-	165058	-	-	2000	-	-	-	-
		WARRICK	-	-	-	-	44920	-	-	2000	-	-	-	-
	INDIANAPOLIS	BOONE	-	-	-	-	38147	-	-	2000	-	-	-	-
		HAMILTON	-	-	-	-	108936	-	-	2000	-	-	-	-
		HANCOCK	-	-	-	-	45527	-	-	2000	-	-	-	-
		HENDRICKS	-	-	-	-	75717	-	-	2000	-	-	-	-
		JOHNSON	-	-	-	-	88109	-	-	2000	-	-	-	-
		MARION	-	-	-	-	797159	-	-	2000	-	-	-	-
		MORGAN	-	-	-	-	55920	-	-	2000	-	-	-	-
		SHELBY	-	-	-	-	40307	-	-	2000	-	-	-	-
	SOUTH BEND CMSA	ST JOSEPH	-	-	-	-	247052	-	-	2000	-	-	-	-
		ELKHART	-	-	-	-	156198	-	-	2000	-	-	-	-
	OTHER COUNTIES		-	-	-	-	-	-	2829709	-	-	-	-	-
	TOTALS	5544159	-	604526	-	220906	1889018	-	2829709	-	-	-	-	-
ILLINOIS	CHICAGO CMSA	COOK	-	5105067	-	-	-	-	-	1995	-	-	-	-
		DU PAGE	-	781666	-	-	-	-	-	1995	-	-	-	-
		GRUNDY	-	32337	-	-	-	-	-	1995	-	-	-	-
		KANE	-	317471	-	-	-	-	-	1995	-	-	-	-
		KENDALL	-	39413	-	-	-	-	-	1995	-	-	-	-
		LAKE	-	516418	-	-	-	-	-	1995	-	-	-	-
		MCHENRY	-	183241	-	-	-	-	-	1995	-	-	-	-
		WILL	-	357313	-	-	-	-	-	1995	-	-	-	-
	ST LOUIS CMSA	CLINTON	-	-	-	33944	-	-	-	2000	-	-	-	-
		JERSEY	-	-	-	20539	-	-	-	2000	-	-	-	-
		MADISON	-	-	-	249238	-	-	-	2000	-	-	-	-
		MONROE	-	-	-	22422	-	-	-	2000	-	-	-	-
		ST CLAIR	-	-	-	262852	-	-	-	2000	-	-	-	-
	OTHER COUNTIES		-	-	-	-	-	-	3508681	-	-	-	-	-
	TOTALS	11430602	-	7332926	-	588995	-	-	3508681	-	-	-	-	-

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COUNTY POPULATIONS FROM US BUREAU OF THE CENSUS, MARCH 1991 NATIONAL PETROLEUM COUNCIL OCTOBER 19, 1992 TIME 9:41

STATE AND COUNTY OXYGENATE BASES AND POPULATIONS -- NPC REGION 5

			COUNTY OZONE NON-ATTAINMENT BASIS AND POPULATION							EFFECT YEAR		CO DATA		
			EXTREME	SEVERE	SERIOUS	MODERATE	MARGINAL	OTHER	ATTAIN	OZONE	CO	MIN O2 %	MONTHS	DAYS
KENTUCKY	CINCINNATI CMSA	BOONE	-	-	-	57589	-	-	-	2000	-	-	-	-
		CAMPBELL	-	-	-	83866	-	-	-	2000	-	-	-	-
		KENTON	-	-	-	142031	-	-	-	2000	-	-	-	-
	HUNTINGTON-ASHLAND	BOYD	-	-	-	51150	-	-	-	2000	-	-	-	-
		CARTER	-	-	-	24340	-	-	-	2000	-	-	-	-
		GREENUP	-	-	-	36742	-	-	-	2000	-	-	-	-
	LOUISVILLE CMSA	BULLITT	-	-	-	47567	-	-	-	2000	-	-	-	-
		JEFFERSON	-	-	-	664937	-	-	-	2000	-	-	-	-
		OLDHAM	-	-	-	33263	-	-	-	2000	-	-	-	-
		SHELBY	-	-	-	24824	-	-	-	2000	-	-	-	-
	EDMONSON	EDMONSON	-	-	-	-	10357	-	-	2000	-	-	-	-
	INDIANAPOLIS	HENDERSON	-	-	-	-	43044	-	-	2000	-	-	-	-
	LEXINGTON CMSA	BOURBON	-	-	-	-	19236	-	-	2000	-	-	-	-
		CLARKE	-	-	-	-	29496	-	-	2000	-	-	-	-
		FAYETTE	-	-	-	-	225366	-	-	2000	-	-	-	-
		JESSAMINE	-	-	-	-	30508	-	-	2000	-	-	-	-
		SCOTT	-	-	-	-	23867	-	-	2000	-	-	-	-
		WOODFORD	-	-	-	-	19955	-	-	2000	-	-	-	-
	OWENSBORO	DAVIESS	-	-	-	-	87189	-	-	2000	-	-	-	-
		HANCOCK	-	-	-	-	7864	-	-	2000	-	-	-	-
	PADUCAH	LIVINGSTON	-	-	-	-	9062	-	-	2000	-	-	-	-
		MARSHALL	-	-	-	-	27205	-	-	2000	-	-	-	-
	OTHER COUNTIES		-	-	-	-	-	-	1985838	-	-	-	-	-
			========	========	========	========	========	========	========	========	========	========	========	========
	TOTALS	3685296	-	-	-	1166309	533149	-	1985838	-	-	-	-	-
TENNESSEE	NASHVILLE CMSA	CHEATHAM	-	-	-	27140	-	-	-	2000	-	-	-	-
		DAVIDSON	-	-	-	510784	-	-	-	2000	-	-	-	-
		DICKSON	-	-	-	35061	-	-	-	2000	-	-	-	-
		ROBERTSON	-	-	-	41494	-	-	-	2000	-	-	-	-
		RUTHERFORD	-	-	-	118570	-	-	-	2000	-	-	-	-
		SUMNER	-	-	-	103281	-	-	-	2000	-	-	-	-
		WILLIAMSON	-	-	-	81021	-	-	-	2000	-	-	-	-
		WILSON	-	-	-	67675	-	-	-	2000	-	-	-	-
	KNOXVILLE	ANDERSON	-	-	-	-	68250	-	-	2000	-	-	-	-
		BLOUNT	-	-	-	-	85969	-	-	2000	-	-	-	-
		GRAINGER	-	-	-	-	17095	-	-	2000	-	-	-	-
		JEFFERSON	-	-	-	-	33016	-	-	2000	-	-	-	-
		KNOX	-	-	-	-	335749	-	-	2000	-	-	-	-
		SEVIER	-	-	-	-	51043	-	-	2000	-	-	-	-
		UNION	-	-	-	-	13694	-	-	2000	-	-	-	-
	MEMPHIS	SHELBY	-	-	-	-	826330	-	-	2000	1993	2.7	4	14
		TIPTON	-	-	-	-	37568	-	-	2000	1993	2.7	4	14
	OTHER COUNTIES		-	-	-	-	-	-	2423445	-	-	-	-	-
			========	========	========	========	========	========	========	========	========	========	========	========
	TOTALS	4877185	-	-	-	985026	1468714	-	2423445	-	-	-	-	-

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COUNTY POPULATIONS FROM US BUREAU OF THE CENSUS, MARCH 1991 NATIONAL PETROLEUM COUNCIL OCTOBER 19, 1992 TIME 9:41

STATE AND COUNTY OXYGENATE BASES AND POPULATIONS -- NPC REGION 6

			COUNTY OZONE NON-ATTAINMENT BASIS AND POPULATION							EFFECT YEAR		CO DATA		
			EXTREME	SEVERE	SERIOUS	MODERATE	MARGINAL	OTHER	ATTAIN	OZONE	CO	MIN 02 %	MONTHS	DAYS
WISCONSIN	MILWAUKEE CMSA	KENOSHA	-	128181	-	-	-	-	-	1995	-	-	-	-
		MILWAUKEE	-	959275	-	-	-	-	-	1995	-	-	-	-
		QZAUKEE	-	72831	-	-	-	-	-	1995	-	-	-	-
		RACINE	-	175034	-	-	-	-	-	1995	-	-	-	-
		WASHINGTON	-	95328	-	-	-	-	-	1995	-	-	-	-
		WAUKESHA	-	304715	-	-	-	-	-	1995	-	-	-	-
	SHEBOYGAN	SHEBOYGAN	-	-	103877	-	-	-	-	2000	-	-	-	-
	KEWAUNEE	KEWAUNEE	-	-	-	18878	-	-	-	2000	-	-	-	-
	MANITOWOC	MANITOWOC	-	-	-	80421	-	-	-	2000	-	-	-	-
	OOOR	DOOR	-	-	-	-	25690	-	-	2000	-	-	-	-
	WALWORTH	WALWORTH	-	-	-	-	75000	-	-	2000	-	-	-	-
	DULUTH	DOUGLAS	-	-	-	-	-	-	41758	-	1993	2.7	4	14
	MINNEAPOLIS-ST PAUL	ST CROIX	-	-	-	-	-	-	50251	-	1993	2.7	4	14
	OTHER COUNTIES		-	-	-	-	-	-	2760530	-	-	-	-	-
	TOTALS	4891769	-	1735364	103877	99299	100690	-	2852539	-	-	-	-	-
MINNESOTA	DULUTH	ST LOUIS	-	-	-	-	-	-	198213	-	1993	2.7	4	14
	MINNEAPOLIS-ST PAUL	ANOKA	-	-	-	-	-	-	243641	-	1993	2.7	4	14
		CARVER	-	-	-	-	-	-	47915	-	1993	2.7	4	14
		CHISAGO	-	-	-	-	-	-	30521	-	1993	2.7	4	14
		DAKOTA	-	-	-	-	-	-	275227	-	1993	2.7	4	14
		HENNEPIN	-	-	-	-	-	-	1032431	-	1993	2.7	4	14
		ISANTI	-	-	-	-	-	-	25921	-	1993	2.7	4	14
		RAMSEY	-	-	-	-	-	-	485765	-	1993	2.7	4	14
		SCOTT	-	-	-	-	-	-	57846	-	1993	2.7	4	14
		WASHINGTON	-	-	-	-	-	-	145896	-	1993	2.7	4	14
		WRIGHT	-	-	-	-	-	-	68710	-	1993	2.7	4	14
	OTHER COUNTIES		-	-	-	-	-	-	1763013	-	-	-	-	-
	TOTALS	4375099	-	-	-	-	-	-	4375099	-	-	-	-	-

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STATE AND COUNTY OXYGENATE BASES AND POPULATIONS -- NPC REGION 7

			COUNTY OZONE NON-ATTAINMENT BASIS AND POPULATION							EFFECT YEAR			CO DATA	
			EXTREME	SEVERE	SERIOUS	MODERATE	MARGINAL	OTHER	ATTAIN	OZONE	CO	MIN 02 %	MONTHS	DAYS
MISSOURI	ST LOUIS CMSA	FRANKLIN	-	-	-	80603	-	-	-	2000	-	-	-	-
		JEFFERSON	-	-	-	171380	-	-	-	2000	-	-	-	-
		ST CHARLES	-	-	-	212907	-	-	-	2000	-	-	-	-
		ST LOUIS	-	-	-	993529	-	-	-	2000	-	-	-	-
		ST LOUIS-CITY	-	-	-	396685	-	-	-	2000	-	-	-	-
	KANSAS CITY CMSA	CASS	-	-	-	-	63808	-	-	2000	-	-	-	-
		CLAY	-	-	-	-	153411	-	-	2000	-	-	-	-
		JACKSON	-	-	-	-	633232	-	-	2000	-	-	-	-
		LAFAYETTE	-	-	-	-	31107	-	-	2000	-	-	-	-
		PLATTE	-	-	-	-	57867	-	-	2000	-	-	-	-
		RAY	-	-	-	-	21971	-	-	2000	-	-	-	-
	OTHER COUNTIES		-	-	-	-	-	-	2300573	-	-	-	-	-
	TOTALS	5117073	-	-	-	1855104	961396	-	2300573	-	-	-	-	-
KANSAS	KANSAS CITY CMSA	JOHNSON	-	-	-	-	355054	-	-	2000	-	-	-	-
		LEAVENWORTH	-	-	-	-	64371	-	-	2000	-	-	-	-
		MIAMI	-	-	-	-	23466	-	-	2000	-	-	-	-
		WYANDOTTE	-	-	-	-	161993	-	-	2000	-	-	-	-
	OTHER COUNTIES		-	-	-	-	-	-	1872690	-	-	-	-	-
	TOTALS	2477574	-	-	-	-	604884	-	1872690	-	-	-	-	-

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STATE AND COUNTY OXYGENATE BASES AND POPULATIONS -- NPC REGION 8

			COUNTY OZONE NON-ATTAINMENT BASIS AND POPULATION							EFFECT YEAR		CO DATA		
			EXTREME	SEVERE	SERIOUS	MODERATE	MARGINAL	OTHER	ATTAIN	OZONE	CO	MIN 02 %	MONTHS	DAYS
ALABAMA	BIRMINGHAM	BLOUNT	-	-	-	-	39248	-	-	2000	-	-	-	-
		JEFFERSON	-	-	-	-	651525	-	-	2000	-	-	-	-
		ST CLAIR	-	-	-	-	50009	-	-	2000	-	-	-	-
		SHELBY	-	-	-	-	99358	-	-	2000	-	-	-	-
		WALKER	-	-	-	-	67670	-	-	2000	-	-	-	-
	OTHER COUNTIES		-	-	-	-	-	-	3132777	-	-	-	-	-
			========	========	========	========	========	========	========	========	========	========	========	========
	TOTALS	4040587	-	-	-	-	907810	-	3132777	-	-	-	-	-
LOUISIANA	BATON ROUGE CMSA	ASCENSION	-	-	58214	-	-	-	-	2000	-	-	-	-
		EAST BATON ROUGE	-	-	380105	-	-	-	-	2000	-	-	-	-
		LIVINGSTON	-	-	70526	-	-	-	-	2000	-	-	-	-
		WEST BATON ROUGE	-	-	19419	-	-	-	-	2000	-	-	-	-
		IBERVILLE	-	-	31049	-	-	-	-	2000	-	-	-	-
		POINTE COUPEE	-	-	22540	-	-	-	-	2000	-	-	-	-
	LAKE CHARLES	CALCASIEU	-	-	-	-	168134	-	-	2000	-	-	-	-
	OTHER COUNTIES		-	-	-	-	-	-	3469986	-	-	-	-	-
			========	========	========	========	========	========	========	========	========	========	========	========
	TOTALS	4219973	-	-	581853	-	168134	-	3469986	-	-	-	-	-
TEXAS	HOUSTON CMSA	BRAZORIA	-	191707	-	-	-	-	-	1995	-	-	-	-
		FORT BENO	-	225421	-	-	-	-	-	1995	-	-	-	-
		GALVESTON	-	217399	-	-	-	-	-	1995	-	-	-	-
		HARRIS	-	2818199	-	-	-	-	-	1995	-	-	-	-
		LIBERTY	-	52726	-	-	-	-	-	1995	-	-	-	-
		MONTGOMERY	-	182201	-	-	-	-	-	1995	-	-	-	-
		WALLER	-	23390	-	-	-	-	-	1995	-	-	-	-
		CHAMBERS	-	20088	-	-	-	-	-	1995	-	-	-	-
	BEAUMONT CMSA	HARDIN	-	-	41320	-	-	-	-	2000	-	-	-	-
		JEFFERSON	-	-	239397	-	-	-	-	2000	-	-	-	-
		ORANGE	-	-	80509	-	-	-	-	2000	-	-	-	-
	EL PASO	EL PASO	-	-	591610	-	-	-	-	2000	1993	2.7	4	14
	DALLAS-FT WORTH	COLLIN	-	-	-	264036	-	-	-	2000	-	-	-	-
		DALLAS	-	-	-	1852810	-	-	-	2000	-	-	-	-
		DENTON	-	-	-	273525	-	-	-	2000	-	-	-	-
		ELLIS	-	-	-	85167	-	-	-	2000	-	-	-	-
		JOHNSON	-	-	-	97165	-	-	-	2000	-	-	-	-
		KAUFMAN	-	-	-	52220	-	-	-	2000	-	-	-	-
		PARKER	-	-	-	64785	-	-	-	2000	-	-	-	-
		ROCKWALL	-	-	-	25604	-	-	-	2000	-	-	-	-
		TARRANT	-	-	-	1170103	-	-	-	2000	-	-	-	-
	OTHER COUNTIES		-	-	-	-	-	-	8417128	-	-	-	-	-
			========	========	========	========	========	========	========	========	========	========	========	========
	TOTALS	16986510	-	3731131	952836	3885415	-	-	8417128	-	-	-	-	-
NEW MEXICO	ALBUQUERQUE	BERNALILLO	-	-	-	-	-	-	480577	-	1993	2.7	4	14
	OTHER COUNTIES		-	-	-	-	-	-	1034492	-	-	-	-	-
			========	========	========	========	========	========	========	========	========	========	========	========
	TOTALS	1515069	-	-	-	-	-	-	1515069	-	-	-	-	-

DAYS TO CLEAR REFINERY TO TERMINAL LEG SHOWN IN RIGHT-HAND COLUMN. AN ADDITIONAL 21 DAYS ARE REQUIRED TO CLEAR THE LEG TO THE GASOLINE SERVICE STATION.
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COUNTY POPULATIONS FROM US BUREAU OF THE CENSUS, MARCH 1991 NATIONAL PETROLEUM COUNCIL OCTOBER 19, 1992 TIME 9:41

STATE AND COUNTY OXYGENATE BASES AND POPULATIONS -- NPC REGION 9

			COUNTY OZONE NON-ATTAINMENT BASIS AND POPULATION							EFFECT YEAR		CO DATA		
			EXTREME	SEVERE	SERIOUS	MODERATE	MARGINAL	OTHER	ATTAIN	OZONE	CO	MIN O2 %	MONTHS	DAYS
MONTANA	MISSOULA	MISSOULA	-	-	-	-	-	-	78687	-	1993	2.7	4	14
	OTHER COUNTIES		-	-	-	-	-	-	720378	-	-	-	-	-
	TOTALS	799065	-	-	-	-	-	-	799065	-	-	-	-	-
COLORADO	DENVER CMSA	ADAMS	-	-	-	-	-	-	265038	-	1993	2.7	4	14
		ARAPAHOE	-	-	-	-	-	-	391511	-	1993	2.7	4	14
		BOULDER	-	-	-	-	-	-	225339	-	1993	2.7	4	14
		DENVER	-	-	-	-	-	-	467610	-	1993	2.7	4	14
		DOUGLAS	-	-	-	-	-	-	60391	-	1993	2.7	4	14
		JEFFERSON	-	-	-	-	-	-	438430	-	1993	2.7	4	14
	COLORADO SPRINGS	EL PASO	-	-	-	-	-	-	397014	-	1993	2.7	4	14
		TELLER	-	-	-	-	-	-	12468	-	1993	2.7	4	14
	FORT COLLINS	LARIMER	-	-	-	-	-	-	186136	-	1993	2.7	4	14
	LONGMONT	WELD	-	-	-	-	-	-	131821	-	1994	2.7	4	14
	OTHER COUNTIES		-	-	-	-	-	-	718636	-	-	-	-	-
	TOTALS	3294394	-	-	-	-	-	-	3294394	-	-	-	-	-
UTAH	SALT LAKE CITY CMSA	DAVIS	-	-	-	187941	-	-	-	2000	1994	2.7	4	14
		SALT LAKE	-	-	-	725956	-	-	-	2000	1994	2.7	4	14
		WEBER	-	-	-	158330	-	-	-	2000	1994	2.7	4	14
	PROVO	UTAH	-	-	-	-	-	-	263590	-	1993	2.7	4	14
	OTHER COUNTIES		-	-	-	-	-	-	387033	-	-	-	-	-
	TOTALS	1722850	-	-	-	1072227	-	-	650623	-	-	-	-	-

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COUNTY POPULATIONS FROM US BUREAU OF THE CENSUS, MARCH 1991   NATIONAL PETROLEUM COUNCIL   OCTOBER 19, 1992   TIME 9:41

STATE AND COUNTY OXYGENATE BASES AND POPULATIONS -- NPC REGION 10

			COUNTY OZONE NON-ATTAINMENT BASIS AND POPULATION							EFFECT YEAR		CO DATA		
			EXTREME	SEVERE	SERIOUS	MODERATE	MARGINAL	OTHER	ATTAIN	OZONE	CO	MIN O2 %	MONTHS	DAYS
WASHINGTON	PORTLAND-VANCOUVER	CLARK	-	-	-	-	238053	-	-	2000	1993	2.7	4	14
	SEATTLE-TACOMA	KING	-	-	-	-	1507319	-	-	2000	1993	2.7	4	14
		PIERCE	-	-	-	-	586203	-	-	2000	1993	2.7	4	14
		SNOHOMISH	-	-	-	-	465642	-	-	2000	1993	2.7	4	14
	SPOKANE	SPOKANE	-	-	-	-	-	-	361364	-	1993	2.7	6	14
	OTHER COUNTIES		-	-	-	-	-	-	1708111	-	-	-	-	-
	TOTALS	4866692	-	-	-	-	2797217	-	2069475	-	-	-	-	-
OREGON	PORTLAND-VANCOUVER	CLACKAMAS	-	-	-	-	278850	-	-	2000	1993	2.7	4	14
		MULTNOMAH	-	-	-	-	583887	-	-	2000	1993	2.7	4	14
		WASHINGTON	-	-	-	-	311554	-	-	2000	1993	2.7	4	14
		YAMHILL	-	-	-	-	65551	-	-	2000	1993	2.7	4	14
	GRANTS PASS	JOSEPHINE	-	-	-	-	-	-	62649	-	1993	2.7	4	14
	KLAMATH FALLS	KLAMATH	-	-	-	-	-	-	57702	-	1993	2.7	4	14
	MEDFORD	JACKSON	-	-	-	-	-	-	146389	-	1993	2.7	4	14
	OTHER COUNTIES		-	-	-	-	-	-	1335739	-	-	-	-	-
	TOTALS	2842321	-	-	-	-	1239842	-	1602479	-	-	-	-	-

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COUNTY POPULATIONS FROM US BUREAU OF THE CENSUS, MARCH 1991 NATIONAL PETROLEUM COUNCIL OCTOBER 19, 1992 TIME 9:41

APP L.III.5-27

STATE AND COUNTY OXYGENATE BASES AND POPULATIONS -- NPC REGION 11

			COUNTY OZONE NON-ATTAINMENT BASIS AND POPULATION							EFFECT YEAR		CO DATA		
			EXTREME	SEVERE	SERIOUS	MODERATE	MARGINAL	OTHER	ATTAIN	OZONE	CO	MIN 02 %	MONTHS	DAYS
CALIFORNIA	SACRAMENTO CMSA	EL DORADO	-	-	125995	-	-	-	-	1996	1993	2.0	4	14
		PLACER	-	-	172796	-	-	-	-	1996	1993	2.0	4	14
		SACRAMENTO	-	-	1041219	-	-	-	-	1996	1993	2.0	4	14
		SOLANO	-	-	340421	-	-	-	-	1996	1993	2.0	4	14
		SUTTER	-	-	64415	-	-	-	-	1996	1993	2.0	4	14
		YOLO	-	-	141092	-	-	-	-	1996	1993	2.0	4	14
	SAN JOAQUIN VALLEY	FRESNO	-	-	667490	-	-	-	-	1996	1993	2.0	4	14
		KINGS	-	-	101469	-	-	-	-	1996	1993	2.0	4	14
		MADERA	-	-	88090	-	-	-	-	1996	1993	2.0	4	14
		MERCED	-	-	178403	-	-	-	-	1996	1993	2.0	4	14
		SAN JOAQUIN	-	-	480628	-	-	-	-	1996	1993	2.0	4	14
		STANISLAUS	-	-	370522	-	-	-	-	1996	1993	2.0	4	14
		TULARE	-	-	311921	-	-	-	-	1996	1993	2.0	4	14
	MONTEREY BAY	MONTEREY	-	-	-	355660	-	-	-	1996	1993	2.0	4	14
		SAN BENITO	-	-	-	36697	-	-	-	1996	1993	2.0	4	14
		SANTA CRUZ	-	-	-	229734	-	-	-	1996	1993	2.0	4	14
	SAN FRANCISCO CMSA	ALAMEDA	-	-	-	1279182	-	-	-	1996	1993	2.0	4	14
		CONTRA COSTA	-	-	-	803732	-	-	-	1996	1993	2.0	4	14
		MARIN	-	-	-	230096	-	-	-	1996	1993	2.0	4	14
		NAPA	-	-	-	110765	-	-	-	1996	1993	2.0	4	14
		SAN FRANCISCO	-	-	-	723959	-	-	-	1996	1993	2.0	4	14
		SAN MATEO	-	-	-	649623	-	-	-	1996	1993	2.0	4	14
		SANTA CLARA	-	-	-	1497577	-	-	-	1996	1993	2.0	4	14
		SONOMA	-	-	-	388222	-	-	-	1996	1993	2.0	4	14
	STATE IMPLEMENT	ALPINE	-	-	-	-	-	1113	-	1996	1993	2.0	4	14
		AMADOR	-	-	-	-	-	30039	-	1996	1993	2.0	4	14
		BUTTE	-	-	-	-	-	182120	-	1996	1993	2.0	4	14
		CALAVERAS	-	-	-	-	-	31998	-	1996	1993	2.0	4	14
		COLUSA	-	-	-	-	-	16275	-	1996	1993	2.0	4	14
		DEL NORTE	-	-	-	-	-	23460	-	1996	1993	2.0	4	14
		GLENN	-	-	-	-	-	24798	-	1996	1993	2.0	4	14
		HUMBOLDT	-	-	-	-	-	119118	-	1996	1993	2.0	4	14
		INYO	-	-	-	-	-	18281	-	1996	1993	2.0	4	14
		LAKE	-	-	-	-	-	50631	-	1996	1993	2.0	4	14
		LASSEN	-	-	-	-	-	27598	-	1996	1993	2.0	4	14
		MARIPOSA	-	-	-	-	-	14302	-	1996	1993	2.0	4	14
		MENDOCINO	-	-	-	-	-	80345	-	1996	1993	2.0	4	14
		MODOC	-	-	-	-	-	9678	-	1996	1993	2.0	4	14
		MONO	-	-	-	-	-	9956	-	1996	1993	2.0	4	14
		NEVADA	-	-	-	-	-	78510	-	1996	1993	2.0	4	14
		PLUMAS	-	-	-	-	-	19739	-	1996	1993	2.0	4	14
		SHASTA	-	-	-	-	-	147036	-	1996	1993	2.0	4	14
		SIERRA	-	-	-	-	-	3318	-	1996	1993	2.0	4	14
		SISKIYOU	-	-	-	-	-	43531	-	1996	1993	2.0	4	14
		TEHAMA	-	-	-	-	-	49625	-	1996	1993	2.0	4	14
		TRINITY	-	-	-	-	-	13063	-	1996	1993	2.0	4	14
		TUOLUMNE	-	-	-	-	-	48456	-	1996	1993	2.0	4	14
		YUBA	-	-	-	-	-	58228	-	1996	1993	2.0	4	14
	OTHER COUNTIES		-	-	-	-	-	-	-	-	-	-	-	-
	TOTALS	11490926	-	-	4084461	6305247	-	1101218	-	-	-	-	-	-

DAYS TO CLEAR REFINERY TO TERMINAL LEG SHOWN IN RIGHT-HAND COLUMN. AN ADDITIONAL 21 DAYS ARE REQUIRED TO CLEAR THE LEG TO THE GASOLINE SERVICE STATION.
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COUNTY POPULATIONS FROM US BUREAU OF THE CENSUS, MARCH 1991 NATIONAL PETROLEUM COUNCIL OCTOBER 19, 1992 TIME 9:41

STATE AND COUNTY OXYGENATE BASES AND POPULATIONS -- NPC REGION 11

			COUNTY OZONE NON-ATTAINMENT BASIS AND POPULATION							EFFECT YEAR		CO DATA		
			EXTREME	SEVERE	SERIOUS	MODERATE	MARGINAL	OTHER	ATTAIN	OZONE	CO	MIN O2 %	MONTHS	DAYS
NEVADA	RENO	WASHOE	-	-	-	-	254667	-	-	2000	1993	2.7	4	14
	OTHER COUNTIES	CHURCHILL	-	-	-	-	-	-	17938	-	-	-	-	-
		DOUGLAS	-	-	-	-	-	-	27637	-	-	-	-	-
		ELKO	-	-	-	-	-	-	33530	-	-	-	-	-
		EUREKA	-	-	-	-	-	-	1547	-	-	-	-	-
		HUMBOLDT	-	-	-	-	-	-	12844	-	-	-	-	-
		LANDER	-	-	-	-	-	-	6266	-	-	-	-	-
		LYON	-	-	-	-	-	-	20001	-	-	-	-	-
		MINERAL	-	-	-	-	-	-	6475	-	-	-	-	-
		PERSHING	-	-	-	-	-	-	4336	-	-	-	-	-
		STOREY	-	-	-	-	-	-	2526	-	-	-	-	-
		WHITE PINE	-	-	-	-	-	-	9264	-	-	-	-	-
		CARSON	-	-	-	-	-	-	40443	-	-	-	-	-
	OTHER COUNTIES		-	-	-	-	-	-	-	-	-	-	-	-
	TOTALS	437474	-	-	-	-	254667	-	182807	-	-	-	-	-

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COUNTY POPULATIONS FROM US BUREAU OF THE CENSUS, MARCH 1991 NATIONAL PETROLEUM COUNCIL OCTOBER 19, 1992 TIME 9:41

STATE AND COUNTY OXYGENATE BASES AND POPULATIONS -- NPC REGION 12

			COUNTY OZONE NON-ATTAINMENT BASIS AND POPULATION							EFFECT YEAR		CO DATA		
			EXTREME	SEVERE	SERIOUS	MODERATE	MARGINAL	OTHER	ATTAIN	OZONE	CO	MIN O2 %	MONTHS	DAYS
CALIFORNIA	LA AND SOUTH COAST	LOS ANGELES	8863164	-	-	-	-	-	-	1995	1993	2.0	6	14
		ORANGE	2410556	-	-	-	-	-	-	1995	1993	2.0	6	14
		RIVERSIDE	1170413	-	-	-	-	-	-	1995	1993	2.0	6	14
		SAN BERNARDINO	1418380	-	-	-	-	-	-	1995	1993	2.0	6	14
	SAN DIEGO	SAN DIEGO	-	2498016	-	-	-	-	-	1995	1993	2.0	4	14
	VENTURA COUNTY	VENTURA	-	669016	-	-	-	-	-	1995	1993	2.0	4	14
	SAN JOAQUIN VALLEY	KERN	-	-	543477	-	-	-	-	1996	1993	2.0	4	14
	SANTA BARBARA	SANTA BARBARA	-	-	-	369608	-	-	-	1996	1993	2.0	4	14
	STATE IMPLEMENT	IMPERIAL	-	-	-	-	-	109303	-	1996	1993	2.0	4	14
		SAN LUIS OBISPO	-	-	-	-	-	217162	-	1996	1993	2.0	4	14
	OTHER COUNTIES		-	-	-	-	-	-	-	-	-	-	-	-
	TOTALS	18269095	13862513	3167032	543477	369608	-	326465	-	-	-	-	-	-
NEVADA	LAS VEGAS	CLARK	-	-	-	-	-	-	741459	-	1993	2.7	6	14
	OTHER COUNTIES	ESMERALDA	-	-	-	-	-	-	1344	-	-	-	-	-
		LINCOLN	-	-	-	-	-	-	3775	-	-	-	-	-
		NYE	-	-	-	-	-	-	17781	-	-	-	-	-
	OTHER COUNTIES		-	-	-	-	-	-	-	-	-	-	-	-
	TOTALS	764359	-	-	-	-	-	-	764359	-	-	-	-	-
ARIZONA	PHOENIX CMSA	MARICOPA	-	-	-	2122101	-	-	-	2000	1993	2.7	6	14
	TUSCON	PIMA	-	-	-	-	-	-	666880	-	1993	2.7	6	14
	OTHER COUNTIES		-	-	-	-	-	-	876247	-	-	-	-	-
	TOTALS	3665228	-	-	-	2122101	-	-	1543127	-	-	-	-	-

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STATE AND COUNTY OXYGENATE BASES AND POPULATIONS -- NPC REGION 13

			COUNTY OZONE NON-ATTAINMENT BASIS AND POPULATION							EFFECT YEAR		CO DATA		
			EXTREME	SEVERE	SERIOUS	MODERATE	MARGINAL	OTHER	ATTAIN	OZONE	CO	MIN O2 %	MONTHS	DAYS
ALASKA	ANCHORAGE	ANCHORAGE	-	-	-	-	-	-	226338	-	1993	2.7	4	14
	FAIRBANKS	FAIRBANKS N STAR	-	-	-	-	-	-	77720	-	1993	2.7	4	14
	OTHER COUNTIES		-	-	-	-	-	-	245985	-	-	-	-	-
	TOTALS	550043	-	-	-	-	-	-	550043	-	-	-	-	-

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COUNTY POPULATIONS FROM US BUREAU OF THE CENSUS, MARCH 1991 NATIONAL PETROLEUM COUNCIL OCTOBER 19, 1992 TIME 9:41

Appendix L, Section III-6

JP-4 to Kerojet Basis

EXXON COMPANY, U.S.A.

POST OFFICE BOX 2180 • HOUSTON, TEXAS 77252-2180

DOWNSTREAM PLANNING AND ANALYSIS

W.R. FINGER
COORDINATOR OF ENERGY ANALYSIS

February 10, 1992

Members of the NPC Refining Study Supply/Demand/Logistics Task Group:

Gentlemen:

There are two items dealing with jet fuel where we would like your concurrence.

The first attachment shows the 1989 state demands proposed for both naphtha jet fuel and kerosene jet fuel. The reported data are from EIA's 1989 Petroleum Marketing Annual (PMA). For the kerosene jet fuel, the data are reported for all the states.

Nearly all the naphtha jet fuel data are withheld (not reported). The New Mexico and Utah estimates require only estimating one of the missing months. The estimates for the other "unreported" states are based on Defense Fuel Supply Center solicitations for 1989 by delivery point. The estimates are then normalized to equal the PADD totals from the PMA. If you can think of a better methodology, please let me know.

Before 1995, the naphtha jet fuel demand is projected to be replaced by a kerosene jet fuel. To create the post-1989 state shares, the 1989 arrays for naphtha and kerosene jet fuel were added. The result is most easily seen on the second attachment, which is for the No Demand Increase Case.

Sincerely,

Graham K. Barnes

Graham K. Barnes

GKB:yg
Attachments

c - w/attachments:
Mr. John H. Guy, IV – National Petroleum Council

A DIVISION OF EXXON CORPORATION

HISTORIC 1989 NAPHTHA JET FUEL AND KERO JET FUEL (K=THOUSAND)

	NAPHTHA JET (KGAL/YEAR)			NAPHTHA JET (KB/CD)			KERO JET (KGAL/YEAR)			KERO JET (KB/CD)		
	REPORTED	ESTIMATED	TOTAL	TOTAL	DOE	DELTA	REPORTED	ESTIMATED	TOTAL	TOTAL	DOE	DELTA
MAINE	-	5099	5099	-	1	-	45350	-	45350	3	4	(1)
NEW HAMPSHIRE	-	-	-	-	-	-	8808	-	8808	1	1	-
VERMONT	-	-	-	-	-	-	6316	-	6316	-	1	-
MASSACHUSETTS	-	-	-	-	-	-	363719	-	363719	24	33	(9)
RHODE ISLANE	-	-	-	-	-	-	25900	-	25900	2	2	(1)
CONNECTICUT	67	-	67	-	-	-	80499	-	80499	5	7	(2)
NEW YORK	-	111680	111680	7	16	(9)	174041	-	174041	11	16	(4)
NEW JERSEY	-	-	-	-	-	-	1628994	-	1628994	106	146	(40)
PENNSYLVANIA	-	-	-	-	-	-	350258	-	350258	23	31	(9)
DELAWARE	-	-	-	-	-	-	3532	-	3532	-	-	-
MARYLAND	-	128922	128922	8	18	(10)	121748	-	121748	8	11	(3)
DIST COL	-	-	-	-	-	-	-	-	-	-	-	-
W VIRGINIA	-	-	-	-	-	-	11865	-	11865	1	1	-
VIRGINIA	-	1735	1735	-	-	-	459522	-	459522	30	41	(11)
N CAROLINA	-	1380	1380	-	-	-	197507	-	197507	13	18	(5)
S CAROLINA	-	-	-	-	-	-	30123	-	30123	2	3	(1)
GEORGIA	-	970	970	-	-	-	608088	-	608088	40	55	(15)
FLORIDA	-	2436	2436	-	-	-	1051873	-	1051873	69	94	(26)
MICHIGAN	-	-	-	-	-	-	286618	-	286618	19	28	(9)
OHIO	-	30250	30250	2	2	-	361801	-	361801	24	35	(12)
INDIANA	58501	-	58501	4	3	-	639602	-	639602	42	63	(21)
ILLINOIS	-	5050	5050	-	-	-	146224	-	146224	10	14	(5)
KENTUCKY	-	-	-	-	-	-	182837	-	182837	12	18	(6)
TENNESSEE	-	-	-	-	-	-	153207	-	153207	10	15	(5)
WISCONSIN	-	7050	7050	-	-	-	40187	-	40187	3	4	(1)
MINNESOTA	-	4500	4500	-	-	-	168973	-	168973	11	17	(6)
N DAKOTA	-	30833	30833	2	2	-	9450	-	9450	1	1	-
S DAKOTA	-	27700	27700	2	2	-	6262	-	6262	-	1	-
IOWA	-	1500	1500	-	-	-	24376	-	24376	2	2	(1)
NEBRASKA	-	26200	26200	2	2	-	23694	-	23694	2	2	(1)
MISSOURI	28477	-	28477	2	2	-	264644	-	264644	17	26	(9)
KANSAS	-	25200	25200	2	1	-	111908	-	111908	7	11	(4)
OKLAHOMA	194029	-	194029	13	11	1	263703	-	263703	17	26	(9)
ALABAMA	-	11300	11300	1	1	-	48520	-	48520	3	2	1
MISSISSIPPI	-	-	-	-	-	-	210011	-	210011	14	8	6
ARKANSAS	-	21137	21137	1	1	-	24828	-	24828	2	1	1
LOUISIANA	401839	-	401839	26	23	3	755369	-	755369	49	29	21
TEXAS	768452	-	768452	50	44	6	3303094	-	3303094	215	125	90
NEW MEXICO	-	19478	19478	1	1	-	42325	-	42325	3	2	1
MONTANA	-	17100	17100	1	1	-	19960	-	19960	1	2	(1)
IDAHO	-	62812	62812	4	3	1	17743	-	17743	1	2	(1)
WYOMING	-	2850	2850	-	-	-	4836	-	4836	-	1	-
COLORADO	-	25700	25700	2	1	-	189796	-	189796	12	21	(8)
UTAH	-	59161	59161	4	3	1	162397	-	162397	11	18	(7)
WASHINGTON	-	91133	91133	6	7	(1)	691522	-	691522	45	47	(2)
OREGON	-	8800	8800	1	1	-	119677	-	119677	8	8	-
CALIFORNIA	611858	-	611858	40	46	(6)	2913845	-	2913845	190	199	(9)
NEVADA	-	-	-	-	-	-	147372	-	147372	10	10	-
ARIZONA	83312	-	83312	5	6	(1)	193721	-	193721	13	13	(1)
ALASKA	63222	-	63222	4	5	(1)	622000	-	622000	41	42	(2)
HAWAII	-	-	-	-	-	-	423004	-	423004	28	29	(1)
TOTAL US	2939733	-	2939733	192	205	(13)	17741649	-	17741649	1157	1284	(127)

PRINTED DATA MAY NOT ADO DUE TO INDEPENDENT ROUNDING. NATIONAL PETROLEUM COUNCIL JANUARY 2, 1992 TIME 9:44

FOUNDATION CASE II -- NO DEMAND INCREASE -- THOUSAND BARRELS PER DAY

	NAPHTHA JET FUEL				KEROSENE JET FUEL			
	1989	1995	2000	2010	1989	1995	2000	2010
MAINE	1	-	-	-	4	5	5	5
NEW HAMPSHIRE	-	-	-	-	1	1	1	1
VERMONT	-	-	-	-	1	1	1	1
MASSACHUSETTS	-	-	-	-	33	33	33	33
RHODE ISLANE	-	-	-	-	2	2	2	2
CONNECTICUT	-	-	-	-	7	7	7	7
NEW YORK	16	-	-	-	16	32	32	32
NEW JERSEY	-	-	-	-	146	146	146	146
PENNSYLVANIA	-	-	-	-	31	31	31	31
DELAWARE	-	-	-	-	-	-	-	-
MARYLAND	18	-	-	-	11	29	29	29
DIST COL	-	-	-	-	-	-	-	-
W VIRGINIA	-	-	-	-	1	1	1	1
VIRGINIA	-	-	-	-	41	41	41	41
N CAROLINA	-	-	-	-	18	18	18	18
S CAROLINA	-	-	-	-	3	3	3	3
GEORGIA	-	-	-	-	55	55	55	55
FLORIDA	-	-	-	-	94	95	95	95
MICHIGAN	-	-	-	-	28	28	28	28
OHIO	2	-	-	-	35	37	37	37
INDIANA	3	-	-	-	63	66	66	66
ILLINOIS	-	-	-	-	14	15	15	15
KENTUCKY	-	-	-	-	18	18	18	18
TENNESSEE	-	-	-	-	15	15	15	15
WISCONSIN	-	-	-	-	4	4	4	4
MINNESOTA	-	-	-	-	17	17	17	17
N DAKOTA	2	-	-	-	1	3	3	3
S DAKOTA	2	-	-	-	1	2	2	2
IOWA	-	-	-	-	2	2	2	2
NEBRASKA	2	-	-	-	2	4	4	4
MISSOURI	2	-	-	-	26	28	28	28
KANSAS	1	-	-	-	11	12	12	12
OKLAHOMA	11	-	-	-	26	37	37	37
ALABAMA	1	-	-	-	2	2	2	2
MISSISSIPPI	-	-	-	-	8	8	8	8
ARKANSAS	1	-	-	-	1	2	2	2
LOUISIANA	23	-	-	-	29	52	52	52
TEXAS	44	-	-	-	125	170	170	170
NEW MEXICO	1	-	-	-	2	3	3	3
MONTANA	1	-	-	-	2	3	3	3
IDAHO	3	-	-	-	2	5	5	5
WYOMING	-	-	-	-	1	1	1	1
COLORADO	1	-	-	-	21	22	22	22
UTAH	3	-	-	-	18	21	21	21
WASHINGTON	7	-	-	-	47	54	54	54
OREGON	1	-	-	-	8	9	9	9
CALIFORNIA	46	-	-	-	199	244	244	244
NEVADA	-	-	-	-	10	10	10	10
ARIZONA	6	-	-	-	13	19	19	19
ALASKA	5	-	-	-	42	47	47	47
HAWAII	-	-	-	-	29	29	29	29
TOTAL US	205	-	-	-	1284	1489	1489	1489

SHEET 130 PRINTED DATA MAY NOT ADD DUE TO INDEPENDENT ROUNDING. NATIONAL PETROLEUM COUNCIL JANUARY 30, 1992 TIME 8:31

Appendix L, Section III-7

World Oil Demand – Product Regional Details

The NPC developed an assessment of product demands for regions of the world outside the United States. The tables that follow include product demands for the six foreign modeled regions and for the foreign non-modeled areas covering 1989, 1995, 2000, and 2010 for Foundation Cases I, II, and III.

Historical product demand data for 1989 were obtained from the EIA. Demand split assumptions for future years were developed from information provided by the EIA.

NPC REFINING STUDY

FOREIGN REGIONAL DEMANDS - MMB/D

	EIA Data 1989	1995 Foundation Case I	II	III	2000 Foundation Case I	II	III	2010 Foundation Case I	II	III
CANADA										
MG	0.578	0.597	0.601	0.600	0.602	0.601	0.567	0.591	0.601	0.534
DIST	0.401	0.403	0.417	0.417	0.396	0.417	0.393	0.371	0.417	0.370
HFO	0.183	0.145	0.190	0.190	0.117	0.190	0.180	0.118	0.190	0.169
K/JF	0.138	0.153	0.143	0.143	0.164	0.143	0.135	0.182	0.143	0.127
LPG	0.165	0.211	0.171	0.171	0.253	0.171	0.162	0.285	0.171	0.152
OTH	0.267	0.302	0.277	0.277	0.327	0.277	0.262	0.333	0.277	0.247
CRD	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
TOT	1.733	1.810	1.800	1.800	1.860	1.800	1.700	1.880	1.800	1.600
NORTHWEST EUROPE										
MG	2.234	2.351	2.239	2.239	2.381	2.253	2.222	2.332	2.287	2.222
DIST	3.104	3.266	3.111	3.111	3.272	3.167	3.088	3.304	3.215	3.088
HFO	1.175	1.144	1.178	1.178	1.086	1.185	1.169	0.864	1.204	1.169
K/JF	0.531	0.604	0.532	0.532	0.645	0.543	0.528	0.785	0.551	0.528
LPG	0.470	0.560	0.471	0.471	0.617	0.484	0.468	0.624	0.492	0.468
OTH	1.377	1.448	1.380	1.380	1.498	1.351	1.370	1.687	1.372	1.370
CRD	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
TOT	8.891	9.373	8.911	8.911	9.499	8.984	8.844	9.597	9.119	8.844
MEDITERRANEAN/NORTH AFRICA										
MG	0.838	0.923	0.868	0.868	0.972	0.890	0.874	1.040	0.925	0.890
DIST	1.530	1.691	1.585	1.585	1.781	1.641	1.595	1.921	1.718	1.625
HFO	1.494	1.512	1.548	1.548	1.486	1.551	1.557	1.444	1.608	1.587
K/JF	0.265	0.311	0.275	0.275	0.345	0.290	0.276	0.401	0.304	0.282
LPG	0.380	0.453	0.394	0.394	0.502	0.405	0.396	0.596	0.416	0.404
OTH	0.690	0.775	0.715	0.715	0.823	0.729	0.719	0.902	0.756	0.733
CRD	0.001	0.000	0.001	0.001	0.000	0.000	0.001	0.000	0.000	0.001
TOT	5.198	5.665	5.386	5.386	5.909	5.505	5.418	6.303	5.727	5.522

NPC REFINING STUDY

FOREIGN REGIONAL DEMANDS - MMB/D, CONT.

	EIA Data 1989	1995 Foundation Case			2000 Foundation Case			2010 Foundation Case		
		I	II	III	I	II	III	I	II	III
MIDDLE EAST										
MG	0.503	0.637	0.580	0.560	0.759	0.623	0.574	1.024	0.715	0.597
DIST	0.917	1.117	1.036	1.022	1.289	1.094	1.046	1.622	1.210	1.088
HFO	0.929	1.055	1.014	1.035	1.148	1.040	1.059	1.292	1.090	1.102
K/JF	0.323	0.364	0.351	0.360	0.393	0.359	0.368	0.436	0.374	0.383
LPG	0.119	0.132	0.128	0.133	0.140	0.130	0.136	0.173	0.142	0.141
OTH	0.335	0.412	0.381	0.373	0.480	0.404	0.382	0.593	0.442	0.397
CRD	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
TOT	3.126	3.716	3.489	3.482	4.210	3.650	3.564	5.140	3.974	3.708
LATIN AMERICA										
MG	1.339	1.706	1.572	1.542	1.978	1.669	1.577	2.452	1.834	1.638
DIST	1.174	1.514	1.390	1.352	1.763	1.481	1.383	2.182	1.621	1.437
HFO	1.247	1.394	1.370	1.436	1.455	1.383	1.469	1.712	1.486	1.526
K/JF	0.274	0.355	0.325	0.316	0.415	0.347	0.323	0.549	0.394	0.335
LPG	0.507	0.599	0.572	0.584	0.653	0.589	0.597	0.765	0.631	0.620
OTH	0.697	0.883	0.814	0.803	1.024	0.864	0.821	1.211	0.929	0.853
CRD	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
TOT	5.238	6.451	6.042	6.032	7.288	6.333	6.169	8.872	6.895	6.410

NPC REFINING STUDY

FOREIGN REGIONAL DEMANDS - MMB/D, CONT.

	EIA Data 1989	1995 Foundation Case I	II	III	2000 Foundation Case I	II	III	2010 Foundation Case I	II	III
OECD PACIFIC RIM										
MG	1.052	1.288	1.113	1.113	1.404	1.152	1.113	1.456	1.230	1.131
DIST	1.238	1.570	1.309	1.309	1.758	1.349	1.309	1.979	1.432	1.331
HFO	0.925	0.934	0.978	0.978	0.864	1.005	0.978	0.656	1.063	0.994
K/JF	0.582	0.712	0.616	0.616	0.774	0.633	0.616	0.903	0.671	0.626
LPG	0.741	0.899	0.784	0.784	0.970	0.806	0.784	1.009	0.854	0.797
OTH	0.914	1.061	0.967	0.967	1.103	0.993	0.967	1.062	1.051	0.982
CRD	0.319	0.341	0.337	0.337	0.331	0.346	0.337	0.275	0.365	0.343
TOT	5.771	6.806	6.103	6.103	7.206	6.284	6.103	7.340	6.664	6.203
NON-OECD PACIFIC RIM										
MG	0.550	0.728	0.649	0.613	0.899	0.711	0.627	1.161	0.799	0.652
DIST	1.501	1.792	1.679	1.672	2.031	1.757	1.711	2.610	1.963	1.780
HFO	1.321	1.436	1.411	1.472	1.505	1.424	1.506	1.499	1.419	1.567
K/JF	0.685	0.829	0.772	0.763	0.951	0.812	0.781	1.217	0.906	0.812
LPG	0.275	0.311	0.299	0.306	0.337	0.307	0.314	0.454	0.350	0.326
OTH	0.571	0.732	0.662	0.636	0.880	0.715	0.651	1.120	0.796	0.677
CRD	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
TOT	4.903	5.828	5.472	5.462	6.603	5.726	5.591	8.061	6.233	5.815
TOTAL OECD PACIFIC RIM AND NON-OECD PACIFIC RIM										
MG	1.602	2.016	1.761	1.725	2.303	1.864	1.740	2.617	2.028	1.783
DIST	2.739	3.362	2.988	2.981	3.789	3.106	3.021	4.589	3.395	3.111
HFO	2.246	2.370	2.389	2.450	2.369	2.428	2.485	2.155	2.482	2.561
K/JF	1.267	1.542	1.387	1.379	1.725	1.445	1.397	2.120	1.577	1.438
LPG	1.016	1.210	1.083	1.090	1.307	1.112	1.097	1.463	1.204	1.123
OTH	1.485	1.793	1.629	1.603	1.983	1.708	1.618	2.182	1.847	1.660
CRD	0.319	0.341	0.337	0.337	0.331	0.346	0.337	0.275	0.365	0.343
TOT	10.674	12.634	11.575	11.565	13.809	12.009	11.694	15.402	12.897	12.019

NPC REFINING STUDY

FOREIGN REGIONAL DEMANDS - MMB/D, CONT.

UNMODELED REGIONS

	EIA Data 1989	1995 Foundation Case			2000 Foundation Case			2010 Foundation Case		
		I	II	III	I	II	III	I	II	III
AFRICA (EXCLUDING NORTH AFRICA)										
MG	0.296	0.356	0.332	0.330	0.406	0.349	0.338	0.498	0.381	0.351
DIST	0.304	0.386	0.351	0.339	0.460	0.377	0.347	0.617	0.432	0.361
HFO	0.189	0.199	0.199	0.211	0.202	0.198	0.216	0.198	0.197	0.224
K/JF	0.135	0.159	0.150	0.150	0.179	0.156	0.154	0.213	0.168	0.160
LPG	0.017	0.019	0.018	0.019	0.020	0.018	0.019	0.021	0.019	0.020
OTH	0.104	0.124	0.116	0.116	0.141	0.122	0.119	0.171	0.132	0.123
CRD	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
TOT	1.045	1.242	1.166	1.164	1.407	1.220	1.192	1.718	1.329	1.239
CHINA										
MG	0.451	0.515	0.515	0.515	0.568	0.568	0.568	0.668	0.668	0.668
DIST	0.531	0.631	0.631	0.631	0.721	0.721	0.721	0.932	0.932	0.932
HFO	0.722	0.814	0.814	0.814	0.888	0.888	0.888	0.852	0.852	0.852
K/JF	0.079	0.089	0.089	0.089	0.097	0.097	0.097	0.121	0.121	0.121
LPG	0.079	0.088	0.088	0.088	0.095	0.095	0.095	0.100	0.100	0.100
OTH	0.437	0.582	0.582	0.582	0.730	0.730	0.730	1.028	1.028	1.028
CRD	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
TOT	2.300	2.720	2.720	2.720	3.100	3.100	3.100	3.700	3.700	3.700
USSR (FORMER)/EASTERN EUROPE/OTHER										
MG	1.815	1.492	1.492	1.492	1.752	1.752	1.752	2.430	2.430	2.430
DIST	2.177	1.677	1.677	1.677	1.889	1.889	1.889	2.347	2.347	2.347
HFO	3.170	2.307	2.307	2.307	2.521	2.521	2.521	2.308	2.308	2.308
K/JF	0.721	0.626	0.626	0.626	0.776	0.776	0.776	1.098	1.098	1.098
LPG	0.745	0.693	0.693	0.693	0.914	0.914	0.914	1.294	1.294	1.294
OTH	1.561	1.365	1.365	1.365	1.667	1.667	1.667	2.082	2.082	2.082
CRD	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
TOT	10.189	8.159	8.159	8.159	9.519	9.519	9.519	11.558	11.558	11.558

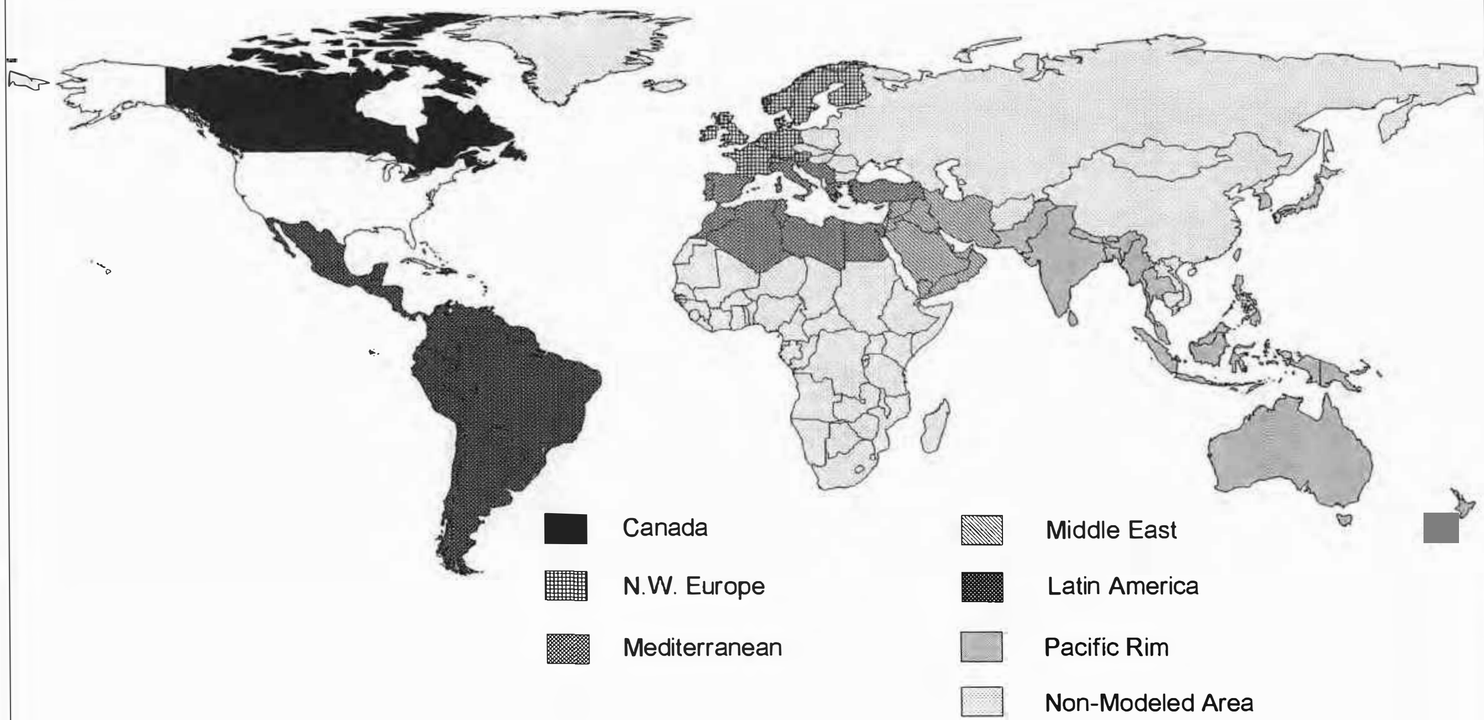
NPC REFINING STUDY

FOREIGN REGIONAL DEMANDS - MMB/D, CONT.

	EIA Data 1989	1995 Foundation Case			2000 Foundation Case			2010 Foundation Case		
		I	II	III	I	II	III	I	II	III
TOTAL MODELED WORLD (EXCLUDING U.S.)										
MG	7.094	8.230	7.621	7.535	8.994	7.899	7.553	10.056	8.391	7.664
DIST	9.865	11.353	10.527	10.468	12.290	10.906	10.525	13.990	11.575	10.719
HFO	7.274	7.619	7.688	7.837	7.662	7.778	7.918	7.586	8.059	8.114
K/JF	2.798	3.329	3.013	3.004	3.687	3.127	3.027	4.474	3.343	3.094
LPG	2.657	3.164	2.820	2.843	3.473	2.892	2.856	3.906	3.057	2.908
OTH	4.851	5.613	5.196	5.151	6.136	5.334	5.171	6.907	5.623	5.259
CRD	0.321	0.341	0.338	0.338	0.331	0.346	0.338	0.275	0.365	0.344
TOT	34.860	39.649	37.203	37.177	42.574	38.281	37.390	47.193	40.413	38.102
TOTAL WORLD (EXCLUDING U.S.)										
MG	9.656	10.593	9.959	9.872	11.720	10.568	10.211	13.651	11.869	11.113
DIST	12.877	14.047	13.186	13.115	15.360	13.892	13.481	17.886	15.285	14.358
HFO	11.355	10.939	11.008	11.168	11.273	11.385	11.543	10.944	11.416	11.497
K/JF	3.733	4.203	3.878	3.870	4.739	4.157	4.054	5.905	4.730	4.473
LPG	3.498	3.964	3.619	3.643	4.502	3.920	3.885	5.320	4.469	4.322
OTH	6.953	7.684	7.259	7.214	8.674	7.852	7.687	10.188	8.865	8.492
CRD	0.321	0.341	0.338	0.338	0.331	0.346	0.338	0.275	0.365	0.344
TOT	48.394	51.770	49.248	49.220	56.600	52.120	51.200	64.170	57.000	54.600

Totals may not add due to rounding.

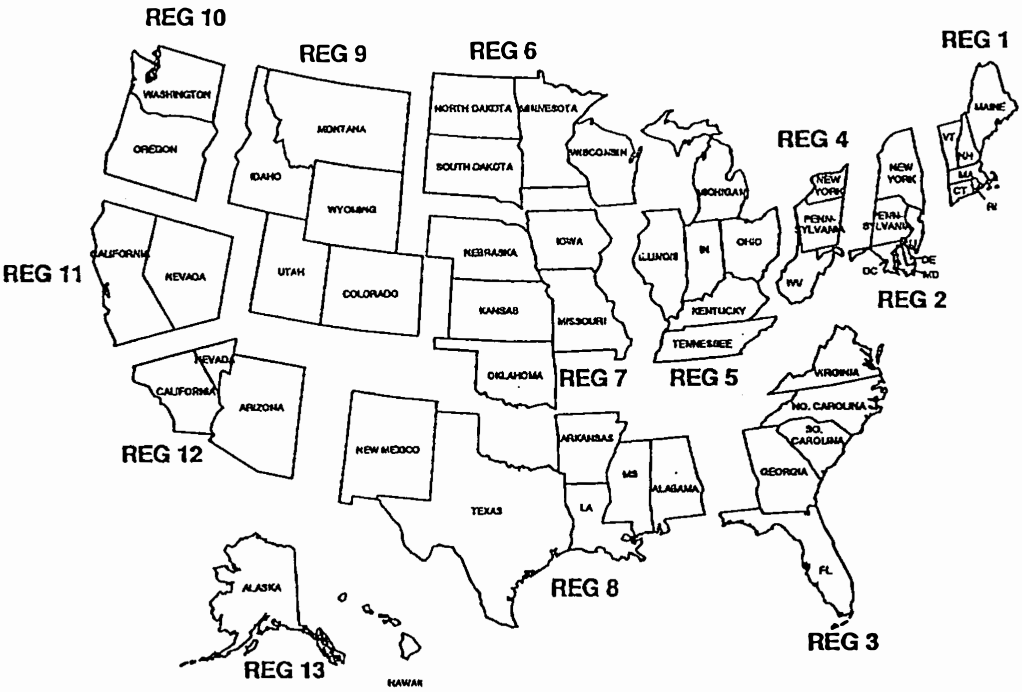
1993 National Petroleum Council Refining Study
Foreign Modeled Regions



Appendix L, Section IV-1

The NPC Logistics Model

National Petroleum Council



NPC REFINING STUDY – SUPPLY, DEMAND, AND LOGISTICS

LOGISTICS MODELING

PREPARED BY
BONNER & MOORE MANAGEMENT SCIENCE

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NPC Logistics Modeling

In June 1991, the National Petroleum Council (NPC) commissioned Bonner & Moore Management Science to develop a large optimizing model designed to assist in the analysis of the future U.S. light product supply trends. These models were developed and analyzed using a modified version of Bonner & Moore's proprietary supply and distribution system SAND, a module of Bonner & Moore's Refinery and Petrochemical Modeling System (RPMS$^{(R)}$2000)*.

The future pattern of supply for U.S. petroleum product demand can be estimated by determining the combination of supply regions and transportation links, as constrained by capacity, that provide products to demand centers at the lowest production and transportation costs. The many combinations of supply points, demand centers, transportation modes, and product types require a large optimizing mathematical model to determine the supply pattern likely to result from scenarios depicting supply/demand conditions for future years.

USE OF THE SAND SYSTEM

The proprietary Bonner & Moore SAND modeling system enables an analyst to define a supply and distribution system easily. Supply regions, for example, can be represented with a great range of detail, from a complete refinery model to a single yield pattern. A transportation network can be defined as a series of linked regions, and, for each combination of linked regions, multiple transportation modes can be defined. The modeler can also impose capacity constraints on supply regions, transportation modes, and demand regions. Components can be blended at one region and transshipped to another. (**Table 1** presents other key features of the SAND system.)

Bonner & Moore used many of these features in developing the models used in the NPC analysis of the supply trends of future U.S. light products (**M** motor gasoline, **J** jet fuel, **D** distillate). NPC provided for Bonner & Moore the definition of supply and demand regions and the use of cost volume relationships to represent refinery operations, as well as all the data used in the models. These data included, but were not limited to, transportation costs and capacities, product demands, refining cost/volume relationships, and oxygenate availabilities.

DEFINITION OF CASES

Bonner & Moore used the models to calculate the expected movement of light products within the United States for the years 1995, 2000 and 2010, under varying economic and environmental conditions. We refer to these cases as the **Foundation Cases**. Prior to use for the future years, Bonner & Moore tested the model using 1989 and 1987 actual data. We refer to these cases as the **Calibration Cases** and the **Validation Cases**, respectively.

Table 1
Features of SAND

SAND allows the user to perform a variety of modeling functions, including the following:

Transportation

- Multiple modes
- Multiple cost categories for individual or group of modes
- Combined cargo movements
- Transshipment through multiple terminals
- Global and route-specific mode capacity limits
- Ability to make global changes to transportation costs data banked with ease

Raw material supply

- Cost and availability by source
- Availability to each process unit
- Multi-step cost/availability
- Intermediate stream purchase, sales, and transfers between process plants
- Properties of streams

Product demands

- Product demands at each terminal/destination
- Multi-step price/demand
- Product groupings

Inventories and terminals

- Inventory limits on individual products
- Inventory limits on group of products
- Inventory limits by group of terminals
- Throughput limits of single/group products at single/group terminals
- Product blending at terminals
- Terminal operating costs

Table 1 (continued)

Exchange agreements

- Barrel-for-barrel liftings of same product at two terminals
- Multiple product liftings at multiple terminals
- Balancing of exchanges within user-specified tolerances
- Variations in cost/price of exchanged products
- Product intermediate/raw material exchanges

Other key features of SAND

- Multi-period modeling
- Extensive data checking and error analysis
- Variety of stylized reports
- Capability to generate user-specific reports
- Easy interface with spreadsheets

METHODOLOGY

In developing the models, NPC divided the United States into 13 regions. Each of these regions, with one exception, was both a demand region and a supply region. The one exception was the New England Region, Region 01, which had no supply region. In addition to the domestic supply regions, Canada, Northwest Europe, the Mediterranean, the Middle East, the Far East, and the Caribbean/Venezuela regions were defined as foreign supply regions.

Nomenclature

The SAND system requires certain naming rules for the model-building logic. These rules apply mainly to the tag size of the identification. **Tables 2, 3,** and **4** present the SAND identifications used for the supply regions, demand regions, products, and transportation modes.

Supply/Demand Nodes

Table 2

Region Description		Supply Regions	Demand Region
1	New England		NE
2	Central Atlantic	#2	CA
3	Lower Atlantic	#3	LA
4	Appalachian No. 1	#4	A1
5	Indiana-Illinois-Kentucky	#5	IK
6	Minnesota-Wisconsin-North & South Dakota	#6	MW
7	Okla-Kansas-Missouri	#7	OK
8	PAD District III	#8	P3
9	Rocky Mountain	#9	RM
10	Pacific Northwest	#N	PN
11	Central PADD V	#C	C5
12	Southern PADD V	#S	S5
13	Hawaii & Alaska	#P	PC
	Canada	#D	
	Northwest Europe	#E	
	Mediterranean	#I	
	Middle East	#M	
	Far East	#F	
	Caribbean-Venezuela	#V	

Products

Table 3

Product		SAND Designation
Leaded Regular		RL
Unld Regular	Conventional	RS
	Reformulated	RZ
	Oxygenated	RO
	Oxygenated-reformulated	RB
	Reformulated Hyc-base*	RH
	Oxygenated Hyc-base*	RX
	Gasohol	RG
Unld Midgrade	Conventional	MS
	Reformulated	MZ
	Oxygenated	MO
	Oxygenated-reformulated	MB
	Reformulated Hyc-base*	MH
	Oxygenated Hyc-base*	MX
	Gasohol	MG
Unld Premium	Conventional	PS
	Reformulated	PZ
	Oxygenated	PO
	Oxygenated-reformulated	PB
	Reformulated Hyc-base*	PH
	Oxygenated Hyc-base*	PX
	Gasohol	PG
Kero/Jet		KJ
Diesel	On Highway	2D
	Off Highway	2H
NO 2 Oil/Other Diesel		2O
Ethanol		ET
MTBE		ME

**Hyc-base = hydrocarbon base gasoline without oxygenates*

No hyc-base for oxygenated-reformulated gasoline. The model uses reformulated gasoline with more oxygenates.

Transportation

Table 4	
Transportation Modes	**SAND Designation**
35 DWT Tankers- Foreign Flag	D
35 DWT Tankers- American Flag	A
Barges	C
Rail	F
Truck	T
Pipeline	P
Intra-region	L

TRANSPORTATION NETWORK

Table 5 presents the transportation network represented in the model. Six interregional transportation modes were used, although all modes are not included between all regions.

The transportation costs include the following three components:

- **Basic transportation cost of moving product by whatever mode used.** Bonner & Moore assumed that product is moved from a central point in one region to a central point in another, and then calculated transportation costs based on this centroid movement. The selection of centroids and determination of transportation costs was done by NPC.
- **Octane/RVP correction for gasoline grades moved from a supply region to a demand region.** NPC developed the refinery cost relationships based on producing gasoline at the specifications of the supply region; however, the octane/RVP specifications at other regions could be more or less stringent. Thus, as gasoline is moved from a supply region to a demand region, a cost adjustment is made on the differences in octane & RVP. **Tables 6** and **7** presents the gasoline specifications of the supply and demand regions and the methodology of cost correction.

Table 5

Transportation Network in Model Demand Regions

		NE	CA	LA	A1	IK	MW	OK	P3	RM	PN	C5	S5	PC
	#2	AC			P									
	#3		P			P								
	#4					C								
S	#5	FT	FT	FT	CPFT		CPFT	P		FT	FT	FT	FT	
U	#6	FT	FT	FT	FT	C		CP		FT	FT	FT	FT	
P	#7	FT	FT	FT	FT	FT	CPFT			PFT	FT	FT	FT	
P	#8	AFT	AFT	APFT	CPFT	CPFT	CPFT	CPFT		PFT	AFT	AFT	APFT	A
L	#9						P	P			PFT			
Y	#N											A	A	A
	#C										A		A	A
R	#S										A	A		A
E	#P													
G	F1	D	D	D					D					
I	F7										D	D	D	D
O	#D													
N	#E	D	D	D					D		D	D	D	
S	#I	D	D	D					D					
	#V	D	D	D					D		D	D	D	D
	#F	D	D	D					D		D	D	D	D
	#M	D	D	D					D		D	D	D	D

P = Pipeline
C = Barge
A = 35 DWT Tanker American Flag
D = 35 DWT Tanker Foreign Flag
F = Rail
T = Truck

Table 6

Octane and RVP Data

U.S. Regions	CONSUMER DEMAND Yearly Average Octane RM/2 ULR	ULM	ULF	Leaded	Yearly Average RVP, psi All Grades	PACE Yearly Average Octane RM/2 ULR	ULM	ULF	Leaded	Yearly Average RVP, psi All Grades
1	87.2	89.1	92.5	89.0	11.0					
2	87.2	89.1	92.5	89.0	12.0	87.2	89.1	92.2	89.2	11.5
3	87.2	89.1	92.5	89.0	11.0					
4	87.2	89.1	92.5	89.0	12.0					
5	87.2	89.1	92.1	89.0	12.0					
6	87.2	89.1	92.1	89.0	12.0	87.2	89.1	92.2	88.7	12.2
7	87.2	89.1	92.1	89.0	11.5					
8	87.2	89.1	92.1	89.0	11.0	87.1	89.1	92.2	88.8	11.0
9	85.4	88.1	91.1	87.0	11.0	85.8	87.9	90.8	87.3	11.8
10	87.2	89.1	92.1	88.5	12.0					
11	87.2	89.1	92.1	88.5	10.0	87.2	89.1	92.0	88.4	10.9
12	87.2	89.1	92.1	88.5	10.0					
13	87.2	89.1	92.1	88.5	11.5	87.2	89.1	92.0	88.4	11.5
Foreign Regions										
Canada						87.2		92.2		11.5
Northwest Europe						87.2		92.2		11.5
Mediterranean						87.2		92.2		11.5
Middle East						87.2		92.2		11.5
Caribbean						87.2		92.2		11.5
Far East						87.2		92.0		10.9

[1] *Recommended by Product Quality Task Group (6/2/92) for both 1989 and 1987.*

TABLE 7	
MOGAS COST CORRECTIONS	
RVP [of a given grade of gasoline]	
cost at RVP(new) =	**cost at RVP(old) + [RVP(n)-RVP(o)] * [cost of RVP]**
cost of RVP =	**0.018 * [index(nc4) - index(gasoline)]**
Octane [(R&M/2)]	
cost at octane (new) =	**cost at octane(old) + [octane(n) - octane(o)] * [cost of octane]**
cost of octane =	**[index(PUL) - index(RUL)] / [octane(PUL) - octane(RUL)]**
where INDEX = SPOT PRICE	

- **Import duties, loss, and superfund tax associated with receipt of products from foreign supply regions.** These costs varied by product. In the Foundation Cases, the Canadian supply region was duty-free. These costs were added to the transportation and octane/RVP correction costs for foreign product movements to the United States.

SUPPLY REGIONS

Supply regions were represented by small submodels relating refining marginal cost to quantity of MJD (motor gasoline, jet, distillate) produced in a fixed ratio of products and grades within products. A submodel was developed for each foreign and domestic supply region.

For the U.S. supply regions, a submodel was developed for each PADD. For PADD 5, two submodels were developed because of the differences in refining capabilities in PADD 5 between California and the other states. Because the 13 regions were subsets of the PADDs, the same PADD relationships were used for each region within a given PADD; however, in Regions 6,7,10 and 13, the ratio of products supplied within the PADD had to be adjusted to reflect the actual refinery production. These adjustments were made only for the Calibration Case and Validation Case analyses.

Refining cost relationships were developed and incorporated them into each supply region submodel, representing the increase of yield for one of the products with a consequent decrease in the yields of the other two products. This allowed changes in the ratio of M to J to D supplied from a region. The amount of this ratio change was limited to a percent of the total product yielded.

Shifts in the ratios of grades within the gasoline (M) and distillate (D) groups were allowed, but only a single grade of jet was represented. The shifts in grades (regular/premium and diesel/No.2 oil) were allowed barrel- for-barrel at a cost equal to the differences in spot prices at the supply region.

Finally, for gasoline, barrel-for-barrel shifts within a grade among the conventional and various oxygenated gasolines were also allowed. The cost (or credit) for such a shift was based on the difference in incremental cost of production of each type of gasoline within that grade.

Attachment 1 presents the supply submodel representation for Region 8 (PADD 3) for Foundation Case F1 YR2000, incorporating all of the above discussed options. A similar submodel was included for each of the other supply regions.

DEMAND REGIONS

The 13 U.S. demand regions were each represented as a slate of fixed product demands which changed for each scenario. The products could be transported from a supply region as finished product or they could be blended at the demand region to produce oxygenated gasolines.

GASOLINE BLENDING

Midgrade Gasoline

In the Calibration and Validation Cases, midgrade gasoline was yielded directly by the refining submodels. However, in the Foundation cases, with the expanded number of gasolines, the midgrade gasolines were made as a blend of regular and premium. With the exception of midgrade gasohol, all other midgrade gasolines had to be blended at the supply region and then shipped as blended product to the demand region. The blending formulations, supplied by NPC, varied by supply region.

Table 8 presents the various formulations and the applicable supply region. The column names in the table are four characters in length, where the first two characters represent the gasoline identification and the last two characters represent a formula index.

Oxygenated Gasolines

In the Calibration and Validation Cases, the refining submodels yielded conventional unleaded gasoline and a leaded regular. In the Foundation Cases, the refining submodels were developed yielding conventional unleaded (RS & PS), all-hydrocarbon base for oxygenated gasoline (RX & PX), and all-hydrocarbon base reformulated and oxygenated-reformulated gasoline (RH & PH) for both premium and regular pools.

The hydrocarbon base gasolines could be blended with either ethanol or MTBE to produce finished product. The hydrocarbon base blend for oxygenated (RX & PX) could be blended with ethanol or MTBE to produce finished oxygenated gasoline (RO & PO). The hydrocarbon base blend for reformulated (RH & PH) could be blended with ethanol or MTBE to produce finished oxygenated-reformulated gasoline (RB & PB), but could be blended only with MTBE to produce finished reformulated gasoline (RZ & PZ).

Table 8

MIDGRADE GASOLINE BLENDING RECIPES

		MSR1	MOR2	MZR3	MBR4	MGR5	MHR6	MXR7	MSS1	MOS2	MZS3	MBS4	MGS5	MHS6	MXS7	MSQ1
RS	UNLD REG-Conventional	0.6420							0.5260							0.6120
PS	UNLD PRM-Conventional	0.3580							0.4740							0.3880
RO	UNLD REG-CO Non-attain		0.6420							0.5260						
PO	UNLD PRM-CO Non-attain		0.3580							0.4740						
RZ	UNLD REG-Reformulated			0.6420							0.5260					
PZ	UNLD PRM-Reformulated			0.3580							0.4740					
RB	UNLD REG-Co-reformulated				0.6420							0.5260				
PB	UNLD PRM-Co-reformulated				0.3580							0.4740				
RG	UNLD REG-Gasohol					0.6420							0.5260			
PG	UNLD PRM-Gasohol					0.3580							0.4740			
RH	UNLD REG-Hydrocarbon Base						0.6420							0.5260		
PH	UNLD PRM-Hydrocarbon Base						0.3580							0.4740		
RX	UNLD REG-Hydrocarbon Base							0.6420							0.5260	
PX	UNLD PRM-Hydrocarbon Base							0.3580							0.4740	
ET	ETHANOL															
ME	MTBE															
	TERMINALS USING DESIGNATED RECIPE	#2 #3 #4 #D #E #I #M #V #F	#2 #3 #4 #D #E #I #M #V #F	#2 #3 #4 #D #E #I #M #V #F	#2 #3 #4 #D #E #I #M #V #F	LA	#2 #3 #4 #D #E #I #M #V #F	#2 #3 #4 #D #E #I #M #V #F	#5 #6 #7 #8 #N #C #S #P	#5 #6 #7 #8 #N #C #S #P	#5 #6 #7 #8 #N #C #S #P	#5 #6 #7 #8 #N #C #S #P	IK MW OK P3	#5 #6 #7 #8 #N #C #S #P	#5 #6 #7 #8 #N #C #S #P	#9

		MOQ2	MZQ3	MBQ4	MGQ5	MHQ6	MXQ7
RS	UNLD REG-Conventional						
PS	UNLD PRM-Conventional						
RO	UNLD REG-CO Non-attain	0.6120					
PO	UNLD PRM-CO Non-attain	0.3880					
RZ	UNLD REG-Reformulated		0.6120				
PZ	UNLD PRM-Reformulated		0.3880				
RB	UNLD REG-Co-reformulated			0.6120			
PB	UNLD PRM-Co-reformulated			0.3880			
RG	UNLD REG-Gasohol				0.6120		
PG	UNLD PRM-Gasohol				0.3880		
RH	UNLD REG-Hydrocarbon Base					0.6120	
PH	UNLD PRM-Hydrocarbon Base					0.3880	
RX	UNLD REG-Hydrocarbon Base						0.6120
PX	UNLD PRM-Hydrocarbon Base						0.3880
ET	ETHANOL						
ME	MTBE						
	TERMINALS USING DESIGNATED RECIPE	#9	#9	#9	#9	#9	#9

Ethanol could be blended only at the demand regions. MTBE could be blended at the supply regions or at the demand regions. Blending at the demand region used all-hydrocarbon base blends transported from supply regions. Blending at a demand region incurred an additional $0.105/bbl cost over blending at the supply region.

Table 9 presents the blending formulations used for the various oxygenated gasolines. Different blending formulations were used for the California regions (11 & 12) than for the rest of the United States. These formulations were supplied by NPC. The column names in the table are four characters in length, where the first two characters represent the gasoline identification and the last two characters represent a formula index.

Oxygenate Structure

The two major oxygenates used in the model were ethanol and MTBE. Existing TAME capacity was converted into MTBE equivalents.

Ethanol

Ethanol production was centered in Region 5. Ethanol could be transported only by rail to all demand regions. The cost of movement included transportation cost and state subsidies. A maximum of three subsidy levels was allowed for each region. The volume limits for each level were based on the maximum potential use of ethanol in those states grouped at that subsidy level.

MTBE

The following two categories of MTBE were used:

- **Captive**, representing MTBE directly associated with refineries. Captive MTBE was at a lower cost, but could only be used at the supply region where it was produced.
- **Merchant**, produced in the U.S. Gulf Coast, Venezuela, Western Canada, Northwest Europe and the Middle East. From these sources it could be shipped by marine transport to any supply and/or demand region that was supplied by marine transport. In addition, merchant MTBE from the U.S. Gulf Coast could be shipped to Regions 4, 5, 6, 7, 9 by rail or barge (where appropriate). Only one pipeline, going to Region 5, was allowed to carry MTBE as a product. Northwestern Europe and the Middle East had import duties of 5.6% of the CIF price imposed. Venezuela and Western Canada had no import duties.

**RPMS(R)2000 is a registered trademark of Bonner & Moore Associates, Inc.*

Table 9

OXYGENATED FUEL BLENDING RECIPES
Excluding CALIFORNIA

		RGR8	PGR9	RORA	PORB	RORC	PORD	RBRI	PBRJ	RBRK	PBRL	RZRE	PZRF
RS	UNLD REG-Conventional	0.9000											
PS	UNLD PRM-Conventional		0.9000										
RO	UNLD REG-CO Non-attain												
PO	UNLD PRM-CO Non-attain												
RZ	UNLD REG-Reformulated												
PZ	UNLD PRM-Reformulated												
RB	UNLD REG-Co-reformulated												
PB	UNLD PRM-Co-reformulated												
RG	UNLD REG-Gasohol												
PG	UNLD PRM-Gasohol												
RH	UNLD REG-Hydrocarbon Base							0.8496		0.9260		0.8829	
PH	UNLD PRM-Hydrocarbon Base								0.8496		0.9260		0.8829
RX	UNLD REG-Hydrocarbon Base			0.8496		0.9260							
PX	UNLD PRM-Hydrocarbon Base				0.8496		0.9260						
ET	ETHANOL	0.1000	0.1000			0.0740	0.0740			0.0740	0.0740		
ME	MTBE			0.1504	0.1504			0.1504	0.1504			0.1171	0.1171

OXYGENATED FUEL BLENDING RECIPES
CALIFORNIA ONLY

		RGR8	PGR9	RORM	PORN	RORS	PORT	RBRP	PBRQ	RBRU	PBRV	RZRW	PZRX
**													
RS	UNLD REG-Conventional	0.9000											
PS	UNLD PRM-Conventional		0.9000										
RO	UNLD REG-CO Non-attain												
PO	UNLD PRM-CO Non-attain												
RZ	UNLD REG-Reformulated												
PZ	UNLD PRM-Reformulated												
RB	UNLD REG-Co-reformulated												
PB	UNLD PRM-Co-reformulated												
RG	UNLD REG-Gasohol												
PG	UNLD PRM-Gasohol												
RH	UNLD REG-Hydrocarbon Base							0.8885		0.9452		0.8885	
PH	UNLD PRM-Hydrocarbon Base								0.8885		0.9452		0.8885
RX	UNLD REG-Hydrocarbon Base			0.8885		0.9452							
PX	UNLD PRM-Hydrocarbon Base				0.8885		0.9452						
ET	ETHANOL	0.1000	0.1000			0.0548	0.0548			0.0548	0.0548		
ME	MTBE			0.1115	0.1115			0.1115	0.1115			0.1115	0.1115

Attachment 1

REFINERY SUBMODEL REGION #8 CASE F1 YR 2000

		BS#8	1D#8	2D#8	3D#8	4D#8	5D#8	6D#8	7D#8	8D#8	MB#8	M1#8	M2#8	JB#8	J1#8	J2#8	DB#8
TTCAP	BASE MJD PRODUCTIN	1.000															
1DCAP	1ST INCREMENT MJD		1.000														
2DCAP	2ND INCREMENT MJD			1.000													
3DCAP	3RD INCREMENT MJD				1.000												
4DCAP	4TH INCREMENT MJD					1.000											
5DCAP	5TH INCREMENT MJD						1.000										
6DCAP	6TH INCREMENT MJD							1.000									
7DCAP	7TH INCREMENT MJD								1.000								
8DCAP	8TH INCREMENT MJD									1.000							
9DCAP	9TH INCREMENT MJD																
ZDCAP	1ST BCKDWN INC MJD																
YDCAP	2ND BCKDWN INC MJD																
XDCAP	3RD BCKDWN INC MJD																
WDCAP	4TH BCKDWN INC MJD																
MBCAP	MOGAS DELTA LIM B	-0.036	-0.036	-0.036	-0.036						1.000						
JBCAP	JET DELTA LIM BASE	-0.170	-0.170	-0.170	-0.170									1.000			
DBCAP	DIST. DELT LIM BAS	-0.425	-0.425	-0.425	-0.425									1.000			1.000
M1CAP	MOGAS DELTA LIM 1					-0.036	-0.036					1.000					
J1CAP	JET DELTA LIMIT 1					-0.170	-0.170								1.000		
D1CAP	DIST. DELT LIM 1					-0.425	-0.425								1.000		
M2CAP	MOGAS DELTA LIM 2							-0.036	-0.036	-0.036			1.000				
J2CAP	JET DELTA LIMIT 2							-0.170	-0.170	-0.170						1.000	
D2CAP	DIST DELT LIM 2							-0.425	-0.425	-0.425						1.000	
M3CAP	MOGAS DELTA LIM 3																
J3CAP	JET DELTA LIMIT 3																
D3CAP	DIST. DELT LIM 3																
M4CAP	MOGAS DELTA LIM 4																
J4CAP	JET DELTA LIMIT 4																
D4CAP	DIST. DELT LIM 4																
M5CAP	MOGAS DELTA LIM 5																
J5CAP	JET DELTA LIMIT 5																
D5CAP	DIST. DELT LIM 5																
M6CAP	MOGAS DELTA LIM 6																
J6CAP	JET DELTA LIMIT 6																
D6CAP	DIST. DELT LIM 6																
BSCST	ZERO BASE COST	25.830	25.830	25.830	25.830	25.830	25.830	25.830	25.830	25.830							
DLCST	DELTA COST	0.000	0.000	0.670	0.720	0.930	2.980	5.030	7.080	13.230	0.130	0.130	0.190	-0.030	-0.060	-0.060	-0.120
KJ	KERO JET	-0.147	-0.147	-0.147	-0.147	-0.147	-0.147	-0.147	-0.147	-0.147	0.369	0.369	0.369	-1.000	-1.000	-1.000	0.197
2D	DIESEL- ON HWY	-0.176	-0.176	-0.176	-0.176	-0.176	-0.176	-0.176	-0.176	-0.176	0.443	0.443	0.443	0.206	0.206	0.206	-0.702
2H	DIESEL- OFF HWY																
2O	DISTILLATE POOL	-0.075	-0.075	-0.075	-0.075	-0.075	-0.075	-0.075	-0.075	-0.075	0.188	0.188	0.188	0.087	0.087	0.087	-0.298
H6	HI SULFUR F.O.	-0.013	-0.041	-0.199	-0.163	-0.227	-0.227	-0.227	-0.227	-0.227							
RS	UNLEADED REGULAR	-0.172	-0.172	-0.172	-0.172	-0.172	-0.172	-0.172	-0.172	-0.172	-0.287	-0.287	-0.287	0.203	0.203	0.203	0.230
PS	UNLEADED PREMIUM	-0.061	-0.061	-0.061	-0.061	-0.061	-0.061	-0.061	-0.061	-0.061	-0.101	-0.101	-0.101	0.071	0.071	0.071	0.081
RX	UNLD REGULAR OXYFL	-0.005	-0.005	-0.005	-0.005	-0.005	-0.005	-0.005	-0.005	-0.005	-0.009	-0.009	-0.009	0.006	0.006	0.006	0.007
PX	UNLD PREMIUM OXYFL	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002	-0.003	-0.003	-0.003	0.002	0.002	0.002	0.002
RH	H/C REFORM REG	-0.267	-0.267	-0.267	-0.267	-0.267	-0.267	-0.267	-0.267	-0.267	-0.445	-0.445	-0.445	0.314	0.314	0.314	0.357
PH	H/C REFORM PREM	-0.094	-0.094	-0.094	-0.094	-0.094	-0.094	-0.094	-0.094	-0.094	-0.156	-0.156	-0.156	0.111	0.111	0.111	0.125
DOCAP	DIESEL TO 2O LIMIT	-0.063	-0.063	-0.063	-0.063	-0.063	-0.063	-0.063	-0.063	-0.063	0.157	0.157	0.157	0.073	0.073	0.073	-0.250
ODCAP	2O TO DIESEL LIMIT	-0.012	-0.012	-0.012	-0.012	-0.012	-0.012	-0.012	-0.012	-0.012	0.031	0.031	0.031	0.015	0.015	0.015	-0.050
PRCAP	PUL TO RUL LIM @	-0.156	-0.156	-0.156	-0.156	-0.156	-0.156	-0.156	-0.156	-0.156	-0.260	-0.260	-0.260	0.184	0.184	0.184	0.209
JTCAP	EXTRA KJ AVAIL	-0.023	-0.023	-0.023	-0.023	-0.023	-0.023	-0.023	-0.023	-0.023	-0.369	-0.369	-0.369	1.000	1.000	1.000	-0.197
DSCAP	EXTRA DSL AVAIL	-0.062	-0.062	-0.062	-0.062	-0.062	-0.062	-0.062	-0.062	-0.062	-1.000	-1.000	-1.000	0.707	0.707	0.707	0.803

Attachment 1 Continued

		D1#8	D2#8	DH#8	DO#8	OD#8	RP#8	PR#8	OP#8	PO#8	XH#8	HX#8	RH#8	HR#8	PH#8	HP#8
TTCAP	BASE MJD PRODUCTIN															
1DCAP	1ST INCREMENT MJD															
2DCAP	2ND INCREMENT MJD															
3DCAP	3RD INCREMENT MJD															
4DCAP	4TH INCREMENT MJD															
5DCAP	5TH INCREMENT MJD															
6DCAP	6TH INCREMENT MJD															
7DCAP	7TH INCREMENT MJD															
8DCAP	8TH INCREMENT MJD															
9DCAP	9TH INCREMENT MJD															
ZDCAP	1ST BCKDWN INC MJD															
YDCAP	2ND BCKDWN INC MJD															
XDCAP	3RD BCKDWN INC MJD															
WDCAP	4TH BCKDWN INC MJD															
MBCAP	MOGAS DELTA LIM B															
JBCAP	JET DELTA LIM BASE															
DBCAP	DIST. DELT LIM BAS															
M1CAP	MOGAS DELTA LIM 1															
J1CAP	JET DELTA LIMIT 1															
D1CAP	DIST. DELT LIM 1	1.000														
M2CAP	MOGAS DELTA LIM 2															
J2CAP	JET DELTA LIMIT 2															
D2CAP	DIST DELT LIM 2		1.000													
M3CAP	MOGAS DELTA LIM 3															
J3CAP	JET DELTA LIMIT 3															
D3CAP	DIST. DELT LIM 3															
M4CAP	MOGAS DELTA LIM 4															
J4CAP	JET DELTA LIMIT 4															
D4CAP	DIST. DELT LIM 4															
M5CAP	MOGAS DELTA LIM 5															
J5CAP	JET DELTA LIMIT 5															
D5CAP	DIST. DELT LIM 5															
M6CAP	MOGAS DELTA LIM 6															
J6CAP	JET DELTA LIMIT 6															
D6CAP	DIST. DELT LIM 6															
BSCST	ZERO BASE COST															
DLCST	DELTA COST	-0.140	-0.140	0.000	-0.418	0.420	2.560	-2.558	0.790	-0.788	1.110	-1.108	0.160	-0.158	0.170	-0.168
KJ	KERO JET	0.197	0.197													
2D	DIESEL- ON HWY	-0.702	-0.702		1.000	-1.000										
2H	DIESEL- OFF HWY			-1.000												
20	DISTILLATE POOL	-0.298	-0.298	1.000	-1.000	1.000										
H6	HI SULFUR F.O.															
RS	UNLEADED REGULAR	0.230	0.230				1.000	-1.000					1.000	-1.000		
PS	UNLEADED PREMIUM	0.081	0.081				-1.000	1.000							1.000	-1.000
RX	UNLD REGULAR OXYFL	0.007	0.007								1.000	-1.000				
PX	UNLD PREMIUM OXYFL	0.002	0.002						1.000	-1.000						
RH	H/C REFORM REG	0.357	0.357								-1.000	1.000	-1.000	1.000		
PH	H/C REFORM PREM	0.125	0.125						-1.000	1.000					-1.000	1.000
DOCAP	DIESEL TO 20 LIMIT	-0.250	-0.250		1.000											
ODCAP	20 TO DIESEL LIMIT	-0.050	-0.050			1.000										
PRCAP	PUL TO RUL LIM @	0.209	0.209				-1.000	5.000								
JTCAP	EXTRA KJ AVAIL	-0.197	-0.197													
DSCAP	EXTRA DSL AVAIL	0.803	0.803													

Appendix L, Section IV-2

Production Price Basis Tables (1987/89)

NORMAL BUTANE

Region	City	1987 Term	1987 Spot	1987 Δ	1988 Term	1988 Spot	1988 Δ	1989 Term	1989 Spot	1989 Δ	1990 Term	1990 Spot	1990 Δ
						$/Barrel							
1	Boston		15.50						12.25				
2	New York		15.50						12.25				
3	Baltimore		15.50						12.25				
4	Pittsburgh		15.50						12.25				
5	Chicago		15.50						12.25				
6	Minneapolis		15.50						12.25				
7	Oklahoma		15.50						12.25				
8	Houston		15.50						12.25				
9	Rocky Mountains		15.50						12.25				
10	Seattle		15.50						12.25				
11	San Francisco		15.50						12.25				
12	Los Angeles		15.50						12.25				
13	Honolulu		15.50						12.25				
						U.S. Dollars/Barrel							
14	Northwest Europe		13.25						11.25				
15	Mediterranean		13.25						11.25				
16	Middle East		13.25						11.25				
17	Far East		13.25						11.25				
18	Canada		15.50						12.25				
19	Caribbean		15.50						12.25				

The 1989 costs are those used by Pace in the development of the cost-volume curves for 1989. The 1987 data assume the same change at all locations as seen at Mt. Belvieu.

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APP L.IV.2-1

APP L.IV.2-2

LEADED REGULAR

Region	City	1987 Term	1987 Spot	1987 Δ	1988 Term	1988 Spot	1988 Δ	1989 Term	1989 Spot	1989 Δ	1990 Term	1990 Spot	1990 Δ
						Cents/Gallon							
1	Boston	57.1	52.9	+4.2	55.9	50.7	+5.2	64.3	57.8	+6.5	-	-	-
2	New York	58.4	52.5	+5.9	58.2	50.3	+7.9	-	57.4	-	-	-	-
3	Baltimore	55.4	52.5	+2.9	54.1	50.3	+2.8	63.4	57.4	+6.0	-	-	-
4	Pittsburgh	56.6	54.7	+1.9	55.0	52.7	+2.3	63.7	60.8	+2.9	-	-	-
5	Chicago	54.6	52.7	+1.9	53.7	51.4	+2.3	61.5	58.6	+2.9	-	-	-
6	Minneapolis	57.7	55.8	+1.9	55.4	53.1	+2.3	65.1	62.2	+2.9	76.4		
7	Oklahoma	54.5	52.7	+1.8	51.7	49.5	+2.2	61.4	58.6	+2.8	-	71.2	-
8	Houston	53.3	51.3	+2.0	51.3	49.1	+2.2	59.5	56.8	+2.7	-	-	-
9	Rocky Mountains	56.4	54.6	+1.8	54.3	52.1	+2.2	62.9	60.1	+2.8	74.8		
10	Seattle	54.2	52.9	+1.3	53.1	50.0	+3.1	62.0	60.8	+1.2	76.9	73.6	+3.3
11	San Francisco	53.3	52.1	+1.2	52.0	49.2	+2.8	60.2	59.9	+0.3	75.8	73.7	+2.1
12	Los Angeles	56.6	54.6	+2.0	55.3	51.2	+4.1	64.2	61.4	+2.8	77.5	75.5	+2.0
* 13	Honolulu	-	66.1	-	-	67.9	-	-	79.2	-	-	-	-
						U.S. Dollars/Barrel							
* 14	Northwest Europe		20.05						21.71				
* 15	Mediterranean		19.88						21.50			-	
* 16	Middle East		21.32						21.63				
17	Far East		23.21			19.82			23.23			-	
** 18	Canada		21.02						23.05				
* 19	Caribbean		20.57						22.40				

** Revised August 12, 1992

*Revised June 25, 1992

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NOTES - LEADED REGULAR

General: Unless noted otherwise, the "un-boxed" price data are taken from Platt's 1990 Oil Price Handbook and Oilmanac. The "boxed" data are calculated as explained below, where applicable. The "Terminal" prices are wholesale for tank car/truck delivery from refinery, pipeline, and inland waterway terminals. The "Spot" prices are for bulk cargo/pipeline delivery. After 1989, terminal prices are no longer available on the East Coast; the same is effectively true after 1Q90 for the Gulf Coast, Midcontinent, and Great Lakes regions. As a result, the 1989 Platt's is used, where necessary, to obtain the 1987-89 data. Possibly because of the limited U.S. use of leaded regular after 1989, foreign values are also not available after 1989.

Boston: Spot prices are waterborne cargoes. The spot prices are arbitrarily set equal to the unleaded regular spot differentials versus New York.

New York: Spot prices are waterborne cargoes.

Baltimore: While this location is just north of Region 3, it appears to be a reasonable selection as a proxy for the refined product supplies in the northern part of Region 3. The spot price is arbitrarily set equal to that for New York. (The low New York-Houston differentials suggest leaded regular rarely goes all the way from the Gulf Coast to New York.)

Differentials, ¢/gallon	1987	1988	1989
Boston-New York	0.4	0.4	0.4
New York-Houston [fyi]	1.2	1.2	0.6

Pittsburgh: The spot prices are arbitrarily set using the Chicago terminal-spot differentials.

Chicago: Spot prices are FOB Chicago for pipeline movements. Chicago spot prices are not available until 1991. By that time, leaded regular is no longer published. The Chicago terminal-spot differentials assume the unleaded regular relationship. (See Unleaded Regular Notes.)

Minneapolis: The spot prices are arbitrarily set using the Chicago terminal-spot differentials.

Oklahoma: Spot prices are FOB Tulsa, Oklahoma, for movements on the Williams Pipeline.

Houston: Spot prices are for movement on the Colonial Pipeline with input at Pasadena, Texas.

Notes - Leaded Regular, page 2

Rocky Mountains: The spot prices are arbitrarily set using the Oklahoma terminal-spot differentials. The terminal prices are for Denver.

Terminal, ¢/gallon	1987	1988	1989	1990
Denver	56.4	54.3	62.9	74.8

Seattle: Spot prices are for pipeline movement out of the Seattle area.

San Francisco: Spot prices are for pipeline movement out of the San Francisco area.

Los Angeles: Spot prices are for pipeline movement out of the Los Angeles area.

***Honolulu:** The spot prices retain the difference between the "Sales for Resale" for Hawaii and California taken from the EIA's Petroleum Marketing Annuals (1987: Table 30, 1988: Table 30, 1989: Table 31, and 1990: Table 31). These differences are arbitrarily applied to the San Francisco spot prices.

Sales for Resale, ¢/gallon	1987	1988	1989	1990
Hawaii	71.5	75.5	82.6	-
California	57.5	56.8	63.3	76.5
Delta	14.0	18.7	19.3	-

APP L.IV.2-4

*Revised June 12, 1992

Notes - Leaded Regular, page 3

***Northwest Europe:** Spot prices are for FOB cargoes, netback from Rotterdam to New York Harbor:

Netback Calculation	1987	1988	1989	1990
NYH, ¢/gal	52.5		57.4	
$/B	22.05		24.11	
0.5% Loss	(0.11)		(0.12)	
Import Fee	(0.53)		(0.53)	
Superfund Tax	(0.12)		(0.12)	
Net	21.29		23.34	
Freight	(1.24)		(1.63)	
Northwest Europe	20.05		21.71	

APP L.IV.2-5

***Mediterranean:** Spot prices are for FOB cargoes, netback from Naples to New York Harbor:

Netback Calculation	1987	1988	1989	1990
NYH, ¢/gal	52.5		57.4	
$/B	22.05		24.11	
0.5% Loss	(0.11)		(0.12)	
Import Fee	(0.53)		(0.53)	
Superfund Tax	(0.12)		(0.12)	
Net	21.29		23.34	
Freight	(1.41)		(1.84)	
Mediterranean	19.88		21.50	

Memo: Spot prices from Platt's (Genoa/Lavera) are for FOB cargoes divided by 8.5 barrels per metric ton as follows. The higher value netback calculation was used.

	1987	1988	1989	1990
Platt's	18.96	16.94	20.78	-

*Revised June 25, 1992

Notes - Leaded Regular, page 4

***Middle East:** Spot prices are for FOB cargoes, the Arab Gulf. Prices are netback off of the Far East.

	1987	1988	1989	1990
Netback Calculation				
Far East, $/B	23.21		23.23	
0.5% Loss	(0.12)		(0.12)	
Freight	(1.77)		(1.48)	
Middle East	21.32		21.63	

For comparison, the netback calculations from Ras Tanura (via Suez) to New York Harbor:

	1987	1988	1989	1990
Netback Calculation				
NYH, ¢/gal	52.5		57.4	
$/B	22.05		24.11	
0.5% Loss	(0.11)		(0.12)	
Import Fee	(0.53)		(0.53)	
Superfund Tax	(0.12)		(0.12)	
Net	21.29		23.34	
Freight	(4.26)		(3.83)	
Middle East	17.03		19.51	

Far East: Spot prices are for FOB cargoes, Singapore. For comparison, the netbacks to Los Angeles:

	1987	1988	1989	1990
Netback Calculation				
LA, ¢/gal	54.6		61.4	
$/B	22.93		25.79	
0.5% Loss	(0.12)		(0.13)	
Import Fee	(0.53)		(0.53)	
Superfund Tax	(0.12)		(0.12)	
Net	22.16		25.01	
Freight	(2.24)		(2.94)	
Singapore	19.92		22.07	

*Revised June 25, 1992

APP L.IV.2-6

Notes - Leaded Regular, page 5

****Canada:** Spot prices are for FOB cargoes, netback from Come by Chance to Boston:

Netback Calculation		1987	1988	1989	1990
Boston,	¢/gal	52.9		57.8	
	$/B	22.22		24.28	
0.5% Loss		(0.11)		(0.12)	
Import Fee		(0.53)		(0.42)	
Superfund Tax		(0.12)		(0.12)	
Net		21.46		23.62	
Freight		(0.44)		(0.57)	
Canada		21.02		23.05	

APP L.IV.2-7

***Caribbean:** Spot prices are for FOB cargoes, netback from Curacao to New York Harbor:

Netback Calculation		1987	1988	1989	1990
NYH,	¢/gal	52.5		57.4	
	$/B	22.05		24.11	
0.5% Loss		(0.11)		(0.12)	
Import Fee		(0.53)		(0.53)	
Superfund Tax		(0.12)		(0.12)	
Net		21.29		23.34	
Freight		(0.72)		(0.94)	
Caribbean		20.57		22.40	

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*Revised June 25, 1992

APP L.IV.2-8

UNLEADED REGULAR

Region	City	1987 Term	1987 Spot	1987 Δ	1988 Term	1988 Spot	1988 Δ	1989 Term	1989 Spot	1989 Δ	1990 Term	1990 Spot	1990 Δ
						Cents/Gallon							
1	Boston	56.0	51.8	4.2	54.1	48.8	+5.3	62.3	57.0	+5.3	78.9	71.9	+7.0
2	New York	57.5	51.4	+6.1	56.6	48.4	+8.2	71.2	56.6	+14.6	83.8	71.2	+12.6
3	Baltimore	54.6	51.4	+3.2	52.4	48.4	+4.0	59.2	56.6	+2.6	75.2	71.2	+4.0
4	Pittsburgh	55.6	54.3	+1.3	52.9	51.3	+1.6	60.7	58.8	+1.9	75.9	73.8	+2.1
5	Chicago	54.0	52.7	+1.3	52.0	50.4	+1.6	59.1	57.2	+1.9	72.5	70.4	+2.1
6	Minneapolis	57.2	55.9	+1.3	54.1	52.5	+1.6	63.6	61.7	+1.9	74.7	72.6	+2.1
7	Oklahoma	54.0	52.8	+1.2	50.7	49.2	+1.5	60.2	58.4	+1.8	72.7	70.7	+2.0
8	Houston	52.3	50.5	+1.8	49.6	47.6	+2.0	57.5	55.7	+1.8	73.1	70.6	+2.5
9	Rocky Mountains	55.9	54.7	+1.2	53.7	52.2	+1.5	61.9	60.1	+1.8	73.7	71.7	+2.0
10	Seattle	54.2	53.6	+0.6	53.1	50.3	+2.8	62.0	60.9	+1.1	76.9	73.6	+3.3
11	San Francisco	54.6	52.9	+0.7	52.5	49.7	+2.8	60.0	59.9	+0.1	75.4	73.6	+1.8
12	Los Angeles	56.9	55.1	+1.8	55.3	51.3	+4.0	64.2	61.4	+2.8	75.5	75.4	+0.1
* 13	Honolulu	-	67.6	-	-	68.0	-	-	76.7	-	-	86.4	-
						U.S. Dollars/Barrel							
* 14	Northwest Europe		20.88			18.64			21.98			29.07	
* 15	Mediterranean		20.71						21.77				
* 16	Middle East		22.15						21.90				
* 17	Far East		24.04						23.50				
** 18	Canada		20.56						22.71				
* 19	Caribbean		20.11						22.06				

**Revised August 12, 1992
* Revised June 25, 1992
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NOTES - UNLEADED REGULAR

General: Unless noted otherwise, the "un-boxed" price data are taken from Platt's 1990 Oil Price Handbook and Oilmanac. The "boxed" data are calculated as explained below, where applicable. The "Terminal" prices are wholesale for tank car/truck delivery from refinery, pipeline, and inland waterway terminals. The "Spot" prices are for bulk cargo/pipeline delivery.

Boston: Spot prices are waterborne cargoes. The 1987 spot assumes the 1988 relationship to the New York spot.

New York: Spot prices are waterborne cargoes.

Baltimore: While this location is just north of Region 3, it appears to be a reasonable selection as a proxy for the refined product supplies in the northern part of Region 3. The spot price is arbitrarily set equal to that for New York. (The low New York-Houston differentials suggest unleaded regular rarely goes all the way from the Gulf Coast to New York.)

Differentials, ¢/gallon	1987	1988	1989	1990
Boston-New York	0.4	0.4	0.4	0.7
New York-Houston	0.9	0.8	0.9	0.6

Pittsburgh: The spot prices are arbitrarily set using the Chicago terminal-spot differentials.

Chicago: Spot prices are FOB Chicago for pipeline movements. The data are unpublished until 1991, when the terminal-spot differential is +1.6¢/gallon. The 1991 Oklahoma differential is +1.5¢/gallon. The 1987-90 spot prices are arbitrarily set using the Oklahoma terminal-spot differential plus 0.1 added to the differential.

Minneapolis: The spot prices are arbitrarily set using the Chicago terminal-spot differentials.

Oklahoma: Spot prices are FOB Tulsa, Oklahoma, for movements on the Williams Pipeline.

Houston: Spot prices are for movement on the Colonial Pipeline with input at Pasadena, Texas.

Notes - Unleaded Regular, page 2

Rocky Mountains: The spot prices are arbitrarily set using the Oklahoma terminal-spot differentials. The terminal prices are for Denver.

Terminal, ¢/gallon	1987	1988	1989	1990
Denver	55.9	53.7	61.9	73.7

Seattle: Spot prices are for pipeline movement out of the Seattle area.

San Francisco: Spot prices are for pipeline movement out of the San Francisco area.

Los Angeles: Spot prices are for pipeline movement out of the Los Angeles area.

***Honolulu:** The spot prices retain the difference between the "Sales for Resale" for Hawaii and California taken from the EIA's Petroleum Marketing Annuals (1987: Table 31, 1988: Table 31, 1989: Table 32, and 1990: Table 32). These differences are arbitrarily applied to the San Francisco spot prices.

Sales for Resale, ¢/gallon	1987	1988	1989	1990
Hawaii	75.2	77.9	81.5	90.8
California	60.5	59.6	64.7	78.0
Delta	14.7	18.3	16.8	12.8

*Revised June 12, 1992

Notes - Unleaded Regular, page 3

***Northwest Europe:** Spot prices are for FOB cargoes divided by 8.5 barrels per metric ton. Note--the 1987 data below look suspect--the premium barge should be above the cargo.

Cargo/Barge, $/MeT	1987	1988	1989	1990
Unleaded Barge, FOB Rotterdam	183.17	163.82	192.91	253.69
Premium 0.15g Barge, FOB Rotterdam	186.27	176.04	207.84	274.12
Delta	(3.1)	(12.22)	(14.93)	(20.43)
Premium 0.15g Cargo, FOB NWE	190.17	170.67	201.78	267.56
Estimated Unleaded Cargo, FOB NWE	187.07	158.45	186.85	247.13

Correcting the 1987 Premium Barge to the 1988/89 average above the Cargo value (+5.72) yields an Unleaded Cargo of $177.45/MeT.

	1987	1988	1989	1990
Estimated Unleaded Cargo, FOB NWE, $/B	20.88	18.64	21.98	29.07

Memo: Netback calculations off of New York Harbor (similar to those for leaded regular) result in lower prices. The higher prices in the table above were used.

	1987	1988	1989	1990
Netback	19.58		21.37	

***Mediterranean:** Spot prices are for FOB cargoes. The prices use the Northwest Europe differentials for Unleaded Regular minus Leaded Regular.

	$/B	1987	1988	1989	1990
Northwest Europe:	Unleaded Regular	20.88		21.98	
	Leaded Regular	20.05		21.71	
		0.83		0.27	
Mediterranean:	Leaded Regular	19.88		21.50	
	Unleaded Regular	20.71		21.77	

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APP L.IV.2-11

APP L.IV.2-12

Notes - Unleaded Regular, page 4

***Middle East:** Spot prices are for FOB cargoes, the Arab Gulf. The prices use the Mediterranean differentials for Unleaded Regular minus Leaded Regular.

	$/B	1987	1988	1989	1990
Mediterranean:	Unleaded Regular	20.71		21.77	
	Leaded Regular	19.88		21.50	
		0.83		0.27	
Middle East:	Leaded Regular	21.32		21.63	
	Unleaded Regular	22.15		21.90	

For comparison, the netback calculations from Ras Tanura (via Suez) to New York Harbor:

	1987	1988	1989	1990
Netback Calculation				
NYH, ¢/gal	51.4		56.6	
$/B	21.59		23.77	
0.5% Loss	(0.11)		(0.12)	
Import Fee	(0.53)		(0.53)	
Superfund Tax	(0.12)		(0.12)	
Net	20.83		23.00	
Freight	(4.26)		(3.83)	
Middle East	16.57		19.17	

Notes - Unleaded Regular, page 5

***Far East:** Spot prices are for FOB cargoes, Singapore. Prices are forward calculated off of the Middle East.

	1987	1988	1989	1990
Netforward Calculation				
Middle East, $/B	22.15		21.90	
0.5% Loss	0.12		0.12	
Freight	1.77		1.48	
Far East	24.04		23.50	

For comparison, the netback calculations from Singapore to Los Angeles:

	1987	1988	1989	1990
Netback Calculation				
LA, ¢/gal	55.1		61.4	
$/B	23.14		25.79	
0.5% Loss	(0.12)		(0.13)	
Import Fee	(0.53)		(0.53)	
Superfund Tax	(0.12)		(0.12)	
Net	22.37		25.01	
Freight	(2.24)		(2.94)	
Singapore	20.13		22.07	

*Revised June 25, 1992

Notes - Unleaded Regular, page 6

****Canada:** Spot prices are for FOB cargoes, netback from Come by Chance to Boston:

Netback Calculation	1987	1988	1989	1990
Boston, ¢/gal	51.8		57.0	
$/B	21.76		23.94	
0.5% Loss	(0.11)		(0.12)	
Import Fee	(0.53)		(0.42)	
Superfund Tax	(0.12)		(0.12)	
Net	20.00		23.28	
Freight	(0.44)		(0.57)	
Canada	20.56		22.71	

***Caribbean:** Spot prices are for FOB cargoes, netback from Curacao to New York Harbor:

Netback Calculation	1987	1988	1989	1990
NYH, ¢/gal	51.4		56.6	
$/B	21.59		23.77	
0.5% Loss	(0.11)		(0.12)	
Import Fee	(0.53)		(0.53)	
Superfund Tax	(0.12)		(0.12)	
Net	20.83		23.00	
Freight	(0.72)		(0.94)	
Caribbean	20.11		22.06	

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*Revised June 25, 1992

APP L.IV.2-15

UNLEADED MID-GRADE

Region	City	1987 Term	1987 Spot	1987 Δ	1988 Term	1988 Spot	1988 Δ	1989 Term	1989 Spot	1989 Δ	1990 Term	1990 Spot	1990 Δ
						Cents/Gallon							
1	Boston		53.8						59.3				
2	New York		53.4						58.9			73.9	
3	Baltimore		53.4						58.9				
4	Pittsburgh		56.7						62.4				
5	Chicago		54.7						60.9				
6	Minneapolis		57.9						64.8				
7	Oklahoma		54.5						60.6				
8	Houston		52.2						58.0			73.2	
9	Rocky Mountains		56.8						63.0				
10	Seattle		56.2						63.5				
11	San Francisco		54.8						62.3				
12	Los Angeles		56.9						63.8				
13	Honolulu		69.0						78.8				
						U.S. Dollars/Barrel							
14	Northwest Europe												
15	Mediterranean												
16	Middle East												
17	Far East												
18	Canada												
19	Caribbean												

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NOTES - UNLEADED MID-GRADE

General: Spot price data for the Unleaded Mid-Grade are extremely limited. The Platt's 1990 Oil Price Handbook and Oilmanac contains 1990 data for only the New York Harbor and the Gulf Coast (Houston). Relative to the 1990 values for the Unleaded Regular and Premium grades, these 1990 Mid-grade prices are 43.5 percent and 42.6 percent of the price differences, respectively. These are slightly higher than the octane differences from the table below (35.9 percent and 38.8 percent, respectively). Since linear octane costing will be used in the Logistics Model, the octane table below was used to estimate the 1987 and 1989 Mid-grade prices.

Region	Yearly Average Octane, RM/2		
	ULR	ULM	ULP
Boston	87.2	89.1	92.5
New York	87.2	89.1	92.5
Baltimore	87.2	89.1	92.5
Pittsburgh	87.2	89.1	92.5
Chicago	87.2	89.1	92.1
Minneapolis	87.2	89.1	92.1
Oklahoma	87.2	89.1	92.1
Houston	87.2	89.1	92.1
Rocky Mountains	85.4	88.1	91.1
Seattle	87.2	89.1	92.1
San Francisco	87.2	89.1	92.1
Los Angeles	87.2	89.1	92.1
Honolulu	87.2	89.1	92.1

APP L.IV.2-17

UNLEADED PREMIUM

Region	City	1987 Term	1987 Spot	1987 Δ	1988 Term	1988 Spot	1988 Δ	1989 Term	1989 Spot	1989 Δ	1990 Term	1990 Spot	1990 Δ
							Cents/Gallon						
1	Boston	63.7	57.5	+6.2	64.1	57.4	+6.7	70.9	63.3	+7.6	87.5	78.1	+9.4
2	New York	66.0	57.1	+8.9	66.5	57.0	+9.5	84.3	62.9	+21.4	97.8	77.4	+20.4
3	Baltimore	61.1	57.1	+4.0	61.9	57.0	+4.9	68.2	62.9	+5.3	84.1	77.4	+6.7
4	Pittsburgh	63.4	60.9	+2.5	62.8	58.7	+4.1	71.8	68.9	+2.9	87.0	83.0	+4.0
5	Chicago	60.4	57.9	+2.5	60.3	56.2	+4.1	69.7	66.8	+2.9	82.7	78.7	+4.0
6	Minneapolis	63.5	61.0	+2.5	61.4	57.3	+4.1	72.5	69.6	+2.9	83.7	79.7	+4.0
7	Oklahoma	59.7	57.3	+2.4	57.2	53.2	+4.0	67.0	64.2	+2.8	79.6	75.7	+3.9
8	Houston	57.8	54.8	+3.0	57.5	55.0	+2.5	67.1	61.6	+5.5	82.8	76.7	+6.1
9	Rocky Mountains	61.6	59.2	+2.4	59.9	55.9	+4.0	69.1	66.3	+2.8	80.8	76.9	+3.9
10	Seattle	64.3	60.2	+4.1	63.7	59.7	+4.0	74.1	67.6	+6.5	89.8	81.9	+7.9
11	San Francisco	61.9	57.8	+4.1	61.2	57.2	+4.0	69.5	66.2	+3.3	85.8	80.8	+5.0
12	Los Angeles	64.9	59.8	+5.1	64.8	58.8	+6.0	74.6	67.5	+7.1	88.7	82.7	+6.0
* 13	Honolulu	-	71.1	-	-	72.6	-	-	82.1	-	-	93.3	-
							U.S. Dollars/Barrel						
* 14	Northwest Europe		23.27						24.63				
* 15	Mediterranean		23.10						24.42				
* 16	Middle East		24.54						24.55				
* 17	Far East		26.43						26.15				
** 18	Canada		22.94						25.35				
* 19	Caribbean		22.49						24.70				

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NOTES - UNLEADED PREMIUM

General: Unless noted otherwise, the "un-boxed" price data are taken from Platt's 1990 Oil Price Handbook and Oilmanac. The "boxed" data are calculated as explained below, where applicable. The "Terminal" prices are wholesale for tank car/truck delivery from refinery, pipeline, and inland waterway terminals. The "Spot" prices are for bulk cargo/pipeline delivery.

Boston: Spot prices are waterborne cargoes. The spot prices are arbitrarily set using the Boston-New York spot differentials for unleaded regular.

New York: Spot prices are waterborne cargoes.

Baltimore: While this location is just north of Region 3, it appears to be a reasonable selection as a proxy for the refined product supplies in the northern part of Region 3. The spot price is arbitrarily set equal to that for New York. (The low New York-Houston differentials, particularly after 1988, suggest unleaded premium rarely goes all the way from the Gulf Coast to New York.)

Differentials, ¢/gallon	1987	1988	1989	1990
Boston-New York	0.4	0.4	0.4	0.7
New York-Houston [fyi]	2.3	2.0	1.3	0.7

Pittsburgh: The spot prices are arbitrarily set using the Chicago terminal-spot differentials.

Chicago: Spot prices are FOB Chicago for pipeline movements. The Chicago terminal-spot differentials assume the unleaded regular relationship. (See Unleaded Regular Notes.)

Minneapolis: The spot prices are arbitrarily set using the Chicago terminal-spot differentials.

Oklahoma: Spot prices are FOB Tulsa, Oklahoma, for movements on the Williams Pipeline. The 1987 terminal-spot differential presumes the relationship versus Houston of the 1987 terminal-spot differentials for unleaded regular.

Houston: Spot prices are for movement on the Colonial Pipeline with input at Pasadena, Texas.

Notes - Unleaded Premium, page 2

Rocky Mountains: The spot prices are arbitrarily set using the Oklahoma terminal-spot differentials. The terminal prices are for Denver.

Terminal, ¢/gallon	1987	1988	1989	1990
Denver	61.6	59.9	69.1	80.8

Seattle: Spot prices are for pipeline movement out of the Seattle area. The 1987-88 spot prices are arbitrarily set using the San Francisco terminal-spot differentials. This relationship seems reasonable based on the 1987-88 data for both leaded and unleaded regular.

San Francisco: Spot prices are for pipeline movement out of the San Francisco area.

Los Angeles: Spot prices are for pipeline movement out of the Los Angeles area.

***Honolulu:** The spot prices retain the difference between the "Sales for Resale" for Hawaii and California taken from the EIA's Petroleum Marketing Annuals (1987: Table 32, 1988: Table 32, 1989: Table 34, and 1990: Table 34). These differences are arbitrarily applied to the San Francisco spot prices.

Sales for Resale, ¢/gallon	1987	1988	1989	1990
Hawaii	83.5	87.0	93.4	102.9
California	70.2	71.6	77.5	90.4
Delta	13.3	15.4	15.9	12.5

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APP L.IV.2-20

Notes - Unleaded Premium, page 3

***Northwest Europe:** Spot prices are for FOB cargoes. There are no data for non-U.S. unleaded premium. The costs have been estimated by adding the New York Harbor differentials to the Unleaded Regular.

New York Harbor, $/B	1987	1988	1989	1990
Unleaded Premium	23.98	23.94	26.42	32.51
Unleaded Regular	21.59	20.33	23.77	29.90
Delta	2.39	3.61	2.65	2.61

***Mediterranean:** Spot prices are for FOB cargoes. See "Northwest Europe."

***Middle East:** Spot prices are for FOB cargoes, the Arab Gulf. See "Northwest Europe."

For comparison, the netback calculations from Ras Tanura (via Suez) to New York Harbor:

	1987	1988	1989	1990
Netback Calculation				
NYH, ¢/gal	57.1		62.9	
$/B	23.98		26.42	
0.5% Loss	(0.12)		(0.13)	
Import Fee	(0.53)		(0.53)	
Superfund Tax	(0.12)		(0.12)	
Net	23.21		25.64	
Freight	(4.26)		(3.83)	
Middle East	18.95		21.81	

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Notes - Unleaded Premium, page 4

***Far East:** Spot prices are for FOB cargoes, Singapore. See "Northwest Europe."

For comparison, the netback calculations from Singapore to Los Angeles:

Netback Calculation	1987	1988	1989	1990
LA, ¢/gal	59.8		67.5	
$/B	25.12		28.35	
0.5% Loss	(0.13)		(0.14)	
Import Fee	(0.53)		(0.53)	
Superfund Tax	(0.12)		(0.12)	
Net	24.34		27.56	
Freight	(2.24)		(2.94)	
Singapore	22.10		24.62	

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APP L.IV.2-21

Notes - Unleaded Premium, page 5

****Canada:** Spot prices are for FOB cargoes, netback from Come by Chance to Boston:

Netback Calculation	1987	1988	1989	1990
Boston, ¢/gal	57.5		63.3	
$/B	24.15		26.59	
0.5% Loss	(0.12)		(0.13)	
Import Fee	(0.53)		(0.42)	
Superfund Tax	(0.12)		(0.12)	
Net	23.38		25.92	
Freight	(0.44)		(0.57)	
Canada	22.94		25.35	

***Caribbean:** Spot prices are for FOB cargoes, netback from Curacao to New York Harbor:

Netback Calculation	1987	1988	1989	1990
NYH, ¢/gal	57.1		62.9	
$/B	23.98		26.42	
0.5% Loss	(0.12)		(0.13)	
Import Fee	(0.53)		(0.53)	
Superfund Tax	(0.12)		(0.12)	
Net	23.21		25.64	
Freight	(0.72)		(0.94)	
Caribbean	22.49		24.70	

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APP L.IV.2-22

APP L.IV.2-23

KEROJET

Region	City	1987 Term	1987 Spot	1987 Δ	1988 Term	1988 Spot	1988 Δ	1989 Term	1989 Spot	1989 Δ	1990 Term *	1990 Spot	1990 Δ
							Cents/Gallon						
1	Boston	55.6	53.9	+1.7	54.3	49.7	+4.6	62.2	58.9	+3.3	78.7	75.7	+3.0
2	New York	61.4	53.7	+7.7	56.0	49.5	+6.5	63.5	58.5	+5.0	81.4	75.2	+6.2
3	Baltimore	54.1	53.5	+0.6	50.6	49.3	+1.3	59.1	58.1	+1.0	76.0	74.7	+1.3
4	Pittsburgh	54.3	53.8	+0.5	52.0	50.2	+1.8	59.9	59.2	+0.7	75.4	75.2	+0.2
5	Chicago	56.8	56.3	+0.5	51.8	50.0	+1.8	58.3	57.6	+0.7	78.9	78.7	+0.2
6	Minneapolis	56.0	55.5	+0.5	53.2	51.4	+1.8	60.3	59.6	+0.7	76.7	76.5	+0.2
7	Oklahoma	52.6	52.1	+0.5	50.6	48.8	+1.8	57.6	56.9	+0.7	80.1	79.9	+0.2
8	Houston	52.0	51.5	+0.5	48.2	46.4	+1.8	56.2	55.5	+0.7	73.0	72.8	+0.2
9	Rocky Mountains	54.7	54.2	+0.5	51.0	49.2	+1.8	58.0	57.3	+0.7	75.4	75.2	+0.2
10	Seattle	54.3	54.4	(0.1)	51.2	47.8	+3.4	60.8	59.3	+1.5	76.7	74.7	+2.0
11	San Francisco	54.5	54.4	+0.1	51.8	47.8	+4.0	60.8	59.8	+1.0	77.8	75.8	+2.0
12	Los Angeles	54.5	55.0	(0.5)	51.8	47.8	+4.0	60.8	59.8	+1.0	77.8	76.5	+1.3
* 13	Honolulu	58.0	57.9	+0.1	54.5	50.5	+4.0	62.0	61.0	+1.0	80.8	78.8	+2.0
							U.S. Dollars/Barrel						
14	Northwest Europe		21.47			19.16			22.93			31.30	
15	Mediterranean		21.00			18.46			22.36			30.56	
16	Middle East		20.67			18.30			22.51			30.84	
17	Far East		22.10			20.02			24.09			32.71	
** 18	Canada		21.41						23.47				
* 19	Caribbean		21.02						22.79				

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NOTES - KEROJET

General: Unless noted otherwise, the "un-boxed" price data are taken from Platt's 1990 Oil Price Handbook and Oilmanac. The "boxed" data are calculated as explained below, where applicable. The "Spot" prices are for bulk cargo/pipeline delivery. The 1987-89 "Terminal" prices are the state average jet fuel prices delivered to the Transportation Sector as reported in the EIA's 1989 State Energy Price and Expenditure Report (SEPER). 1990 prices are not yet available from this source. The 1990 "Terminal" prices are from the EIA's 1990 Petroleum Marketing Annual, Table 35; this is the basis for the eventual 1990 SEPER data.

Boston: Spot prices are waterborne cargoes. See "Baltimore" (below) and the Distillate Notes. The spot prices are arbitrarily set using the distillate spot differentials for Boston-New York.

New York: Spot prices are waterborne cargoes.

Baltimore: While this location is just north of Region 3, it appears to be a reasonable selection as a proxy for the refined product supplies in the northern part of Region 3. The spot price is arbitrarily set by subtracting the Boston-New York differential from New York. (Also see the Distillate Notes; the New York-Houston differentials are approximately the same.)

Differentials, ¢/gallon	1987	1988	1989	1990
New York-Houston [fyi]	2.2	3.1	3.0	2.4

Pittsburgh: The spot prices are arbitrarily set using the Houston terminal-spot differentials.

Chicago: Spot prices are FOB Chicago for pipeline movements. The spot prices are arbitrarily set using the Houston terminal-spot differentials.

Minneapolis: The spot prices are arbitrarily set using the Houston terminal-spot differentials.

Notes - Kerojet, page 2

Oklahoma: Spot prices are FOB Tulsa, Oklahoma, for movements on the Williams Pipeline. The spot prices are arbitrarily set using the Houston terminal-spot differentials.

Houston: Spot prices are for movement on the Colonial Pipeline with input at Pasadena, Texas.

Rocky Mountains: The spot prices are arbitrarily set using the Houston terminal-spot differentials. The terminal prices are for Denver.

Terminal, ¢/gallon	1987	1988	1989	1990*
Denver	54.7	51.0	58.0	75.4

Seattle: Spot prices are for pipeline movement out of the Seattle area. The 1987 and 1988 spot prices are arbitrarily set equal to those for San Francisco.

San Francisco: Spot prices are for pipeline movement out of the San Francisco area.

Los Angeles: Spot prices are for pipeline movement out of the Los Angeles area.

***Honolulu:** Spot prices are arbitrarily set using the San Francisco terminal-spot differentials.

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APP L.IV.2-26

Notes - Kerojet, page 3

Northwest Europe: Spot prices are for FOB cargoes divided by 7.95 barrels per metric ton.

Mediterranean: Spot prices are for FOB cargoes divided by 7.95 barrels per metric ton.

Middle East: Spot prices are for FOB cargoes, the Arab Gulf.

Far East: Spot prices are for FOB cargoes, Singapore.

****Canada:** Netback calculation from Come by Chance to Boston:

Netback Calculation	1987	1988	1989	1990
Boston, ¢/gal	53.9		58.9	
$/B	22.64		24.74	
0.5% Loss	(0.11)		(0.12)	
Import Fee	(0.53)		(0.42)	
Superfund Tax	(0.12)		(0.12)	
Net	21.38		24.08	
Freight	(0.47)		(0.61)	
Canada	21.41		23.47	

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APP L.IV.2-27

Notes - Kerojet, page 4

***Caribbean:** Netback calculation from Curacao to New York Harbor:

Netback Calculation	1987	1988	1989	1990
NYH, ¢/gal	53.7		58.5	
$/B	22.55		24.57	
0.5% Loss	(0.11)		(0.12)	
Import Fee	(0.53)		(0.53)	
Superfund Tax	(0.12)		(0.12)	
Net	21.79		23.80	
Freight	(0.77)		(1.01)	
Caribbean	21.02		22.79	

Memo: Spot prices from Platt's are for FOB cargoes divided by 7.95 barrels per metric ton as follows. The higher value netback calculation was used.

	1987	1988	1989	1990
Platt's	20.75	18.80	22.25	28.68

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APP L.IV.2-28

DIESEL/DISTILLATE #2

Region	City	1987 Term	1987 Spot	1987 Δ	1988 Term	1988 Spot	1988 Δ	1989 Term	1989 Spot	1989 Δ	1990 Term	1990 Spot	1990 Δ
	Cents/Gallon												
1	Boston	55.8	52.2	+3.6	50.8	46.3	+4.5	59.5	55.2	+4.3	75.3	68.5	+6.8
2	New York	56.1	52.0	+4.1	51.2	46.1	+5.1	58.9	54.8	+4.1	74.4	68.0	+6.4
3	Baltimore	53.8	51.8	+2.0	48.1	45.9	+2.2	56.8	54.4	+2.4	71.6	67.5	+4.1
4	Pittsburgh	57.5	55.3	+2.2	51.0	48.8	+2.2	59.3	57.0	+2.3	74.8	71.8	+3.0
5	Chicago	53.8	51.6	+2.2	47.5	45.3	+2.2	55.7	53.4	+2.3	68.9	65.9	+3.0
6	Minneapolis	55.3	53.1	+2.2	48.1	45.9	+2.2	57.4	55.1	+2.3	70.2	67.2	+3.0
7	Oklahoma	52.9	50.9	+2.0	46.5	44.5	+2.0	55.9	53.8	+2.1	69.1	66.3	+2.8
8	Houston	51.5	49.7	+1.8	45.0	43.2	+1.8	54.0	52.1	+1.9	68.5	65.6	+2.9
9	Rocky Mountains	53.4	51.4	+2.0	47.2	45.2	+2.0	56.2	54.1	+2.1	71.1	68.3	+2.8
10	Seattle	52.8	51.2	+1.6	47.3	46.0	+1.3	58.5	57.2	+1.3	70.4	68.9	+1.5
11	San Francisco	53.3	51.4	+1.9	46.1	44.2	+1.9	57.7	56.3	+1.4	70.9	68.0	+2.9
12	Los Angeles	53.6	50.6	+3.0	47.5	43.6	+3.9	60.2	55.7	+4.5	69.9	66.6	+3.3
* 13	Honolulu	56.7	54.8	+1.9	50.5	48.6	+1.9	58.8	57.4	+1.4	70.5	67.6	+2.9
	U.S. Dollars/Barrel												
14	Northwest Europe		20.69			17.72			21.39			28.01	
15	Mediterranean		20.16			17.37			21.10			27.84	
16	Middle East		19.44			16.95			20.96			27.08	
17	Far East		20.99			18.43			22.77			29.34	
** 18	Canada		21.08						22.21				
* 19	Caribbean		20.68						21.61				

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NOTES - DIESEL/DISTILLATE #2

General: Unless noted otherwise, the "un-boxed" price data are taken from Platt's 1990 Oil Price Handbook and Oilmanac. The "boxed" data are calculated as explained below, where applicable. The "Terminal" prices are wholesale for tank car/truck delivery from refinery, pipeline, and inland waterway terminals. The "Spot" prices are for bulk cargo/pipeline delivery.

Boston: Spot prices are waterborne cargoes. The 1987 spot assumes the 1988 relationship to the New York spot.

New York: Spot prices are waterborne cargoes.

Baltimore: While this location is just north of Region 3, it appears to be a reasonable selection as a proxy for the refined product supplies in the northern part of Region 3. The spot price is arbitrarily set by subtracting the Boston-New York differential from New York.

Differentials, ¢/gallon	1987	1988	1989	1990
Boston-New York	0.2	0.2	0.4	0.5
New York-Houston [fyi]	2.3	2.9	2.7	2.4

Pittsburgh: The spot prices are arbitrarily set using the Chicago terminal-spot differentials.

Chicago: Spot prices are FOB Chicago for pipeline movements. The data are unpublished until 1991, when the terminal-spot differential is +2.4¢/gallon. The 1991 Oklahoma differential is +2.2¢/gallon. The 1987-90 spot prices are arbitrarily set using the Oklahoma terminal-spot differential plus 0.2 added to the differential.

Minneapolis: The spot prices are arbitrarily set using the Chicago terminal-spot differentials.

Oklahoma: Spot prices are FOB Tulsa, Oklahoma, for movements on the Williams Pipeline.

Houston: Spot prices are for movement on the Colonial Pipeline with input at Pasadena, Texas.

Notes - Diesel/Distillate #2, page 2

Rocky Mountains: The spot prices are arbitrarily set using the Oklahoma terminal-spot differentials. The terminal prices are for Denver.

Terminal, ¢/gallon	1987	1988	1989	1990
Denver	53.4	47.2	56.2	71.1

Seattle: Spot prices are for pipeline movement out of the Seattle area.

San Francisco: Spot prices are for pipeline movement out of the San Francisco area.

Los Angeles: Spot prices are for pipeline movement out of the Los Angeles area.

***Honolulu:** The terminal prices retain the difference between the "Sales to End Users" for Hawaii and California taken from the EIA's Petroleum Marketing Annuals (1987: Table 34, 1988: Table 34, 1989: Table 36, and 1990: Table 36). These differences are arbitrarily applied to the San Francisco terminal prices. The Honolulu "Terminal-Spot Δ" is arbitrarily the same as that for San Francisco.

Sales to Users, ¢/gallon	1987	1988	1989	1990
Hawaii	57.9	53.2	61.9	72.2
California	54.5	48.8	60.8	72.6
Delta	3.4	4.4	1.1	(0.4)

*Revised June 12, 1992

APP L.IV.2-31

Notes - Diesel/Distillate #2, page 3

Northwest Europe: Spot prices are for FOB cargoes divided by 7.45 barrels per metric ton.

Mediterranean: Spot prices are for FOB cargoes divided by 7.45 barrels per metric ton.

Middle East: Spot prices are for FOB cargoes, the Arab Gulf.

Far East: Spot prices are for FOB cargoes, Singapore.

****Canada:** Netback calculation from Come by Chance to Boston:

Netback Calculation	1987	1988	1989	1990
Boston, ¢/gal	52.2		55.2	
$/B	21.92		23.18	
0.5% Loss	(0.11)		(0.11)	
Import Fee	(0.11)		(0.08)	
Superfund Tax	(0.12)		(0.12)	
Net	21.58		22.87	
Freight	(0.50)		(0.66)	
Canada	21.08		22.21	

**Revised August 12, 1992
*Revised June 25, 1992

APP L.IV.2-32

Notes - Diesel/Distillate #2, page 4

***Caribbean:** Netback calculation from Curacao to New York Harbor:

	1987	1988	1989	1990
Netback Calculation				
NYH, ¢/gal	52.0		54.8	
$/B	21.84		23.02	
0.5% Loss	(0.11)		(0.11)	
Import Fee	(0.11)		(0.11)	
Superfund Tax	(0.12)		(0.12)	
Net	21.50		22.68	
Freight	(0.82)		(1.07)	
Caribbean	20.68		21.61	

Memo: Spot prices from Platt's are for FOB cargoes as follows. The higher value netback calculation was used.

Platt's	20.50	17.83	21.08	26.16

*Revised June 25, 1992

Appendix L, Section IV-3

Reference Point Costs

REFERENCE POINT VOLUMES AND COSTS -- 1987 HISTORIC DATA

	U.S. REGIONS													FOREIGN REGIONS					
	1	2	3	4	5	6	7	8	9	10	11	12	13	CAN	LATIN	NWE	MED	MID E	FAR E
REFERENCE POINT VOLUMES*, BARRELS PER DAY																			
LEADED REGULAR	-	18957	959	1385	97530	15635	35736	255500	73200	60503	73073	116727	5924	-	-	-	-	-	-
UNLEADED REGULAR	-	329478	16659	24063	747028	119753	273720	1737300	133700	87238	201394	321707	29004	34700	97700	56700	37800	15000	48600
UNLEADED MID-GRADE	-	66394	3357	4849	73950	11855	27096	281500	1000	1820	4235	6765	195	-	-	-	-	-	-
UNLEADED PREMIUM	-	198381	10031	14489	182483	29253	66864	861200	29900	39542	90514	144587	6329	20400	57400	33300	22200	38000	26200
KEROSENE JET FUEL	-	84016	4248	6136	134341	21536	49224	760300	42200	68096	98445	157256	69541	10000	75000	10000	500	1000	58900
DIESEL ON/OFF HWY	-	159399	8060	11642	313549	50264	114888	973300	92000	57319	100784	160993	23800	-	-	-	-	-	-
OTHER DISTILLATE	-	159399	8060	11642	134341	21536	49224	324400	30600	35413	15717	25106	15177	65000	200000	25000	15000	1000	122100
TOTAL	-	1016024	51374	74206	1683222	269832	616752	5193500	402600	349931	584162	933141	149970	130100	430100	125000	75500	55000	255800
REFERENCE POINT COMPOSITION, %																			
LEADED REGULAR	-	1.87	1.87	1.87	5.79	5.79	5.79	4.92	18.18	17.29	12.51	12.51	3.95	-	-	-	-	-	-
UNLEADED REGULAR	-	32.43	32.43	32.43	44.38	44.38	44.38	33.45	33.21	24.93	34.48	34.48	19.34	26.67	22.72	45.36	50.07	27.27	19.00
UNLEADED MID-GRADE	-	6.53	6.53	6.53	4.39	4.39	4.39	5.42	0.25	0.52	0.72	0.72	0.13	-	-	-	-	-	-
UNLEADED PREMIUM	-	19.53	19.53	19.53	10.84	10.84	10.84	16.58	7.43	11.30	15.49	15.49	4.22	15.68	13.35	26.64	29.40	69.09	10.24
KEROSENE JET FUEL	-	8.27	8.27	8.27	7.98	7.98	7.98	14.64	10.48	19.46	16.85	16.85	46.37	7.69	17.44	8.00	0.66	1.82	23.03
DIESEL ON/OFF HWY	-	15.69	15.69	15.69	18.63	18.63	18.63	18.74	22.85	16.38	17.25	17.25	15.87	-	-	-	-	-	-
OTHER DISTILLATE	-	15.69	15.69	15.69	7.98	7.98	7.98	6.25	7.60	10.12	2.69	2.69	10.12	49.96	46.50	20.00	19.87	1.82	47.73
REFERENCE POINT COSTS, DOLLARS PER BARREL																			
LEADED REGULAR	22.22	22.35	22.35	22.97	21.93	22.64	21.48	21.55	22.58	21.92	21.48	22.43	27.76	21.87	21.02	20.25	19.88	16.55	16.55
UNLEADED REGULAR	21.76	21.89	21.89	22.81	21.93	22.68	21.53	21.21	22.62	22.21	21.82	22.64	28.39	21.41	20.56	20.39	20.02	16.70	16.70
UNLEADED MID-GRADE	22.60	22.73	22.73	23.81	22.77	23.52	22.24	21.92	23.51	23.30	22.62	23.40	28.98	-	-	-	-	-	-
UNLEADED PREMIUM	24.15	24.28	24.28	25.58	24.12	24.82	23.42	23.02	24.51	24.98	23.88	24.62	29.86	23.79	22.94	22.78	22.41	19.09	19.09
KEROSENE JET FUEL	22.64	22.85	22.77	22.60	23.45	22.51	21.23	21.63	22.41	22.55	22.45	22.60	24.32	21.41	21.27	21.32	20.81	17.42	17.42
DIESEL ON/OFF HWY	21.92	22.14	22.06	23.23	21.47	21.50	20.73	20.87	21.24	21.20	21.19	20.75	23.02	21.18	21.53	19.25	19.87	16.69	16.69
OTHER DISTILLATE	21.92	22.14	22.06	23.23	21.47	21.50	20.73	20.87	21.24	21.20	21.19	20.75	23.02	21.18	21.53	19.25	19.87	16.69	16.69
COMPOSITE REFERENCE POINT COST, DOLLARS PER BARREL																			
REF POINT COST	-	22.58	22.54	23.53	22.21	22.62	21.52	21.54	22.31	22.28	22.08	22.54	25.14	21.67	21.45	20.87	20.70	18.36	17.11

* THE REFERENCE POINT VOLUME FOR THE FAR EAST IS ACTUALLY AT ZERO. THESE VOLUMES YIELD THE CORRECT REFERENCE POINT COST AT ZERO VOLUME.
DUE TO INDEPENDENT ROUNDING, COSTS MAY NOT ADD TO TOTALS NATIONAL PETROLEUM COUNCIL OCTOBER 15, 1992 TIME 9:12

REFERENCE POINT VOLUMES AND COSTS -- 1989 HISTORIC DATA

	U.S. REGIONS													FOREIGN REGIONS						
	1	2	3	4	5	6	7	8	9	10	11	12	13	CAN	LATIN	NWE	MED	MID E	FAR E
REFERENCE POINT VOLUMES*, BARRELS PER DAY																			
LEADED REGULAR	-	18957	959	1385	97530	15635	35736	255500	73200	60503	73073	116727	5924	-	-	-	-	-	-
UNLEADED REGULAR	-	329478	16659	24063	747028	119753	273720	1737300	133700	87238	201394	321707	29004	34700	97700	56700	37800	15000	48600
UNLEADED MID-GRADE	-	66394	3357	4849	73950	11855	27096	281500	1000	1820	4235	6765	195	-	-	-	-	-	-
UNLEADED PREMIUM	-	198381	10031	14489	182483	29253	66864	861200	29900	39542	90514	144587	6329	20400	57400	33300	22200	38000	26200
KEROSENE JET FUEL	-	84016	4248	6136	134341	21536	49224	760300	42200	68096	98445	157256	69541	10000	75000	10000	500	1000	58900
DIESEL ON/OFF HWY	-	159399	8060	11642	313549	50264	114888	973300	92000	57319	100784	160993	23800	-	-	-	-	-	-
OTHER DISTILLATE	-	159399	8060	11642	134341	21536	49224	324400	30600	35413	15717	25106	15177	65000	200000	25000	15000	1000	122100
TOTAL	-	1016024	51374	74206	1683222	269832	616752	5193500	402600	349931	584162	933141	149970	130100	430100	125000	75500	55000	255800
REFERENCE POINT COMPOSITION, %																			
LEADED REGULAR	-	1.87	1.87	1.87	5.79	5.79	5.79	4.92	18.18	17.29	12.51	12.51	3.95	-	-	-	-	-	-
UNLEADED REGULAR	-	32.43	32.43	32.43	44.38	44.38	44.38	33.45	33.21	24.93	34.48	34.48	19.34	26.67	22.72	45.36	50.07	27.27	19.00
UNLEADED MID-GRADE	-	6.53	6.53	6.53	4.39	4.39	4.39	5.42	0.25	0.52	0.72	0.72	0.13	-	-	-	-	-	-
UNLEADED PREMIUM	-	19.53	19.53	19.53	10.84	10.84	10.84	16.58	7.43	11.30	15.49	15.49	4.22	15.68	13.35	26.64	29.40	69.09	10.24
KEROSENE JET FUEL	-	8.27	8.27	8.27	7.98	7.98	7.98	14.64	10.48	19.46	16.85	16.85	46.37	7.69	17.44	8.00	0.66	1.82	23.03
DIESEL ON/OFF HWY	-	15.69	15.69	15.69	18.63	18.63	18.63	18.74	22.85	16.38	17.25	17.25	15.87	-	-	-	-	-	-
OTHER DISTILLATE	-	15.69	15.69	15.69	7.98	7.98	7.98	6.25	7.60	10.12	2.69	2.69	10.12	49.96	46.50	20.00	19.87	1.82	47.73
REFERENCE POINT COSTS, DOLLARS PER BARREL																			
LEADED REGULAR	24.28	24.41	24.41	25.54	24.41	25.32	23.96	23.86	24.89	25.24	24.76	25.29	33.26	23.90	22.85	21.91	21.50	19.03	19.03
UNLEADED REGULAR	23.94	24.07	24.07	24.70	23.82	25.11	23.88	23.39	24.89	25.28	24.76	25.29	32.21	23.56	22.51	22.18	21.77	19.30	19.30
UNLEADED MID-GRADE	24.91	25.04	25.04	26.21	25.38	26.42	24.80	24.36	26.11	26.37	25.77	26.30	33.10	-	-	-	-	-	-
UNLEADED PREMIUM	26.59	26.72	26.72	28.94	27.86	28.43	26.31	25.87	27.50	28.09	27.40	27.85	34.48	26.20	25.15	24.83	24.42	21.95	21.95
KEROSENE JET FUEL	24.74	24.87	24.70	24.86	23.99	24.23	23.25	23.31	23.72	24.61	24.72	24.62	25.62	23.47	23.04	22.93	22.36	19.91	19.91
DIESEL ON/OFF HWY	23.18	23.32	23.15	23.94	22.23	22.34	21.95	21.88	22.37	23.72	23.25	22.89	24.11	22.31	22.46	19.99	20.55	18.36	18.36
OTHER DISTILLATE	23.18	23.32	23.15	23.94	22.23	22.34	21.95	21.88	22.37	23.72	23.25	22.89	24.11	22.31	22.46	19.99	20.55	18.36	18.36
COMPOSITE REFERENCE POINT COST, DOLLARS PER BARREL																			
REF POINT COST	-	24.49	24.42	25.42	23.95	24.74	23.62	23.49	24.20	25.05	24.87	25.10	27.19	23.34	22.93	22.51	22.31	21.12	19.26

* THE REFERENCE POINT VOLUME FOR THE FAR EAST IS ACTUALLY AT ZERO. THESE VOLUMES YIELD THE CORRECT REFERENCE POINT COST AT ZERO VOLUME.
DUE TO INDEPENDENT ROUNDING, COSTS MAY NOT ADD TO TOTALS   NATIONAL PETROLEUM COUNCIL   OCTOBER 14, 1992   TIME 15:37

1995 REFERENCE POINT VOLUMES AND COSTS -- FOUNDATION CASE I

REFERENCE POINT VOLUMES*, BARRELS PER DAY

	U.S. REGIONS													FOREIGN REGIONS					
	1	2	3	4	5	6	7	8	9	10	11	12	13	CAN	LATIN	NWE	MED	MID E	FAR E
REG: CONVENTIONAL	-	-	-	-	729740	116981	267386	1928824	164158	42370	70924	113294	39605	-	-	-	-	-	68707
CO NON-ATTAIN	-	-	-	-	43294	6940	15863	150689	27974	35325	59131	94457	18367	-	-	-	-	-	-
REFORMULATED	-	221210	11185	16156	128527	20604	47094	179702	-	53584	89695	143280	-	17304	48909	28232	18944	16864	44367
CO-REFORM	-	214411	10841	15659	-	-	-	46211	-	49456	82784	132240	-	16772	47406	27364	18362	16346	40701
PREM: CONVENTIONAL	-	-	-	-	166747	26730	61098	677695	34580	13675	22891	36566	8459	-	-	-	-	-	22298
CO NON-ATTAIN	-	-	-	-	9892	1586	3625	52945	5893	11401	19085	30486	3923	-	-	-	-	-	-
REFORMULATED	-	89043	4502	6503	29368	4708	10761	63139	-	17294	28949	46244	-	6965	19687	11364	7626	6788	14343
CO-REFORM	-	86306	4364	6303	-	-	-	16236	-	15962	26719	42680	-	6751	19082	11015	7391	6580	13158
KEROSENE JET FUEL	-	83994	4247	6134	134000	21481	49099	760212	42258	58817	98454	157270	43205	10003	74874	10209	7190	6413	48319
DIESEL: ON-HIGHWAY	-	258929	13092	18911	369337	59207	135330	910824	82528	69588	116484	186071	30991	52809	161821	20343	24367	24109	57252
OFF-HIGHWAY	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OTHER DISTILLATE	-	59848	3026	4371	77319	12395	28331	386440	40243	-	-	-	9083	12202	37466	4708	2802	-	-
TOTAL	-	1013740	51257	74037	1688224	270631	618586	5172917	397634	367472	615116	982588	153634	122806	409245	113235	86682	77100	309145

REFERENCE POINT COMPOSITION, %

	1	2	3	4	5	6	7	8	9	10	11	12	13	CAN	LATIN	NWE	MED	MID E	FAR E
REG: CONVENTIONAL	-	-	-	-	43.23	43.23	43.23	37.29	41.28	11.53	11.53	11.53	25.78	-	-	-	-	-	22.22
CO NON-ATTAIN	-	-	-	-	2.56	2.56	2.56	2.91	7.04	9.61	9.61	9.61	11.96	-	-	-	-	-	-
REFORMULATED	-	21.82	21.82	21.82	7.61	7.61	7.61	3.47	-	14.58	14.58	14.58	-	14.09	11.95	24.93	21.85	21.87	14.35
CO-REFORM	-	21.15	21.15	21.15	-	-	-	0.89	-	13.46	13.46	13.46	-	13.66	11.58	24.17	21.18	21.20	13.17
PREM: CONVENTIONAL	-	-	-	-	9.88	9.88	9.88	13.10	8.70	3.72	3.72	3.72	5.51	-	-	-	-	-	7.21
CO NON-ATTAIN	-	-	-	-	0.59	0.59	0.59	1.02	1.48	3.10	3.10	3.10	2.55	-	-	-	-	-	-
REFORMULATED	-	8.78	8.78	8.78	1.74	1.74	1.74	1.22	-	4.71	4.71	4.71	-	5.67	4.81	10.04	8.80	8.80	4.64
CO-REFORM	-	8.51	8.51	8.51	-	-	-	0.31	-	4.34	4.34	4.34	-	5.50	4.66	9.73	8.53	8.53	4.26
KEROSENE JET FUEL	-	8.29	8.29	8.29	7.94	7.94	7.94	14.70	10.63	16.01	16.01	16.01	28.12	8.15	18.30	9.02	8.29	8.32	15.63
DIESEL: ON-HIGHWAY	-	25.54	25.54	25.54	21.88	21.88	21.88	17.61	20.75	18.94	18.94	18.94	20.17	43.00	39.54	17.97	28.11	31.27	18.52
OFF-HIGHWAY	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OTHER DISTILLATE	-	5.90	5.90	5.90	4.58	4.58	4.58	7.47	10.12	-	-	-	5.91	9.94	9.15	4.16	3.23	-	-

REFERENCE POINT COSTS, DOLLARS PER BARREL

	1	2	3	4	5	6	7	8	9	10	11	12	13	CAN	LATIN	NWE	MED	MID E	FAR E
REG: CONVENTIONAL	-	26.16	26.31	27.19	26.43	27.79	26.18	25.80	27.26	27.72	28.02	28.54	35.81	26.78	25.10	25.10	24.37	22.10	22.10
CO NON-ATTAIN	-	25.60	25.76	26.63	25.27	26.64	25.02	25.09	25.79	27.02	27.25	27.77	35.12	26.07	24.38	24.38	23.66	21.39	21.39
REFORMULATED	-	25.97	26.12	26.99	25.85	27.22	25.61	25.43	26.53	27.38	27.62	28.14	35.48	26.41	24.73	24.72	24.00	21.73	21.73
CO-REFORM	-	25.82	25.98	26.85	25.55	26.92	25.31	25.24	26.16	27.20	27.42	27.93	35.30	26.22	24.54	24.54	23.82	21.54	21.54
PREM: CONVENTIONAL	-	28.81	28.96	31.50	30.59	31.21	28.68	28.35	29.90	30.57	30.60	31.03	38.10	29.41	27.73	27.74	27.02	24.74	24.74
CO NON-ATTAIN	-	28.44	28.60	31.13	29.83	30.46	27.92	27.89	28.93	30.11	30.10	30.53	37.64	28.95	27.26	27.27	26.55	24.28	24.28
REFORMULATED	-	28.70	28.86	31.39	30.14	30.77	28.23	28.10	29.46	30.28	30.39	30.82	37.81	29.16	27.47	27.48	26.76	24.49	24.49
CO-REFORM	-	28.60	28.75	31.29	29.94	30.57	28.03	27.97	29.22	30.16	30.25	30.68	37.69	29.03	27.35	27.36	26.64	24.36	24.36
KEROSENE JET FUEL	-	26.73	26.71	27.10	26.46	26.74	25.38	25.63	25.82	26.79	27.54	27.41	28.72	26.31	25.28	25.50	24.62	22.36	22.36
DIESEL: ON-HIGHWAY	-	25.64	25.62	26.67	25.73	25.88	25.14	24.92	25.20	27.43	26.97	26.57	28.70	25.86	25.50	22.86	23.15	21.60	21.60
OFF-HIGHWAY	-	25.11	25.09	26.13	24.62	24.77	24.03	24.14	24.42	25.88	26.01	25.61	27.15	25.10	24.67	22.44	22.73	20.75	20.75
OTHER DISTILLATE	-	25.11	25.09	26.13	24.62	24.77	24.03	24.14	24.42	25.88	26.01	25.61	27.15	25.10	24.67	22.44	22.73	20.75	20.75

COMPOSITE REFERENCE POINT COST, DOLLARS PER BARREL

	1	2	3	4	5	6	7	8	9	10	11	12	13	CAN	LATIN	NWE	MED	MID E	FAR E
REF POINT COST	-	26.33	26.42	27.59	26.62	27.48	26.01	25.85	26.54	27.74	27.90	28.12	31.96	26.31	25.36	24.85	24.20	22.17	22.32

* THE REFERENCE POINT VOLUME FOR THE FAR EAST IS ACTUALLY AT ZERO. THESE VOLUMES YIELD THE CORRECT REFERENCE POINT COST AT ZERO VOLUME.
DUE TO INDEPENDENT ROUNDING, COSTS MAY NOT ADD TO TOTALS NATIONAL PETROLEUM COUNCIL MARCH 3, 1993 TIME 15:17

APP L.IV.3-4

2000 REFERENCE POINT VOLUMES AND COSTS -- FOUNDATION CASE I

	U.S. REGIONS													FOREIGN REGIONS					
	1	2	3	4	5	6	7	8	9	10	11	12	13	CAN	LATIN	NWE	MED	MID E	FAR E
REFERENCE POINT VOLUMES*, BARRELS PER DAY																			
REG: CONVENTIONAL	-	-	-	-	409894	65708	150190	890116	145330	95459	11781	18820	40911	-	-	-	-	-	26027
CO NON-ATTAIN	-	-	-	-	23887	3829	8752	27551	29097	53868	10014	15997	23087	-	-	-	-	-	22123
REFORMULATED	-	219191	11083	16008	447151	71681	163842	1201233	22469	-	296769	474060	-	17311	48879	28309	18877	16825	66075
CO-REFORM	-	212453	10742	15516	21415	3433	7847	180143	-	-	-	-	-	16779	47377	27438	18297	16308	-
PREM: CONVENTIONAL	-	-	-	-	93661	15014	34319	312744	30614	20390	3802	6074	8738	-	-	-	-	-	8476
CO NON-ATTAIN	-	-	-	-	5458	875	2000	9680	6129	11506	3232	5163	4931	-	-	-	-	-	7204
REFORMULATED	-	88229	4461	6444	102175	16379	37438	422055	4733	-	95783	153003	-	6968	19675	11395	7599	6773	21528
CO-REFORM	-	85517	4324	6246	4894	784	1793	63293	-	-	-	-	-	6754	19070	11045	7365	6564	-
KEROSENE JET FUEL	-	84036	4249	6137	134333	21534	49221	760307	42205	100796	98465	157289	43198	10003	75187	9987	7158	6383	36733
DIESEL: ON-HIGHWAY	-	258953	13093	18912	370367	59372	135707	911011	82411	72309	59649	95284	30990	52814	162087	20422	24342	23855	39305
OFF-HIGHWAY	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OTHER DISTILLATE	-	59907	3029	4375	77484	12421	28391	386713	40206	21211	56876	90855	9090	12203	37528	4474	2799	-	-
TOTAL	-	1008286	50981	73639	1690718	271031	619500	5164846	403194	375539	636373	1016543	160945	122832	409803	113070	86437	76708	227471
REFERENCE POINT COMPOSITION, %																			
REG: CONVENTIONAL	-	-	-	-	24.24	24.24	24.24	17.23	36.04	25.42	1.85	1.85	25.42	-	-	-	-	-	11.44
CO NON-ATTAIN	-	-	-	-	1.41	1.41	1.41	0.53	7.22	14.34	1.57	1.57	14.34	-	-	-	-	-	9.73
REFORMULATED	-	21.74	21.74	21.74	26.45	26.45	26.45	23.26	5.57	-	46.63	46.63	-	14.09	11.93	25.04	21.84	21.93	29.05
CO-REFORM	-	21.07	21.07	21.07	1.27	1.27	1.27	3.49	-	-	-	-	-	13.66	11.56	24.27	21.17	21.26	-
PREM: CONVENTIONAL	-	-	-	-	5.54	5.54	5.54	6.06	7.59	5.43	0.60	0.60	5.43	-	-	-	-	-	3.73
CO NON-ATTAIN	-	-	-	-	0.32	0.32	0.32	0.19	1.52	3.06	0.51	0.51	3.06	-	-	-	-	-	3.17
REFORMULATED	-	8.75	8.75	8.75	6.04	6.04	6.04	8.17	1.17	-	15.05	15.05	-	5.67	4.80	10.08	8.79	8.83	9.46
CO-REFORM	-	8.48	8.48	8.48	0.29	0.29	0.29	1.23	-	-	-	-	-	5.50	4.65	9.77	8.52	8.56	-
KEROSENE JET FUEL	-	8.33	8.33	8.33	7.95	7.95	7.95	14.72	10.47	26.84	15.47	15.47	26.84	8.14	18.35	8.83	8.28	8.32	16.15
DIESEL: ON-HIGHWAY	-	25.68	25.68	25.68	21.91	21.91	21.91	17.64	20.44	19.25	9.37	9.37	19.25	43.00	39.55	18.06	28.16	31.10	17.28
OFF-HIGHWAY	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OTHER DISTILLATE	-	5.94	5.94	5.94	4.58	4.58	4.58	7.49	9.97	5.65	8.94	8.94	5.65	9.93	9.16	3.96	3.24	-	-
REFERENCE POINT COSTS, DOLLARS PER BARREL																			
REG: CONVENTIONAL	-	26.24	26.84	28.24	26.78	28.12	26.67	26.02	28.21	28.35	28.19	28.85	37.40	27.75	26.36	26.28	25.44	23.24	23.24
CO NON-ATTAIN	-	25.50	26.10	27.50	25.82	27.16	25.70	25.06	27.08	27.77	26.26	26.92	36.82	27.03	25.65	25.57	24.73	22.52	22.52
REFORMULATED	-	27.86	28.46	29.85	26.80	28.14	26.69	26.70	28.06	28.82	28.93	29.59	37.87	27.37	25.99	25.91	25.07	22.86	22.86
CO-REFORM	-	27.67	28.26	29.66	26.55	27.89	26.44	26.46	27.79	28.67	28.42	29.09	37.72	27.19	25.80	25.73	24.88	22.68	22.68
PREM: CONVENTIONAL	-	28.89	29.49	32.55	30.94	31.54	29.17	28.58	30.87	31.20	30.45	31.03	39.68	30.38	29.00	28.93	28.08	25.88	25.88
CO NON-ATTAIN	-	28.41	29.00	32.06	30.31	30.91	28.54	27.96	30.13	30.82	29.19	29.77	39.31	29.91	28.53	28.46	27.62	25.41	25.41
REFORMULATED	-	30.58	31.18	34.24	31.02	31.62	29.25	29.28	30.65	31.76	31.70	32.27	40.24	30.12	28.74	28.67	27.83	25.62	25.62
CO-REFORM	-	30.46	31.05	34.11	30.86	31.45	29.08	29.11	30.47	31.66	31.36	31.94	40.14	30.00	28.62	28.55	27.71	25.50	25.50
KEROSENE JET FUEL	-	27.62	28.04	28.95	27.29	27.54	26.35	26.23	27.24	27.44	28.32	28.33	30.32	27.28	26.54	26.69	25.68	23.50	23.50
DIESEL: ON-HIGHWAY	-	26.53	26.96	28.53	26.57	26.68	26.10	25.52	26.62	28.07	27.74	27.49	30.30	26.83	26.76	24.18	24.41	23.00	23.00
OFF-HIGHWAY	-	26.00	26.42	27.99	25.46	25.57	24.99	24.74	25.84	26.52	26.79	26.53	28.75	26.07	25.94	23.63	23.80	21.89	21.89
OTHER DISTILLATE	-	26.00	26.42	27.99	25.46	25.57	24.99	24.74	25.84	26.52	26.79	26.53	28.75	26.07	25.94	23.63	23.80	21.89	21.89
COMPOSITE REFERENCE POINT COST, DOLLARS PER BARREL																			
REF POINT COST	-	27.81	28.33	30.03	27.21	28.05	26.74	26.50	27.72	28.09	28.90	29.28	33.74	27.28	26.63	26.07	25.32	23.39	23.45

* THE REFERENCE POINT VOLUME FOR THE FAR EAST IS ACTUALLY AT ZERO. THESE VOLUMES YIELD THE CORRECT REFERENCE POINT COST AT ZERO VOLUME.
DUE TO INDEPENDENT ROUNDING, COSTS MAY NOT ADD TO TOTALS   NATIONAL PETROLEUM COUNCIL   MARCH 3, 1993   TIME 15:17

2010 REFERENCE POINT VOLUMES AND COSTS -- FOUNDATION CASE I

	U.S. REGIONS													FOREIGN REGIONS					
	1	2	3	4	5	6	7	8	9	10	11	12	13	CAN	LATIN	NWE	MED	MID E	FAR E
REFERENCE POINT VOLUMES*, BARRELS PER DAY																			
REG: CONVENTIONAL	-	-	-	-	409894	65708	150190	890116	145330	95459	11781	18820	40911	-	-	-	-	-	27462
CO NON-ATTAIN	-	-	-	-	23887	3829	8752	27551	29097	53868	10014	15997	23087	-	-	-	-	-	23342
REFORMULATED	-	219191	11083	16008	447151	71681	163842	1201233	22469	-	296769	474060	-	17311	48828	28309	18877	16687	69716
CO-REFORM	-	212453	10742	15516	21415	3433	7847	180143	-	-	-	-	-	16779	47327	27438	18297	16174	-
PREM: CONVENTIONAL	-	-	-	-	93661	15014	34319	312744	30614	20390	3802	6074	8738	-	-	-	-	-	8943
CO NON-ATTAIN	-	-	-	-	5458	875	2000	9680	6129	11506	3232	5163	4931	-	-	-	-	-	7601
REFORMULATED	-	88229	4461	6444	102175	16379	37438	422055	4733	-	95783	153003	-	6968	19654	11395	7599	6717	22715
CO-REFORM	-	85517	4324	6246	4894	784	1793	63293	-	-	-	-	-	6754	19050	11045	7365	6511	-
KEROSENE JET FUEL	-	84036	4249	6137	134333	21534	49221	760307	42205	100796	98465	157289	43198	10003	75160	9987	7158	6459	38772
DIESEL: ON-HIGHWAY	-	258953	13093	18912	370367	59372	135707	911011	82411	72309	59649	95284	30990	52814	162030	20422	24342	24134	46015
OFF-HIGHWAY	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OTHER DISTILLATE	-	59907	3029	4375	77484	12421	28391	386713	40206	21211	56876	90855	9090	12203	37514	4474	2799	-	-
TOTAL	-	1008286	50981	73639	1690718	271031	619500	5164846	403194	375539	636373	1016543	160945	122832	409563	113070	86437	76682	244566
REFERENCE POINT COMPOSITION, %																			
REG: CONVENTIONAL	-	-	-	-	24.24	24.24	24.24	17.23	36.04	25.42	1.85	1.85	25.42	-	-	-	-	-	11.23
CO NON-ATTAIN	-	-	-	-	1.41	1.41	1.41	0.53	7.22	14.34	1.57	1.57	14.34	-	-	-	-	-	9.54
REFORMULATED	-	21.74	21.74	21.74	26.45	26.45	26.45	23.26	5.57	-	46.63	46.63	-	14.09	11.92	25.04	21.84	21.76	28.51
CO-REFORM	-	21.07	21.07	21.07	1.27	1.27	1.27	3.49	-	-	-	-	-	13.66	11.56	24.27	21.17	21.09	-
PREM: CONVENTIONAL	-	-	-	-	5.54	5.54	5.54	6.06	7.59	5.43	0.60	0.60	5.43	-	-	-	-	-	3.66
CO NON-ATTAIN	-	-	-	-	0.32	0.32	0.32	0.19	1.52	3.06	0.51	0.51	3.06	-	-	-	-	-	3.11
REFORMULATED	-	8.75	8.75	8.75	6.04	6.04	6.04	8.17	1.17	-	15.05	15.05	-	5.67	4.80	10.08	8.79	8.76	9.29
CO-REFORM	-	8.48	8.48	8.48	0.29	0.29	0.29	1.23	-	-	-	-	-	5.50	4.65	9.77	8.52	8.49	-
KEROSENE JET FUEL	-	8.33	8.33	8.33	7.95	7.95	7.95	14.72	10.47	26.84	15.47	15.47	26.84	8.14	18.35	8.83	8.28	8.42	15.85
DIESEL: ON-HIGHWAY	-	25.68	25.68	25.68	21.91	21.91	21.91	17.64	20.44	19.25	9.37	9.37	19.25	43.00	39.56	18.06	28.16	31.47	18.81
OFF-HIGHWAY	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OTHER DISTILLATE	-	5.94	5.94	5.94	4.58	4.58	4.58	7.49	9.97	5.65	8.94	8.94	5.65	9.93	9.16	3.96	3.24	-	-
REFERENCE POINT COSTS, DOLLARS PER BARREL																			
REG: CONVENTIONAL	-	26.90	27.71	29.51	27.45	28.78	27.34	26.53	29.11	29.07	28.86	29.62	38.78	28.52	27.85	26.91	26.25	24.84	24.84
CO NON-ATTAIN	-	26.16	26.97	28.77	26.49	27.82	26.37	25.58	27.98	28.49	26.93	27.69	38.20	27.80	27.13	26.20	25.53	24.12	24.12
REFORMULATED	-	28.52	29.33	31.12	27.47	28.80	27.36	27.22	28.97	29.54	29.60	30.36	39.25	28.14	27.47	26.54	25.87	24.46	24.46
CO-REFORM	-	28.33	29.14	30.93	27.22	28.55	27.10	26.98	28.69	29.39	29.10	29.85	39.09	27.96	27.29	26.35	25.69	24.28	24.28
PREM: CONVENTIONAL	-	29.55	30.36	33.81	31.61	32.19	29.83	29.09	31.77	31.92	31.12	31.79	41.06	31.15	30.48	29.55	28.89	27.48	27.48
CO NON-ATTAIN	-	29.07	29.88	33.33	30.98	31.56	29.20	28.47	31.04	31.55	29.86	30.53	40.68	30.68	30.01	29.09	28.42	27.01	27.01
REFORMULATED	-	31.24	32.05	35.51	31.70	32.28	29.92	29.80	31.56	32.48	32.37	33.04	41.62	30.89	30.22	29.30	28.63	27.22	27.22
CO-REFORM	-	31.12	31.93	35.38	31.53	32.11	29.75	29.63	31.37	32.38	32.03	32.70	41.52	30.77	30.10	29.17	28.51	27.10	27.10
KEROSENE JET FUEL	-	28.28	28.91	30.22	27.97	28.20	27.02	26.74	28.14	28.16	28.99	29.09	31.70	28.05	28.02	27.32	26.49	25.10	25.10
DIESEL: ON-HIGHWAY	-	27.19	27.83	29.80	27.24	27.34	26.77	26.03	27.53	28.79	28.41	28.25	31.67	27.60	28.29	24.81	25.21	24.67	24.67
OFF-HIGHWAY	-	26.66	27.29	29.26	26.13	26.23	25.66	25.26	26.74	27.24	27.46	27.30	30.12	26.84	27.42	24.26	24.60	23.49	23.49
OTHER DISTILLATE	-	26.66	27.29	29.26	26.13	26.23	25.66	25.26	26.74	27.24	27.46	27.30	30.12	26.84	27.42	24.26	24.60	23.49	23.49
COMPOSITE REFERENCE POINT COST, DOLLARS PER BARREL																			
REF POINT COST	-	28.47	29.21	31.30	27.88	28.71	27.41	27.01	28.62	28.82	29.57	30.05	35.12	28.04	28.12	26.69	26.13	25.01	25.06

* THE REFERENCE POINT VOLUME FOR THE FAR EAST IS ACTUALLY AT ZERO. THESE VOLUMES YIELD THE CORRECT REFERENCE POINT COST AT ZERO VOLUME.
DUE TO INDEPENDENT ROUNDING, COSTS MAY NOT ADD TO TOTALS NATIONAL PETROLEUM COUNCIL MARCH 3, 1993 TIME 15:17

1995 REFERENCE POINT VOLUMES AND COSTS -- FOUNDATION CASE II

	U.S. REGIONS													FOREIGN REGIONS					
	1	2	3	4	5	6	7	8	9	10	11	12	13	CAN	LATIN	NWE	MED	MID E	FAR E
REFERENCE POINT VOLUMES*, BARRELS PER DAY																			
REG: CONVENTIONAL	-	-	-	-	729740	116981	267386	1928824	164158	42370	70924	113294	39605	-	-	-	-	-	25291
CO NON-ATTAIN	-	-	-	-	43294	6940	15863	150689	27974	35325	59131	94457	18367	-	-	-	-	-	-
REFORMULATED	-	221210	11185	16156	128527	20604	47094	179702	-	53584	89695	143280	-	17304	48587	28431	18945	16690	50317
CO-REFORM	-	214411	10841	15659	-	-	-	46211	-	49456	82784	132240	-	16772	47094	27557	18363	16177	46124
PREM: CONVENTIONAL	-	-	-	-	166747	26730	61098	677695	3458D	13675	22891	36566	8459	-	-	-	-	-	77779
CO NON-ATTAIN	-	-	-	-	9892	1586	3625	52945	5893	11401	19085	30486	3923	-	-	-	-	-	-
REFORMULATED	-	89043	4502	6503	29368	4708	10761	63139	-	17294	28949	46244	-	6965	19558	11444	7626	6718	16267
CO-REFORM	-	86306	4364	6303	-	-	-	16236	-	15962	26719	42680	-	6751	18956	11092	7392	6511	14911
KEROSENE JET FUEL	-	83994	4247	6134	134000	21481	49099	760212	42258	58817	98454	157270	43205	10003	75172	10282	7190	6455	57646
DIESEL: ON-HIGHWAY	-	258929	13092	18911	369337	59207	135330	910824	82528	69588	116484	186071	30991	52809	162232	20211	24368	24120	77855
OFF-HIGHWAY	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OTHER DISTILLATE	-	59848	3026	4371	77319	12395	28331	386440	40243	-	-	-	9083	12202	37561	4428	2802	-	-
TOTAL	-	1013740	51257	74037	1688224	270631	618586	5172917	397634	367472	615116	982588	153634	122806	409160	113445	86686	76671	366190
REFERENCE POINT COMPOSITION, %																			
REG: CONVENTIONAL	-	-	-	-	43.23	43.23	43.23	37.29	41.28	11.53	11.53	11.53	25.78	-	-	-	-	-	6.91
CO NON-ATTAIN	-	-	-	-	2.56	2.56	2.56	2.91	7.04	9.61	9.61	9.61	11.96	-	-	-	-	-	-
REFORMULATED	-	21.82	21.82	21.82	7.61	7.61	7.61	3.47	-	14.58	14.58	14.58	-	14.09	11.87	25.06	21.85	21.77	13.74
CO-REFORM	-	21.15	21.15	21.15	-	-	-	0.89	-	13.46	13.46	13.46	-	13.66	11.51	24.29	21.18	21.10	12.60
PREM: CONVENTIONAL	-	-	-	-	9.88	9.88	9.88	13.10	8.70	3.72	3.72	3.72	5.51	-	-	-	-	-	21.24
CO NON-ATTAIN	-	-	-	-	0.59	0.59	0.59	1.02	1.48	3.10	3.10	3.10	2.55	-	-	-	-	-	-
REFORMULATED	-	8.78	8.78	8.78	1.74	1.74	1.74	1.22	-	4.71	4.71	4.71	-	5.67	4.78	10.09	8.80	8.76	4.44
CO-REFORM	-	8.51	8.51	8.51	-	-	-	0.31	-	4.34	4.34	4.34	-	5.50	4.63	9.78	8.53	8.49	4.07
KEROSENE JET FUEL	-	8.29	8.29	8.29	7.94	7.94	7.94	14.70	10.63	16.01	16.01	16.01	28.12	8.15	18.37	9.06	8.29	8.42	15.74
DIESEL: ON-HIGHWAY	-	25.54	25.54	25.54	21.88	21.88	21.88	17.61	20.75	18.94	18.94	18.94	20.17	43.00	39.65	17.82	28.11	31.46	21.26
OFF-HIGHWAY	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OTHER DISTILLATE	-	5.90	5.90	5.90	4.58	4.58	4.58	7.47	10.12	-	-	-	5.91	9.94	9.18	3.90	3.23	-	-
REFERENCE POINT COSTS, DOLLARS PER BARREL																			
REG: CONVENTIONAL	-	26.16	26.31	27.19	26.43	27.79	26.18	25.80	27.26	27.72	28.02	28.54	35.81	26.78	25.35	25.13	24.42	22.16	22.16
CO NON-ATTAIN	-	25.60	25.76	26.63	25.27	26.64	25.02	25.09	25.79	27.02	27.25	27.77	35.12	26.07	24.64	24.42	23.70	21.44	21.44
REFORMULATED	-	25.97	26.12	26.99	25.85	27.22	25.61	25.43	26.53	27.38	27.62	28.14	35.48	26.41	24.98	24.76	24.04	21.79	21.79
CD-REFORM	-	25.82	25.98	26.85	25.55	26.92	25.31	25.24	26.16	27.20	27.42	27.93	35.30	26.23	24.79	24.57	23.86	21.60	21.60
PREM: CONVENTIONAL	-	28.81	28.96	31.50	30.59	31.21	28.68	28.35	29.90	30.57	30.60	31.03	38.10	29.42	27.98	27.77	27.06	24.80	24.80
CO NON-ATTAIN	-	28.44	28.60	31.13	29.83	30.46	27.92	27.89	28.93	30.11	3D.10	30.53	37.64	28.95	27.52	27.31	26.59	24.34	24.34
REFORMULATED	-	28.70	28.86	31.39	30.14	30.77	28.23	28.10	29.46	30.28	30.39	30.82	37.81	29.16	27.73	27.52	26.80	24.55	24.55
CO-REFORM	-	28.60	28.75	31.29	29.94	30.57	28.03	27.97	29.22	30.16	30.25	30.68	37.69	29.04	27.60	27.39	26.68	24.42	24.42
KEROSENE JET FUEL	-	26.73	26.71	27.10	26.46	26.74	25.38	25.63	25.82	26.79	27.54	27.41	28.72	26.32	25.53	25.54	24.66	22.42	22.42
DIESEL: ON-HIGHWAY	-	25.64	25.62	26.67	25.73	25.88	25.14	24.92	25.20	27.43	26.97	26.57	28.70	25.85	25.80	22.89	23.19	21.41	21.41
OFF-HIGHWAY	-	25.11	25.09	26.13	24.62	24.77	24.03	24.14	24.42	25.88	26.01	25.61	27.15	25.11	24.93	22.47	22.77	20.81	20.81
OTHER DISTILLATE	-	25.11	25.09	26.13	24.62	24.77	24.03	24.14	24.42	25.88	26.01	25.61	27.15	25.11	24.93	22.47	22.77	20.81	20.81
COMPOSITE REFERENCE POINT COST, DOLLARS PER BARREL																			
REF POINT COST	-	26.33	26.42	27.59	26.62	27.48	26.01	25.85	26.54	27.74	27.90	28.12	31.96	26.31	25.63	24.90	24.24	22.15	22.68

* THE REFERENCE POINT VOLUME FOR THE FAR EAST IS ACTUALLY AT ZERO. THESE VOLUMES YIELD THE CORRECT REFERENCE POINT COST AT ZERO VOLUME.
DUE TO INDEPENDENT ROUNDING, COSTS MAY NOT ADD TO TOTALS   NATIONAL PETROLEUM COUNCIL   MARCH 18, 1993   TIME 9:41

APP L.IV.3-7

2000 REFERENCE POINT VOLUMES AND COSTS -- FOUNDATION CASE II

	U.S. REGIONS													FOREIGN REGIONS					
	1	2	3	4	5	6	7	8	9	10	11	12	13	CAN	LATIN	NWE	MED	MID E	FAR E
REFERENCE POINT VOLUMES*, BARRELS PER DAY																			
REG: CONVENTIONAL	-	-	-	-	409894	65708	150190	890116	145330	95459	11781	18820	40911	-	-	-	-	-	27478
CO NON-ATTAIN	-	-	-	-	23887	3829	8752	27551	29097	53868	10014	15997	23087	-	-	-	-	-	23356
REFORMULATED	-	219191	11083	16008	447151	71681	163842	1201233	22469	-	296769	474060	-	17314	46937	28334	18887	16700	69757
CO-REFORM	-	212453	10742	15516	21415	3433	7847	180143	-	-	-	-	-	16782	45494	27464	18306	16187	-
PREM: CONVENTIONAL	-	-	-	-	93661	15014	34319	312744	30614	20390	3802	6074	8738	-	-	-	-	-	8948
CO NON-ATTAIN	-	-	-	-	5458	875	2000	9680	6129	11506	3232	5163	4931	-	-	-	-	-	7606
REFORMULATED	-	88229	4461	6444	102175	16379	37438	422055	4733	-	95783	153003	-	6969	18893	11405	7602	6722	22728
CO-REFORM	-	85517	4324	6246	4894	784	1793	63293	-	-	-	-	-	6755	18312	11055	7369	6516	-
KEROSENE JET FUEL	-	84036	4249	6137	134333	21534	49221	760307	42205	100796	98465	157289	43198	10003	75266	9985	7158	6458	38728
DIESEL: ON-HIGHWAY	-	258953	13093	18912	370367	59372	135707	911011	82411	72309	59649	95284	30990	52815	162257	20418	24345	24130	45963
OFF-HIGHWAY	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OTHER DISTILLATE	-	59907	3029	4375	77484	12421	28391	386713	40206	21211	56876	90855	9090	12203	37567	4473	2799	-	-
TOTAL	-	1008286	50981	73639	1690718	271031	619500	5164846	403194	375539	636373	1016543	160945	122841	404726	113134	86466	76713	244564
REFERENCE POINT COMPOSITION, %																			
REG: CONVENTIONAL	-	-	-	-	24.24	24.24	24.24	17.23	36.04	25.42	1.85	1.85	25.42	-	-	-	-	-	11.24
CO NON-ATTAIN	-	-	-	-	1.41	1.41	1.41	0.53	7.22	14.34	1.57	1.57	14.34	-	-	-	-	-	9.55
REFORMULATED	-	21.74	21.74	21.74	26.45	26.45	26.45	23.26	5.57	-	46.63	46.63	-	14.09	11.60	25.04	21.84	21.77	28.52
CO-REFORM	-	21.07	21.07	21.07	1.27	1.27	1.27	3.49	-	-	-	-	-	13.66	11.24	24.28	21.17	21.10	-
PREM: CONVENTIONAL	-	-	-	-	5.54	5.54	5.54	6.06	7.59	5.43	0.60	0.60	5.43	-	-	-	-	-	3.66
CO NON-ATTAIN	-	-	-	-	0.32	0.32	0.32	0.19	1.52	3.06	0.51	0.51	3.06	-	-	-	-	-	3.11
REFORMULATED	-	8.75	8.75	8.75	6.04	6.04	6.04	8.17	1.17	-	15.05	15.05	-	5.67	4.67	10.08	8.79	8.76	9.29
CO-REFORM	-	8.48	8.48	8.48	0.29	0.29	0.29	1.23	-	-	-	-	-	5.50	4.52	9.77	8.52	8.49	-
KEROSENE JET FUEL	-	8.33	8.33	8.33	7.95	7.95	7.95	14.72	10.47	26.84	15.47	15.47	26.84	8.14	18.60	8.83	8.28	8.42	15.84
DIESEL: ON-HIGHWAY	-	25.68	25.68	25.68	21.91	21.91	21.91	17.64	20.44	19.25	9.37	9.37	19.25	42.99	40.09	18.05	28.16	31.45	18.79
OFF-HIGHWAY	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OTHER DISTILLATE	-	5.94	5.94	5.94	4.58	4.58	4.58	7.49	9.97	5.65	8.94	8.94	5.65	9.93	9.28	3.95	3.24	-	-
REFERENCE POINT COSTS, DOLLARS PER BARREL																			
REG: CONVENTIONAL	-	26.24	26.84	28.24	26.78	28.12	26.67	26.02	28.21	28.35	28.19	28.85	37.40	27.79	26.28	26.34	25.58	23.13	23.13
CO NON-ATTAIN	-	25.50	26.10	27.50	25.82	27.16	25.70	25.06	27.08	27.77	26.26	26.92	36.82	27.07	25.57	25.63	24.86	22.42	22.42
REFORMULATED	-	27.86	28.46	29.85	26.80	28.14	26.69	26.70	28.06	28.82	28.93	29.59	37.87	27.41	25.91	25.97	25.20	22.76	22.76
CO-REFORM	-	27.67	28.26	29.66	26.55	27.89	26.44	26.46	27.79	28.67	28.42	29.09	37.72	27.23	25.72	25.78	25.02	22.57	22.57
PREM: CONVENTIONAL	-	28.89	29.49	32.55	30.94	31.54	29.17	28.58	30.87	31.20	30.45	31.03	39.68	30.42	28.91	28.99	28.22	25.77	25.77
CO NON-ATTAIN	-	28.41	29.00	32.06	30.31	30.91	28.54	27.96	30.13	30.82	29.19	29.77	39.31	29.95	28.44	28.52	27.75	25.31	25.31
REFORMULATED	-	30.58	31.18	34.24	31.02	31.62	29.25	29.28	30.65	31.76	31.70	32.27	40.24	30.16	28.65	28.73	27.96	25.52	25.52
CO-REFORM	-	30.46	31.05	34.11	30.86	31.45	29.08	29.11	30.47	31.66	31.36	31.94	40.14	30.04	28.53	28.61	27.84	25.39	25.39
KEROSENE JET FUEL	-	27.62	28.04	28.95	27.29	27.54	26.35	26.23	27.24	27.44	28.32	28.33	30.32	27.32	26.46	26.75	25.82	23.39	23.39
DIESEL: ON-HIGHWAY	-	26.53	26.96	28.53	26.57	26.68	26.10	25.52	26.62	28.07	27.74	27.49	30.30	26.86	26.73	24.19	24.45	22.48	22.48
OFF-HIGHWAY	-	26.00	26.42	27.99	25.46	25.57	24.99	24.74	25.84	26.52	26.79	26.53	28.75	26.11	25.85	23.69	23.93	21.78	21.78
OTHER DISTILLATE	-	26.00	26.42	27.99	25.46	25.57	24.99	24.74	25.84	26.52	26.79	26.53	28.75	26.11	25.85	23.69	23.93	21.78	21.78
COMPOSITE REFERENCE POINT COST, DOLLARS PER BARREL																			
REF POINT COST	-	27.81	28.33	30.03	27.21	28.05	26.74	26.50	27.72	28.09	28.90	29.28	33.74	27.31	26.56	26.12	25.43	23.15	23.26

* THE REFERENCE POINT VOLUME FOR THE FAR EAST IS ACTUALLY AT ZERO. THESE VOLUMES YIELD THE CORRECT REFERENCE POINT COST AT ZERO VOLUME.
DUE TO INDEPENDENT ROUNDING, COSTS MAY NOT ADD TO TOTALS   NATIONAL PETROLEUM COUNCIL   MARCH 18, 1993   TIME 9:41

APP L.IV3-8

2010 REFERENCE POINT VOLUMES AND COSTS -- FOUNDATION CASE II

	U.S. REGIONS													FOREIGN REGIONS					
	1	2	3	4	5	6	7	8	9	10	11	12	13	CAN	LATIN	NWE	MED	MID E	FAR E
REFERENCE POINT VOLUMES*, BARRELS PER DAY																			
REG: CONVENTIONAL	-	-	-	-	409894	65708	150190	890116	145330	95459	11781	18820	40911	-	-	-	-	-	27478
CO NON-ATTAIN	-	-	-	-	23887	3829	8752	27551	29097	53868	10014	15997	23087	-	-	-	-	-	23356
REFORMULATED	-	219191	11083	16008	447151	71681	163842	1201233	22469	-	296769	474060	-	17314	46937	28334	18887	16700	69757
CO-REFORM	-	212453	10742	15516	21415	3433	7847	180143	-	-	-	-	-	16782	45494	27464	18306	16187	-
PREM: CONVENTIONAL	-	-	-	-	93661	15014	34319	312744	30614	20390	3802	6074	8738	-	-	-	-	-	8948
CO NON-ATTAIN	-	-	-	-	5458	875	2000	9680	6129	11506	3232	5163	4931	-	-	-	-	-	7606
REFORMULATED	-	88229	4461	6444	102175	16379	37438	422055	4733	-	95783	153003	-	6969	18893	11405	7602	6722	22728
CO-REFORM	-	85517	4324	6246	4894	784	1793	63293	-	-	-	-	-	6755	18312	11055	7369	6516	-
KEROSENE JET FUEL	-	84036	4249	6137	134333	21534	49221	760307	42205	100796	98465	157289	43198	10003	75266	9985	7158	6458	38728
DIESEL: ON-HIGHWAY	-	258953	13093	18912	370367	59372	135707	911011	82411	72309	59649	95284	30990	52815	162257	20418	24345	24130	45963
OFF-HIGHWAY	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OTHER DISTILLATE	-	59907	3029	4375	77484	12421	28391	386713	40206	21211	56876	90855	9090	12203	37567	4473	2799	-	-
TOTAL	-	1008286	50981	73639	1690718	271031	619500	5164846	403194	375539	636373	1016543	160945	122841	404726	113134	86466	76713	244564
REFERENCE POINT COMPOSITION, %																			
REG: CONVENTIONAL	-	-	-	-	24.24	24.24	24.24	17.23	36.04	25.42	1.85	1.85	25.42	-	-	-	-	-	11.24
CO NON-ATTAIN	-	-	-	-	1.41	1.41	1.41	0.53	7.22	14.34	1.57	1.57	14.34	-	-	-	-	-	9.55
REFORMULATED	-	21.74	21.74	21.74	26.45	26.45	26.45	23.26	5.57	-	46.63	46.63	-	14.09	11.60	25.04	21.84	21.77	28.52
CO-REFORM	-	21.07	21.07	21.07	1.27	1.27	1.27	3.49	-	-	-	-	-	13.66	11.24	24.28	21.17	21.10	-
PREM: CONVENTIONAL	-	-	-	-	5.54	5.54	5.54	6.06	7.59	5.43	0.60	0.60	5.43	-	-	-	-	-	3.66
CO NON-ATTAIN	-	-	-	-	0.32	0.32	0.32	0.19	1.52	3.06	0.51	0.51	3.06	-	-	-	-	-	3.11
REFORMULATED	-	8.75	8.75	8.75	6.04	6.04	6.04	8.17	1.17	-	15.05	15.05	-	5.67	4.67	10.08	8.79	8.76	9.29
CO-REFORM	-	8.48	8.48	8.48	0.29	0.29	0.29	1.23	-	-	-	-	-	5.50	4.52	9.77	8.52	8.49	-
KEROSENE JET FUEL	-	8.33	8.33	8.33	7.95	7.95	7.95	14.72	10.47	26.84	15.47	15.47	26.84	8.14	18.60	8.83	8.28	8.42	15.84
DIESEL: ON-HIGHWAY	-	25.68	25.68	25.68	21.91	21.91	21.91	17.64	20.44	19.25	9.37	9.37	19.25	42.99	40.09	18.05	28.16	31.45	18.79
OFF-HIGHWAY	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OTHER DISTILLATE	-	5.94	5.94	5.94	4.58	4.58	4.58	7.49	9.97	5.65	8.94	8.94	5.65	9.93	9.28	3.95	3.24	-	-
REFERENCE POINT COSTS, DOLLARS PER BARREL																			
REG: CONVENTIONAL	-	26.90	27.71	29.51	27.45	28.78	27.34	26.53	29.11	29.07	28.86	29.62	38.78	28.46	27.53	26.94	26.40	24.37	24.37
CO NON-ATTAIN	-	26.16	26.97	28.77	26.49	27.82	26.37	25.58	27.98	28.49	26.93	27.69	38.20	27.74	26.82	26.23	25.69	23.65	23.65
REFORMULATED	-	28.52	29.33	31.12	27.47	28.80	27.36	27.22	28.97	29.54	29.60	30.36	39.25	28.08	27.16	26.57	26.03	23.99	23.99
CO-REFORM	-	28.33	29.14	30.93	27.22	28.55	27.10	26.98	28.69	29.39	29.10	29.85	39.09	27.90	26.97	26.38	25.84	23.81	23.81
PREM: CONVENTIONAL	-	29.55	30.36	33.81	31.61	32.19	29.83	29.09	31.77	31.92	31.12	31.79	41.06	31.09	30.16	29.59	29.05	27.01	27.01
CO NON-ATTAIN	-	29.07	29.88	33.33	30.98	31.56	29.20	28.47	31.04	31.55	29.86	30.53	40.68	30.62	29.70	29.12	28.58	26.54	26.54
REFORMULATED	-	31.24	32.05	35.51	31.70	32.28	29.92	29.80	31.56	32.48	32.37	33.04	41.62	30.83	29.91	29.33	28.79	26.75	26.75
CO-REFORM	-	31.12	31.93	35.38	31.53	32.11	29.75	29.63	31.37	32.38	32.03	32.70	41.52	30.71	29.78	29.21	28.67	26.63	26.63
KEROSENE JET FUEL	-	28.28	28.91	30.22	27.97	28.20	27.02	26.74	28.14	28.16	28.99	29.09	31.70	27.99	27.71	27.35	26.64	24.63	24.63
DIESEL: ON-HIGHWAY	-	27.19	27.83	29.80	27.24	27.34	26.77	26.03	27.53	28.79	28.41	28.25	31.67	27.52	27.98	24.79	25.28	23.72	23.72
OFF-HIGHWAY	-	26.66	27.29	29.26	26.13	26.23	25.66	25.26	26.74	27.24	27.46	27.30	30.12	26.78	27.10	24.29	24.76	23.02	23.02
OTHER DISTILLATE	-	26.66	27.29	29.26	26.13	26.23	25.66	25.26	26.74	27.24	27.46	27.30	30.12	26.78	27.10	24.29	24.76	23.02	23.02
COMPOSITE REFERENCE POINT COST, DOLLARS PER BARREL																			
REF POINT COST	-	28.47	29.21	31.30	27.88	28.71	27.41	27.01	28.62	28.82	29.57	30.05	35.12	27.98	27.81	26.72	26.26	24.39	24.50

* THE REFERENCE POINT VOLUME FOR THE FAR EAST IS ACTUALLY AT ZERO. THESE VOLUMES YIELD THE CORRECT REFERENCE POINT COST AT ZERO VOLUME.
DUE TO INDEPENDENT ROUNDING, COSTS MAY NOT ADD TO TOTALS   NATIONAL PETROLEUM COUNCIL   MARCH 18, 1993   TIME 9:41

APP L.IV.3-9

1995 REFERENCE POINT VOLUMES AND COSTS -- FOUNDATION CASE III

	U.S. REGIONS													FOREIGN REGIONS					
	1	2	3	4	5	6	7	8	9	10	11	12	13	CAN	LATIN	NWE	MED	MID E	FAR E
REFERENCE POINT VOLUMES*, BARRELS PER DAY																			
REG: CONVENTIONAL	-	-	-	-	729740	116981	267386	1928824	164158	42370	70924	113294	39605	-	-	-	-	-	25291
CO NON-ATTAIN	-	-	-	-	43294	6940	15863	150689	27974	35325	59131	94457	18367	-	-	-	-	-	-
REFORMULATED	-	221210	11185	16156	128527	20604	47094	179702	-	53584	89695	143280	-	17304	48587	28431	18945	16690	50317
CO-REFORM	-	214411	10841	15659	-	-	-	46211	-	49456	82784	132240	-	16772	47094	27557	18363	16177	46124
PREM: CONVENTIONAL	-	-	-	-	166747	26730	61098	677695	34580	13675	22891	36566	8459	-	-	-	-	-	77779
CO NON-ATTAIN	-	-	-	-	9892	1586	3625	52945	5893	11401	19085	30486	3923	-	-	-	-	-	-
REFORMULATED	-	89043	4502	6503	29368	4708	10761	63139	-	17294	28949	46244	-	6965	19558	11444	7626	6718	16267
CO-REFORM	-	86306	4364	6303	-	-	-	16236	-	15962	26719	42680	-	6751	18956	11092	7392	6511	14911
KEROSENE JET FUEL	-	83994	4247	6134	134000	21481	49099	760212	42258	58817	98454	157270	43205	10003	75172	10282	7190	6455	57646
DIESEL: ON-HIGHWAY	-	258929	13092	18911	369337	59207	135330	910824	82528	69588	116484	186071	30991	52809	162232	20211	24368	24120	77855
OFF-HIGHWAY	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OTHER DISTILLATE	-	59848	3026	4371	77319	12395	28331	386440	40243	-	-	-	9083	12202	37561	4428	2802	-	-
TOTAL	-	1013740	51257	74037	1688224	270631	618586	5172917	397634	367472	615116	982588	153634	122806	409160	113445	86686	76671	366190
REFERENCE POINT COMPOSITION, %																			
REG: CONVENTIONAL	-	-	-	-	43.23	43.23	43.23	37.29	41.28	11.53	11.53	11.53	25.78	-	-	-	-	-	6.91
CO NON-ATTAIN	-	-	-	-	2.56	2.56	2.56	2.91	7.04	9.61	9.61	9.61	11.96	-	-	-	-	-	-
REFORMULATED	-	21.82	21.82	21.82	7.61	7.61	7.61	3.47	-	14.58	14.58	14.58	-	14.09	11.87	25.06	21.85	21.77	13.74
CO-REFORM	-	21.15	21.15	21.15	-	-	-	0.89	-	13.46	13.46	13.46	-	13.66	11.51	24.29	21.18	21.10	12.60
PREM: CONVENTIONAL	-	-	-	-	9.88	9.88	9.88	13.10	8.70	3.72	3.72	3.72	5.51	-	-	-	-	-	21.24
CO NON-ATTAIN	-	-	-	-	0.59	0.59	0.59	1.02	1.48	3.10	3.10	3.10	2.55	-	-	-	-	-	-
REFORMULATED	-	8.78	8.78	8.78	1.74	1.74	1.74	1.22	-	4.71	4.71	4.71	-	5.67	4.78	10.09	8.80	8.76	4.44
CO-REFORM	-	8.51	8.51	8.51	-	-	-	0.31	-	4.34	4.34	4.34	-	5.50	4.63	9.78	8.53	8.49	4.07
KEROSENE JET FUEL	-	8.29	8.29	8.29	7.94	7.94	7.94	14.70	10.63	16.01	16.01	16.01	28.12	8.15	18.37	9.06	8.29	8.42	15.74
DIESEL: ON-HIGHWAY	-	25.54	25.54	25.54	21.88	21.88	21.88	17.61	20.75	18.94	18.94	18.94	20.17	43.00	39.65	17.82	28.11	31.46	21.26
OFF-HIGHWAY	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OTHER DISTILLATE	-	5.90	5.90	5.90	4.58	4.58	4.58	7.47	10.12	-	-	-	5.91	9.94	9.18	3.90	3.23	-	-
REFERENCE POINT COSTS, DOLLARS PER BARREL																			
REG: CONVENTIONAL	-	26.16	26.31	27.19	26.43	27.79	26.18	25.80	27.26	27.72	28.02	28.54	35.81	26.78	25.42	25.13	24.42	21.95	21.95
CO NON-ATTAIN	-	25.60	25.76	26.63	25.27	26.64	25.02	25.09	25.79	27.02	27.25	27.77	35.12	26.07	24.70	24.42	23.70	21.23	21.23
REFORMULATED	-	25.97	26.12	26.99	25.85	27.22	25.61	25.43	26.53	27.38	27.62	28.14	35.48	26.41	25.04	24.76	24.04	21.58	21.58
CO-REFORM	-	25.82	25.98	26.85	25.55	26.92	25.31	25.24	26.16	27.20	27.42	27.93	35.30	26.23	24.86	24.57	23.86	21.39	21.39
PREM: CONVENTIONAL	-	28.81	28.96	31.50	30.59	31.21	28.68	28.35	29.90	30.57	30.60	31.03	38.10	29.42	28.05	27.77	27.06	24.59	24.59
CO NON-ATTAIN	-	28.44	28.60	31.13	29.83	30.46	27.92	27.89	28.93	30.11	30.10	30.53	37.64	28.95	27.58	27.31	26.59	24.13	24.13
REFORMULATED	-	28.70	28.86	31.39	30.14	30.77	28.23	28.10	29.46	30.28	30.39	30.82	37.81	29.16	27.79	27.52	26.80	24.34	24.34
CO-REFORM	-	28.60	28.75	31.29	29.94	30.57	28.03	27.97	29.22	30.16	30.25	30.68	37.69	29.04	27.67	27.39	26.68	24.21	24.21
KEROSENE JET FUEL	-	26.73	26.71	27.10	26.46	26.74	25.38	25.63	25.82	26.79	27.54	27.41	28.72	26.32	25.60	25.54	24.66	22.21	22.21
DIESEL: ON-HIGHWAY	-	25.64	25.62	26.67	25.73	25.88	25.14	24.92	25.20	27.43	26.97	26.57	28.70	25.85	25.80	22.89	23.19	21.44	21.44
OFF-HIGHWAY	-	25.11	25.09	26.13	24.62	24.77	24.03	24.14	24.42	25.88	26.01	25.61	27.15	25.11	24.99	22.47	22.77	20.60	20.60
OTHER DISTILLATE	-	25.11	25.09	26.13	24.62	24.77	24.03	24.14	24.42	25.88	26.01	25.61	27.15	25.11	24.99	22.47	22.77	20.60	20.60
COMPOSITE REFERENCE POINT COST, DOLLARS PER BARREL																			
REF POINT COST	-	26.33	26.42	27.59	26.62	27.48	26.01	25.85	26.54	27.74	27.90	28.12	31.96	26.31	25.67	24.90	24.24	22.01	22.52

* THE REFERENCE POINT VOLUME FOR THE FAR EAST IS ACTUALLY AT ZERO. THESE VOLUMES YIELD THE CORRECT REFERENCE POINT COST AT ZERO VOLUME.
DUE TO INDEPENDENT ROUNDING, COSTS MAY NOT ADD TO TOTALS   NATIONAL PETROLEUM COUNCIL   MARCH 15, 1993   TIME 10:41

APP L.IV.3-10

2000 REFERENCE POINT VOLUMES AND COSTS -- FOUNDATION CASE III

REFERENCE POINT VOLUMES*, BARRELS PER DAY

	U.S. REGIONS 1	2	3	4	5	6	7	8	9	10	11	12	13	FOREIGN REGIONS CAN	LATIN	NWE	MED	MID E	FAR E
REG: CONVENTIONAL	-	-	-	-	409894	65708	150190	890116	145330	42370	11781	18820	40911	-	-	-	-	-	27478
CO NON-ATTAIN	-	-	-	-	23887	3829	8752	27551	29097	35325	10014	15997	23087	-	-	-	-	-	23356
REFORMULATED	-	219191	11083	16008	447151	71681	163842	1201233	22469	53584	296769	474060	-	17314	46937	28334	18887	16700	69757
CO-REFORM	-	212453	10742	15516	21415	3433	7847	180143	-	49456	-	-	-	16782	45494	27464	18306	16187	-
PREM: CONVENTIONAL	-	-	-	-	93661	15014	34319	312744	30614	13675	3802	6074	8738	-	-	-	-	-	8948
CO NON-ATTAIN	-	-	-	-	5458	875	2000	9680	6129	11401	3232	5163	4931	-	-	-	-	-	7606
REFORMULATED	-	88229	4461	6444	102175	16379	37438	422055	4733	17294	95783	153003	-	6969	18893	11405	7602	6722	22728
CO-REFORM	-	85517	4324	6246	4894	784	1793	63293	-	15962	-	-	-	6755	18312	11055	7369	6516	-
KEROSENE JET FUEL	-	84036	4249	6137	134333	21534	49221	760307	42205	58817	98465	157289	43198	10003	75266	9985	7158	6458	38728
DIESEL: ON-HIGHWAY	-	258953	13093	18912	370367	59372	135707	911011	82411	69588	59649	95284	30990	52815	162257	20418	24345	24130	45963
OFF-HIGHWAY	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OTHER DISTILLATE	-	59907	3029	4375	77484	12421	28391	386713	40206	-	56876	90855	9090	12203	37567	4473	2799	-	-
TOTAL	-	1008286	50981	73639	1690718	271031	619500	5164846	403194	367472	636373	1016543	160945	122841	404726	113134	86466	76713	244564

REFERENCE POINT COMPOSITION, %

	1	2	3	4	5	6	7	8	9	10	11	12	13	CAN	LATIN	NWE	MED	MID E	FAR E
REG: CONVENTIONAL	-	-	-	-	24.24	24.24	24.24	17.23	36.04	11.53	1.85	1.85	25.42	-	-	-	-	-	11.24
CO NON-ATTAIN	-	-	-	-	1.41	1.41	1.41	0.53	7.22	9.61	1.57	1.57	14.34	-	-	-	-	-	9.55
REFORMULATED	-	21.74	21.74	21.74	26.45	26.45	26.45	23.26	5.57	14.58	46.63	46.63	-	14.09	11.60	25.04	21.84	21.77	28.52
CO-REFORM	-	21.07	21.07	21.07	1.27	1.27	1.27	3.49	-	13.46	-	-	-	13.66	11.24	24.28	21.17	21.10	-
PREM: CONVENTIONAL	-	-	-	-	5.54	5.54	5.54	6.06	7.59	3.72	0.60	0.60	5.43	-	-	-	-	-	3.66
CO NON-ATTAIN	-	-	-	-	0.32	0.32	0.32	0.19	1.52	3.10	0.51	0.51	3.06	-	-	-	-	-	3.11
REFORMULATED	-	8.75	8.75	8.75	6.04	6.04	6.04	8.17	1.17	4.71	15.05	15.05	-	5.67	4.67	10.08	8.79	8.76	9.29
CO-REFORM	-	8.48	8.48	8.48	0.29	0.29	0.29	1.23	-	4.34	-	-	-	5.50	4.52	9.77	8.52	8.49	-
KEROSENE JET FUEL	-	8.33	8.33	8.33	7.95	7.95	7.95	14.72	10.47	16.01	15.47	15.47	26.84	8.14	18.60	8.83	8.28	8.42	15.84
DIESEL: ON-HIGHWAY	-	25.68	25.68	25.68	21.91	21.91	21.91	17.64	20.44	18.94	9.37	9.37	19.25	42.99	40.09	18.05	28.16	31.45	18.79
OFF-HIGHWAY	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OTHER DISTILLATE	-	5.94	5.94	5.94	4.58	4.58	4.58	7.49	9.97	-	8.94	8.94	5.65	9.93	9.28	3.95	3.24	-	-

REFERENCE POINT COSTS, DOLLARS PER BARREL

	1	2	3	4	5	6	7	8	9	10	11	12	13	CAN	LATIN	NWE	MED	MID E	FAR E
REG: CONVENTIONAL	-	26.24	26.84	28.24	26.78	28.12	26.67	26.02	28.21	28.71	28.19	28.85	37.85	27.77	26.27	26.26	25.55	23.09	23.09
CO NON-ATTAIN	-	25.50	26.10	27.50	25.82	27.16	25.70	25.06	27.08	28.13	26.26	26.92	37.27	27.06	25.56	25.54	24.83	22.38	22.38
REFORMULATED	-	27.86	28.46	29.85	26.80	28.14	26.69	26.70	28.06	29.18	28.93	29.59	38.32	27.40	25.90	25.89	25.17	22.72	22.72
CO-REFORM	-	27.67	28.26	29.66	26.55	27.89	26.44	26.46	27.79	29.03	28.42	29.09	38.17	27.21	25.71	25.70	24.99	22.53	22.53
PREM: CONVENTIONAL	-	28.89	29.49	32.55	30.94	31.54	29.17	28.58	30.87	31.57	30.45	31.03	40.14	30.40	28.90	28.90	28.19	25.73	25.73
CO NON-ATTAIN	-	28.41	29.00	32.06	30.31	30.91	28.54	27.96	30.13	31.19	29.19	29.77	39.76	29.94	28.44	28.44	27.72	25.27	25.27
REFORMULATED	-	30.58	31.18	34.24	31.02	31.62	29.25	29.28	30.65	32.13	31.70	32.27	40.70	30.15	28.65	28.65	27.93	25.48	25.48
CO-REFORM	-	30.46	31.05	34.11	30.86	31.45	29.08	29.11	30.47	32.03	31.36	31.94	40.60	30.03	28.52	28.52	27.81	25.36	25.36
KEROSENE JET FUEL	-	27.62	28.04	28.95	27.29	27.54	26.35	26.23	27.24	27.80	28.32	28.33	30.77	27.30	26.45	26.67	25.79	23.35	23.35
DIESEL: ON-HIGHWAY	-	26.53	26.96	28.53	26.57	26.68	26.10	25.52	26.62	28.43	27.74	27.49	30.75	26.84	26.66	24.11	24.42	22.68	22.68
OFF-HIGHWAY	-	26.00	26.42	27.99	25.46	25.57	24.99	24.74	25.84	26.88	26.79	26.53	29.20	26.10	25.84	23.60	23.90	21.74	21.74
OTHER DISTILLATE	-	26.00	26.42	27.99	25.46	25.57	24.99	24.74	25.84	26.88	26.79	26.53	29.20	26.10	25.84	23.60	23.90	21.74	21.74

COMPOSITE REFERENCE POINT COST, DOLLARS PER BARREL

	1	2	3	4	5	6	7	8	9	10	11	12	13	CAN	LATIN	NWE	MED	MID E	FAR E
REF POINT COST	-	27.81	28.33	30.03	27.21	28.05	26.74	26.50	27.72	29.06	28.90	29.28	34.20	27.30	26.53	26.03	25.40	23.19	23.27

* THE REFERENCE POINT VOLUME FOR THE FAR EAST IS ACTUALLY AT ZERO. THESE VOLUMES YIELD THE CORRECT REFERENCE POINT COST AT ZERO VOLUME.
DUE TO INDEPENDENT ROUNDING, COSTS MAY NOT ADD TO TOTALS   NATIONAL PETROLEUM COUNCIL   MARCH 15, 1993   TIME 10:41

APP I.IV3-11

2010 REFERENCE POINT VOLUMES AND COSTS -- FOUNDATION CASE III

	U.S. REGIONS													FOREIGN REGIONS					
	1	2	3	4	5	6	7	8	9	10	11	12	13	CAN	LATIN	NWE	MED	MID E	FAR E
REFERENCE POINT VOLUMES*, BARRELS PER DAY																			
REG: CONVENTIONAL	-	-	-	-	409894	65708	150190	890116	145330	42370	11781	18820	40911	-	-	-	-	-	27478
CO NON-ATTAIN	-	-	-	-	23887	3829	8752	27551	29097	35325	10014	15997	23087	-	-	-	-	-	23356
REFORMULATED	-	219191	11083	16008	447151	71681	163842	1201233	22469	53584	296769	474060	-	17314	46937	28334	18887	16700	69757
CO-REFORM	-	212453	10742	15516	21415	3433	7847	180143	-	49456	-	-	-	16782	45494	27464	18306	16187	-
PREM: CONVENTIONAL	-	-	-	-	93661	15014	34319	312744	30614	13675	3802	6074	8738	-	-	-	-	-	8948
CO NON-ATTAIN	-	-	-	-	5458	875	2000	9680	6129	11401	3232	5163	4931	-	-	-	-	-	7606
REFORMULATED	-	88229	4461	6444	102175	16379	37438	422055	4733	17294	95783	153003	-	6969	18893	11405	7602	6722	22728
CO-REFORM	-	85517	4324	6246	4894	784	1793	63293	-	15962	-	-	-	6755	18312	11055	7369	6516	-
KEROSENE JET FUEL	-	84036	4249	6137	134333	21534	49221	760307	42205	58817	98465	157289	43198	10003	75266	9985	7158	6458	38728
DIESEL: ON-HIGHWAY	-	258953	13093	18912	370367	59372	135707	911011	82411	69588	59649	95284	30990	52815	162257	20418	24345	24130	45963
OFF-HIGHWAY	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OTHER DISTILLATE	-	59907	3029	4375	77484	12421	28391	386713	40206	-	56876	90855	9090	12203	37567	4473	2799	-	-
TOTAL	-	1008286	50981	73639	1690718	271031	619500	5164846	403194	367472	636373	1016543	160945	122841	404726	113134	86466	76713	244564
REFERENCE POINT COMPOSITION, %																			
REG: CONVENTIONAL	-	-	-	-	24.24	24.24	24.24	17.23	36.04	11.53	1.85	1.85	25.42	-	-	-	-	-	11.24
CO NON-ATTAIN	-	-	-	-	1.41	1.41	1.41	0.53	7.22	9.61	1.57	1.57	14.34	-	-	-	-	-	9.55
REFORMULATED	-	21.74	21.74	21.74	26.45	26.45	26.45	23.26	5.57	14.58	46.63	46.63	-	14.09	11.60	25.04	21.84	21.77	28.52
CO-REFORM	-	21.07	21.07	21.07	1.27	1.27	1.27	3.49	-	13.46	-	-	-	13.66	11.24	24.28	21.17	21.10	-
PREM: CONVENTIONAL	-	-	-	-	5.54	5.54	5.54	6.06	7.59	3.72	0.60	0.60	5.43	-	-	-	-	-	3.66
CO NON-ATTAIN	-	-	-	-	0.32	0.32	0.32	0.19	1.52	3.10	0.51	0.51	3.06	-	-	-	-	-	3.11
REFORMULATED	-	8.75	8.75	8.75	6.04	6.04	6.04	8.17	1.17	4.71	15.05	15.05	-	5.67	4.67	10.08	8.79	8.76	9.29
CO-REFORM	-	8.48	8.48	8.48	0.29	0.29	0.29	1.23	-	4.34	-	-	-	5.50	4.52	9.77	8.52	8.49	-
KEROSENE JET FUEL	-	8.33	8.33	8.33	7.95	7.95	7.95	14.72	10.47	16.01	15.47	15.47	26.84	8.14	18.60	8.83	8.28	8.42	15.84
DIESEL: ON-HIGHWAY	-	25.68	25.68	25.68	21.91	21.91	21.91	17.64	20.44	18.94	9.37	9.37	19.25	42.99	40.09	18.05	28.16	31.45	18.79
OFF-HIGHWAY	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OTHER DISTILLATE	-	5.94	5.94	5.94	4.58	4.58	4.58	7.49	9.97	-	8.94	8.94	5.65	9.93	9.28	3.95	3.24	-	-
REFERENCE POINT COSTS, DOLLARS PER BARREL																			
REG: CONVENTIONAL	-	27.06	27.92	29.79	27.62	28.95	27.49	26.67	29.31	29.61	29.02	29.79	39.55	28.54	27.44	26.88	26.35	24.23	24.23
CO NON-ATTAIN	-	26.32	27.18	29.05	26.66	27.98	26.53	25.72	28.18	29.03	27.09	27.86	38.97	27.82	26.72	26.17	25.64	23.52	23.52
REFORMULATED	-	28.68	29.54	31.40	27.64	28.96	27.51	27.36	29.16	30.08	29.76	30.53	40.02	28.16	27.06	26.51	25.98	23.86	23.86
CO-REFORM	-	28.49	29.35	31.21	27.39	28.71	27.26	27.12	28.89	29.93	29.26	30.03	39.87	27.98	26.88	26.33	25.79	23.68	23.68
PREM: CONVENTIONAL	-	29.71	30.57	34.10	31.78	32.36	29.99	29.23	31.97	32.46	31.29	31.97	41.84	31.17	30.07	29.53	29.00	26.88	26.88
CO NON-ATTAIN	-	29.23	30.09	33.61	31.15	31.73	29.36	28.61	31.23	32.08	30.03	30.71	41.46	30.70	29.60	29.06	28.53	26.41	26.41
REFORMULATED	-	31.40	32.26	35.79	31.86	32.44	30.07	29.94	31.75	33.02	32.53	33.21	42.40	30.91	29.81	29.27	28.74	26.62	26.62
CO-REFORM	-	31.27	32.14	35.66	31.70	32.27	29.91	29.77	31.57	32.92	32.20	32.88	42.30	30.79	29.69	29.15	28.62	26.50	26.50
KEROSENE JET FUEL	-	28.43	29.12	30.50	28.13	28.36	27.17	26.88	28.34	28.70	29.15	29.27	32.48	28.07	27.62	27.29	26.59	24.50	24.50
DIESEL: ON-HIGHWAY	-	27.35	28.04	30.08	27.41	27.50	26.93	26.17	27.72	29.33	28.57	28.43	32.45	27.60	27.82	24.73	25.22	23.83	23.83
OFF-HIGHWAY	-	26.82	27.50	29.54	26.30	26.39	25.82	25.39	26.94	27.78	27.62	27.47	30.90	26.86	27.01	24.23	24.71	22.88	22.88
OTHER DISTILLATE	-	26.82	27.50	29.54	26.30	26.39	25.82	25.39	26.94	27.78	27.62	27.47	30.90	26.86	27.01	24.23	24.71	22.88	22.88
COMPOSITE REFERENCE POINT COST, DOLLARS PER BARREL																			
REF POINT COST	-	28.63	29.42	31.58	28.05	28.87	27.56	27.15	28.82	29.95	29.74	30.22	35.90	28.06	27.69	26.66	26.20	24.33	24.41

* THE REFERENCE POINT VOLUME FOR THE FAR EAST IS ACTUALLY AT ZERO. THESE VOLUMES YIELD THE CORRECT REFERENCE POINT COST AT ZERO VOLUME.
DUE TO INDEPENDENT ROUNDING, COSTS MAY NOT ADD TO TOTALS NATIONAL PETROLEUM COUNCIL MARCH 15, 1993 TIME 10:41

1995 REFERENCE POINT VOLUMES AND COSTS -- FOUNDATION CASE I (ENVIRONMENTAL SENSITIVITY)

	U.S. REGIONS													FOREIGN REGIONS					
	1	2	3	4	5	6	7	8	9	10	11	12	13	CAN	LATIN	NWE	MED	MID E	FAR E
REFERENCE POINT VOLUMES*, BARRELS PER DAY																			
REG: CONVENTIONAL	-	-	-	-	729740	116981	267386	1928824	164158	42370	70924	113294	39605	-	-	-	-	-	68707
CO NON-ATTAIN	-	-	-	-	43294	6940	15863	150689	27974	35325	59131	94457	18367	-	-	-	-	-	-
REFORMULATED	-	221210	11185	16156	128527	20604	47094	179702	-	53584	89695	143280	-	17304	48909	28232	18944	16864	44367
CO-REFORM	-	214411	10841	15659	-	-	-	46211	-	49456	82784	132240	-	16772	47406	27364	18362	16346	40701
PREM: CONVENTIONAL	-	-	-	-	166747	26730	61098	677695	34580	13675	22891	36566	8459	-	-	-	-	-	22298
CO NON-ATTAIN	-	-	-	-	9892	1586	3625	52945	5893	11401	19085	30486	3923	-	-	-	-	-	-
REFORMULATED	-	89043	4502	6503	29368	4708	10761	63139	-	17294	28949	46244	-	6965	19687	11364	7626	6788	14343
CO-REFORM	-	86306	4364	6303	-	-	-	16236	-	15962	26719	42680	-	6751	19082	11015	7391	6580	13158
KEROSENE JET FUEL	-	83994	4247	6134	134000	21481	49099	760212	42258	58817	98454	157270	43205	10003	74874	10209	7190	6413	48319
DIESEL: ON-HIGHWAY	-	258929	13092	18911	369337	59207	135330	910824	82528	69588	116484	186071	30991	52809	161821	20343	24367	24109	57252
OFF-HIGHWAY	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OTHER DISTILLATE	-	59848	3026	4371	77319	12395	28331	386440	40243	-	-	-	9083	12202	37466	4708	2802	-	-
TOTAL	-	1013740	51257	74037	1688224	270631	618586	5172917	397634	367472	615116	982588	153634	122806	409245	113235	86682	77100	309145
REFERENCE POINT COMPOSITION, %																			
REG: CONVENTIONAL	-	-	-	-	43.23	43.23	43.23	37.29	41.28	11.53	11.53	11.53	25.78	-	-	-	-	-	22.22
CO NON-ATTAIN	-	-	-	-	2.56	2.56	2.56	2.91	7.04	9.61	9.61	9.61	11.96	-	-	-	-	-	-
REFORMULATED	-	21.82	21.82	21.82	7.61	7.61	7.61	3.47	-	14.58	14.58	14.58	-	14.09	11.95	24.93	21.85	21.87	14.35
CO-REFORM	-	21.15	21.15	21.15	-	-	-	0.89	-	13.46	13.46	13.46	-	13.66	11.58	24.17	21.18	21.20	13.17
PREM: CONVENTIONAL	-	-	-	-	9.88	9.88	9.88	13.10	8.70	3.72	3.72	3.72	5.51	-	-	-	-	-	7.21
CO NON-ATTAIN	-	-	-	-	0.59	0.59	0.59	1.02	1.48	3.10	3.10	3.10	2.55	-	-	-	-	-	-
REFORMULATED	-	8.78	8.78	8.78	1.74	1.74	1.74	1.22	-	4.71	4.71	4.71	-	5.67	4.81	10.04	8.80	8.80	4.64
CO-REFORM	-	8.51	8.51	8.51	-	-	-	0.31	-	4.34	4.34	4.34	-	5.50	4.66	9.73	8.53	8.53	4.26
KEROSENE JET FUEL	-	8.29	8.29	8.29	7.94	7.94	7.94	14.70	10.63	16.01	16.01	16.01	28.12	8.15	18.30	9.02	8.29	8.32	15.63
DIESEL: ON-HIGHWAY	-	25.54	25.54	25.54	21.88	21.88	21.88	17.61	20.75	18.94	18.94	18.94	20.17	43.00	39.54	17.97	28.11	31.27	18.52
OFF-HIGHWAY	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OTHER DISTILLATE	-	5.90	5.90	5.90	4.58	4.58	4.58	7.47	10.12	-	-	-	5.91	9.94	9.15	4.16	3.23	-	-
REFERENCE POINT COSTS, DOLLARS PER BARREL																			
REG: CONVENTIONAL	-	26.16	26.31	27.19	26.43	27.79	26.18	25.80	27.26	27.72	28.02	28.54	35.81	25.52	24.44	24.07	23.41	21.44	21.44
CO NON-ATTAIN	-	25.60	25.76	26.63	25.27	26.64	25.02	25.09	25.79	27.02	27.25	27.77	35.12	24.80	23.73	23.35	22.70	20.73	20.73
REFORMULATED	-	25.97	26.12	26.99	25.85	27.22	25.61	25.43	26.53	27.38	27.62	28.14	35.48	25.14	24.07	23.69	23.04	21.07	21.07
CO-REFORM	-	25.82	25.98	26.85	25.55	26.92	25.31	25.24	26.16	27.20	27.42	27.93	35.30	24.96	23.89	23.51	22.85	20.89	20.89
PREM: CONVENTIONAL	-	28.81	28.96	31.50	30.59	31.21	28.68	28.35	29.90	30.57	30.60	31.03	38.10	28.15	27.08	26.71	26.06	24.09	24.09
CO NON-ATTAIN	-	28.44	28.60	31.13	29.83	30.46	27.92	27.89	28.93	30.11	30.10	30.53	37.64	27.68	26.61	26.24	25.59	23.62	23.62
REFORMULATED	-	28.70	28.86	31.39	30.14	30.77	28.23	28.10	29.46	30.28	30.39	30.82	37.81	27.89	26.82	26.45	25.80	23.83	23.83
CO-REFORM	-	28.60	28.75	31.29	29.94	30.57	28.03	27.97	29.22	30.16	30.25	30.68	37.69	27.77	26.70	26.33	25.68	23.71	23.71
KEROSENE JET FUEL	-	26.73	26.71	27.10	26.46	26.74	25.38	25.63	25.82	26.79	27.54	27.41	28.72	25.05	24.62	24.47	23.65	21.71	21.71
DIESEL: ON-HIGHWAY	-	25.64	25.62	26.67	25.73	25.88	25.14	24.92	25.20	27.43	26.97	26.57	28.70	24.60	24.85	21.83	22.19	20.95	20.95
OFF-HIGHWAY	-	25.11	25.09	26.13	24.62	24.77	24.03	24.14	24.42	25.88	26.01	25.61	27.15	23.84	24.02	21.41	21.77	20.09	20.09
OTHER DISTILLATE	-	25.11	25.09	26.13	24.62	24.77	24.03	24.14	24.42	25.88	26.01	25.61	27.15	23.84	24.02	21.41	21.77	20.09	20.09
COMPOSITE REFERENCE POINT COST, DOLLARS PER BARREL																			
REF POINT COST	-	26.33	26.42	27.59	26.62	27.48	26.01	25.85	26.54	27.74	27.90	28.12	31.96	25.05	24.71	23.82	23.24	21.51	21.66

* THE REFERENCE POINT VOLUME FOR THE FAR EAST IS ACTUALLY AT ZERO. THESE VOLUMES YIELD THE CORRECT REFERENCE POINT COST AT ZERO VOLUME.
DUE TO INDEPENDENT ROUNDING, COSTS MAY NOT ADD TO TOTALS   NATIONAL PETROLEUM COUNCIL   MARCH 1, 1993   TIME 14:18

2000 REFERENCE POINT VOLUMES AND COSTS -- FOUNDATION CASE I (ENVIRONMENTAL SENSITIVITY)

	U.S. REGIONS													FOREIGN REGIONS					
	1	2	3	4	5	6	7	8	9	10	11	12	13	CAN	LATIN	NWE	MED	MID E	FAR E
									REFERENCE POINT VOLUMES*, BARRELS PER DAY										
REG: CONVENTIONAL	-	-	-	-	409894	65708	150190	890116	145330	95459	11781	18820	40911	-	-	-	-	-	26027
CO NON-ATTAIN	-	-	-	-	23887	3829	8752	27551	29097	53868	10014	15997	23087	-	-	-	-	-	22123
REFORMULATED	-	219191	11083	16008	447151	71681	163842	1201233	22469	-	296769	474060	-	17311	48879	28309	18877	16825	66075
CO-REFORM	-	212453	10742	15516	21415	3433	7847	180143	-	-	-	-	-	16779	47377	27438	18297	16308	-
PREM: CONVENTIONAL	-	-	-	-	93661	15014	34319	312744	30614	20390	3802	6074	8738	-	-	-	-	-	8476
CO NON-ATTAIN	-	-	-	-	5458	875	2000	9680	6129	11506	3232	5163	4931	-	-	-	-	-	7204
REFORMULATED	-	88229	4461	6444	102175	16379	37438	422055	4733	-	95783	153003	-	6968	19675	11395	7599	6773	21528
CO-REFORM	-	85517	4324	6246	4894	784	1793	63293	-	-	-	-	-	6754	19070	11045	7365	6564	-
KEROSENE JET FUEL	-	84036	4249	6137	134333	21534	49221	760307	42205	100796	98465	157289	43198	10003	75187	9987	7158	6383	36733
DIESEL: ON-HIGHWAY	-	258953	13093	18912	370367	59372	135707	911011	82411	72309	59649	95284	30990	52814	162087	20422	24342	23855	39305
OFF-HIGHWAY	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OTHER DISTILLATE	-	59907	3029	4375	77484	12421	28391	386713	40206	21211	56876	90855	9090	12203	37528	4474	2799	-	-
TOTAL	-	1008286	50981	73639	1690718	271031	619500	5164846	403194	375539	636373	1016543	160945	122832	409803	113070	86437	76708	227471
									REFERENCE POINT COMPOSITION, %										
REG: CONVENTIONAL	-	-	-	-	24.24	24.24	24.24	17.23	36.04	25.42	1.85	1.85	25.42	-	-	-	-	-	11.44
CO NON-ATTAIN	-	-	-	-	1.41	1.41	1.41	0.53	7.22	14.34	1.57	1.57	14.34	-	-	-	-	-	9.73
REFORMULATED	-	21.74	21.74	21.74	26.45	26.45	26.45	23.26	5.57	-	46.63	46.63	-	14.09	11.93	25.04	21.84	21.93	29.05
CO-REFORM	-	21.07	21.07	21.07	1.27	1.27	1.27	3.49	-	-	-	-	-	13.66	11.56	24.27	21.17	21.26	-
PREM: CONVENTIONAL	-	-	-	-	5.54	5.54	5.54	6.06	7.59	5.43	0.60	0.60	5.43	-	-	-	-	-	3.73
CO NON-ATTAIN	-	-	-	-	0.32	0.32	0.32	0.19	1.52	3.06	0.51	0.51	3.06	-	-	-	-	-	3.17
REFORMULATED	-	8.75	8.75	8.75	6.04	6.04	6.04	8.17	1.17	-	15.05	15.05	-	5.67	4.80	10.08	8.79	8.83	9.46
CO-REFORM	-	8.48	8.48	8.48	0.29	0.29	0.29	1.23	-	-	-	-	-	5.50	4.65	9.77	8.52	8.56	-
KEROSENE JET FUEL	-	8.33	8.33	8.33	7.95	7.95	7.95	14.72	10.47	26.84	15.47	15.47	26.84	8.14	18.35	8.83	8.28	8.32	16.15
DIESEL: ON-HIGHWAY	-	25.68	25.68	25.68	21.91	21.91	21.91	17.64	20.44	19.25	9.37	9.37	19.25	43.00	39.55	18.06	28.16	31.10	17.28
OFF-HIGHWAY	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OTHER DISTILLATE	-	5.94	5.94	5.94	4.58	4.58	4.58	7.49	9.97	5.65	8.94	8.94	5.65	9.93	9.16	3.96	3.24	-	-
									REFERENCE POINT COSTS, DOLLARS PER BARREL										
REG: CONVENTIONAL	-	25.62	25.89	26.94	26.16	27.47	25.97	25.52	27.18	27.66	27.57	28.12	36.01	25.72	24.90	24.45	23.48	21.75	21.75
CO NON-ATTAIN	-	24.88	25.15	26.20	25.19	26.50	25.00	24.57	26.04	27.08	25.63	26.19	35.43	25.00	24.18	23.74	22.76	21.03	21.03
REFORMULATED	-	27.23	27.51	28.56	26.17	27.49	25.98	26.21	27.03	28.13	28.31	28.86	36.48	25.34	24.52	24.08	23.10	21.37	21.37
CO-REFORM	-	27.04	27.32	28.36	25.92	27.24	25.73	25.97	26.75	27.98	27.80	28.35	36.33	25.16	24.34	23.89	22.92	21.19	21.19
PREM: CONVENTIONAL	-	28.26	28.54	31.25	30.31	30.88	28.46	28.08	29.84	30.51	29.83	30.30	38.29	28.35	27.53	27.10	26.12	24.39	24.39
CO NON-ATTAIN	-	27.78	28.06	30.76	29.68	30.25	27.83	27.47	29.10	30.14	28.57	29.04	37.92	27.88	27.06	26.63	25.65	23.92	23.92
REFORMULATED	-	29.96	30.23	32.94	30.40	30.97	28.54	28.79	29.62	31.07	31.07	31.54	38.85	28.09	27.27	26.84	25.86	24.13	24.13
CO-REFORM	-	29.83	30.11	32.81	30.23	30.80	28.38	28.62	29.44	30.97	30.74	31.20	38.75	27.97	27.15	26.72	25.74	24.01	24.01
KEROSENE JET FUEL	-	26.99	27.09	27.66	26.67	26.89	25.64	25.73	26.21	26.75	27.69	27.59	28.93	25.25	25.08	24.86	23.72	22.01	22.01
DIESEL: ON-HIGHWAY	-	25.91	26.01	27.23	25.94	26.03	25.40	25.02	25.59	27.38	27.12	26.75	28.91	24.80	25.30	22.35	22.44	21.51	21.51
OFF-HIGHWAY	-	25.37	25.47	26.69	24.83	24.92	24.29	24.25	24.81	25.83	26.16	25.80	27.36	24.04	24.47	21.80	21.83	20.39	20.39
OTHER DISTILLATE	-	25.37	25.47	26.69	24.83	24.92	24.29	24.25	24.81	25.83	26.16	25.80	27.36	24.04	24.47	21.80	21.83	20.39	20.39
									COMPOSITE REFERENCE POINT COST, DOLLARS PER BARREL										
REF POINT COST	-	27.18	27.39	28.73	26.59	27.40	26.03	26.01	26.68	27.41	28.28	28.55	32.35	25.25	25.16	24.24	23.35	21.90	21.96

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DUE TO INDEPENDENT ROUNDING, COSTS MAY NOT ADO TO TOTALS NATIONAL PETROLEUM COUNCIL MARCH 1, 1993 TIME 14:18

Appendix L, Section IV-4

GDP Deflator

EXXON COMPANY, U.S.A.
POST OFFICE BOX 2180 • HOUSTON, TEXAS 77252-2180

DOWNSTREAM PLANNING AND ANALYSIS

W.R. FINGER
COORDINATOR OF ENERGY ANALYSIS

May 12, 1992

Members of the NPC Refining Study Supply/Demand/Logistics (SD&L) Task Group:

At our Task Group Meeting in Denver (May 5-6), we discussed the issue of which inflator/deflator to use. We decided to use the Gross Domestic Product (GDP) Deflator to develop constant dollar costs. The attached provides the factors for our study.

Sincerely,

Graham K. Barnes

Graham K. Barnes

GKB:yg
Attachment

c - w/attachment:
Mr. John H. Guy, IV – National Petroleum Council
Mr. Louis P. Karvelas – Bonner & Moore Associates, Inc.
Mr. T. Stan McGowin – Texaco Refining & Marketing, Inc.
Mr. Joe F. Moore – Bonner & Moore Associates, Inc.
Mr. Robert B. Warden – Chevron Research & Technology Co.
Mr. Keith Zarker – Consultant, Shell Oil Co.

A DIVISION OF EXXON CORPORATION

FACTORS FOR INFLATION/DEFLATION

	Gross Domestic Product (GDP) Deflator	For 1990 $, Multiply Nominal $ By:
1980	71.7	1.5746
1981	78.9	1.4309
1982	83.8	1.3473
1983	87.2	1.2947
1984	91.9	1.2393
1985	94.4	1.1960
1986	96.9	1.1651
1987	100.0	1.129
1988	103.9	1.0866
1989	108.4	1.0415
1990	112.9	1.0
1991	117.0	0.9650

Appendix L, Section IV-5

Return on Capital

RATE OF RETURN COMPARISON

	Percent Return		
	Nominal	Real (3)	Comments
Prof. J. L. Sweeney (Stanford) 2/89			
Capital Cost	15	19	Market Experience
Typical DCF Hurdle Rates (1)	20	15	Investment Decisions
Actual ROR on Invested Capital	9-15	5-10	Non-financial Corporations
W. E. Stevenson (Bechtel) 2/89			
Capital Cost	14-17	9-12	Market Experience
Capital Costs	20	~15	Trinidad/Middle East
Typical DCF Hurdle Rates (1)	20	~15	Investment Decisions
Turner, Mason – 1991 (2)			
Hurdle Rates		15	Long-Term U.S. Experience
Expected ROR		8	
Dr. Hahn – 1991 (2)			
Long-Term ROI		7	
Hurdle Rate		9	Includes 2% Risk

(1) Used by U.S. corporations in project analysis.
(2) From Auto/Oil Research Program.
(3) Assumes 5% rate of inflation.

RECOMMENDATIONS FROM JULY 24 INTER-TASK GROUP MEETING:

- Foundation Cases: 10% cost of capital regardless of location.
  - Work in 1990 real dollars.
- Possible Issue Cases.
  - All "developing" locations at +3% (i.e., 13%).
  - Middle East and Venezuela at 0% (zero).
    + Government initiatives for employment, etc.

Appendix L, Section V-1

Oxygenate Properties

TYPICAL PROPERTIES OF OXYGEN COMPOUNDS

		MTBE	TAME	Ethanol	ETBE
Octane (R+M)/2		110	105	115	111
Vapor Pressure					
Neat RVP @ 100F		7.8	1.5	2.3	4.0
Blending RVP		8	1.5	18	4.0
O_2 Content (Wt%)		18.15	15.66	34.73	15.66
MW		88.15	102.18	46.07	102.18
Density (lb/G)		6.22	6.47	6.62	6.29
Energy Density					
MBTU/G (LHV)		93.5	100.6	76.1	96.9
Boiling Point (°F)		131	187	173	163
Heat of Vaporization					
MBTU at NBP		0.86	0.90	2.39	0.83
Content in Oxygenated Gasoline					
@ 2.0 Wt% Oxygen	(Wt%)	11.02	12.77	5.76	12.77
(56.5 API mogas)	(Vol%)	11.15	12.53	5.48	12.73
@ 2.7 Wt% Oxygen	(Wt%)	14.88	17.24	7.77	17.24
(56.5 API mogas)	(Vol%)	15.04	16.93	7.40	17.19
MTBE Equivalents	(Wt%)	1.00	0.86	1.92	0.86
	(Vol%)	1.00	0.89	2.03	0.87
Formula		$CH_3OC(CH_3)_3$	$(CH_3)_3CCH_2OCH_3$	CH_3CH_2OH	$CH_3CH_2OC(CH_3)_3$

MBTU = Thousand BTU
Gasoline: 56.5 API = 6.27 lb/G

Appendix L, Section V-2

EIA MTBE Capacity Survey

Table D5. Methyl Tertiary Butyl Ether (MTBE) Plant Capacity by Petroleum Administration for Defense (PAD) District as of October 1, 1992
(Barrels per Calendar Day)

Company Name	Site	Capacity
PAD District I		
Amerada Hess	Port Reading, NJ	1,500
Amoco Oil Co.	Yorktown, VA	500
Sun Co. Inc.	Marcus Hook, PA	2,600
Total		**4,600**
PAD District II		
Amoco Oil Co.	Whiting, IN	3,000
Ashland Oil Inc.	Catlettsburg, KY	2,000
Conoco Inc.	Ponca City, OK	1,000
Marathon Oil Co.	Robinson, IL	1,800
Marathon Oil Co.	Detroit, MI	1,100
Total		**8,900**
PAD District III		
Arco Chemical Co.	Channelview, TX	30,000
Arco Chemical Co.	Corpus Christi, TX	12,000
Arco/Lyondell	Channelview, TX	8,000
Chevron USA Inc.	Pascagula, MS	2,200
Citgo Refining & Chemical	Corpus Christi, TX	1,700
Citgo Petroleum Corp.	Lake Charles, LA	E 2,000
Conoco Inc.	Westlake, LA	1,000
Crown Central Petroleum Corp.	Pasadena, TX	2,500
Diamond Shamrock Refining & Marketing	McKee, TX	1,500
Enron Corp.	Houston, TX	15,000
Exxon Chemical	Baton Rouge, LA	5,700
Exxon Chemical	Baytown, TX	3,200
Fina Oil and Chemical Co.	Big Spring, TX	800
Global Octanes Inc.	Houston, TX	12,000
Lyondell Petrochemical Co.	Channelview, TX	3,000
Mobil Oil Corp.	Beaumont, TX	4,000
Oxychem, Petrochemicals Div.	Houston,TX	1,800
Phibro Refining Inc.	Houston,TX	1,500
Phibro Refining Inc.	Krotz Springs, LA	1,700
Phibro Refining Inc.	Texas City, TX	1,400
Phillips 66 Co.	Sweeny, TX	4,200
Southwestern Refining Co. Inc.	Corpus Christi, TX	1,100
Star Enterprise	Convent, LA	2,400
Texaco Chemical	Port Neches, TX	7,000
Texas Petrochemical	Houston, TX	20,000
Valero Refining Co.	Corpus Christi, TX	2,000
Total		**E 147,700**
PAD District IV		
Coastal Chemical Inc.	Cheyenne, WY	4,300
Total		**4,300**
PAD District V		
Arco Products Co.	Los Angeles, CA	2,000
Chevron USA Inc.	El Segundo, CA	2,300
Total		**4,300**
U.S. Total		**E 169,800**

E = Estimated.
Source: Form EIA-822A (updated September 1992).

Table D6. Methyl Tertiary Butyl Ether (MTBE) Plant Capacity by Petroleum Administration for Defense (PAD) District as of January 1, 1992, October 1, 1992, and January 1, 1993
(Barrels per Calendar Day)

PAD District	January 1, 1992[a]	October 1, 1992	January 1, 1993
U.S. Total	131,100	169,800	169,800
PAD District I	4,300	4,600	4,600
PAD District II	9,200	8,900	8,900
PAD District III	114,400	147,700	147,700
PAD District IV	0	4,300	4,300
PAD District V	3,200	4,300	4,300

[a] Capacity for Trans American Refining Co. at Good Hope, LA and Coastal Chem Inc. at Cheyenne, WY are excluded because these plants did not operate during the period from January-August 1992.
Source: Form EIA-822A (updated September 1992).

Table D8. MTBE Production Capacity Utilization
(Percent)

Total (Captive and Merchant Plants)

PAD District	Month (1992) Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Total Capacity[a] as of January 1, 1992 (Captive and Merchant Plants)*
U.S. Total	75	72	68	60	68	69	77	69	131,100
PAD District I	96	111	88	103	104	108	78	92	4,300
PAD District II	43	44	45	23	45	51	57	51	9,200
PAD District III	77	72	67	60	67	68	77	68	114,400
PAD District IV	NA	NA	NA	NA	NA	NA	NA	NA	0
PAD District V	59	96	114	104	123	111	133	125	3,200

Captive Plants

PAD District	Month (1992) Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Capacity as of January 1, 1992 for Captive Plants*
U.S. Total	58	55	52	54	62	69	68	71	51,400
PAD District I	96	111	88	103	104	108	78	92	4,300
PAD District II	43	44	45	23	45	51	57	51	9,200
PAD District III	57	48	44	52	55	64	63	69	34,700
PAD District IV	NA	NA	NA	NA	NA	NA	NA	NA	0
PAD District V	59	96	114	104	123	111	133	125	3,200

Merchant Plants

PAD District	Month (1992) Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Capacity as of January 1, 1992 for Merchant Plants*
U.S. Total	85	82	78	64	73	69	83	68	79,700
PAD District I	NA	NA	NA	NA	NA	NA	NA	NA	0
PAD District II	NA	NA	NA	NA	NA	NA	NA	NA	0
PAD District III	85	82	78	64	73	69	83	68	79,700
PAD District IV	NA	NA	NA	NA	NA	NA	NA	NA	0
PAD District V	NA	NA	NA	NA	NA	NA	NA	NA	0

* = Barrels per Day
NA = Not applicable (no capacity).
[a] Capacity for Trans American Refining Co. at Good Hope, LA and Coastal Chem Inc. at Cheyenne, WY are excluded because these plants did not operate during the period from January-August 1992.
Note: Captive plant capacity represents capacity at production facilities located within or adjacent to a refinery complex. Merchant plant capacity represents capacity at production facilities not associated with a petroleum refinery.
Source: Form EIA-819 and Form EIA-822A.

Appendix L, Section V-3

EIA Fuel Ethanol Capacity Survey

Table D7. Fuel Ethanol Plant Capacity by Petroleum Administration for Defense (PAD) District as of October 1, 1992
(Barrels per Calendar Day)

PAD District	Location	Total Capacity
PAD District I		
Bartow Ethanol Inc.	Clearwater, FL	E 290
Butterwood Farms	Dinwiddie, VA	230
Floyd Agricultural Energy Corp.	Floyd, VA	E 190
Montvale Ethanol Inc.	Montvale, VA	E 410
Parker Oil Co.	Charles City, VA	260
Pinedell Association Ltd.	Charles City, VA	260
RAJ Chemicals of Virginia Inc.	Chesapeake, VA	0
Virginia Solid Fuels	Bealton, VA	240
Total		E 1,880
PAD District II		
A.E. Staley Manufacturing	Loudon, TN	2,600
Alchem Ltd.	Grafton, ND	410
Archer Daniels Midland	IL, IA, ND	E 57,210
Baum Agri-Energy Inc.	Springport, MI	190
Broin Enterprises Inc.	Scotland, SD	200
Cargill Inc.	Eddyville, IA	2,000
Chief Ethanol Fuels Inc.	Hastings, NE	950
Ese Alcohol Inc.	Leoti, KS	40
G & S Gasohol Inc.	Mankato, MN	70
Grain Processing Corp.	Muscatine, IA	1,570
Grudem Brothers	Jim Falls, WI	E 70
High Plains Corp.	Colwich, KS	1,170
Hubinger Co.	Keokuk, IA	E 860
Kraft General Foods	Melrose, MN	100
Manildra Energy Inc.	Hamburg, IA	430
Midwest Grain Products Inc.	Pekin, IL	910
Midwest Grain Products Inc.	Atchinson, KS	460
Milwaukee Solvents & Chemical Corp.	Morris, MN	260
Minnesota Corn Processors	Marshall, MN	1,950
New Energy Co. of Indiana	South Bend, IN	4,640
Pekin Energy Co.	Pekin, IL	6,520
Reeve Agri Energy	Garden City, KS	160
South Point Ethanol	South Point, OH	4,430
Southern Illinois Agri Foods	Brookport, IL	20
Vienna Correctional Center	Vienna, IL	30
Total		E 87,250
PAD District III		
Biocom USA Ltd.	Jennings, LA	E 0
Giant Refining	Portales, NM	860
Grain Power of New Mexico Inc.	Tucumcari, NM	E 210
Jonton Alcohol Inc.	Edinburg, TX	20
Shreveport Energy Management Co.	Shreveport, LA	E 0
Total		E 1,090
PAD District IV		
A.G. Power of Colorado	Golden, CO	100
Alcotech Inc.	Ringling, MT	410
Baca Energy Inc.	Walsh, CO	240
J.R. Simplot Co.	Heyburn, ID	E 210
J.R. Simplot Co.	Caldwell, ID	E 190
Total		E 1,150
PAD District V		
Dairymens Cooperative	Tulane, CA	E 20
Georgia Pacific Corp.	Bellingham, WA	290
Golden Cheese Co. of California	Corona, CA	190
Pabst Brewing Co.	Olympia, WA	80
Parallel Products Inc.	Cucamonga, CA	140
Total		E 720
U.S. Total		E 92,090

E = Estimated.
Source: Form EIA-822A (updated September 1992).

Table D9. Fuel Ethanol Production Capacity Utilization
(Percent)

PAD District	Month (1992) Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Capacity (Barrels per Calendar Day)*
U.S. Total	83	76	72	73	73	71	71	75	93,510
PAD District I	80	83	91	61	59	61	59	59	1,620
PAD District II	83	75	71	73	72	70	70	75	88,120
PAD District III	115	98	106	94	115	118	120	115	2,290
PAD District IV	37	43	48	37	48	47	46	46	880
PAD District V	105	96	95	99	107	108	92	99	600

Source: Form EIA-819 and Form EIA-822A.

Table D10. Methyl Tertiary Butyl Ether (MTBE) Plant Capacity by Petroleum Administration for Defense (PAD) District Projected for 1993-1997 as of January 1
(Barrels per Calendar Day)

PAD District	1993	1994	1995	1996	1997
U.S. Total	169,800	260,800	340,200	340,200	341,500
PAD District I	4,600	4,600	17,100	17,100	17,100
PAD District II	8,900	12,800	29,100	29,100	29,100
PAD District III	147,700	226,400	277,000	277,000	277,000
PAD District IV	4,300	4,300	4,300	4,300	5,600
PAD District V	4,300	12,700	12,700	12,700	12,700

Source: Form EIA-822A (updated September 1992).

Table D11. Fuel Ethanol Plant Capacity by Petroleum Administration for Defense (PAD) District Projected for 1993-1997 as of January 1
(Barrels per Calendar Day)

PAD District	1993	1994	1995	1996	1997
U.S. Total	92,090	92,460	92,460	92,460	92,460
PAD District I	1,880	1,880	1,880	1,880	1,880
PAD District II	87,250	87,610	87,610	87,610	87,610
PAD District III	1,090	1,100	1,100	1,100	1,100
PAD District IV	1,150	1,150	1,150	1,150	1,150
PAD District V	720	720	720	720	720

Source: Form EIA-822A (updated September 1992).

NATIONAL PETROLEUM COUNCIL REFINING STUDY

ANNOUNCED U.S. OXYGENATE CAPACITY
Thousand Barrels Per Stream Day

	Region													
	1	2	3	4	5	6	7	8	9	10	11	12	13	Total
1995														
FCC MTBE	-	4	1	-	12	3	4	82	1	-	5	7	-	119
TAME	-	6	4	-	-	-	-	10	-	-	-	2	-	22
Other MTBE	-	13	-	-	14	-	-	203	4	-	-	-	-	234
TAME	-	-	-	-	-	-	-	1	-	-	-	-	-	1
EtOH	-	-	2	-	36	21	26	1	1	-	1	-	-	88
2000														
FCC MTBE	-	12	4	-	20	3	7	100	1	2	11	8	-	168
TAME	-	6	4	-	-	-	-	15	-	-	-	2	-	27
Other MTBE	-	13	-	-	26	-	-	267	4	-	-	-	-	310
TAME	-	-	-	-	-	-	-	1	-	-	-	-	-	1
EtOH	-	-	2	-	36	21	26	1	1	-	1	-	-	88
2010														
FCC MTBE														
TAME														
Other MTBE						**Same as 2000**								
TAME														
EtOH														

- Ethanol corrected from denatured basis (95%) to pure (100%).

Appendix L, Section V-5

Foreign Oxygenates Supply/Demand Balances

1995 NON-U.S. MTBE BALANCE
(Thousand Barrels per Day)

	Capacity (Stream Day)			Potential Production (Calendar Day)			Foundation Case					
							Local Demand			Net Supply Available		
	FCC	Other	Total	FCC	Other	Total	I	II	III	I	II	III
Canada*	–	13	13	–	12	12	21	20	20	10	10	10
Latin America†	10	18	28	9	16	25	20	18	18	5	7	7
Northwest Europe*	15‡	46	61	14	41	55	28	26	26	8	11	11
Mediterranean/ North Africa	10	9	19	9	8	17	11	10	10	6	7	7
Middle East	1	49	50	1	44	45	0	0	0	45	45	45
Pacific Rim	9	23	32	8	21	29	22	19	19	7	10	10
Total Modeled Region	**45**	**158**	**203**	**41**	**142**	**183**	**102**	**93**	**93**	**81**	**90**	**90**
China						4	4			–		
USSR/E. Europe						7	7			–		
Africa						0	0			–		
World (excluding U.S.)						**194**	**113**			**81**		

* 2 thousand barrels per calendar day of Canadian production used for local demand; rest exported. Eastern Canadian local demand from Europe.

† MTBE requirement in addition to ethanol use in Brazil.

‡ Includes 5 thousand barrels per stream day of TAME, 4 thousand barrels per stream day of MTBE equivalent.

2000 NON-U.S. MTBE BALANCE
(Thousand Barrels per Day)

							Foundation Case					
	Capacity (Stream Day)			Potential Production (Calendar Day)			Local Demand			Net Supply Available		
	FCC	Other	Total	FCC	Other	Total	I	II	III	I	II	III
Canada*	–	26	26	–	23	23	20	19	19	21	21	21
Latin America*,†	16	55	71	14	50	64	28	22	20	18	25	27
Northwest Europe	23‡	76	99	21	68	89	187	163	161	(98)	(74)	(72)
Mediterranean/ North Africa	10	41	51	9	37	46	70	62	61	(24)	(16)	(15)
Middle East	5	139	144	4	125	129	0	0	0	129	129	129
Pacific Rim	9	27	36	8	24	32	57	46	43	(25)	(14)	(11)
Total Modeled Region	**63**	**364**	**427**	**56**	**327**	**383**	**362**	**312**	**304**	**21**	**71**	**79**
China						5	5			–	–	–
USSR/E. Europe						41	41			–	–	–
Africa						0	0			–	–	–
World (excluding U.S.)						**429**	**408**			**21**	**71**	**79**

* 2 thousand barrels per calendar day of Canadian production used for local demand; rest exported. Eastern Canadian local demand from Latin America.

† MTBE requirement in addition to ethanol use in Brazil.

‡ Includes 10 thousand barrels per stream day of TAME, 9 thousand barrels per stream day of MTBE equivalent.

2010 NON-U.S. MTBE BALANCE
(Thousand Barrels per Day)

							Foundation Case					
	Capacity (Stream Day)			Potential Production§ (Calendar Day)			Local Demand			Net Supply Available		
	FCC	Other	Total	FCC	Other	Total	I	II	III	I	II	III
Canada*	–	26	26	–	23	23	20	20	17	21	21	21
Latin America*,†	16	55	71	14	50	64	53	25	22	(7)	21	27
Northwest Europe	23‡	76	99	21	68	89	183	166	161	(94)	(77)	(72)
Mediterranean/ North Africa	10	41	51	9	37	46	74	65	62	(28)	(19)	(16)
Middle East	5	139	144	4	125	129	68	0	0	61	129	129
Pacific Rim	9	27	36	8	24	32	74	50	41	(42)	(18)	(9)
Total Modeled Region	**63**	**364**	**427**	**56**	**327**	**383**	**472**	**326**	**303**	**(89)**	**57**	**80**
China						5	5			–		–
USSR/E. Europe						41	41			–		–
Africa						0	0			–		–
World (excluding U.S.)						**429**	**518**			**(89)**		**80**

* 2 thousand barrels per calendar day of Canadian production used for local demand; rest exported. Eastern Canadian local demand from Latin America.

† MTBE requirement in addition to ethanol use in Brazil.

‡ Includes 10 thousand barrels per stream day of TAME, 9 thousand barrels per stream day of MTBE equivalent.

§ Assumed equal to 2000 levels.

Appendix L, Section V-6

MTBE Facility Capital Investment Costs

(Refer to Table 3-35, Volume I)

- Refinery MTBE unit based on Purvin & Gertz study for the NPC Coordinating Research Council.

- Bechtel study based on 20 MB/SD Offshore Green Field Plant.

- Green field onsite costs for butane isomerization, isobutane dehydrogenation, and MTBE units.

- Green field capacity lowered to a 12.5 MB/SD using a ratio to the 0.6 exponent ratio for capital cost evaluation (12.5/20) exp. 0.6.

- Off-site investment 45 percent of on-site costs, with an additional 20 percent of on-site costs for unknowns.

- Includes capital for initial catalysts and chemicals requirements.

- Includes royalties.

- Cost basis in mid-1990 U.S. dollars.

- Green field facilities built adjacent to existing industrial area.

- Utilities available at the plant fence.

- Exclusions
  - Working capital
  - Taxes and any import fees
  - Building licenses and permits
  - Insurance
  - Office Equipment
  - Costs of land and operator training
  - Operating and maintenance shelters.

Appendix L, Section V-7

Ethanol Cost Assumptions

(Refer to Table 3-32 and 3-33, Volume I)

- Average investment is based upon the 1988 U.S. Department of Agriculture (USDA) study of $2.00 to $2.50 per gallon of ethanol.
- Plant facilities operate an average of 330 days per year.
- Capital investment is based upon 1988 USDA study average capital cost of $2.25/gal of ethanol capacity ($2.45/gal in 1990 dollars).
- Capital recovery includes 20 percent of capital investment one-time charge for facility start-up and miscellaneous costs.
- Capital recovery of a 10 percent real return on investment after taxes equates to an annual capital charge of 17.1 percent per year.
- 1988 USDA capital and operating costs are inflated to 1990 dollars using NPC inflation factors.
- Commodity costs are based on 10 year average (1981-1990) actual feedstock prices per the USDA.
- One bushel of corn yields: Wet Milling Process – 2.5 gal ethanol, 14 lbs gluten feed, 3 lbs gluten meal, 1.5 lbs corn oil; Dry Milling Process – 2.6 gal ethanol, 18 lbs distillers dried grains.
- Excludes potential 2.5 cpg credit for carbon dioxide recovery and sale.

Appendix L, Section V-8

Ethanol State Subsidies

	Ethanol Subsidy	
Blending States	**Cents/Gallon of Ethanol**	**Expiration Date**
Alaska	80 cpg	None
Connecticut	10 cpg	None
Illinois *	2 %	12/31/99
Iowa	10 cpg	6/30/99
Kansas	20 cpg	6/30/93
Minnesota †	20 cpg	None
Missouri	20 cpg	6/30/96
Montana	30 cpg	7/01/93
Nebraska ‡	20 cpg	12/31/2000
North Dakota	40 cpg	7/01/95
Ohio	15 cpg	9/30/93
Oregon	50 cpg	12/31/97
South Dakota	20 cpg	None
Washington	37 cpg	12/31/99
Wyoming	40 cpg	7/01/93

* Subsidy based on 2 percent gasoline sales tax exemption; i.e., $1.00 per gallon of gasohol would equate to a 2 cents per gallon (cpg) tax savings for gasohol (10 percent of gasohol as ethanol means a 20 cpg ethanol subsidy).

† An additional 20 cpg subsidy available for ethanol produced in the state.

‡ 20 cpg is a producer incentive subsidy, not an excise tax exemption.

Appendix L, Section V-9

MTBE Facility Production Costs

(Refer to Table 3-36, Volume I)

- Capital recovery of a 10 percent real return on investment after taxes equates to an annual capital charge of 17.1 percent per year.
- Facility stream day capacities based on 2.0 MB/SD for a refinery isobutylene MTBE unit, 12.5 MB/SD for a green field facility.
- MTBE Volumetric Equations
  - 0.79 Isobutylene + 0.34 Methanol = 1.0 MTBE
  - 0.95 Mixed Butanes + 0.34 Methanol = 1.0 MTBE
- Methanol prices per the Hahn study.
- Refinery MTBE operating costs per the NPC refining study.
- Green field MTBE operating costs per the Bechtel study.
- Capital recovery includes 20 percent of capital investment one time charge for facility start-up and miscellaneous costs.
- Excludes transportation, import duty, and working capital charges.

Appendix L, Section V-10
Ethanol Incentives

The NPC Logistics Model determined that currently existing ethanol capacity should be fully utilized to provide oxygenates for the expected gasohol and CO non-attainment gasoline requirements. Using Table 3-30 (in Volume I) and converting the CO non-attainment, CO reformulated, and gasohol grades to equivalent ethanol (2.03 divisor) shows the potential ethanol use is approximately twice current production capability.

This Appendix works through the development of the ethanol/MTBE economics at the last geographic area to which the Model supplied ethanol. The specific example is for Foundation Case I, year 2000. According to the Model results, the last area satisfied using ethanol was Las Vegas/Phoenix/Tucson. Additional ethanol supplies would have been used in areas less economic than the following example.

The reader is cautioned that the economics in this Appendix are the result of using specific values for the hydrocarbons and oxygenates. These specific value are those built-up and used throughout the study. Alternative value (particularly those that lower the "hydrocarbon base" to MTBE differential) may lower the incentive illustrated in the following example.

OXYGENATE DELIVERY COSTS
(For Production Costs, see Volume I, Chapter Three, Table 3-21)

	Cents/Gallon	Dollars/Barrel
Gulf Coast Greenfield	0.88	36.96
Transportation to Los Angeles		
Panama Canal		
Delivered Los Angeles		**40.45**
Venezuela Greenfield	0.93	39.06
Transportation to Los Angeles		
Panama Canal		
Delivered Los Angeles		**41.31**
Note: Gulf Coast Incentive is		0.86
U.S. Captive and Merchant Capability Fully Utilized		
Venezuela Source is Marginal (Last Increment)		
Midwest Ethanol	(1.38 – 0.54)	35.28
Rail Cost to Phoenix/Las Vegas		8.37
Delivered		**43.65**

The NPC Logistics Model used annual average data. The following analysis converts the annual average data to a winter-time CO non-attainment basis.

- Oxygenate blending factors are in Appendix L, Section V-1:
  - For 2.7% Oxygen: 84.96% Hydrocarbon + 15.04% MTBE:

    [0.8496 (28.01)] + [0.1504 (41.31)] = $30.01/barrel

    + The Hydrocarbon value is from the Model results.

    NOTE: The final result (in southern California) compares to the $26.92 value (year 2000, FC-1, Region 12) for the CO non-attainment Hydrocarbon portion used as part of the reference point calculation for Region 12 (see Appendix L, Section VIII-2).

    + The MTBE value was calculated earlier

  - Octane value for the annual average Hydrocarbon portion (HC):

    + The calculation below and the value above are for Regular Grade

    $$[0.8496\,(Y)] + [0.1504\,(110.0)] = 87.2$$

    $$Y = 83.16 \quad \left(\frac{R+M}{2} \text{ for Hydrocarbon}\right)$$

  - RVP of the annual average Hydrocarbon portion:

    $$[0.8496\,(Y)] + [0.1504\,(8)] = 1\,(9.4)$$

    $$Y = 9.65 \text{ RVP}$$

- For winter time, the RVP is raised from 9.4 average to 10.1 using Normal Butane. The following calculation maintains the Oxygen content at 2.7%:
  - Let "Y" be the unknown volume of Normal Butane

    $$[1\,(9.4)] + [Y\,(65)] + \left[\frac{0.1504}{0.8496}\,(Y)\,8\right] = \left[1 + Y + \frac{0.1504}{0.8496}\,Y\right] 10.1$$

    $$9.4 + [65\,Y] + [1.4162\,Y] = [1 + (1.1770\,Y)]\,10.1$$

    $$Y = 0.0128 \text{ barrels Normal Butane } (nC_4)$$

    + A 65 RVP blending value is used for Normal Butane

    + Additional MTBE: $\frac{0.1504}{0.8496}\,(0.0128) = 0.0023$ barrels

+ Winter blend: 1.0151 barrels/average barrel

[0.8496 (HC)] + [(0.1504 + 0.0023 MTBE] + [0.0128 (nC_4)]

- Correct the Octane and value of the Hydrocarbon portion:

  – Octane of the winter-time blend:

  Let "Y" = the Hydrocarbon portion

  [0.8496 Y] + [0.1527 (110.0)] + [0.0128 (95)] = [1.0151 (87.2)]

  Y= 82.98

  + A 95.0 $\frac{R+M}{2}$ Octane is used for Normal Butane

  – Value of Octane:

  + For year 2000, FC-1, Region 12, see Appendix L, Section VIII-2

  Conventional Premium (92.0 $\frac{R+M}{2}$) = \$31.03

  Conventional Regular (87.2 $\frac{R+M}{2}$) = \$28.85

  Delta = \$0.454 per $\frac{R+M}{2}$

  – Corrected value for Hydrocarbon portion:

  \$28.01 + [(82.98 – 83.16) 0.454] = \$27.93/barrel

- Value of winter-time CO non-attainment gasoline in Los Angeles:

  [0.8496 (27.93)] + [0.1527 (41.31)] + [0.0128 (12.76)] = 1.0151 (Y)

  Y = \$29.75/barrel

  – Normal Butane value in 1990 dollars: \$12.25 (1.0415) = \$12.76

  – The 1989 value is in Appendix L, Section IV-2

  – Compared to the earlier calculation, the winter-time value is lower due to the lower value for Normal Butane and the lower Octane of the Hydrocarbon base.

- Value of winter-time CO non-attainment gasoline in Phoenix/Las Vegas:
  - Pipeline transportation adds \$1.26/barrel (3.0 cents/gallon)
- Volume of winter-time CO non-attainment gasoline with ethanol:
  - For 2.7% Oxygen: 92.6% Hydrocarbon + 7.4% Ethanol
  - Assume Hydrocarbon + nC_4 out of Los Angeles is constant

$$0.8496 + 0.0128 + \left[\frac{0.074}{0.926}\ (0.8496 + 0.0128)\right] = 0.9313 \text{ barrels}$$

Ethanol volume = 0.0689 barrels

The reader will note the above volume is lower than the volume that results from MTBE (1.0151 barrels). Handled correctly, the difference does not impact the ethanol incentive calculations. However, in passing, note that if purchased ethanol is used to replace purchase, MTBE, the refinery utilization for the impacted hydrocarbon increases by about 9 percent to hold gasoline supplies constant (1.015/0.9313).

- RVP of Ethanol blend:

$$[0.8496\ (9.65)] + [0.0128\ (65)] + [0.0689\ (18)] = \frac{Y}{0.9313}$$

$$Y = 11.03 \text{ RVP}$$

  - This is below the 1 psi waiver (10.1 + 1 = 11.1). The reader can make the appropriate Normal Butane adjustments if a constant RVP impact is sought.

- Correct the Octane of the Hydrocarbon portion:

$$[0.8496\ (Y)] + [0.0128\ (95)] + [0.0689\ (115)] = [0.9313\ (87.2)]$$

$$Y = 84.83\ \frac{R+M}{2}$$

  - Hydrocarbon value:

$$28.01 + [(84.83 - 83.16)\ 0.454] = \$28.77/\text{barrel.}$$

- Ethanol incentive in Phoenix/Las Vegas:

	Dollars/Barrel
CO Non-Attainment Gasoline in Los Angeles (with MTBE)	29.75
Pipeline Transportation	1.26
Value in Phoenix/Las Vegas	31.01
Terminal Blending for Ethanol [0.25 cents/gallon]	(0.11)
Value of Ethanol Blend	30.90

  - Value of Hydrocarbon streams for blending in Phoenix/Las Vegas:

$$[0.8496\ (28.77)] + [0.0128\ (12.76)] + [(0.8496 + 0.0128)\ 1.26] = \frac{Y}{(0.8496 + 0.0128)}$$

$Y = \$29.79/\text{barrel}$

  - Value of Ethanol in Phoenix/Las Vegas:

$$[(0.8496 + 0.0128)\ 29.79] + [0.0689\ (Y)] = [(0.9313)\ 30.90]$$

Y = 44.79	44.79
Cost of Ethanol	43.65
Incentive	1.14

Appendix L, Section V-11

Oxygenate Issues— Data Revisions, Changes, and Updates

This section is intended to discuss data and information changes that have occurred in the latter months of the study. Many of these changes have been made in the oxygenates section of the study report but have been excluded from other report sections and model runs. Decisions made to exclude these changes from model runs were believed to have little or no impact on the conclusions and findings in this report.

Oxygenate Physical Properties

API Publication 4261 was used as the primary source of physical property data for oxygenates. Originally, the data was based on Publication 4261 from year 1976. This publication was updated in 1988 and the physical property data was subsequently updated. These changes were very minor, mostly to the second decimal place.

Ethanol Supply Capacity

The EIA ethanol supply surveys are based on denatured ethanol production. The study originally assumed the supply data was based on pure (100%) ethanol. Assuming the composition of denatured ethanol is 95 percent ethanol and 5 percent gasoline, the volumetric supply impact is a reduction of 4 MB/D of ethanol or 8 MB/D in MTBE equivalent barrels. This change has been included in the oxygenates section of the report but was excluded from the foundation case model runs.

Pipelines Transporting Oxygenates

The study originally assumed the Texas Eastern Pipeline was the only common carrier pipeline that would transport pure ethers (MTBE et al). The model runs were based on this assumption. The logistics section of the study now includes two other common carrier pipelines that have transported MTBE and continue to maintain the potential for future MTBE and other ether shipments: the Explorer Pipeline and the ARCO North Pipeline. This exclusion from the model runs will not significantly alter the oxygenate balances in the affected regions.

Department of Agriculture Information Bulletin No. 663: January 1993

The Department of Agriculture released an update of "Emerging Technologies in Ethanol Production" dated January, 1993. This bulletin discusses technological and economic improvements that will lower the costs associated with ethanol production. The NPC study is based on the 1988 Department of Agriculture study report. The updated report suggests that ethanol production costs are as much as 10-15 cpg lower than the 1988 report (based on 1990 dollars). This would suggest ethanol stands to be even more competitive, particularly with merchant produced MTBE. The oxygenates section of the NPC study indicates that ethanol is economically competitive with MTBE based on the 1988 Department of Agriculture study. While the NPC report excludes the information from the updated report, we recognize the updated study affirms the study conclusion that economics indicate that additional ethanol would be blended in all oxygenated gasolines (excluding summer RFG) if additional supply capacity were available.

Appendix L, Section VI-1

Logistics Centroids for U.S. & Foreign Regions

	Supply/Demand Regional Centers of Gravity	
	Supply Point	**Demand Point**
Region 1 New England		
Ocean Delivery		Boston
Barge Delivery		Boston
Rail Delivery		Boston
Truck Delivery		Boston
Region 2 Central Atlantic		
Ocean Delivery	New York Harbor	New York Harbor
Barge Delivery	New York Harbor	New York Harbor
Pipeline Delivery to Appalachia	Philadelphia	
Pipeline Receipts		Linden Jct
Rail Delivery		New York
Truck Delivery		New York
Region 3 Lower Atlantic		
Ocean Delivery		Port Everglades
Barge Delivery		Port Everglades
Pipeline Receipts & Delivery	Greensboro,NC	Greensboro,NC
Rail Delivery		Greensboro,NC
Truck Delivery		Greensboro,NC
Region 4 Appalachia		
Barge Delivery		Pittsburgh
Pipeline Receipts from Ind./Ill/Kentucy		Coraopolis,PA
Pipeline Receipts from Central Atlantic		Pittsburgh
Rail Delivery		Pittsburgh
Truck Delivery		Pittsburgh
Region 5 Indiana-Illinois- Kentucky		
Barge Delivery	Louisville	Louisville
Pipeline Delivery to Other Regions	East Chicago,Il	
Pipeline Receipts from Transshipping Terminal		Nashville,TN
Pipeline Receipts from Gulf Coast		Chicago
Rail Delivery	Peoria	Chicago
Truck Delivery	Chicago	Chicago
Region 6 Minneasota-Wisconsin-Dakotas		
Barge Delivery	Minneapolis/ St. Paul	Minneapolis/ St. Paul
Pipeline Receipts		Minneapolis/ St. Paul
Pipeline Deliveries to Okla/Kan/Mo	Minneapolis/ St. Paul	
Rail Delivery	Minneapolis/ St. Paul	Minneapolis/ St. Paul
Truck Delivery	Minneapolis/ St. Paul	Minneapolis/ St. Paul
Region 7 Oklahoma-Kansas-Missouri		
Barge Delivery		Kansas City
Pipeline Delivery to North & East	Tulsa	
Pipeline Delivery to Rocky Mountains	El Dorado, KS	
Pipeline Receipts from Minn/Wisc/Dakotas		Kansas City
Pipeline Receipts from Gulf Coast		Kansas City
Pipeline Receipts from Rocky Mountains		No. Platt, NB
Rail Delivery	Kansas City	Kansas City
Truck Delivery	Kansas City	Kansas City

Table APP.L.VI.1-1 (Con't.)

Logistics Centroids for U.S. & Foreign Regions

	Supply/Demand Regional Centers of Gravity	
	Supply Point	**Demand Point**
Region 8 PADD III		
Ocean Delivery	Houston	Houston
Barge Delivery	Houston	Houston
Pipeline Delivery North & East (Except 9 & 12)	Houston	
Pipeline Delivery to Rocky Mountains	Borger McKee, TX	
Pipeline Delivery to Southern PADD V	El Paso	
Rail Delivery	Houston	Houston
Truck Delivery	Houston	Houston
Region 9 Rocky Mountains		
Pipeline Delivery to Minn/Wisc/Dakotas	Casper, Wy	
Pipeline Delivery to Okla/Kan/Mo	Cheyenne, Wy	
Pipeline Delivery to Pacific Northwest	Billings, MT	
All Pipeline Receipts		Denver
Rail Delivery	Denver	Denver
Truck Delivery From Canada		Great Falls, MT
Truck Delivery From all Regions except Canada	Denver	Denver
Region 10 Pacific Northwest		
Ocean Delivery	Seattle	Seattle
Pipeline Delivery from Rocky Mountains		Spokane
Rail Delivery		Seattle
Truck Delivery		Seattle
Region 11 Central PADD V		
Ocean Delivery	San Francisco	San Francisco
Rail Delivery		San Francisco
Truck Delivery		San Francisco
Region 12 Southern PADD V		
Ocean Delivery	Los Angeles	Los Angeles
Pipeline Delivery from PADD III		Tucson
Rail Delivery		Los Angeles
Truck Delivery		Los Angeles
Region 13 Pacific (Alaska/Hawaii)		
Ocean Delivery	Honolulu/Anchorage	Honolulu/Anchorage
Foreign Regions		
Eastern Canada		
Ocean Delivery	Come-By-Chance	
Pipeline Delivery	Sarnia, Ont	
Western Canada		
Ocean Delivery	Vancouver	
Truck Delivery	Calgary	
Northwest Europe-Ocean Delivery	Rotterdam	
Mediterranean-Ocean Delivery	Naples	
Middle East -Ocean Delivery	Ras Tanura	
Latin America-Ocean Delivery	Curacao	
Pacific Rim-Ocean Delivery	Singapore	

Appendix L, Section VI-2

Logistics Transportation Cost Matrix

Table APP.L.VI.2-1

1993 NPC Refining Study
U.S. Flag(Jones Act) Ocean Transportation Cost Matrix

$/Barrel

Gasolines

Product Destination

Product	New England				Central Atlantic				Lower Atlantic				Gulf Coast			
Source	1989	1995	2000	2010	1989	1995	2000	2010	1989	1995	2000	2010	1989	1995	2000	2010
Central Atlantic	$0.502	$0.573	$0.623	$0.656												
Gulf Coast	$1.301	$1.485	$1.615	$1.702	$1.196	$1.365	$1.484	$1.564	$0.738	$0.842	$0.916	$0.965				

Product Destination

Product	Pacific Northwest				Central California				Southern California				Alaska/Hawaii			
Source	1989	1995	2000	2010	1989	1995	2000	2010	1989	1995	2000	2010	1989	1995	2000	2010
Gulf Coast	$3.282	$3.723	$4.033	$4.241	$2.904	$3.291	$3.564	$3.746	$2.744	$3.108	$3.365	$3.536	$3.729	$4.232	$4.588	$4.825
Pacific Northwest					$0.676	$0.771	$0.839	$0.884	$0.838	$0.956	$1.040	$1.096				
Central Calfornia	$0.676	$0.771	$0.839	$0.884					$0.473	$0.540	$0.588	$0.619	$1.236	$1.411	$1.534	$1.617
Southern California	$0.838	$0.956	$1.040	$1.096	$0.473	$0.540	$0.588	$0.619					$1.351	$1.542	$1.676	$1.766
Alaska/Hawaii					$1.236	$1.411	$1.534	$1.617	$1.351	$1.542	$1.676	$1.766				

Table APP.L.VI.2-2

1993 NPC Refining Study
Foreign Flag Ocean Transportation Cost Matrix

Gasolines

$/Barrel

Product Destination

Product Source	New England 1989	New England 1995	New England 2000	New England 2010	Central Atlantic 1989	Central Atlantic 1995	Central Atlantic 2000	Central Atlantic 2010	Lower Atlantic 1989	Lower Atlantic 1995	Lower Atlantic 2000	Lower Atlantic 2010	Gulf Coast 1989	Gulf Coast 1995	Gulf Coast 2000	Gulf Coast 2010
Eastern Canada	$0.572	$0.630	$0.653	$0.682	$0.677	$0.745	$0.772	$0.807	$0.918	$1.009	$1.047	$1.093	$1.230	$1.352	$1.403	$1.465
Venezuela	$0.947	$1.041	$1.080	$1.128	$0.938	$1.032	$1.070	$1.117	$0.706	$0.777	$0.805	$0.841	$0.922	$1.014	$1.052	$1.099
Northwest Europe	$1.537	$1.691	$1.753	$1.831	$1.622	$1.784	$1.850	$1.932	$1.844	$2.029	$2.104	$2.197	$2.158	$2.374	$2.462	$2.572
Mediterranean	$1.813	$1.994	$2.068	$2.160	$1.835	$2.019	$2.094	$2.187	$2.025	$2.227	$2.310	$2.412	$2.399	$2.639	$2.736	$2.858
Middle East	$3.638	$4.049	$4.178	$4.339	$3.722	$4.142	$4.274	$4.439	$4.011	$4.355	$4.495	$4.670	$4.327	$4.703	$4.856	$5.047
Far East	$4.651	$4.049	$4.178	$4.339	$4.600	$4.142	$4.274	$4.439	$4.343	$4.355	$4.495	$4.670	$4.998	$4.703	$4.856	$5.047
Western Canada																

Product Destination

Product Source	Pacific Northwest 1989	Pacific Northwest 1995	Pacific Northwest 2000	Pacific Northwest 2010	Central California 1989	Central California 1995	Central California 2000	Central California 2010	Southern California 1989	Southern California 1995	Southern California 2000	Southern California 2010	Alaska/Hawaii 1989	Alaska/Hawaii 1995	Alaska/Hawaii 2000	Alaska/Hawaii 2010
Eastern Canada																
Venezuela	$2.302	$2.512	$2.598	$2.705	$2.012	$2.194	$2.268	$2.360	$1.892	$2.062	$2.130	$2.217	$3.046	$3.331	$3.447	$3.591
Northwest Europe	$3.866	$4.232	$4.382	$4.568	$3.572	$3.909	$4.046	$4.218								
Mediterranean																
Middle East	$4.032	$4.435	$4.599	$4.804	$4.107	$4.518	$4.685	$4.894	$4.212	$4.633	$4.805	$5.019	$4.130	$4.543	$4.711	$4.920
Far East	$2.729	$4.435	$4.599	$4.804	$2.827	$4.518	$4.685	$4.894	$2.929	$4.633	$4.805	$5.019	$2.849	$4.543	$4.711	$4.920
Western Canada	$0.363	$0.399	$0.414	$0.433	$0.570	$0.627	$0.650	$0.679	$0.682	$0.750	$0.777	$0.812	$0.929	$1.022	$1.060	$1.107

Table APP.L.VI.2-3

1993 NPC Refining Study
Inland BargeTransportation Cost Matrix

$/Barrel

Gasolines

Product Destination

Product Source	New England 1989	New England 1995	New England 2000	New England 2010	Lower Atlantic 1989	Lower Atlantic 1995	Lower Atlantic 2000	Lower Atlantic 2010	Appalachia 1989	Appalachia 1995	Appalachia 2000	Appalachia 2010
Eastern Canada									$0.500	$0.638	$0.690	$0.742
Central Atlantic	$0.500	$0.638	$0.690	$0.742	$1.100	$1.403	$1.518	$1.633				
Appalachia												
Indiana/Illinois/Kentucky									$0.620	$0.791	$0.856	$0.920
Minn./Wis./Dakotas												
Okla/Kansas/Missouri												
Gulf Coast									$2.300	$2.934	$3.174	$3.414

Product Destination

Product Source	Indiana/Illinois/Kentucky 1989	Indiana/Illinois/Kentucky 1995	Indiana/Illinois/Kentucky 2000	Indiana/Illinois/Kentucky 2010	Minnesota/Wisconsin/Dakotas 1989	Minnesota/Wisconsin/Dakotas 1995	Minnesota/Wisconsin/Dakotas 2000	Minnesota/Wisconsin/Dakotas 2010	Oklahoma/Kansas/Missouri 1989	Oklahoma/Kansas/Missouri 1995	Oklahoma/Kansas/Missouri 2000	Oklahoma/Kansas/Missouri 2010
Eastern Canada					$1.260	$1.608	$1.739	$1.870				
Central Atlantic												
Appalachia	$0.620	$0.791	$0.856	$0.920								
Indiana/Illinois/Kentucky					$1.260	$1.608	$1.739	$1.870				
Minn./Wis./Dakotas	$1.260	$1.608	$1.739	$1.870					$1.060	$1.352	$1.463	$1.573
Okla/Kansas/Missouri												
Gulf Coast	$1.750	$2.233	$2.415	$2.597	$2.170	$2.769	$2.995	$3.221	$1.910	$2.437	$2.636	$2.835

Table APP.L.VI.2-4

1993 NPC Refining Study
Pipeline Transportation Cost Matrix

Gasolines

Product Destination

$/Barrel Product Source	Central Atlantic 1989	1995	2000	2010	Lower Atlantic (Transshipping Point) 1989	1995	2000	2010	Appalachia 1989	1995	2000	2010	Indiana/ Illinois/Kentucky 1989	1995	2000	2010
Canada													$1.000	$1.140	$1.140	$1.140
Central Atlantic									$0.600	$0.690	$0.690	$0.690				
Gulf Coast					$0.820	$0.940	$0.940	$0.940	$1.520	$1.750	$1.750	$1.750	$0.720	$0.820	$0.820	$0.820
Ind./Ill./Kentucky									$1.040	$1.190	$1.190	$1.190				
Okla/Kan/Mo													$0.720	$0.820	$0.820	$0.820
Lower Atlantic T/S	$0.170	$0.190	$0.190	$0.190									-$0.040	-$0.040	-$0.040	-$0.040

Product Destination

Product Source	Minneasota/Wisconsin/Dakotas 1989	1995	2000	2010	Oklahoma/Kansas/Missouri 1989	1995	2000	2010	Rocky Mountains 1989	1995	2000	2010	Southern California 1989	1995	2000	2010
Central Atlantic																
Gulf Coast	$1.770	$2.020	$2.020	$2.020	$1.150	$1.320	$1.320	$1.320	$0.700	$0.800	$0.800	$0.800	$0.670	$0.763	$0.763	$0.763
Ind./Ill./Kentucky	$1.330	$1.520	$1.520	$1.520	$2.450	$2.810	$2.810	$2.810								
Minn./Wisc./Dakotas					$1.130	$1.290	$1.290	$1.290								
Okla/Kan/Mo	$1.130	$1.290	$1.290	$1.290					$0.630	$0.730	$0.730	$0.730				
Rocky Mountains	$1.050	$1.205	$1.205	$1.205	$1.150	$1.323	$1.323	$1.323								

Product Destination

Product Source	Pacific Northwest 1989	1995	2000	2010	PADD III(Dallas) 1989	1995	2000	2010
Gulf Coast					$0.550	$0.630	$0.630	$0.630
Rocky Mountains	$0.935	$1.071	$1.071	$1.071				

Table APP.L.VI.2-5

1993 NPC Refining Study
Rail Tankcar Transportation Cost Matrix

$/Barrel

Gasolines
ALL YEARS
Product Destination

Product Source	New England	Central Atlantic	Lower Atlantic	Appalachia	Ind/Ill/ Kentucky	Minn/Wisc/ Dakotas	Rocky Mountains	Pacific Northwest	Central California	Southern California	Okla/Kan/ Missouri
Ind/Ill/Kentucky	$4.10	$3.78	$3.47	$2.08		$1.80	$4.22	$8.72	$9.76	$8.87	
Minn/Wisc/Dakotas	$5.21	$4.93	$5.00	$3.60			$3.62	$7.99	$9.53	$9.46	
Okla/Kan/Mo	$5.75	$5.33	$4.67	$3.63	$2.02	$2.15	$2.73	$8.04	$8.39	$7.12	
Gulf Coast	$7.69	$6.81	$4.96	$5.47	$4.34	$4.97	$4.33	$10.64	$8.44	$7.24	$3.14
Rocky Mountains								$6.44			

Table APP.L.VI.2-6

1993 NPC Refining Study
Tank TruckTransportation Cost Matrix

Gasolines

$/Barrel

Product Destination

Product Source	New England 1989	New England 1995	New England 2000	New England 2010	Central Atlantic 1989	Central Atlantic 1995	Central Atlantic 2000	Central Atlantic 2010	Lower Atlantic 1989	Lower Atlantic 1995	Lower Atlantic 2000	Lower Atlantic 2010	Appalachia 1989	Appalachia 1995	Appalachia 2000	Appalachia 2010
Ind./Ill./Kentucky	$14.31	$18.62	$18.62	$18.62	$13.08	$17.03	$17.03	$17.03	$11.92	$15.52	$15.52	$15.52	$6.67	$8.69	$8.69	$8.69
Minn/Wisc/Dokatas	$18.51	$24.10	$24.10	$24.10	$17.46	$22.74	$22.74	$22.74	$17.73	$23.08	$23.08	$23.08	$12.39	$16.14	$16.14	$16.14
Okla/Kan/Missouri	$20.57	$26.78	$26.78	$26.78	$18.95	$24.67	$24.67	$24.67	$16.48	$21.46	$21.46	$21.46	$12.54	$16.33	$16.33	$16.33
Gulf Coast	$27.92	$36.35	$36.35	$36.35	$24.58	$32.00	$32.00	$32.00	$17.55	$22.85	$22.85	$22.85	$19.51	$25.40	$25.40	$25.40

Product Destination

Product Source	Minneasota/Wisconsin/Dakotas 1989	Minneasota/Wisconsin/Dakotas 1995	Minneasota/Wisconsin/Dakotas 2000	Minneasota/Wisconsin/Dakotas 2010	Rocky Mountains 1989	Rocky Mountains 1995	Rocky Mountains 2000	Rocky Mountains 2010	Pacific Northwest 1989	Pacific Northwest 1995	Pacific Northwest 2000	Pacific Northwest 2010	Central California 1989	Central California 1995	Central California 2000	Central California 2010
Ind./Ill./Kentucky	$5.81	$7.56	$7.56	$7.56	$14.74	$19.19	$19.19	$19.19	$29.59	$38.53	$38.53	$38.53	$31.49	$40.99	$40.99	$40.99
Minn/Wisc/Dokatas					$12.49	$16.27	$16.27	$16.27	$23.64	$30.77	$30.77	$30.77	$28.52	$37.13	$37.13	$37.13
Okla/Kan/Missouri	$6.93	$9.02	$9.02	$9.02	$9.11	$11.87	$11.87	$11.87	$27.04	$35.20	$35.20	$35.20	$26.98	$35.12	$35.12	$35.12
Gulf Coast	$17.61	$22.93	$22.93	$22.93	$15.19	$19.77	$19.77	$19.77	$33.43	$43.52	$43.52	$43.52	$28.11	$36.59	$36.59	$36.59
Rocky Mountains									$19.21	$25.01	$25.01	$25.01				
Canada					$1.00	$1.30	$1.30	$1.30								

Product Destination

Product Source	Southern California 1989	Southern California 1995	Southern California 2000	Southern California 2010	Indiana/Illinois/Kentucky 1989	Indiana/Illinois/Kentucky 1995	Indiana/Illinois/Kentucky 2000	Indiana/Illinois/Kentucky 2010	Oklahoma/Kansas/Missouri 1989	Oklahoma/Kansas/Missouri 1995	Oklahoma/Kansas/Missouri 2000	Oklahoma/Kansas/Missouri 2010
Ind./Ill./Kentucky	$30.19	$39.31	$39.31	$39.31								
Minn/Wisc/Dokatas	$27.77	$36.15	$36.15	$36.15								
Okla/Kan/Missouri	$23.36	$30.41	$30.41	$30.41	$6.43	$8.37	$8.37	$8.37				
Gulf Coast	$22.61	$29.43	29.43.	$29.43	$15.22	$19.81	$19.81	$19.81	$10.69	$13.92	$13.92	$13.92

Appendix L, Section VI-3

U.S. Flag (Jones Act) Tankers Operating in Clean Product Service

For the purpose of measuring the U.S. Flag (Jones Act) tanker capacity to be used in the Logistics Model, the attached list of tankers were assumed to be operating in clean product service transporting gasoline, jet fuel and distillates. Ships were limited to the 25,000-50,000 DWT size range for operating flexibility. This list is not an exclusive list of the only ships available because vessels move in and out of clean product service from dirty and chemical products trading. Ships may be unexpectedly retired. Large ocean going barges may also move into and out of clean product trading. Some larger and smaller ships beyond the selected size range may transport clean products in specialized situations. However, the ships selected were in clean service at the time and are representative of a feasible clean product fleet.

SUMMARY OF U.S. FLAG JONES ACT CLEAN PRODUCT SERVICE TO 25-50 MDWT VESSELS

	Vessels in Clean Product Service			
		Year Built/	Cannot Operate After Jan. 1 Under	
Model Assumptions	**MDWT**	**Rebuilt**	**OPA '90**	**IMO**
Star Rhode Island	25,418	1964	1998	1995
Star Massachusetts	25,728	1963	1998	1995
Star Georgia	26,276	1964	1999	1995
Star Mississippi	26,588	1964	1999	1995
Exxon Galveston	27,153	1978	2005	2003
Syosset	30,293	1958	1997	1995
Chablis	30,806	1960	1997	1995
Coastal Manatee	30,806	1962	1998	1995
Montrachet	30,806	1959	1997	1995
Solar	30,806	1959	1997	1995
Spray	30,806	1960	1997	1995
Concho	32,741	1970	2001	1995
Philadelphia Sun	34,090	1981	2007	2006
Pennsylvania Trader	34,397	1962	1998	1995
New York Sun	34,397	1980	2006	2005
King	34,723	1957	1996	1995
Knight	34,723	1958	1997	1995
Tropic Sun	34,723	1957	1996	1995
St. Emilion	34,779	1956	1996	1995
Neches	34,930	1958	1997	1995
Sabine	35,079	1957	1996	1995
Blue Ridge	37,076	1981	2011	2011
OMI Star	37,115	1970	2001	1995
Falcon Princess	37,276	1972	2002	1997
OMI Charger	37,807	1969	2000	1995
Overseas Alice	37,814	1968	2000	1995
Overseas Valdez	37,814	1968	2000	1995
Overseas Vivian	37,814	1969	2000	1995
OMI Willamette	37,853	1969	2000	1995
OMI Champion	37,874	1969	2000	1995
Star Oregon	39,249	1972	2002	1997
Chevron Colorado	39,304	1976	DH	DH
Chevron Arizona	39,561	1977	DH	DH
Chrvron Washington	39,561	1976	DH	DH
Overseas New Orleans	42,595	1983	2013	2013
Exxon Wilmington	48,011	1984	2014	2014
Exxon Charleston	48,075	1983	2013	2013
Seminole	49,298	1961	1998	1995
Total — DWTs	**1,344,165**			
Number Of Vessels	**38**			
Average Ship Size-	**35,373**	**DWT**		

NOTES:

1. Source of Year Built: "Vessel Inventory Report," U.S. Department of Transportation, July 1, 1991.
2. DH denotes Double-Hull construction.

Appendix L, Section VI-4

Tanker Markets, Worldscale and ATRS

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People not directly involved in the tanker business often fail to appreciate the size and importance of the industry. In rough numbers, the world produced and consumed 66 million barrels of petroleum and its products per day in 1989. In more familiar terms, this amounts to 2.8 billion gallons per day. About half of this oil will at one time or another be shipped by tanker. The commercial tanker fleet at this same time was made up of 2813 vessels with a total deadweight of 240 million tons. At mid 1989 shipyard prices, the replacement cost of the fleet is over $100 billion. The size and distribution and ownership of the fleet is shown in the following table.

TABLE 1

WORLD COMMERCIAL TANKER FLEET END 1989

Size Group MDWT	Independent	Oil Company	Total
10-25	275	342	617
25-45	492	296	788
45-90	383	227	610
90-160	238	133	371
160+	286	141	427
Total	**1674**	**1139**	**2813**

Figure 1 shows the major crude oil trade patterns. The thickness of each arrow is in proportion to the volume of oil moved.

WORLDSCALE

In order to discuss the commercial aspects of the tanker business, it is necessary to introduce the concept of Worldscale. Worldscale, which is now produced annually by the Worldscale Association (London) Limited is a reference

Figure 1. Crude Oil Seaborne Trade.

tariff for the cost of moving oil. The reference rate is called W100. For example, the 1991 W100 rates were:

TABLE 2

SAMPLE W100 RATES (1991 WS)

Load Port	Discharge Port	W100 U.S.$/Metric Ton
Rotterdam	New York	$7.28
Ras Tanura (Saudi Arabia)	Houston	$16.88 S
Curacao, Venezuela	New York	$4.21
Singapore	San Francisco	$12.69
Ras Tanura	Los Angeles	$18.91
Naples	New York	$8.24
Montreal, Canada	New York	$4.06
Ras Tanura	Yokohama	$11.80
Ras Tanura	Rotterdam(cape/cape)	$19.50

NOTE: S denotes that an additional fixed charge for the Suez Canal must be added to the rate.

The majority of single voyage charters are made in Worldscale. When a vessel is chartered to carry oil, the charterer and the owner negotiate the charter rate in terms of Worldscale. If a charter is made at W50, the charterer will pay the owner one-half the W100 rate for each metric ton of crude or product carried. A W200 charter commands twice the W100 rate. The rate paid for a particular charter depends largely on the supply/demand balance for the size range of the tankers involved.

WHY WORLDSCALE?

The purpose of the Worldscale system is to facilitate the process of tanker chartering. If an owner received two offers for his tanker, say $5.00 per ton for a voyage from the Arabian Gulf to Japan (6590 miles) and $8.75 per ton for a voyage from the Arabian Gulf to Rotterdam (11,170 miles) he cannot, without further analysis, know which is the best offer. He knows he is getting more per ton for the Rotterdam delivery, but it is much longer and therefore a more expensive voyage. The Worldscale system is designed so that at equal Worldscale rates, an owner will receive the same contribution to profit (revenue less port charges and fuel expense) per day regardless of the trade. This means, in rate negotiations, the owner does not have to worry about the trade. He need only concentrate on obtaining the highest rate. On the other hand, the charterer tries to obtain the lowest rate. Using the above example, and the W100 rates from Table 2, the voyage from the Arabian Gulf (Ras Tanura) to Japan (Yokohama) is being offered at W42 and the voyage from the

Arabian Gulf to Rotterdam at W45. The choice is now obvious: the owner is financially better off taking the voyage to Rotterdam.

In real life, the process is more complicated than this, but the example demonstrates the principle that the Worldscale system allows the profitability of a charter to be looked at without having to deal with a specific trade.

WHAT IS ATRS?

The Merchant Marine Act of 1920, otherwise known as the Jones Act, requires that all ocean or waterway transportation from one U.S. port to another U.S. port be moved in a vessel built in the United States, owned by a U.S. person or corporate entity, manned by a certified U.S. crew and registered in the United States (U.S. flag). Tankers meeting these specifications are known as Jones Act tonnage. Some U.S. registered ships which are not U.S. built or were built with Federal Government subsidies fly the U.S. flag, but are not Jones Act ships. Foreign flag ships, i.e. ships not registered in the United States, and non-Jones Act U.S. tonnage are precluded from moving cargo from a United States location to another United States location.

The combined source and destination of the cargo define the limitation. Any item or material which originates in the United States and is ultimately shipped to a United States location must be shipped in Jones Act tonnage. For example, Alaskan North Slope crude oil is shipped from Valdez, Alaska (U.S. port) to the west coast of Panama (foreign port) where it is pipelined to the Gulf Coast of Panama. It is then loaded in Panama (foreign port) on a tanker for shipment to the U.S. Gulf Coast, say Houston (U.S. port). Although it is shipped from a U.S. port to a foreign location before being shipped to another U.S. port, it must be carried in Jones Act tonnage because the cargo is sourced from Valdez, Alaska, a U.S. port and is ultimately going to Houston, a U.S. port.

The Jones Act has created a unique niche market for ships meeting its requirements. Because U.S. costs differ from foreign ships and the market is restricted, a rate schedule similar to Worldscale has evolved. The U.S. Jones Act rate schedule is called the American Tanker Rate Schedule or ATRS.

ATRS is used in a similar fashion to Worldscale. Charter rates are expressed as AR50 or AR75 meaning 50% or 75% of the AR100 rate. U.S. flag charter rates are expressed in AR equivalents in the same manner as Worldscale described above. The AR100 rates refer to dollars per long-ton, not metric ton, as is the case for Worldscale. A series of 1991 ATRS rates are shown in Table 3.

TABLE 3

SAMPLE ATRS AR 100 RATES (1991 ATRS)

Loading Port	**Discharge Port**	**AR100 U.S. $/Long-Ton**
Houston	New York	$7.15
Houston	Los Angeles	$15.40 P
San Francisco	Seattle	$4.04
Houston	Port Everglades	$4.41
Los Angeles	San Francisco	$2.83
New York	Boston	$3.00

NOTE: P Denotes an additional fixed charge for the Panama Canal which must be added to the rate.

Appendix L, Section VII-1

Supplemental Notes on Methodology for Refining Industry Modeling Section of Chapter Three

Foreign Region Areas

Demands in China, Vietnam, North Korea, Cambodia, Cuba, Eastern European States, the former Soviet Union, and African countries south of the Sahara were not modeled. These countries were assumed to not affect significantly interregional movements or imports to the United States. In addition there was insufficient refining data available to model these areas on a basis consistent with the six selected regions. Any movements of petroleum products into and out of these regions were assumed to continue at 1989 levels. (Note that for North Korea, Cambodia, and Cuba, capacities and historical (1989) demands were built into the base but excluded from future projections).

Regional Refining Capacity

The listing of process unit types and rated capacities was composited into single generic types of process units for the single refinery regional model. For example, Unifining, Hydrofining, and Distillate Hydrodesulfurization all are included in the broad category of distillate hydrotreating. Similarly, Residfining and Resid Isomax is included in the broad category of (A)tmospheric (R)esid (D)e(S)ulfurization (ARDS). Information concerning capacities of minor units such as chemical treating, gas concentration units, or fractionation was not available in the literature, and capacity was assumed to be available as required. Refer to Appendix L, Section VII-2, for a summary by region of the basic capacity of crude oil distillation, distillate conversion, catalytic reforming and distillate hydrotreating assumed available in 1989.

With 1989 capacities as the basis, capacity adjustments for 1995 were prepared which take into account all increments/decrements announced (prior to April 1992 cutoff) in the trade journals (e.g., Oil & Gas Journal) and as supplemented by specific industry information. A judgmental probability factor was applied to some of the announced capacity where it was felt that the prospect was speculative. For the foreign regions Pace supplied the base data. A 5 percent creep, defined as increase above nameplate capacity by minimal debottlenecking, has been added to 1989 capacities to allow for unit debottlenecking or capacity stretch between 1989 and 1995. An exception was for catalytic processes such as reforming, hydrodesulfurizing, isomerization and alkylation that were not considered to be capable of debottle-necking without significant investment. Creep also was not considered available from 1995 onward, on the premise that more restrictive permitting practices would prevent such increases. Where data source inconsistencies show a decrease in unit capacity that cannot be reconciled with announced unit shutdowns, the prior capacity data was used rather than show a reduction from 1989 to 1995.

Product Quality and Demand

(See Appendix L, Section VII-4, for more discussion on product quality.)

In their study of the U.S. supply regions, Turner & Mason, consultants to the NPC, proposed use of testing manufacturing tolerances that would be added to most proposed US specifications from 1995 onwards, in order to obtain manufacturing specifications for use in the LP studies. The NPC decided that such testing tolerances should be applied to the product specifications for all mogas imported into the United States as well as U.S. products, therefore such tolerances should be applied to all foreign gasoline specifications. Details of the tolerances used for the study are covered in the Chapter Four. However, testing tolerances were not applied to foreign jet flash, smoke and aromatics; to diesel flash; and to none of the residual fuel specs.

The 1989 specifications are those used in the 1989 reference cases, and were intended to reflect the actual quality existing in the marketplace during 1989. Gasoline data was taken from various industry sources such as Associated Octel and Ethyl Corporation. Pour point depressant was assumed added to automotive diesel (ADO) and home heating oil (HHO) in Northwest Europe and Mediterranean regions. MMT was assumed added to gasoline in Canada.

In 1995 the HSFO yield and sulfur level guidelines were relaxed for some regions in order to get a solution. There was insufficient low sulfur crude oil segregation with the investment fixed for the year and the specifications were made less restrictive. For 1995 the LP solution could not include additional processing facilities such as desulfurizing, in order that demands could be met within product specification guidelines.

Demand for minor products such as lubes, asphalt, and petrochemical naphtha (N) were assumed fixed at 1989 levels. However holding chemical naphtha production levels constant at 1989 levels in the Pacific Rim region caused a significant oversupply potential for gasoline that would be available for importation to the United States PADD V region at very low marginal values. This was seen in modeling the Pacific Rim region in 1995. A side study revealed that there was and is significant ethylene capacity being added in the Pacific Rim between 1989 and 1995 with naphtha as the primary feedstock. Estimates from 200,000 to 400,000 B/SD of additional chemical naphtha demand were indicated in studies published in trade journals. No additional ethylene demand growth was forecast beyond 1995. Accordingly, 200,000 B/SD of additional chemical naphtha demand was added to the 1995 Pacific Rim regional model.

For 1995, the NPC decided to include import quantities of M or J or D based on EIA consumption data for the importing PADD region, such that the ratio of MJD for imports matched the ratio of MJD within that PADD. The 1995 base MJD (mogas+jet+distillate) reference cases were developed initially utilizing the same interregional transfers as in 1989.

Crude Oil/Product Costs

Additive costs for lead, MMT and MTBE were established from historical public data and reported in the regional models. Oxygenates were set using a landed cost in the US Gulf Coast assuming shipment from Saudi Arabia. From there costs were netted back to Saudi Arabia and then freight and tariff adjusted to the other regions, including other U.S. destinations. The price for TEL was taken from historical data provided by Ethyl Corporation as 1 cent/gm lead. The 1995 price for purchased MTBE was calculated at $35.60/bbl USGC (United States Gulf Coast) or $29.46 FOB Saudi Arabia, based upon incremental supply from Middle East grassroots facilities utilizing butane isomerization and dehydrogeneration, with 10 percent DCF rate of return (ROR).

In the foreign modeling, butane costs were set by Pace based on very limited intelligence data. Methanol was treated as an imported feedstock into regional models. Ethanol appears only to be in significant use outside the United States in Brazil, and the ethanol consumption in that country (based on EIA data) was reflected in the analysis.

U.S. Import/Export Assumptions

One issue that has not been addressed in this study is the potential for change in U.S. export patterns and volumes in the future. For example quality differences could alter these historical patterns. Data gathered from the NPC survey and experts indicate that the US distillate pool is of poorer quality with respect to sulfur and cetane number than many of the foreign regions currently enjoy as typical. Similarly kerojet is expected to meet more stringent IATA specifications in 1999 and it is unclear if the U.S. industry will meet these more severe specifications with respect to freeze point.

The only significant importer of U.S. product outside of the regions modeled in this study is the People's Republic of China (PRC). Only in the last 3 years has the PRC become an importer and that has been restricted to distillate product. The primary markets for U.S. products have been the Pacific Rim region and Latin America. In the Pacific Rim area, Japan consistently accounted for well over 50 percent of MJD imports until 1990 after which movements declined. Pacific Rim regional imports from the United States reflected large increases of product flow into Singapore and Korea. These movements are not likely to be sustained with announced crude oil capacity increases in these markets and the return of refining capacity in the Middle East. Growth in the U.S. exports to Latin America is almost totally accounted for by increased gasoline shipments to Mexico (0 in 1988 to 44 MB/D in 1991). This movement is expected to be sustainable for the next few years. Canadian imports are relatively steady at about 20 MB/D MJD. Northwest Europe surged in distillate imports in the early 1990s, caused by a loss of supplies from the Middle East during the Gulf Crisis, from what appeared to be a small volatile flow in the 1980s. This data could be affected by the role of Rotterdam as a clearing house for excess product inventory.

Exports from the United States

An important consideration for the study of U.S. refining is the issue of U.S. light product export levels. In 1989, exports of motor gasoline, kerosene/jet fuel and distillate averaged 163 MB/D. More recently, MJD exports have increased, reaching 340 MB/D in 1991 and are estimated at 321 in 1992. These recent increases reflect a gradual tightening of worldwide conversion capacity which was exacerbated by the loss of Kuwait refinery capacity during the Gulf War. As a consequence, increasing quantities of U.S. distillates have been exported to the Pacific Rim, Northwest Europe, and Latin America. Gasoline exports have also increased, primarily to Mexico to cover rapidly growing demand and shutdown of refining capacity for environmental reasons.

The NPC analysis assumed that the effect of these factors would, on balance, diminish over time. The analysis was conducted assuming U.S. exports were at the 1989 levels for 1995, 2000, and 2010. There are several factors that could affect the level of exports, including light product demand trends in the U.S. and overseas, the growth of U.S. and foreign conversion capacity, and the increased replacement of hydrocarbon gasoline by MTBE, ethanol, and other oxygenates. In particular, rapid MJD demand growth is expected in the Pacific Rim and Latin America. Significant conversion capacity additions have been announced and are under consideration in these regions which are intended to meet these demands. However, the amount of capacity addition which will actually come to fruition is somewhat unclear. Among the uncertainties is the ability to raise adequate financing for the projects.

As discussed in Chapter Four, significant investments in U.S. light product refining capability are planned to meet product quality requirements of the 1990 CAAA. In California, CARB specifications for Phase 2 reformulated gasoline could free up heavy motor gasoline components that might be suitable for limited finished gasoline exports to Pacific Rim or Latin American countries. This situation could apply more broadly across the United States to the extent federal reformulated gasoline regulations impose similar specifications on motor gasoline nationwide. The availability of product would be further increased as oxygenates replace hydrocarbon gasoline components in order to reduce carbon monoxide and ozone formation. Product exports to Canada and Mexico would also be facilitated by terms of the North American Free Trade Agreement.

On the other hand, there are other factors tending to limit further U.S. exports. Based on past industry experience, there is some risk of over expansion of foreign capacity as more than one refiner invests to meet the same demand. Also, from a crude oil transportation viewpoint, the United States is at the end of the cost flow line from the marginal source of crude oil supply in the Middle East. Product exports from the United States must carry the high cost of crude oil transportation from the Middle East to U.S. refineries plus product transportation costs from the refinery to the importing country. Further, developing nations are not likely to plan on increasing product import dependence, but directionally will prefer to retain locally the economic benefits of adding value via upgrading crude oil to finished products and also minimize the negative trade balance effects of high cost product imports.

Issue Cases

Regional Model Overoptimization

The refining industry in each foreign region was represented in the Pace LP model as a composite (single refinery). This inherently leads to LP optimization on flows between refineries in the region. However, in the real world, logistics or economics might inhibit flows from one refinery to another because of location (e.g., inland vs. coastal refineries), surplus capacity residing in hands of one company; or structural import/export limits some refineries may have regard to import/export of segregated unfinished streams in economic size parcels.

This was tested for selected foreign regions by estimating the effect of lowering utilization of resid conversion units (cat cracking, hydrocracking, coking, visbreaking) in forward years from 100 percent down to 80 or 90 percent, compared to the effect of these same utilization changes in 1989. The percentage reduction chosen for each region depended on the geographic and refining diversity of that region. Further, it was assumed that any reduction in the hydrocarbon portion of MJDN cpg costs between 1989 and the forward years (raw material costs less by-product revenues, labeled "Delta Stock Balance" in the product costs buildup tables) was all attributable to added conversion capability.

Three regions, all of which between 1989 and 1995 had large increases in resid conversion capacity relative to crude oil capacity additions, as well as a large Delta Stock Balance cost reduction between these same two years, were analyzed:

- The Pacific Rim, because it represented a wide geographic area with diverse refinery configurations (ranging from simple topping in some third world countries to complex upgrading in developed countries like Japan), was downrated to 80 percent utilization.

- Latin America and the Mediterranean were downrated to 90 percent of utilization, since the range of complexity was lower and geographic dispersion less than the Pacific Rim.

The remaining three foreign modeled regions were judged to have had much less potential for overoptimization in the LP model. Northwest Europe and Canada have fairly well integrated logistical, petroleum marketing, and geopolitical systems. The Middle East had the lowest resid conversion capacity relative to crude oil capacity of all the regions modeled, and showed no increase in this ratio between 1989 and 1995. Moreover, all three of these regions had much smaller "Delta Stock Balance" cost reductions than did the regions analyzed.

Similarly, the U.S. modeled regions, which were generally well-integrated along with an almost flat demand growth over the study period, would not be expected to see significant overoptimization effects in the forward years that were not there in 1989.

Sensitivities for the three foreign regions studied focused on two model years: 1995, when new capacity is assumed onstream and fixed, and 2000 when the model had the option of adding further capacity. All sensitivity cases were run for FC-1 only, as this the highest demand scenario, would be expected to show the greatest impact on MJDN costs. From these sensitivities it was concluded:

- For 1995 cases, the marginal cost of incremental MJDN exports to the United States would have increased by 0.3 cpg (Latin America and the Mediterranean) to 1.0 cpg (Pacific Rim) over the corresponding FC-1 reference case costs, if corrections were to be made to account for over-optimization. The higher cost reflects the need to run more crude oil in a topping or topping/reforming mode to generate the required MJDN than was required in FC-1 with the benefit of higher resid conversion utilization levels. Cost changes for Latin America and the Mediterranean were not large enough to have any significant impact on U.S. import levels, while Pacific Rim cost increases would have been neutralized by the assumption of parity with Middle East import costs for imports to the United States.

- With the foreign regions showing anywhere from small to no "Delta Stock Balance" cost reduction between 1995 and 2000, effect of the over-optimization sensitivity in 2000 would have been 0.1 cpg or less. The model elected to add resid conversion in the 2000 FC-1 reference cases. Therefore, the need to add further conversion capacity to compensate for the lower utilization rate of this sensitivity, would not have been expected to alter the cpg cost of the last increment of MJDN production significantly.

Overall, it is concluded that U.S. import levels would not have been materially different if adjustments were made to account for overoptimization.

Crude Oil vs. Heavy Fuel Oil Price Differentials

Foreign region LP cases were run to meet projected light product demand slates, with crude oil input and heavy fuel oil production allowed to float within limits on price. Consistent with study methodology, product costs and cost differentials were kept constant at 1989 levels for all years of the study.

In some regions, particularly the Pacific Rim, the optimal LP solution for year 2000 resulted in incremental Topping or Topping/Reforming crude oil runs, adding primarily reforming, light ends upgrading and desulfurization facilities. Although the LP solution had the option to add heavy fuel oil (VGO or resid) conversion in most cases this was not the preferred solution. This appears in conflict with many industry announcements on heavy fuel oil conversion capacity additions, particularly in the Pacific Rim, South America, and the Middle East.

One reason for this anomaly may lie with the decision to use 1989 prices, which may not be consistent with the future supply/demand environment. For example, the 1989 price reflected significantly narrower crude oil vs. differentials than those that prevailed in the 1990-92 period, and may have been closer to the basis used for new investment decisions. The 1989 price differentials, which would not have reflected the lightening demand barrel projected for year 2000, provided insufficient incentive to build added heavy fuel oil conversion capacity, favoring instead to produce the needed MJD via the processing of incremental crude oil in topping or topping/reforming capacity with the attendant production of significant volumes of heavy fuel oil.

To test this hypothesis, and more importantly assess the impact on the foreign product costs (and by extension impact on costs of foreign region supply of products to the United States), the HSFO price was lowered by $2.30/barrel for the Pacific Rim and Latin America regions. This resulted in increasing the crude oil vs. HSFO differential from $1.80/barrel (1989 estimate) to $4.05/barrel (1991-92 estimated average). While this may have produced an artificially low HSFO price, it is the crude oil vs. HSFO differential that is key, as it provides the primary economic drive for resid conversion vs. crude oil run.

Latin America and the Pacific Rim were selected for this sensitivity analysis, as changes to costs in these regions, along with the Middle East, were judged to have the greatest potential impact on U.S. product import levels.

The higher crude oil vs. HSFO differential ($4.05/barrel) for these sensitivity cases led to reduction in HSFO production and corresponding reduction in crude oil runs (at constant MJD compared to the base case (year 2000, FC-1 reference case) in the regions tested. With the United States having about one-third as much of residual demand as the foreign regions. Applying this same sensitivity to the U.S.

PADD regions would be expected to have an impact of about one third of the foreign regions tested. The resulting impact on foreign vs. U.S. cost would be as follows:

- For Latin America the sensitivity case resulted in adding cat cracking, coking and distillate desulfurizing capacity, compared to only cat cracking for the FC-1 case. Corresponding incremental values on jet plus distillate increased by about 0.8 cents/gallon over the reference case relative to the U.S. production costs, while gasoline cost dropped by about 0.4 cpg. The resultant MJD, weighted to approximate the U.S. import overall mix would have seen an effective cost increase of about 0.5 cpg.

- For the Pacific Rim the sensitivity case facility additions included cat cracking, coking, visbreaking, atmospheric residue desulfurization and alkylation compared to just alkylation for the reference case. With a much more limiting jet plus distillate to gasoline demand ratio (2.3/1.0) than for Latin America (1.2/1.0), gasoline marginal costs dropped versus the reference case by about 5 cpg, while jet plus distillate increased by about 5.5 cpg. The resultant weighted MJD cost increase would have also been about 0.5 cpg in this region.

- While not tested, the Middle East region with jet plus distillate to gasoline demand ratios greater than the Pacific Rim, would probably see cost sensitivities at or perhaps somewhat above those for the Pacific Rim.

The magnitude of the weighted MJD cost changes is judged not be enough to significantly impact total MJD import volume levels to the United States.

Sensitivity case prices for the initial study are derived as follows:

CRUDE VS HSFO PRICE DIFFERENTIALS
(Values in Dollars per Barrel)

	HSFO Singapore FOB	Dubais Crude Oil FOB	Crude Oil vs HSFO (1)
A. 1989	13.93	15.70	1.77
B. 1990/91 Avg.	14.50	18.55	4.05
Adjustment (B-A)			2.28
Rounded			2.30

	Pacific Rim	Latin America
Sensitivity (1)		
HSFO 1989 LP Price	13.93	12.96
Adjust Crude/HSFO Diff.	(2.30)	(2.30)
Sensitivity 1 HSFO Price	11.63	10.66
Rounded	11.60	10.70

Reduction in Sulfur Level of Bunker Fuel

The reference cases and cost curves have all been developed on the assumption that there will be no reduction in bunker fuel sulfur levels. However, there have been proposals to the International Maritime Organization (IMO) and regional governments for a reduction in bunker fuel oil sulfur levels being imposed either regionally (e.g. while in or near ports) or on the high seas.

Should this happen, this could severely limit the outlets available for HSFO and put downward pressure on HSFO price. The extent of this pressure would likely depend on how widespread were any restrictions on high sulfur bunker fuel usage and the degree of sulfur reduction.

While bunker fuel oil sulfur levels below the current 3.5 percent sulfur were not studied, the sensitivity case for the increased crude oil vs. HSFO price differential discussed under (b) might also represent a scenario where some limited restrictions were imposed on bunker fuel oil sulfur levels.

An extreme case, which might eliminate use of high sulfur bunker fuel, would likely have to consider the alternatives of destroying residue with perhaps newer technology, desulfurizing HSFO, or use of diesel for bunkers with the cost of generating the added distillate that would be required to accomplish this. Again this is an issue beyond the scope of this study, since this would have a major impact on a number of the guiding premises.

Higher Distillate Sulfur

The primary study for the foreign regions has been based on projections for sulfur specifications for home heating oil (HHO) for Canada, Northwest Europe and the Mediterranean regions to decrease to 0.05 percentS by 1996. This level was based on the assumption that HHO sulfur specifications would be the same as for automotive diesel (ADO) for the same time period. The assumption for automotive diesel sulfur level was taken from the NPC survey (see Appendix). A recent European study in the United Kingdom indicated that burning HHO with sulfur contents less than 0.2 percent did not result in significant improvement in London urban air quality. Consideration is being given to deferring the requirement for a second stage reduction in HHO sulfur (from 0.2 to 0.1 percent) pending an assessment of the environmental benefits.

Based on the foregoing, higher sulfur specifications for home heating oil in only Northwest Europe for the year 2000 were evaluated. This step out study was done off-line with higher sulfur specifications of 0.2 percent instead of 0.05 percent. Of particular interest is the impact on additional distillate hydrotreating capacity in Northwest Europe.

Analysis of this issue case showed that, in order to bring all of Northwest Europe ADO and HHO to a 0.05 wt% distillate sulfur specification in the 1995 to 2000 time frame, an additional 139,000 B/SD of distillate desulfurizing capacity was required. This adds less than 0.2 cents/gallon to the manufactured cost of low sulfur distillate for the region. Accordingly it was concluded that this assumption has a minor impact of the cost of producing low sulfur diesel.

While this sensitivity could be considered speculative, changing the sulfur specification for European home heating oil from the assumed 0.05 wt% sulfur to a less restrictive 0.2 wt% sulfur would result in less than 0.5 cents/gallon lower home heating oil costs.

Reduced Gasoline Aromatics and Benzene Levels

By the year 2000, the Refining Survey predicted that gasoline aromatics and benzene contents for regions with a large number of developed countries would generally be controlled or regulated to 35 percent max and 2 to 3 percent max, respectively. By comparison, the U.S. specification for reformulated gasoline will be 25 and 2.0 percent maximums, respectively by 2000. For most of the regions, this specification will be restrictive for blending of unleaded premium gasoline. The restriction is most acute in the Pacific Rim and less acute for Canada, Northwest Europe, and the Mediterranean, resulting in sub optimal blending of unleaded grades. It has been suggested that these properties are not particularly significant in the key marketing areas in these regions. Furthermore the consumer may not be willing to pay for the ultimate cost that such restrictive specifications may impose.

It was agreed that this analysis could be achieved by evaluation of existing foreign LP runs using the LP-indicated incentives for making limiting specifications less restrictive, and that additional regional LP runs were not justified.

The analysis from this case showed that, for example the Pacific Rim 2000 FC-1 results indicated for unleaded premium gasoline that aromatics and benzene specifications were limiting at 32 and 2.7 percent, respectively. The LP incentive for making these specifications less restrictive was 0.087 and 0.047 $/bbl/percent. Therefore the savings for moving from 32 to 35 percent aromatics would be on the order of 0.7 cents/gallon. Similarly the savings in moving to a 5 percent benzene maximum limit would be about 0.35 cents/gallon. Smaller savings would apply in the other foreign regions due to lower LP incentives.

It was concluded that this issue case did not provide a significant impact on the costs of product to be supplied to the U.S. market.

Appendix L, Section VII-2

Pace Report on U.S. PADD and Foreign Regional Models

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PRODUCTION COST VOLUME ANALYSIS OF U.S. AND FOREIGN REFINING REGION

Prepared For

NATIONAL PETROLEUM COUNCIL

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A

INTRODUCTION

This report provides details about the role of The Pace Consultants Inc. within the National Petroleum Council (NPC) Refining Study. Other sections within the NPC report provide a detailed discussion of procedures used to develop cost/volume relationships and will, therefore, not be revisited in depth. Rather, this section discusses the LP model used, its capabilities, and a number of the modeling-related procedural judgments made by Pace with the concurrence of the Foreign Sub-Group of the Supply, Demand, and Logistics Task Group (SD&L), and the Pace Work Group of the Product Quality Task Group.

The overall objective of the NPC study was to answer the study request made by the Secretary of Energy. In requesting the study, the Secretary asked that the NPC focus on the impact of environmental regulations of refineries and petroleum products. The main concerns involved the effects of changing conditions on the U.S. refining industry due to the impact of new environmental regulations and the potential economic impact of the industry's response on American consumers.

By developing a quantitative analysis of costs and capabilities, it would be possible to compare the competitive position of the U.S. refining industry to foreign refining regions. One of the major tasks was the preparation of supply cost/volume relationships of both domestic and foreign refiners. These cost/volume relationships are used to represent the cost of supplying light fuels (gasoline, jet fuel, kerosene, light diesel, and home heating oil) to the U.S. market.

The NPC retained Pace to supply linear modeling capability and to assist in preparation of these supply cost/volume relationships. Pace modeled six U.S. PADDs (PADD 1-4, PADD 5 California, and PADD 5 outside California) and six foreign regions. Details regarding construction of the cost/volume relationships are briefly discussed in this report, as well as information on the Pace LP Model and its general capabilities.

Execution of the project required literally thousands of linear model runs and more than four man years of professional time. The principal professionals involved in the assignment for Pace were:

- ***Mr. Karl Bartholomew***—Senior Consultant. Mr. Bartholomew was primarily responsible for the execution of the linear programming effort and the preparation of cost/volume relationships. Mr. Bartholomew has over 14 years of experience in the industry, mostly in refinery consulting. He holds BSChE and MBA degrees, and is a member of both Phi Beta Kappa and Tau Beta Pi honor societies. In 1991, Mr. Bartholomew was named the Texas Society of Professional Engineers *"Young Engineer of the Year"* for the Houston area.

- *Mr. Jack Carney*—Senior Consultant. Mr. Carney's primary responsibilities on the project included preparation of basis data for domestic and foreign refineries, including capabilities, pricing, and product specifications, and analysis of linear programming (LP) results. Mr Carney has over 28 years experience in the refining industry in both operating and consulting environments and has directed a wide variety of worldwide studies on supply, demand, and pricing of refined products. He holds Bachelor's and Master's degrees in chemistry and a Master's degree in Business Administration. Mr. Carney is a member of the AIChE, the ACS, and the International Association of Energy Economists.

In addition, many other members of the professional and support staff at Pace assisted during the project.

We at Pace would like to express our appreciation to all the members of the Pace Work Group of the Product Quality Task Group and the Foreign Sub-Group of the Supply, Demand, and Logistics Task Groups for their insights and contributions.

B

METHODOLOGY AND BASIS

PACE LP AND GRTMPS II

The Pace Linear Programming (LP) Model was used to simulate operation of the six U.S. refining PADDs and the six foreign regions for the years 1989, 1995, 2000, and 2010. A generalized discussion of the model and its capabilities follow.

The Pace LP is a comprehensive oil and petrochemical company planning system built around the application of linear programming and its various extensions. It is designed to meet virtually all of the planning and optimization needs of today's petroleum refiners and marketers, as well as those of many other types of manufacturing. The model can run on main frame machines, mini computers, and personal computers. For the NPC project, personal computers were used exclusively.

GRTMPS

The model makes use of the Generalized Refining-Transportation-Marketing Planning System (GRTMPS) which is licensed from Haverly Systems, Inc. GRTMPS can be used to formulate, solve, and report on, easily and automatically, all the important types of models used within these industries. Models can range in complexity from simple product blending representations to elaborate multi-terminal, multi-period formulations. There are a wide range of capabilities within the GRTMPS/Pace Model that were not specifically used in the NPC project, such as product distribution, marketing, and inventory simulation and which will not be discussed herein.

PACE DATABASE

Refinery representations are based on Pace's proprietary data base of crudes, process operations, and stream qualities. The data base includes assay work-ups for several hundred crudes and generalized yield structures for over fifty different process units. In addition, new yield and delta yield vectors can be created if the generalized yield structures and correctors do not match experience. Operating costs, utility factors, capacity loading effects, yields, and numerous other parameters can be tied to an individual operation or group of operations to drive and/or control the process. Process capacities and other limits, including ratio controls and direct bounds on individual operations, are readily input by the user.

Well over 100 blended products and stream pools can be collectively represented using detailed specification blending LP formulations. For the NPC project, as many as twenty five product pools were handled. In areas that export to the United States, both domestic and import pools were modelled. For Northwest Europe gasoline, for example, grades (premium and regular) included local leaded grades, local unleaded, U.S. conventional grades, and U.S. reformulated. Different specifications and properties were introduced as required in the domestic and foreign regional models. A large variety of blending controls are possible with the model. In this project, a variety of macro specifications were used to control total gasoline pool properties as dictated by reformulation rules.

Other features of the Pace LP Model as used within the project include:

- Tracking of oxygen content, benzene and other toxics, aromatics, sulfur, RVP, octane, olefins, and distillation (to include 10%, 50%, 90% points) on all gasoline component streams. Octane, RVP, and distillation points for all component streams are included in the Pace database as linear blending values, while other properties are entered as neat or blending values. Other properties are tracked by crude oil cut fraction through the model or, such as in the case of the FCCU yield stream qualities, are calculated through advanced recursion techniques.

  Product qualities for all blended streams were reviewed by NPC personnel early in the project.

- Control of the above-mentioned properties through standard LP min/max techniques of quality specifications. Removal or disposal of stream qualities—for example, sulfur removal—occurs in process units such as hydrotreating, hydrogenation, extraction, or disposal into other products. Anti-dumping can be modeled by limiting properties on a global basis, a pool basis, an individual stream basis, or by limiting the amount of a given stream going to a product pool.

- Naphtha cut points in the data base were frequently changed to better model actual data and operations, especially outside the United States. The model allows multiple naphtha cuts of crude oil with various temperature cut points, each with its own properties. Similarly, cat naphtha from the FCC unit was modelled with multiple cuts with differing properties. When gasoline distillation specifications are varied, the model can blend varying blend components (each with its own properties such as RON, MON, etc.) to achieve the most economical blend which meets the specifications required. Alternatively, the heavier cuts can be blended to jet/kerosene or No. 2 fuel oil as specifications allow.

TABLE B-1

PROCESS UNITS

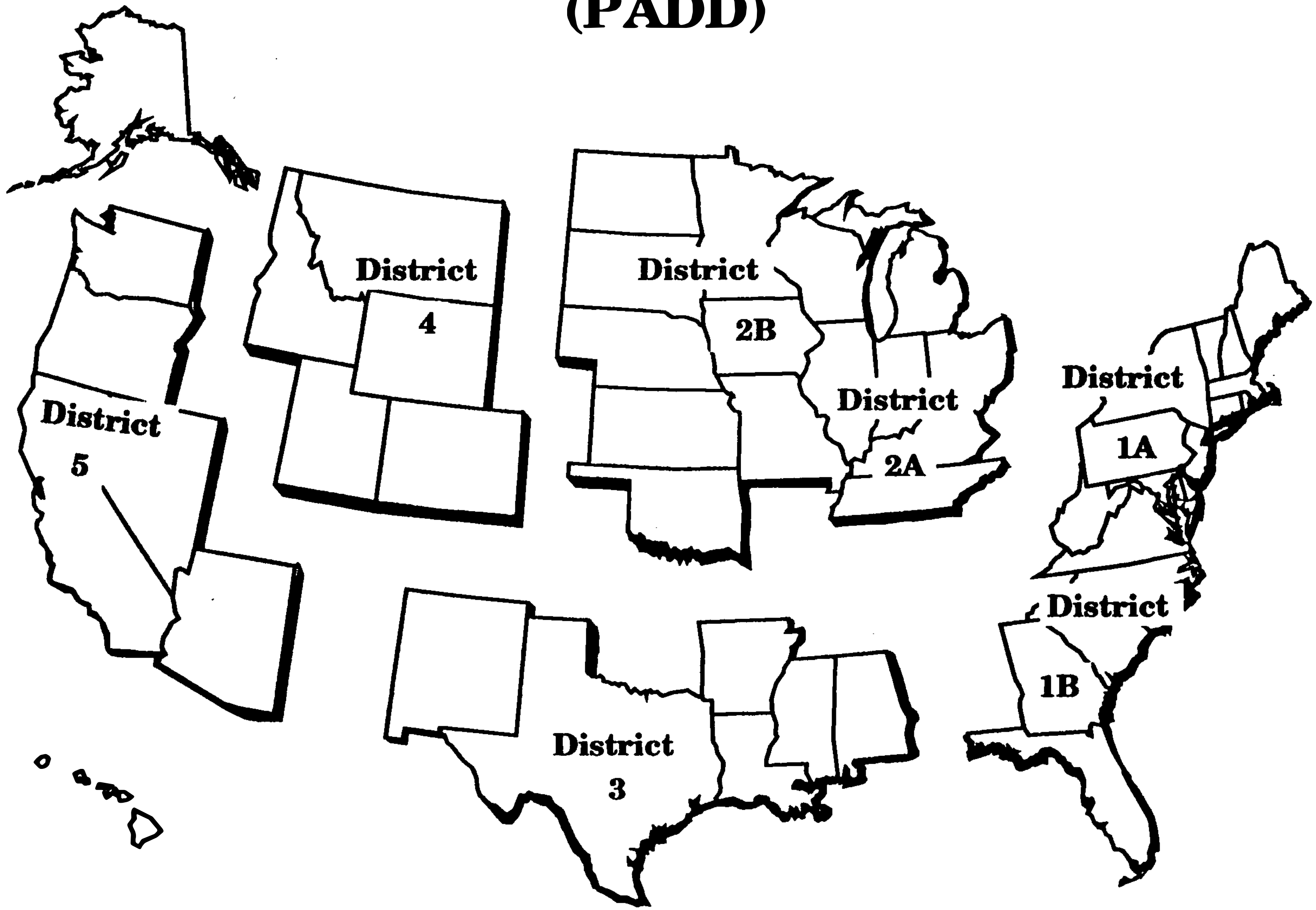
- Crude Distillation Unit
- Vacuum Crude Distillation Unit
- Fluid Catalytic Cracking
- FCC Naphtha Splitter
- Hydrocracking
- Resid Catalytic Cracking
- Resid Hydrocracking
- Hydrogen Plant
- Delayed Coker
- Fluid Coker
- Flexicoker
- Visbreaker
- Thermal Cracker (VGO Feed)
- Atmospheric Resid Desulfurization
- Low Pressure Semi-Regen Reformer
- High Pressure Semi-Regen Reformer
- Continuous Reformer
- Aromatics (BTX [Benzene, Toluene, Xylene]) Reformer
- C_5/C_6 Isomerization: Single Pass
- C_5/C_6 Isomerization: Full Recycle
- Dimersol
- Catalytic Polymerization
- $C_3/C_4/C_5$ Alkylation (Sulfuric Acid)
- $C_3/C_4/C_5$ Alkylation (Hydrofluoric Acid)
- Deisopentanizer
- Depentanizer
- MTBE Unit
- Butylene Dehydrogenation
- Toluene Dealkylation
- Naphtha Hydrotreating
- Distillate Hydrotreating
- Gas Oil Hydrotreating
- FCC Feed Hydrotreating
- Merox Treating
- Saturated Gas Plant
- Unsaturated Gas Plant

Table B-1 (Continued)

- Mixed (Saturated/Unsaturated) Gas Plant
- Thermal Naphtha Splitter
- Sulfur Plant
- Solvent Deasphalting
- Propylene Splitter
- TAME Unit
- Naphtha Hydrocracking
- LPG Hydrocracking
- Light Naphtha Saturator (Benzene reduction)
- Light Reformate Splitter
- Light Reformate Saturator

Figure B-1

Petroleum Administration for Defense Districts (PADD)



- The Pace LP Model contains the necessary properties for all the major oxygenates which have been developed from multiple industry client sources such as ARCO and various literature sources. All non-linear effects of octane blending are handled by using blending values rather than pure component values. Octane correction factors are added to various blending components depending on their destination gasoline stream.

- The Pace LP Model handles both ethers and alcohols for oxygenate blending into gasoline. Reformulated and oxygenated gasolines were assumed to use only ethers such as MTBE or TAME for this work, as the NPC considered ethanol blending at terminals as a separate issue.

- The distillation properties of the gasoline components are part of the properties which the model carries into gasoline blending. These distillation values are not the "pure" values of the components, but are the "blending values" which can affect the gasoline distillation cost/volume relationships either more or less than the pure distillation value might. For example: butane has a distillation point of 115% off at 158°F. This can simulate the "scavenging" effect that a very light component has in "pulling" other components from the gasoline pool. The model then uses these "blending values" to blend the components to meet the specifications established for gasoline distillation. Results of these calculations were reviewed by the NPC.

- Distillate and jet fuel properties are blended linearly in the Pace Model. On distillates, we typically specify pour point index, flash point, cetane index and sulfur content. On jet fuel, we typically specify percent off at 400°F, aromatics content, freeze point, flash point, smoke point, and sulfur content. Because of the nonlinear behavior of pour point and flash points, we use indices for these properties. We use cetane index to represent cetane number.

The LP Model simulated the process units in Table B-1 for this study.

REGIONAL BREAKDOWNS

For the U.S. study, Pace modelled each PADD, with PADD 5 subdivided into 5C (California, Arizona, and Nevada) and 5NC (Washington, Oregon, Alaska, and Hawaii). A map of the states included in each PADD is given in Figure B-1. The foreign regions, which are detailed by country in Table B-2, include the following:

TABLE B-2

COUNTRIES BY REGION

Region 1
- Canada

Region 2: Northern Europe
- Austria
- Belgium
- Denmark
- Finland
- France
- Germany
- Ireland
- Luxembourg
- Netherlands
- Norway
- Sweden
- Switzerland
- United Kingdom

Region 3: Mediterranean
- Algeria
- Egypt
- Greece
- Italy
- Libya
- Morocco
- Portugal
- Spain
- Tunisia
- Turkey
- Yugoslavia

Region 4: Middle East
- Abu Dhabi
- Bahrain
- Cyprus
- Iran
- Iraq
- Israel
- Jordan
- Kuwait
- Lebanon
- Oman
- Qatar
- Saudi Arabia
- Syria
- Yemen

Region 5: South America
- Argentina
- Aruba
- Bahamas
- Barbados
- Bermuda
- Bolivia
- Brazil
- Chile
- Colombia
- Costa Rica
- Cuba
- Dominican Republic
- Ecuador
- El Salvador
- Guatemala
- Honduras
- Jamaica
- Martinique
- Mexico
- Netherlands Antilles
- Nicaragua
- Other Western Hemisphere
- Panama
- Paraguay
- Peru
- Puerto Rico
- Trinidad
- Uruguay
- Venezuela
- Virgin Islands

Region 6: Pacific Rim
- Afghanistan
- Australia
- Bangladesh
- Bhutan
- Burma
- Cambodia
- Fiji
- India
- Indonesia
- Japan
- Korea
- Laos
- Malaysia
- Nepal
- New Caledonia
- New Zealand
- Other Far East
- Pakistan
- Papua New Guinea
- Philippines
- Sri Lanka
- Taiwan
- Thailand
- Vietnam

- Canada
- Latin America (all of North and South America except the United States, Canada, and Cuba)
- Northern Europe
- Mediterranean (Southern Europe and North Africa)
- Middle East
- Pacific Rim (Pakistan, India, and all countries to the east except China and North Korea)

We did not include China, CIS (former Soviet Union), former Eastern Bloc countries, or Sub-Saharan Africa in this modeling effort.

INFORMATION SOURCES AND MODELING ASSUMPTIONS

Unit Capacities

Additional information on process unit capacity for the domestic refining regions are contained in Section C.

1989 Capacity

Refinery unit operating capacities for both the United States and the foreign refining areas were derived largely from government and public data such as the U.S. Department of Energy (DOE) and the *Oil & Gas Journal.* DOE data were the primary sources for domestic capacities, while other sources such as the *Oil & Gas Journal* were the sources for foreign refining capacities. Because Pace has considerable data on petroleum coke capacities and operations, coker data were adjusted by Pace as required.

1995 Capacity Additions

For 1995 it was assumed that no capacity would be added beyond that already under construction, in engineering, or in the planning stage. Public data sources, including the *Oil and Gas Journal* and *Hydrocarbon Processing,* were used. In the United States it was assumed that all capacity listed in either the *Oil & Gas Journal* or *Hydrocarbon Processing* would be completed by 1995. Outside the United States this was judged to be an invalid assumption since projects frequently take much longer to develop and, in some cases, never develop at all. A procedure was required to adjust additional capacity data. Pace developed a probability weighting system to estimate additions to capacity in the six foreign regions.

The procedure to estimate foreign additions in 1995 was a blend of logic and current industry knowledge. Unless Pace was aware of contrary information, projects that were identified as being under construction were assumed to have a 100% probability of being available by 1995. Projects that were identified as "in engineering" received higher probabilities than those shown to be "under study." Different probabilities were used in different parts of the world based on Pace's judgment and historical construction trends. To preserve confidentiality, and to avoid legal problems involved in identifying specific installations, Pace provided only aggregate data by region. No specific projects were identified. The estimates were then reviewed by the Foreign Sub-Group of the SD&L Group.

In addition to new construction, the Foreign Sub-Group added a "capacity creep" factor of 5% of 1989 capacity to the 1995 capacity figures for the six foreign regions. This increase was included to account for minor debottlenecking projects and learning curve effects that are unreported, but do increase capacity over time. The types of processes that were allowed to "creep" capacity are shown in Table B-3.

2000 and 2010 Case Capacity Additions

Capacity additions in 2000 and 2010 were essentially determined by the refined products demand set in each region. The LP was allowed to select the optimum configuration using existing capacity and investing in new capacity as needed. It should be noted that in the U.S. regions no additional conversion (vacuum gasoil and residuum) capacity investment was allowed except for specific issue cases. Conversion capacity was open for all foreign regions.

Unit Severities and Operating Mode

There are three major processes in which severity or conversion is a variable in the Pace Model—reforming, hydrocracking, and catalytic cracking. As described in the more detailed discussion of the model, feed quality parameters are used to adjust yields in the other conversion processes, but there is no conversion/severity variable. The constraints and ranges used for these three critical units were as follows:

- **Reforming**—The Pace Linear Model has the capability of modeling four types of unit as independent operations: a high pressure semi-regenerative unit, a low pressure semi-regenerative unit, a low pressure continuous unit (such as a Universal Oil Products CCR), and a generic BTX (Benzene, Toluene, Xylene) reformer. For this study, the low

TABLE B-3

FOREIGN REFINING CAPACITY UNITS ALLOWED TO CREEP

- Atmospheric Crude Distillation Towers
- Vacuum Crude Distillation Towers
- Fluid Catalytic Cracking Units
- Hydrocracking Units
- Resid Hydrocracking Units
- Delayed Cokers
- Fluid Cokers
- Flexicokers
- Thermal Cracking Units
- Visbreakers
- Solvent Deasphalting Units
- Distillate HDS
- FCCU Feed HDS
- Naphtha HDS
- Hydrogen Plants

pressure semi-regenerative and the CCR representations were selected as representative. Any naphtha that is now used as feed for BTX units was treated as a product from the refining centers. Public data from various sources and from the DOE were used to set the capacity of the different reformer types. In the future, all new units were assumed to be of the continuous type. Reformer octanes were allowed to vary in all of the runs. The range was set between 90 and 100 RON (Research Octane) severity for both the semi-regenerative and the continuous units.

- **Catalytic Cracking**—Conversion is an important variable in modeling the foreign regions and U.S. PADDs and in preparing cost/volume relationships since unused conversion represents capability to produce incremental gasoline. The Pace LP model has the capability of operating between 60 to 80% conversion, so it was necessary to limit this variable within realistic ranges to calibrate and reasonably predict future capability. Since the calibration LP runs were made against historical crude throughput and light-product (mogas-jet distillate) production data, conversion was used as an indicator of the "validity" of the run. In the United States, data are available for historical conversion levels. Outside the United States, "typical" conversion levels were obtained though discussions with foreign operating personnel and with licensors. Once a conversion was found for the 1989 calibration case, it was limited within a narrow range for future years.

- **Hydrocracker**—The Pace Model has the ability to select between several "modes" of operation: high, medium, and low severities which nominally reflect gasoline, jet, or distillate production. Outside the United States it was occasionally found that these modes were not sufficiently selective toward distillates. This was a particular problem in the Pacific Rim 2010 simulation, where distillate demand is forecasted to be especially high relative to motor gasoline demand. For this reason, a new hydrocracker formulation, based on licensor data for maximum distillate yield operation, was added in the Pacific Rim Model for 2010. The LP runs for 2010 assume the new hydrocracker operation for new and existing hydrocrackers without any additional investment. The incremental investment required for this change was added to the costs by the Foreign Sub-Group.

TABLE B-4

LP QUALITY SPECIFICATIONS FOR MAJOR PRODUCTS

	Product Specifications																
	Asphalt	Lubes	Naphtha	LPG's	Leaded Mogas	Unlead Mogas	RFG	CARB	Jet A Kero	Diesel	HHO	LSFO	MSFO	HSFO	Plant Fuel	Sulfur	Delayed Coke
Composition	X	X	X	X											X	X	X
Distillation					M/M	M/M	M/M	M/M	M/M								
Aromatics					Limit	Limit	Max	Max	Max	Max	Max						
Benzene					Limit	Limit	Max	Max									
Sulfur					Limit	Limit	Limit	Max	Max	Max	Max	Max	Max	Max			
RVP					Max	Max	Max	Max									
O2 Content					Max	Max	M/M	M/M									
Olefin					Limit	Limit	Limit	Max									
R+M/2					Min	Min	Min	Min									
Lead Content					Max												
Density									M/M	M/M	M/M	Max	M/M	M/M			
Flash Point									Min	Min	Min	Min	Min	Min			
Smoke Point									Min								
Pour Point										Max	Max	Max	Max	Max			
Cetane Index										Min							
Visc Index											Min	Min	Min	Min			

Stream Qualities

Table B-4 shows the qualities that were specified for the major products on the project. There are multiple distillation specifications in the model that vary depending on the product. As shown, the quality of some products such as LPG, asphalt, and lubes are not directly specified within the model. Rather, quality is indirectly specified by limiting the streams that go to the pool. Not all specifications were used in every model, especially in the case of RFG or CARB gasoline specifications that are not enforced outside the United States.

Table B-5 shows the possible routing of streams into the various final product pools. The fact that a stream is "open" to a particular pool does not indicate that the material went to that pool in any of the runs. The actual disposition is a matter of specifications and economics. It may also be noted that streams which should be hydrotreated can apparently go directly to product pools. This is not true. In the Pace LP Model, streams do not lose their identity after hydrotreating. For example, thermal naphtha can only go to gasoline after proper hydrotreating. The properties of the naphtha are changed across the unit, but the identification of the stream remains. Similarly, materials such as propane and light naphtha are treated as required before going to product pools.

While Table B-5 shows product pool options, it does not show other possible processing options. For example, hydrocrackates of proper boiling range are simultaneously open to the reformer as well as product pools. The distillation shown in Table B-5 are typical values only. These were changed as required in the calibration process.

Input and Product Volumes

Wherever possible, historical data for 1989 on volumes of feedstocks and products were from information supplied by the DOE. Historical data on feedstocks and products for modeling in the United States were derived principally from the DOE. Data from the California Energy Commission were used as a supplement to DOE data to aid in segregating California from total PADD 5. Historical data on major refined products (gasoline, jet, kerosene, light diesel, home heating oil, and residual fuel oil) for the foreign regions were obtained from the DOE, using data derived from the IEA/OECD. Volumes of feedstocks and other refined products in foreign regions for 1989 were generated by Pace using data from the DOE, IAE/OECD, the UN, and miscellaneous other sources. Where data were lacking or in conflict, Pace reviewed the problems with the Foreign Sub-Group, and either estimated or adjusted data as needed. Tables B-6 and B-7 detail the volumetric data used in the models for 1989 for the domestic and foreign regions, respectively. Tables B-8 and B-9 are the corresponding tables for the domestic refining regions for 1995 and 2000.

TABLE B-5

STREAM DISPOSITIONS IN LP PRODUCT POOLS

	Asphalt	Lubes	Naphtha	LPG's	Leaded Mogas	Unlead Mogas	RFG	CARB	Jet A Kero	Diesel	HHO	LSFO	MSFO	HSFO	Plant Fuel	Sulfur	Delayed Coke
Hydrogen															X		
H2S																X	
Light Gases															X		
Propylene				X													
Propane				X													
Butylenes				X	X	X	X	X									
Isobutane				X	X	X	X	X									
Butane				X	X	X	X	X									
C5/160 (Virgin)					X	X	X	X									
160/220 (Virgin)			X		X	X	X	X									
220/285 (Virgin)			X		X	X	X	X									
285/350 (Virgin)									X	X	X						
350/400 (Virgin)									X	X	X						
400/430 (Virgin)			X		X	X	X	X	X	X	X						
430/525 (Virgin)									X	X	X	X	X	X			
525/650 (Virgin)										X	X	X	X	X	X		
650+ Resid (Virgin)												X	X	X	X		
650/1000 (Virgin)		X										X	X	X	X		
1000+ Resid (Virgin)	X											X	X	X	X		
Natural Gasoline					X	X	X	X									
Toluene					X	X	X	X									
MTBE					X	X	X	X									
Alkylate					X	X	X	X									
Isomerates					X	X	X	X									
Lt. Reformate					X	X	X	X									
Hvy Reformate					X	X	X	X									

TABLE B-5 (cont)

STREAM DISPOSITIONS IN LP PRODUCT POOLS

	Asphalt	Lubes	Naphtha	LPG's	Leaded Mogas	Unlead Mogas	RFG	CARB	Jet A Kero	Diesel	HHO	LSFO	MSFO	HSFO	Plant Fuel	Sulfur	Delayed Coke
C5/160 Th Naphtha *			X		X	X	X	X									
160/220 Th Naphtha *			X		X	X	X	X									
220/285 Th Naphtha *			X		X	X	X	X	X	X	X						
285/350 Th Naphtha *			X						X	X	X						
350/400 Th Dist *									X	X	X	X	X	X			
400/430 Th Dist *									X	X	X	X	X	X			
430/525 Th Dist *									X	X	X	X	X	X			
525/650 Th Dist *									X	X	X	X	X	X			
C5/160 HyK Naphtha			X		X	X	X	X									
160/220 HyK Naphtha			X		X	X	X	X									
285/350 HyK			X		X	X	X	X	X	X	X						
350/400 HyK			X						X	X	X	X	X	X			
400/430 HyK									X	X	X	X	X	X			
430/525 HyK									X	X	X	X	X	X			
525/650 HyK									X	X	X	X	X	X			
Lt. Cat Naphtha					X	X	X	X									
Med. Cat Naphtha					X	X	X	X									
Hvy. Cat Naphtha *					X	X	X	X	X	X	X	X					
FCCU LCO *										X	X	X	X	X	X		
FCCU HCO												X	X	X	X		
FCCU Slurry												X	X	X	X		
Visbreaker Btms												X	X	X	X		
FCCU Coke															X		
Delayed Coke																	X

* *May require hydrotreating*

TABLE B-6

U.S. Refining Industry Model
1989 U.S. Refining Volumes
MBPD

	PADD I	PADD II	PADD III	PADD IV	PADD V CALIFORNIA	PADD V NON-CALIFORNIA
Inputs						
Total Crude	1,287.8	2,904.5	6,158.3	458.2	1,935.9	699.2
Light gas feeds	3.4	117.8	280.8	20.3	18.7	6.7
Unfinished Oils	178.9	25.4	281.6		30.2	1.5
Mogas blend	25.0	33.0			25.5	

	PADD I	PADD II	PADD III	PADD IV	PADD V CALIFORNIA	PADD V NON-CALIFORNIA
Production						
C2-C4s	54.0	94.2	342.8	7.0	44.7	11.4
Total Gasoline	689.0	1,680.9	3,135.4	237.9	959.0	222.4
Naph/Avgas Jet	17.8	22.3	115.9	15.5	49.5	10.4
Jet/Kero	76.6	182.8	644.4	26.7	206.2	133.6
Distillate	358.2	683.8	1,297.7	122.6	302.6	129.6
Total Resid	126.8	72.9	357.5	10.5	252.5	133.6
PC/Spec. Naphtha	12.3	30.4	133.5	0.1	8.2	
Other Petrofeed	0.3	22.1	185.2	0.5	7.9	
Lubes/Waxes	24.3	24.7	112.3	2.0	21.8	
Asphalt/Road Oil	88.5	140.5	103.7	28.6	53.4	9.7
Misc	12.2	12.1	40.1	2.1	3.7	

Source: DOE, Pace

TABLE B-7

1989 FOREIGN REFINING VOLUMES
(Thousand Barrels Per Day)

	Canada	N.W. Europe	Med./ N. Africa	Middle East	Latin America	Pacific Rim
Inputs:						
Total Crude	1,420	7,450	4,800	4,350	5,415	8,298
Other Feeds	90	200	31			15
Unfinished Oils	70	1,000	350			

	Canada	N.W. Europe	Med./ N. Africa	Middle East	Latin America	Pacific Rim
Production:						
LPGs (C3/C4)	55	334	228	84	231	299
Total Gasoline	600	2,284	955	611	1,303	1,497
Jet/Kero	138	593	369	522	376	1,178
Distillate	453	2,854	1,483	1,288	1,381	2,443
Total Resid	145	1,325	1,578	1,509	252	2,037
Naphthas, PC Fee	183	590	411	419	440	639
Lubes/Waxes	19	119	70	33	51	106
Asphalt/Road Oil	45	205	115	69	87	169

Source: Pace
Note: Other feeds do not include NGLs

TABLE B-8

U.S. Refining Industry Model
1995 Reference Case Refining Volumes
MBPD

	PADD I	PADD II	PADD III	PADD IV	PADD V CALIFORNIA	PADD V NON-CALIFORNIA
Inputs						
Total Crude	1,258.0	2,907.9	6,166.2	452.1	1,928.2	707.4
Light gas feeds	21.9	124.4	40.2	17.7	4.5	3.4
Unfinished Oils	178.9	25.4	281.6		30.2	1.5
Mogas blend	25.0	33.0			25.5	

	PADD I	PADD II	PADD III	PADD IV	PADD V CALIFORNIA	PADD V NON-CALIFORNIA
Production						
C2-C4s	46.8	104.6	298.0	11.4	81.0	16.5
Total Gasoline	792.4	1,739.5	3,192.4	239.0	1,168.4	247.8
Jet/Kero	94.4	205.1	760.3	42.2	255.7	144.4
Distillate	358.2	683.8	1,297.7	122.6	303.1	133.6
Total Resid	141.9	74.6	232.1	15.6	180.6	158.4
Petrochemical Naphtha	13.9	33.5	146.9	0.1	9.0	
Other Petrofeed	0.3	25.2	211.1	0.6	9.0	
Lubes/Waxes	23.5	23.9	108.5	1.9	21.2	
Asphalt/Road Oil	85.6	135.8	100.3	24.8	51.6	9.4
Misc	11.9	11.8	39.0	2.0	3.6	

TABLE B-9

U.S. Refining Industry Model
2000 Reference Case Refining Volumes
MBPD

	PADD I	PADD II	PADD III	PADD IV	PADD V CALIFORNIA	PADD V NON-CALIFORNIA
Inputs						
Total Crude	1,258.0	2,907.9	6,166.3	452.1	1,928.2	707.4
Light gas feeds	21.2	120.2	79.9	17.6	4.5	5.8
Unfinished Oils	178.9	25.4	281.6		30.2	1.5
Mogas blend	25.0	33.0			25.5	

	PADD I	PADD II	PADD III	PADD IV	PADD V CALIFORNIA	PADD V NON-CALIFORNIA
Production						
C2-C4s	47.4	69.2	290.0	11.1	115.9	17.6
Total Gasoline	784.9	1,813.4	3,264.8	248.0	1,235.2	275.9
Jet/Kero	94.4	205.1	760.3	42.2	255.7	144.4
Distillate	358.2	683.8	1,297.7	122.6	303.1	133.6
Total Resid	144.5	76.2	234.9	15.5	158.2	135.0
Petrochemical Naphtha	14.8	35.7	156.7	0.1	9.6	
Other Petrofeed	0.4	27.4	229.9	0.6	9.8	
Lubes/Waxes	22.6	23.0	104.6	1.9	20.4	
Asphalt/Road Oil	82.6	131.2	96.8	23.9	49.9	9.1
Misc	11.5	11.4	37.9	2.0	3.5	

For the years 1995, 2000, and 2010, demand in the foreign regions was set based on one of three foundation cases (FC I, FC II, and FC III). The details of these cases are described in Chapter 3.III.

Product Qualities/Specifications

For modeling purposes, Pace and the NPC used typical "as sold" product qualities for 1989 as specifications for products. These qualities were derived from various sources, including NIPER, Octel, and NPRA. Specifications used for 1995, 2000, and 2010 were adjusted based upon data supplied by the NPC. Quality specifications used in the domestic regions by region for 1989, 1995, and 2000 as detailed in Tables B-10 through B-12. The foreign quality specifications are detailed in Chapter 3.III.

The Product Quality Sub-Group provided data to Pace on gasoline class and grade splits for 1995 and 2000. These splits are detailed in Tables B-13 and B-14.

Stream to Operating Day Adjustments

One of the key factors in modeling is setting the unit operating capacity. While there is often much discussion over the meaning of the various terms used by refiners, Pace suggested the NPC adopt the following definitions for this study:

- **Stream Day Capacity**—This is the design or stated capacity for the process unit under normal operating conditions and with adequate feed supply.

- **Calendar Day Capacity**—This is the average daily available capacity of the process unit over a sufficient period of time to account for planned and unplanned shutdowns.

- **Operating Day Capacity**—This is calendar day capacity adjusted to account for capacity limitations over time due to the combined effects of logistic problems due to lack of feed or market for product or unattractive short-term economics and the variations in refinery "efficiencies." Most refiners in OECD countries were classified as "High Efficiency," with the adjustment of operating capacity, depending on the process, in the range of 96 to 98% of calendar day capacity. Medium efficiency and Low efficiency refiner operating factor was set at 97% of the High and Medium, respectively.

TABLE B-10

U.S. Refining Industry Model
Modeling Specifications
1989 Reference Cases

PADD:		PADD I	PADD II	PADD III	PADD IV	PADD V CALIFORNIA	PADD V NON-CALIFORNIA
NPC Region:		1,2,3,4	5,6,7	8	9	11,12	10,13
				Gasolines			
Global Specs							
Aromatics Vol%	Max	36	29	32	30	36	31
Benzene Vol%	Max	2.2	2.7	1.7	2	2.4	2.8
Olefins Vol%	Max	18	12	14	15	10	11
Local Ld Regular							
RVP (psi)	Max	11.5	12.2	11	11.8	10.9	11.5
TEL (g/US Gal)	Max	0.1	0.1	0.1	0.1	0.1	0.1
Sulfur (wt%)	Max	0.04	0.05	0.05	0.07	0.02	0.06
% off 158 F	Min	16	16	16	16	10	16
% off 212 F	Min	38	38	38	38	40	38
% off 212 F	Max	64	64	64	64	58	64
% off 356 F	Min	89	89	89	89	91	89
(R+M)/2	Min	89.2	88.7	88.8	87.3	88.4	88.4
Local Unl Premium							
RVP (psi)	Max	11.5	12.2	11	11.8	10.9	11.5
Sulfur (wt%)	Max	0.04	0.05	0.05	0.07	0.02	0.06
% off 158 F	Min	16	16	16	16	10	16
% off 212 F	Min	38	38	38	38	40	38
% off 212 F	Max	64	64	64	64	58	64
% off 356 F	Min	89	89	89	89	91	89
(R+M)/2	Min	92.2	92.2	92.2	90.8	92	92
Local Unl Regular							
RVP (psi)	Max	11.5	12.2	11	11.8	10.9	11.5
Sulfur (wt%)	Max	0.04	0.05	0.05	0.07	0.02	0.06
% off 158 F	Min	16	16	16	16	10	16
% off 212 F	Min	38	38	38	38	40	38
% off 212 F	Max	64	64	64	64	58	64
% off 356 F	Min	91	89	89	91	91	89
(R+M)/2	Min	87.2	87.2	87.1	85.8	87.2	87.2
Unleaded Midgrade							
RVP (psi)	Max	11.5	12.2	11	11.8	10.9	11.5
Sulfur (wt%)	Max	0.04	0.05	0.05	0.07	0.02	0.06
% off 158 F	Min	16	16	16	16	10	16
% off 212 F	Min	38	38	38	38	40	38
% off 212 F	Max	64	64	64	64	58	64
% off 356 F	Min	91	89	89	91	91	89
(R+M)/2	Min	89.1	89.1	89.1	87.9	89.1	89.1

Notes
1. Annual Average Basis
2. Modeling specifications to simulate average quality product, not ASTM or regulatory specifications.

TABLE B-10 (cont)

U.S. Refining Industry Model
Modeling Specifications
1989 Reference Cases

PADD:		PADD I	PADD II	PADD III	PADD IV	PADD V CALIFORNIA	PADD V NON-CALIFORNIA
NPC Region:		1,2,3,4	5,6,7	8	9	11,12	10,13
Distillates							
JP-4							
Sulfur (wt%)	Max	0.02	0.05	0.02	0.05	0.05	0.02
RVP (psi)	Max	2.6	2.6	2.6	2.6	2.6	2.6
Pour Pt Indx	Max	36.434	36.434	36.434	36.434	36.434	36.434
Aromatics (Vol%)	Max	12.2	12.2	12.2	12.2	14	12.2
Density (Sp gr)	Min	0.75047	0.75047	0.75047	0.75047	0.75076	0.75047
Density (Sp gr)	Max	0.78821	0.78821	0.78821	0.78821	0.78821	0.78821
Jet A							
Density (Sp gr)	Max	0.83967	0.83967	0.83967	0.83967	0.84053	0.83967
Sulfur (wt%)	Max	0.05	0.08	0.05	0.2	0.06	0.08
Aromatics (vol%)	Max	20	20	20	20	22	22
% off 400 F	Min	10	10	10	10	10	10
% off 400 F	Max	50	50	50	50	50	50
Smoke pt. (mm)	Min	23	23	23	23	23	20
Flash Index (110F)	Max	495	495	495	495	495	495
Local Auto Diesel							
Cetane Index	Min	45	45	45	45.5	44.5	45.2
Sulfur (wt%)	Max	0.2	0.3	0.28	0.35	0.1	0.3
Density (Sp gr)	Max	0.85482	0.85768	0.85768	0.85482	0.86283	0.85482
Flash Ind (140F)	Max	155	155	155	155	155	155
Pour Index	Max	360.35 0F	360.35 0F	360.35 0F	360.35 0F	360.35 0F	360.35
Local Home Heating Oil							
Sulfur (wt%)	Max	0.2	0.3	0.3	0.35		0.3
Density (Sp gr)	Max	0.85482	0.85482	0.85482	0.85482		0.8654
Vis Index (122F)	Min	48.2	48.2	48.2	48.2		48.2
Pour Index	Max	360.35 0F	360.35 0F	360.35 0F	360.35 0F		360.35
Flash Ind (140F)	Max	155	155	155	155		155
Residual Fuels							
LSFO							
Sulfur (wt%)	Max	0.7	1	0.7	0.7	0.7	0.7
Flash Ind (160F)	Max	76.5	76.5	76.5	76.5	76.5	76.5
Vis (122F) 380cst	Min	20.67	20.67	20.67	20.67	20.6735	20.67
Density (Sp gr)	Max	0.99634	0.99634	0.99634	0.99634	0.99634	0.99634
HSFO							
Sulfur (wt%)	Max	3	3	3	3	3	3
Flash Ind (160F)	Max	76.5	76.5	76.5	76.5	76.5	76.5
Vis (122F) 380cst	Min	20.67	20.67	20.67	20.67	20.67	20.67
Density (Sp gr)	Max	0.99634	0.99634	0.99634	0.99634	0.99634	0.99634

Notes
1. Annual Average Basis
2. Modeling specifications to simulate average quality product, not ASTM or regulatory specifications.

TABLE B-11

U.S. Refining Industry Model
Modeling Specifications
1995 Reference Cases

PADD:		PADD I	PADD II	PADD III	PADD IV	PADD V CALIFORNIA	PADD V NON-CALIFORNIA
NPC Region:		1,2,3,4	5,6,7	8	9	11,12	10,13
			Gasolines				
Global Specs - Conventional Gasolines							
Aromatics Vol%	Max	32.838	28.484	30.56	26.524	33.377	27.86
Benzene Vol%	Max	1.674	1.679	1.7	1.319	1.575	1.601
Olefins Vol%	Max	12.297	10.649	11.873	12.289	10	9.995
Sulfur (wt%)	Max	0.028	0.027	0.04	0.038	0.019	0.035
% off 212 F	Monitor	52.545	53.489	51.767	48.781	49.115	51.315
% off 300 F	Min	80.033	80.909	80.027	81.293	81.202	82.067
% off 356 F	Min	90.291	89.653	89	90.133	91	90.632
Global Specs - Reformulated Gasolines							
Aromatics Vol%	Max	27.9	27.9	27.9	27.9	27.9	27.9
Benzene Vol%	Max	0.7	0.7	0.7	0.7	0.7	0.7
Olefins Vol%	Max	12.297	10.649	11.873	12.289	10	9.995
Sulfur (wt%)	Max	0.028	0.027	0.04	0.038	0.019	0.035
% off 212 F	Monitor	52.545	53.489	51.767	48.781	49.115	51.315
% off 300 F	Min	80.033	80.909	80.027	81.293	81.202	82.067
% off 356 F	Min	90.291	89.653	89	90.133	91	90.632
Conventional Unl Premium							
Winter RVP (psi)	Max	12.2	12.5	11.9	12	10.1	12.3
Summer RVP (psi)	Max	8.2	8.4	7.9	7.9	7.5	8.7
Avg RVP (psi)	Max	10.2	10.45	9.9	9.95	8.8	10.5
% off 158 F	Min	16	16	16	16	10	16
% off 212 F	Max	64	64	64	64	58	64
Wt % Oxygen	Min	0	0.18	0.23	0.45	1.34	0.95
(R+M)/2	Min	92.2	92.2	92.2	90.8	92	92
Conventional Unl Regular							
Winter RVP (psi)	Max	12.2	12.5	11.9	12	10.1	12.3
Summer RVP (psi)	Max	8.2	8.4	7.9	7.9	7.5	8.7
Avg RVP (psi)	Max	10.2	10.45	9.9	9.95	8.8	10.5
% off 158 F	Min	16	16	16	16	10	16
% off 212 F	Max	64	64	64	64	58	64
Wt% Oxygen	Min	0	0.18	0.23	0.45	1.34	0.95
(R+M)/2	Min	87.2	87.2	87.1	85.8	87.2	87.2
Reformulated Unl Premium							
Winter RVP (psi)	Max	12.2	12.5	11.9	12	10.1	12.3
Summer RVP (psi)	Max	7.8	7.8	6.9	6.9	6.9	7.8
Avg RVP (psi)	Max	10	10.15	9.4	9.45	8.5	10.05
% off 158 F	Min	16	16	16	16	10	16
% off 212 F	Max	64	64	64	64	58	64
Vol% Benzene	Max	1	1	1	1	1	1
Wt % Oxygen	Min	2.4	2.1	2.23	2.1	2.39	2.1
(R+M)/2	Min	92.2	92.2	92.2	90.8	92	92
Reformulated Unl Regular							
Winter RVP (psi)	Max	12.2	12.5	11.9	12	10.1	12.3
Summer RVP (psi)	Max	7.8	7.8	6.9	6.9	6.9	7.8
Avg RVP (psi)	Max	10	10.15	9.4	9.45	8.5	10.05
% off 158 F	Min	16	16	16	16	10	16
% off 212 F	Max	64	64	64	64	58	64
Vol% Benzene	Max	1	1	1	1	1	1
Wt % Oxygen	Min	2.4	2.1	2.23	2.1	2.39	2.1
(R+M)/2	Min	87.2	87.2	87.1	85.8	87.2	87.2

Notes 1. Annual Average Basis
2. Modeling specifications to simulate average quality product, not ASTM or regulatory specifications.

TABLE B-11 (cont)

U.S. Refining Industry Model
Modeling Specifications
1995 Reference Cases

PADD:		PADD I	PADD II	PADD III	PADD IV	PADD V CALIFORNIA	PADD V NON-CALIFORNIA
NPC Regions:		1,2,3,4	5,6,7	8	9	11,12	10,13
Distillates							
Jet A							
Density (Sp gr)	Max	0.840	0.840	0.840	0.840	0.841	0.840
Density (Sp gr)	Min	0.793	0.793	0.793	0.793	0.793	0.793
Density (Lb/Bbl)	Max	293.7	293.7	293.7	293.7	294	293.7
Density (Sp gr)	Min	277.28	277.28	277.28	277.28	277.28	277.28
Sulfur (wt%)	Max	0.1	0.08	0.05	0.2	0.06	0.08
Aromatics (vol%)	Max	20	20	20	20	22	22
% off 400 F	Min	10	10	10	10	10	10
% off 400 F	Max	50	50	50	50	50	50
Smoke pt. (mm)	Min	23	23	23	23	23	20
Flash Index (110F)	Max	495	495	495	495	495	495
Low S, Low A Diesel							
Cetane Index	Min					44.5	
Sulfur (wt%)	Max					0.042	
Aromatics	Max					7.3	
Density (Sp gr)	Max					0.865	
Density (Lb/BBL)	Max					302.71	
Density (Sp gr)	Min					0.832	
Density (Lb/BBL)	Min					291.14	
Flash Ind (140F)	Max					155	
Pour Index	Max					360.35 OF	
Low S Diesel							
Cetane Index	Min	45	45	45	45.5	44.5	45.2
Sulfur (wt%)	Max	0.042	0.042	0.042	0.042	0.042	0.042
Density (Sp gr)	Max	0.865	0.865	0.865	0.865	0.865	0.865
Density (Lb/BBL)	Max	302.71	302.71	302.71	302.71	302.71	302.71
Density (Sp gr)	Min	0.832	0.832	0.832	0.832	0.832	0.832
Density (Lb/BBL)	Min	291.14	291.14	291.14	291.14	291.14	291.14
Flash Ind (140F)	Max	155	155	155	155	155	155
Pour Index	Max	360.35 OF	360.35 OF	360.35 OF	360.35 OF	360.35 OF	360.35
Home Heating Oil							
Sulfur (wt%)	Max	0.25	0.25	0.25	0.25		0.25
Density (Sp gr)	Max	0.873	0.873	0.873	0.873	0.873	0.873
Density (Lb/BBL)	Max	305.52	305.52	305.52	305.52	305.52	305.52
Density (Sp gr)	Min	0.832	0.832	0.832	0.832	0.832	0.832
Density (Lb/BBL)	Min	291.14	291.14	291.14	291.14	291.14	291.14
Vis Index (122F)	Min	48.2	48.2	48.2	48.2		48.2
Pour Index	Max	360.35 OF	360.35 OF	360.35 OF	360.35 OF		360.35
Flash Ind (140F)	Max	155	155	155	155		155
Residual Fuels							
LSFO							
Sulfur (wt%)	Max	0.7	1	0.7	0.7	0.7	0.7
Flash Ind (160F)	Max	76.5	76.5	76.5	76.5	76.5	76.5
Vis (122F) 380cst	Min	20.67	20.67	20.67	20.67	20.6735	20.67
Density (Sp gr)	Max	0.996	0.996	0.996	0.996	0.996	0.996
HSFO							
Sulfur (wt%)	Max	3	3	3	3	3	3
Flash Ind (160F)	Max	76.5	76.5	76.5	76.5	76.5	76.5
Vis (122F) 380cst	Min	20.67	20.67	20.67	20.67	20.67	20.67
Density (Sp gr)	Max	0.996	0.996	0.996	0.996	0.996	0.996

Notes
1. Annual Average Basis
2. Modeling specifications to simulate average quality product, not ASTM or regulatory specifications.

TABLE B-12

U.S. Refining Industry Model
Modeling Specifications
2000 Reference Cases

PADD:		PADD I	PADD II	PADD III	PADD IV	PADD V CALIFORNIA	PADD V NON-CALIFORNIA
NPC Regions:		1,2,3,4	5,6,7	8	9	11,12	10,13
			Gasolines				
Global Specs - Conventional Gasolines							
Aromatics Vol%	Max	32.838	28.484	30.56	26.524	33.377	27.86
Benzene Vol%	Max	1.674	1.679	1.7	1.319	1.575	1.601
Olefins Vol%	Max	12.297	10.649	11.873	12.289	10	9.995
Sulfur (wt%)	Max	0.028	0.027	0.04	0.038	0.019	0.035
% off 212 F	Monitor	52.545	53.489	51.767	48.781	49.115	51.315
% off 300 F	Min	80.033	80.909	80.027	81.293	81.202	82.067
% off 356 F	Min	90.291	89.653	89	90.133	91	90.632
Global Specs - Reformulated Gasolines							
Aromatics Vol%	Max	25	25	25	25	25	25
Benzene Vol%	Max	0.7	0.7	0.7	0.7	0.7	0.7
Olefins Vol%	Max	12	12	12	12	10	12
Sulfur (wt%)	Max	0.015	0.015	0.015	0.015	0.015	0.015
% off 212 F	Min	50.1	50.1	50.1	50.1	50.1	50.1
% off 300 F	Min	82	82	82	82	82	82
% off 356 F	Min	92	92	92	92	92	92
Global Specs - CARB Phase 2							
Aromatics Vol%	Max					22	
Benzene Vol%	Max					0.8	
Olefins Vol%	Max					4	
Sulfur (wt%)	Max					0.003	
% off 212 F	Min					57	
% off 300 F	Min					92	
Conventional Unl Premium							
Winter RVP (psi)	Max	12.2	12.5	11.9	12	10.1	12.3
Summer RVP (psi)	Max	8.7	8.7	8.7	8.7	8.7	8.7
Avg RVP (psi)	Max	10.45	10.6	10.3	10.35	9.4	10.5
% off 158 F	Min	16	16	16	16	10	16
% off 212 F	Max	64	64	64	64	58	64
Wt % Oxygen	Min	0	0.17	0.09	0.51	1.35	1.08
(R+M)/2	Min	92.2	92.2	92.2	90.8	92	92
Conventional Unl Regular							
Winter RVP (psi)	Max	12.2	12.5	11.9	12	10.1	12.3
Summer RVP (psi)	Max	8.7	8.7	8.7	8.7	8.7	8.7
Avg RVP (psi)	Max	10.45	10.6	10.3	10.35	9.4	10.5
% off 158 F	Min	16	16	16	16	10	16
% off 212 F	Max	64	64	64	64	58	64
Wt% Oxygen	Min	0	0.17	0.09	0.51	1.35	1.08
(R+M)/2	Min	87.2	87.2	87.1	85.8	87.2	87.2
Reformulated Unl Premium							
Winter RVP (psi)	Max	12.2	12.5	11.9	12	10.1	12.3
Summer RVP (psi)	Max	6.5	6.5	6.5	6.5	6.5	6.5
Avg RVP (psi)	Max	9.35	9.5	9.2	9.25	8.3	9.4
% off 158 F	Min	16	16	16	16	10	16
% off 212 F	Max						
Vol% Benzene	Max	1	1	1	1	1	1
Wt % Oxygen	Min	2.4	2.13	2.18	2.1	2.1	2.1
(R+M)/2	Min	92.2	92.2	92.2	90.8	92	92
Reformulated Unl Regular							

TABLE B-12 (cont)

U.S. Refining Industry Model
Modeling Specifications
2000 Reference Cases

PADD:		PADD I	PADD II	PADD III	PADD IV	PADD V CALIFORNIA	PADD V NON-CALIFORNIA
NPC Regions:		1,2,3,4	5,6,7	8	9	11,12	10,13
			Distillates				
Jet A							
Density (Sp gr)	Max	0.840	0.840	0.840	0.840	0.841	0.840
Density (Sp gr)	Min	0.793	0.793	0.793	0.793	0.793	0.793
Density (Lb/Bbl)	Max	293.70	293.70	293.70	293.70	294.00	293.70
Density (Lb/Bbl)	Min	277.28	277.28	277.28	277.28	277.28	277.28
Sulfur (wt%)	Max	0.05	0.05	0.05	0.05	0.05	0.05
Aromatics (vol%)	Max	20	20	20	20	22	22
% off 400 F	Min	10	10	10	10	10	10
% off 400 F	Max	50	50	50	50	50	50
Smoke pt. (mm)	Min	23	23	23	23	23	20
Flash Index (110F)	Max	495	495	495	495	495	495
Low S, Low A Diesel							
Cetane Index	Min					44.5	
Sulfur (wt%)	Max					0.042	
Aromatics	Max					7.3	
Density (Sp gr)	Max					0.865	
Density (Lb/BBL)	Max					302.71	
Density (Sp gr)	Min					0.832	
Density (Lb/BBL)	Min					291.14	
Flash Ind (140F)	Max					155	
Pour Index	Max					360.35 0F	
Low S Diesel							
Cetane Index	Min	45	45	45	45.5	44.5	45.2
Sulfur (wt%)	Max	0.042	0.042	0.042	0.042	0.042	0.042
Density (Sp gr)	Max	0.865	0.865	0.865	0.865	0.865	0.865
Density (Lb/BBL)	Max	302.71	302.71	302.71	302.71	302.71	302.71
Density (Sp gr)	Min	0.832	0.832	0.832	0.832	0.832	0.832
Density (Lb/BBL)	Min	291.14	291.14	291.14	291.14	291.14	291.14
Flash Ind (140F)	Max	155	155	155	155	155	155
Pour Index	Max	360.35 0F	360.35 0F	360.35 0F	360.35 0F	360.35 0F	360.35
Home Heating Oil							
Sulfur (wt%)	Max	0.25	0.25	0.25	0.25		0.25
Density (Sp gr)	Max	0.873	0.873	0.873	0.873	0.873	0.873
Density (Lb/BBL)	Max	305.52	305.52	305.52	305.52	305.52	305.52
Density (Sp gr)	Min	0.832	0.832	0.832	0.832	0.832	0.832
Density (Lb/BBL)	Min	291.14	291.14	291.14	291.14	291.14	291.14
Vis Index (122F)	Min	48.2	48.2	48.2	48.2		48.2
Pour Index	Max	360.35 0F	360.35 0F	360.35 0F	360.35 0F		360.35
Flash Ind (140F)	Max	155	155	155	155		155
			Residual Fuels				
LSFO							
Sulfur (wt%)	Max	0.7	1	0.7	0.7	0.7	0.7
Flash Ind (160F)	Max	76.5	76.5	76.5	76.5	76.5	76.5
Vis (122F) 380cst	Min	20.67	20.67	20.67	20.67	20.6735	20.67
Density (Sp gr)	Max	0.99634	0.99634	0.99634	0.99634	0.99634	0.99634
HSFO							
Sulfur (wt%)	Max	3	3	3	3	3	3
Flash Ind (160F)	Max	76.5	76.5	76.5	76.5	76.5	76.5
Vis (122F) 380cst	Min	20.67	20.67	20.67	20.67	20.67	20.67
Density (Sp gr)	Max	0.996	0.996	0.996	0.996	0.996	0.996

Notes 1. Annual Average Basis
2. Modeling specifications to simulate average quality product, not ASTM or regulatory specifications.

TABLE B-12 (cont)

U.S. Refining Industry Model
Modeling Specifications
2000 Reference Cases

PADD:		PADD I	PADD II	PADD III	PADD IV	PADD V CALIFORNIA	PADD V NON-CALIFORNIA
NPC Regions:		1,2,3,4	5,6,7	8	9	11,12	10,13
Winter RVP (psi)	Max	12.2	12.5	11.9	12	10.1	12.3
Summer RVP (psi)	Max	6.5	6.5	6.5	6.5	6.5	6.5
Avg RVP (psi)	Max	9.35	9.5	9.2	9.25	8.3	9.4
% off 158 F	Min	16	16	16	16	10	16
% off 212 F	Max						
Vol% Benzene	Max	1	1	1	1	1	1
Wt % Oxygen	Min	2.4	2.13	2.18	2.1	2.1	2.1
(R+M)/2	Min	87.2	87.2	87.1	85.8	87.2	87.2
CARB Phase 2 Unl Premium							
Winter RVP (psi)	Max					10.1	
Summer RVP (psi)	Max					6.6	
Avg RVP (psi)	Max					8.35	
% off 158 F	Min					10	
% off 212 F	Max						
Wt % Oxygen	Fix					2	
(R+M)/2	Min					92	
CARB Phase 2 Unl Regular							
Winter RVP (psi)	Max					10.1	
Summer RVP (psi)	Max					6.6	
Avg RVP (psi)	Max					8.35	
% off 158 F	Min					10	
% off 212 F	Max						
Wt % Oxygen	Fix					2	
Vol% Benzene	Max					1	
(R+M)/2	Min					87.2	

Notes
1. Annual Average Basis
2. Modeling specifications to simulate average quality product, not ASTM or regulatory specifications.

TABLE B-13

U.S. Refining Industry Model
Gasoline Grade Splits
1995 Reference Cases

	CLASS SPLIT					GRADE SPLIT		
PADD	CG	OG	RFG-OG	RFG	Total	Regular	Premium	Total
PADD I			50.2%	49.8%	100.0%	71.3%	28.7%	100.0%
PADD II	78.8%	5.5%		15.7%	100.0%	81.4%	18.6%	100.0%
PADD III	81.6%	7.5%	2.3%	8.6%	100.0%	74.0%	26.0%	100.0%
PADD IV	83.3%	16.7%			100.0%	82.6%	17.4%	100.0%
PADD V Non-California	64.7%	35.3%			100.0%	82.4%	17.6%	100.0%
PADD V California	20.9%	20.5%	28.7%	29.9%	100.0%	75.6%	24.4%	100.0%
Wt% O2	0.0	2.7	2.7	2.1				

CG = Conventional Gasoline
OG = Oxygenated Gasoline
RFG-OG = Reformulated Oxygenated Gasoline
RFG = Reformulated Gasoline

TABLE B-14

U.S. Refining Industry Model
Gasoline Grade Splits
2000 Reference Cases

	CLASS SPLIT						GRADE SPLIT		
PADD	CG	OG	RFG-OG	RFG	CARB	Total	Regular	Premium	Total
PADD I			50.2%	49.8%		100.0%	71.3%	28.7%	100.0%
PADD II	42.3%	2.9%	2.6%	52.2%		100.0%	81.4%	18.6%	100.0%
PADD III	35.7%	1.3%	8.5%	54.5%		100.0%	74.0%	26.0%	100.0%
PADD IV	70.9%	16.7%		12.4%		100.0%	82.6%	17.4%	100.0%
PADD V Non-California	60.1%	39.9%				100.0%	82.4%	17.6%	100.0%
PADD V California	3.3%	3.3%			93.4%	100.0%	75.6%	24.4%	100.0%
Wt% O2	0	2.7	2.7	2.1	2				

CG = Conventional Gasoline
OG = Oxygenated Gasoline
RFG-OG = Reformulated Oxygenated Gasoline
RFG = Reformulated Gasoline
CARB = California Air Resources Board Gasoline

The importance of these different numbers is that the operating day capacity is the capacity number used in the LP analysis. Since different data sources report capacities in either stream day or calendar day basis, a logical method goes from either capacity to operating day capacity was implemented.

Examples of these adjustments are shown in the following table:

Unit	Calendar Day Factor % of Stream Day	Operating Day Factor, % Of Calendar Day		
		High Eff.	Med. Eff.	Low Eff.
Crude, Atmospheric	96%	98%	95%	92%
Hydrotreater Distillate	96%	97%	94%	91%

Investment Options/Discussion of Calculation

As noted, capacity additions in 2000 and 2010 were determined by refined products demand set in each region. The LP was allowed to select the optimum configuration using existing capacity and investing in new capacity as needed. In the U.S. regions, no additional conversion (vacuum gasoil and residuum) capacity investment was allowed except for specific issue cases. Conversion capacity was open for all foreign regions. As shown in Chapter 2, the Refinery Facilities Sub-Committee supplied the basis for estimating the capital cost for new investments, including offsites and location factors. The Facilities Sub-Committee did not provide the capital cost for all processes available in Pace's LP Model. For such process units, Pace estimated the capital cost using its own cost data and factoring these costs via a comparison of processes cost estimates that Pace and the Facilities Sub-Committee had in common.

An example of the calculation is shown in Table B-15.

1989 REFERENCE CASE BASIS

Crude Oil Feeds

The models for each region started with the premise of a base crude slate with a incremental crude available for future time periods. The incremental crude was typically

TABLE B-15

INVESTMENT CALCULATION EXAMPLES

<u>Single Unit Investment - TAME Unit</u>

Size Built (MBPOD)	9.759	LP Solution
Std B/OD Size (MBPOD)	1.900	Input
Std. Invest $MM	$13.00	Input
Offsite Mult.	1.65	Input
Locn Mult.	1.1	Input
Avg $/BBL Cost	$12,418	
Total Cost $M	$121,191	

*Avg $/BBL = Std Cost / Std Size * Offsite * Location*
*Total $M = Avg $/BBL * Size Built*

<u>Total Investment Cost</u>

Total Investment $M	$2,147,071	
Capital Charge Factor	0.242	Input [1]
$/D Investment	$1,423,537	

*$/D Invest = Total Invest * Capf * 1000 / 365*

<u>Fixed Other Charges (Taxes, Insurance, Maintenance)</u>

Labor Men	53.2	LP Solution
Hour Wage	$15.96	Input
Hours/shift	8	Input
Shifts/Day	4.2	Input
Supv/ohvd mult.	1.94	Input
Total Labor $	$55,349	

*Labor $/D = Men * Hr/Shift * Shift/D * $/Hr * Ovhd*

Maint/misc mult.	0.036	Input
Ins/tax mult.	0.015	Input
MTI $	$300,002	

*MTI = Total Invest/D * (Maint + Ins/Tax)*

Total Fixed Other Charges ($/D)	$355,351

<u>*Note [1]*</u> *For LP optimization only. Costs evaluated with capital charge factor of 0.172 corresponding to 10% after tax constant dollar ROR.*

Arab Light, except in several U.S. regions where either a sweet domestic crude (like West Texas Intermediate) or Alaskan North Slope (ANS) crude was used. The volumes of the base and incremental crudes were set by analysis of the total crude volumes processed in the region for 1989 and backing out how much of the incremental crude or crude type similar to the incremental crude were available for processing. The data sources for the crudes were either a combination of DOE or Pace information for the United States, and Pace information for the foreign regions.

In several of the foreign model regions it became evident that additional segregation of crudes would be required for the models to represent the manufacture of the various grades of low-sulfur resids as forecasted by the NPC. The base crude was further delineated in these regions into base sour and sweet crudes. The Mediterranean/North Africa region required even further segregation of two sweet base crudes in order to meet the forecasted LSFO demands. In the 2000 and 2010 cases (Mediterranean and Latin America), the sulfur specifications were relaxed on the low-sulfur resid grades to achieve reasonable marginal values on the residuum products. Off-line calculations were performed to confirm that the resid volumes with the correct sulfur specifications could still be manufactured with additional crude and product segregations. In all regions this was determined to be possible.

Table B-16 lists the qualities of the base, incremental, and fixed sweet crudes for each U.S. PADD and foreign region. Table B-17 shows the major foreign crudes used for each region.

Feeds and Products

The basic methodology of the cost/volume relationships, as described in Chapter 3 of the SD&L report, required that certain feeds and products be fixed in volume, while other products floated. The feed (input) volumes which were allowed to float or reach a maximum volume were:

- Butanes (Iso and normal)
- Purchased natural gas
- MTBE
- Methanol
- Lead additive (for leaded gasoline grades)

The product volumes which were allowed to vary in all of the regions were:

- LPGs (Propane in the United States; C_3/C_4 mix for foreign regions)
- High Sulfur Fuel Oil (HSFO)

TABLE B-16

CRUDE OIL QUALITIES

			Whole Crude		650-1050			1050+			650+		
PADD/Region	Crude	Year	API	% S	Vol %	API	% S	Vol %	API	% S	Vol %	API	% S
PADD I	Incremental	1989+	33.4	1.80	31.1	22.7	2.61	15.2	7.3	4.01	46.3	17.2	3.11
	Base	1989+	31.9	0.93	30.2	21.7	1.02	15.3	8.3	2.85	45.5	16.9	1.67
PADD II	Incremental	1989+	39.8	0.49	25.2	26.0	0.76	10.9	15.7	1.35	36.1	22.7	0.95
	Base	1989+	33.3	1.13	28.2	22.2	1.33	16.4	6.9	3.13	44.6	16.2	2.03
PADD III	Incremental	1989+	33.4	1.80	31.1	22.7	2.61	15.2	7.3	4.01	46.3	17.2	3.11
	Base	1989+	34.1	1.19	27.0	23.1	1.40	15.8	7.2	3.54	42.8	17.2	2.25
PADD IV	Incremental	1989+	39.8	0.49	25.2	26.0	0.76	10.9	15.7	1.35	36.1	22.7	0.95
	Base	1989+	33.3	1.03	29.2	22.2	1.22	15.0	7.7	2.87	44.3	17.0	1.82
PADD VC	Incremental	1989+	27.6	1.05	32.7	20.3	1.26	19.2	7.2	2.29	51.9	15.2	1.66
	Base	1989+	22.3	1.30	35.3	16.3	1.28	23.6	4.8	2.54	58.9	11.5	1.81
PADD VOC	Incremental	1989+	27.6	1.05	32.7	20.3	1.26	19.2	7.2	2.29	51.9	15.2	1.66
	Base	1989+	29.8	1.08	30.1	20.6	1.36	17.1	6.2	2.67	47.2	15.1	1.86
Canada	Incremental	1989+	33.4	1.80	31.1	22.7	2.61	15.2	7.3	4.01	46.3	17.2	3.11
	Base	1989	34.5	0.82	28.0	21.3	0.99	12.4	5.8	2.70	40.4	16.1	1.55
	Incremental	1995+	34.4	0.91	27.7	21.0	1.08	12.8	4.9	2.91	40.6	15.5	1.70
	Sweet	1995+	34.0	0.20	30.9	22.1	0.35	9.9	14.6	0.49	40.9	20.2	0.38
N.W. Europe	Incremental	1989+	33.4	1.80	31.1	22.7	2.61	15.2	7.3	4.01	46.3	17.2	3.11
	Base	1989	34.0	0.62	29.7	22.9	0.90	12.0	12.6	1.86	41.7	19.8	1.19
	Base	1995+	35.1	0.63	29.8	22.9	0.92	12.1	12.5	1.90	41.9	19.7	1.21
	Sweet	1995+	37.1	0.28	29.3	23.9	0.50	8.9	15.2	0.80	38.2	21.8	0.57
Med/N. Africa	Incremental	1989+	33.4	1.80	31.1	22.7	2.61	15.2	7.3	4.01	46.3	17.2	3.11
	Base	1989	32.3	1.48	28.9	22.2	1.80	18.5	8.2	3.61	47.4	16.4	2.55
	Sweet	1989	35.9	0.15	27.9	27.7	0.16	19.7	14.6	0.35	47.6	22.0	0.24
	Base	1995+	32.0	1.58	28.7	21.8	1.93	18.5	7.8	3.85	47.3	16.0	2.73
	Sweet	1995+	36.2	0.15	29.7	27.3	0.18	18.9	14.5	0.33	48.6	22.1	0.24
Middle East	Incremental	1989+	33.4	1.80	31.1	22.7	2.61	15.2	7.3	4.01	46.3	17.2	3.11
	Base	1989+	30.3	2.37	29.4	20.6	2.95	20.2	6.7	5.15	49.7	14.6	3.90
Latin America	Incremental	1989+	33.4	1.80	31.1	22.7	2.61	15.2	7.3	4.01	46.3	17.2	3.11
	Base	1989	27.7	1.56	32.4	21.2	1.65	22.7	6.2	3.31	55.1	14.7	2.37
	Base	1995+	27.7	1.62	31.8	21.0	1.74	22.8	5.9	3.44	54.5	14.3	2.49
	Sweet	1995+	27.9	0.49	42.4	24.8	0.54	21.3	11.2	0.96	63.7	20.0	0.69
Pacific Rim	Incremental	1989+	33.4	1.80	31.1	22.7	2.61	15.2	7.3	4.01	46.3	17.2	3.11
	Base	1989+	35.4	1.01	28.2	23.6	1.50	13.2	11.4	2.84	41.4	19.5	1.95
	Sweet	1989+	38.7	0.09	29.5	29.0	0.15	10.2	15.7	0.17	39.8	25.4	0.16

TABLE B-17

MAJOR FOREIGN CRUDES

Region	Base Crudes	Swing Crude
Canada	Interprov. Sweet Sundre Lloydminster Blend Brent	Saudi Light
S. Europe/ Mediterranean	Algerian Sarir Bahregan Sar Saudi Medium Urals	Saudi Light
Middle East	Iranian Light Kuwaiti Murban	Saudi Light
N.W. Europe	Ekofisk Brent Urals	Saudi Light
Pacific Rim	Minas Ardjuna Iranian Light Murban	Saudi Light
Caribbean	Isthmus Maya	Saudi Light

Note: Listed crudes are those comprising >10% of mix; they are not in any particular order

Source: Pace Consultants Inc. (Proprietary)

TABLE B-18

U.S. Refining Industry Model
Volumetric Input & Output Information
1989 Reference Cases

PADD:	**PADD I**	**PADD II**	**PADD III**	**PADD IV**	**PADD V CALIFORNIA**	**PADD V NON-CALIFORNIA**
NPC Regions:	**1,2,3,4**	**5,6,7**	**8**	**9**	**11,12**	**10,13**
Incremental Crude Type:	Arab Light	WTI	Arab Light	WTI	ANS	ANS
Fixed Input Volumes (MBPD)						
Base Crude	1000.0	2020.0	5340.0	310.0	1300.0	200.0
Unfinished Oil	178.9	25.4	281.6		30.2	1.5
Mogas blendstock	25.0	33.0			25.5	
Natural Gasoline				5.3	4.5	
Isobutane			25.5			
Fixed Output Products (MBPD)						
Petrochemical Naphtha	12.6	30.4	133.5	0.1	8.2	
Petrochemical Other Oils	0.3	22.1	185.2	0.5	7.9	
Asphalt	88.5	140.5	103.7	25.6	53.4	9.7
Lubes	24.3	24.7	112.3	2.0	21.9	
Misc Product	12.2	12.1	40.1	2.1	3.7	

Note: volumes listed are for those feeds or products set at fixed limits

Unfinished Oil is typically FCCU feedstock except in PADD V California; in that region mix of Atmospheric tower bottoms and Vacuum tower resid
Mogas blendstock based on 1989 NPRA mogas blendstock qualities
Petrochemical naphtha is C5-350F range material
Petrochemical Other Oils is typically 400F-650F range material

WTI = West Texas Intermediate
ANS = Alaskan North Slope

- Sulfur (from refinery sulfur plants)
- Coke (from Delayed or Fluid coking units).

These volumes for the domestic regions for 1989, 1995, and 2000 are given in Tables B-18, B-19, and B-20.

Calibration Criteria

Since most of the feed and product volumes were fixed for the 1989 reference cases, only a few volumes and unit operation throughputs were monitored to determine whether the LP cases were considered "calibrated" to the 1989 operation. In general, the following criteria were used:

- Crude run within 1% of 1989 target volume
- Individual unit weight balance within each refinery within 1 percent
- Total refinery weight balance within 1 percent
- Residual fuel oil blends with 650-°F less than 30 percent
- High sulfur fuel oil within +/-20% of base production
- Unit operations within reasonable limits of utilization for each refining region
- Marginal values within reasonable ranges based on analysis by Pace and the NPC U.S. and Foreign Groups.

COST/VOLUME RELATIONSHIPS

Methodology

The basic methodology for the cost/volume relationships for both domestic and foreign regions are discussed in detail in Chapter 3.VIII of the SD&L report. The discussion in the Pace report will be a brief overview of the mechanics of the cost/volume relationships and normalization of the results prior to input to the logistics modeling efforts of the NPC study.

The basic premise of the cost/volume relationship is to calculate the delta cost between different refining regimes across a volume of light product production for a given refining region. The different refining regimes seen in the cost/volume relationships are:

- **Coking**—Lowest cost portion of the cost/volume relationship path; where residual processing operations are not fully utilized. This regime typically exhibits the lowest ratio of resid production per crude feed.

- **Cracking**—Portion of cost/volume relationship path where FCCs and Hydrocrackers are becoming fully utilized.

TABLE B-19

U.S. Refining Industry Model
Volumetric Input & Output Information
1995 Reference Cases

PADD:	PADD I	PADD II	PADD III	PADD IV	PADD V CALIFORNIA	PADD V NON-CALIFORNIA
NPC Region:	1,2,3,4	5,6,7	8	9	11,12	10,13
Incremental Crude Type	Arab Light	WTI	Arab Light	WTI	ANS	ANS
Fixed Input Volumes (MBPD)						
Base Crude	1000.00	2020.00	5340.00	310.00	1300.00	200.00
Incremental Crude	255.10	887.94	826.27	142.05	628.16	507.42
Unfinished Oil	178.90	25.40	281.60		30.20	1.50
Mogas blendstock	25.00	33.00			25.50	
Natural Gasoline				5.30	4.50	
Isobutane			25.53			
Fixed Output Products (MBPD)						
Petrochemical Naphtha	13.86	33.45	146.90	0.11	9.02	0.00
Petrochemical Other Oils	0.34	25.20	211.14	0.57	9.01	0.00
Asphalt	85.57	135.85	100.27	24.75	51.63	9.38
Lubes	23.47	23.86	108.47	1.93	21.15	0.00
Misc Product	11.86	11.76	38.99	2.04	3.60	0.00

Note: volumes listed are for those feeds or products set at fixed limits

Volumes of fixed products are based relative to 1989 volumes
The following ratios are used:

	1995/1989
Petrochemical Naphtha	1.100
Petrochemical Other Oils	1.140
Asphalt	0.967
Lubes	0.966
Misc Product	0.972

Unfinished Oil is typically FCCU feedstock except in PADD V California; in that region mix of Atmospheric tower bottoms and Vacuum tower resid
Mogas blendstock based on 1989 NPRA mogas blendstock qualities
Petrochemical naphtha is C5-350F range material
Petrochemical Other Oils is typically 400F-650F range material

WTI = West Texas Intermediate
ANS = Alaskan North Slope

TABLE B-20

U.S. Refining Industry Model
Volumetric Input & Output Information
2000 Reference Cases

PADD:	PADD I	PADD II	PADD III	PADD IV	PADD V CALIFORNIA	PADD V NON-CALIFORNIA
NPC Regions:	1,2,3,4	5,6,7	8	9	11,12	10,13
Incremental Crude Type	Arab Light	WTI	Arab Light	WTI	ANS	ANS
Fixed Input Volumes (MBPD)						
Base Crude	1000.0	2020.0	5340.0	310.0	1300.0	200.0
Incremental Crude	255.1	887.9	826.3	142.1	628.2	507.4
Unfinished Oil	178.9	25.4	281.6		30.2	1.5
Mogas blendstock	25.0	33.0			25.5	
Natural Gasoline				5.3	4.5	
Isobutane			25.5			
Fixed Output Products (MBPD)						
Petrochemical Naphtha	14.8	35.7	156.7	0.1	9.6	0.0
Petrochemical Other Oils	0.4	27.4	229.9	0.6	9.8	0.0
Asphalt	82.6	131.2	96.8	23.9	49.9	9.1
Lubes	22.6	23.0	104.6	1.9	20.4	0.0
Misc Product	11.5	11.4	37.9	2.0	3.5	0.0

Note: volumes listed are for those feeds or products set at fixed limits

Volumes of fixed products are based relative to 1989 volumes
The following ratios are used:

	2000/1989
Petrochemical Naphtha	1.174
Petrochemical Other Oils	1.241
Asphalt	0.934
Lubes	0.932
Misc Product	0.944

Unfinished Oil is typically FCCU feedstock except in PADD V California; in that region mix of Atmospheric tower bottoms and Vacuum tower resid
Mogas blendstock based on 1989 NPRA mogas blendstock qualities
Petrochemical naphtha is C5-350F range material
Petrochemical Other Oils is typically 400F-650F range material

WTI = West Texas Intermediate
ANS = Alaskan North Slope

- **Topping/Reforming**—Portion of cost/volume relationship path where all available conversion capacity is full and the only incremental means of MJD production is by crude topping and naphtha reforming operations; regime of largest resid production per barrel of crude run.

The actual cost involves the calculation of incremental input costs less incremental product credits plus incremental operating costs. An example calculation is shown in Table B-21. In this example, the incremental input costs are:

- Incremental crude
- Isobutane
- Normal butane
- Natural gas

The increment by-product credits are:

- C_3 olefins
- LPG
- High sulfur fuel oil
- Sulfur
- Coke

The incremental operating costs are:

- Lead additives
- Variable utility costs.

As seen by the example in Table B-21, the incremental cost per barrel for the step from the base run to the delta run is $19.74/barrel.

Besides the base light product cost/volume relationship which was run at the same fixed ratio of gasoline:jet:distillate across a range of product volumes, "prime" cost/volume relationships were run in which the ratios of each product was varied. The "M Prime" cost/volume relationship was based on a higher gasoline to jet/distillate ratio than the base cost/volume relationship. Similar cost/volume relationships were constructed for "J Prime" and "D Prime". In each of these cost/volume relationships, the ratio of the other products was kept in the same relationship as the base cost/volume relationships.

The domestic prime relationships were run at constant crude runs for each year to represent higher and lower volumes of light products. The foreign relationships were run at fixed light product volumes, while the incremental crude volumes changed over the range of light product production.

TABLE B-21

EXAMPLE COST VOLUME RELATIONSHIP CALCULATION

Input Costs	Base Run Volume (MBPD)	Delta Run Volume (MBPD)	Delta (MBPD)	Cost ($/Bbl)	Cost (M$/D)
Incremental Crude	826.3	890.1	63.9	18.16	1,160
Isobutane	25.5	25.5	0.0	14.84	0
Normal Butane	94.5	95.6	1.1	12.76	14
Natural Gas	32.0	32.2	0.2	12.50	2
					$1,176

Byproduct Credits	Volume (MBPD)	Volume (MBPD)	Delta (MBPD)	Credit ($/Bbl)	Credit (M$/D)
C3 Olefins	64.3	64.3	0.0	14.77	(0)
LPG	219.6	220.8	1.2	9.83	(12)
HSFO	261.6	272.4	10.8	14.05	(152)
Sulfur	33.6	34.1	0.5	4.37	(2)
Coke	2.0	2.0	0.0	3.28	0
					($166)

Operating Costs	Base Run	Delta Run	(M$/D)
Lead Additive	5.80	5.85	0
Variable Operating Cost	2,840.42	2,854.10	14
			14

Total Costs (M$):	$1,024

	Base Run Volume (MBPD)	Delta Run Volume (MBPD)	Delta (MBPD)	$/Bbl
MJD Volume	5193.5	5245.4	51.9	$19.74

It is important to note that those cost/volume relationships are representative of the cost of making a mixture of light products at various ratios of each, and **not** the cost of any individual components. By changing the ratios of each component in the various cost/volume relationships, we have defined the cost of manufacturing the total light product volume over a defined range of variation in the mixtures of the components.

Normalization Corrections

Due to the methodology, the different cost/volume relationships (Base, M′, J′ D′) generated for a given model for a given year resulted in different cost/volume relationship data points. These data points for the M′, J′, and D′ cases differed from the base cost/volume relationship data points due to either running at fixed crude runs, and/or the effects of blending oxygenates by weight (as required by law). The first change to the cost/volume relationship was to normalize the oxygenates to a constant volume percent basis. The second normalization was to recalculate the volume balances so that all cost/volume relationships had the same light product data points. The last normalization was to calculate the correct light product cost given the corrected light product data points.

NPC WORKING PAPERS

Tables B-22 and B-23 detail the LP cases and cost/volume relationship spreadsheets that are included in the Appendix of this report. Tables B-24 through B-27 are the cases and spreadsheets that will be working papers onsite at the NPC.

TABLE B-22

DOMESTIC AND FOREIGN REGIONAL LP CASES IN APPENDIX

Case ID	Description
PD3 89	1989 PADD III Reference Case
PD3 95	1995 PADD III Reference Case
PD3 00	2000 PADD III Reference Case
LAT 00(R)	2000 Latin America Reference Case w/Revised RF2 Sulfur – FC–I

TABLE B-23

DOMESTIC AND FOREIGN COST/VOLUME RELATIONSHIP SPREADSHEETS IN APPENDIX

Relationship ID	Description
PD I 89 MJD	1989 PADD I MJD
PD II 89 MJD	1989 PADD II MJD
PD III 89 MJD	1989 PADD III MJD
PD IV 89 MJD	1989 PADD IV MJD
PD VC 89 MJD	1989 PADD VC MJD
PD VOC 89 MJD	1989 PADD VOC MJD
PD I 95MJD Normal	1995 PADD I MJD Normalized
PD I 95 MJD	1995 PADD I MJD
PD II 95MJD Normal	1995 PADD II MJD Normalized
PD II 95 MJD	1995 PADD II MJD
PD III 95 MJD Normal	1995 PADD III MJD Normalized
PD III 95 MJD	1995 PADD III MJD
PD IV 95 MJD Normal	1995 PADD IV MJD Normalized
PD IV 95 MJD	1995 PADD IV MJD
PD VC 95 MJD Normal	1995 PADD VC MJD Normalized
PD VC 95 MJD	1995 PADD VC MJD
PD VOC 95 MJD Normal	1995 PADD VOC MJD Normalized
PD VOC 95 MJD	1995 PADD VOC MJD
PD I 00 MJD Normal	2000 PADD I MJD Normalized
PD I 00 MJD	2000 PADD I MJD
PD II 00 MJD Normal	2000 PADD II MJD Normalized
PD II 00 MJD	2000 PADD II MJD
PD III 00 MJD Normal	2000 PADD III MJD Normalized
PD III 00 MJD	2000 PADD III MJD
PD IV 00 MJD Normal	2000 PADD IV MJD Normalized
PD VC 00 MJD Normal	2000 PADD VC MJD Normalized
PD VC 00 MJD	2000 PADD VC MJD
PD VOC 00 MJD Normal	2000 PADD VOC MJD Normalized
PD VOC 00 MJD	2000 PADD VOC MJD
LAT 00 MJD	2000 Latin America MJD

TABLE B-24

DOMESTIC REGIONAL LP CASES IN NPC WORKING PAPERS

Case ID	Description
PD1 89	1989 PADD I Reference Case
PD2 89	1989 PADD II Reference Case
PD3 89	1989 PADD III Reference Case
PD3 M89	1989 PADD III M' Case
PD3 J89	1989 PADD III J' Case
PD3 D89	1989 PADD III D' Case
PD4 89	1989 PADD IV Reference Case
PD5C 89	1989 PADD V (California) Reference Case
PD5OC 89	1989 PADD V (Outside CA) Reference Case
PD1 95	1995 PADD I Reference Case
PD2 95	1995 PADD II Reference Case
PD3 95	1995 PADD III Reference Case
PD3 M95	1995 PADD III M' Case
PD3 J95	1995 PADD III J' Case
PD3 D95	1995 PADD III D' Case
PD4 95	1995 PADD IV Reference Case
PD5C 95	1995 PADD V (California) Reference Case
PD5OC 95	1995 PADD V (Outside CA) Reference Case
PD1 00	2000 PADD I Reference Case
PD2 00	2000 PADD II Reference Case
PD3 00	2000 PADD III Reference Case
PD3 M00	2000 PADD III M' Case
PD3 J00	2000 PADD III J' Case
PD3 D00	2000 PADD III D' Case
PD4 00	2000 PADD IV Reference Case
PD5C 00	2000 PADD V (California) Reference Case
PD5OC 00	2000 PADD V (Outside CA) Reference Case
PD3 00 ISS	2000 PADD III High MJD w/Bottoms Investment

TABLE B-25

FOREIGN REGIONAL LP CASES IN NPC WORKING PAPERS

Case ID	Description
CAN 89	1989 Canada Reference Case
CAN 95(R)	1995 Canada Reference Case – FC I
CAN 00(R)	2000 Canada Reference Case – FC I
CAN 00(R) FC–II	2000 Canada Reference Case – FC II
NWE 89	1989 N.W. Europe Reference Case
NWE 89(S)	1989 N.W. Europe Reference w/1995 Crude Segregations
NWE 95	1995 N.W. Europe Reference Case – FC I
NWE 00	2000 N.W. Europe Reference Case – FC I
NWE 00 FC–II	2000 N.W. Europe Reference Case – FC II
NWE 95 FC–III	1995 N.W. Europe Reference Case – FC III
MED 89	1989 Mediterranean Reference Case
MED 89(S)	1989 Mediterranean Reference w/1995 Crude Segregations
MED 95	1995 Mediterranean Reference Case – FC I
MED 95(R)	1995 Mediterranean Reference Case w/ Revised RFO Sulfur –
MED 95(.9CR)	1995 Mediterranean Issue Case – Downrated Conversion Capacity
MED 00	2000 Mediterranean Reference Case – FC I
MED 00(R)	2000 Mediterranean Reference Case w/ Revised RFO Sulfur –
MED 95(R) FC–II	1995 Mediterranean Reference Case – FC III
MED 00(R) FC–II	2000 Mediterranean Reference Case – FC III
ME 89	1989 Middle East Reference Case
ME 95	1995 Middle East Reference Case – FC I
ME 00	2000 Middle East Reference Case – FC I
ME 10	2010 Middle East Reference Case – FC I
ME 10(H)	2010 Middle East High MJD Case – FC I
ME 95 FC–III	1995 Middle East Reference Case – FC III
ME 00 FC–II	2000 Middle East Reference Case – FC II
LAT 89	1989 Latin America Reference Case
LAT 89(S)	1989 Latin America Reference Case w/1995 Crude Segregations
LAT 95	1995 Latin America Reference Case – FC I
LAT 95(R)	1995 Latin America Reference Case w/ Revised RFO Sulfur –
LAT 95(.9CR)	1995 Latin America Issue Case – Downrated Conversion Capacity
LAT 00	2000 Latin America Reference Case – FC I
LAT 00(R)	2000 Latin America Reference Case w/ Revised RFO Sulfur –
LAT 00(PR)	2000 Latin America Issue Case – Lower HSFO Price – FC I
LAT 00(.9CR)	2000 Latin America Issue Case – Downrated Conversion Capacity
LAT 10(R)	2010 Latin America Reference Case – FC I
LAT 10(HR)	2010 Latin America High MJD at Base HSFO Case – FC I

FOREIGN REGIONAL LP CASES - continued

LAT 95(R) FC–II	1995 Latin America Reference Case – FC III
LAT 00(R) FC–II	2000 Latin America Reference Case – FC II
PAC 89	1989 Pacific Rim Reference Case
PAC 95	1995 Pacific Rim Reference Case – FC I
PAC 95(.8C)	1995 Pacific Rim Issue Case – Downrated Conversion Capacity
PAC 00	2000 Pacific Rim Reference Case – FC I
PAC 00(P)	2000 Pacific Rim Issue Case – Lower HSFO Price – FC I
PAC 00(.8C)	2000 Pacific Rim Issue Case – Downrated Conversion Capacity
PAC 10(D)	2010 Pacific Rim Reference Case – FC I
PAC 10(DH)	2010 Pacific Rim High MJD at Base HSFO – FC I
PAC 95 FC–III	1995 Pacific Rim Reference Case – FC III
PAC 00 FC–III	2000 Pacific Rim Reference Case – FC III

TABLE B-26

DOMESTIC COST/VOLUME RELATIONSHIP SPREADSHEETS IN NPC WORKING PAPERS

Relationship ID	Description
PD I 89 MJD	1989 PADD I MJD
PD I 89M	1989 PADD I M'
PD I 89J	1989 PADD I J'
PD I 89D	1989 PADD I D'
PD II 89 MJD	1989 PADD II MJD
PD II 89M	1989 PADD II M'
PD II 89J	1989 PADD II J'
PD II 89D	1989 PADD II D'
PD III 89 MJD	1989 PADD III MJD
PD III 89M	1989 PADD III M'
PD III 89J	1989 PADD III J'
PD III 89D	1989 PADD III D'
PD IV 89 MJD	1989 PADD IV MJD
PD IV 89M	1989 PADD IV M'
PD IV 89J	1989 PADD IV J'
PD IV 89D	1989 PADD IV D'
PD VC 89 MJD	1989 PADD VC MJD
PD VC 89M	1989 PADD VC M'
PD VC 89J	1989 PADD VC J'
PD VC 89D	1989 PADD VC D'
PD VOC 89 MJD	1989 PADD VOC MJD
PD VOC 89M	1989 PADD VOC M'
PD VOC 89J	1989 PADD VOC J'
PD VOC 89D	1989 PADD VOC D'
PD I 95MJD Normal	1995 PADD I MJD Normalized
PD I 95 MJD	1995 PADD I MJD
PD II 95MJD Normal	1995 PADD II MJD Normalized
PD II 95 MJD	1995 PADD II MJD
PD III 95 MJD Normal	1995 PADD III MJD Normalized
PD III 95 MJD	1995 PADD III MJD
PD III 95M	1995 PADD III M'
PD III 95J	1995 PADD III J'
PD III 95D	1995 PADD III D'
PD IV 95 MJD Normal	1995 PADD IV MJD Normalized
PD IV 95 MJD	1995 PADD IV MJD
PD VC 95 MJD Normal	1995 PADD VC MJD Normalized
PD VC 95 MJD	1995 PADD VC MJD

DOMESTIC COST/VOLUME RELATIONSHIP SPREADSHEETS – continued

Relationship ID	Description
PD VOC 95 MJD Normal	1995 PADD VOC MJD Normalized
PD VOC 95 MJD	1995 PADD VOC MJD
PD 1 00 MJD Normal	2000 PADD I MJD Normalized
PD I 00 MJD Normal	2000 PADD I MJD Normalized
PD I 00 MJD	2000 PADD I MJD
PD II 00 MJD Normal	2000 PADD II MJD Normalized
PD III 00 MJD Normal	2000 PADD III MJD Normalized
PD III 00 MJD	2000 PADD III MJD
PD IV 00 MJD Normal	2000 PADD IV MJD Normalized
PD VC 00 MJD Normal	2000 PADD VC MJD Normalized
PD VC 00 MJD	2000 PADD VC MJD
PD VOC 00 MJD Normal	2000 PADD VOC MJD Normalized
PD VOC 00 MJD	2000 PADD VOC MJD

TABLE B-27

FOREIGN COST/VOLUME RELATIONSHIPS IN NPC WORKING PAPERS

Relationship ID	Description
CAN 89 MJD	1989 Canada MJD
CAN 89M	1989 Canada M'
CAN 89J	1989 Canada J'
CAN 89D	1989 Canada D'
NWE 89 MJD	1989 N.W. Europe MJD
NWE 89M	1989 N.W. Europe M'
NWE 89J	1989 N.W. Europe J'
NWE 89D	1989 N.W. Europe D'
MED 89 MJD	1989 Mediterranean MJD
MED 89M	1989 Mediterranean M'
MED 89D	1989 Mediterranean D'
MID 89	1989 Middle East MJD
LAT 89 MJD	1989 Latin America MJD
LAT 89M	1989 Latin America M'
LAT 89J	1989 Latin America J'
LAT 89D	1989 Latin America D'
PAC 89	1989 Pacific Rim MJD
CAN 95 MJD	1995 Canada MJD
CAN 95M	1995 Canada M'
CAN 95J	1995 Canada J'
CAN 95D	1995 Canada D'
NWE 95 MJD	1995 N.W. Europe MJD
NWE 95M	1995 N.W. Europe M'
NWE 95J	1995 N.W. Europe J'
NWE 95D	1995 N.W. Europe D'
MED 95 MJD	1995 Mediterranean MJD
MED 95M	1995 Mediterranean M'
MED 95J	1995 Mediterranean J'
MED 95D	1995 Mediterranean D'
ME 95 MJD	1995 Middle East MJD
ME 95M	1995 Middle East M'
ME 95J	1995 Middle East J'
ME 95D	1995 Middle East D'
LAT 95 MJD	1995 Latin America MJD
LAT 95M	1995 Latin America M'
LAT 95J	1995 Latin America J'
LAT 95D	1995 Latin America D'

TABLE B-27 (cont)

FOREIGN COST/VOLUME RELATIONSHIP SPREADSHEETS - continued

PAC 95 MJD	1995 Pacific Rim MJD
PAC 95M	1995 Pacific Rim M'
PAC 95J	1995 Pacific Rim J'
PAC 95D	1995 Pacific Rim D'
NWE FC-III 95 MJD	1995 FC-III N.W. Europe MJD
NWE FC-III 95M	1995 FC-III N.W. Europe M'
NWE FC-III 95J	1995 FC-III N.W. Europe J'
NWE FC-III 95D	1995 FC-III N.W. Europe D'
MED FC-III 95 MJD	1995 FC-III Mediterranean MJD
MED FC-III 95M	1995 FC-III Mediterranean M'
MED FC-III 95J	1995 FC-III Mediterranean J'
MED FC-III 95D	1995 FC-III Mediterranean D'
ME FC-III 95 MJD	1995 FC-III Middle East MJD
ME FC-III 95M	1995 FC-III Middle East M'
ME FC-III 95J	1995 FC-III Middle East J'
ME FC-III 95D	1995 FC-III Middle East D'
LAT FC-III 95 MJD	1995 FC-III Latin America MJD
LAT FC-III 95M	1995 FC-III Latin America M'
LAT FC-III 95J	1995 FC-III Latin America J'
LAT FC-III 95D	1995 FC-III Latin America D'
PAC FC-III 95 MJD	1995 FC-III Pacific Rim MJD
PAC FC-III 95M	1995 FC-III Pacific Rim M'
PAC FC-III 95J	1995 FC-III Pacific Rim J'
PAC FC-III 95D	1995 FC-III Pacific Rim D'
CAN 00 MJD	2000 Canada MJD
CAN 00M	2000 Canada M'
CAN 00J	2000 Canada J'
CAN 00D	2000 Canada D'
NWE 00 MJD	2000 N.W. Europe MJD
NWE 00M	2000 N.W. Europe M'
NWE 00J	2000 N.W. Europe J'
NWE 00D	2000 N.W. Europe D'
MED 00 MJD	2000 Mediterranean MJD
MED 00M	2000 Mediterranean M'
MED 00J	2000 Mediterranean J'
MED 00D	2000 Mediterranean D'
ME 00 MJD	2000 Middle East MJD
ME 00M	2000 Middle East M'

TABLE B-27 (cont)

FOREIGN COST/VOLUME RELATIONSHIP SPREADSHEETS - continued

ME 00J	2000 Middle East J'
ME 00D	2000 Middle East D'
LAT 00 MJD	2000 Latin America MJD
LAT 00M	2000 Latin America M'
LAT 00J	2000 Latin America J'
LAT 00D	2000 Latin America D'
PAC 00 MJD	2000 Pacific Rim MJD
PAC 00M	2000 Pacific Rim M'
PAC 00J	2000 Pacific Rim J'
PAC 00D	2000 Pacific Rim D'
CAN FC-II 00 MJD	2000 FC-II Canada MJD
CAN FC-II 00M	2000 FC-II Canada M'
CAN FC-II 00J	2000 FC-II Canada J'
CAN FC-II 00D	2000 FC-II Canada D'
NWE FC-II 00 MJD	2000 FC-II N.W. Europe MJD
NWE FC-II 00M	2000 FC-II N.W. Europe M'
NWE FC-II 00J	2000 FC-II N.W. Europe J'
NWE FC-II 00D	2000 FC-II N.W. Europe D'
MED FC-II 00 MJD	2000 FC-II Mediterranean MJD
MED FC-II 00M	2000 FC-II Mediterranean M'
MED FC-II 00J	2000 FC-II Mediterranean J'
MED FC-II 00D	2000 FC-II Mediterranean D'
ME FC-II 00 MJD	2000 FC-II Middle East MJD
ME FC-II 00M	2000 FC-II Middle East M'
ME FC-II 00J	2000 FC-II Middle East J'
ME FC-II 00D	2000 FC-II Middle East D'
LAT FC-II 00 MJD	2000 FC-II Latin America MJD
LAT FC-II 00M	2000 FC-II Latin America M'
LAT FC-II 00J	2000 FC-II Latin America J'
LAT FC-II 00D	2000 FC-II Latin America D'
PAC FC-III 00 MJD	2000 FC-III Pacific Rim MJD
PAC FC-III 00M	2000 FC-III Pacific Rim M'
PAC FC-III 00J	2000 FC-III Pacific Rim J'
PAC FC-III 00D	2000 FC-III Pacific Rim D'
ME FC-I 10 MJD	2010 FC-I Middle East MJD
ME FC-I 10M	2010 FC-I Middle East M'
ME FC-I 10J	2010 FC-I Middle East J'
ME FC-I 10D	2010 FC-I Middle East D'

FOREIGN COST/VOLUME RELATIONSHIP SPREADSHEETS - continued

LAT FC-I 10 MJD	2010 FC-I Latin America MJD
LAT FC-I 10M	2010 FC-I Latin America M'
LAT FC-I 10J	2010 FC-I Latin America J'
LAT FC-I 10D	2010 FC-I Latin America D'
PAC FC-I 10 MJD	2010 FC-I Pacific Rim MJD
PAC FC-I 10M	2010 FC-I Pacific Rim M'
PAC FC-I 10J	2010 FC-I Pacific Rim J'
PAC FC-I 10D	2010 FC-I Pacific Rim D'

C

APPENDIX TABLES

U.S. Refining Industry Model
Process Unit Capacity
1989 Reference Cases

PADD:		PADD I	PADD II	PADD III	PADD IV	PADD V CALIFORNIA	PADD V NON-CALIFORNIA
NPC Regions:		1,2,3,4	5,6,7	8	9	11,12	10,13
Process Unit	Capacity						
Max Atm. Crude	MBPD	1436.1	3268.2	6779.1	533.4	2182.4	837.9
Max Vac. Crude	MBPD	729.8	1365.7	3265.1	213.1	1331.9	329.8
FCCU	MBPD	485.0	1127.3	2166.0	175.0	593.3	117.3
Resid FCCU	MBPD			183.8			
Hydrocracker	MBPD	62.9	139.5	350.0	10.7	285.0	71.1
Resid Hydrocracker	MBPD			80.8			
Delayed Coker	MBPD	32.7	271.5	511.5	16.7	310.0	66.0
Fluid Coker	MBPD	40.5		7.0	6.8	64.7	
Flexicoker	MBPD			24.4		19.1	
Visbreaker	MBPD			199.5		44.5	10.4
Solv. Deasphalter	MBPD	14.1	34.5	108.2	11.2	57.1	5.1
CC Reformer	MBPD	100.7	359.3	777.9	23.8	93.0	45.1
LP SR Reformer	MBPD	225.4	390.0	657.1	85.3	409.8	86.9
C4 Isom	MBPD		12.4	28.2	11.0	5.7	2.3
C5/C6 Isom	MBPD	30.0	115.7	198.6	3.1	6.0	4.4
C3= Poly	MBPD	8.0	16.7	40.0	6.6	6.5	3.7
HF Alkylation	MBPD	33.3	158.9	217.5	21.0	30.3	4.9
H2SO4 Alkylation	MBPD	37.4	75.7	229.6	9.0	76.6	21.1
Resid HDS	MBPD			249.2			
Distillate HDS	MBPD	379.8	493.6	1857.8	105.1	430.0	125.0
FCCU HDS	MBPD	82.8	296.1	379.5	17.3	401.9	6.8
Naphtha HDS	MBPD	364.0	981.3	1762.6	102.0	473.6	127.1
Hydrogen Plant	MMSCFD	106.0	161.0	936.8	9.2	935.0	104.0

MBPD = Thousand Barrels per Day
MMSCFD = Million Standard Cubic Feet per Day

U.S. Refining Industry Model
Process Unit Capacity
1996 Reference Cases

PADD:		PADD I	PADD II	PADD III	PADD IV	PADD V CALIFORNIA	PADD V NON-CALIFORNIA
NPC Regions:		1,2,3,4	5,6,7	8	9	11,12	10,13
Process Unit	Capacity						
Max Atm. Crude	MBPD	1392.9	3322.8	6944.9	547.1	2138.9	901.7
Max Vac. Crude	MBPD	682.9	1411.3	3187.1	221.3	1335.3	359.4
FCCU	MBPD	494.1	1198.1	2304.4	179.5	626.3	126.4
Resid FCCU	MBPD			183.8			
Hydrocracker	MBPD	65.0	142.0	428.1	11.8	307.5	77.7
Resid Hydrocracker	MBPD			80.8			
Delayed Coker	MBPD	31.7	275.0	593.4	19.0	370.0	65.6
Fluid Coker	MBPD	40.7		7.0	6.8	64.7	
Flexicoker	MBPD			24.4		19.1	
Visbreaker	MBPD			178.0		44.5	10.4
Solv. Deasphalter	MBPD	13.5	38.2	120.0	10.7	57.1	5.1
CC Reformer	MBPD	100.7	540.8	777.9	28.8	93.0	53.9
LP SR Reformer	MBPD	194.5	412.8	654.4	85.3	407.1	86.9
C4 Isom	MBPD		15.6	64.2	12.5	5.4	2.3
C5/C6 Isom	MBPD	48.2	126.8	251.0	3.3	14.5	4.4
C3= Poly	MBPD	5.8	15.7	36.5	6.7	5.5	3.9
HF Alkylation	MBPD	32.8	161.7	245.9	21.6	29.9	5.4
H2SO4 Alkylation	MBPD	46.9	81.7	243.4	9.0	93.5	23.0
Resid HDS	MBPD			267.1			
Distillate HDS	MBPD	352.6	803.3	2122.5	124.4	480.6	225.0
FCCU HDS	MBPD	82.8	273.7	339.9	32.1	476.7	6.8
Naphtha HDS	MBPD	325.5	998.1	1800.4	104.8	468.5	134.1
MTBE	MBPD	13.2	24.6	61.7	0.5	14.4	1.8
Hydrogen Plant	MMSCFD	106.0	228.9	1006.6	9.2	1023.4	127.3

MBPD = Thousand Barrels per Day
MMSCFD = Million Standard Cubic Feet per Day

U.S. Refining Industry Model
Process Unit Capacity
2000 Reference Cases

PADD:		PADD I	PADD II	PADD III	PADD IV	PADD V CALIFORNIA	PADD V NON-CALIFORNIA
NPC Regions:		1,2,3,4	5,6,7	8	9	11,12	10,13
Process Unit	**Capacity**						
Max Atm. Crude	MBPD	1392.9	3322.8	6944.9	547.1	2138.9	901.7
Max Vac. Crude	MBPD	682.9	1411.3	3187.1	221.3	1335.3	359.4
FCCU	MBPD	494.1	1196.1	2304.4	179.5	626.3	126.4
Resid FCCU	MBPD			183.8			
Hydrocracker	MBPD	65.0	142.0	428.1	11.8	307.5	77.7
Resid Hydrocracker	MBPD			80.8			
Delayed Coker	MBPD	31.7	275.0	593.4	19.0	370.0	65.6
Fluid Coker	MBPD	40.7		7.0	6.8	64.7	
Flexicoker	MBPD			24.4		19.1	
Visbreaker	MBPD			178.0		44.5	10.4
Solv. Deasphalter	MBPD	13.5	38.2	120.0	10.7	57.1	5.1
CC Reformer	MBPD	100.7	540.8	777.9	28.8	93.0	53.9
LP SR Reformer	MBPD	194.5	412.8	654.4	85.3	407.1	86.9
C4 Isom	MBPD		15.6	64.2	12.5	5.4	2.3
C5/C6 Isom	MBPD	48.2	126.8	251.0	3.3	14.5	4.4
C3= Poly	MBPD	5.8	15.7	36.5	6.7	5.5	3.9
HF Alkylation	MBPD	32.8	161.7	245.9	21.6	29.9	5.4
H2SO4 Alkylation	MBPD	46.9	81.7	243.4	9.0	93.5	23.0
Resid HDS	MBPD			267.1			
Distillate HDS	MBPD	352.6	803.3	2122.5	124.4	480.6	225.0
FCCU HDS	MBPD	82.8	273.7	339.9	32.1	476.7	6.8
Naphtha HDS	MBPD	325.5	998.1	1800.4	104.8	468.5	134.1
MTBE	MBPD	13.2	24.6	61.7	0.5	14.4	1.8
Hydrogen Plant	MMSCFD	106.0	228.9	1006.6	9.2	1023.4	127.3

MBPD = Thousand Barrels per Day
MMSCFD = Million Standard Cubic Feet per Day

ECONOMIC SUMMARY

ACCOUNTING CATEGORY	.M $	.. $/CD
X TOTAL SYSTEM		
SAX Product Values - Sales	143783	143782672
BRX Raw Material Costs	-122915	-122915148
UTP Utilities Costs	-2840	-2840415
TEL Antiknock Costs	-6	-5795
TOTAL VARIABLE REVENUES	143783	143782672
TOTAL VARIABLE COSTS	-125761	-125761358
GROSS VARIABLE INCOME	18021	18021314
CASE SUMMARY (ALL PERIODS)		
TOTAL VARIABLE REVENUES	143783	143782672
TOTAL VARIABLE COSTS	-125761	-125761358
GROSS VARIABLE INCOME	18021	18021314
NET PRESENT VALUE (I= 0.00 PCT)	18021	18021313

****SOLUTION STATUS: OPTIMAL AFTER 2719 ITERATIONS (6 RECURSIONS)

****SYSTEM NAME: GRTMPS - II
****SYSTEM DATE: 1 APRIL 1992 - VERSION 2.002

PD3 89

MULTI-PRODUCT SPECIFICATIONS -

GROUP X MEMBERS

	LOCATION	PRODUCT
1A2GR	Single Refinery	Leaded Regular
1A3GS	Single Refinery	Unleaded Premium
1A4GU	Single Refinery	Unleaded Regular
1A5GM	Single Refinery	Unleaded Midgrade

	BLEND PROPERTIES	LP BLEND	SPECIFICATIONS MIN	MAX	FIX	INCENTIVE $/unit
1AARO	Aromatics	30.560		32.000		
1ABEN	Benzene	1.700		1.700		0.0038
1AOLE	Olefins	11.873		14.000		

Raw Material Purchases

--------STOCK--------	------LOCATION---ACTUAL UNITS	Volume .M Bbls	B/CD	UNIT PRICE $/BBL	C/Gal	MARGINAL VALUE $/BBL	C/Gal	DIFFERENCE $/BBL	C/Gal
C4I Iso-butane	1 Single Refinery	26	25530	14.25	33.93	16.43	39.12	2.18	5.19
C4N Normal Butane	1 Single Refinery	94	94469	12.25	29.17	12.25	29.17		
NFG Purch Nat Gas	1 Single Refinery	32	32022	12.00	28.57	12.00	28.57		
ZPH Purch Hvy. FCC Feed	1 Single Refinery	282	281600	20.00	47.62	19.83	47.22	-0.17	-0.40
P3S PADD 3 Swing	1 Single Refinery	826	826265	18.46	43.95	18.46	43.95		
P3B PADD 3 Base	1 Single Refinery	5340	5340000	18.75	44.64	17.97	42.79	-0.78	-1.85
	**GRAND TOTAL	6600	6599885						

Product Sales

--------STOCK--------	------LOCATION---ACTUAL	UNITS	Volume .M Bbls	B/CD	UNIT PRICE $/BBL	C/Gal	MARGINAL VALUE $/BBL	C/Gal	DIFFERENCE $/BBL	C/Gal
C3M Propylene	1 Single Refinery		64	64285	14.18	33.76	14.18	33.76		
C4M Mixed C4=	1 Single Refinery		9	8800	20.00	47.62	17.20	40.96	-2.80	-6.66
SUL Sulfur	1 Single Refinery	13284	34	33605	0.01	0.02	0.01	0.02		
B3P Propane Sales	1 Single Refinery		220	219581	9.44	22.48	9.44	22.48		
2GR Leaded Regular	1 Single Refinery		256	255500	23.86	56.81	20.11	47.88	-3.75	-8.93
3GS Unleaded Premium	1 Single Refinery		861	861200	25.87	61.60	20.80	49.51	-5.07	-12.08
4GU Unleaded Regular	1 Single Refinery		1737	1737300	23.39	55.69	20.12	47.90	-3.27	-7.79
5GM Unleaded Midgrade	1 Single Refinery		282	281500	24.63	58.64	20.36	48.46	-4.27	-10.18
1J4 JP4	1 Single Refinery		116	115900	22.50	53.57	19.61	46.70	-2.89	-6.87
3JA JetA/Kero	1 Single Refinery		644	644400	23.31	55.50	20.32	48.37	-2.99	-7.13
5D2 Diesel	1 Single Refinery		973	973300	21.88	52.10	20.06	47.76	-1.82	-4.34
6D3 Home Heating Oil	1 Single Refinery		324	324400	21.88	52.10	19.86	47.28	-2.02	-4.82
8R6 No. 6 LSFO	1 Single Refinery		91	90500	17.34	41.29	17.39	41.40	0.05	0.11
9R7 No. 6 HSFO	1 Single Refinery		262	261572	13.49	32.12	13.49	32.12		
BAP Asphalt	1 Single Refinery		104	103700	19.62	46.71	13.36	31.82	-6.26	-14.90
BNP Naphtha	1 Single Refinery		134	133500	22.00	52.38	18.79	44.75	-3.21	-7.63
BGF Gasoil	1 Single Refinery		185	185200	18.00	42.86	20.21	48.11	2.21	5.25
BLU Lubes	1 Single Refinery		112	112300	35.55	84.64	23.87	56.83	-11.68	-27.81
CFX Flex Coke	1 Single Refinery	366	1	915	0.01	0.02	0.01	0.02		
CFK Fluid Coke	1 Single Refinery	431	1	1078	0.01	0.02	0.01	0.02		
ex# Extract	1 Single Refinery		40	40100	15.00	35.71	18.56	44.19	3.56	8.48

Product Sales

--------STOCK--------	------LOCATION------		Volume .M Bbls	B/CD	UNIT PRICE $/BBL	C/Gal	MARGINAL VALUE $/BBL	C/Gal	DIFFERENCE $/BBL	C/Gal
CXK Delayed Coke	1 Single Refinery	58967	147	147419	0.01	0.02	0.01	0.02		
	**GRAND TOTAL		6596	6596056						

PLANT INPUT/OUTPUT SUMMARY (CONT.)
Single Refinery ALL PERIODS

	ACTUAL UNITS	------VOLUME------ .M Bbls	B/CD	PERCENT OF INPUT	SUPPLY LIMITS MIN	MAX	------WEIGHT------ .M Lbs	L/CD	PERCENT OF INPUT	SUPPLY LIMITS MIN	MAX
FEA Plant Fuel Gas		264	264081	4.00			73414	73414499	3.74		
LOA Low-BTU Gas		3	3242	0.05			859	859093	0.04		
HSA RFCC Coke Burn	7137	0	7	0.00			7137	7136821	0.36		
CKA KCC Coke Burn	36023	0	36	0.00			36023	36023012	1.83		
CxA FLX Coke Burn	854	0	1	0.00			854	853589	0.04		
CkA FLK Coke Burn	185	0	0	0.00			185	184875	0.01		
COA CO2 (H2 Plt)	3603	0	4	0.00			3603	3603435	0.18		
SUA H2O (Sul Plt)	824	0	1	0.00			824	823943	0.04		
AFA Plant Fuel Oil		3	3000	0.05			957	957457	0.05		
TOTAL		313	313036	4.74			129165	129164736	6.57		
GRAND TOTAL		6909	6909091	104.69			1949978	1949977651	99.24		
PLANT GAIN		309	309206	4.69							
PLANT LOSS							14922	14921629	0.76		

PROCESS UTILIZATION SUMMARY
Single Refinery

----PROCESS UNIT----	----PROCESS LIMIT----	OPERATING RATE .M Bbls	OPERATING RATE B/CD	UNUSED CAPACITY .M Bbls	UNUSED CAPACITY B/CD	PCT OF MAX CAPACITY	EXPANSION INCENTIVE $/BBL
CRD-DU Crude Tower	CRD Feed	6166	6166265	206	206135	96.8	
VAC-VU Vacuum Tower	VAC Feed	2471	2470652	598	598448	80.5	
SGP-SG Sats Gas Plant	SGP Feed	400	399850	9599	9599150	4.0	
UGP-UG Unsats Gas Plant	UGP Feed	590	590145	9409	9408854	5.9	
CD5-C5 FCC DeC5 Tower	CD5 Feed			9999	9999000		
PPS-PS C3= Splitter	PPS Feed			9999	9999000		
FCC-FC FCC (Total Capacity)	FCC Total Feed	2077	2076865	89	89134	95.9	
	KCC Feed (KC)	2077	2076865	89	89134	95.9	
	ZCC Feed (ZC)						
	OKC CO Boiler (KC)						2.596
	OZC CO Boiler (ZC)						
HYK-HK Hydrocracker	HYK Total Feed	350	350000			100.0	
	HHK High Sev	158	157500			100.0	1.428
	MHK Med. Sev	158	157500			100.0	1.413
	LHK Low Sev	35	35000			100.0	1.152
RDS-RD ARDS Unit Total Cap	RDS Total ARDS	197	196788	52	52412	79.0	
	RD3 0.3% S ARDS						
	RD5 0.5% S ARDS	197	196788	52	52412	79.0	
	RD1 1.0% S ARDS						
HOC-HC Resid FCC	HOC RFCC Feed	184	183800			100.0	0.447
	OHC CO Boiler						2.596
HOL-HO H-Oil Unit	HOL Feed	81	80800			100.0	5.042
KNS-KS FCC Gaso splitter	KNS Feed	296	295892	9703	9703108	3.0	
COK-XK Delayed Coker	COK Feed & Recy	512	511500			100.0	2.621
FLX-FX Flexicoker	FLX Feed	24	24400			100.0	3.754
VIS-VB Visbreaker	VIS Feed	165	164789	35	34711	82.6	
FLK-FK Fluid Coker	FLK Feed	7	7000			100.0	2.302

PROCESS UTILIZATION SUMMARY (CONT.)
Single Refinery

----PROCESS UNIT----	----PROCESS LIMIT----	OPERATING RATE .M Bbls	OPERATING RATE B/CD	UNUSED CAPACITY .M Bbls	UNUSED CAPACITY B/CD	PCT OF MAX CAPACITY	EXPANSION INCENTIVE $/BBL
CRU-CR CCR	CRU Feed	778	777900			100.0	0.344
SRU-SR LP SR Reformer	SRU Feed	477	476668	180	180432	72.5	
ALK-AL HF Alky	ALK Alkylate product	218	217500			100.0	0.772
SAA-SA H2SO4 Alky	SAA Alkylate product	175	175299	54	54301	76.3	
C4I-I4 C4 Isom	C4I Feed	28	28200			100.0	3.298
PCL-PL Cat Poly	PCL Total product			40	40000		
ISO-IM Isom (Tot Recy)	ISO Isomerate	69	68600			100.0	0.012
ISM-IS Isom (1 Pass)	ISM Isomerate	95	95468	35	34632	73.4	
DHT-DH Dist. Htr.	DHT Total Capacity	769	769266	1089	1088534	41.4	
	DHD SR Diesel Feed	1	1000				-0.196
	DHJ Jet/Kero Feed	290	290174				
	DHC FCC Stk.	345	345092				
	DHc Coker Stk.	133	133001				
FHT-FH FCC Hydrotreater	FHT Feed	380	379500			100.0	0.316
NHT-NH Naphtha Hydtrt	NHT Total feed	1453	1453392	309	309208	82.5	
	NHL for Isom	199	198824				
	NHC for Reformer	1255	1254568				
HYD-H2 Hydrogen Plant	HYD Total MSCF H2	639	639315	297	297485	68.2	
	H2A via plant fuel			937	936800		
	H2B via LPG			937	936800		-0.485
	H2C via naphtha			937	936800		-0.330
	H2D via purch gas	639	639315	297	297485	68.2	
LUB-LU Lube Unit	LUB Feed	322	322461				
SUL-SU Sulfur Plant	SUL Feed	13183	13183096				
SDA-SD Solvent Deasphalter	SDA Feed	108	108200			100.0	3.074
MRD-MD Diesel Merox Unit	MRD Treating	696	696034				

PROCESS UTILIZATION SUMMARY (CONT.)
Single Refinery

----PROCESS UNIT----	----PROCESS LIMIT----	OPERATING RATE .M Bbls	OPERATING RATE B/CD	UNUSED CAPACITY .M Bbls	UNUSED CAPACITY B/CD	PCT OF MAX CAPACITY	EXPANSION INCENTIVE $/BBL
MRJ-MJ Jet Merox Unit	MRJ Feed	275	274936				
FUL-90 Fuel System	PFO Fuel Oil	3	3000				
	FLR Flare						
UTL-95 General Utilities	STM Steam (Mlbs)	285	285174				
	VNT Steam Vent						
	KWH Power (kwh)	22495	22495010				
	CWR Cooling H2O (MGal)	3810	3810410				
	KWT Condensing Turbine						0.101

ECONOMIC SUMMARY

ACCOUNTING CATEGORY	.M $	.. $/CD
X TOTAL SYSTEM		
SAX Product Values - Sales	142632	142631891
BRX Raw Material Costs	-115677	-115676680
UTP Utilities Costs	-3188	-3187837
TOTAL VARIABLE REVENUES	142632	142631891
TOTAL VARIABLE COSTS	-118865	-118864516
GROSS VARIABLE INCOME	23767	23767374
CASE SUMMARY (ALL PERIODS)		
TOTAL VARIABLE REVENUES	142632	142631891
TOTAL VARIABLE COSTS	-118865	-118864516
GROSS VARIABLE INCOME	23767	23767374
NET PRESENT VALUE (I= 0.00 PCT)	23767	23767379

****SOLUTION STATUS: OPTIMAL AFTER 2740 ITERATIONS
CASE 01 7 RECURSION PASSES

****SYSTEM NAME : GRTMPS - II
****SYSTEM VERSION: VER 2.00

PD3 95

PLANT INPUT/OUTPUT SUMMARY
Single Refinery

	ACTUAL UNITS	------VOLUME------ .M Bbls	B/CD	PERCENT OF INPUT	SUPPLY LIMITS MIN	MAX	------WEIGHT------ .M Lbs	L/CD	PERCENT OF INPUT	SUPPLY LIMITS MIN	MAX
	PLANT INPUT										
C4I Iso-butane		26	25530	0.39	26	26	5025	5024610	0.25		
C4N Normal Butane		15	14662	0.22		500	2996	2995949	0.15		
NFG Purch Nat Gas		75	75115	1.14		999	19905	19905434	1.01		
MTB MTBE		20	19712	0.30			5076	5075768	0.26		
MOH Methanol		19	19452	0.29			5417	5417463	0.27		
ZPH Purch Hvy. FCC Fe		282	281600	4.27	282	282	88479	88478725	4.49		
P3B PADD 3 Base		5340	5340000	80.88	5340	5340	1595645	1595645387	80.98		
P3S PADD 3 Swing		826	826240	12.51	826	826	247955	247954626	12.58		
TOTAL		6602	6602311	100.00			1970498	1970497963	100.00		
	PLANT OUTPUT										
C3M Propylene		64	64300	0.97	64	64	11729	11728707	0.60		
C4M Mixed C4=		9	8800	0.13	9	9	1848	1848000	0.09		
SUL Sulfur	14350662	36	36304	0.55			14351	14350661	0.73		
B3P Propane Sales		225	224860	3.41	50	500	39854	39854193	2.02		
3GS Unleaded Premium		740	739674	11.20	350		194357	194356835	9.86		
4GU Unleaded Regular		2105	2104734	31.88	750		534626	534626366	27.13		
7EU Unleaded Reformul		258	257625	3.90	125		63171	63171460	3.21		
9ES Unl Prem Reformul		90	90344	1.37	45		22816	22816408	1.16		
3JA JetA/Kero		760	760300	11.52	760	760	215252	215251744	10.92		
5D2 Diesel		911	911000	13.80	911	911	271163	271163064	13.76		
6D3 Home Heating Oil		387	386700	5.86	387	387	118137	118136854	6.00		
8R6 No. 6 MSFO		91	90500	1.37	91	91	29877	29876743	1.52		
9R7 No. 6 HSFO		142	141613	2.14		500	49352	49351968	2.50		
BAP Asphalt		100	100300	1.52	100	100	36967	36966774	1.88		
BNP Naphtha		147	146900	2.22	147	147	34481	34480647	1.75		
BGF Gasoil		211	211100	3.20	211	211	61475	61475178	3.12		
BLU Lubes		109	108500	1.64	109	109	32963	32962905	1.67		
CFX Flex Coke	365824	1	915	0.01			366	365824	0.02		
CFK Fluid Coke	431375	1	1078	0.02			431	431375	0.02		
ex# Extract		39	39000	0.59	39	39	12808	12807785	0.65		
CXK Delayed Coke	67071914	168	167680	2.54			67072	67071913	3.40		
TOTAL		6592	6592226	99.85			1813095	1813095402	92.01		
PROCESS FUEL USED											
HLA H2 (Unrec.)	729	38	37529	0.57			3866	3865838	0.20		

PLANT INPUT/OUTPUT SUMMARY (CONT.)
Single Refinery ALL PERIODS

	ACTUAL UNITS	------VOLUME------ .M Bbls	B/CD	PERCENT OF INPUT	SUPPLY LIMITS MIN	MAX	------WEIGHT------ .M Lbs	L/CD	PERCENT OF INPUT	SUPPLY LIMITS MIN	MAX
NFA Purch Nat Gas		34	34410	0.52			9119	9118535	0.46		
FEA Plant Fuel Gas		270	269732	4.09			74985	74985444	3.81		
LOA Low-BTU Gas		3	3242	0.05			859	859093	0.04		
HSA RFCC Coke Burn	7743	0	8	0.00			7743	7743173	0.39		
CKA KCC Coke Burn	37797	0	38	0.00			37797	37796601	1.92		
CxA FLX Coke Burn	854	0	1	0.00			854	853589	0.04		
CkA FLK Coke Burn	185	0	0	0.00			185	184875	0.01		
COA CO2 (H2 Plt)	5559	0	6	0.00			5559	5559352	0.28		
SUA H2O (Sul Plt)	891	0	1	0.00			891	890621	0.05		
AFA Plant Fuel Oil		3	3000	0.05			996	996025	0.05		
TOTAL		348	347966	5.27			142853	142853146	7.25		
GRAND TOTAL		6940	6940192	105.12			1955949	1955948548	99.26		
PLANT GAIN		338	337881	5.12							
PLANT LOSS							14549	14549415	0.74		

Raw Material Purchases

--------STOCK--------	------LOCATION---	ACTUAL UNITS	Volume .M Bbls	Volume B/CD	UNIT PRICE $/BBL	UNIT PRICE C/Gal	MARGINAL VALUE $/BBL	MARGINAL VALUE C/Gal	DIFFERENCE $/BBL	DIFFERENCE C/Gal
C4I Iso-butane	1 Single Refinery		26	25530	14.25	33.93	12.95	30.84	-1.30	-3.09
C4N Normal Butane	1 Single Refinery		15	14662	12.25	29.17	12.25	29.17		
NFG Purch Nat Gas	1 Single Refinery		75	75115	12.00	28.57	12.00	28.57		
MTB MTBE	1 Single Refinery		20	19712	35.70	85.00	35.70	85.00		
MOH Methanol	1 Single Refinery		19	19452	18.35	43.69	18.35	43.69		
ZPH Purch Hvy. FCC Feed	1 Single Refinery		282	281600	20.00	47.62	24.00	57.15	4.00	9.53
P3B PADD 3 Base	1 Single Refinery		5340	5340000	17.44	41.52	21.28	50.67	3.84	9.15
P3S PADD 3 Swing	1 Single Refinery		826	826240	17.44	41.52	22.01	52.41	4.57	10.89
	**GRAND TOTAL		6602	6602311						

GENERALIZED REFINING-TRANSPORTATION-MARKETING PLANNING SYSTEM - SECOND EDITION
The Pace Consultants Inc.
Pace Refining Model

DATE: 24 SEP 92 PAGE 5
TIME: 12:16 HRS PADD-III 1995 Reference Case LCU 01080

Product Sales

--------STOCK--------	------LOCATION---	ACTUAL UNITS	Volume .M Bbls	B/CD	UNIT PRICE $/BBL	C/Gal	MARGINAL VALUE $/BBL	C/Gal	DIFFERENCE $/BBL	C/Gal
C3M Propylene	1 Single Refinery		64	64300	14.18	33.76	25.74	61.28	11.56	27.52
C4M Mixed C4=	1 Single Refinery		9	8800	20.00	47.62	28.32	67.44	8.32	19.82
SUL Sulfur	1 Single Refinery	14351	36	36304	0.01	0.02	0.01	0.02		
B3P Propane Sales	1 Single Refinery		225	224860	9.44	22.48	9.44	22.48		
B4P Butane	1 Single Refinery				12.14	28.90	12.31	29.31	0.17	0.41
3GS Unleaded Premium	1 Single Refinery		740	739674	25.87	61.60	24.46	58.25	-1.41	-3.35
4GU Unleaded Regular	1 Single Refinery		2105	2104734	23.39	55.69	23.73	56.50	0.34	0.81
7EU Unleaded Reformulat	1 Single Refinery		258	257625	23.39	55.69	24.76	58.94	1.37	3.25
9ES Unl Prem Reformulat	1 Single Refinery		90	90344	25.87	61.60	25.52	60.76	-0.35	-0.83
3JA JetA/Kero	1 Single Refinery		760	760300	23.31	55.50	24.74	58.91	1.43	3.41
5D2 Diesel	1 Single Refinery		911	911000	21.88	52.10	25.11	59.78	3.23	7.69
6D3 Home Heating Oil	1 Single Refinery		387	386700	21.88	52.10	24.52	58.38	2.64	6.28
8R6 No. 6 MSFO	1 Single Refinery		91	90500	17.34	41.29	19.02	45.29	1.68	4.00
9R7 No. 6 HSFO	1 Single Refinery		142	141613	13.49	32.12	13.49	32.12		
BAP Asphalt	1 Single Refinery		100	100300	19.62	46.71	14.06	33.49	-5.56	-13.23
BNP Naphtha	1 Single Refinery		147	146900	22.00	52.38	21.81	51.93	-0.19	-0.45
BGF Gasoil	1 Single Refinery		211	211100	18.00	42.86	25.26	60.13	7.26	17.27
BLU Lubes	1 Single Refinery		109	108500	25.55	60.83	28.48	67.80	2.93	6.97
CFX Flex Coke	1 Single Refinery	366	1	915	0.01	0.02	0.01	0.02		
CFK Fluid Coke	1 Single Refinery	431	1	1078	0.01	0.02	0.01	0.02		
ex# Extract	1 Single Refinery		39	39000	15.00	35.71	22.38	53.28	7.38	17.56
CXK Delayed Coke	1 Single Refinery	67072	168	167680	0.01	0.02	0.01	0.02		

Product Sales

--------STOCK--------	------LOCATION------	Volume .M Bbls	B/CD	UNIT PRICE $/BBL	C/Gal	MARGINAL VALUE $/BBL	C/Gal	DIFFERENCE $/BBL	C/Gal
	**GRAND TOTAL	6592	6592226						

PROCESS UTILIZATION SUMMARY
Single Refinery

----PROCESS UNIT----	----PROCESS LIMIT----	OPERATING RATE .M Bbls	OPERATING RATE B/CD	UNUSED CAPACITY .M Bbls	UNUSED CAPACITY B/CD	PCT OF MAX CAPACITY	EXPANSION INCENTIVE $/BBL
CRD-DU Crude Tower	CRD Feed	6166	6166240	387	386560	94.1	
VAC-VU Vacuum Tower	VAC Feed	2401	2400755	608	607545	79.8	
SGP-SG Sats Gas Plant	SGP Feed	389	388652	111	111348	77.7	
UGP-UG Unsats Gas Plant	UGP Feed	623	623385	127	126615	83.1	
CD5-C5 FCC DeC5 Tower	CD5 Feed	130	130332				
PPS-PS C3= Splitter	PPS Feed						
FCC-FC FCC (Total Capacity)	FCC Total Feed	2018	2017862	287	286538	87.6	
	KCC Feed (KC)	2018	2017862	287	286538	87.6	
	ZCC Feed (ZC)						
	OKC CO Boiler (KC)						2.596
	OZC CO Boiler (ZC)						
HYK-HK Hydrocracker	HYK Total Feed	428	428100			100.0	0.615
	HHK High Sev	236	235600				
	MHK Med. Sev	158	157500			100.0	0.628
	LHK Low Sev	35	35000			100.0	0.952
RDS-RD ARDS Unit Total Cap	RDS Total ARDS	267	266673	0	427	99.8	
	RD3 0.3% S ARDS						
	RD5 0.5% S ARDS	267	266673	0	427	99.8	
	RD1 1.0% S ARDS						
HOC-HC Resid FCC	HOC RFCC Feed	184	183800			100.0	2.400
	OHC CO Boiler						2.596
HOL-HO H-Oil Unit	HOL Feed	81	80800			100.0	7.626
KNS-KS FCC Gaso splitter	KNS Feed	306	305943				
COK-XK Delayed Coker	COK Feed & Recy	593	593400			100.0	5.031
FLX-FX Flexicoker	FLX Feed	24	24400			100.0	6.736
TNS-TN Thermal Naph Split	TNS Feed	137	136881				
VIS-VB Visbreaker	VIS Feed	44	44390	134	133610	24.9	

PROCESS UTILIZATION SUMMARY (CONT.)
Single Refinery

----PROCESS UNIT----	----PROCESS LIMIT----	OPERATING RATE .M Bbls	OPERATING RATE B/CD	UNUSED CAPACITY .M Bbls	UNUSED CAPACITY B/CD	PCT OF MAX CAPACITY	EXPANSION INCENTIVE $/BBL
FLK-FK Fluid Coker	FLK Feed	7	7000			100.0	5.294
CRU-CR CCR	CRU Feed	778	777900			100.0	0.470
SRU-SR LP SR Reformer	SRU Feed	453	453339	201	201061	69.3	
ALK-AL HF Alky	ALK Alkylate product	246	245900			100.0	0.432
SAA-SA H2SO4 Alky	SAA Alkylate product	138	137567	106	105833	56.5	
C4I-I4 C4 Isom	C4I Feed	10	9506	55	54694	14.8	
PCL-PL Cat Poly	PCL Total product			37	36500		
ISO-IM Isom (Tot Recy)	ISO Isomerate	88	88400			100.0	0.007
ISM-IS Isom (1 Pass)	ISM Isomerate	97	96679	53	53321	64.5	
DHT-DH Dist. Htr.	DHT Total Capacity	1198	1197631	925	924869	56.4	
	DHD SR Diesel Feed	312	311892				
	DHJ Jet/Kero Feed	273	272715				
	DHC FCC Stk.	466	465981				
	DHc Coker Stk.	147	147043				
FHT-FH FCC Hydrotreater	FHT Feed	339	338900			100.0	0.614
NHT-NH Naphtha Hydtrt	NHT Total feed	1463	1463077	337	337323	81.3	
	NHL for Isom	232	231838				
	NHC for Reformer	1231	1231239				
HYD-H2 Hydrogen Plant	HYD Total MSCF H2	986	986330	20	20270	98.0	
	H2A via plant fuel						-0.023
	H2B via LPG						
	H2C via naphtha						
	H2D via purch gas	986	986330				
LUB-LU Lube Unit	LUB Feed	312	311550				
SUL-SU Sulfur Plant	SUL Feed	14250	14249933				
SDA-SD Solvent Deasphalter	SDA Feed	120	120000			100.0	5.017

PROCESS UTILIZATION SUMMARY (CONT.)
Single Refinery

----PROCESS UNIT----	----PROCESS LIMIT----	OPERATING RATE .M Bbls	OPERATING RATE B/CD	UNUSED CAPACITY .M Bbls	UNUSED CAPACITY B/CD	PCT OF MAX CAPACITY	EXPANSION INCENTIVE $/BBL
MTB-MT MTBE Unit	MTB Feed	58	57748	1	1252	97.9	
MRJ-MJ Jet Merox Unit	MRJ Feed	407	406874				
MRD-MD Diesel Merox Unit	MRD Treating	216	215943				
FUL-90 Fuel System	PFO Fuel Oil	3	3000				
	FLR Flare						-12.000
UTL-95 General Utilities	STM Steam (Mlbs)	353	353009				
	VNT Steam Vent						
	KWH Power (kwh)	24918	24918041				
	CWR Cooling H2O (MGal)	4233	4232523				
	KWT Condensing Turbine						0.101

MULTI-PRODUCT SPECIFICATIONS -

GROUP C MEMBERS

	LOCATION	PRODUCT
1A3GS	Single Refinery	Unleaded Premium
1A4GU	Single Refinery	Unleaded Regular

BLEND PROPERTIES		LP BLEND	SPECIFICATIONS			INCENTIVE
			MIN	MAX	FIX	$/unit
1AARO	Aromatics	30.560		30.560		0.0011
1ABEN	Benzene	1.621		1.700		
1AOLE	Olefins	9.661		11.873		
1ASUL	Sulfur	0.036		0.040		
1A300	% at 300	80.000	80.000			-0.0133
1A356	% at 356	89.519	89.000			

GROUP R MEMBERS

	LOCATION	PRODUCT
1A7EU	Single Refinery	RFG Unl Regular
1A9ES	Single Refinery	RFG Unl Premium

BLEND PROPERTIES		LP BLEND	SPECIFICATIONS			INCENTIVE
			MIN	MAX	FIX	$/unit
1AARO	Aromatics	27.900		27.900		0.0046
1ABEN	Benzene	0.556		0.700		
1AOLE	Olefins	7.664		11.873		
1ASUL	Sulfur	0.040		0.040		0.0103
1A300	% at 300	80.000	80.000			-0.0001
1A356	% at 356	89.000	89.000			-0.0010

ECONOMIC SUMMARY

	ACCOUNTING CATEGORY	.M $	.. $/CD
	X TOTAL SYSTEM		
SAX	Product Values - Sales	55256807	151388512
BRX	Raw Material Costs	-44426824	-121717325
UTP	Utilities Costs	-1186389	-3250381
	TOTAL VARIABLE REVENUES	55256807	151388512
	TOTAL VARIABLE COSTS	-45613213	-124967706
	GROSS VARIABLE INCOME	9643594	26420806
IVS	Investment less credits	-138304	-378914
FOC	Added Fixed Costs	-39264	-107572
	CASE SUMMARY (ALL PERIODS)		
	TOTAL VARIABLE REVENUES	55256807	151388512
	TOTAL VARIABLE COSTS	-45613213	-124967706
	GROSS VARIABLE INCOME	9643594	26420806
IVS	Investment less credits	-138304	-378914
FOC	Added Fixed Costs	-39264	-107572
	NET PRESENT VALUE (I= 0.00 PCT)	9466028	25934324

****SOLUTION STATUS: OPTIMAL AFTER 4731 ITERATIONS
CASE 01 7 RECURSION PASSES

FOUNDATION CASE II BASIS

****SYSTEM NAME : GRTMPS - II
****SYSTEM VERSION: VER 2.00

PD3 00

GENERALIZED REFINING-TRANSPORTATION-MARKETING PLANNING SYSTEM - SECOND EDITION
The Pace Consultants Inc.
Pace Refining Model

DATE: 30 SEP 92 PAGE 2
TIME: 19:20 HRS PADD-III 2000 Reference Case LCU 01020

PROCESS-UNIT INVESTMENT SUMMARY

	--PROCESS INVESTMENT--(NO)------LOCATION------			PURCHASED CAPACITY	----------TOTAL INVESTMENT---------- ----------(INCL. OFFSITES)---------- -----(L.P.)------		-----ACTUAL------		ADDED LABOR MEN/SHIFT
				B/SD	.M $	$/BBL	.M $	$/BBL	
CD5	FCC Gasoline DeC5	6	PADD 3	101113	57683	570	59327	587	2.7
KNS	FCC Naphtha Splitter	14	PADD 3	237110	139725	589	140475	592	6.5
TME	Tame	18	PADD 3	33137	374094	11289	377235	11384	17.4
			**GRAND TOTAL	371359	571502	1539	577037	1554	26.6

DATE: 30 SEP 92 PAGE 3
TIME: 19:20 HRS PADD-III 2000 Reference Case LCU 01250

PLANT INPUT/OUTPUT SUMMARY
PADD 3

	PER DAY ACTUAL UNITS	------ VOLUME ------ .M Bbls	B/CD	PERCENT OF INPUT	SUPPLY LIMITS MIN	MAX	------ WEIGHT ------ .M Lbs	L/CD	PERCENT OF INPUT	SUPPLY LIMITS MIN	MAX
PLANT INPUT											
C4I Iso-butane		9318	25530	0.38	9318	9318	1833983	5024610	0.25		
C4N Normal Butane		19828	54323	0.80			4051454	11099873	0.55		
NFG Purch Nat Gas		27990	76686	1.13		364635	7417437	20321747	1.01		
MTB MTBE		61864	169490	2.49			15929966	43643743	2.16		
MOH Methanol		10848	29720	0.44			3021156	8277140	0.41		
ZPH Purch Hvy. FCC Fe		102784	281600	4.14	102784	102784	32294734	88478725	4.38		
P3B PADD 3 Base		1949100	5340000	78.49	1949100	1949100	582410558	1595645387	78.97		
P3S PADD 3 Swing		301587	826265	12.14	301587	301587	90506178	247962136	12.27		
TOTAL		2483319	6803615	100.00			737465467	2020453362	100.00		
PLANT OUTPUT											
C3M Propylene		23470	64300	0.95	23470	23470	4280978	11728707	0.58		
C4M Mixed C4=		3212	8800	0.13	3212	3212	674520	1848000	0.09		
SUL Sulfur	13789602	12733	34885	0.51			5033204	13789601	0.68		
B3P Propane Sales		79159	216875	3.19	18250		14030183	38438859	1.90		
3GS Unleaded Premium		118149	323696	4.76			28863085	79076945	3.91		
4GU Unleaded Regular		336271	921290	13.54			87512453	239760150	11.87		
7EU Unleaded Reformul		572569	1568683	23.06	109500		144516000	395934252	19.60		
9ES Unl Prem Reformul		201173	551159	8.10			51556079	141249532	6.99		
3JA JetA/Kero		277509	760300	11.17	277509	277509	78528182	215145708	10.65		
5D2 Diesel		332515	911000	13.39	332515	332515	97215358	266343450	13.18		
6D3 Home Heating Oil		141146	386700	5.68	141146	141146	43119951	118136854	5.85		
8R6 No. 6 MSFO		33032	90500	1.33	33032	33032	10951213	30003324	1.48		
9R7 No. 6 HSFO		52720	144437	2.12			18372803	50336448	2.49		
BAP Asphalt		35332	96800	1.42	35332	35332	13037703	35719736	1.77		
BNP Naphtha		57195	156700	2.30	57195	57195	14432402	39540828	1.96		
BGF Gasoil		83913	229900	3.38	83913	83913	24469007	67038377	3.32		
BLU Lubes		38179	104600	1.54	38179	38179	11597027	31772677	1.57		
CFX Flex Coke	365824	334	915	0.01			133526	365824	0.02		
CFK Fluid Coke	431375	394	1078	0.02			157452	431375	0.02		
ex# Extract		13834	37900	0.56	13834	13834	4542218	12444432	0.62		
CXK Delayed Coke	67071820	61203	167680	2.46			24481214	67071819	3.32		
TOTAL		2474042	6778198	99.63			677504557	1856176896	91.87		

PROCESS FUEL USED

PLANT INPUT/OUTPUT SUMMARY (CONT.)
PADD 3 ALL PERIODS

	PER DAY ACTUAL UNITS	------ VOLUME ------ .M Bbls	B/CD	PERCENT OF INPUT	SUPPLY LIMITS MIN	MAX	------ WEIGHT ------ .M Lbs	L/CD	PERCENT OF INPUT	SUPPLY LIMITS MIN	MAX
HLA H2 (Unrec.)	589	11069	30326	0.45			1140182	3123787	0.15		
HFA Purch Nat Gas		12828	35144	0.52			3399304	9313162	0.46		
FEA Plant Fuel Gas		100546	275468	4.05			27951736	76580100	3.79		
LOA Low-BTU Gas		1183	3242	0.05			313569	859093	0.04		
HSA RFCC Coke Burn	7743	3	8	0.00			2826258	7743173	0.38		
CKA KCC Coke Burn	43420	16	43	0.00			15848452	43420418	2.15		
CxA FLX Coke Burn	854	0	1	0.00			311560	853589	0.04		
CkA FLK Coke Burn	185	0	0	0.00			67479	184875	0.01		
COA CO2 (H2 Plt)	5674	2	6	0.00			2070865	5673604	0.28		
SUA H2O (Sul Plt)	856	0	1	0.00			312277	855555	0.04		
AFA Plant Fuel Oil		1095	3000	0.04			362968	994432	0.05		
TOTAL		126742	347238	5.10			54604652	149601788	7.40		
GRAND TOTAL		2600784	7125436	104.73			732109209	2005778684	99.27		
PLANT GAIN		117465	321821	4.73							
PLANT LOSS							5356257	14674678	0.73		

Raw Material Purchases

STOCK	LOCATION	PER DAY ACTUAL UNITS	Volume .M Bbls	Volume B/CD	UNIT PRICE $/BBL	UNIT PRICE C/Gal	MARGINAL VALUE $/BBL	MARGINAL VALUE C/Gal	DIFFERENCE $/BBL	DIFFERENCE C/Gal
C4I Iso-butane	1 PADD 3		9318	25530	14.25	33.93	12.95	30.82	-1.30	-3.11
C4N Normal Butane	1 PADD 3		19828	54323	12.25	29.17	12.25	29.17		
NFG Purch Nat Gas	1 PADD 3		27990	76686	12.00	28.57	12.00	28.57		
MTB MTBE	1 PADD 3		61864	169490	35.70	85.00	35.70	85.00		
MOH Methanol	1 PADD 3		10848	29720	18.35	43.69	18.35	43.69		
ZPH Purch Hvy. FCC Feed	1 PADD 3		102784	281600	20.00	47.62	23.98	57.10	3.98	9.48
P3B PADD 3 Base	1 PADD 3		1949100	5340000	17.44	41.52	21.29	50.68	3.85	9.16
P3S PADD 3 Swing	1 PADD 3		301587	826265	17.44	41.52	22.02	52.42	4.58	10.89
	**GRAND TOTAL		2483319	6803615						

Product Sales

STOCK	LOCATION	PER DAY ACTUAL UNITS	Volume .M Bbls	Volume B/CD	UNIT PRICE $/BBL	UNIT PRICE C/Gal	MARGINAL VALUE $/BBL	MARGINAL VALUE C/Gal	DIFFERENCE $/BBL	DIFFERENCE C/Gal
C3M Propylene	1 PADD 3		23470	64300	14.18	33.76	28.39	67.60	14.21	33.84
C4M Mixed C4=	1 PADD 3		3212	8800	20.00	47.62	31.15	74.17	11.15	26.55
C5I Iso-Pentane	1 PADD 3				12.00	28.57	22.33	53.17	10.33	24.60
C5N Normal Pentane	1 PADD 3				12.00	28.57	19.82	47.19	7.82	18.61
SUL Sulfur	1 PADD 3	13789602	12733	34885	0.01	0.02	0.01	0.02		
B3P Propane Sales	1 PADD 3		79159	216875	9.44	22.48	9.44	22.48		
B4P Butane	1 PADD 3				12.14	28.90	12.31	29.31	0.17	0.41
3GS Unleaded Premium	1 PADD 3		118149	323696	25.94	61.76	24.99	59.50	-0.95	-2.26
4GU Unleaded Regular	1 PADD 3		336271	921290	23.46	55.86	24.00	57.15	0.54	1.29
7EU Unleaded Reformulat	1 PADD 3		572569	1568683	25.19	59.98	25.51	60.74	0.32	0.76
9ES Unl Prem Reformulat	1 PADD 3		201173	551159	27.67	65.88	26.41	62.88	-1.26	-3.00
3JA JetA/Kero	1 PADD 3		277509	760300	23.31	55.50	24.53	58.40	1.22	2.90
5D2 Diesel	1 PADD 3		332515	911000	22.30	53.10	24.70	58.82	2.40	5.73
6D3 Home Heating Oil	1 PADD 3		141146	386700	21.88	52.10	23.77	56.59	1.89	4.50
8R6 No. 6 MSFO	1 PADD 3		33032	90500	17.34	41.29	19.30	45.95	1.96	4.67
9R7 No. 6 HSFO	1 PADD 3		52720	144437	13.49	32.12	13.49	32.12		
BAP Asphalt	1 PADD 3		35332	96800	19.62	46.71	14.06	33.48	-5.56	-13.24
BNP Naphtha	1 PADD 3		57195	156700	22.00	52.38	22.26	53.00	0.26	0.62
BGF Gasoil	1 PADD 3		83913	229900	18.00	42.86	24.85	59.17	6.85	16.31
BLU Lubes	1 PADD 3		38179	104600	25.55	60.83	28.27	67.31	2.72	6.47
CFX Flex Coke	1 PADD 3	365824	334	915	0.01	0.02	0.01	0.02		
CFK Fluid Coke	1 PADD 3	431375	394	1078	0.01	0.02	0.01	0.02		
ex# Extract	1 PADD 3		13834	37900	15.00	35.71	22.24	52.96	7.24	17.25
CXK Delayed Coke	1 PADD 3	67071820	61203	167680	0.01	0.02	0.01	0.02		
	**GRAND TOTAL		2474042	6778198						

PROCESS UTILIZATION SUMMARY
PADD 3

----PROCESS UNIT----	----PROCESS LIMIT----	OPERATING RATE .M Bbls	OPERATING RATE B/CD	UNUSED CAPACITY .M Bbls	UNUSED CAPACITY B/CD	PCT OF MAX CAPACITY	EXPANSION INCENTIVE $/BBL
CRD-DU Crude Tower	CRD Feed	2250687	6166265	284202	778635	88.8	
VAC-VU Vacuum Tower	VAC Feed	876124	2400340	287167	786760	75.3	
SGP-SG Sats Gas Plant	SGP Feed	139866	383194	65118	178406	68.2	
UGP-UG Unsats Gas Plant	UGP Feed	254940	698467	76370	209233	76.9	
CD5-C5 FCC DeC5 Tower	CD5 Feed	104833	287213			100.0	0.486
FCC-FC FCC (Total Capacity)	FCC Total Feed	838777	2298021				
	KCC Feed (KC)	838777	2298021	2328	6379	99.7	
	ZCC Feed (ZC)						
	OKC CO Boiler (KC)						2.596
	OZC CO Boiler (ZC)						
HYK-HK Hydrocracker	HYK Total Feed	156256	428100			100.0	1.899
	HHK High Sev	13268	36350				
	MHK Med. Sev	57614	157847				
	LHK Low Sev	85375	233903				
RDS-RD ARDS Unit Total Cap	RDS Total ARDS	97492	267100			100.0	0.310
	RD3 0.3% S ARDS						
	RD5 0.5% S ARDS	97492	267100			100.0	
	RD1 1.0% S ARDS						
HOC-HC Resid FCC	HOC RFCC Feed	67087	183800			100.0	2.719
	OHC CO Boiler						2.596
HOL-HO H-Oil Unit	HOL Feed	29492	80800			100.0	7.379
KNS-KS FCC Gaso splitter	KNS Feed	246086	674210			100.0	0.502
COK-XK Delayed Coker	COK Feed & Recy	216591	593400			100.0	5.083
FLX-FX Flexicoker	FLX Feed	8906	24400			100.0	6.596
TNS-TN Thermal Naph Split	TNS Feed	17723	48557	55058	150843	24.4	
VIS-VB Visbreaker	VIS Feed	17433	47763	47537	130237	26.8	
FLK-FK Fluid Coker	FLK Feed	2555	7000			100.0	5.159

PROCESS UTILIZATION SUMMARY (CONT.)
PADD 3

----PROCESS UNIT----	----PROCESS LIMIT----	OPERATING RATE .M Bbls	OPERATING RATE B/CD	UNUSED CAPACITY .M Bbls	UNUSED CAPACITY B/CD	PCT OF MAX CAPACITY	EXPANSION INCENTIVE $/BBL
CRU-CR CCR	CRU Feed	283934	777900			100.0	0.351
SRU-SR LP SR Reformer	SRU Feed	70390	192849	168466	461551	29.5	
ALK-AL HF Alky	ALK Alkylate product	89753	245900			100.0	0.542
SAA-SA H2SO4 Alky	SAA Alkylate product	74696	204645	14145	38755	84.1	
C4I-I4 C4 Isom	C4I Feed	22089	60518	1344	3682	94.3	
PCL-PL Cat Poly	PCL Total product			13322	36500		
ISO-IM Isom (Tot Recy)	ISO Isomerate	32266	88400			100.0	0.621
ISM-IS Isom (1 Pass)	ISM Isomerate	54750	150000			100.0	0.474
DHT-DH Dist. Htr.	DHT Total Capacity	398784	1092560	375928	1029940	51.5	
	DHD SR Diesel Feed	51600	141371				
	DHJ Jet/Kero Feed	87496	239715				
	DHC FCC Stk.	205901	564113				
	DHc Coker Stk.	53787	147362				
FHT-FH FCC Feed Hydrtrtr	FHT Feed	123698	338900			100.0	0.774
NHT-NH Naphtha Hydtrt	NHT Total feed	493094	1350943	164052	449457	75.0	
	NHL for Isom	138771	380194				
	NHC for Reformer	354323	970749				
CNT-CN FCC Naph Hydtrt (U)	CNT Feed						1.890
HYD-H2 Hydrogen Plant	HYD Total MSCF H2	367409	1006600			100.0	0.083
	H2A via plant fuel						
	H2B via LPG						-0.485
	H2C via naphtha						
	H2D via purch gas	367409	1006600				
LUB-LU Lube Unit	LUB Feed	109628	300351	8997	24649	92.4	
TME-TM Tame	TME Feed	12095	33137				9.610
SUL-SU Sulfur Plant	SUL Feed	4996438	13688872	2369262	6491128	67.8	

PROCESS UTILIZATION SUMMARY (CONT.)
PADD 3

----PROCESS UNIT----	----PROCESS LIMIT----	OPERATING RATE .M Bbls	OPERATING RATE B/CD	UNUSED CAPACITY .M Bbls	UNUSED CAPACITY B/CD	PCT OF MAX CAPACITY	EXPANSION INCENTIVE $/BBL
SDA-SD Solvent Deasphalter	SDA Feed	43800	120000			100.0	4.596
MTB-MT MTBE Unit	MTB Product	21535	59000			100.0	4.379
MRJ-MJ Jet Merox Unit	MRJ Feed	161349	442053	46190	126547	77.7	
MRD-MD Diesel Merox Unit	MRD Treating	89459	245093	25772	70607	77.6	
FUL-90 Fuel System	PFO Fuel Oil	1095	3000				
	FLR Flare						
UTL-95 General Utilities	STM Steam (Mlbs)	151806	415906				
	VNT Steam Vent						-1.496
	KWH Power (kwh)	8679319	23778957				
	CWR Cooling H2O (MGal)	1605170	4397726				
	KWT Condensing Turbine						0.101

MULTI-PRODUCT SPECIFICATIONS

GROUP C MEMBERS

	LOCATION	PRODUCT
1A3GS	PADD 3	Unleaded Premium
1A4GU	PADD 3	Unleaded Regular

BLEND PROPERTIES		LP BLEND	SPECIFICATIONS MIN	MAX	FIX	INCENTIVE $/unit
1AARO	Aromatics	27.825		30.560		
1ABEN	Benzene	1.029		1.700		
1AOLE	Olefins	10.913		11.873		
1ASUL	Sulfur	0.039		0.040		
1A300	% at 300	80.000	80.000			-0.0606
1A356	% at 356	89.000	89.000			-0.0006

GROUP R MEMBERS

	LOCATION	PRODUCT
1A7EU	PADD 3	RFG Unl Regular
1A9ES	PADD 3	RFG Unl Premium

BLEND PROPERTIES		LP BLEND	SPECIFICATIONS MIN	MAX	FIX	INCENTIVE $/unit
1AARO	Aromatics	25.000		25.000		0.0135
1ABEN	Benzene	0.700		0.700		0.2800
1AOLE	Olefins	6.268		12.000		
1ASUL	Sulfur	0.015		0.015		0.0574
1A212	% at 212	61.848	50.100			
1A300	% at 300	86.749	82.000			
1A356	% at 356	96.373	91.000			

ECONOMIC SUMMARY

	ACCOUNTING CATEGORY	.M $	.. $/CD
	X TOTAL SYSTEM		
SAX	Product Values - Sales	48597297	133143278
BRX	Raw Material Costs	-42098697	-115338895
UTP	Utilities Costs	-676972	-1854717
TEL	Antiknock Costs	-41087	-112568
	TOTAL VARIABLE REVENUES	48597297	133143278
	TOTAL VARIABLE COSTS	-42816757	-117306181
	GROSS VARIABLE INCOME	5780540	15837097
IVS	Investment less credits	-796648	-2182597
FOC	Added Fixed Costs	-188469	-516353
	CASE SUMMARY (ALL PERIODS)		
	TOTAL VARIABLE REVENUES	48597297	133143278
	TOTAL VARIABLE COSTS	-42816757	-117306181
	GROSS VARIABLE INCOME	5780540	15837097
IVS	Investment less credits	-796648	-2182597
FOC	Added Fixed Costs	-188469	-516353
	NET PRESENT VALUE (I= 0.00 PCT)	4795425	13138151

****SOLUTION STATUS: OPTIMAL AFTER 5986 ITERATIONS
CASE 01 8 RECURSION PASSES

FOUNDATION CASE I BASIS

****SYSTEM NAME : GRTMPS - II
****SYSTEM VERSION: VER 2.01

LAT 00 (R)

GENERALIZED REFINING-TRANSPORTATION-MARKETING PLANNING SYSTEM - SECOND EDITION
The Pace Consultants Inc.
Pace Refining Model

DATE: 4 DEC 92
TIME: 15:21 HRS

Latin America 2000 Reference Case

PAGE 2
LCU 01020

PROCESS-UNIT INVESTMENT SUMMARY

	--PROCESS INVESTMENT--(NO)------LOCATION------			PURCHASED CAPACITY	----------TOTAL INVESTMENT---------- ----------(INCL. OFFSITES)---------- -----(L.P.)------		-----ACTUAL------		ADDED LABOR MEN/SHIFT
				B/SD	.M $	$/BBL	.M $	$/BBL	
CD5	FCC Gasoline DeC5	3	Lat. Am.	50853	37714	742	38993	767	1.4
NHT	Naphtha Hydrotreater	3	Lat. Am.	68904	204016	2961	216528	3142	2.5
CRU	CCR	1	Lat. Am.	23351	77776	3331	87034	3727	1.2
KCC	FCC	5	Lat. Am.	295262	1491374	5051	1526557	5170	23.2
SAA	H2SO4 Alkylation	10	Lat. Am.	167899	1158353	6899	1165360	6941	11.8
MTB	MTBE	12	Lat. Am.	19854	236592	11917	238143	11995	11.0
TME	Tame	4	Lat. Am.	5867	86107	14676	89397	15237	3.1
			*** GRAND TOTAL	631990	3291933	5209	3362013	5320	54.2

PLANT INPUT/OUTPUT SUMMARY
Lat. Am.

	PER DAY ACTUAL UNITS	------ VOLUME ------ .M Bbls	B/CD	PERCENT OF INPUT	SUPPLY LIMITS MIN	MAX	------ WEIGHT ------ .M Lbs	L/CD	PERCENT OF INPUT	SUPPLY LIMITS MIN	MAX
PLANT INPUT											
C4I Iso-butane		14483	39680	0.58			2850461	7809482	0.37		
NFG Purch Nat Gas		26135	71604	1.04			6925882	18975019	0.90		
MTB MTBE		18271	50058	0.73			4704863	12890035	0.61		
MOH Methanol		4368	11968	0.17			1216585	3333109	0.16		
SAB S. American Ba		1661845	4553000	66.02	1661845	1661845	516612770	1415377471	67.00		
SAS S.America Swng		687357	1883170	27.31		3285000	206275803	565139195	26.75		
SWT LA Sweet Base		104755	287000	4.16	104755	104755	32529151	89120962	4.22		
TOTAL		2517215	6896480	100.00			771115514	2112645273	100.00		
PLANT OUTPUT											
SUL Sulfur	12217529	11281	30908	0.45			4459398	12217529	0.58		
B34 C3/C4 LPG		43645	119574	1.73			7735561	21193319	1.00		
1GP Leaded Premium		114245	313000	4.54	114245	114245	29283917	80229910	3.80		
2GR Leaded Regular		48800	133700	1.94	48800	48800	12375807	33906320	1.60		
3GS Unleaded Premium		450446	1234100	17.89	450446	450446	116911922	320306641	15.16		
4GU Unleaded Regular		57013	156200	2.26	57013	57013	14667168	40184022	1.90		
3JA JetA/Kero		161330	442000	6.41	161330	161330	45505044	124671355	5.90		
5JA JetA/Kero		27375	75000	1.09	27375	27375	7723761	21160989	1.00		
5D2 Local Diesel		552537	1513800	21.95	552537	552537	163278430	447338170	21.17		
6D3 Local HHO		84388	231200	3.35	84388	84388	25861548	70853556	3.35		
7R5 No. 6 LSFO		212430	582000	8.44	212430	212430	74031854	202827000	9.60		
8R6 No. 6 MSFO		79570	218000	3.16	79570	79570	27730145	75973000	3.60		
9R7 No. 6 HSFO		252705	692344	10.04			88067847	241281776	11.42		
G3S U.S. ULP		182	500	0.01	182	182	47973	131434	0.01		
G4U U.S. ULR		182	500	0.01	182	182	44250	121233	0.01		
9ES U.S. RFG ULP		16242	44500	0.65	16242	16242	4135272	11329512	0.54		
7EU U.S. RFG ULR		40369	110600	1.60	40369	40369	10261000	28112330	1.33		
1D7 U.S. Diesel		59276	162400	2.35	59276	59276	17732906	48583305	2.30		
2D4 U.S. HHO		13724	37600	0.55	13724	13724	4192682	11486800	0.54		
3D5 NWE Diesel		4471	12250	0.18	4471	4471	1365698	3741638	0.18		
4D6 NWE HHO		4654	12750	0.18	4654	4654	1399848	3835200	0.18		
BAP Asphalt		31755	87000	1.26	31755	31755	11924106	32668784	1.55		
BNP Naphtha		127750	350000	5.08	127750	127750	31074142	85134637	4.03		
BGF Gasoil		32850	90000	1.31	32850	32850	9761504	26743848	1.27		
BLU Lubes		18615	51000	0.74	18615	18615	5654585	15492014	0.73		
CFX Flex Coke	721638	658	1804	0.03			263398	721638	0.03		
CXK Delayed Coke	22290084	20340	55725	0.81			8135880	22290083	1.06		

PLANT INPUT/OUTPUT SUMMARY (CONT.)
Lat. Am. ALL PERIODS

	PER DAY ACTUAL UNITS	VOLUME .M Bbls	VOLUME B/CD	PERCENT OF INPUT	SUPPLY LIMITS MIN	SUPPLY LIMITS MAX	WEIGHT .M Lbs	WEIGHT L/CD	PERCENT OF INPUT	SUPPLY LIMITS MIN	SUPPLY LIMITS MAX
TOTAL		2466836	6758455	98.00			723625646	1982536044	93.84		
PROCESS FUEL USED											
HLA H2 (Unrec.)	240	4500	12329	0.18			463534	1269956	0.06		
HFA Purch Nat Gas		15574	42670	0.62			4127223	11307461	0.54		
FEA Plant Fuel Gas		62669	171696	2.49			17421949	47731369	2.26		
LOA Low-BTU Gas		2342	6415	0.09			620521	1700059	0.08		
CKA KCC Coke Burn	32909	12	33	0.00			12011642	32908609	1.56		
CXA FLX Coke Burn	1684	1	2	0.00			614595	1683822	0.08		
COA CO2 (H2 Plt)	3952	1	4	0.00			1442373	3951706	0.19		
SUA H2O (Sul Plt)	753	0	1	0.00			274719	752655	0.04		
AFA Plant Fuel Oil		10950	30000	0.44			3816075	10455000	0.49		
TOTAL		96049	263149	3.82			40792632	111760636	5.29		
GRAND TOTAL		2562885	7021603	101.81			764418277	2094296680	99.13		
PLANT GAIN		45670	125124	1.81							
PLANT LOSS							6697236	18348593	0.87		

Raw Material Purchases

STOCK		LOCATION	PER DAY ACTUAL UNITS	Volume .M Bbls	Volume B/CD	UNIT PRICE $/BBL	UNIT PRICE C/Gal	MARGINAL VALUE $/BBL	MARGINAL VALUE C/Gal	DIFFERENCE $/BBL	DIFFERENCE C/Gal
C4I	Iso-butane	1 Lat. Am.		14483	39680	14.25	33.93	14.25	33.93		-
C4N	Normal Butane	1 Lat. Am.				12.25	29.17	11.56	27.52	-0.69	-1.64
HFG	Purch Nat Gas	1 Lat. Am.		26135	71604	13.60	32.38	13.60	32.38		
MTB	MTBE	1 Lat. Am.		18271	50058	34.09	81.17	34.09	81.17		
MOH	Methanol	1 Lat. Am.		4368	11968	18.35	43.69	18.35	43.69		
SAB	S. American Ba	1 Lat. Am.		1661845	4553000	16.64	39.62	15.66	37.28	-0.98	-2.34
SAS	S.America Swng	1 Lat. Am.		687357	1883170	16.64	39.62	16.64	39.62		
SWT	LA Sweet Base	1 Lat. Am.		104755	287000	16.64	39.62	16.91	40.26	0.27	0.64
		**GRAND TOTAL		2517215	6896480						

Product Sales

STOCK	LOCATION	PER DAY ACTUAL UNITS	Volume .M Bbls	Volume B/CD	UNIT PRICE $/BBL	UNIT PRICE C/Gal	MARGINAL VALUE $/BBL	MARGINAL VALUE C/Gal	DIFFERENCE $/BBL	DIFFERENCE C/Gal
SUL Sulfur	1 Lat. Am.	12217529	11281	30908	0.01	0.02	0.01	0.02		
B34 C3/C4 LPG	1 Lat. Am.		43645	119574	10.00	23.81	10.00	23.81		
1GP Leaded Premium	1 Lat. Am.		114245	313000	24.02	57.19	23.68	56.39	-0.34	-0.80
2GR Leaded Regular	1 Lat. Am.		48800	133700	21.39	50.93	20.46	48.71	-0.93	-2.22
3GS Unleaded Premium	1 Lat. Am.		450446	1234100	23.69	56.40	24.10	57.38	0.41	0.97
4GU Unleaded Regular	1 Lat. Am.		57013	156200	21.06	50.14	22.57	53.74	1.51	3.60
3JA JetA/Kero	1 Lat. Am.		161330	442000	21.78	51.86	20.73	49.35	-1.05	-2.51
5JA JetA/Kero	1 Lat. Am.		27375	75000	22.78	54.24	20.62	49.09	-2.16	-5.15
5D2 Local Diesel	1 Lat. Am.		552537	1513800	20.60	49.05	19.41	46.21	-1.19	-2.83
6D3 Local HHO	1 Lat. Am.		84388	231200	20.60	49.05	17.83	42.46	-2.77	-6.59
7R5 No. 6 LSFO	1 Lat. Am.		212430	582000	16.59	39.50	13.44	32.00	-3.15	-7.50
8R6 No. 6 MSFO	1 Lat. Am.		79570	218000	14.78	35.19	13.01	30.99	-1.77	-4.20
9R7 No. 6 HSFO	1 Lat. Am.		252705	692344	12.96	30.86	12.96	30.86		
G3S U.S. ULP	1 Lat. Am.		182	500	24.69	58.79	22.86	54.42	-1.83	-4.36
G4U U.S. ULR	1 Lat. Am.		182	500	22.06	52.52	22.77	54.21	0.71	1.68
9ES U.S. RFG ULP	1 Lat. Am.		16242	44500	24.69	58.79	25.16	59.91	0.47	1.13
7EU U.S. RFG ULR	1 Lat. Am.		40369	110600	22.06	52.52	23.64	56.29	1.58	3.77
1D7 U.S. Diesel	1 Lat. Am.		59276	162400	21.60	51.43	18.59	44.25	-3.01	-7.18
2D4 U.S. HHO	1 Lat. Am.		13724	37600	21.60	51.43	17.82	42.43	-3.78	-8.99
3D5 NWE Diesel	1 Lat. Am.		4471	12250	20.60	49.05	17.83	42.44	-2.77	-6.61
4D6 NWE HHO	1 Lat. Am.		4654	12750	20.60	49.05	18.06	43.00	-2.54	-6.05
BAP Asphalt	1 Lat. Am.		31755	87000	19.62	46.71	11.61	27.64	-8.01	-19.08
BNP Naphtha	1 Lat. Am.		127750	350000	19.00	45.24	18.46	43.94	-0.54	-1.30
BGF Gasoil	1 Lat. Am.		32850	90000	17.00	40.48	17.44	41.53	0.44	1.06
BLU Lubes	1 Lat. Am.		18615	51000	25.55	60.83	20.85	49.64	-4.70	-11.19
CFX Flex Coke	1 Lat. Am.	721638	658	1804	0.01	0.02	0.01	0.02		
CXK Delayed Coke	1 Lat. Am.	22290084	20340	55725	0.01	0.02	0.01	0.02		
	**GRAND TOTAL		2466836	6758455						

PROCESS UTILIZATION SUMMARY
Lat. Am.

----PROCESS UNIT----	----PROCESS LIMIT----	OPERATING RATE .M Bbls	OPERATING RATE B/CD	UNUSED CAPACITY .M Bbls	UNUSED CAPACITY B/CD	PCT OF MAX CAPACITY	EXPANSION INCENTIVE $/BBL
CRD-DU Crude Tower	CRD Feed	2453957	6723169	544701	1492330	81.8	
VAC-VU Vacuum Tower	VAC Feed	1201560	3291946	123864	339354	90.7	
SGP-SG Sats Gas Plant	SGP Feed	80165	219631	1120	3069	98.6	
UGP-UG Unsats Gas Plant	UGP Feed	126063	345379	2015	5521	98.4	
CD5-C5 FCC DeC5 Tower	CD5 Feed	18561	50853				0.623
FCC-FC FCC (Total Capacity)	FCC Total Feed	604901	1657262				
	KCC Feed (KC)	604901	1657262			100.0	4.136
	ZCC Feed (ZC)						
	OKC CO Boiler (KC)						2.942
	OZC CO Boiler (ZC)						
HYK-HK Hydrocracker	HYK Total Feed	73219	200600			100.0	5.937
	HHK High Sev						
	MHK Med. Sev	1606	4400				
	LHK Low Sev	71613	196200				
RDS-RD ARDS Unit Total Cap	RDS Total ARDS						3.695
	RD3 0.3% S ARDS						
	RD5 0.5% S ARDS						
	RD1 1.0% S ARDS						
HOC-HC RFCCU	HOC RFCC Feed						4.887
	OHC CO Boiler						2.942
HOL-HO R-HYK Unit	HOL Feed	12045	33000			100.0	4.545
KNS-KS FCC Gaso splitter	KNS Feed	138842	380388	17743	48612	88.7	
COK-XK Delayed Coker	COK Feed & Recy	69605	190700			100.0	3.310
FLX-FX Flexicoker	FLX Feed	16024	43900			100.0	3.050
TNS-TN Thermal Naph Split	TNS Feed						0.665
VIS-VB Visbreaker	VIS Feed	116163	318256	98201	269044	54.2	
CRU-CR CCR	CRU Feed	25569	70051			100.0	2.729

PROCESS UTILIZATION SUMMARY (CONT.)
Lat. Am.

----PROCESS UNIT----	----PROCESS LIMIT----	OPERATING RATE .M Bbls	B/CD	UNUSED CAPACITY .M Bbls	B/CD	PCT OF MAX CAPACITY	EXPANSION INCENTIVE $/BBL
SRU-SR LP SR Reformer	SRU Feed	154322	422800			100.0	2.210
ALK-AL HF Alky	ALK Alkylate product	11242	30800			100.0	6.720
SAA-SA H2SO4 Alky	SAA Alkylate product	79424	217599			100.0	5.611
C4I-I4 C4 Isom	C4I Feed	10658	29200			100.0	1.791
PCL-PL Cat Poly	PCL Total product			5329	14600		
ISO-IM Isom (Tot Recy)	ISO Isomerate	5657	15500			100.0	0.785
ISM-IS Isom (1 Pass)	ISM Isomerate			5657	15500		
DHT-DH Dist. Htr.	DHT Total Capacity	399787	1095307	472	1293	99.9	
	DHD SR Diesel Feed	181930	498439				
	DHJ Jet/Kero Feed	81842	224224				
	DHC FCC Stk.	109693	300530				
	DHc Coker Stk.	26322	72114				
FHT-FH FCC Hydrotreater	FHT Feed	161147	441500			100.0	0.680
NHT-NH Naphtha Hydtrt	NHT Total feed	217651	596304			100.0	2.415
	NHL for Isom	37760	103453				
	NHC for Reformer	179891	492851				
HYD-H2 Hydrogen Plant	HYD Total MSCF H2	255903	701104	17847	48896	93.5	
	H2A via plant fuel						-0.027
	H2B via LPG						
	H2C via naphtha						
	H2D via purch gas	255903	701104				
LUB-LU Lube Unit	LUB Feed	53452	146443	10423	28557	83.7	
TME-TM Tame	TME Feed	2141	5867				12.329
SUL-SU Sulfur Plant	SUL Feed	4395505	12042479	1322476	3623221	76.9	
SDA-SD Solvent Deasphalter	SDA Feed	53472	146500			100.0	0.582
MTB-MT MTBE Unit	MTB Product	11079	30354			100.0	10.144

PROCESS UTILIZATION SUMMARY (CONT.)
Lat. Am.

----PROCESS UNIT----	----PROCESS LIMIT----	OPERATING RATE .M Bbls	OPERATING RATE B/CD	UNUSED CAPACITY .M Bbls	UNUSED CAPACITY B/CD	PCT OF MAX CAPACITY	EXPANSION INCENTIVE $/BBL
MRJ-MJ Merox Unit	MRJ Feed	95913	262776				
MRD-MD Merox Unit	MRD Treating	401381	1099673				
FUL-90 Fuel System	PFO Fuel Oil	10950	30000				
	FLR Flare						
UTL-95 General Utilities	STM Steam (Mlbs)	103705	284125				
	VNT Steam Vent						-1.875
	KWH Power (kwh)	5360666	14686756				
	CWR Cooling H2O (MGal)	880787	2413115				
	KWT Condensing Turbine						0.109

MULTI-PRODUCT SPECIFICATIONS -

GROUP C MEMBERS

	LOCATION	PRODUCT
1AG3U	Lat. Am.	
1AG4U	Lat. Am.	U.S. Unl. Reg.

BLEND PROPERTIES		LP BLEND	SPECIFICATIONS MIN	MAX	FIX	INCENTIVE $/unit
1AARO	Aromatics	8.469		32.838		
1ABEN	Benzene	0.116		1.674		
1AOLE	Olefins	0.724		12.297		
1ASUL	Sulfur	0.020		0.028		
1A300	% at 300	89.559	80.030			
1A356	% at 356	90.290	90.290			-0.0711

GROUP R MEMBERS

	LOCATION	PRODUCT
1A9ES	Lat. Am.	U.S. RFG ULP
1A7EU	Lat. Am.	U.S. RFG ULR

BLEND PROPERTIES		LP BLEND	SPECIFICATIONS MIN	MAX	FIX	INCENTIVE $/unit
1AARO	Aromatics	16.965		25.000		
1ABEN	Benzene	0.358		0.700		
1AOLE	Olefins	0.535		12.000		
1ASUL	Sulfur	0.015		0.015		0.1160
1A212	% at 212	64.000	50.100			
1A300	% at 300	89.049	82.000			
1A356	% at 356	91.000	91.000			-0.0229

Region: PADD-I

Year: 1989

Case: Base MJD

GDP Inflator:	1.0416	Inputs									Outputs (ex MJD)				
Swing Crude:	Arab Light	IC4	nC4	Nat Gas	MTBE	Lead	Var Util.		C3=	C3	C4=	C4s	HSFO	Sulfur	Coke
1989 Price:	$17.44	$15.25	$12.25	$14.47	$39.00	$1.00	$1.00		$15.18	$9.44	$13.00	$12.14	$14.47	$4.20	$3.15
1990 Price:	$18.16	$15.88	$12.76	$15.07	$40.62	$1.04	$1.04		$15.81	$9.83	$13.54	$12.64	$15.07	$4.37	$3.28
			BPD								BPD				
Base * 0.830	18,832	1,324	25,750	82	0	401	445,002		12,900	33,164	855	0	0	3,506	12,847
Base * 0.90	106,506	1,324	28,066	0	0	435	486,889		12,900	35,318	2,300	0	4,334	4,417	14,101
Base * 0.95	181,818	1,324	30,070	1,728	0	458	496,966		12,900	36,273	2,300	0	22,989	4,840	13,736
Base * 1.00	258,015	1,324	32,446	4,601	0	483	507,067		12,900	37,292	2,300	0	41,957	5,478	13,371
Base * 1.04	325,245	1,324	34,207	5,232	0	503	515,978		12,900	36,274	1,783	0	62,947	5,676	13,053
Delta 1	87,674	0	2,316	-82	0	34	41,887		0	2,152	1,445	0	4,334	911	1,254
Delta 2	75,310	0	2,004	1,728	0	23	10,077		0	957	0	0	18,655	423	-365
Delta 3	76,199	0	2,378	2,873	0	25	10,101		0	1,019	0	0	18,968	638	-365
Delta 4	67,230	0	1,761	631	0	20	8,911		0	982	-517	0	20,990	198	-318
Delta 5															
Delta 6															
								Inputs							
								Total Costs							
Cost Delta 1	$1,592,489	$0	$29,548	-$1,236	$0	$35	$43,625	$1,664,463	$0	$21,158	$19,565	$0	$65,316	$3,985	$4,114
Cost Delta 2	$1,367,913	$0	$25,568	$26,042	$0	$24	$10,495	$1,430,042	$0	$9,409	$0	$0	$281,140	$1,850	-$1,197
Cost Delta 3	$1,384,060	$0	$30,314	$43,298	$0	$26	$10,520	$1,468,218	$0	$10,019	$0	$0	$285,857	$2,791	-$1,197
Cost Delta 4	$1,221,150	$0	$22,467	$9,509	$0	$21	$9,281	$1,262,428	$0	$9,655	-$7,000	$0	$316,330	$866	-$1,043

Region: PADD-I
Year: 1989
Case: Base MJD
GDP Inflator:
Swing Crude:

	"M" - Gasolines					Jet Fuels		
	LR	ULP	ULR	ULM	Total M	JP4	Jet A	Total J
1989 Price:	$24.11	$26.42	$23.77	$25.10		$22.50	$24.57	
1990 Price:	$25.11	$27.52	$24.76	$26.14		$23.43	$25.59	
		BPD					BPD	
Base * 0.830	17,700	185,000	307,300	61,900	571,900	14,800	63,600	78,400
Base * 0.90	19,200	200,600	333,200	67,100	620,100	16,000	68,900	84,900
Base * 0.95	20,200	211,600	351,700	70,900	654,600	16,900	72,800	89,700
Base * 1.00	21,300	222,900	370,200	74,600	689,000	17,800	76,600	94,400
Base * 1.04	22,200	231,600	385,000	77,600	716,600	18,500	79,700	98,200
Delta 1					48,200			6,500
Delta 2					34,500			4,800
Delta 3					34,400			4,700
Delta 4					27,600			3,800
Delta 5								
Delta 6								

	Outputs Total Costs	Inputs - Outputs	Delta MJD	Cost/MJD	Crude/MJD	HSFO/MJD	LPGs/MJD	HSFO/Crude	Inputs/MJD
Cost Delta 1	$114,137	$1,550,326	79,700	$19.45	1.10	0.054	0.017	0.049	1.083
Cost Delta 2	$291,202	$1,138,839	57,100	$19.94	1.32	0.327	-0.049	0.248	1.368
Cost Delta 3	$297,469	$1,170,749	57,100	$20.50	1.33	0.332	-0.074	0.249	1.409
Cost Delta 4	$318,808	$943,621	45,800	$20.60	1.47	0.458	-0.042	0.312	1.510

Region: PADD-I
Year: 1989
Case: Base MJD
GDP Inflator:

		Distillates		
Swing Crude:	Diesel	HHO	Total D	Total MJD
1989 Price:	$23.02	$23.02		
1990 Price:	$23.98	$23.98		
		BPD		
Base * 0.830	148,700	148,700	297,400	947,700
Base * 0.90	161,200	161,200	322,400	1,027,400
Base * 0.95	170,100	170,100	340,200	1,084,500
Base * 1.00	179,100	179,100	358,200	1,141,600
Base * 1.04	186,300	186,300	372,600	1,187,400
Delta 1			25,000	79,700
Delta 2			17,800	57,100
Delta 3			18,000	57,100
Delta 4			14,400	45,800
Delta 5				
Delta 6				

Cost Delta 1
Cost Delta 2
Cost Delta 3
Cost Delta 4

Region: PADD-II

Year: 1989

Case: Base MJD

GDP Inflator:	1.0416		Inputs								Outputs (ex MJD)				
Swing Crude:	WTI	IC4	nC4	Nat Gas	MTBE	Lead	Var Util.		C3=	C3	C4=	C4s	HSFO	Sulfur	Coke
1989 Price:	$20.06	$14.25	$12.25	$14.15	$39.00	$1.00	$1.00		$24.18	$9.44	$20.00	$12.14	$13.49	$4.20	$3.15
1990 Price:	$20.89	$14.84	$12.76	$14.74	$40.62	$1.04	$1.04		$25.18	$9.83	$20.83	$12.64	$14.05	$4.37	$3.28
			BPD								BPD				
Base * .910	611,439	0	98,934	0	0	3,073	1,108,070		30,230	86,400	0	0	19,230	8,451	68,998
Base * .995	872,454	0	107,622	0	0	3,361	1,156,905		35,938	92,720	0	0	58,159	8,628	64,992
Base * .1.0	887,937	0	108,055	0	0	3,377	1,159,294		36,260	93,088	0	0	60,616	8,637	64,721
Base * 1.085	1,143,310	0	116,584	0	0	3,665	1,211,730		36,260	98,288	0	0	100,831	8,644	61,064
Delta 1	281,015	0	8,688	0	0	288	48,835		5,708	6,320	0	0	38,929	177	-4,006
Delta 2	15,483	0	433	0	0	16	2,389		322	368	0	0	2,457	9	-271
Delta 3	255,373	0	8,529	0	0	288	52,436		0	5,200	0	0	40,215	7	-3,657
								Inputs Total Costs							
Cost Delta 1	$5,453,253	$0	$110,845	$0	$0	$300	$50,862	$5,615,260	$143,747	$62,137	$0	$0	$546,946	$774	-$13,143
Cost Delta 2	$323,478	$0	$5,524	$0	$0	$17	$2,488	$331,508	$8,109	$3,618	$0	$0	$34,520	$39	-$889
Cost Delta 3	$5,335,378	$0	$108,816	$0	$0	$300	$54,612	$5,499,108	$0	$51,125	$0	$0	$565,014	$31	-$11,998

Region: PADD-II
Year: 1989
Case: Base MJD

	"M" - Gasolines					Jet Fuels		
GDP Inflator:								
Swing Crude:	LR	ULP	ULR	ULM	Total M	JP4	Jet A	Total J
1989 Price:	$24.61	$28.06	$24.02	$26.04		$22.50	$24.19	
1990 Price:	$25.63	$29.22	$25.02	$27.12		$23.43	$25.19	
		BPD					BPD	
Base * .910	135,500	253,500	1,037,900	102,700	1,529,600	20,300	166,300	186,600
Base * .995	148,200	277,200	1,134,600	112,300	1,672,500	22,200	181,900	204,100
Base * .1.0	148,900	278,600	1,140,500	112,900	1,680,900	22,300	182,600	205,100
Base * 1.085	161,600	302,300	1,237,400	122,500	1,823,800	24,200	198,300	222,500
Delta 1					142,900			17,500
Delta 2					8,400			1,000
Delta 3					142,900			17,400

	Outputs								
	Total Costs	Inputs - Outputs	Delta MJD	Cost/MJD	Crude/MJD	HSFO/MJD	LPGs/MJD	HSFO/Crude	Inputs/MJD
Cost Delta 1	$740,462	$4,874,798	218,600	$22.30	1.19	0.178	0.015	0.149	1.179
Cost Delta 2	$45,398	$286,110	12,800	$22.35	1.21	0.192	0.020	0.159	1.190
Cost Delta 3	$604,172	$4,894,934	218,400	$22.41	1.17	0.184	-0.015	0.157	1.185

Region: PADD-II

Year: 1989

Case: Base MJD

GDP Inflator:

	Distillates			
Swing Crude:	Diesel	HHO	Total D	Total MJD
1989 Price:	$22.43	$22.43		
1990 Price:	$23.36	$23.36		
		BPD		
Base * .910	435,600	186,600	622,200	2,338,400
Base * .995	476,300	204,100	680,400	2,557,000
Base * .1.0	478,700	205,100	683,800	2,569,800
Base * 1.085	519,400	222,500	741,900	2,788,200
Delta 1			58,200	218,600
Delta 2			3,400	12,800
Delta 3			58,100	218,400
Cost Delta 1				
Cost Delta 2				
Cost Delta 3				

Region: PADD III
Year: 1989
Case: MJD Base

GDP Inflator:	1.0416		Inputs								Outputs (ex MJD)			
Swing Crude:	Arab Light	IC4	nC4	Nat Gas	MTBE	Lead	Var Util.		C3=	C3	C4=	C4s	HSFO	Sulfur
1989 Price:	$17.44	$14.25	$12.25	$12.00	$39.00	$1.00	$1.00		$14.18	$9.44	$20.00	$12.14	$13.49	$4.20
1990 Price:	$18.16	$14.84	$12.76	$12.50	$40.62	$1.04	$1.04		$14.77	$9.83	$20.83	$12.64	$14.05	$4.37
			BPD								BPD			
Base * 0.89	126,286	13,061	85,575	34,016	0	5,157	2,744,659		64,300	201,857	8,800	0	142,081	27,554
Base * 0.94	440,692	25,341	87,389	32,042	0	5,448	2,759,041		64,300	211,508	8,800	0	193,425	30,402
Base * 0.996	794,293	25,530	93,894	31,959	0	5,765	2,833,938		64,300	218,970	8,800	0	256,130	33,341
Base * 1	826,265	25,530	94,469	32,022	0	5,795	2,840,415		64,285	219,581	8,800	0	261,572	33,605
Base * 1.01	890,131	25,530	95,595	32,166	0	5,854	2,854,102		64,300	220,607	8,800	0	272,390	34,107
Base * 1.05	1,149,428	25,530	100,524	34,661	0	6,085	2,925,942		64,300	225,450	8,800	0	321,413	35,951
Base * 1.09	1,412,955	25,530	104,455	40,194	0	6,316	2,990,043		64,300	229,995	8,800	0	374,121	37,402
Delta 1	314,606	12,280	1,814	-1,974	0	291	14,382		0	9,651	0	0	51,364	2,848
Delta 2	353,401	189	6,505	-83	0	317	74,897		0	7,462	0	0	62,705	2,939
Delta 3	31,972	0	575	63	0	30	6,477		-15	611	0	0	5,442	264
Delta 4	63,866	0	1,126	164	0	59	13,887		15	1,226	0	0	10,818	502
Delta 5	259,297	0	4,929	2,495	0	231	71,840		0	4,643	0	0	49,023	1,844
Delta 6	263,527	0	3,931	5,513	0	231	64,101		0	4,545	0	0	52,708	1,451
								Inputs						
								Total Costs						
Cost Delta 1	$5,714,428	$182,252	$23,144	-$24,671	$0	$303	$14,979	$5,910,435	$0	$94,886	$0	$0	$721,656	$12,458
Cost Delta 2	$6,419,091	$2,805	$82,993	-$1,037	$0	$330	$78,005	$6,582,187	$0	$73,365	$0	$0	$880,995	$12,856
Cost Delta 3	$580,732	$0	$7,336	$787	$0	$31	$6,746	$595,632	-$222	$6,007	$0	$0	$76,459	$1,155
Cost Delta 4	$1,160,047	$0	$14,366	$2,050	$0	$61	$14,255	$1,190,779	$222	$12,054	$0	$0	$151,991	$2,196
Cost Delta 5	$4,709,808	$0	$62,886	$31,183	$0	$241	$74,821	$4,878,939	$0	$45,649	$0	$0	$688,765	$8,066
Cost Delta 6	$4,786,641	$0	$50,153	$68,901	$0	$241	$66,761	$4,972,698	$0	$44,685	$0	$0	$740,539	$6,347

Region:	**PADD III**										
Year:	**1989**										
Case:	**MJD Base**										
GDP Inflator:					**"M" - Gasolines**						**Jet Fuels**
Swing Crude:	**Coke**			**LR**	**ULP**	**ULR**	**ULM**	**Total M**		**JP4**	**Jet A**
1989 Price:	$3.15			$24.61	$28.06	$24.02	$26.04			$22.50	$24.19
1990 Price:	$3.28			$25.63	$29.22	$25.02	$27.12			$23.43	$25.19
					BPD						BPD
Base * 0.89	1,993			227,400	766,500	1,546,200	250,500	2,790,600		103,200	573,500
Base * 0.94	1,993			240,200	809,500	1,633,100	264,600	2,947,400		108,900	605,700
Base * 0.995	1,993			254,200	856,900	1,728,600	280,100	3,119,800		115,300	641,200
Base * 1	1,993			255,500	861,200	1,737,300	281,500	3,135,500		115,900	644,400
Base * 1.01	1,993			258,100	869,800	1,754,700	284,300	3,166,900		117,100	650,800
Base * 1.05	1,993			268,300	904,300	1,824,200	295,600	3,292,400		121,700	676,600
Base * 1.09	1,993			278,500	938,700	1,893,700	306,800	3,417,700		126,300	702,400
Delta 1	0							156,800			
Delta 2	0							172,400			
Delta 3	0							15,700			
Delta 4	0							31,400			
Delta 5	0							125,500			
Delta 6	0							125,300			
		Outputs									
		Total Costs	**Inputs - Outputs**	**Delta MJD**	**Cost/MJD**	**Crude/MJD**	**HSFO/MJD**	**LPGs/MJD**	**HSFO/Crude**	**Inputs/MJD**	
Cost Delta 1	$0	$629,000	$5,081,434	259,600	$19.57	1.2119	0.1979	-0.0095	0.1633	1.2214	
Cost Delta 2	$0	$967,216	$5,614,972	285,700	$19.65	1.2370	0.2195	0.0030	0.1774	1.2340	
Cost Delta 3	$0	$83,400	$512,233	26,000	$19.70	1.2297	0.2093	-0.0016	0.1702	1.2313	
Cost Delta 4	$0	$166,462	$1,024,316	51,900	$19.74	1.2306	0.2084	-0.0009	0.1694	1.2315	
Cost Delta 5	$0	$742,480	$4,136,459	207,900	$19.90	1.2472	0.2358	-0.0134	0.1891	1.2606	
Cost Delta 6	$0	$791,571	$4,181,126	207,600	$20.14	1.2694	0.2539	-0.0236	0.2000	1.2930	

Region: PADD III
Year: 1989
Case: MJD Base
GDP Inflator:

	Total J	Distillates Diesel	HHO	Total D	Total MJD
Swing Crude:					
1989 Price:		$22.43	$22.43		
1990 Price:		$23.36	$23.36		
			BPD		
Base * 0.89	676,700	866,200	288,700	1,154,900	4,622,200
Base * 0.94	714,600	914,900	304,900	1,219,800	4,881,800
Base * 0.996	756,500	968,400	322,800	1,291,200	5,167,500
Base * 1	760,300	973,300	324,400	1,297,700	5,193,500
Base * 1.01	767,900	983,000	327,600	1,310,600	5,245,400
Base * 1.05	798,300	1,022,000	340,600	1,362,600	5,453,300
Base * 1.09	828,700	1,060,900	353,600	1,414,500	5,660,900
Delta 1	37,900			64,900	259,600
Delta 2	41,900			71,400	285,700
Delta 3	3,800			6,500	26,000
Delta 4	7,600			12,900	51,900
Delta 5	30,400			52,000	207,900
Delta 6	30,400			51,900	207,600

Cost Delta 1
Cost Delta 2
Cost Delta 3
Cost Delta 4
Cost Delta 5
Cost Delta 6

Region:	PADD-IV															
Year:	1989															
Case:	Base MJD															
GDP Inflator:		1.0416		Inputs								Outputs (ex MJD)				
Swing Crude:		WTI	IC4	nC4	Nat Gas	MTBE	Lead	Var Util.		C3=	C3	C4=	C4s	HSFO	Sulfur	Coke
1989 Price:		$20.01	$14.25	$12.25	$14.15	$35.70	$1.00	$1.00		$24.18	$9.44	$20.00	$12.14	$13.49	$4.20	$3.15
1990 Price:		$20.84	$14.84	$12.76	$14.74	$37.18	$1.04	$1.04		$25.18	$9.83	$20.83	$12.64	$14.05	$4.37	$3.28
				BPD								BPD				
Base * 0.86		82,656	0	13,299	0	0	1,429	139,486		0	10,321	0	0	5,984	1,083	4,278
Base * 0.995		139,739	0	17,150	0	0	1,651	148,795		0	11,489	0	0	9,751	1,103	4,808
Base * 1		142,053	0	17,294	0	0	1,660	149,134		0	11,525	0	0	10,017	1,105	4,808
Base * 1.12		195,963	0	19,478	0	0	1,860	164,764		0	12,316	0	0	16,385	1,279	4,808
Delta 1		57,083	0	3,851	0	0	222	9,309		0	1,168	0	0	3,767	20	530
Delta 2		2,314	0	144	0	0	9	339		0	36	0	0	266	2	0
Delta 3		53,910	0	2,184	0	0	200	15,630		0	791	0	0	6,368	174	0
									Inputs Total Costs							
Cost Delta 1		$1,189,633	$0	$49,133	$0	$0	$231	$9,695	$1,248,692	$0	$11,483	$0	$0	$52,926	$87	$1,739
Cost Delta 2		$48,225	$0	$1,837	$0	$0	$9	$353	$50,424	$0	$354	$0	$0	$3,737	$9	$0
Cost Delta 3		$1,123,507	$0	$27,864	$0	$0	$208	$16,279	$1,167,858	$0	$7,777	$0	$0	$89,469	$761	$0

Region: PADD-IV
Year: 1989
Case: Base MJD
GDP Inflator:
Swing Crude:

	"M" - Gasolines					Jet Fuels		
	LR	ULP	ULR	ULM	Total M	JP4	Jet A	Total J
1989 Price:	$25.79	$28.39	$25.87	$27.13		$22.50	$25.58	
1990 Price:	$26.86	$29.57	$26.94	$28.26		$23.43	$26.64	
		BPD					BPD	
Base * 0.86	63,000	25,700	115,000	900	204,600	13,300	23,000	36,300
Base * 0.995	72,800	29,800	133,000	1,000	236,600	15,400	26,600	42,000
Base * 1	73,200	29,900	133,700	1,000	237,800	15,500	26,700	42,200
Base * 1.12	82,000	33,500	149,700	1,100	266,300	17,400	29,900	47,300
Delta 1					32,000			5,700
Delta 2					1,200			200
Delta 3					28,500			5,100

	Outputs Total Costs	Inputs - Outputs	Delta MJD	Cost/MJD	Crude/MJD	HSFO/MJD	LPGs/MJD	HSFO/Crude	Inputs/MJD
Cost Delta 1	$66,235	$1,182,457	54,200	$21.82	1.0532	0.0695	-0.0495	0.0660	1.1027
Cost Delta 2	$4,100	$46,324	2,100	$22.06	1.1019	0.1267	-0.0514	0.1150	1.1533
Cost Delta 3	$98,007	$1,069,851	48,300	$22.15	1.1161	0.1318	-0.0288	0.1181	1.1450

Region:	**PADD-IV**			
Year:	**1989**			
Case:	**Base MJD**			
GDP Inflator:		**Distillates**		
Swing Crude:	**Diesel**	**HHO**	**Total D**	**Total MJD**
1989 Price:	$24.23	$24.23		
1990 Price:	$25.24	$25.24		
		BPD		
Base * 0.86	79,100	26,300	105,400	346,300
Base * 0.995	91,500	30,400	121,900	400,500
Base * 1	92,000	30,600	122,600	402,600
Base * 1.12	103,000	34,300	137,300	450,900
Delta 1			16,500	54,200
Delta 2			700	2,100
Delta 3			14,700	48,300
Cost Delta 1				
Cost Delta 2				
Cost Delta 3				

Region:	PADD-VC										
Year:	1989										
Case:	Base MJD										
GDP Inflator:	1.0416		Inputs								Outputs (ex MJD)
Swing Crude:	ANS	IC4	nC4	Nat Gas	MTBE	Lead	Var Util.		C3=	C3	C4=
1989 Price:	$16.93	$14.25	$12.25	$14.15	$39.00	$1.00	$1.00		$24.18	$9.44	$20.00
1990 Price:	$17.63	$14.84	$12.76	$14.74	$40.62	$1.04	$1.04		$25.18	$9.83	$20.83
			BPD								BPD
Base * .906	410,928	0	19,422	44,447	0	3,901	1,044,415		35,607	70,610	0
Base * .995	512,006	0	20,959	44,992	0	4,089	1,067,115		36,580	72,696	0
Base * 1	628,163	0	22,252	44,897	0	4,305	1,092,492		36,580	75,576	0
Base * 1.022	678,361	0	23,823	45,687	0	4,398	1,100,032		36,580	76,230	0
Base * 1.071	794,185	0	27,400	49,111	0	4,611	1,124,556		36,580	76,110	0
Base *											
Base *											
Delta 1	101,078	0	1,537	545	0	188	22,700		973	2,086	0
Delta 2	116,157	0	1,293	-95	0	216	25,377		0	2,880	0
Delta 3	50,198	0	1,571	790	0	93	7,540		0	654	0
Delta 4	115,824	0	3,577	3,424	0	213	24,524		0	-120	0
								Inputs Total Costs			
Cost Delta 1	$1,782,267	$0	$19,610	$8,032	$0	$196	$23,642	$1,833,747	$24,504	$20,509	$0
Cost Delta 2	$2,048,149	$0	$16,497	-$1,400	$0	$225	$26,430	$2,089,901	$0	$28,315	$0
Cost Delta 3	$885,121	$0	$20,043	$11,642	$0	$97	$7,853	$924,757	$0	$6,430	$0
Cost Delta 4	$2,042,278	$0	$45,637	$50,460	$0	$222	$25,542	$2,164,138	$0	-$1,180	$0

Region:	PADD-VC											
Year:	1989											
Case:	Base MJD											
GDP Inflator:									"M" - Gasolines			
Swing Crude:		C4s	HSFO	Sulfur	Coke			LR	ULP	ULR	ULM	Total M
1989 Price:		$12.14	$14.15	$4.20	$3.15			$25.79	$28.35	$25.79	$27.07	
1990 Price:		$12.64	$14.74	$4.37	$3.28			$26.86	$29.53	$26.86	$28.19	
									BPD			
Base * .906		14,967	156,311	9,915	83,797			172,000	213,000	473,900	10,000	868,900
Base * .995		15,345	187,418	10,225	83,895			180,300	233,300	496,900	10,500	911,000
Base * 1		14,533	224,236	10,429	83,895			189,800	235,100	523,100	11,000	959,000
Base * 1.022		15,026	241,231	10,527	83,895			193,900	240,200	534,400	11,200	979,700
Base * 1.071		15,660	283,372	11,031	83,895			203,300	251,800	560,200	11,800	1,027,100
Base *												
Base *												
Delta 1		378	31,107	310	98							42,100
Delta 2		-812	36,818	204	0							48,000
Delta 3		493	16,995	98	0							20,700
Delta 4		634	42,141	504	0							47,400
						Outputs						
						Total Costs	Inputs - Outputs	Delta MJD	Cost/MJD	Crude/MJD	HSFO/MJD	LPGs/MJD
Cost Delta 1		$4,779	$458,431	$1,356	$322	$509,900	$1,323,846	66,700	$19.85	1.5154	0.4664	0.0203
Cost Delta 2		-$10,267	$542,595	$892	$0	$561,536	$1,528,365	75,900	$20.14	1.5304	0.4851	0.0115
Cost Delta 3		$6,233	$250,459	$429	$0	$263,551	$661,205	32,700	$20.22	1.5351	0.5197	-0.0371
Cost Delta 4		$8,016	$621,041	$2,205	$0	$630,082	$1,534,056	75,000	$20.45	1.5443	0.5619	-0.0865

Region:	**PADD-VC**							
Year:	**1989**							
Case:	**Base MJD**							
GDP Inflator:			**Jet Fuels**			**Distillates**		
Swing Crude:		**JP4**	**Jet A**	**Total J**	**Diesel**	**HHO**	**Total D**	**Total MJD**
1989 Price:		$22.50	$25.12		$23.39	$23.39		
1990 Price:		$23.43	$26.16		$24.36	$24.36		
			BPD			BPD		
Base * .906		44,800	186,800	231,600	274,200	0	274,200	1,374,700
Base * .995		47,000	195,900	242,900	287,500	0	287,500	1,441,400
Base * 1		49,500	206,200	255,700	302,600	0	302,600	1,517,300
Base * 1.022		50,600	210,600	261,200	309,100	0	309,100	1,550,000
Base * 1.071		53,000	220,800	273,800	324,100	0	324,100	1,625,000
Base *								
Base *								
Delta 1				11,300			13,300	66,700
Delta 2				12,800			15,100	75,900
Delta 3				5,500			6,500	32,700
Delta 4				12,600			15,000	75,000

	HSFO/Crude	**Inputs/MJD**
Cost Delta 1	0.3078	1.4951
Cost Delta 2	0.3170	1.5189
Cost Delta 3	0.3386	1.5722
Cost Delta 4	0.3638	1.6308

Region:	PADD-VOC													
Year:	1989													
Case:	Base MJD													
GDP Inflator:	1.0416		Inputs								Outputs (ex MJD)			
Swing Crude:	ANS	IC4	nC4	Nat Gas	MTBE	Lead	Ver Util.		C3=	C3	C4=	C4s	HSFO	Sulfur
1989 Price:	$16.93	$14.25	$12.25	$13.87	$39.00	$1.00	$1.00		$24.18	$9.44	$20.00	$12.14	$13.87	$4.20
1990 Price:	$17.63	$14.84	$12.76	$14.45	$40.62	$1.04	$1.04		$25.18	$9.83	$20.83	$12.64	$14.45	$4.37
			BPD								BPD			
Base * 0.914	412,007	0	4,727	11,482	0	1,290	251,157		0	14,717	0	2,645	75,281	1,978
Base * .995	501,640	0	4,851	12,863	0	1,404	261,127		0	15,694	0	4,174	121,257	1,998
Base * .1.0	507,416	0	4,857	12,947	0	1,411	261,738		0	15,750	0	4,264	124,227	1,999
Base * 1.084	601,041	0	4,897	14,394	0	1,529	271,478		0	16,617	0	5,690	172,451	2,018
Delta 1	89,633	0	124	1,381	0	114	9,970		0	977	0	1,529	45,976	20
Delta 2	5,776	0	6	64	0	7	611		0	56	0	90	2,970	1
Delta 3	93,625	0	40	1,447	0	118	9,740		0	867	0	1,426	48,224	19
								Inputs Total Costs						
Cost Delta 1	$1,580,462	$0	$1,582	$19,949	$0	$119	$10,384	$1,612,496	$0	$9,606	$0	$19,332	$664,151	$87
Cost Delta 2	$101,846	$0	$77	$1,213	$0	$7	$636	$103,779	$0	$551	$0	$1,138	$42,903	$4
Cost Delta 3	$1,650,852	$0	$510	$20,903	$0	$123	$10,144	$1,682,532	$0	$8,524	$0	$18,030	$696,625	$83

Region:	**PADD-VOC**										
Year:	**1989**										
Case:	**Base MJD**										
GDP Inflator:					**"M" - Gasolines**						**Jet Fuels**
Swing Crude:	**Coke**			**LR**	**ULP**	**ULR**	**ULM**	**Total M**		**JP4**	**Jet A**
1989 Price:	$3.15			$25.16	$28.35	$25.79	$27.07			$22.50	$25.12
1990 Price:	$3.28			$26.20	$29.53	$26.86	$28.19			$23.43	$26.16
					BPD						BPD
Base * 0.914	19,264			56,900	26,000	119,500	800	203,200		9,500	122,100
Base * .995	19,503			61,900	28,400	130,000	900	221,200		10,300	132,900
Base * .1.0	19,519			62,200	28,500	130,700	900	222,300		10,400	133,600
Base * 1.084	19,756			67,400	30,900	141,700	1,000	241,000		11,300	144,600
Delta 1	239							18,000			
Delta 2	16							1,100			
Delta 3	237							18,700			
		Outputs Total Costs	**Inputs - Outputs**	**Delta MJD**	**Cost/MJD**	**Crude/MJD**	**HSFO/MJD**	**LPGs/MJD**	**HSFO/Crude**	**Inputs/MJD**	
Cost Delta 1	$784	$693,961	$918,536	40,400	$22.74	2.2186	1.1380	0.0248	0.5129	2.1939	
Cost Delta 2	$52	$44,649	$59,131	2,600	$22.74	2.2215	1.1423	0.0215	0.5142	2.2000	
Cost Delta 3	$778	$724,040	$958,492	42,100	$22.77	2.2239	1.1455	0.0191	0.5151	2.2047	

Region:	PADD-VOC					
Year:	1989					
Case:	Base MJD					
GDP Inflator:			Distillates			
Swing Crude:		Total J	Diesel	HHO	Total D	Total MJD
1989 Price:			$23.39	$23.39		
1990 Price:			$24.36	$24.36		
				BPD		
Base * 0.914		131,600	74,700	47,400	122,100	456,900
Base * .995		143,200	81,300	51,600	132,900	497,300
Base * .1.0		144,000	81,700	51,900	133,600	499,900
Base * 1.084		156,100	88,600	56,300	144,900	542,000
Delta 1		11,600			10,800	40,400
Delta 2		800			700	2,600
Delta 3		12,100			11,300	42,100
Cost Delta 1						
Cost Delta 2						
Cost Delta 3						

Region: PADD-I
Period: 1995

		M w/MTBE								M w/o MTBE					
	MTBE BPD	ULR BPD	ULP BPD	OULR BPD	OULP BPD	RULR BPD	RULP BPD	ROULR BPD	ROULP BPD	HC OULR BPD	HC OULP BPD	HC RULR BPD	HC RULP BPD	HC ROULR BPD	HC ROULP BPD
Base MJD															
Low Case	87,559	0	0	0	0	233,640	94,048	235,516	94,801	0	0	208,537	83,136	200,189	80,581
Base @ 1.05 MJD	97,390	0	0	0	0	259,871	104,605	261,959	105,445	0	0	229,726	92,470	222,665	89,628
Base * 1	105,370	0	0	0	0	281,167	113,176	283,425	114,085	0	0	248,551	100,046	240,911	96,973
High Case	110,070	0	0	0	0	293,708	118,225	296,067	119,174	0	0	259,638	104,511	251,657	101,298
M'															
Low Case	94,955	0	0	0	0	253,375	101,990	255,411	102,809	0	0	223,984	90,159	217,099	87,388
Base @ 1.05 MJD	105,616	0	0	0	0	281,623	113,441	284,086	114,352	0	0	249,131	100,281	241,473	97,199
Base * 1	114,271	0	0	0	0	304,917	122,737	307,366	123,722	0	0	269,548	108,499	261,261	105,164
High Case	119,368	0	0	0	0	318,518	128,211	321,076	129,241	0	0	281,570	113,339	272,915	109,855
J'															
Low Case	85,989	0	0	0	0	229,450	92,359	231,293	93,101	0	0	202,834	81,646	196,599	79,136
Base @ 1.05 MJD	95,643	0	0	0	0	255,212	102,729	257,262	103,554	0	0	225,607	90,812	218,672	88,021
Base * 1	103,481	0	0	0	0	276,125	111,147	278,343	112,040	0	0	244,095	98,254	236,591	95,234
High Case	108,097	0	0	0	0	288,442	116,105	290,758	117,037	0	0	254,982	102,637	247,145	99,482
D'															
Low Case	78,140	0	0	0	0	208,507	83,929	210,182	84,603	0	0	184,320	74,193	178,654	71,913
Base @ 1.05 MJD	86,913	0	0	0	0	231,917	93,352	233,760	94,102	0	0	205,014	82,523	198,713	79,987
Base * 1	94,036	0	0	0	0	250,921	101,002	252,937	101,813	0	0	221,814	89,286	214,996	86,541
High Case	98,230	0	0	0	0	262,114	105,507	264,219	106,355	0	0	231,708	93,268	224,586	90,401

Region: PADD-I
Period: 1995

	M ex MTBE BPD	Jet BPD	LS Diesel BPD	Diesel BPD	HHO BPD	Total MJD ex MTBE	Crude BPD	HSFO BPD	M % MJD ex MTBE	J % MJD ex MTBE	LS D % MJD ex MTBE	D % MJD ex MTBE	HHO % MJD ex MTBE
Base MJD													
Low Case	570,444	78,422	241,754	0	55,878	946,498	18,800	0	60.269%	8.286%	25.542%	0.000%	5.904%
Base @ 1.05 MJD	634,490	87,227	268,896	0	62,152	1,052,765	144,700	14,034	60.269%	8.286%	25.542%	0.000%	5.904%
Base * 1	688,483	94,375	290,931	0	67,245	1,139,034	258,015	41,616	60.269%	8.286%	25.542%	0.000%	5.904%
High Case	717,104	98,584	303,908	0	70,244	1,189,841	325,200	58,671	60.269%	8.286%	25.542%	0.000%	5.904%
M'													
Low Case	618,629	68,388	210,795	0	48,685	946,498	31,710	24,457	65.360%	7.225%	22.271%	0.000%	5.144%
Base @ 1.05 MJD	688,085	76,067	234,462	0	54,151	1,052,765	157,610	38,491	65.360%	7.225%	22.271%	0.000%	5.144%
Base * 1	744,471	82,300	253,675	0	58,589	1,139,034	260,015	50,171	65.360%	7.225%	22.271%	0.000%	5.144%
High Case	777,678	85,971	264,990	0	61,202	1,189,841	326,750	66,416	65.360%	7.225%	22.271%	0.000%	5.144%
J'													
Low Case	560,215	94,092	237,347	0	54,844	946,498	32,180	15,895	59.188%	9.941%	25.076%	0.000%	5.794%
Base @ 1.05 MJD	623,113	104,656	263,995	0	61,001	1,052,765	158,080	29,929	59.188%	9.941%	25.076%	0.000%	5.794%
Base * 1	674,174	113,232	285,628	0	66,000	1,139,034	260,538	41,684	59.188%	9.941%	25.076%	0.000%	5.794%
High Case	704,246	118,283	298,369	0	68,944	1,189,841	327,272	57,928	59.188%	9.941%	25.076%	0.000%	5.794%
D'													
Low Case	509,081	69,999	298,444	0	68,974	946,498	42,376	17,672	53.786%	7.396%	31.531%	0.000%	7.287%
Base @ 1.05 MJD	566,237	77,858	331,952	0	76,718	1,052,765	168,276	31,708	53.786%	7.396%	31.531%	0.000%	7.287%
Base * 1	612,637	84,238	359,153	0	83,005	1,139,034	271,840	45,076	53.786%	7.396%	31.531%	0.000%	7.287%
High Case	639,964	87,996	375,174	0	86,707	1,189,841	338,576	61,320	53.786%	7.396%	31.531%	0.000%	7.287%

Region: PADD-I
Period: 1995

	% MJD											
	ULR ex MTBE	ULP ex MTBE	HC OULR ex MTBE	HC OULP ex MTBE	RULR ex MTBE	RULP ex MTBE	ROULR ex MTBE	ROULP ex MTBE	M % MJD ex MTBE	% Incr Prime/Base	MJD $/D	MJD $/BBL
Base MJD												
Low Case	0.000%	0.000%	0.000%	0.000%	21.821%	8.784%	21.150%	8.514%	60.269%		$17,983,462	
Base @ 1.05 MJD	0.000%	0.000%	0.000%	0.000%	21.821%	8.784%	21.150%	8.514%	60.269%		$20,015,254	$19.12
Base * 1	0.000%	0.000%	0.000%	0.000%	21.821%	8.784%	21.150%	8.514%	60.269%		$21,728,564	$19.86
High Case	0.000%	0.000%	0.000%	0.000%	21.821%	8.784%	21.150%	8.514%	60.269%		$22,779,856	$20.69
M'												
Low Case	0.000%	0.000%	0.000%	0.000%	23.664%	9.526%	22.937%	9.233%	65.360%	5.091%		
Base @ 1.05 MJD	0.000%	0.000%	0.000%	0.000%	23.664%	9.526%	22.937%	9.233%	65.360%	5.091%	$21,706,711	
Base * 1	0.000%	0.000%	0.000%	0.000%	23.664%	9.526%	22.937%	9.233%	65.360%	5.091%		
High Case	0.000%	0.000%	0.000%	0.000%	23.664%	9.526%	22.937%	9.233%	65.360%	5.091%		
J'												
Low Case	0.000%	0.000%	0.000%	0.000%	21.430%	8.626%	20.771%	8.361%	59.188%	1.656%		
Base @ 1.05 MJD	0.000%	0.000%	0.000%	0.000%	21.430%	8.626%	20.771%	8.361%	59.188%	1.656%	$21,699,346	
Base * 1	0.000%	0.000%	0.000%	0.000%	21.430%	8.626%	20.771%	8.361%	59.188%	1.656%		
High Case	0.000%	0.000%	0.000%	0.000%	21.430%	8.626%	20.771%	8.361%	59.188%	1.656%		
D'												
Low Case	0.000%	0.000%	0.000%	0.000%	19.474%	7.839%	18.875%	7.598%	53.786%	7.373%		
Base @ 1.05 MJD	0.000%	0.000%	0.000%	0.000%	19.474%	7.839%	18.875%	7.598%	53.786%	7.373%	$21,623,160	
Base * 1	0.000%	0.000%	0.000%	0.000%	19.474%	7.839%	18.875%	7.598%	53.786%	7.373%		
High Case	0.000%	0.000%	0.000%	0.000%	19.474%	7.839%	18.875%	7.598%	53.786%	7.373%		

Region: PADD-I
Year: 1995
Case: Base MJD

GDP Inflator:	1.0416			Inputs		Purch.				Produced		Outputs (ex MJD)			
Swing Crude:	Arab Light	IC4	nC4	Nat Gas	Meth.	MTBE	Lead	Var Util.		MTBE	C3=	C3	C4=	C4s	HSFO
1989 Price:	$17.44	$15.25	$12.25	$14.47	$18.35	$35.70		$1.00			$15.18	$9.44	$13.00	$0.00	$14.47
1990 Price:	$18.16	$15.88	$12.76	$15.07	$19.11	$37.18	$0.00	$1.04			$15.81	$9.83	$13.54	$0.00	$15.07
			BPD										BPD		
Low Case	18,600	1,324	19,154	9,240	3,919	75,702		415,802		11,635	12,900	27,227	2,300	0	0
Base @ 1.05 MJD	144,700	1,324	19,355	8,286	4,551	83,532		474,022		13,512	12,900	29,985	2,300	0	14,034
Base * 1	258,015	1,324	20,578	12,167	4,418	92,062		475,048		13,115	12,900	31,608	2,300	0	41,616
High Case	325,200	1,324	23,128	14,926	4,344	97,171		485,568		12,896	12,900	31,833	2,300	0	58,671
M Prime	258,000	1,324	28,593	11,597	4,527	101,070		490,611		13,438	12,900	31,677	2,300	0	49,681
J Prime	258,000	1,324	18,494	11,657	4,419	89,869		472,551		13,119	12,900	31,575	2,300	0	41,067
D Prime	258,000	1,324	11,788	12,137	4,219	80,192		454,189		12,525	12,900	30,241	2,300	0	41,707
Delta 1	125,900	0	201	-954	632	7,830	0	58,220			0	2,758	0	0	14,034
Delta 2	113,315	0	1,223	3,881	-133	8,530	0	1,026			0	1,623	0	0	27,582
Delta 3	67,185	0	2,550	2,759	-74	5,109	0	10,520			0	225	0	0	17,055
									Inputs						
									Total Costs						
Cost Delta 1	$2,286,817	$0	$2,564	-$14,377	$12,078	$291,132	$0	$60,636	$2,638,851		$0	$27,116	$0	$0	$211,499
Cost Delta 2	$2,058,226	$0	$15,603	$58,489	-$2,542	$317,159	$0	$1,069	$2,448,004		$0	$15,957	$0	$0	$415,675
Cost Delta 3	$1,220,332	$0	$32,534	$41,580	-$1,414	$189,961	$0	$10,957	$1,493,948		$0	$2,212	$0	$0	$257,027

Region:	PADD-I							
Year:	1995							
Case:	Base MJD							
GDP Inflator:			MTBE	"M" Gasolines (inc MTBE)				Total M
Swing Crude:	Sulfur	Coke	In Gasoline	ULR	ULP	ULR Ref	ULP Ref	(exc MTBE)
1989 Price:	$4.20	$3.15	$35.70	$23.77	$26.42	$23.77	$26.42	
1990 Price:	$4.37	$3.28	$37.18	$24.76	$27.52	$24.76	$27.52	
					BPD			
Low Case	3,923	12,925	87,337			469,022	188,788	570,473
Base @ 1.05 MJD	5,089	13,663	97,044			521,636	209,966	634,558
Base * 1	5,649	13,119	105,177			564,429	227,182	686,434
High Case	5,881	13,297	110,067			589,732	237,376	717,041
M Prime	5,491	13,119	114,508			611,764	246,192	743,468
J Prime	5,596	13,354	102,988			553,289	222,730	673,031
D Prime	5,704	13,354	92,717			498,921	200,766	606,970
Delta 1	1,166	738	9,707					64,085
Delta 2	560	-544	8,133					51,876
Delta 3	232	178	4,890					30,607

	Sulfur	Coke	MTBE In Gasoline	Outputs Total Costs	Inputs - Outputs	Delta MJD	Cost/MJD	Crude/MJD	HSFO/MJD	LPGs/MJD	HSFO/Crude
Cost Delta 1	$5,100	$2,421	$360,921	$607,058	$2,031,792	106,267	$19.12	1.1848	0.1321	0.0330	0.1115
Cost Delta 2	$2,450	-$1,785	$302,398	$734,694	$1,713,310	86,269	$19.86	1.3135	0.3197	-0.0404	0.2434
Cost Delta 3	$1,015	$584	$181,818	$442,656	$1,051,292	50,607	$20.89	1.3224	0.3357	-0.1001	0.2539

Region:	PADD-I							
Year:	1995							
Case:	Base MJD							
GDP Inflator:			Jet Fuels			Distillates		Total MJD
Swing Crude:		JP4	Jet A	Total J	Diesel	HHO	Total D	(exc MTBE)
1989 Price:			$24.57		$23.02	$23.02		
1990 Price:		$0.00	$25.59		$23.98	$23.98		
			BPD			BPD		
Low Case			78,412	78,412	241,752	55,861	297,613	946,498
Base @ 1.05 MJD			87,208	87,208	268,872	62,127	330,999	1,052,765
Base * 1			94,400	94,400	290,900	67,300	358,200	1,139,034
High Case			98,592	98,592	303,971	70,237	374,208	1,189,841
M Prime			62,189	62,189	253,333	58,510	311,843	1,137,500
J Prime			113,040	113,040	285,144	65,888	351,032	1,137,103
D Prime			83,459	83,459	355,831	82,237	438,068	1,128,497
Delta 1				8,796			33,386	106,267
Delta 2				7,192			27,201	86,269
Delta 3				4,192			16,008	50,807
		Inputs/MJD						
Cost Delta 1		1.1517						
Cost Delta 2		1.3539						
Cost Delta 3		1.4224						

Region: PADD-II
Period: 1996

		M w/MTBE								M w/o MTBE					
	MTBE	ULR	ULP	OULR	OULP	RULR	RULP	ROULR	ROULP	HC OULR	HC OULP	HC RULR	HC RULP	HC ROULR	HC ROULP
	BPD	BPD	BPD	BPD	BPD	BPD	BPD	BPD	BPD	BPD	BPD	BPD	BPD	BPD	BPD
Base MJD															
Low Case	41,500	1,005,961	229,863	70,213	16,044	200,426	45,798	0	0	59,681	13,637	177,177	40,485	0	0
Base * 1	45,962	1,114,107	254,575	77,761	17,769	221,973	50,721	0	0	66,097	15,103	196,224	44,837	0	0
High Case	49,815	1,207,512	275,918	84,281	19,258	240,583	54,973	0	0	71,639	16,369	212,675	48,597	0	0
M'															
Low Case	43,808	1,061,894	242,644	74,117	16,936	211,570	48,344	0	0	62,999	14,395	187,028	42,736	0	0
Base * 1	48,518	1,176,053	268,730	82,085	18,757	234,315	53,541	0	0	69,772	15,943	207,135	47,331	0	0
High Case	52,585	1,274,652	291,259	68,967	20,329	253,960	58,030	0	0	75,622	17,280	224,500	51,299	0	0
J'															
Low Case	41,186	998,349	228,124	69,682	15,922	198,910	45,451	0	0	59,229	13,534	175,836	40,179	0	0
Base * 1	45,614	1,105,676	252,648	77,173	17,634	220,293	50,337	0	0	65,597	14,989	194,739	44,498	0	0
High Case	49,438	1,198,374	273,830	83,643	19,113	238,762	54,558	0	0	71,096	16,246	211,066	48,229	0	0
D'															
Low Case	39,196	950,093	217,097	66,314	15,153	189,295	43,254	0	0	56,367	12,880	167,337	38,237	0	0
Base * 1	43,409	1,052,233	240,436	73,443	16,782	209,645	47,904	0	0	62,426	14,264	185,326	42,347	0	0
High Case	47,049	1,140,450	260,594	79,600	18,189	227,222	51,920	0	0	67,660	15,460	200,864	45,898	0	0

Region: PADD-II
Period: 1995

	M ex MTBE BPD	Jet BPD	LS Diesel BPD	Diesel BPD	HHO BPD	Total MJD ex MTBE	Crude BPD	HSFO BPD	M % MJD ex MTBE	J % MJD ex MTBE	LS D % MJD ex MTBE	D % MJD ex MTBE	HHO % MJD ex MTBE
Base MJD													
Low Case	1,526,805	184,721	509,139	0	106,586	2,327,251	611,400	17,908	65.606%	7.937%	21.877%	0.000%	4.580%
Base * 1	1,690,944	204,580	563,873	0	118,045	2,577,442	887,900	61,267	65.606%	7.937%	21.877%	0.000%	4.580%
High Case	1,832,710	221,731	611,148	0	127,942	2,793,530	1,143,300	98,729	65.606%	7.937%	21.877%	0.000%	4.580%
M'													
Low Case	1,611,698	165,091	455,309	0	95,154	2,327,251	605,834	17,311	69.253%	7.094%	19.564%	0.000%	4.089%
Base * 1	1,784,963	182,839	504,257	0	105,383	2,577,442	882,334	60,670	69.253%	7.094%	19.564%	0.000%	4.089%
High Case	1,934,611	198,168	546,533	0	114,218	2,793,530	1,137,348	98,132	69.253%	7.094%	19.564%	0.000%	4.089%
J'													
Low Case	1,515,251	201,458	504,949	0	105,593	2,327,251	610,829	16,987	65.109%	8.656%	21.697%	0.000%	4.537%
Base * 1	1,678,148	223,115	559,234	0	116,945	2,577,442	887,329	60,346	65.109%	8.656%	21.697%	0.000%	4.537%
High Case	1,818,841	241,821	606,119	0	126,749	2,793,530	1,142,689	97,808	65.109%	8.656%	21.697%	0.000%	4.537%
D'													
Low Case	1,442,010	174,628	587,709	0	122,904	2,327,251	616,465	15,417	61.962%	7.504%	25.253%	0.000%	5.281%
Base * 1	1,597,034	193,401	650,890	0	136,117	2,577,442	892,965	58,776	61.962%	7.504%	25.253%	0.000%	5.281%
High Case	1,730,926	209,615	705,460	0	147,529	2,793,530	1,148,717	96,239	61.962%	7.504%	25.253%	0.000%	5.281%

Region: PADD-II
Period: 1995

	% MJD											
	ULR ex MTBE	ULP ex MTBE	HC OULR ex MTBE	HC OULP ex MTBE	RULR ex MTBE	RULP ex MTBE	ROULR ex MTBE	ROULP ex MTBE	M % MJD ex MTBE	% Incr Prime/Base	MJD $/D	MJD $/BBL
Base MJD												
Low Case	43.225%	9.877%	2.564%	0.586%	7.613%	1.740%	0.000%	0.000%	65.606%		$44,217,769	
Base * 1	43.225%	9.877%	2.564%	0.586%	7.613%	1.740%	0.000%	0.000%	65.606%		$49,600,235	$22.31
High Case	43.225%	9.877%	2.564%	0.586%	7.613%	1.740%	0.000%	0.000%	65.606%		$54,666,557	$22.52
M'												
Low Case	45.629%	10.426%	2.707%	0.619%	8.036%	1.836%	0.000%	0.000%	69.253%	3.648%		
Base * 1	45.629%	10.426%	2.707%	0.619%	8.036%	1.836%	0.000%	0.000%	69.253%	3.648%	$49,838,122	
High Case	45.629%	10.426%	2.707%	0.619%	8.036%	1.836%	0.000%	0.000%	69.253%	3.648%		
J'												
Low Case	42.898%	9.802%	2.545%	0.582%	7.556%	1.726%	0.000%	0.000%	65.109%	0.719%		
Base * 1	42.898%	9.802%	2.545%	0.582%	7.556%	1.726%	0.000%	0.000%	65.109%	0.719%	$49,817,687	
High Case	42.898%	9.802%	2.545%	0.582%	7.556%	1.726%	0.000%	0.000%	65.109%	0.719%		
D'												
Low Case	40.825%	9.328%	2.422%	0.553%	7.190%	1.643%	0.000%	0.000%	61.962%	4.077%		
Base * 1	40.825%	9.328%	2.422%	0.553%	7.190%	1.643%	0.000%	0.000%	61.962%	4.077%	$49,769,724	
High Case	40.825%	9.328%	2.422%	0.553%	7.190%	1.643%	0.000%	0.000%	61.962%	4.077%		

Region:	**PADD-II**														
Year:	**1995**														
Case:	**Base MJD**														
GDP Inflator:	**1.0416**			**Inputs**		**Purch.**				**Produced**		**Outputs (ex MJD)**			
Swing Crude:	**WTI**	**IC4**	**nC4**	**Nat Gas**	**Meth.**	**MTBE**	**Lead**	**Var Util.**		**MTBE**	**C3=**	**C3**	**C4=**	**C4s**	**HSFO**
1989 Price:	$20.06	$15.25	$12.25	$15.44	$18.35	$35.70		$1.00			$24.18	$9.44			$13.49
1990 Price:	$20.89	$15.88	$12.76	$16.06	$19.11	$37.18	$0.00	$1.04			$25.18	$9.83	$0.00	$0.00	$14.05
			BPD										BPD		
Low Case	611,400	38,317	66,707	1,086	8,287	15,938		1,036,745		24,600	14,838	85,011	0	0	17,906
Base * 1	887,900	50,000	74,376	2,160	8,287	26,384		1,182,351		24,600	14,838	89,740	0	0	61,267
High Case	1,143,300	49,909	78,845	0	8,287	32,464		1,227,345		24,600	14,838	91,973	0	0	98,729
M Prime	887,900	50,000	81,203	0	8,287	32,639		1,190,915		24,600	12,695	91,659	0	0	61,543
J Prime	887,900	50,000	74,139	2,478	8,287	25,945		1,179,509		24,600	14,838	69,027	0	0	60,436
D Prime	887,900	44,138	69,053	3,430	8,287	25,604		1,129,042		24,600	14,838	77,600	0	0	57,982
Delta 1	276,500	11,683	7,669	1,074	0	10,446	0	145,606			0	4,729	0	0	43,359
Delta 2	255,400	-91	4,469	-2,160	0	6,080	0	44,994			0	2,233	0	0	37,462
									Inputs Total Costs						
Cost Delta 1	$5,776,773	$165,560	$97,844	$17,271	$0	$388,398	$0	$151,649	$6,617,495		$0	$46,494	$0	$0	$609,187
Cost Delta 2	$5,335,942	-$1,445	$57,017	-$34,734	$0	$226,064	$0	$46,861	$5,629,704		$0	$21,954	$0	$0	$526,335

Region: PADD-II											
Year: 1995											
Case: Base MJD											
GDP Inflator:			MTBE			"M" Gasolines (inc MTBE)				Total M	
Swing Crude:	Sulfur	Coke	In Gasoline			ULR	ULP	ULR Ref	ULP Ref	(exc MTBE)	
1989 Price:	$4.20	$3.15	$35.70			$24.02	$28.06	$24.02	$28.06		
1990 Price:	$4.37	$3.28	$37.18			$25.02	$29.22	$25.02	$29.22		
							BPD				
Low Case	9,094	69,945	40,538			1,077,107	246,013	200,552	45,935	1,529,069	
Base * 1	9,842	66,189	50,984			1,193,663	272,758	222,311	50,794	1,688,542	
High Case	10,196	62,373	57,064			1,296,735	296,177	241,445	55,302	1,832,595	
M Prime	9,837	66,395	57,239			1,266,536	289,313	235,991	53,850	1,788,451	
J Prime	9,865	66,269	50,545			1,186,507	270,999	221,057	50,467	1,678,485	
D Prime	9,893	66,092	50,204			1,128,442	257,847	210,107	46,002	1,594,194	
Delta 1	748	-3,756	10,446							159,473	
Delta 2	354	-3,816	6,080							144,053	
				Outputs Total Costs	Inputs - Outputs	Delta MJD	Cost/MJD	Crude/MJD	HSFO/MJD	LPGs/MJD	HSFO/Crude
Cost Delta 1	$3,272	-$12,322	$388,398	$1,035,029	$5,582,466	250,191	$22.31	1.1052	0.1733	-0.0627	0.1568
Cost Delta 2	$1,549	-$12,519	$228,064	$763,382	$4,866,322	216,088	$22.52	1.1819	0.1734	0.0001	0.1467

Region: PADD-II
Year: 1995
Case: Base MJD
GDP Inflator:

	Jet Fuels			Distillates			Total MJD
Swing Crude:	JP4	Jet A	Total J	Diesel	HHO	Total D	(exc MTBE)
1989 Price:		$24.19		$22.43	$22.43		
1990 Price:	$0.00	$25.19		$23.36	$23.36		
		BPD			BPD		
Low Case		184,214	184,214	507,654	106,314	613,968	2,327,251
Base * 1		205,100	205,100	565,500	118,300	683,800	2,577,442
High Case		221,776	221,776	611,167	127,992	739,159	2,793,530
M Prime		183,196	183,196	505,242	105,589	610,831	2,582,478
J Prime		223,160	223,160	559,346	116,968	676,314	2,577,959
D Prime		193,057	193,057	649,733	135,875	785,608	2,572,859
Delta 1			20,886			69,832	250,191
Delta 2			16,676			55,359	216,088

	Inputs/MJD
Cost Delta 1	1.1679
Cost Delta 2	1.1819

Region: PADD-III
Period: 1995

		M w/MTBE								M w/o MTBE					
	MTBE BPD	ULR BPD	ULP BPD	OULR BPD	OULP BPD	RULR BPD	RULP BPD	ROULR BPD	ROULP BPD	HC OULR BPD	HC OULP BPD	HC RULR BPD	HC RULP BPD	HC ROULR BPD	HC ROULP BPD
Base MJD															
Low Case	69,367	1,697,468	596,408	156,017	54,817	178,900	62,857	47,845	16,811	132,615	46,594	158,147	55,565	40,669	14,289
Base @ 4.8	73,536	1,799,465	632,252	165,394	58,111	189,652	66,634	50,721	17,821	140,585	49,395	167,652	58,905	43,113	15,148
Base * 1	78,822	1,928,824	677,695	177,282	62,268	203,283	71,424	54,366	19,102	150,689	52,945	179,702	63,139	46,211	16,236
High Case	86,368	2,113,463	742,575	194,254	68,251	222,745	78,262	59,571	20,930	165,116	58,014	196,906	69,183	50,636	17,791
M'															
Low Case	73,327	1,794,371	630,455	164,924	57,946	189,113	66,445	50,577	17,770	140,185	49,254	167,176	58,737	42,990	15,105
Base @ 4.8	77,734	1,902,212	668,345	174,836	61,429	200,478	70,438	53,616	18,836	148,610	52,214	177,223	62,267	45,574	16,012
Base * 1	83,321	2,038,934	716,382	187,402	65,844	214,888	75,501	57,470	20,192	159,292	55,967	189,961	66,743	48,849	17,163
High Case	91,298	2,234,135	784,966	205,343	72,148	235,460	82,729	62,972	22,125	174,542	61,325	208,147	73,133	53,526	18,806
J'															
Low Case	67,469	1,651,025	580,090	151,749	53,317	174,005	61,137	46,536	16,351	126,966	45,320	153,820	54,045	39,556	13,898
Base @ 4.8	71,524	1,750,250	614,953	160,869	56,521	184,463	64,811	49,333	17,333	136,738	48,043	163,085	57,293	41,933	14,733
Base * 1	76,665	1,876,050	659,153	172,431	60,584	197,721	69,470	52,879	18,579	146,566	51,496	174,785	61,411	44,947	15,792
High Case	84,005	2,055,657	722,258	188,939	66,384	216,650	76,120	57,941	20,358	160,598	56,426	191,519	67,290	49,250	17,304
D'															
Low Case	66,256	1,621,336	569,659	149,020	52,358	170,876	60,038	45,699	16,057	126,667	44,505	151,054	53,073	38,845	13,648
Base @ 4.8	70,238	1,718,777	603,895	157,976	55,505	181,146	63,646	48,446	17,022	134,279	47,179	160,133	56,263	41,179	14,468
Base * 1	75,266	1,842,315	647,300	169,330	59,494	194,166	68,220	51,928	18,245	143,931	50,570	171,642	60,307	44,139	15,508
High Case	82,494	2,018,692	709,270	165,542	65,190	212,754	74,752	56,899	19,992	157,710	55,412	188,075	66,080	48,364	16,993

Region: PADD-III
Period: 1995

	M ex MTBE BPD	Jet BPD	LS Diesel BPD	Diesel BPD	HHO BPD	Total MJD ex MTBE	Crude BPD	HSFO BPD	M % MJD ex MTBE	J % MJD ex MTBE	LS D % MJD ex MTBE	D % MJD ex MTBE	HHO % MJD ex MTBE
Base MJD													
Low Case	2,741,756	669,027	801,574	0	340,088	4,552,445	126,300	65,174	60.226%	14.696%	17.608%	0.000%	7.470%
Base @ 4.8	2,906,533	709,235	849,748	0	360,527	4,826,044	414,700	77,984	60.226%	14.696%	17.608%	0.000%	7.470%
Base * 1	3,115,442	760,212	910,824	0	386,440	5,172,918	828,240	141,614	60.226%	14.696%	17.608%	0.000%	7.470%
High Case	3,413,704	832,992	998,024	0	423,436	5,668,156	1,413,000	232,391	60.226%	14.696%	17.608%	0.000%	7.470%
M'													
Low Case	2,898,273	610,892	732,053	0	311,226	4,552,445	116,764	68,243	63.664%	13.419%	16.080%	0.000%	6.836%
Base @ 4.8	3,072,458	647,606	776,049	0	329,931	4,826,044	442,325	106,553	83.664%	13.419%	16.080%	0.000%	6.836%
Base * 1	3,293,292	694,153	831,828	0	353,645	5,172,918	842,360	158,540	83.664%	13.419%	16.080%	0.000%	6.836%
High Case	3,608,581	760,609	911,464	0	387,502	5,668,156	1,413,496	232,764	83.664%	13.419%	16.080%	0.000%	6.836%
J'													
Low Case	2,666,740	774,511	780,053	0	331,141	4,552,445	126,526	68,404	58.578%	17.013%	17.135%	0.000%	7.274%
Base @ 4.8	2,827,009	821,059	826,934	0	351,043	4,826,044	442,057	107,410	58.578%	17.013%	17.135%	0.000%	7.274%
Base * 1	3,030,201	880,072	886,370	0	376,274	5,172,918	869,476	175,666	58.578%	17.013%	17.135%	0.000%	7.274%
High Case	3,320,303	964,328	971,228	0	412,297	5,668,156	1,440,612	249,890	58.578%	17.013%	17.135%	0.000%	7.274%
D'													
Low Case	2,618,786	639,012	908,654	0	385,993	4,552,445	137,735	73,333	57.525%	14.037%	19.960%	0.000%	8.479%
Base @ 4.8	2,776,173	677,416	963,263	0	409,191	4,826,044	453,264	114,339	57.525%	14.037%	19.960%	0.000%	8.479%
Base * 1	2,975,712	726,106	1,032,498	0	438,602	5,172,918	877,943	176,342	57.525%	14.037%	19.960%	0.000%	8.479%
High Case	3,260,597	795,621	1,131,346	0	480,592	5,668,156	1,449,079	250,565	57.525%	14.037%	19.960%	0.000%	8.479%

Region: PADD-III
Period: 1995

	% MJD											
	ULR ex MTBE	ULP ex MTBE	HC OULR ex MTBE	HC OULP ex MTBE	RULR ex MTBE	RULP ex MTBE	ROULR ex MTBE	ROULP ex MTBE	M % MJD ex MTBE	% Incr Prime/Base	MJD $/D	MJD $/BBL
Base MJD												
Low Case	37.287%	13.101%	2.913%	1.024%	3.474%	1.221%	0.893%	0.314%	60.226%		$86,496,455	
Base @ 4.8	37.287%	13.101%	2.913%	1.024%	3.474%	1.221%	0.893%	0.314%	60.226%		$91,782,706	$19.32
Base * 1	37.287%	13.101%	2.913%	1.024%	3.474%	1.221%	0.893%	0.314%	60.226%		$98,517,988	$19.42
High Case	37.287%	13.101%	2.913%	1.024%	3.474%	1.221%	0.893%	0.314%	60.226%		$108,244,398	$19.64
M'												
Low Case	39.416%	13.849%	3.079%	1.082%	3.672%	1.290%	0.944%	0.332%	63.664%	3.438%	$86,337,284	
Base @ 4.8	39.416%	13.849%	3.079%	1.082%	3.672%	1.290%	0.944%	0.332%	83.664%	3.438%	$91,658,961	$19.45
Base * 1	39.416%	13.849%	3.079%	1.082%	3.672%	1.290%	0.944%	0.332%	63.664%	3.438%	$98,425,422	$19.51
High Case	39.416%	13.849%	3.079%	1.082%	3.672%	1.290%	0.944%	0.332%	83.664%	3.438%	$108,246,383	$19.83
J'												
Low Case	36.287%	12.742%	2.833%	0.995%	3.379%	1.187%	0.869%	0.305%	58.578%	2.317%	$86,580,408	
Base @ 4.8	36.287%	12.742%	2.833%	0.995%	3.379%	1.187%	0.869%	0.305%	58.578%	2.317%	$91,859,088	$19.29
Base * 1	36.287%	12.742%	2.833%	0.995%	3.379%	1.187%	0.869%	0.305%	58.578%	2.317%	$98,574,100	$19.36
High Case	36.287%	12.742%	2.833%	0.995%	3.379%	1.187%	0.869%	0.305%	58.578%	2.317%	$108,186,152	$19.41
D'												
Low Case	35.615%	12.513%	2.782%	0.978%	3.318%	1.166%	0.853%	0.300%	57.525%	3.360%	$86,686,186	
Base @ 4.8	35.615%	12.513%	2.782%	0.978%	3.318%	1.166%	0.853%	0.300%	57.525%	3.360%	$91,938,894	$19.20
Base * 1	35.615%	12.513%	2.782%	0.978%	3.318%	1.166%	0.853%	0.300%	57.525%	3.360%	$98,628,118	$19.28
High Case	35.615%	12.513%	2.782%	0.978%	3.318%	1.166%	0.853%	0.300%	57.525%	3.360%	$108,283,380	$19.50

Region: PADD-III
Year: 1995
Case: Base MJD

GDP Inflator:	1.0416			Inputs		Purch.				Produced		Outputs (ex MJD)		
Swing Crude:	Arab Light	IC4	nC4	Nat Gas	Meth.	MTBE	Lead	Var Util.		MTBE	C3=	C3	C4=	C4s
1989 Price:	$17.44	$14.25	$12.25	$12.00	$18.35	$35.70		$1.00		$0.00	$14.18	$9.44	$20.00	$12.14
1989 Price:	$17.44	$14.25	$12.25	$12.00	$18.35	$35.70		$1.00		$0.00	$14.18	$9.44	$20.00	$12.14
1990 Price:	$18.16	$14.84	$12.76	$12.50	$19.11	$37.18	$0.00	$1.04		$0.00	$14.77	$9.83	$20.83	$12.64
			BPD										BPD	
Low Case	126,300	25,530	0	74,189	16,534	19,003		2,793,651		49,065	64,300	204,668	8,800	21,823
Base @ 4.8	414,700	25,530	1,676	74,606	17,914	18,769		2,995,697		53,181	64,300	214,338	8,800	2,489
Base * 1	826,240	25,530	14,662	75,115	19,452	19,712		3,187,826		57,747	64,300	224,860	8,800	0
High Case	1,413,000	25,530	34,765	74,364	19,874	25,483		3,459,984		59,000	64,300	239,439	8,800	0
M Prime	826,300	25,530	45,435	54,896	19,874	23,469		3,321,678		59,000	64,300	233,954	8,800	0
J Prime	826,400	25,530	3,430	81,578	18,737	19,279		3,139,370		55,624	64,300	221,695	8,800	0
D Prime	826,200	25,530	0	72,610	17,927	19,996		3,033,820		53,220	64,300	216,898	8,800	2,695
Delta 1	288,400	0	1,876	417	1,380	-234	0	202,046			0	9,670	0	-19,334
Delta 2	411,540	0	12,786	509	1,538	943	0	192,129			0	10,522	0	-2,489
Delta 3	586,760	0	20,103	-751	422	5,771	0	272,158			0	14,579	0	0
									Inputs					
									Total Costs					
Cost Delta 1	$5,238,428	$0	$23,935	$5,212	$26,374	-$8,700	$0	$210,431	$5,495,679		$0	$95,073	$0	-$244,455
Cost Delta 2	$7,475,114	$0	$163,129	$6,361	$29,394	$35,062	$0	$200,102	$7,909,162		$0	$103,450	$0	-$31,470
Cost Delta 3	$10,657,768	$0	$256,482	-$9,386	$8,065	$214,575	$0	$283,453	$11,410,956		$0	$143,337	$0	$0

Region: PADD-III
Year: 1995
Case: Base MJD

GDP Inflator:				MTBE				"M" Gasolines (inc MTBE)			Total M
Swing Crude:	HSFO	Sulfur	Coke	In Gasoline			ULR	ULP	ULR Ref	ULP Ref	(exc MTBE)
1989 Price:	$13.49	$4.20	$3.15	$35.70			$23.39	$25.87	$23.39	$25.87	
1989 Price:	$13.49	$4.20	$3.15	$35.70			$23.39	$25.87	$23.39	$25.87	
1990 Price:	$14.05	$4.37	$3.26	$37.18			$24.36	$26.94	$24.36	$26.94	
								BPD			
Low Case	65,174	30,303	165,996	68,088			1,852,372	651,033	226,668	79,473	2,741,658
Base @ 4.8	77,984	32,741	173,466	71,950			1,963,606	690,127	240,492	84,245	2,906,520
Base * 1	141,614	36,304	169,673	77,459			2,104,734	739,674	257,625	90,344	3,114,918
High Case	232,391	41,444	164,235	84,483			2,306,233	810,547	282,455	96,945	3,413,697
M Prime	142,962	35,741	169,672	82,469			2,230,619	783,745	272,636	95,861	3,300,592
J Prime	144,324	36,501	169,673	74,903			2,044,989	718,708	250,578	87,545	3,026,917
D Prime	154,976	36,785	169,673	73,216			2,000,568	703,227	244,850	85,619	2,961,048
Delta 1	12,810	2,438	7,490	3,862							164,862
Delta 2	63,630	3,563	-3,813	5,509							208,398
Delta 3	90,777	5,140	-5,438	7,024							298,779
					Outputs Total Costs	Inputs - Outputs	Delta MJD	Cost/MJD	Crude/MJD	HSFO/MJD	LPGs/MJD
Cost Delta 1	$179,978	$10,665	$24,573	$143,595	$209,428	$5,286,251	273,599	$19.32	1.054	0.047	-0.044
Cost Delta 2	$893,991	$15,586	-$12,509	$204,833	$1,173,880	$6,735,282	346,874	$19.42	1.186	0.183	-0.015
Cost Delta 3	$1,275,402	$22,484	-$17,841	$261,163	$1,684,546	$9,726,410	495,238	$19.64	1.185	0.183	-0.010

Region: PADD-III
Year: 1995
Case: Base MJD

	Jet Fuels		Distillates			Total MJD
GDP Inflator:						
Swing Crude:	Jet A	Total J	Diesel	HHO	Total D	(exc MTBE)
1989 Price:	$23.31		$21.88	$21.88		
1989 Price:	$23.31		$21.88	$21.88		
1990 Price:	$24.28		$22.79	$22.79		
	BPD			BPD		
Low Case	669,053	669,053	801,663	340,071	1,141,734	4,552,445
Base @ 4.8	709,230	709,230	849,802	360,492	1,210,294	4,826,044
Base * 1	760,300	760,300	911,000	386,700	1,297,700	5,172,918
High Case	832,982	832,982	998,083	423,394	1,421,477	5,668,156
M Prime	695,785	695,785	833,783	354,476	1,188,259	5,184,636
J Prime	879,120	879,120	885,411	375,867	1,261,278	5,167,315
D Prime	722,543	722,543	1,027,432	436,450	1,463,882	5,147,473
Delta 1		40,177			68,560	273,599
Delta 2		51,070			87,406	346,874
Delta 3		72,682			123,777	495,238

	HSFO/Crude	Inputs/MJD
Cost Delta 1	0.044	1.098
Cost Delta 2	0.155	1.202
Cost Delta 3	0.155	1.194

Region: PADD-IV
Period: 1995

	MTBE	M w/MTBE								M w/o MTBE					
	MTBE	ULR	ULP	OULR	OULP	RULR	RULP	ROULR	ROULP	HC OULR	HC OULP	HC RULR	HC RULP	HC ROULR	HC ROULP
Base MJD															
Low Case	5,211	143,144	30,154	28,698	6,045	0	0	0	0	24,393	5,138	0	0	0	0
Base * 1	5,976	164,158	34,580	32,910	6,933	0	0	0	0	27,974	5,893	0	0	0	0
High Case	6,658	182,886	38,526	36,665	7,724	0	0	0	0	31,165	6,565	0	0	0	0
M'															
Low Case	5,831	160,172	33,741	32,111	6,764	0	0	0	0	27,295	5,750	0	0	0	0
Base * 1	6,687	183,685	38,694	36,825	7,757	0	0	0	0	31,301	6,594	0	0	0	0
High Case	7,450	204,641	43,108	41,026	8,642	0	0	0	0	34,872	7,346	0	0	0	0
J'															
Low Case	5,122	140,684	29,636	28,204	5,941	0	0	0	0	23,974	5,050	0	0	0	0
Base * 1	5,874	161,336	33,986	32,345	6,814	0	0	0	0	27,493	5,792	0	0	0	0
High Case	6,544	179,743	37,864	36,035	7,591	0	0	0	0	30,630	6,452	0	0	0	0
D'															
Low Case	4,959	136,216	28,695	27,309	5,753	0	0	0	0	23,212	4,890	0	0	0	0
Base * 1	5,687	156,213	32,907	31,318	6,597	0	0	0	0	26,620	5,608	0	0	0	0
High Case	6,336	174,035	36,661	34,891	7,350	0	0	0	0	29,657	6,247	0	0	0	0

Region: PADD-IV
Period: 1995

	M ex MTBE	Jet	LS Diesel	Diesel	HHO	Total MJD	Crude	HSFO	M % MJD	J % MJD	LS D % MJD	D % MJD	HHO % MJD
Base MJD													
Low Case	202,830	36,849	71,964	0	35,091	346,734	82,700	6,558	58.497%	10.627%	20.755%	0.000%	10.121%
Base * 1	232,605	42,258	82,528	0	40,243	397,634	142,100	12,795	58.497%	10.627%	20.755%	0.000%	10.121%
High Case	259,142	47,080	91,943	0	44,834	442,999	196,000	18,839	58.497%	10.627%	20.755%	0.000%	10.121%
M'													
Low Case	226,957	30,646	59,871	0	29,261	346,734	81,501	4,049	65.456%	8.838%	17.267%	0.000%	8.439%
Base * 1	260,274	35,144	68,660	0	33,556	397,634	140,901	10,286	65.456%	8.838%	17.267%	0.000%	8.439%
High Case	289,968	39,154	76,493	0	37,385	442,999	194,780	16,319	65.456%	8.838%	17.267%	0.000%	8.439%
J'													
Low Case	199,344	42,418	70,545	0	34,427	346,734	82,889	6,676	57.492%	12.234%	20.346%	0.000%	9.929%
Base * 1	226,607	48,645	80,901	0	39,481	397,634	142,289	12,913	57.492%	12.234%	20.346%	0.000%	9.929%
High Case	254,668	54,195	90,131	0	43,985	442,999	196,192	18,959	57.492%	12.234%	20.346%	0.000%	9.929%
D'													
Low Case	193,013	35,041	79,766	0	38,914	346,734	83,229	6,909	55.666%	10.106%	23.005%	0.000%	11.223%
Base * 1	221,347	40,185	91,475	0	44,627	397,634	142,629	13,146	55.666%	10.106%	23.005%	0.000%	11.223%
High Case	246,600	44,769	101,911	0	49,718	442,999	196,538	19,194	55.666%	10.106%	23.005%	0.000%	11.223%

Region: PADD-IV
Period: 1995

	% MJD											
	ULR	ULP	HC OULR	HC OULP	RULR	RULP	ROULR	ROULP	M % MJD	% Incr		
Base MJD												
Low Case	41.284%	8.697%	7.035%	1.482%	0.000%	0.000%	0.000%	0.000%	58.497%		$6,567,946	
Base * 1	41.284%	8.697%	7.035%	1.482%	0.000%	0.000%	0.000%	0.000%	58.497%		$7,728,912	$22.42
High Case	41.284%	8.697%	7.035%	1.482%	0.000%	0.000%	0.000%	0.000%	58.497%		$8,763,123	$22.80
M'												
Low Case	46.194%	9.731%	7.872%	1.658%	0.000%	0.000%	0.000%	0.000%	65.456%	6.958%		
Base * 1	46.194%	9.731%	7.872%	1.658%	0.000%	0.000%	0.000%	0.000%	65.456%	6.958%	$7,765,584	
High Case	46.194%	9.731%	7.872%	1.658%	0.000%	0.000%	0.000%	0.000%	65.456%	6.958%		
J'												
Low Case	40.574%	8.547%	6.914%	1.456%	0.000%	0.000%	0.000%	0.000%	57.492%	1.606%		
Base * 1	40.574%	8.547%	6.914%	1.456%	0.000%	0.000%	0.000%	0.000%	57.492%	1.606%	$7,726,733	
High Case	40.574%	8.547%	6.914%	1.456%	0.000%	0.000%	0.000%	0.000%	57.492%	1.606%		
D'												
Low Case	39.286%	8.276%	6.695%	1.410%	0.000%	0.000%	0.000%	0.000%	55.666%	3.353%		
Base * 1	39.286%	8.276%	6.695%	1.410%	0.000%	0.000%	0.000%	0.000%	55.666%	3.353%	$7,724,659	
High Case	39.286%	8.276%	6.695%	1.410%	0.000%	0.000%	0.000%	0.000%	55.666%	3.353%		

Region:	PADD-IV															
Year:	1995															
Case:	Base MJD															
GDP Inflator:	1.0416			Inputs		Purch.				Produced		Outputs (ex MJD)				
Swing Crude:	WTI	IC4	nC4	Nat Gas	Meth.	MTBE	Lead	Var Util.		MTBE	C3=	C3	C4=	C4s	HSFO	Sulfur
1989 Price:	$20.01		$12.25		$18.35	$35.70		$1.00				$9.44			$13.49	$4.20
1990 Price:	$20.84	$0.00	$12.76	$0.00	$19.11	$37.18	$0.00	$1.04			$0.00	$9.83	$0.00	$0.00	$14.05	$4.37
			BPD										BPD			
Low Case	62,700		13,457		155	4,687		129,364		460		10,312			6,558	1,242
Base * 1	142,100		12,418		155	5,472		144,221		460		11,354			12,795	1,386
High Case	196,000		11,724		155	8,088		158,577		460		12,368			18,839	1,454
M Prime	142,100		12,033		155	8,919		162,685		460		12,451			10,412	1,464
J Prime	142,100		12,403		155	5,357		142,426		460		11,233			12,893	1,370
D Prime	142,100		12,507		155	5,521		139,924		460		11,048			13,090	1,335
Delta 1	59,400	0	-1,039	0	0	785	0	14,857			0	1,042	0	0	6,237	144
Delta 2	53,900	0	-694	0	0	2,616	0	14,356			0	1,014	0	0	6,044	68
									Inputs Total Costs							
Cost Delta 1	$1,237,921	$0	-$13,256	$0	$0	$29,188	$0	$15,474	$1,269,326		$0	$10,245	$0	$0	$87,629	$630
Cost Delta 2	$1,123,298	$0	-$8,854	$0	$0	$97,267	$0	$14,952	$1,226,663		$0	$9,969	$0	$0	$84,917	$297

Region:	PADD-IV											
Year:	1995											
Case:	Base MJD											
GDP Inflator:			MTBE			"M" Gasolines (Inc MTBE)				Total M		
Swing Crude:		Coke	In Gasoline			ULR	ULP	ULR Ref	ULP Ref	(exc MTBE)		
1989 Price:		$3.15	$35.70			$25.87	$28.39	$25.87	$28.39			
1990 Price:		$3.28	$37.18			$26.94	$29.57	$26.94	$29.57			
							BPD					
Low Case		5,541	5,147			171,962	36,230			203,045		
Base * 1		5,745	5,932			197,227	41,539			232,834		
High Case		5,745	8,548			220,668	46,492			258,612		
M Prime		5,745	9,379			223,291	47,034			260,946		
J Prime		5,745	5,817			193,574	40,757			228,514		
D Prime		5,745	5,981			187,583	39,493			221,095		
Delta 1		204	785							29,789		
Delta 2		0	2,616							25,778		
				Outputs								
				Total Costs	Inputs - Outputs	Delta MJD	Cost/MJD	Crude/MJD	HSFO/MJD	LPGs/MJD	HSFO/Crude	Inputs/MJD
Cost Delta 1		$669	$29,188	$128,360	$1,140,966	50,900	$22.42	1.1670	0.1225	0.0409	0.1050	1.1261
Cost Delta 2		$0	$97,267	$192,451	$1,034,212	45,365	$22.80	1.1881	0.1332	0.0377	0.1121	1.1505

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Region:	PADD-IV						
Year:	1995						
Case:	Base MJD						
GDP Inflator:		Jet Fuels			Distillates		Total MJD
Swing Crude:		Jet A	Total J	Diesel	HHO	Total D	(exc MTBE)
1989 Price:		$25.58		$24.23	$24.23		
1990 Price:		$26.64		$25.24	$25.24		
		BPD			BPD		
Low Case		36,794	36,794	71,862	35,033	106,895	346,734
Base * 1		42,200	42,200	82,400	40,200	122,600	397,634
High Case		47,215	47,215	92,216	44,956	137,172	442,999
M Prime		35,235	35,235	68,837	33,643	102,480	398,661
J Prime		48,625	48,625	80,868	39,465	120,333	397,472
D Prime		40,139	40,139	91,371	44,576	135,947	397,181
Delta 1			5,406			15,705	50,900
Delta 2			5,015			14,572	45,365
Cost Delta 1							
Cost Delta 2							

Region: PADD-VC
Period: 1995

	MTBE	M w/MTBE								M w/o MTBE					
	MTBE BPD	ULR BPD	ULP BPD	OULR BPD	OULP BPD	RULR BPD	RULP BPD	ROULR BPD	ROULP BPD	HC OULR BPD	HC OULP BPD	HC RULR BPD	HC RULP BPD	HC ROULR BPD	HC ROULP BPD
Base MJD															
Low Case	114,510	168,781	53,829	163,589	52,798	238,600	77,008	229,024	73,918	139,050	44,879	210,922	68,076	194,671	62,830
Base * 1	126,482	184,218	59,457	180,692	58,319	263,546	85,060	252,969	81,646	153,588	49,571	232,975	75,193	215,024	69,399
High Case	134,990	196,609	63,456	192,846	62,241	281,273	90,781	269,984	87,138	163,919	52,905	248,645	80,251	229,486	74,067
M'															
Low Case	123,365	179,678	57,991	176,239	56,881	257,051	82,964	246,735	79,634	149,803	48,349	227,233	73,340	209,724	67,689
Base * 1	136,263	196,464	64,054	194,665	62,828	283,926	91,638	272,531	87,960	165,465	53,404	250,991	81,008	231,852	74,768
High Case	145,428	211,812	68,363	207,759	67,054	303,023	97,801	290,862	93,876	176,595	56,996	267,873	86,456	247,233	79,795
J'															
Low Case	112,462	163,798	52,866	160,663	51,854	234,332	75,631	224,928	72,596	136,563	44,076	207,150	66,858	191,189	61,706
Base * 1	124,220	180,923	58,393	177,460	57,276	258,832	83,539	248,444	80,186	150,841	48,684	228,808	73,848	211,178	68,158
High Case	132,575	193,092	62,321	189,396	61,128	276,242	89,157	265,155	85,579	160,987	51,959	244,198	78,815	225,382	72,742
D'															
Low Case	113,274	164,980	53,248	161,823	52,229	236,024	76,177	226,552	73,120	137,549	44,394	208,646	67,341	192,569	62,152
Base * 1	125,117	182,229	58,815	178,742	57,689	260,701	84,142	250,238	80,765	151,930	49,036	230,460	74,381	212,703	68,650
High Case	133,532	194,486	62,771	190,764	61,569	278,236	89,801	267,070	86,197	162,149	52,334	245,981	79,384	227,009	73,268

Region: PADD-VC
Period: 1995

	M ex MTBE BPD	Jet BPD	LS Diesel BPD	Diesel BPD	HHO BPD	Total MJD ex MTBE	Crude BPD	HSFO BPD	M % MJD ex MTBE	J % MJD ex MTBE	LS D % MJD ex MTBE	D % MJD ex MTBE	HHO % MJD ex MTBE
Base MJD													
Low Case	941,037	231,519	273,916	0	0	1,446,472	410,900	100,126	65.057%	16.006%	18.937%	0.000%	0.000%
Base * 1	1,039,425	255,724	302,555	0	0	1,597,704	628,200	158,114	65.057%	16.006%	18.937%	0.000%	0.000%
High Case	1,109,337	272,925	322,905	0	0	1,705,167	794,200	209,128	65.057%	16.006%	18.937%	0.000%	0.000%
M'													
Low Case	1,013,807	198,095	234,569	0	0	1,446,472	400,152	107,843	70.088%	13.695%	16.217%	0.000%	0.000%
Base * 1	1,119,803	218,807	259,094	0	0	1,597,704	617,452	165,831	70.088%	13.695%	16.217%	0.000%	0.000%
High Case	1,195,122	233,524	276,521	0	0	1,705,167	782,646	216,162	70.088%	13.695%	16.217%	0.000%	0.000%
J'													
Low Case	924,205	253,405	268,862	0	0	1,446,472	408,296	86,346	63.894%	17.519%	18.587%	0.000%	0.000%
Base * 1	1,020,833	279,899	296,972	0	0	1,597,704	625,596	144,334	63.894%	17.519%	18.587%	0.000%	0.000%
High Case	1,089,495	298,725	316,947	0	0	1,705,167	791,401	195,183	63.894%	17.519%	18.587%	0.000%	0.000%
D'													
Low Case	930,879	228,979	286,614	0	0	1,446,472	409,432	96,127	64.355%	15.830%	19.815%	0.000%	0.000%
Base * 1	1,028,204	252,919	316,580	0	0	1,597,704	628,732	154,115	64.355%	15.830%	19.815%	0.000%	0.000%
High Case	1,097,362	269,931	337,874	0	0	1,705,167	792,621	205,036	64.355%	15.830%	19.815%	0.000%	0.000%

Region: PADD-VC
Period: 1995

	% MJD											
	ULR ex MTBE	ULP ex MTBE	HC OULR ex MTBE	HC OULP ex MTBE	RULR ex MTBE	RULP ex MTBE	ROULR ex MTBE	ROULP ex MTBE	M % MJD ex MTBE	% Incr Prime/Base	MJD $/D	MJD $/BBL
Base MJD												
Low Case	11.530%	3.721%	9.613%	3.103%	14.582%	4.706%	13.458%	4.344%	65.057%		$27,462,968	
Base * 1	11.530%	3.721%	9.613%	3.103%	14.582%	4.706%	13.458%	4.344%	65.057%		$30,476,674	$19.80
High Case	11.530%	3.721%	9.613%	3.103%	14.582%	4.706%	13.458%	4.344%	65.057%		$32,618,135	$19.93
M'												
Low Case	12.422%	4.009%	10.356%	3.343%	15.709%	5.070%	14.499%	4.680%	70.088%	5.031%		
Base * 1	12.422%	4.009%	10.356%	3.343%	15.709%	5.070%	14.499%	4.680%	70.088%	5.031%	$30,371,292	
High Case	12.422%	4.009%	10.356%	3.343%	15.709%	5.070%	14.499%	4.680%	70.088%	5.031%		
J'												
Low Case	11.324%	3.655%	9.441%	3.047%	14.321%	4.622%	13.218%	4.266%	63.894%	1.513%		
Base * 1	11.324%	3.655%	9.441%	3.047%	14.321%	4.622%	13.218%	4.266%	63.894%	1.513%	$30,778,875	
High Case	11.324%	3.655%	9.441%	3.047%	14.321%	4.622%	13.218%	4.266%	63.894%	1.513%		
D'												
Low Case	11.406%	3.681%	9.509%	3.069%	14.424%	4.656%	13.313%	4.297%	64.355%	0.878%		
Base * 1	11.406%	3.681%	9.509%	3.069%	14.424%	4.656%	13.313%	4.297%	64.355%	0.878%	$30,672,862	
High Case	11.406%	3.681%	9.509%	3.069%	14.424%	4.656%	13.313%	4.297%	64.355%	0.878%		

Region: PADD-VC

Year: 1995

Case: Base MJD

GDP Inflator:	1.0416			Inputs		Purch.				Produced		Outputs (ex MJD)			
Swing Crude:	ANS	IC4	nC4	Nat Gas	Meth.	MTBE	Lead	Var Util.		MTBE	C3=	C3	C4=	C4s	HSFO
1989 Price:	$16.93	$0.00	$0.00	$14.15	$18.35	$35.70		$1.00			$24.18	$9.44	$13.00	$12.14	$14.15
1990 Price:	$17.63	$0.00	$0.00	$14.74	$19.11	$37.18	$0.00	$1.04			$25.18	$9.83	$13.54	$12.64	$14.74
			BPD										BPD		
Low Case	410,900			74,589	606	104,272		1,102,683		12,415	8,705	66,070	0	309	100,126
Base * 1	628,200			80,142	606	115,004		1,183,753		14,039	10,333	70,049	0	645	158,114
High Case	794,200			79,236	606	123,566		1,239,959		14,400	10,333	73,394	0	3,012	209,128
M Prime	628,200	17,522	2,722	73,485	4,851	125,204		1,241,988		14,400	0	72,531	0	0	168,699
J Prime	628,200			78,712	4,704	113,054		1,184,850		13,963	6,971	69,787	0	3,734	145,029
D Prime	628,200			80,979	4,710	113,630		1,181,731		13,981	10,124	69,859	0	1,199	154,507
Delta 1	217,300	0	0	5,553	0	10,732	0	81,070			1,628	3,979	0	336	57,988
Delta 2	166,000	0	0	-906	0	8,562	0	56,206			0	3,345	0	2,367	51,014
									Inputs						
									Total Costs						
Cost Delta 1	$3,831,563	$0	$0	$81,836	$0	$399,032	$0	$84,434	$4,396,866		$40,999	$39,121	$0	$4,248	$854,582
Cost Delta 2	$2,927,011	$0	$0	-$13,352	$0	$318,348	$0	$58,539	$3,290,546		$0	$32,887	$0	$29,928	$751,805

Region:	PADD-VC											
Year:	1995											
Case:	Base MJD											
GDP Inflator:				MTBE				"M" Gasolines (inc MTBE)			Total M	
Swing Crude:		Sulfur	Coke	in Gasoline			ULR	ULP	ULR Ref	ULP Ref	(exc MTBE)	
1989 Price:		$4.20	$3.15	$35.70			$25.79	$28.35	$25.79	$28.35		
1990 Price:		$4.37	$3.28	$37.18			$26.86	$29.53	$26.86	$29.53		
								BPD				
Low Case		10,193	9,245	116,687			331,077	106,764	468,635	151,314	941,103	
Base * 1		11,289	9,245	129,043			365,724	118,013	517,622	167,088	1,039,404	
High Case		11,905	9,245	137,966			390,376	125,886	552,571	178,415	1,109,282	
M Prime		11,400	9,245	139,604			395,870	127,711	580,319	180,750	1,125,046	
J Prime		11,214	9,245	127,017			359,637	116,023	508,982	164,366	1,021,991	
D Prime		10,124	9,245	127,611			362,013	116,873	512,204	165,383	1,028,862	
Delta 1		1,096	0	12,356							98,301	
Delta 2		616	0	8,923							69,878	
					Outputs Total Costs	Inputs - Outputs	Delta MJD	Cost/MJD	Crude/MJD	HSFO/MJD	LPGs/MJD	HSFO/Crude
Cost Delta 1		$4,794	$0	$459,415	$1,403,159	$2,993,706	151,232	$19.80	1.4369	0.3834	0.0026	0.2669
Cost Delta 2		$2,695	$0	$331,771	$1,149,065	$2,141,460	107,463	$19.93	1.5447	0.4747	0.0616	0.3073

Region: PADD-VC
Year: 1995
Case: Base MJD

	Jet Fuels		Distillates			Total MJD
GDP inflator:						
Swing Crude:	Jet A	Total J	Diesel	HHO	Total D	(exc MTBE)
1989 Price:	$25.12		$23.39	$23.39		
1990 Price:	$26.16		$24.36	$24.36		
	BPD			BPD		
Low Case	231,504	231,504	273,865		273,865	1,446,472
Base * 1	255,700	255,700	302,600		302,600	1,597,704
High Case	272,968	272,968	322,917		322,917	1,705,167
M Prime	219,831	219,831	260,307		260,307	1,605,184
J Prime	280,216	280,216	297,309		297,309	1,599,516
D Prime	253,081	253,081	316,783		316,783	1,598,726
Delta 1		24,196			28,735	151,232
Delta 2		17,268			20,317	107,463

	Inputs/MJD
Cost Delta 1	1.4343
Cost Delta 2	1.4831

Region: PADD VOC
Period: 1995

	MTBE	M w/MTBE								M w/o MTBE					
	MTBE	ULR	ULP	OULR	OULP	RULR	RULP	ROULR	ROULP	HC OULR	HC OULP	HC RULR	HC RULP	HC ROULR	HC ROULP
	BPD	BPD	BPD	BPD	BPD	BPD	BPD	BPD	BPD	BPD	BPD	BPD	BPD	BPD	BPD
Base MJD															
Low Case	11,890	119,716	25,570	65,316	13,951	0	0	0	0	55,519	11,858	0	0	0	0
Base * 1	13,112	132,018	28,198	72,029	15,385	0	0	0	0	61,224	13,077	0	0	0	0
High Case	14,056	141,518	30,227	77,212	16,492	0	0	0	0	65,630	14,018	0	0	0	0
M'															
Low Case	12,759	128,461	27,438	70,088	14,970	0	0	0	0	59,575	12,725	0	0	0	0
Base * 1	14,070	141,662	30,258	77,290	16,509	0	0	0	0	65,697	14,032	0	0	0	0
High Case	15,082	151,856	32,435	82,852	17,697	0	0	0	0	70,424	15,042	0	0	0	0
J'															
Low Case	11,448	115,269	24,621	62,890	13,433	0	0	0	0	53,457	11,418	0	0	0	0
Base * 1	12,625	127,115	27,151	69,353	14,813	0	0	0	0	58,950	12,591	0	0	0	0
High Case	13,533	136,262	29,104	74,344	15,879	0	0	0	0	63,192	13,497	0	0	0	0
D'															
Low Case	11,511	115,896	24,754	63,232	13,506	0	0	0	0	53,747	11,480	0	0	0	0
Base * 1	12,694	127,806	27,298	69,730	14,894	0	0	0	0	59,271	12,660	0	0	0	0
High Case	13,607	137,002	29,263	74,748	15,966	0	0	0	0	63,536	13,571	0	0	0	0

Region: PADD VOC
Period: 1995

	M ex MTBE BPD	Jet BPD	LS Diesel BPD	Diesel BPD	HHO BPD	Total MJD ex MTBE	Crude BPD	HSFO BPD	M % MJD ex MTBE	J % MJD ex MTBE	LS D % MJD ex MTBE	D % MJD ex MTBE	HHO % MJD ex MTBE
Base MJD													
Low Case	212,663	130,597	93,676	0	27,456	464,392	412,000	69,224	45.794%	28.122%	20.172%	0.000%	5.912%
Base * 1	234,518	144,017	103,302	0	30,277	512,115	507,400	113,691	45.794%	28.122%	20.172%	0.000%	5.912%
High Case	251,394	154,381	110,736	0	32,456	548,967	601,000	167,890	45.794%	28.122%	20.172%	0.000%	5.912%
M'													
Low Case	228,199	122,536	87,880	0	25,777	464,392	417,042	73,864	49.139%	26.386%	18.924%	0.000%	5.551%
Base * 1	251,649	135,128	96,911	0	28,426	512,115	512,442	118,331	49.139%	26.386%	18.924%	0.000%	5.551%
High Case	269,758	144,852	103,885	0	30,472	548,967	607,406	173,889	49.139%	26.386%	18.924%	0.000%	5.551%
J'													
Low Case	204,764	143,000	90,208	0	26,419	464,392	432,218	88,142	44.093%	30.793%	19.425%	0.000%	5.689%
Base * 1	225,807	157,695	99,479	0	29,134	512,115	527,618	132,609	44.093%	30.793%	19.425%	0.000%	5.689%
High Case	242,056	169,043	106,637	0	31,231	548,967	626,688	192,259	44.093%	30.793%	19.425%	0.000%	5.689%
D'													
Low Case	205,877	126,448	102,121	0	29,945	464,392	406,893	66,220	44.333%	27.229%	21.990%	0.000%	6.448%
Base * 1	227,034	139,443	112,615	0	33,023	512,115	504,293	110,687	44.333%	27.229%	21.990%	0.000%	6.448%
High Case	243,372	149,477	120,719	0	35,399	548,967	597,053	164,049	44.333%	27.229%	21.990%	0.000%	6.448%

Region: PADD VOC
Period: 1995

	% MJD											
	ULR ex MTBE	ULP ex MTBE	HC OULR ex MTBE	HC OULP ex MTBE	RULR ex MTBE	RULP ex MTBE	ROULR ex MTBE	ROULP ex MTBE	M % MJD ex MTBE	% Incr Prime/Base	MJD $/D	MJD $/BBL
Base MJD												
Low Case	25.779%	5.506%	11.955%	2.554%	0.000%	0.000%	0.000%	0.000%	45.794%		$8,623,448	
Base * 1	25.779%	5.506%	11.955%	2.554%	0.000%	0.000%	0.000%	0.000%	45.794%		$9,888,112	$22.31
High Case	25.779%	5.506%	11.955%	2.554%	0.000%	0.000%	0.000%	0.000%	45.794%		$10,779,266	$24.18
M'												
Low Case	27.662%	5.908%	12.829%	2.740%	0.000%	0.000%	0.000%	0.000%	49.139%	3.345%		
Base * 1	27.662%	5.908%	12.829%	2.740%	0.000%	0.000%	0.000%	0.000%	49.139%	3.345%	$9,848,403	
High Case	27.662%	5.908%	12.829%	2.740%	0.000%	0.000%	0.000%	0.000%	49.139%	3.345%		
J'												
Low Case	24.821%	5.302%	11.511%	2.459%	0.000%	0.000%	0.000%	0.000%	44.093%	2.671%		
Base * 1	24.821%	5.302%	11.511%	2.459%	0.000%	0.000%	0.000%	0.000%	44.093%	2.671%	$9,732,319	
High Case	24.821%	5.302%	11.511%	2.459%	0.000%	0.000%	0.000%	0.000%	44.093%	2.671%		
D'												
Low Case	24.956%	5.330%	11.574%	2.472%	0.000%	0.000%	0.000%	0.000%	44.333%	2.355%		
Base * 1	24.956%	5.330%	11.574%	2.472%	0.000%	0.000%	0.000%	0.000%	44.333%	2.355%	$9,913,724	
High Case	24.956%	5.330%	11.574%	2.472%	0.000%	0.000%	0.000%	0.000%	44.333%	2.355%		

Region: PADD-VOC
Year: 1995
Case: Base MJD

GDP Inflator:	1.0416			Inputs		Purch.				Produced		Outputs (ex MJD)				
Swing Crude:	Arab Light	IC4	nC4	Nat Gas	Meth.	MTBE	Lead	Var Util.		MTBE	C3=	C3	C4=	C4s	HSFO	Sulfur
1989 Price:	$16.93		$12.25	$13.87	18.35	$35.70		$1.00			$24.18	$9.44			$13.87	$4.20
1990 Price:	$17.63	$0.00	$12.76	$14.45	$19.11	$37.18	$0.00	$1.04			$25.18	$9.83	$0.00	$0.00	$14.45	$4.37
			BPD										BPD			
Low Case	412,000		3,984	11,600	606	10,039		250,768		1,600	0	15,547	0	0	69,224	2,318
Base * 1	507,400		3,356	13,887	606	11,249		264,094		1,600	0	16,475	0	0	113,691	2,326
High Case	601,000		3,031	15,042	606	12,234		275,489		1,600	0	16,571	0	0	167,890	2,276
M Prime	507,400		3,136	13,999	606	12,159		264,088		1,600	0	17,037	0	0	115,981	2,305
J Prime	507,400		3,512	12,854	606	10,525		258,369		1,600	0	16,484	0	0	123,185	2,249
D Prime	507,400		3,392	13,904	606	10,872		263,149		1,600	0	16,122	0	0	112,135	2,339
Delta 1	95,400	0	-608	2,087	0	1,210	0	13,326			0	928	0	0	44,467	8
Delta 2	93,600	0	-325	1,155	0	985	0	11,395			0	98	0	0	54,199	-50
									Inputs							
									Total Costs							
Cost Delta 1	$1,682,150	$0	-$7,757	$30,148	$0	$44,990	$0	$13,879	$1,763,409		$0	$9,124	$0	$0	$642,353	$35
Cost Delta 2	$1,650,411	$0	-$4,146	$16,685	$0	$36,624	$0	$11,868	$1,711,441		$0	$944	$0	$0	$782,937	-$219

Region:	**PADD-VOC**										
Year:	**1995**										
Case:	**Base MJD**										
GDP Inflator:		**MTBE**				**"M" Gasolines (inc MTBE)**			**Total M**		
Swing Crude:	**Coke**	**In Gasoline**			**ULR**	**ULP**	**ULR Ref**	**ULP Ref**	**(exc MTBE)**		
1989 Price:	$3.15	$35.70			$25.79	$28.35	$25.79	$28.35			
1990 Price:	$3.28	$37.18			$26.86	$29.53	$26.86	$29.53			
						BPD					
Low Case	17,598	11,839			185,013	39,499			212,673		
Base * 1	18,282	13,049			203,999	43,565			234,515		
High Case	18,282	14,034			218,723	46,696			251,385		
M Prime	18,282	13,959			217,854	46,515			250,410		
J Prime	18,282	12,325			192,557	41,115			221,347		
D Prime	18,282	12,672			198,109	42,286			227,723		
Delta 1	684	1,210							21,842		
Delta 2	0	965							16,870		
			Outputs								
			Total Costs	**Inputs - Outputs**	**Delta MJD**	**Cost/MJD**	**Crude/MJD**	**HSFO/MJD**	**LPGs/MJD**	**HSFO/Crude**	**Inputs/MJD**
Cost Delta 1	$2,244	$44,990	$698,745	$1,064,664	47,723	$22.31	2.00	0.932	-0.012	0.466	2.011
Cost Delta 2	$0	$36,624	$820,286	$891,155	36,852	$24.18	2.54	1.471	-0.020	0.579	2.560

Region: PADD-VOC
Year: 1995
Case: Base MJD

	Jet Fuels		Distillates			Total MJD
GDP Inflator:						
Swing Crude:	Jet A	Total J	Diesel	HHO	Total D	(exc MTBE)
1989 Price:	$25.12		$23.39	$23.39		
1990 Price:	$26.16		$24.36	$24.36		
	BPD			BPD		
Low Case	130,600	130,600	93,674	27,445	121,119	464,392
Base * 1	144,000	144,000	103,300	30,300	133,600	512,115
High Case	154,396	154,396	110,741	32,445	143,186	548,967
M Prime	134,463	134,463	96,434	28,286	124,720	509,593
J Prime	154,581	154,581	97,514	28,559	126,073	502,001
D Prime	139,866	139,866	112,957	33,123	146,080	513,669
Delta 1		13,400			12,481	47,723
Delta 2		10,396			9,586	36,852

Cost Delta 1
Cost Delta 2

Region: PADD-I
Period: 2000

	Purch MTBE BPD	Prod MTBE & Equiv BPD	MTBE BPD	M w/MTBE								M w/o MTBE			
				ULR BPD	ULP BPD	OULR BPD	OULP BPD	RULR BPD	RULP BPD	ROULR BPD	ROULP BPD	HC OULR BPD	HC OULP BPD	HC RULR BPD	HC RULP BPD
Base MJD															
Low Case 18.8	71,055	14,445	85,500	0	0	0	0	226,146	91,834	229,978	92,572	0	0	201,681	81,181
Low Case 144.	81,782	14,445	96,227	0	0	0	0	256,768	103,356	258,831	104,166	0	0	226,983	91,366
Low Case 179	84,267	14,445	98,712	0	0	0	0	263,400	106,025	265,516	106,877	0	0	232,846	93,726
Base * .98	89,066	14,445	103,511	0	0	0	0	276,208	111,180	278,424	112,073	0	0	244,166	98,283
Base	89,963	14,445	104,408	0	0	0	0	278,599	112,143	280,837	113,044	0	0	246,282	99,134
High	94,255	14,445	108,700	0	0	0	0	290,052	116,753	292,382	117,891	0	0	256,406	103,210
M'															
Low Case 18.8	78,290	14,445	92,735	0	0	0	0	247,450	99,605	249,437	100,405	0	0	218,746	88,050
Low Case 144.	89,924	14,445	104,369	0	0	0	0	278,494	112,101	280,731	113,001	0	0	246,169	99,097
Low Case 179	92,620	14,445	107,065	0	0	0	0	285,687	114,996	287,982	115,920	0	0	252,548	101,657
Base * .98	97,825	14,445	112,270	0	0	0	0	299,576	120,587	301,983	121,555	0	0	264,825	106,599
Base	98,798	14,445	113,243	0	0	0	0	302,172	121,632	304,599	122,609	0	0	267,120	107,523
High	103,453	14,445	117,898	0	0	0	0	314,595	126,632	317,122	127,649	0	0	278,102	111,943
J'															
Low Case 18.8	69,516	14,445	83,961	0	0	0	0	224,040	90,182	225,839	90,906	0	0	198,051	79,720
Low Case 144.	80,050	14,445	94,495	0	0	0	0	252,147	101,496	254,173	102,311	0	0	222,898	89,722
Low Case 179	82,491	14,445	96,936	0	0	0	0	258,660	104,117	260,737	104,953	0	0	228,655	92,039
Base * .98	87,203	14,445	101,648	0	0	0	0	271,235	109,179	273,414	110,056	0	0	239,772	96,514
Base	88,084	14,445	102,529	0	0	0	0	273,585	110,125	275,783	111,009	0	0	241,850	97,350
High	92,299	14,445	106,744	0	0	0	0	284,833	114,652	287,120	115,573	0	0	251,792	101,352
D'															
Low Case 18.8	61,809	14,445	76,254	0	0	0	0	203,475	81,904	205,109	82,561	0	0	179,872	72,403
Low Case 144.	71,376	14,445	85,821	0	0	0	0	229,002	92,179	230,842	92,919	0	0	202,438	81,486
Low Case 179	73,593	14,445	88,038	0	0	0	0	234,917	94,560	236,804	95,319	0	0	207,667	83,591
Base * .98	77,873	14,445	92,318	0	0	0	0	246,338	99,157	248,316	99,953	0	0	217,763	87,655
Base	78,673	14,445	93,118	0	0	0	0	248,472	100,016	250,468	100,820	0	0	219,650	88,414
High	82,501	14,445	96,946	0	0	0	0	258,687	104,128	260,765	104,964	0	0	228,679	92,049

MTBE Production:	14,000
Tame Production:	500
Tame as MTBE Equiv:	445

Region: PADD-I
Period: 2000

	HC ROULR BPD	HC ROULP BPD	M ex MTBE BPD	Jet BPD	LS Diesel BPD	Diesel BPD	HHO BPD	Total MJD ex MTBE	Crude BPD	HSFO BPD	M % MJD ex MTBE	J % MJD ex MTBE
Base MJD												
Low Case 18.8	195,481	78,686	557,030	77,324	238,266	0	55,121	927,740	18,800	0	60.042%	8.335%
Low Case 144.	220,006	88,558	626,913	87,024	268,158	0	62,036	1,044,132	144,700	17,438	60.042%	8.335%
Low Case 179	225,688	90,845	643,105	89,272	275,084	0	63,638	1,071,100	178,900	25,895	60.042%	8.335%
Base * .98	236,661	95,262	674,371	93,612	288,458	0	66,732	1,123,173	245,400	41,365	60.042%	8.335%
Base	238,711	96,087	680,215	94,423	290,958	0	67,311	1,132,906	258,015	44,231	60.042%	8.335%
High	248,525	100,037	708,178	98,305	302,919	0	70,078	1,179,480	325,200	61,285	60.042%	8.335%
M'												
Low Case 18.8	212,022	85,344	604,162	67,490	207,974	0	48,114	927,740	37,079	13,313	65.122%	7.275%
Low Case 144.	238,622	96,051	679,959	75,958	234,065	0	54,150	1,044,132	162,979	30,751	65.122%	7.275%
Low Case 179	244,785	98,532	697,521	77,919	240,111	0	55,549	1,071,100	180,795	24,819	65.122%	7.275%
Base * .98	256,685	103,322	731,432	81,708	251,784	0	58,250	1,123,173	246,754	41,294	65.122%	7.275%
Base	258,910	104,217	737,770	82,416	253,966	0	58,754	1,132,906	259,201	44,183	65.122%	7.275%
High	269,553	108,502	768,100	85,804	264,407	0	61,170	1,179,480	326,520	61,303	65.122%	7.275%
J'												
Low Case 18.8	191,964	77,270	547,005	92,756	233,877	0	54,102	927,740	35,532	13,558	58.961%	9.998%
Low Case 144.	216,047	86,984	615,631	104,393	263,219	0	60,889	1,044,132	161,432	30,996	58.961%	9.998%
Low Case 179	221,627	89,210	631,532	107,089	270,017	0	62,462	1,071,100	178,981	24,830	58.961%	9.998%
Base * .98	232,402	93,547	662,235	112,295	283,145	0	65,498	1,123,173	244,928	41,328	58.961%	9.998%
Base	234,415	94,358	667,973	113,269	285,598	0	66,066	1,132,906	257,348	44,221	58.961%	9.998%
High	244,052	98,237	695,434	117,925	297,339	0	68,782	1,179,480	324,457	61,238	58.961%	9.998%
D'												
Low Case 18.8	174,343	70,177	496,794	68,897	294,024	0	68,024	927,740	33,391	14,143	53.549%	7.426%
Low Case 144.	196,215	78,981	559,121	77,541	330,912	0	76,558	1,044,132	159,291	31,581	53.549%	7.426%
Low Case 179	201,283	81,021	573,562	79,544	339,459	0	78,535	1,071,100	176,472	25,091	53.549%	7.426%
Base * .98	211,069	84,960	601,447	83,411	355,962	0	82,353	1,123,173	242,400	41,623	53.549%	7.426%
Base	212,898	85,697	606,658	84,134	359,047	0	83,067	1,132,906	254,783	44,521	53.549%	7.426%
High	221,650	89,220	631,598	87,593	373,807	0	86,482	1,179,480	321,602	61,396	53.549%	7.426%

Region: PADD-I
Period: 2000

	LS D % MJD ex MTBE	D % MJD ex MTBE	HHO % MJD ex MTBE	% MJD RULR ex MTBE	RULP ex MTBE	ROULR ex MTBE	ROULP ex MTBE	M % MJD ex MTBE	% Incr Prime/Base	MJD $/D	MJD $/BBL	Total MJD ex MTBE
Base MJD												
Low Case 18.8	25.682%	0.000%	5.941%	21.739%	8.750%	21.071%	8.481%	60.042%		$16,707,330		927,740
Low Case 144.	25.682%	0.000%	5.941%	21.739%	8.750%	21.071%	8.481%	60.042%		$18,899,590	$18.84	1,044,132
Low Case 179	25.682%	0.000%	5.941%	21.739%	8.750%	21.071%	8.481%	60.042%		$19,440,249	$20.05	1,071,100
Base * .98	25.682%	0.000%	5.941%	21.739%	8.750%	21.071%	8.481%	60.042%		$20,509,807	$20.54	1,123,173
Base	25.682%	0.000%	5.941%	21.739%	8.750%	21.071%	8.481%	60.042%		$20,712,075	$20.78	1,132,906
High	25.682%	0.000%	5.941%	21.739%	8.750%	21.071%	8.481%	60.042%		$21,682,348	$20.83	1,179,480
M'												
Low Case 18.8	22.417%	0.000%	5.166%	23.578%	9.491%	22.854%	9.199%	65.122%	5.080%			927,740
Low Case 144.	22.417%	0.000%	5.166%	23.578%	9.491%	22.854%	9.199%	65.122%	5.080%	$20,739,172		1,044,132
Low Case 179	22.417%	0.000%	5.166%	23.578%	9.491%	22.854%	9.199%	65.122%	5.080%			1,071,100
Base * .98	22.417%	0.000%	5.166%	23.578%	9.491%	22.854%	9.199%	65.122%	5.080%			1,123,173
Base	22.417%	0.000%	5.166%	23.578%	9.491%	22.854%	9.199%	65.122%	5.080%			1,132,906
High	22.417%	0.000%	5.166%	23.578%	9.491%	22.854%	9.199%	65.122%	5.080%			1,179,480
J'												
Low Case 18.8	25.209%	0.000%	5.832%	21.348%	8.593%	20.692%	8.329%	58.961%	1.663%			927,740
Low Case 144.	25.209%	0.000%	5.832%	21.348%	8.593%	20.692%	8.329%	58.961%	1.663%	$20,734,019		1,044,132
Low Case 179	25.209%	0.000%	5.832%	21.348%	8.593%	20.692%	8.329%	58.961%	1.663%			1,071,100
Base * .98	25.209%	0.000%	5.832%	21.348%	8.593%	20.692%	8.329%	58.961%	1.663%			1,123,173
Base	25.209%	0.000%	5.832%	21.348%	8.593%	20.692%	8.329%	58.961%	1.663%			1,132,906
High	25.209%	0.000%	5.832%	21.348%	8.593%	20.692%	8.329%	58.961%	1.663%			1,179,480
D'												
Low Case 18.8	31.693%	0.000%	7.332%	19.388%	7.804%	18.792%	7.564%	53.549%	7.401%			927,740
Low Case 144.	31.693%	0.000%	7.332%	19.388%	7.804%	18.792%	7.564%	53.549%	7.401%	$20,808,265		1,044,132
Low Case 179	31.693%	0.000%	7.332%	19.388%	7.804%	18.792%	7.564%	53.549%	7.401%			1,071,100
Base * .98	31.693%	0.000%	7.332%	19.388%	7.804%	18.792%	7.564%	53.549%	7.401%			1,123,173
Base	31.693%	0.000%	7.332%	19.388%	7.804%	18.792%	7.564%	53.549%	7.401%			1,132,906
High	31.693%	0.000%	7.332%	19.388%	7.804%	18.792%	7.564%	53.549%	7.401%			1,179,480

Region: PADD-I
Year: 2000
Case: Base MJD

GDP Inflator:	1.0416			Inputs		Purch.					Produced	Outputs (ex MJD)			
Swing Crude:	Arab Light	IC4	nC4	Nat Gas	Meth.	MTBE	Invest $	Fixed $	Var Util.	Inputs Total Costs	MTBE	C3=	C3	C4=	C4s
1989 Price:	$17.44	$15.25	$12.25	$14.47	$18.35	$35.70	$0.71	$1.00	$1.00			$15.18	$9.44	$13.00	$0.00
1990 Price:	$18.16	$15.88	$12.76	$15.07	$19.11	$37.18	$0.74	$1.04	$1.04			$15.81	$9.83	$13.54	$0.00
			BPD											BPD	
Low Case 18.8	18,800	0	16,064	6,656	4,864	72,309	233,732	60,309	432,563		14,000	12,900	32,113	2,300	0
Low Case 144.	144,700	0	18,924	12,607	4,864	81,628	233,732	60,309	482,784		14,000	12,900	32,716	2,300	0
Low Case 179	178,900	0	19,718	14,404	4,864	84,104	233,732	60,309	490,610		14,000	12,900	32,546	2,300	0
Base * .98	245,400	0	21,135	18,118	4,864	89,022	233,732	60,309	508,526		14,000	12,900	32,265	2,300	0
Base	258,015	0	21,224	18,902	4,864	89,941	233,731	60,309	511,772		14,000	12,900	32,207	2,300	0
High	325,200	0	19,710	19,676	4,864	95,110	251,465	64,515	517,141		14,000	12,900	32,934	2,300	0
M Prime	258,015	0	19,849	16,898	4,864	99,200	295,401	74,018	536,168		14,000	12,900	33,816	2,300	0
J Prime	258,015	0	22,099	18,949	4,864	88,036	240,484	62,114	511,570		14,000	12,900	31,733	2,300	0
D Prime	258,015	0	23,621	20,366	4,617	79,128	282,212	72,702	483,786		13,266	12,900	30,477	2,300	0
Low M Prime	18,800	0	20,605	8,117	4,864	79,088	233,732	60,309	464,239		14,000	12,900	33,026	2,300	0
Low J Prime	18,800	0	14,910	7,677	4,420	70,728	233,732	60,309	431,312		12,682	12,900	31,900	2,300	0
Low D Prime	18,800	0	8,850	7,483	441	95,110	233,732	60,309	397,735		869	12,900	29,469	2,300	0
Delta 1	125,900	0	2,860	5,951	0	9,319	0	0	50,221			0	603	0	0
Delta 2	34,200	0	794	1,797	0	2,476	0	0	7,826			0	-170	0	0
Delta 3	66,500	0	1,417	3,714	0	4,918	0	0	17,916			0	-281	0	0
Delta 4	12,615	0	69	784	0	919	-1	0	3,246			0	-58	0	0
Delta 5	67,185	0	-1,514	774	0	5,169	17,734	4,206	5,369			0	727	0	0
Cost Delta 1	$2,266,817	$0	$36,489	$89,685	$0	$346,495	$0	$0	$52,305	$2,811,791		$0	$5,929	$0	$0
Cost Delta 2	$621,201	$0	$10,130	$27,082	$0	$92,062	$0	$0	$8,151	$758,625		$0	-$1,671	$0	$0
Cost Delta 3	$1,207,890	$0	$18,079	$55,972	$0	$182,859	$0	$0	$18,660	$1,483,459		$0	-$2,763	$0	$0
Cost Delta 4	$229,136	$0	$1,135	$11,815	$0	$34,170	-$1	$0	$3,381	$279,636		$0	-$570	$0	$0
Cost Delta 5	$1,220,332	$0	-$19,316	$11,665	$0	$192,191	$13,127	$4,381	$5,592	$1,427,972		$0	$7,148	$0	$0

Region: PADD-I
Year: 2000
Case: Base MJD
GDP Inflator:

Swing Crude:	HSFO	Sulfur	Coke	MTBE In Gasoline			ULR	ULP	ULR Ref	ULP Ref	Total M (exc MTBE)
							"M" Gasolines (inc MTBE)				
1989 Price:	$14.47	$4.20	$3.15	$35.70			$23.77	$26.42	$23.77	$26.42	
1990 Price:	$15.07	$4.37	$3.28	$37.18			$24.76	$27.52	$24.76	$27.52	
								BPD			
Low Case 18.8	0	3,672	13,814	86,309					458,734	184,658	557,063
Low Case 144.	17,438	4,970	13,663	95,628					515,578	207,540	627,490
Low Case 179	25,895	5,123	13,497	98,104					528,892	212,900	643,688
Base * .98	41,365	5,382	13,354	103,022					554,662	223,273	674,913
Base	44,231	5,514	13,354	103,941					559,485	225,207	680,751
High	61,285	5,822	13,354	109,110					582,876	234,630	708,396
M Prime	43,914	5,389	13,354	113,200					606,625	244,194	737,619
J Prime	44,373	5,312	13,354	102,036					549,544	221,214	668,722
D Prime	45,255	5,571	13,354	92,394					499,684	201,149	606,439
Low M Prime	0	3,874	13,364	93,088					501,256	201,779	609,947
Low J Prime	0	3,644	13,438	83,410					450,024	181,153	547,767
Low D Prime	0	3,981	14,274	95,979					409,364	164,790	478,175
Delta 1	17,438	1,098	-151	9,319							70,407
Delta 2	8,457	153	-166	2,476							16,198
Delta 3	15,470	259	-143	4,918							31,225
Delta 4	2,866	132	0	919							5,838
Delta 5	17,054	308	0	5,169							27,645
					Outputs Total Costs	Inputs - Outputs	Delta MJD	Cost/MJD	Crude/MJD	HSFO/MJD	LPGs/MJD
Cost Delta 1	$262,799	$4,803	-$495	$346,495	$619,530	$2,192,260	116,392	$18.84	1.0817	0.1498	-0.0705
Cost Delta 2	$127,451	$669	-$545	$92,062	$217,966	$540,659	26,968	$20.05	1.2682	0.3136	-0.1024
Cost Delta 3	$233,141	$1,133	-$469	$182,859	$413,901	$1,069,558	52,073	$20.54	1.2771	0.2971	-0.1039
Cost Delta 4	$43,192	$577	$0	$34,170	$77,369	$202,267	9,733	$20.78	1.2961	0.2945	-0.0957
Cost Delta 5	$257,012	$1,347	$0	$192,191	$457,699	$970,273	46,574	$20.83	1.4425	0.3662	0.0315

Region:	**PADD-I**					
Year:	**2000**					
Case:	**Base MJD**					
GDP Inflator:	**Jet Fuels**			**Distillates**		**Total MJD**
Swing Crude:	**Jet A**	**Total J**	**Diesel**	**HHO**	**Total D**	**(exc MTBE)**
1989 Price:	$24.57		$23.02	$23.02		
1990 Price:	$25.59		$23.98	$23.98		
	BPD			BPD		
Low Case 18.8	77,406	77,406	238,518	55,178	293,696	928,185
Low Case 144.	86,998	86,998	268,073	62,016	330,089	1,044,577
Low Case 179	89,244	89,244	274,996	63,617	338,613	1,071,545
Base * .98	93,593	93,593	288,395	66,717	355,112	1,123,618
Base	94,400	94,400	290,900	67,300	358,200	1,133,351
High	98,353	98,353	303,065	70,111	373,176	1,179,925
M Prime	82,349	82,349	253,761	58,707	312,468	1,132,436
J Prime	113,320	113,320	285,728	66,096	351,824	1,133,866
D Prime	84,319	84,319	359,837	83,250	443,087	1,135,845
Low M Prime	68,045	68,045	209,684	48,510	258,194	936,186
Low J Prime	92,798	92,798	233,984	54,126	288,110	928,675
Low D Prime	69,078	69,078	294,795	68,202	362,997	910,250
Delta 1		9,592			36,393	116,392
Delta 2		2,246			8,524	26,968
Delta 3		4,349			16,499	52,073
Delta 4		807			3,088	9,733
Delta 5		3,953			14,976	46,574

	HSFO/Crude	Inputs/MJD
Cost Delta 1	0.1385	1.1522
Cost Delta 2	0.2473	1.3706
Cost Delta 3	0.2326	1.3810
Cost Delta 4	0.2272	1.3918
Cost Delta 5	0.2538	1.4110

PD II 00 MJD Normal

Region: PADD-II
Period: 2000

	Purch MTBE BPD	Prod MTBE & Equiv BPD	MTBE BPD	M w/MTBE ULR BPD	ULP BPD	OULR BPD	OULP BPD	RULR BPD	RULP BPD	ROULR BPD	ROULP BPD	M w/o MTBE HC OULR BPD	HC OULP BPD	HC RULR BPD	HC RULP BPD
Base MJD															
Low Case	77,872	35,547	113,419	567,611	129,700	38,914	8,892	700,456	160,055	34,889	7,972	33,077	7,558	619,203	141,489
Base * 1	89,498	35,547	125,045	625,793	142,994	42,903	9,803	772,255	176,461	38,465	8,789	36,468	8,333	682,673	155,992
High Case	99,823	35,547	135,370	677,465	154,802	46,446	10,613	836,020	191,032	41,641	9,515	39,479	9,021	739,042	168,872
M'															
Low Case	84,376	35,547	119,923	600,156	137,136	41,145	9,402	740,619	169,232	36,889	8,429	34,974	7,992	654,707	149,601
Base * 1	96,668	35,547	132,215	661,674	151,193	45,363	10,365	816,534	186,579	40,670	9,293	38,559	8,811	721,816	164,936
High Case	107,585	35,547	143,132	716,309	163,677	49,109	11,221	883,955	201,985	44,028	10,061	41,742	9,538	781,417	178,555
J'															
Low Case	76,977	35,547	112,524	563,131	128,676	38,607	8,822	694,928	158,792	34,613	7,909	32,816	7,499	614,316	140,372
Base * 1	88,511	35,547	124,058	620,854	141,866	42,564	9,726	766,160	175,068	38,161	8,720	36,180	8,267	677,285	154,760
High Case	98,755	35,547	134,302	672,118	153,580	46,079	10,529	829,422	189,524	41,312	9,440	39,167	8,950	733,209	167,539
D'															
Low Case	71,664	35,547	107,211	536,541	122,600	36,784	8,405	662,114	151,294	32,979	7,536	31,266	7,144	585,309	133,744
Base * 1	82,653	35,547	118,200	591,537	135,167	40,555	9,267	729,982	166,802	36,359	8,308	34,471	7,877	645,304	147,453
High Case	92,413	35,547	127,960	640,381	146,328	43,903	10,032	790,257	180,575	39,361	8,994	37,318	8,527	698,587	159,628

MTBE Production:	24,600
Tame Production	12,300
Tame as MTBE Equiv:	10,947

PD II 00 MJD Normal

Region: PADD-II
Period: 2000

	HC ROULR BPD	HC ROULP BPD	M ex MTBE BPD	Jet BPD	LS Diesel BPD	Diesel BPD	HHO BPD	Total MJD ex MTBE	Crude BPD	HSFO BPD	M % MJD ex MTBE	J % MJD ex MTBE
Base MJD												
Low Case	29,655	6,776	1,535,070	186,020	512,875	0	107,297	2,341,262	611,400	22,605	65.566%	7.945%
Base * 1	32,695	7,471	1,692,418	205,088	565,446	0	118,296	2,581,247	887,900	62,881	65.566%	7.945%
High Case	35,395	8,088	1,832,162	222,022	612,135	0	128,063	2,794,382	1,143,300	103,532	65.566%	7.945%
M'												
Low Case	31,356	7,165	1,623,087	165,714	456,887	0	95,575	2,341,262	628,261	29,070	69.325%	7.078%
Base * 1	34,570	7,899	1,789,457	182,700	503,719	0	105,371	2,581,247	904,761	69,346	69.325%	7.078%
High Case	37,424	8,551	1,937,214	197,785	545,311	0	114,072	2,794,382	1,160,836	110,332	69.325%	7.078%
J'												
Low Case	29,421	6,723	1,522,954	203,009	508,846	0	106,453	2,341,262	642,219	28,655	65.048%	8.671%
Base * 1	32,437	7,412	1,679,061	223,817	561,004	0	117,365	2,581,247	918,719	68,931	65.048%	8.671%
High Case	35,115	8,024	1,817,702	242,298	607,326	0	127,056	2,794,382	1,175,353	110,195	65.048%	8.671%
D'												
Low Case	28,032	6,405	1,451,041	175,785	590,840	0	123,595	2,341,262	674,368	31,712	61.977%	7.508%
Base * 1	30,905	7,062	1,599,777	193,803	651,403	0	136,264	2,581,247	950,868	71,988	61.977%	7.508%
High Case	33,457	7,645	1,731,871	209,806	705,190	0	147,515	2,794,382	1,208,790	113,891	61.977%	7.508%

PD II 00 MJD Normal

Region: PADD-II
Period: 2000

	LS D % MJD ex MTBE	D % MJD ex MTBE	HHO % MJD ex MTBE	% MJD ULR ex MTBE	ULP ex MTBE	HC OULR ex MTBE	HC OULP ex MTBE	RULR ex MTBE	RULP ex MTBE	ROULR ex MTBE	ROULP ex MTBE	M % MJD ex MTBE	% Incr Prime/Base
Base MJD													
Low Case	21.906%	0.000%	4.583%	24.244%	5.540%	1.413%	0.323%	26.447%	6.043%	1.267%	0.289%	65.566%	
Base * 1	21.906%	0.000%	4.583%	24.244%	5.540%	1.413%	0.323%	26.447%	6.043%	1.267%	0.289%	65.566%	
High Case	21.906%	0.000%	4.583%	24.244%	5.540%	1.413%	0.323%	26.447%	6.043%	1.267%	0.289%	65.566%	
M'													
Low Case	19.515%	0.000%	4.082%	25.634%	5.857%	1.494%	0.341%	27.964%	6.390%	1.339%	0.306%	69.325%	3.759%
Base * 1	19.515%	0.000%	4.082%	25.634%	5.857%	1.494%	0.341%	27.964%	6.390%	1.339%	0.306%	69.325%	3.759%
High Case	19.515%	0.000%	4.082%	25.634%	5.857%	1.494%	0.341%	27.964%	6.390%	1.339%	0.306%	69.325%	3.759%
J'													
Low Case	21.734%	0.000%	4.547%	24.052%	5.496%	1.402%	0.320%	26.239%	5.996%	1.257%	0.287%	65.048%	0.726%
Base * 1	21.734%	0.000%	4.547%	24.052%	5.496%	1.402%	0.320%	26.239%	5.996%	1.257%	0.287%	65.048%	0.726%
High Case	21.734%	0.000%	4.547%	24.052%	5.496%	1.402%	0.320%	26.239%	5.996%	1.257%	0.287%	65.048%	0.726%
D'													
Low Case	25.236%	0.000%	5.279%	22.917%	5.236%	1.335%	0.305%	25.000%	5.712%	1.197%	0.274%	61.977%	4.026%
Base * 1	25.236%	0.000%	5.279%	22.917%	5.236%	1.335%	0.305%	25.000%	5.712%	1.197%	0.274%	61.977%	4.026%
High Case	25.236%	0.000%	5.279%	22.917%	5.236%	1.335%	0.305%	25.000%	5.712%	1.197%	0.274%	61.977%	4.026%

PD II 00 MJD Normal

Region: PADD-II
Period: 2000

	MJD $/D	MJD $/BBL	Total MJD ex MTBE
Base MJD			
Low Case	$44,691,971		2,341,262
Base * 1	$50,118,189	$22.61	2,581,247
High Case	$54,985,033	$22.83	2,794,382
M'			
Low Case			2,341,262
Base * 1	$49,867,083		2,581,247
High Case			2,794,382
J'			
Low Case			2,341,262
Base * 1	$49,770,416		2,581,247
High Case			2,794,382
D'			
Low Case			2,341,262
Base * 1	$49,445,891		2,581,247
High Case			2,794,382

Region: PADD-II
Year: 2000
Case: Base MJD

GDP Inflator:	1.0416			Inputs		Purch.					Produced		Outputs (ex MJD)		
Swing Crude:	WTI	IC4	nC4	Nat Gas	Meth.	MTBE	Invest$	Fixed $	Var Util.		MTBE	C3=	C3		
1989 Price:	$20.06	$15.25	$12.25	$15.44	18.35	35.7	$0.71	$1.00	$1.00			24.18	9.44		
1990 Price:	$20.89	$15.88	$12.76	$16.08	$19.11	37.18155	$0.74	$1.04	$1.04			25.18347	9.83176		
			BPD												
Low Case	611,400	44,353	65,291	6,883	11,941	73,992	176,312	47,728	1,042,690		24,600	2,519	66,826		
Base * 1	887,900	50,000	70,178	5,128	11,941	65,521	176,313	47,728	1,118,223		24,600	2,519	66,702		
High Case	1,143,300	49,804	70,996	4,230	11,941	95,147	293,580	74,774	1,187,644		24,600	2,519	75,768		
M Prime	887,900	50,000	69,566	3,603	11,941	91,953	213,776	55,853	1,134,064		24,600	11,579	65,625		
J Prime	887,900	50,000	53,725	4,994	11,941	83,120	149,613	40,650	1,111,459		24,600	14,374	76,778		
D Prime	687,900	32,704	42,573	7,022	11,941	75,884	149,613	40,650	1,086,425		24,600	26,032	70,241		
M Prime Low	611,400	43,269	73,708	5,368	11,941	81,086	176,303	47,726	1,052,935		24,600	2,519	72,233		
J Prime Low	611,400	44,807	63,864	7,087	11,941	72,992	176,312	47,728	1,047,470		24,600	2,519	65,447		
D Prime Low	611,400	40,929	57,138	9,047	11,941	66,753	176,312	47,728	1,043,192		24,600	2,519	52,725		
Delta 1	276,500	5,647	4,887	-1,755	0	11,529	1	0	75,533			0	-124		
Delta 2	255,400	-196	818	-898	0	9,626	117,267	27,046	69,421			0	9,066		
										Inputs Total Costs					
Cost Delta 1	$5,776,773	$89,691	$62,350	-$28,222	$0	$428,666	$1	$0	$78,668	$6,407,927		$0	-$1,219	$0	$0
Cost Delta 2	$5,335,942	-$3,113	$10,436	-$14,441	$0	$357,910	$86,808	$28,168	$72,302	$5,874,010		$0	$89,135	$0	$0

Region:	PADD-II											
Year:	2000											
Case:	Base MJD											
GDP Inflator:					MTBE				"M" Gasolines (inc MTBE)			Total M
Swing Crude:		HSFO	Sulfur	Coke	In Gasoline			ULR	ULP	ULR Ref	ULP Ref	(exc MTBE)
1989 Price:		$13.49	$4.20	$3.15	$35.70			$24.02	$28.06	$24.02	$28.06	
1990 Price:		$14.05	$4.37	$3.28	$37.18			$25.02	$29.22	$25.02	$29.22	
									BPD			
Low Case		22,605	8,929	70,170	98,592			605,054	138,323	733,672	167,586	1,546,043
Base * 1		62,881	9,326	66,102	110,121			667,155	152,508	808,965	184,787	1,703,294
High Case		103,532	9,826	62,077	119,747			722,143	165,091	875,651	200,017	1,843,155
M Prime		66,890	9,180	66,712	116,553			701,520	160,354	850,639	194,299	1,790,259
J Prime		64,442	9,337	66,176	107,720			654,979	149,724	794,197	181,428	1,672,608
D Prime		62,816	9,715	66,034	100,484			617,087	141,055	748,276	170,918	1,576,852
M Prime Low		23,689	8,921	70,237	105,686			640,659	146,442	776,841	177,443	1,635,699
J Prime Low		22,875	9,036	70,182	97,592			600,169	137,195	727,737	166,245	1,533,754
D Prime Low		20,331	9,521	70,195	91,353			571,643	130,668	693,171	158,331	1,462,460
Delta 1		40,276	397	-4,068	11,529							157,251
Delta 2		40,651	500	-4,025	9,626							139,861
						Outputs						
						Total Costs	Inputs - Outputs	Delta MJD	Cost/MJD	Crude/MJD	HSFO/MJD	LPGs/MJD
Cost Delta 1		$565,871	$1,737	-$13,346	$428,668	$981,709	$5,426,218	239,985	$22.61	1.1522	0.1678	-0.0371
Cost Delta 2		$571,140	$2,187	-$13,205	$357,910	$1,007,166	$4,866,844	213,135	$22.83	1.1963	0.1907	0.0438

Region: PADD-II
Year: 2000
Case: Base MJD
GDP Inflator:

	Jet Fuels			Distillates			Total MJD
Swing Crude:	JP4	Jet A	Total J	Diesel	HHO	Total D	(exc MTBE)
1989 Price:		$24.19		$22.43	$22.43		
1990 Price:	0	25.193885		$23.36	$23.36		
		BPD			BPD		
Low Case		186,016	186,016	512,854	107,296	620,150	2,352,209
Base * 1		205,100	205,100	565,500	118,300	683,800	2,592,194
High Case		222,013	222,013	612,101	128,060	740,161	2,605,329
M Prime		181,664	181,664	500,863	104,774	605,637	2,577,560
J Prime		221,498	221,498	555,190	116,149	671,339	2,565,445
D Prime		169,700	169,700	637,611	133,379	770,990	2,537,542
M Prime Low		165,904	165,904	457,410	95,684	553,094	2,354,697
J Prime Low		202,963	202,963	508,730	106,429	615,159	2,351,876
D Prime Low		175,730	175,730	590,656	123,556	714,212	2,352,402
Delta 1			19,084			63,650	239,985
Delta 2			16,913			56,361	213,135

	HSFO/Crude	Inputs/MJD
Cost Delta 1	0.1457	1.1693
Cost Delta 2	0.1592	1.1545

Region: PADD-III
Period: 2000

	Purch	Prod MTBE		M w/MTBE								M w/o MTBE				
	MTBE	& Equiv.	MTBE	ULR	ULP	OULR	OULP	RULR	RULP	ROULR	ROULP	HC OULR	HC OULP	HC RULR	HC RULP	HC ROULR
	BPD	BPD	BPD	BPD	BPD	BPD	BPD	BPD	BPD	BPD	BPD	BPD	BPD	BPD	BPD	BPD
Base MJD																
Low Case	146,591	85,382	231,973	786,480	276,331	28,639	10,062	1,200,649	421,850	187,257	65,793	24,343	8,553	1,061,374	372,915	159,169
Base * .925	155,022	88,116	243,138	824,336	289,632	30,018	10,547	1,258,440	442,155	196,271	68,960	25,515	8,965	1,112,461	390,665	166,830
Base * 1	174,048	88,492	262,540	890,116	312,744	32,413	11,388	1,358,861	477,438	211,932	74,463	27,551	9,680	1,201,233	422,055	180,143
Delta High	187,011	88,492	275,503	934,064	328,185	34,014	11,951	1,425,952	501,010	222,396	78,139	28,912	10,158	1,260,542	442,893	189,037
High Case	198,156	88,492	286,648	971,851	341,461	35,390	12,434	1,483,638	521,278	231,393	81,300	30,081	10,569	1,311,536	460,810	196,684
M'																
Low Case	163,512	82,180	245,692	832,994	292,674	30,333	10,658	1,271,658	446,799	198,332	69,684	25,783	9,059	1,124,146	394,970	168,582
Base * .925	174,202	83,316	257,518	873,089	306,761	31,793	11,171	1,332,867	468,305	207,878	73,038	27,024	9,495	1,178,254	413,981	176,697
Base * 1	192,812	85,255	278,067	942,760	331,240	34,330	12,062	1,439,227	505,674	224,467	78,867	29,181	10,253	1,272,276	447,016	190,797
Delta High	206,541	85,255	291,796	989,307	347,594	36,025	12,657	1,510,286	530,641	235,549	82,761	30,621	10,759	1,335,093	469,087	200,217
High Case	218,346	85,255	303,601	1,029,328	361,656	37,483	13,170	1,571,383	552,107	245,078	86,109	31,860	11,194	1,389,102	488,063	208,316
J'																
Low Case	139,650	86,018	225,668	765,105	268,821	27,861	9,789	1,168,018	410,385	182,168	64,005	23,682	8,321	1,032,528	362,760	154,843
Base * .925	149,376	87,154	236,530	801,932	281,760	29,202	10,260	1,224,239	430,138	190,936	67,086	24,822	8,721	1,082,227	380,242	162,296
Base * 1	166,290	89,115	255,405	865,925	304,244	31,532	11,079	1,321,930	464,462	206,173	72,439	26,802	9,417	1,168,586	410,584	175,247
Delta High	178,900	89,115	268,015	908,678	319,265	33,089	11,626	1,387,198	487,394	216,352	76,016	28,126	9,882	1,226,283	430,856	183,899
High Case	189,742	89,115	278,857	945,438	332,181	34,428	12,096	1,443,315	507,111	225,104	79,091	29,264	10,282	1,275,891	448,286	191,339
D'																
Low Case	139,164	82,546	221,710	751,684	264,105	27,372	9,617	1,147,529	403,186	178,972	62,882	23,266	8,175	1,014,416	356,416	152,127
Base * .925	148,700	83,682	232,381	787,865	276,817	28,690	10,080	1,202,763	422,592	187,587	65,909	24,386	8,568	1,063,243	373,572	159,449
Base * 1	165,331	85,594	250,925	850,735	298,907	30,979	10,885	1,298,741	456,314	202,556	71,168	26,332	9,252	1,148,087	403,382	172,173
Delta High	177,719	85,594	263,314	892,738	313,665	32,509	11,422	1,362,864	478,844	212,557	74,682	27,632	9,709	1,204,772	423,298	180,673
High Case	188,372	85,594	273,966	928,853	326,354	33,824	11,884	1,417,997	498,215	221,155	77,703	28,750	10,101	1,253,509	440,422	187,982

MTBE Production (Max	59,000
Tame Production Base	33,137
Tame Production M'	29,500
Tame Production J'	33,637
Tame Production D'	29,881

Region: PADD-III
Period: 2000

	HC ROULP BPD	M ex MTBE BPD	Jet BPD	LS Diesel BPD	Diesel BPD	HHO BPD	Total MJD ex MTBE	Crude BPD	HSFO BPD	M % MJD ex MTBE	J % MJD ex MTBE	LS D % MJD ex MTBE	D % MJD ex MTBE
Base MJD													
Low Case	55,924	2,745,090	671,784	804,943	0	341,688	4,563,505	126,300	59,423	60.153%	14.721%	17.639%	0.000%
Base * .925	58,616	2,877,220	704,120	843,687	0	358,135	4,783,161	364,000	68,536	60.153%	14.721%	17.639%	0.000%
Base * 1	63,293	3,106,815	760,307	911,011	0	386,713	5,164,646	826,265	144,437	60.153%	14.721%	17.639%	0.000%
Delta High	66,418	3,260,209	797,845	955,991	0	405,806	5,419,851	1,134,300	165,900	60.153%	14.721%	17.639%	0.000%
High Case	69,105	3,392,097	830,121	994,665	0	422,223	5,639,105	1,413,000	235,629	60.153%	14.721%	17.639%	0.000%
M'													
Low Case	59,232	2,907,440	611,812	733,077	0	311,176	4,563,505	134,141	59,720	63.711%	13.407%	16.064%	0.000%
Base * .925	62,083	3,047,384	641,260	768,363	0	326,154	4,783,161	389,822	90,774	63.711%	13.407%	16.064%	0.000%
Base * 1	67,037	3,290,558	692,431	829,676	0	352,181	5,164,646	834,106	144,734	63.711%	13.407%	16.064%	0.000%
Delta High	70,346	3,453,024	726,619	870,640	0	369,569	5,419,851	1,150,081	194,110	63.711%	13.407%	16.064%	0.000%
High Case	73,192	3,592,712	756,013	905,861	0	384,519	5,639,105	1,421,334	236,269	63.711%	13.407%	16.064%	0.000%
J'													
Low Case	54,404	2,670,484	777,302	783,247	0	332,473	4,563,505	129,205	59,430	58.518%	17.033%	17.163%	0.000%
Base * .925	57,023	2,799,023	814,716	820,947	0	348,476	4,783,161	384,886	90,484	58.518%	17.033%	17.163%	0.000%
Base * 1	61,573	3,022,378	879,726	886,456	0	376,283	5,164,646	829,170	144,444	58.518%	17.033%	17.163%	0.000%
Delta High	64,613	3,171,603	923,163	930,224	0	394,862	5,419,651	1,144,835	193,604	58.518%	17.033%	17.163%	0.000%
High Case	67,227	3,299,906	960,509	967,855	0	410,835	5,639,105	1,416,088	235,763	58.518%	17.033%	17.163%	0.000%
D'													
Low Case	53,450	2,623,639	642,065	911,059	0	386,723	4,563,505	140,141	54,831	57.492%	14.070%	19.964%	0.000%
Base * .925	56,023	2,749,923	672,990	954,911	0	405,337	4,783,161	395,822	85,885	57.492%	14.070%	19.964%	0.000%
Base * 1	60,493	2,969,360	726,693	1,031,110	0	437,682	5,164,646	840,106	139,845	57.492%	14.070%	19.964%	0.000%
Delta High	63,480	3,115,967	762,573	1,082,020	0	459,292	5,419,851	1,156,458	169,484	57.492%	14.070%	19.964%	0.000%
High Case	66,046	3,242,020	793,422	1,125,792	0	477,872	5,639,105	1,427,711	231,642	57.492%	14.070%	19.964%	0.000%

Region: PADD-III
Period: 2000

	HHO % MJD ex MTBE	% MJD ULR ex MTBE	ULP ex MTBE	HC OULR ex MTBE	HC OULP ex MTBE	RULR ex MTBE	RULP ex MTBE	ROULR ex MTBE	ROULP ex MTBE	M % MJD ex MTBE	% Incr Prime/Base	MJD $/D	MJD $/BBL	Total MJD ex MTBE
Base MJD														
Low Case	7.487%	17.234%	6.055%	0.533%	0.187%	23.258%	8.172%	3.488%	1.225%	60.153%		$87,266,943		4,563,505
Base * .925	7.487%	17.234%	6.055%	0.533%	0.187%	23.258%	8.172%	3.488%	1.225%	60.153%		$91,459,992	$19.09	4,783,161
Base * 1	7.487%	17.234%	6.055%	0.533%	0.187%	23.258%	8.172%	3.488%	1.225%	60.153%		$99,000,272	$19.78	5,164,646
Delta High	7.487%	17.234%	6.055%	0.533%	0.187%	23.258%	8.172%	3.488%	1.225%	60.153%		$104,050,963	$19.81	5,419,651
High Case	7.487%	17.234%	6.055%	0.533%	0.187%	23.258%	8.172%	3.488%	1.225%	60.153%		$108,439,667	$20.02	5,639,105
M'														
Low Case	6.819%	18.253%	6.413%	0.565%	0.199%	24.633%	8.655%	3.694%	1.298%	63.711%	3.558%			4,563,505
Base * .925	6.819%	18.253%	6.413%	0.565%	0.199%	24.633%	8.655%	3.694%	1.298%	63.711%	3.558%			4,783,161
Base * 1	6.819%	18.253%	6.413%	0.565%	0.199%	24.633%	8.655%	3.694%	1.298%	63.711%	3.558%	$98,636,733		5,164,646
Delta High	6.819%	18.253%	6.413%	0.565%	0.199%	24.633%	8.655%	3.694%	1.298%	63.711%	3.558%			5,419,651
High Case	6.819%	18.253%	6.413%	0.565%	0.199%	24.633%	8.655%	3.694%	1.298%	63.711%	3.558%			5,639,105
J'														
Low Case	7.285%	16.766%	5.891%	0.519%	0.182%	22.626%	7.950%	3.393%	1.192%	58.518%	2.312%			4,563,505
Base * .925	7.285%	16.766%	5.891%	0.519%	0.182%	22.626%	7.950%	3.393%	1.192%	58.518%	2.312%			4,783,161
Base * 1	7.285%	16.766%	5.891%	0.519%	0.182%	22.626%	7.950%	3.393%	1.192%	58.518%	2.312%	$98,969,047		5,164,646
Delta High	7.285%	16.766%	5.891%	0.519%	0.182%	22.626%	7.950%	3.393%	1.192%	58.518%	2.312%			5,419,651
High Case	7.285%	16.766%	5.891%	0.519%	0.182%	22.626%	7.950%	3.393%	1.192%	58.518%	2.312%			5,639,105
D'														
Low Case	8.474%	16.472%	5.787%	0.510%	0.179%	22.229%	7.810%	3.334%	1.171%	57.492%	3.312%			4,563,505
Base * .925	8.474%	16.472%	5.787%	0.510%	0.179%	22.229%	7.810%	3.334%	1.171%	57.492%	3.312%			4,783,161
Base * 1	8.474%	16.472%	5.787%	0.510%	0.179%	22.229%	7.810%	3.334%	1.171%	57.492%	3.312%	$98,757,725		5,164,646
Delta High	8.474%	16.472%	5.787%	0.510%	0.179%	22.229%	7.810%	3.334%	1.171%	57.492%	3.312%			5,419,651
High Case	8.474%	16.472%	5.787%	0.510%	0.179%	22.229%	7.810%	3.334%	1.171%	57.492%	3.312%			5,639,105

Region: PADD-III
Year: 2000
Case: Base MJD

GDP Inflator:	1.9416			Inputs		Purch.					Produced		Outputs (ex MJD)	
Swing Crude:	Arab Light	IC4	nC4	Nat Gas	Meth.	MTBE	Invest$	Fixed $	Var Util.		MTBE	C3=	C3	C4=
1989 Price:	$17.44	$14.25	$12.25	$12.00	$18.35	$35.70	$0.71	$1.00	$1.00		$0.00	$14.18	$9.44	$20.00
1990 Price:	$18.16	$14.64	$12.76	$12.50	$19.11	$37.18	$0.74	$1.04	$1.04		$0.00	$14.77	$9.83	$20.83
			BPD											BPD
Low Case	126,300	25,530	29,667	87,500	28,673	141,931	378,914	107,572	2,868,196		55,890	64,300	193,025	8,800
Base * .925	364,000	25,530	37,398	84,313	29,594	150,473	378,914	107,572	2,981,474		58,624	64,300	199,087	8,800
Base * 1	826,265	25,530	54,323	76,686	29,720	189,490	378,914	107,572	3,250,381		59,000	64,300	216,875	8,800
Delta High	1,134,300	25,530	53,001	79,865	29,501	183,489	365,115	103,655	3,310,661		59,000	64,300	219,741	8,800
High Case	1,413,000	25,530	46,655	89,238	29,759	193,902	386,184	109,638	3,360,396		59,000	64,300	228,411	8,800
M Prime	826,265	25,530	58,228	67,994	28,640	190,142	326,225	92,614	3,276,537		59,000	64,300	223,578	8,800
J Prime	826,265	25,530	47,751	60,535	29,632	162,534	373,315	105,983	3,212,749		59,000	64,300	212,171	8,800
D Prime	826,265	25,530	30,299	84,876	28,753	160,702	317,995	90,277	3,146,678		59,000	64,300	210,279	8,800
Low M Prime	126,300	25,530	45,989	71,993	29,285	154,009	378,914	107,572	2,849,717		57,709	64,300	201,595	8,800
Low J Prime	126,300	25,530	22,683	90,882	28,642	135,232	378,914	107,572	2,859,271		55,798	64,300	190,303	8,800
Low D Prime	126,300	25,530	4,197	89,773	28,309	131,457	378,914	107,572	2,709,477		54,810	64,300	189,842	8,800
Delta 1	237,700	0	7,731	-3,187	921	8,542	0	0	113,278			0	6,062	0
Delta 2	462,265	0	16,925	-7,627	126	19,017	0	0	268,907			0	17,788	0
Delta 3	308,035	0	-1,322	3,179	-219	13,999	-13,799	-3,917	60,260			0	2,866	0
Delta 4	278,700	0	-6,346	9,373	258	10,413	21,069	5,981	49,735			0	8,670	0
										Inputs Total Costs				
Cost Delta 1	$4,317,526	$0	$98,635	-$39,831	$17,602	$317,605	$0	$0	$117,979	$4,829,515		$0	$59,800	$0
Cost Delta 2	$8,396,471	$0	$215,935	-$95,322	$2,408	$707,082	$0	$0	$280,067	$9,506,640		$0	$174,887	$0
Cost Delta 3	$5,595,074	$0	-$16,867	$39,731	-$4,185	$520,505	-$10,215	-$4,080	$62,782	$6,182,745		$0	$28,178	$0
Cost Delta 4	$5,062,240	$0	-$80,965	$117,144	$4,931	$387,171	$15,596	$6,229	$51,799	$5,564,146		$0	$85,241	$0

Region:	PADD-III
Year:	2000
Case:	Base MJD
GDP Inflator:	

								"M" Gasolines (inc MTBE)			
Swing Crude:	C4s	HSFO	Sulfur	Coke	MTBE In Gasoline			ULR	ULP	ULR Ref	ULP Ref
1989 Price:	$12.14	$13.49	$4.20	$3.15	$35.70			$23.39	$25.87	$23.39	$25.87
1990 Price:	$12.64	$14.05	$4.37	$3.28	$37.18			$24.36	$26.94	$24.36	$26.94
									BPD		
Low Case	0	59,423	29,182	167,040	197,821			265,964	813,960	486,939	1,385,840
Base * .925	0	68,536	30,755	173,956	209,097			299,748	853,195	510,411	1,452,642
Base * 1	0	144,437	34,885	169,673	228,490			323,696	921,290	551,159	1,568,683
Delta High	0	185,900	37,210	166,818	242,489			339,745	967,042	578,518	1,646,476
High Case	0	235,629	40,145	164,235	252,902			353,454	1,006,063	601,861	1,712,912
M Prime	0	143,782	34,896	169,673	249,142			342,830	975,749	583,738	1,661,409
J Prime	0	144,091	34,866	169,673	221,534			314,788	895,930	535,989	1,525,495
D Prime	0	138,164	35,294	169,673	219,702			308,846	879,032	525,878	1,496,730
Low M Prime	0	68,196	28,381	167,040	211,718			302,555	861,118	515,160	1,466,227
Low J Prime	0	63,022	29,408	167,040	191,030			277,838	790,768	473,075	1,346,432
Low D Prime	0	56,017	29,140	171,566	186,267			271,984	774,117	463,112	1,318,080
Delta 1	0	9,113	1,573	6,916	11,276						
Delta 2	0	75,901	4,130	-4,283	19,393						
Delta 3	0	41,463	2,325	-2,855	13,999						
Delta 4	0	49,729	2,935	-2,583	10,413						
						Outputs Total Costs	Inputs - Outputs	Delta MJD	Cost/MJD	Crude/MJD	HSFO/MJD
Cost Delta 1	$0	$128,036	$6,881	$22,689	$419,259	$636,466	$4,193,049	219,656	$19.089	1.082	0.041
Cost Delta 2	$0	$1,066,397	$18,066	-$14,051	$721,062	$1,966,360	$7,540,280	381,685	$19.755	1.211	0.199
Cost Delta 3	$0	$582,548	$10,170	-$9,366	$520,505	$1,132,034	$5,050,711	255,005	$19.806	1.208	0.163
Cost Delta 4	$0	$698,684	$12,839	-$8,474	$387,171	$1,175,462	$4,388,684	219,254	$20.016	1.271	0.227

Region: PADD-III
Year: 2000
Case: Base MJD
GDP Inflator:
Swing Crude:

	Total M (exc MTBE)	Jet Fuels Jet A	Total J	Distillates Diesel	HHO	Total D	Total MJD (exc MTBE)
1989 Price:		$23.31		$21.88	$21.88		
1990 Price:		$24.28		$22.79	$22.79		
		BPD			BPD		
Low Case	2,774,882	671,673	671,673	804,809	341,633	1,146,442	4,592,997
Base * .926	2,906,899	704,049	704,049	843,604	358,101	1,201,705	4,812,653
Base * 1	3,136,338	760,300	760,300	911,000	386,700	1,297,700	5,194,338
Delta High	3,289,292	797,995	797,995	956,171	405,885	1,362,056	5,449,343
High Case	3,421,388	830,194	830,194	994,753	422,262	1,417,015	5,668,597
M Prime	3,314,584	691,962	691,962	829,114	351,942	1,181,056	5,187,602
J Prime	3,050,668	879,197	879,197	885,921	376,056	1,261,977	5,191,842
D Prime	2,990,784	725,428	725,428	1,029,315	436,920	1,466,235	5,182,447
Low M Prime	2,933,342	610,670	610,670	731,710	310,596	1,042,306	4,586,318
Low J Prime	2,697,081	775,997	775,997	781,931	331,915	1,113,846	4,586,924
Low D Prime	2,641,026	638,845	638,845	906,462	384,772	1,291,234	4,571,105
Delta 1	132,017		32,376			55,263	219,656
Delta 2	229,439		56,251			95,995	381,685
Delta 3	152,954		37,695			64,356	255,005
Delta 4	132,096		32,199			54,959	219,254

	LPGs/MJD	HSFO/Crude	Inputs/MJD
Cost Delta 1	0.007	0.038	1.075
Cost Delta 2	0.022	0.164	1.189
Cost Delta 3	0.004	0.135	1.204
Cost Delta 4	0.026	0.178	1.245

PD IV 00 MJD Normal

Region: PADD-IV
Period: 2000

	Purch MTBE BPD	Prod MTBE & Equiv. BPD	MTBE BPD	M w/MTBE ULR BPD	M w/MTBE ULP BPD	M w/MTBE OULR BPD	M w/MTBE OULP BPD	M w/MTBE RULR BPD	M w/MTBE RULP BPD	M w/MTBE ROULR BPD	M w/MTBE ROULP BPD	M w/o MTBE HC OULR BPD	M w/o MTBE HC OULP BPD	M w/o MTBE HC RULR BPD	M w/o MTBE HC RULP BPD
Base MJD															
Low Case	7,228	1,256	8,483	125,984	26,539	29,675	6,251	22,034	4,642	0	0	25,223	5,313	19,478	4,103
Base * 1	8,530	1,256	9,786	145,330	30,614	34,231	7,211	25,417	5,354	0	0	29,097	6,129	22,469	4,733
High Case	8,254	2,619	10,873	161,476	34,015	38,034	8,012	28,241	5,949	0	0	32,329	6,810	24,965	5,259
M'															
Low Case	6,290	3,237	9,527	141,487	29,805	33,326	7,020	24,745	5,213	0	0	28,327	5,967	21,875	4,608
Base * 1	7,753	3,237	10,990	163,214	34,382	38,444	8,098	28,545	6,013	0	0	32,677	6,884	25,234	5,316
High Case	7,641	4,570	12,211	181,346	38,201	42,715	8,998	31,716	6,681	0	0	36,308	7,648	28,037	5,906
J'															
Low Case	4,976	3,356	8,332	123,742	26,067	29,147	6,140	21,642	4,559	0	0	24,775	5,219	19,131	4,030
Base * 1	6,256	3,356	9,612	142,744	30,070	33,622	7,083	24,965	5,259	0	0	28,579	6,020	22,069	4,649
High Case	5,828	4,852	10,680	158,602	33,410	37,358	7,870	27,739	5,843	0	0	31,754	6,689	24,521	5,165
D'															
Low Case	6,216	1,864	8,080	120,000	25,279	28,265	5,954	20,987	4,421	0	0	24,025	5,061	18,553	3,908
Base * 1	7,457	1,864	9,321	138,428	29,160	32,606	6,869	24,210	5,100	0	0	27,715	5,838	21,402	4,508
High Case	7,021	3,335	10,357	153,807	32,400	36,228	7,632	26,900	5,667	0	0	30,794	6,487	23,780	5,009

	Min	Max
MTBE Production:	460	4,138
Tame Production	582	894
Tame as MTBE Equiv.	518	796

PD IV 00 MJD Normal

Region: PADD-IV

Period: 2000

	HC ROULR BPD	HC ROULP BPD	M ex MTBE BPD	Jet BPD	LS Diesel BPD	Diesel BPD	HHO BPD	Total MJD ex MTBE	Crude BPD	HSFO BPD	M % MJD ex MTBE	J % MJD ex MTBE	LS D % MJD ex MTBE
Base MJD													
Low Case	0	0	206,641	36,586	71,440	0	34,854	349,521	82,700	6,738	59.121%	10.468%	20.439%
Base * 1	0	0	238,373	42,205	82,411	0	40,206	403,194	142,100	12,698	59.121%	10.468%	20.439%
High Case	0	0	264,855	46,893	91,566	0	44,673	447,987	196,000	18,950	59.121%	10.468%	20.439%
M'													
Low Case	0	0	232,069	30,075	58,727	0	28,650	349,521	81,602	4,511	66.396%	8.605%	16.802%
Base * 1	0	0	267,706	34,694	67,745	0	33,050	403,194	141,002	10,471	66.396%	8.605%	16.802%
High Case	0	0	297,447	36,548	75,271	0	36,722	447,987	194,806	16,695	66.396%	8.605%	16.802%
J'													
Low Case	0	0	202,964	42,173	70,156	0	34,228	349,521	87,542	7,423	58.069%	12.066%	20.072%
Base * 1	0	0	234,131	48,649	80,930	0	39,484	403,194	146,942	13,383	58.069%	12.066%	20.072%
High Case	0	0	260,142	54,054	89,921	0	43,871	447,987	201,264	19,760	58.069%	12.066%	20.072%
D'													
Low Case	0	0	196,827	34,840	79,210	0	38,644	349,521	86,638	7,949	56.313%	9.968%	22.662%
Base * 1	0	0	227,052	40,191	91,374	0	44,578	403,194	146,038	13,909	56.313%	9.968%	22.662%
High Case	0	0	252,276	44,656	101,525	0	49,531	447,987	200,281	20,263	56.313%	9.968%	22.662%

PD IV 00 MJD Normal

Region: PADD-IV
Period: 2000

	D % MJD ex MTBE	HHO % MJD ex MTBE	% MJD ULR ex MTBE	ULP ex MTBE	HC OULR ex MTBE	HC OULP ex MTBE	RULR ex MTBE	RULP ex MTBE	M % MJD ex MTBE	% Incr Prime/Base	MJD $/D	MJD $/BBL	Total MJD ex MTBE
Base MJD													
Low Case	0.000%	9.972%	36.045%	7.593%	7.217%	1.520%	5.573%	1.174%	59.121%		$6,656,023		349,521
Base * 1	0.000%	9.972%	36.045%	7.593%	7.217%	1.520%	5.573%	1.174%	59.121%		$7,845,564	$22.16	403,194
High Case	0.000%	9.972%	36.045%	7.593%	7.217%	1.520%	5.573%	1.174%	59.121%		$8,844,224	$22.30	447,987
M'													
Low Case	0.000%	8.197%	40.480%	8.527%	8.105%	1.707%	6.259%	1.318%	66.396%	7.275%			349,521
Base * 1	0.000%	8.197%	40.480%	8.527%	8.105%	1.707%	6.259%	1.318%	66.396%	7.275%	$7,847,887		403,194
High Case	0.000%	8.197%	40.480%	8.527%	8.105%	1.707%	6.259%	1.318%	66.396%	7.275%			447,987
J'													
Low Case	0.000%	9.793%	35.403%	7.458%	7.088%	1.493%	5.474%	1.153%	58.069%	1.598%			349,521
Base * 1	0.000%	9.793%	35.403%	7.458%	7.088%	1.493%	5.474%	1.153%	58.069%	1.598%	$7,729,507		403,194
High Case	0.000%	9.793%	35.403%	7.458%	7.088%	1.493%	5.474%	1.153%	58.069%	1.598%			447,987
D'													
Low Case	0.000%	11.056%	34.333%	7.232%	6.874%	1.448%	5.308%	1.118%	56.313%	3.307%			349,521
Base * 1	0.000%	11.056%	34.333%	7.232%	6.874%	1.448%	5.308%	1.118%	56.313%	3.307%	$7,770,029		403,194
High Case	0.000%	11.056%	34.333%	7.232%	6.874%	1.448%	5.308%	1.118%	56.313%	3.307%			447,987

Region: PADD-VC
Period: 2000

	Purch MTBE BPD	Prod MTBE & Equiv. BPD	MTBE BPD	M w/MTBE						M w/o MTBE				
				ULR BPD	ULP BPD	OULR BPD	OULP BPD	CULR BPD	CULP BPD	HC OULR BPD	HC OULP BPD	HC CULR BPD	HC CULP BPD	M ex MTBE BPD
Base MJD														
Low Case	115,454	4,786	120,241	27,856	8,990	27,856	8,990	788,397	254,456	23,677	7,642	701,673	226,468	996,304
Low - Delta	121,506	4,786	126,292	29,257	9,443	29,257	9,443	828,074	267,262	24,869	8,026	736,966	237,863	1,046,444
Base * 1	127,305	4,786	132,091	30,601	9,876	30,601	9,876	866,100	279,535	26,011	8,395	770,829	248,786	1,094,498
Base-High	131,145	4,786	135,931	31,491	10,164	31,491	10,164	891,277	287,661	26,767	8,639	793,237	256,018	1,126,315
High Case	135,849	4,786	140,636	32,580	10,515	32,580	10,515	922,122	297,616	27,693	8,938	820,689	264,878	1,165,294
M'														
Low Case	129,128	445	129,573	30,018	9,688	30,018	9,688	849,587	274,205	25,515	8,235	756,133	244,043	1,073,631
Low - Delta	135,649	445	136,094	31,528	10,176	31,528	10,176	892,344	288,005	26,799	8,649	794,186	256,325	1,127,663
Base * 1	141,899	445	142,344	32,976	10,643	32,976	10,643	933,321	301,231	28,030	9,047	830,656	268,095	1,179,446
Base-High	146,036	445	146,481	33,935	10,952	33,935	10,952	960,453	309,987	28,844	9,310	854,803	275,889	1,213,733
High Case	151,106	445	151,551	35,109	11,331	35,109	11,331	993,692	320,715	29,843	9,632	884,386	285,437	1,255,738
J'														
Low Case	117,707	445	118,152	27,372	8,834	27,372	8,834	774,703	250,036	23,266	7,509	689,485	222,532	978,999
Low - Delta	123,653	445	124,098	28,749	9,279	28,749	9,279	813,691	262,620	24,437	7,887	724,185	233,732	1,028,268
Base * 1	129,352	445	129,797	30,069	9,705	30,069	9,705	851,056	274,679	25,559	8,249	757,440	244,465	1,075,487
Base-High	133,125	445	133,570	30,944	9,987	30,944	9,987	875,796	282,664	26,302	8,489	779,459	251,571	1,106,751
High Case	137,748	445	138,193	32,014	10,333	32,014	10,333	906,106	292,447	27,212	8,783	806,434	260,278	1,145,054
D'														
Low Case	113,255	5,743	118,998	27,568	8,897	27,568	8,897	780,248	251,826	23,432	7,563	694,420	224,125	986,006
Low - Delta	119,243	5,743	124,987	28,955	9,345	28,955	9,345	819,515	264,499	24,612	7,943	729,368	235,404	1,035,628
Base * 1	124,983	5,743	130,726	30,285	9,774	30,285	9,774	857,147	276,645	25,742	8,308	762,861	246,214	1,083,185
Base-High	128,783	5,743	134,526	31,165	10,059	31,165	10,059	882,065	284,688	26,490	8,550	785,037	253,372	1,114,673
High Case	133,439	5,743	139,182	32,244	10,407	32,244	10,407	912,591	294,540	27,407	8,846	812,206	262,141	1,153,250

	Min	Max
MTBE Production:	0	0
Tame Production:	500	6,453
Tame as MTBE Equiv.:	445	5,743

Region: PADD-VC
Period: 2000

	Jet BPD	LS Diesel BPD	Diesel BPD	HHO BPD	Total MJD ex MTBE	Crude BPD	HSFO BPD	M % MJD ex MTBE	J % MJD ex MTBE	LS D % MJD ex MTBE	D % MJD ex MTBE	HHO % MJD ex MTBE	ULR ex MTBE
Base MJD													
Low Case	232,809	141,033	0	134,477	1,504,623	410,900	70,976	66.216%	15.473%	9.373%	0.000%	8.938%	1.851%
Low - Delta	244,525	148,131	0	141,245	1,580,345	520,000	104,152	66.216%	15.473%	9.373%	0.000%	8.938%	1.851%
Base * 1	255,754	154,933	0	147,731	1,652,916	628,200	135,697	66.216%	15.473%	9.373%	0.000%	8.938%	1.851%
Base-High	263,188	159,437	0	152,025	1,700,966	700,000	155,934	66.216%	15.473%	9.373%	0.000%	8.938%	1.851%
High Case	272,297	164,955	0	157,287	1,759,833	794,200	184,062	66.216%	15.473%	9.373%	0.000%	8.938%	1.851%
M'													
Low Case	197,395	119,574	0	114,022	1,504,623	427,279	69,608	71.356%	13.119%	7.947%	0.000%	7.578%	1.995%
Low - Delta	207,330	125,591	0	119,761	1,580,345	533,183	103,002	71.356%	13.119%	7.947%	0.000%	7.578%	1.995%
Base * 1	216,850	131,359	0	125,260	1,652,916	641,412	134,428	71.356%	13.119%	7.947%	0.000%	7.578%	1.995%
Base-High	223,154	135,177	0	128,901	1,700,966	713,212	154,665	71.356%	13.119%	7.947%	0.000%	7.578%	1.995%
High Case	230,877	139,855	0	133,362	1,759,833	813,440	186,016	71.356%	13.119%	7.947%	0.000%	7.578%	1.995%
J'													
Low Case	254,832	138,618	0	132,174	1,504,623	427,895	73,916	65.066%	16.937%	9.213%	0.000%	8.785%	1.819%
Low - Delta	267,657	145,594	0	138,626	1,580,345	533,820	107,310	65.066%	16.937%	9.213%	0.000%	8.785%	1.819%
Base * 1	279,948	152,280	0	145,201	1,652,916	642,050	138,730	65.066%	16.937%	9.213%	0.000%	8.785%	1.819%
Base-High	288,086	156,707	0	149,422	1,700,966	713,850	158,967	65.066%	16.937%	9.213%	0.000%	8.785%	1.819%
High Case	298,056	162,130	0	154,593	1,759,833	814,123	190,342	65.066%	16.937%	9.213%	0.000%	8.785%	1.819%
D'													
Low Case	230,337	147,571	0	140,709	1,504,623	418,581	73,744	65.532%	15.309%	9.606%	0.000%	9.352%	1.832%
Low - Delta	241,929	154,997	0	147,790	1,580,345	524,182	107,161	65.532%	15.309%	9.806%	0.000%	9.352%	1.832%
Base * 1	253,039	162,115	0	154,577	1,652,916	632,391	138,668	85.532%	15.309%	9.806%	0.000%	9.352%	1.832%
Base-High	260,395	166,828	0	159,070	1,700,966	704,191	158,905	65.532%	15.309%	9.806%	0.000%	9.352%	1.832%
High Case	269,406	172,601	0	164,575	1,759,833	803,779	189,915	65.532%	15.309%	9.806%	0.000%	9.352%	1.832%

Region: PADD-VC
Period: 2000

	ULP ex MTBE	HC OULR ex MTBE	HC OULP ex MTBE	% MJD CULR ex MTBE	CULP ex MTBE	M % MJD ex MTBE	% Incr Prime/Base	MJD $/D	MJD $/BBL	Total MJD ex MTBE
Base MJD										
Low Case	0.598%	1.574%	0.508%	46.634%	15.051%	66.216%		$28,678,771		1,504,623
Low - Delta	0.598%	1.574%	0.508%	46.634%	15.051%	66.216%		$30,201,584	$20.11	1,580,345
Base * 1	0.598%	1.574%	0.508%	46.634%	15.051%	66.216%		$31,691,925	$20.54	1,652,916
Base-High	0.598%	1.574%	0.508%	46.634%	15.051%	66.216%		$32,737,016	$21.75	1,700,968
High Case	0.598%	1.574%	0.508%	46.634%	15.051%	66.216%		$34,053,556	$22.36	1,759,833
M'										
Low Case	0.644%	1.696%	0.547%	50.254%	16.220%	71.356%	5.139%			1,504,623
Low - Delta	0.644%	1.696%	0.547%	50.254%	16.220%	71.356%	5.139%	$31,997,005		1,580,345
Base * 1	0.644%	1.696%	0.547%	50.254%	16.220%	71.356%	5.139%			1,652,916
Base-High	0.644%	1.696%	0.547%	50.254%	16.220%	71.356%	5.139%			1,700,968
High Case	0.644%	1.696%	0.547%	50.254%	16.220%	71.356%	5.139%			1,759,833
J'										
Low Case	0.587%	1.546%	0.499%	45.824%	14.790%	65.066%	1.464%			1,504,623
Low - Delta	0.587%	1.546%	0.499%	45.824%	14.790%	65.066%	1.464%	$31,491,431		1,580,345
Base * 1	0.587%	1.546%	0.499%	45.824%	14.790%	65.066%	1.464%			1,652,916
Base-High	0.587%	1.546%	0.499%	45.824%	14.790%	65.066%	1.464%			1,700,968
High Case	0.587%	1.546%	0.499%	45.824%	14.790%	65.066%	1.464%			1,759,833
D'										
Low Case	0.591%	1.557%	0.503%	46.152%	14.896%	65.532%	0.849%			1,504,623
Low - Delta	0.591%	1.557%	0.503%	46.152%	14.896%	65.532%	0.849%	$31,429,372		1,580,345
Base * 1	0.591%	1.557%	0.503%	46.152%	14.896%	65.532%	0.849%			1,652,916
Base-High	0.591%	1.557%	0.503%	46.152%	14.896%	65.532%	0.849%			1,700,968
High Case	0.591%	1.557%	0.503%	46.152%	14.896%	65.532%	0.849%			1,759,833

Region: PADD-VC
Year: 2000
Case: Base MJD

GDP Inflator:	1.0416			Inputs		Purch.					Produced		Outputs (ex MJD)		
Swing Crude:	ANS	IC4	nC4	Nat Gas	Meth.	MTBE	Invest$	Fixed $	Var Util.		MTBE	C3=	C3	C4=	C4s
1989 Price:	$16.93	$0.00	$0.00	$14.15	$18.35	$35.70	$0.71	$1.00	$1.00			$24.18	$9.44	$13.00	$12.14
1990 Price:	$17.63	$0.00	$0.00	$14.74	$19.11	$37.18	$0.74	$1.04	$1.04			$25.18	$9.83	$13.54	$12.64
			BPD											BPD	
Low Case	410,900			115,397	662	125,823	589,033	674,227	1,459,836		0	0	84,199	0	29,316
Low - Delta	520,000			117,434	1,033	131,010	589,033	674,227	1,515,557		0	0	67,625	0	27,094
Base * 1	628,200			116,802	1,598	135,399	589,033	674,227	1,563,344		0	0	92,065	0	23,833
Base-High	700,000			116,532	1,937	138,430	619,357	709,220	1,594,011		0	0	94,963	0	22,768
High Case	794,200			115,512	2,373	142,085	670,968	768,859	1,626,938		0	0	98,561	0	24,443
M Prime	628,200			122,634	149	150,610	703,963	802,218	1,631,438		0	0	96,766	0	38,704
J Prime	628,200			116,817	149	137,571	550,653	624,275	1,539,808		0	0	93,242	0	30,338
D Prime	628,200			111,878	1,917	132,706	545,671	626,366	1,538,988		0	0	91,374	0	17,577
Low M Prime	410,900			112,790	0	136,397	589,033	674,227	1,502,543		0	0	89,209	0	32,789
Low J Prime	410,900			115,392	756	123,591	589,033	674,227	1,457,047		0	0	83,123	0	24,094
Low D Prime	410,900			115,872	681	124,586	589,033	674,227	1,457,979		0	0	83,492	0	27,095
Delta 1	109,100	0	0	2,037	371	5,187	0	0	55,721			0	3,426	0	-2,222
Delta 2	108,200	0	0	-632	565	4,389	0	0	47,787			0	4,440	0	-3,261
Delta 3	71,600	0	0	-270	339	3,031	30,324	34,993	30,667			0	2,898	0	-1,065
Delta 4	94,200	0	0	-1,020	436	3,655	51,611	59,639	32,927			0	3,598	0	1,675
										Inputs					
										Total Costs					
Cost Delta 1	$1,923,716	$0	$0	$30,020	$7,090	$192,861	$0	$0	$58,033	$2,211,720		$0	$33,684	$0	-$28,095
Cost Delta 2	$1,907,847	$0	$0	-$9,314	$10,798	$163,190	$0	$0	$49,770	$2,122,291		$0	$43,653	$0	-$41,231
Cost Delta 3	$1,266,020	$0	$0	-$3,979	$6,479	$112,697	$22,447	$36,445	$31,940	$1,472,049		$0	$28,492	$0	-$13,466
Cost Delta 4	$1,660,990	$0	$0	-$15,032	$8,333	$135,899	$38,205	$62,114	$34,293	$1,924,802		$0	$35,375	$0	$21,178

Region: PADD-VC
Year: 2000
Case: Base MJD
GDP Inflator:

Swing Crude:	HSFO	Sulfur	Coke	MTBE In Gasoline	Outputs Total Costs	Inputs - Outputs	ULR	ULP	ULR Ref	ULP Ref	Total M (exc MTBE)
							"M" Gasolines (Inc MTBE)				
1989 Price:	$14.15	$4.20	$3.15	$35.70			$25.79	$28.35	$25.79	$28.35	
1990 Price:	$14.74	$4.37	$3.28	$37.18			$26.86	$29.53	$26.86	$29.53	
								BPD			
Low Case	70,976	10,834	97,332	125,823			56,191	18,130	795,130	256,635	1,000,263
Low - Delta	104,152	11,185	97,332	131,010			58,972	19,027	834,472	269,333	1,050,794
Base * 1	135,697	11,517	97,332	135,399			61,617	19,880	871,893	281,411	1,099,402
Base-High	155,934	11,745	97,332	138,430			63,372	20,446	896,732	289,428	1,131,548
High Case	184,062	12,038	97,332	142,085			65,520	21,140	927,133	299,240	1,170,948
M Prime	130,704	11,634	97,332	150,610			66,239	21,378	937,182	302,491	1,176,680
J Prime	134,826	11,520	97,332	137,571			60,394	19,485	854,591	275,827	1,072,726
D Prime	137,487	11,485	97,332	132,706			60,836	19,628	860,856	277,849	1,086,463
Low M Prime	78,692	10,847	97,332	136,397			59,802	19,294	846,226	273,127	1,062,052
Low J Prime	71,120	10,825	97,332	123,591			55,363	17,862	783,404	252,851	985,889
Low D Prime	70,801	10,832	97,332	124,586			55,682	17,965	787,936	254,313	991,310
Delta 1	33,176	351	0	5,187							50,531
Delta 2	31,545	332	0	4,389							48,608
Delta 3	20,237	228	0	3,031							32,146
Delta 4	28,128	293	0	3,655							39,400
					Outputs Total Costs	Inputs - Outputs	Delta MJD	Cost/MJD	Crude/MJD	HSFO/MJD	LPGs/MJD
Cost Delta 1	$488,922	$1,535	$0	$192,861	$688,907	$1,522,813	75,722	$20.11	1.4408	0.4381	-0.0110
Cost Delta 2	$464,886	$1,452	$0	$163,190	$631,949	$1,490,341	72,571	$20.54	1.4910	0.4347	0.0250
Cost Delta 3	$298,237	$997	$0	$112,697	$426,959	$1,045,091	48,050	$21.75	1.4943	0.4212	0.0438
Cost Delta 4	$414,529	$1,282	$0	$135,899	$608,262	$1,316,540	58,867	$22.36	1.6002	0.4778	0.1069

Region:	**PADD-VC**						
Year:	**2000**						
Case:	**Base MJD**						
GDP Inflator:		**Jet Fuels**			**Distillates**		**Total MJD**
Swing Crude:		**Jet A**	**Total J**	**Diesel**	**HHO**	**Total D**	**(exc MTBE)**
1989 Price:		$25.12		$23.39	$23.39		
1990 Price:		$26.16		$24.36	$24.36		
		BPD			BPD		
Low Case		233,187	233,187	141,263	134,696	275,959	1,509,409
Low - Delta		244,725	244,725	148,252	141,360	289,612	1,585,131
Base * 1		255,700	255,700	154,900	147,700	302,600	1,657,702
~~Base~~-High		262,984	262,984	159,313	151,907	311,220	1,705,752
High Case		271,900	271,900	164,714	157,057	321,771	1,764,619
M Prime		216,260	216,260	131,001	124,919	255,920	1,648,860
J Prime		279,113	279,113	151,826	144,768	296,594	1,648,433
D Prime		252,463	252,463	161,746	154,225	315,971	1,654,897
Low M Prime		195,264	195,264	118,288	112,790	231,078	1,488,394
Low J Prime		255,863	255,863	139,180	132,709	271,889	1,513,641
Low D Prime		231,078	231,078	148,045	141,161	289,206	1,511,594
Delta 1			11,538			13,653	75,722
Delta 2			10,975			12,988	72,571
Delta 3			7,284			8,620	48,050
Delta 4			8,916			10,551	58,867

	HSFO/Crude	Inputs/MJD
Cost Delta 1	0.3041	1.4518
Cost Delta 2	0.2915	1.4660
Cost Delta 3	0.2819	1.4505
Cost Delta 4	0.2986	1.4933

Region: PADD VOC
Period: 2000

	Purch. MTBE	Prod. MTBE & Equiv.	M w/MTBE									M w/o MTBE		
			MTBE	ULR	ULP	OULR	OULP	RULR	RULP	ROULR	ROULP	HC OULR	HC OULP	M ex MTBE
	BPD	BPD	BPD	BPD	BPD	BPD	BPD	BPD	BPD	BPD	BPD	BPD	BPD	BPD
Base MJD														
Low Case	10,715	4,090	14,805	122,500	26,165	81,327	17,371	0	0	0	0	69,128	14,765	232,558
Base * 1	12,391	4,090	16,481	136,370	29,128	90,535	19,338	0	0	0	0	76,955	16,437	258,890
High Case	13,562	4,738	18,300	151,421	32,342	100,528	21,472	0	0	0	0	85,448	18,251	287,463
M'														
Low Case	11,484	4,408	15,892	131,495	28,086	87,299	18,646	0	0	0	0	74,204	15,849	249,635
Base * 1	13,283	4,408	17,691	146,384	31,266	97,183	20,758	0	0	0	0	82,606	17,644	277,900
High Case	14,592	5,052	19,644	162,540	34,717	107,909	23,049	0	0	0	0	91,723	19,591	308,571
J'														
Low Case	10,294	3,997	14,291	118,249	25,257	78,505	16,768	0	0	0	0	66,729	14,253	224,487
Base * 1	11,912	3,997	15,909	131,638	28,117	87,393	18,667	0	0	0	0	74,284	15,867	249,905
High Case	13,043	4,622	17,665	146,166	31,220	97,039	20,727	0	0	0	0	82,483	17,618	277,486
D'														
Low Case	10,697	3,664	14,361	118,831	25,381	78,891	16,851	0	0	0	0	67,058	14,323	225,593
Base * 1	12,323	3,664	15,987	132,288	28,255	87,824	18,758	0	0	0	0	74,650	15,945	251,136
High Case	13,445	4,307	17,752	146,886	31,374	97,517	20,829	0	0	0	0	82,889	17,704	278,853

	Min	Max
MTBE Production:	2,863	3,937
Tame Production	900	900
Tame as MTBE Equiv.	801	801

Region: PADD VOC
Period: 2000

	Jet BPD	LS Diesel BPD	Diesel BPD	HHO BPD	Total MJD ex MTBE	Crude BPD	HSFO BPD	M % MJD ex MTBE	J % MJD ex MTBE	LS D % MJD ex MTBE	D % MJD ex MTBE	HHO % MJD ex MTBE
Base MJD												
Low Case	129,349	92,792	0	27,219	481,918	412,000	50,151	48.257%	26.840%	19.255%	0.000%	5.648%
Base * 1	143,994	103,299	0	30,301	536,484	507,400	90,314	48.257%	26.840%	19.255%	0.000%	5.648%
High Case	159,886	114,699	0	33,645	595,694	601,000	121,305	48.257%	26.840%	19.255%	0.000%	5.648%
M'												
Low Case	120,491	86,438	0	25,354	481,918	411,261	49,657	51.800%	25.002%	17.936%	0.000%	5.261%
Base * 1	134,134	96,225	0	28,224	536,484	506,681	89,820	51.800%	25.002%	17.936%	0.000%	5.261%
High Case	148,938	106,845	0	31,339	595,694	600,350	120,899	51.800%	25.002%	17.936%	0.000%	5.261%
J'												
Low Case	141,599	89,560	0	26,272	481,918	408,330	47,567	46.582%	29.382%	18.584%	0.000%	5.452%
Base * 1	157,831	99,701	0	29,247	536,484	503,730	87,730	46.582%	29.382%	18.584%	0.000%	5.452%
High Case	175,029	110,705	0	32,474	595,694	597,682	119,167	46.582%	29.382%	18.584%	0.000%	5.452%
D'												
Low Case	125,490	101,162	0	29,674	481,918	411,224	49,559	46.811%	26.040%	20.991%	0.000%	6.157%
Base * 1	139,698	112,616	0	33,034	536,484	506,624	89,722	46.811%	26.040%	20.991%	0.000%	6.157%
High Case	155,116	125,045	0	36,679	595,694	600,296	120,808	46.811%	26.040%	20.991%	0.000%	6.157%

Region: PADD VOC
Period: 2000

	% MJD								
	ULR ex MTBE	ULP ex MTBE	HC OULR ex MTBE	HC OULP ex MTBE	M % MJD ex MTBE	% Incr Prime/Base	MJD $/D	MJD $/BBL	Total MJD ex MTBE
Base MJD									
Low Case	25.419%	5.429%	14.344%	3.064%	48.257%		$9,171,661		481,918
Base * 1	25.419%	5.429%	14.344%	3.064%	48.257%		$10,304,615	$20.76	536,484
High Case	25.419%	5.429%	14.344%	3.064%	48.257%		$11,657,175	$22.84	595,694
M'									
Low Case	27.286%	5.828%	15.398%	3.289%	51.800%	3.543%			481,918
Base * 1	27.286%	5.828%	15.398%	3.289%	51.800%	3.543%	$10,320,646		536,484
High Case	27.286%	5.828%	15.398%	3.289%	51.800%	3.543%			595,694
J'									
Low Case	24.537%	5.241%	13.847%	2.958%	46.582%	2.542%			481,918
Base * 1	24.537%	5.241%	13.847%	2.958%	46.582%	2.542%	$10,393,625		536,484
High Case	24.537%	5.241%	13.847%	2.958%	46.582%	2.542%			595,694
D'									
Low Case	24.658%	5.267%	13.915%	2.972%	46.811%	2.246%			481,918
Base * 1	24.658%	5.267%	13.915%	2.972%	46.811%	2.246%	$10,285,674		536,484
High Case	24.658%	5.267%	13.915%	2.972%	46.811%	2.246%			595,694

Region: PADD-VOC
Year: 2000
Case: Base MJD

GDP Inflator:	1.0416			Inputs		Purch.					Produced		Outputs (ex MJD)	
Swing Crude:	Arab Light	IC4	nC4	Nat Gas	Meth.	MTBE	Invest$	Fixed $	Var Util.		MTBE	C3=	C3	C4=
1989 Price:	$16.93		$12.25	$13.87	$18.35	$35.70	$0.71	$1.00	$1.00			$24.18	$9.44	
1990 Price:	$17.63	$0.00	$12.76	$14.45	$19.11	$37.18	$0.74	$1.04	$1.04			$25.18	$9.83	$0.00
			BPD											BPD
Low Case	412,000		5,318	12,814	1,375	10,792	202,603	49,152	259,013		3,289	0	16,401	0
Base * 1	507,400		5,799	14,299	1,375	12,496	202,599	49,151	271,697		3,289	0	17,557	0
High Case	601,000		6,539	15,371	1,594	13,647	333,616	80,274	304,053		3,937	0	19,131	0
M Prime	507,400		7,307	12,916	1,483	13,417	230,069	55,771	275,690		3,607	0	18,340	0
J Prime	507,400		4,496	16,866	1,344	12,033	242,113	58,377	281,635		3,196	0	17,338	0
D Prime	507,400		5,493	14,505	1,232	12,448	168,993	41,098	265,653		2,863	0	17,106	0
M Prime Low	412,000		6,476	12,506	1,375	11,934	202,603	49,152	263,982		3,289	0	17,154	0
J Prime Low	412,000		4,209	12,962	1,375	10,144	202,603	49,152	259,314		3,289	0	16,147	0
D Prime Low	412,000		5,429	13,522	1,298	10,583	202,603	49,152	250,238		3,289	0	15,890	0
Delta 1	95,400	0	481	1,485	0	1,704	-4	-1	12,684			0	1,156	0
Delta 2	93,600	0	740	1,072	219	1,151	131,017	31,123	32,356			0	1,574	0
										Inputs				
										Total Costs				
Cost Delta 1	$1,682,150	$0	$6,137	$21,452	$0	$63,357	-$3	-$1	$13,210	$1,786,302		$0	$11,366	$0
Cost Delta 2	$1,650,411	$0	$9,441	$15,486	$4,185	$42,796	$96,964	$32,415	$33,699	$1,885,417		$0	$15,475	$0

Region: PADD-VOC
Year: 2000
Case: Base MJD
GDP Inflator:

					MTBE			"M" Gasolines (inc MTBE)				Total M
Swing Crude:	C4s	HSFO	Sulfur	Coke	In Gasoline			ULR	ULP	ULR Ref	ULP Ref	(exc MTBE)
1989 Price:		$13.87	$4.20	$3.15	$35.70			$25.79	$28.35	$25.79	$28.35	
1990 Price:	$0.00	$14.45	$4.37	$3.28	$37.18			$26.86	$29.53	$26.66	$29.53	
									BPD			
Low Case	0	50,151	2,444	18,241	14,081			203,892	43,549			233,360
Base * 1	0	90,314	2,648	17,498	15,785			226,987	48,483			259,685
High Case	0	121,305	2,829	18,110	17,584			252,024	53,830			288,270
M Prime	0	90,123	2,658	17,460	17,024			243,855	52,083			278,914
J Prime	0	89,275	2,744	17,576	15,229			219,937	46,976			251,684
D Prime	0	90,049	2,640	17,452	15,311			220,381	47,075			252,145
M Prime Low	0	49,768	2,409	18,237	15,223			219,531	46,888			251,196
J Prime Low	0	52,230	2,524	18,206	13,433			195,623	41,783			223,973
D Prime Low	0	50,968	2,441	18,197	13,872			197,749	42,241			226,118
Delta 1	0	40,163	202	-743	1,704							26,325
Delta 2	0	30,991	183	612	1,799							28,585
						Outputs						
						Total Costs	Inputs - Outputs	Delta MJD	Cost/MJD	Crude/MJD	HSFO/MJD	LPGs/MJD
Cost Delta 1	$0	$580,179	$884	-$2,438	$63,357	$653,348	$1,132,954	54,566	$20.76	1.7483	0.7360	-0.0148
Cost Delta 2	$0	$447,684	$800	$2,006	$66,890	$532,857	$1,352,560	59,210	$22.84	1.5808	0.5234	-0.0040

Region: PADD-VOC
Year: 2000
Case: Base MJD

	Jet Fuels		Distillates			Total MJD
GDP Inflator:						
Swing Crude:	Jet A	Total J	Diesel	HHO	Total D	(exc MTBE)
1989 Price:	$25.12		$23.39	$23.39		
1990 Price:	$26.16		$24.36	$24.36		
	BPD			BPD		
Low Case	129,347	129,347	92,792	27,220	120,012	482,719
Base * 1	144,000	144,000	103,300	30,300	133,600	537,285
High Case	159,882	159,882	114,698	33,645	148,343	596,495
M Prime	134,237	134,237	96,299	28,246	124,545	537,696
J Prime	158,248	158,248	100,091	29,361	129,452	539,384
D Prime	139,814	139,814	112,709	33,061	145,770	537,729
M Prime Low	120,847	120,847	86,694	25,429	112,123	484,166
J Prime Low	140,753	140,753	89,026	26,115	115,141	479,867
D Prime Low	125,456	125,456	101,135	29,666	130,801	482,375
Delta 1		14,653			13,588	54,566
Delta 2		15,882			14,743	59,210

	HSFO/Crude	Inputs/MJD
Cost Delta 1	0.4210	1.7632
Cost Delta 2	0.3311	1.5848

Region: Lat. FC-I
Year: 2000
Case: MJD Base FC-I

				Inputs								Outputs (ex N
GDP Inflator:	1.0416											
Swing Crude:	Arab Light	IC4	nC4	Nat Gas	MeOH	MTBE	Invest	Fixed	Lead	Var Util.		C3/C4 LPG
1989 Price:	$16.64	$14.25	$12.25	$13.60	$18.35	$34.09	$0.71	$1.00	$1.00	$1.00		$10.00
1990 Price:	$17.33	$14.84	$12.76	$14.16	$19.11	$35.50	$0.74	$1.04	$1.04	$1.04		$10.42
			BPD									
Low Case	1,302,425	41,694	6,761	55,791	11,520	31,043	2,182,599	516,354	18,761	1,785,724		115,806
Base Case	1,883,170	39,680	0	71,604	11,968	50,058	2,182,597	516,353	112,568	1,854,717		119,574
High Case	2,445,213	41,062	0	79,343	14,271	63,585	2,832,856	671,483	112,568	1,935,741		126,977
Delta 1	580,745	-2,014	-6,761	15,813	448	19,015	-2	-1	93,807	68,993		3,768
Delta 2	562,043	1,382	0	7,739	2,303	13,527	650,259	155,130	0	81,024		7,403
											Input Total Costs	
Cost Delta 1	$10,084,636	-$29,891	-$86,259	$223,982	$8,562	$675,123	-$1	-$1	$97,700	$71,856	$11,025,706	$39,244
Cost Delta 2	$9,740,520	$20,511	$0	$109,618	$44,014	$480,273	$481,348	$161,568	$0	$84,386	$11,122,237	$77,102

Region: Lat. FC-I
Year: 2000
Case: MJD Base FC-I
GDP Inflator: IJD)

	HSFO	Sulfur	Coke	MTBE in U.S. Gasoline			"M" Gasolines (inc MTBE) Exp ULR	Exp ULP	Exp ULR RFG
Swing Crude:									
1989 Price:	$12.96	$4.20	$3.15	$34.09			$22.06	$24.69	22.06
1990 Price:	$13.50	$4.37	$3.28	$35.50			$22.98	$25.71	$22.98
								BPD	
Low Case	534,959	28,810	57,529	36					280
Base Case	692,344	30,908	57,529	15,076					110,600
High Case	819,265	35,188	57,529	29,860					221,200
Delta 1	157,385	2,098	0	15,040			0	0	110,320
Delta 2	126,921	4,280	0	14,784			0	0	110,600
					Output Total Costs	Inputs - Outputs	Delta MJD	Cost/MJD	Crude/MJD
Cost Delta 1	$2,124,358	$9,177	$0	$533,991	$2,706,770	$8,318,936	413,960	$20.10	1.40
Cost Delta 2	$1,713,159	$18,722	$0	$524,902	$2,333,886	$8,788,352	415,316	$21.16	1.35

Region: Lat. FC-I
Year: 2000
Case: MJD Base FC-I

GDP Inflator:		**Total M (exc MTBE in U.S. Gasoline)**	**Jet Fuels**			**Distillates**		**Total MJD (exc MTBE)**
Swing Crude:	**Exp ULP RFG**		**Jet A**	**Total J**	**Diesel**	**HHO**	**Total D**	
1989 Price:	$24.69		$22.78		$21.60	$21.60		
1990 Price:	$25.71		$23.73		$22.50	$22.50		
			BPD			BPD		
Low Case	110	354	190	190	410	90	500	1,044
Base Case	44,500	140,024	75,000	75,000	162,400	37,600	200,000	415,024
High Case	89,000	280,340	150,000	150,000	324,600	75,200	400,000	830,340
Delta 1	44,390	139,670	74,810	74,810	161,990	37,510	199,500	413,980
Delta 2	44,500	140,316	75,000	75,000	162,400	37,600	200,000	415,316

	HSFO/MJD	**LPGs/MJD**	**HSFO/Crude**	**Inputs/MJD**
Cost Delta 1	0.380	-0.008	0.271	1.411
Cost Delta 2	0.306	-0.004	0.226	1.357

Appendix L, Section VII-3

Expert Panel Notes

NATIONAL PETROLEUM COUNCIL

EXPERT PANEL DISCUSSIONS
FOREIGN REFINING ISSUES

January 14 and 15, 1992

LIST OF PANELS

STATIONARY SOURCES: Environmental Regulations

Moderator

Keith D. Mason: U.S. Environmental Protection Agency

Panelists	Organization	Region to be Addressed
Hugh R. James	Brown & Root Braun	Worldwide
John H. Jenkins	The Pace Consultants Inc.	Worldwide
Stephen R. Weil	Bechtel Environmental, Inc.	Worldwide
Thomas S. Wyman	Chevron Shipping Company	Worldwide

MOBILE SOURCES (PRODUCT QUALITY): Environmental Regulations

Moderator

Christine M. Brunner: U.S. Environmental Protection Agency

Panelists	Organization	Region to be Addressed
Joachim Brandt	Mobil Oil Europe	Western Europe
Robert A. Hermes	Purvin & Gertz	Worldwide
Carlton R. Jones	Arthur D. Little	Worldwide
Kevin Lindemer	Cambridge Energy Research Associates	Worldwide
Jaime Mario Williars	Petroleos Mexicanos	Caribbean/Latin America

PRODUCT DEMAND: Trends and Issues

Moderator

Mark A. Rodekohr: U.S. Department of Energy

Panelists	Organization	Region to be Addressed
Fereidun Fesharaki	East-West Center	Far East
Robert A. Hermes	Purvin & Gertz	Western Hemisphere
John H. Jenkins	The Pace Consultants Inc.	Worldwide
Russell Phillips	Methanol Newsletter, TECNON (UK) Ltd.	Worldwide
Matthew Sagers	PlanEcon, Inc.	Eastern Europe

PRODUCT SUPPLY: Refinery Capacity and Investment

Moderator

Dennis J. O'Brien: Caltex Petroleum Corporation

Panelists	Organization	Region to be Addressed
Anthony A. Churchill	The World Bank	Worldwide
Fereidun Fesharaki	East-West Center	Far East
Edward N. Krapels	Energy Security Analysis	Worldwide
G. Henry M. Schuler	Center for Strategic and International Studies	Caribbean/Latin America
Steven E. Terry	Petroleum Economics Ltd.	Western Europe
Jaime Mario Williars	Petroleos Mexicanos	Caribbean/Latin America

Proposed
Outline of Foreign Issues
for the
NPC's Expert Panel

November 27, 1991

The Foreign Subgroup of the Supply, Demand, and Logistics Task Group of the National Petroleum Council's study on Refining is scheduling panel discussions to broaden the understanding of policy issues affecting U.S. petroleum supplies. The panel discussions are to provide an assessment of the current situation and an outlook of future trends for each of the questions posed below. To be discussed are trends for 1995, 2000, and 2010 for 10 international regions: Canada, Northwestern Europe, Mediterranean, Middle East, Latin America, Japan/Australia/New Zealand, Other Far East, China, Eastern Europe/Soviet Union, and Africa are to be discussed. Experts for the panels are being drawn from petroleum companies, consultants, academia, and the government.

I. Supply Issues

A. What is the outlook for refinery capacity additions and modifications in consuming as well as exporting regions?
   1. Will financing be available for both state-owned and privately-held petroleum companies?
   2. Will tax policies influence the level of investment in refinery operations?
   3. What are the cost/benefits of building new export refineries? Will financing be available for these refineries?
   4. What will the OPEC nations' future policies be for downstream integration?

B. What is the impact of new supply-oriented technologies (such as those listed below) on refinery costs and product availability?
   1. Oremulsion
   2. "New and improved" refinery catalysts

C. Will there be enough flexibility in refinery operations to limit the impact of future supply disruptions and to meet future demand slates with lower quality crudes?

D. Will the supply of ethers, alcohols, and isobutylene be adequate for local demand and what will be the export capability to the U.S.?

E. Will regional markets create (or increase) special tariffs on refined petroleum products? How will this affect the international petroleum supply balance?

F. What is the effect of lifting the ban on U.S. crude oil exports?

G. Are there enough crude and product terminals and storage facilities to meet future demand levels?

H. Will governments continue to own strategic petroleum stockpiles?

II. Demand Issues

A. What is the outlook for demand growth, specifically in the Far East? Is there a risk that refining capacity will exceed demand?

B. How will structural changes affect the demand for petroleum products?
   1. Will there be an increasing preference for light products?
   2. Will the natural gas market share in stationary applications increase?

C. What is the impact of new demand-oriented technologies (such as those listed below) on product availability and price?
   1. Lean burn engines
   2. Alternatively fueled vehicles

      a. Electric
      b. LPG
      c. CNG
      d. Ethanol/methanol
      e. Synthetic gasoline from coal

   3. Fuel efficient aircraft

D. What is the demand for oxygenates, especially in the Far East?

III. Environmental regulations concerning mobile source emissions (VOCs, NOx, SOx, others) - In order to limit ozone, carbon monoxide, carbon dioxide, and air toxins, to what extent will the following fuel qualities be regulated?

A. Gasoline
   1. Lead
   2. RVP
   3. Aromatics
   4. Oxygen
   5. Sulfur
   6. Distillation

B. Diesel and distillate
   1. Aromatics
   2. Cetane
   3. Sulfur

C. Resid, bunker fuels
   1. Sulfur
   2. Metals

D. What are the refining costs associated with these or more stringent fuel specifications?

E. What is the length of time until U.S.-type regulations are adopted?

F. Will regulations limit the dumping of certain gasoline blending components internationally?

G. What is the likelihood that there will be a carbon tax on mobile sources and how much will that tax be?

IV. Environmental regulations concerning facility source emissions - Will refinery activities be affected by regulation of air emissions, water emissions, and solid waste disposal?

A. What are the refining costs associated with these regulations?

B. What is the length of time until U.S.-type regulations are adopted?

C. Similar to the recent announcement in Mexico City, will more urban refineries be closed?

D. Will other countries or international agencies adopt U.S.-type regulations aimed at reducing oil spills?
1. Will there be enough double-hulled tankers?
2. What is the impact on transportation costs?
3. How will unlimited indemnity affect shipping?

E. Will there be some (or more) regulation of air emissions from the transportation and terminalling phases?

F. What is the likelihood that there will be a carbon tax on stationary sources and how much will that tax be?

EXPERT PANEL DISCUSSIONS
FOREIGN REFINING ISSUES

January 14, 1992

MOBILE SOURCES (PRODUCT QUALITY): Environmental Regulations

Christine M. Brunner – Moderator:

Robert A. Hermes – Worldwide:

- Product specifications of a country are a function of political pressures: look at four tiers of countries:
  - Most developed (U.S., Canada, Western Europe, Japan).
  - Relatively strong economies, willing to spend on environmental projects (e.g., Korea, Taiwan).
  - Countries now instituting some environmental controls (e.g., some South American countries).
  - Destitute countries where little is being done.
- The specific specifications might be seen as:

  Diesel sulfur (wt%):
  Group 1 - 0.05 (probably the standard by mid 1990's)
  Group 2 - 0.2-0.3 (Korea, Taiwan; Chile on a local basis)
  Group 3 - 0.5 for large part of world
  Group 4 - 1.0

  Gasoline lead – phase out:
  Group 1 - phase out complete by 2000
  Group 2 - in progress, completion a little later
  Group 3 - reducing in metropolitan areas
  Group 4 - reducing in metropolitan areas, but more slowly

  Gasoline octane:
  Group 1 - Europe premium/regular mix 75/25 (reverse of U.S.); Japan ON < U.S. ON; world average maybe 93 RON. Saudi Arabia going to 95 RON: hence many areas can meet U.S. octane requirements.

Reformulated Gasoline:

Expect benzene content to be first spec met worldwide; RFG specs might be easier to meet in areas where mogas demand is smaller % of products (less cracked stock used).

Fuel Oil:

Getting hard to sell HSFO in major markets. Europe has made progress to LSFO.
3rd and 4th tier are going slowly on S reduction.
Bunker is expected to remain a HSFO product for a long time.

- Meaning to U.S. industry:

  — There will be foreign refiners with the ability to make U.S. spec products (e.g., RFG), but many will be deterred from making added investments to meet uncertain U.S. specs (exceptions being traditional suppliers, i.e., Caribbean and Venezuelan refineries).

  — Products from new project export refineries serving the U.S. will be expensive (because area factors are 1.3 to 1.5 relative to U.S.).

  — While Japanese gasoline quality might meet U.S. specs, Japanese would not want to make the trade balance worse with such low value added products (relative to autos, televisions, VCRs, etc.).

  — Foreign refiners, particularly Far Eastern ones have full investment requirements already without trying to add equipment to meet U.S. specifications.

<u>Jaime M. Williars – Mexican Refining System to 2000:</u>

- System of 6 refineries, 1.5 mmbpd name plate capacity.

- State monopoly with obligation to supply, but new policy is based on "make or buy" to minimize cost. Crude is set at international opportunity cost and products on import displacement basis.

- Demand growth (1988-1991) greatest in mogas (5.6%/yr) and least in fuel oil (1.3%/yr).

- Approach to product specifications:

  — Determine cost/ton to reduce pollutant.

- Set targets for 2000:
  - mogas RVP 7.5 (from 9.0) psi.
  - unleaded mogas - 90% of consumption by 2000.
  - mogas MTBE content 5% by '95 in metropolitan areas.
  - mogas aromatics - 30%.
  - mogas benzene - 3%.
  - heating oil sulfur - 2% to be reduced to 0.5 wt%.
  - diesel sulfur - 0.2% to be reduced to 0.05 wt%.
  - high sulfur fuel oil 4.0 wt% - expect flue gas desulfurization the most economic way to remove sulfur for power plants.
  - Ministry of Environment studying results of U.S. (Auto/Oil) 1991 research for guidance on revised 2000 targets.

<u>Joachim Brandt – Western Europe:</u>

Gasoline specification changes (under discussion of CEN):

- Removing lead from motor gasoline:
  - 1985 EC directive to make adequate supply of unleaded available by 1989 (it was about 80% German supply in 1990, but under 5% in other E.C. countries, e.g., Greece, Spain, Italy).
  - 1993 all new cars will be sold with catalytic mufflers.
  - EC member states are granting tax incentives for unleaded motor gasoline to make it more attractive than leaded.

- RVP – European Petroleum Industry Association proposing five options, based on performance, with evaporative problems controlled by hardware, not RVP.

- Aromatics – No EC request: Italy has discussed a possible limit 30% limit.

- Benzene – 5% limit in gasoline. Germany has requested 1% level, but EC experts concluded there was no need.

- Oxygenates – E.C. directive set maximum of 3.7 wt% oxygen (~15 vol% MTBE) while auto industry requested the a level of 1.8%.

- Sulfur – From 1/95 to be <500 ppm.

- Distillation – ACEA wants to increase the E180 deg C from 85 to 90%.

Diesel – An objective is to split auto diesel from heating oil, reaching 0.2% sulfur by 10/94 for all: by 10/96, auto diesel would be 0.05%. A 1999 target for industrial/home heating oil is 0.1%. By 2000, auto diesel objective would be 0.02% sulfur and 10% aromatics.

- EC has AD Little looking at cost to reduce sulfur in products from gasoline to fuel oil (gasoline 0.05%, kero jet 0.1%, diesel 0.05%, heating oil 0.1%, marine gasoil 0.1%, marine diesel 0.5% and fuel oil 1% and 2%).

- Metals in fuel: Germany has a 1 ppm Ni/liter in flue gas limit (which equals about 24 ppm in fuel).
- Timing of reductions relative to the U.S.:
  - Diesel sulfur about 3 years behind, but industrial/home heating oils more advanced.
    Other diesel quality standards are ahead of the U.S.
  - gasoline specs: about 15 years behind for lead phase-down.

- Carbon tax: proposed $3/bbl (93) rising to $10/bbl in 2000. Tax is seen by Southern Europe as a vehicle to impede Southern Europe's growth.

<u>Kevin Lindemer – Worldwide:</u>

- Major trends: unleaded gasoline, lower sulfur in diesel and lower sulfur in resid.

  - Believe almost 90% of world gasoline pool is now either unleaded or in lead phase down: by '95 over half will be unleaded, reaching over 90% by 2000.

  - Countries to be completely unleaded will be Japan, Canada, the U.S., Brazil, Puerto Rico, Austria followed by remaining EC countries.

  - See 50-60% of world diesel pool in some for sulfur reduction.

  - In bunker fuels, don't see trend emerging, rather local politics dominates: survey of 35 U.S. refining companies asked if resid fuel sulfur level limit cut in half, 60% would simply increase bunker fuel sales, rather than desulfurize.

- U.S. policy is driven by politics, local pressure, technology and "corporate environmentalism".

  - Other areas have more local control (relative to EPA regulations in the U.S.).

  - Improving economic growth will allow more countries to afford environmental improvements.

  - The European Energy Charter has a clause supporting technology transfer to east to help them become more energy efficient. Such transfers may be encouraged by the threat of a carbon tax at the Rio conference (on global warming).

— Technology of cleaner fuels can result in substitution – e.g., MTBE is a "substitute" for 100 mbpd and rising of gasoline imports by 1995.

— Corporate environmentalism may result in corporate initiated actions elsewhere for some subjects (like Starkist's ads for "dolphin safe" tuna fishing).

- For the U.S., present sources of imported products (Venezuela, Saudi Arabia, others) are gearing up to meet U.S. specs as well as supplying MTBE imports.

- To make new spec products, the trade-off of crude quality or equipment will become sharper: from survey, many refining companies, especially smaller independents, are looking a lighter, sweeter crude to meet some specs.

- U.S. should be able to meet 1993 low sulfur diesel needs.

Carlton R. Jones – Worldwide additional comments:

- Don't see other areas of the world reaching U.S. fuel standards by 2000.

- In U.S., 1990 Clean Air Act use of performance standards as alternative fuel specifications will probably continue, though "reg-neg" reduced.

- Reformulated Gasoline, Phase II (1997) will likely further restrict end point, sulfur and olefins, as well as aromatics in diesel. Most of these changes will demand more refinery hydrogen production.

- Don't see a major fuel reformulation in Europe before the end of the century.

- Imports may not be a major problem for the U.S. because growth rate is much higher in other areas, requiring new capacity: example, ME refineries are looking at the Far East, not the U.S. as market. Also U.S. market may not be fungible with European product, making export to U.S. tougher. U.S. markets aren't growing, making outside entry tougher.

- Some concern among European agencies over dumping of U.S. aromatics into European gasoline.

- Believe carbon tax in Europe by 2000 is likely, even though U.S. and Japanese support is not clear now.

- Envision mostly unleaded gasoline in Far East by 2000.

- NPC was looking at product imports in the early 1980s: levels of concern did not materialize because export refineries came on much slower and rates of operation were lower. Now, the grow in markets outside the U.S. will strain such export facilities.

- European and Far East refiners have substantial investment requirements for unleaded gasoline and low sulfur fuels. Many are government or government/private consortiums which do not move very fast.

- While low sulfur diesel may be fungible on the world market, U.S. RFG will not be, limiting opportunistic shipments from abroad. Cargos would have to have segregated tankage at the export refinery, which would be hard to justify for occasional movements.

- With flat U.S. gasoline demand, and displacement of volume with oxygenates, crude runs will be down and conversion down, too, making importation unlikely.

- California has come out with their Phase II gasoline standards: sulfur of 30 to 40 ppm; 5% max olefins; and 300 deg F 90% point.

- Europe will have tighter gasoline specifications with possibly a 3% limit on benzene, and a 215 deg C end point: pretty much all unleaded by 2000.

- Similarly the Far East will be mostly unleaded gasoline by 2000.

- Cost estimates: ADL has estimated RFG at 6 - 9 cent/gal, where their survey of refiners had a median of 6 to 10 cen/gal: California standards have been estimated at 14 -17 cent/gal; ADL estimated very low sulfur and olefins ran about 20 cent/gal.

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Questions and Answers

Q: Will Mexico adopt US product specs in border areas?
A: (JMW) This will be looked at locally. Fuel oil sulfur to power plants may be replaced with natural gas, eliminating that question. Gasoline specifications are in line with the other side of the border.

Q: Will Mexico raise petroleum prices further to reduce demand growth?
A: (JMW) There have been significant increases so that the prices at the borders are in line and inland prices are even higher (unleaded is ~$1.52/gal). Only LPG is still regulated.

Q: Does Pemex estimate flue gas scrubbing to be less expensive than fuel oil desulfurization?

A: (JMW) Using Electric Power Research Institute figures, stack gas scrubbing is \$353/ton SO2 removed. We estimate desulfurization at \$350-630/ton, depending on refinery margins.

Q: How quickly will 0.05% S diesel spread to off-highway uses?

A: (RAH) 50-60% of diesel is on-road applications. Other than in the NE heating oil market, we don't believe a second grade will be handled. Therefore we expect to have about 80% of the market be 0.05%, instead of the 60% which would be required by law.

Q: Where do the former "centrally planned economies" fall in your groupings of environmental levels?

A: (RAH) They would be a fifth level. East Germany, Czechoslovakia, Hungary and Poland might move up soon.

Q: Is the EEC going to set a limit on metal levels in fuel oils?

A: (JB) Italy is the major fuel oil consumer in Europe and has not yet set a level, but has recommended that combustion plants adhere to the level set by Germany (1 ppm/lit in flue gas). The EC has not focused on the subject.

Q: What is the relation of the CEN to the EC?

A: (JB) The EC gave a mandate to the CEN for development of fuel specifications. The CEN works without guidance. It makes proposals which are reviewed by industry groups. For example, TC-19 have acted on gasoline, diesel and automotive LPG). After such review, the proposal goes to the member countries for a vote (where larger countries have more votes). When approved, the specifications are the legally binding. On certain subjects (sulfur, benzene and octane number), the Commission itself will decide.

Q: In view of the U.S. recession, how will the U.S. public pay for the increased cost of RFG?

A: (KL) The increase may be paid partly by the public, partly by the refining industry. The consumer may also substitute regular for premium grades. Note that the amount (estimated from \$0.06 to 0.10/gal plus maybe 0.10 to 0.15 cents more in California) is about the size of swings the public has seen before in gasoline prices.
(Mike Kulakowski) See also the Western States Petroleum Association study (by DRI McGraw Hill) of the economic impact of the California Phase II regulations.

Q: Will refiners increase crude runs to make RFG?

A: (CRJ) No, runs will be lower.

Q: Will Olefin specs increase C5 exports form the West Coast?
A: (CRJ) There has been some interest in Japan for this material.

Comments from the floor:

(Larry Goldstein) re the European Carbon Tax: producing countries are becoming organized to oppose the development of a tax.

Diesel sulfur: at present, imported distillate has a 10.5 cents/bbl tariff while transportation fuels have 52 cents/bbl. U.S. Customs is preparing to be certain all 0.05% S imported material pays the 52 cents.

If product demands were stagnant, might expect some U.S. refiners to export product. (KL) several coastal refiners responding to CERA survey indicated that they were looking at exports.

Q: Has anyone studied world butane balance if RVP is reduced and increased demand for MTBE?
A: (CRJ) Have looked at RFG and believe that while there may be a short run surplus, butane will be needed for MTBE production, resulting in a tight market.

Q: Elaborate on U.S. dumping of aromatics in the EC.
A: (CRJ) There will be more work on this next year. We believe that toluene may find a home in the EC, and with possibly alkylate returning to the U.S.

EXPERT PANEL DISCUSSIONS
FOREIGN REFINING ISSUES

January 14, 1992

PRODUCT DEMAND: Trends and Issues

Mark Rodekohr – Moderator:

Two questions to consider:

- Will demand grow in next ten to twenty years and by how much and where?
- What will product mix be – what portion will be gasoline?

Fereidun Fesharaki – Far East:

- Defining Asia Pacific market as East Asia, Southeast Asia, South Asia, and Australiasia.
- Demand has grown steadily in light products from early '70s: drop in oil demand after 1979 was almost entirely in Japanese fuel oil consumption.
- 1990, 1991 rates (ex-Japan) have been over 7%/yr (5.4% and 6.2%, respectively, including Japan – or 700 mbpd and 800 mbpd of growth).
- Factors affecting growth:
  - — appreciation of local currency relative to the dollar (e.g., East Asian currencies appreciated 14+% against the dollar).
  - — countries maintained an "oil stabilization" import price of about $34/bbl until the late 1980s.
  - — economic growth rates have been high.
- Korea had fastest growing petroleum demand in 1991: even with oil stabilization price change and currency appreciation behind, oil demand grew 22% in 1991; gasoline grew at 28% – in prior four years it grew at rates > 30%/yr.

- Project 3.7 to 3.8% annual growth (6 mmbpd increase by 2000, from 12 to 18 mmbpd).
  - Do not expect large quantities of exports from the U.S. nor significant amounts from Middle East given attitudes post the Gulf conflict.
  - One third of the required refining capacity additions have been committed.
  - But no information on units being built to meet U.S. west coast standards (described yesterday as "Cal Com") except the Malaka, Malaysian project.
- No drop in fuel oil demand expected in area (Japan's decrease is offset by India, Pakistan, and Thailand's increases).
- High sulfur fuel oil is giving way to lower sulfur. The region, ex-Japan, is targeting 1.5% sulfur by mid to late 1990's (though Taiwan has a 1993 goal of 1% sulfur).
- Dependence on imported crude in area 60-65% by turn of century: local low sulfur waxy crude is in decline. Expect increased dependence on Middle Eastern crudes.
- Environmental concern is in local air quality, not global warming and CO2.

Japan: see demand growth rates a little higher than MITI targets.

Indonesia: expect strong growth: a 22% increase in gasoline prices in 1991 decreased demand 1%! Expect 15% demand increase in 1992.

China: has practiced maintenance of export volume: but demand will double (1989 to 2000 to 3.8 mmbpd) with a resulting 6% per year growth.

<u>Robert A. Hermes – Western Hemisphere (Latin America):</u>

- Latin America has been main source of U.S. product imports.
- U.S. has exported some product to L.A.: if U.S. exports, L.A. logical direction in view of longer range crude supply logistics (which would add crude transportation cost to U.S. refiners' expenses as well as product shipping to compete in Asia Pacific or European markets).
- Product growth rates:

	gasoline	2.0%/yr
	middle dist	3.3%/yr
	residual fuel	1.0%/yr
	overall rate:	2.5%/yr

- L.A. domestic refining capacity expected to keep up with demand.

- Mexico: most important to U.S. because one of the largest petroleum demands in L.A. and closest to the U.S., with the benefit of free trade with the U.S.

- Venezuela: more important to U.S. for supply rather than domestic demand.

- Brazil: large population and oil consumption: has exported gasoline to the U.S. recently.

- Argentina/Chile: market economies, with Argentina trying to do in 2-3 years what Chile did in 7-8.

- Source of surprise: if growth 4.5% vs. 2.5% – then it would be hard to keep up with product demand requirements. But like Singapore (which, rather than shutting down capacity as predicted in the early '80s, supplied local countries with shortfalls) Caribbean could swing to supplying Latin American rather than U.S.

- Source of concern: if growth surges, with concurrent growth in capacity, only to fall back, leaving a big surplus of refining capacity ready to compete in the U.S. market at marginal costs.

<u>John H. Jenkins – Western Europe:</u>

- Western Europe has low demand growth and export refineries (in the Antwerp-Rotterdam-Amsterdam area) supplied by VLCCs, which can compete effectively in the U.S. east coast market (see demand profile comparison, 1990 over 1970).

- European shift out of petroleum into natural gas for stationary applications.

- U.S. overall petroleum demand growth rate about +0.9%/yr ('70-'90) vs. Europe's -0.1%.

- Lower transportation petroleum consumption share in Europe, compared to U.S. (45% to 63% – 1990).

- Europe still not as saturated with autos, even comparing to U.S. states with similar mass transportation.

- Projections to 2000, based on prior 20 years:
  - — U.S. mogas growth of 0.7%/yr vs. European growth of about 2.0%.
  - — Heavy oils (No. 2 to heavy gasoils, but not resid) are projected to decline in Europe (0.6%/yr).
  - — Resid also should decline (0.9%/yr) in Europe to 2000.

<u>Russell Phillips – Oxygenates:</u>

- The Clean Air Act makes the U.S. different from the rest of the world – in that oxygenates are mandated under the CAA for CO emission control, while in the rest of the world, oxygenates are used for octane in lead reduction programs.
- Primary type oxygenate will be MTBE: ETBE and TAME will be minority products. Ethanol use (in the U.S.) is dependent on government subsidies.
- World demand driven by lead phase down, in which oxygenates compete with aromatics.
- U.S. oxygenate requirement for CO reduction will drive world markets.
- New U.S. "cost plus" formula pricing (roughly Mt. Belview nC4 price plus 0.34 of methanol plus $0.55) makes NWE MTBE competitive in the U.S.
- Worldscale MTBE plants are 0.5 mm tons/yr (12.5 mbpd) based on isomerization-dehydrogenation of butane. Recent tally of U.S. plans lists 27 plants under 100 mtons/yr.
- U.S. capacity for MTBE production grows from 7.5 mm tons/yr (1992) to over 12 mm tons/yr 1995 while demand growth could be over 15 mm tons/yr (1995). The big source of uncertainty in such number is the level of "opt-ins" by areas not required to have oxygenated fuels.
- Saudi Arabia and Venezuela already have worldscale plants and are exporting to the U.S.
- Saudi Arabia will have over 2 mm tons/yr capacity with three additional plants planned on stream, while Venezuela plans one and Qatar has one with an associated methanol project. Kuwait is looking a methanol plant. Worldscale plants for Sweden and Malaysia are reasonably firm.
- Other parts of the world: Mexico is to be self sufficient, Brazil has capacity and is exporting some MTBE. Korea has a plant with more capacity than current demand. Algeria and Libya may build export plants. Japan has approved

addition of MTBE to gasoline (~7 volume %) staring 11/92, but will be supplied locally from small plants using available isobutylene.

- Butane supply should be ample in the short term, especially with material made available by lower U.S. RVP specs. In addition, much Middle Eastern butane is sent to the Far East for fuel which could have a higher value in MTBE.

- Methanol capacity and demand have been flat. Planned capacity for Trinidad, Venezuela, and Norway, as well as restart of two U.S. plants are possible. But prices of methanol have cycled around a level (45 cents/gal) which cannot support new construction.

- Methanol or M85 appear to have niche market use at best in the alternative fuels area. No one appears willing to make the plant and transportation investments necessary for broad use.

Matthew Sagers – Eastern Europe and the Former USSR (Commonwealth of Independent States - C.I.S.):

- Decline of GNP in Eastern Europe in double digit range for several years: in C.I.S., decline will be 14 - 15% this year.

- Oil consumption down in proportion, though level of decline varies from country to country (e.g., -3% for Bulgaria, to -26% in other areas).

- Exports of petroleum from the former USSR have been temporarily depressed, but should increase after freeing of domestic prices (which will depress domestic demand).

- Net effect of Eastern Europe being on its own for crude and redeploying of C.I.S. crude is a wash.

- Demand within C.I.S. will be down to 6 mmbpd by mid-1990s.

- Expect a growing exportable surplus in oil, like other former USSR commodities.

- Crude oil exports will be down, partly because re-export of Iraqi crude (counted in total) is gone, and partly because more oil is exported as product or unfinished materials. The C.I.S. has refining capacity of 480 mm met tons/yr (9.6 mmbpd, with 1990 demand of 455 mm met tons in 1990.

- Refining output is very inflexible (USSR had 40% fuel oil yield and

Eastern Europe had 30%): basically increase crude run to meet light product requirements. Replacement of fuel oil by natural gas in the electrical generation sector is impacting on refining inflexibility. More long resid will be exported. Product quality is low: gasoline is 76 octane, high sulfur fuel oil is 5 - 6% sulfur.

- Major export has been high sulfur residual fuel oil in the summer when in excess, hence getting the lowest return.

- Eastern Europe's refining industry was based on low cost USSR crude, allowing export of products to western markets for hard currency: last year this trade collapsed: Romania decline 45%, Bulgaria lost 40% of hard currency earnings.

- Conversely, freeing of Eastern Europe prices has brought in some western product.

- Export transportation access for Russia is across the Ukraine and Byelorussia (about 80%). Assume access continues for mutual self interest.

- Energy sector is a major contributor to environmental situation. Very limited unleaded gasoline is made for West Berlin demand. There is potential for MTBE production from natural gas/liquids.

- All refineries looking for major Western partners for new processes, equipments.

- Crude transportation has been by pipeline from inland (Russia) to Eastern Europe: even coast refineries received crude by pipeline: expect the later, especially in the Baltic, to develop their own import terminals.

- C.I.S. has the world's largest natural gas industry (800 bil cu m per year, flaring 15 bil cu m per year of associated gas). Have two large methanol plants. Potential very large contributors to MTBE, butane and methanol production.

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Questions and Answers

Q: How much of Far East growth is population and how much is per capita consumption?

A: (FF) About one quarter is population and three quarters is per capita consumption.

Q: How much pressure is the to move refining offshore in Japan?
A: (FF) Not much.

Q: Is Eastern Europe going to export HSFO?
A: (MS) Yes, but as long resid for feedstock.

Q: What is the prospect for coal and HSFO clean up in Eastern Europe?
A: (MS) The local "green" groups were successful in the 1989 election in the USSR, but have eased off in political importance. The problems are gigantic: for instance, they have some stations ~ 4,000 mw fueled with low quality lignite of ~ 60% ash which have created virtual deserts around them. Since coal cost seven times natural gas in the former USSR, there should be little holding back the replacement of coal and HSFO with gas. Natural gas has gone from 25% to 45% of the fuel mix in the past decade.

Q: Will the Ukraine and Russia sell oil exploration rights to pay for rebuilding their infrastructure?
A: (MS) They already have, but so far, oil companies have been disappointed at what has been offered. That is going to change because the countries are going to be very hungry for hard currency and have few other resources to attack it. They are going to have to be more attractive than other oil industry investment opportunities.

Q: When will China end exporting petroleum?
A: (FF) On a net basis, before 1995. But they continue to export crude to Japan (who pays a \$2-3 premium more than a U.S. company on the West Coast would) and import diesel and gasoline.

Q: Are CAFE standards likely to spread to foreign areas?
A: (FF) Not to the Pacific (save Japan). Lead elimination and sulfur reduction in diesel will occur.
(MS) In Eastern Europe, there is sort of quasi-regulation: the governments have made it difficult to import used (more polluting) cars from the West.

Q: Will ether supply meet U.S. demand in 1992?
A: (RP) There are layers of uncertainty, but we believe it should.

Q: What is the outlook for TAME vs. MTBE?
A: (RP) New merchant capacity is based on butane dehyrogentation and isomerization. To my knowledge, only one plant, Diamond Shamrock's, can make TAME.
(JHJ) While there is about twice as much iC5 as iC4 olefin from cat cracking operations, the conversion to ether is about half as great. Hence about equal volumes can be made in a given facility. In California, TAME has an advantage in lowering vapor pressure and elimination of an olefin problem, encouraging its growth.

(R. Pratt) TAME conversion has reached 90 to 95% levels in separate (not mixed stream) processes.

Q: Does MTBE reduce gasoline mileage?
A: (RP) Not aware of anybody measuring a significant difference.
(R.B.Warden) The Auto/Oil studies showed a larger loss than the relative change in theoretical heating values.
(M. Kulakowski) Turner Mason work for Western States Petroleum Association indicated that gasoline volume had to increase 2.5% on average to get the same mileage as 2% MTBE.

Q: If RVP is to be decreased, is ETBE the only answer?
A: (RP) ETBE does help lower vapor pressure, but more volume must be added to get the same weight % of oxygen in the fuel. Only one plant (Phillips) is being designed to make either MTBE or ETBE.

Q: Are comparisons of GNP to motor gas demand ratios between the U.S. and Europe weak because of the interregional fuel price differentials?
(JHJ) We felt we had good correlation in Europe, but in the U.S., efficiency improvement over the decade dominated the regressions.

Q: Can European air traffic support the projected 5%/yr jet fuel demand forecast?
A: (JHJ) 5% is the projection from the last ten years' experience.

Q: Looking out 1995 to 2000 at HSFO and LSFO, what trends can we look for?
A: (RAH) Resid demand will decline and sulfur will decrease.

Q: Do you have any comments on the EIA foundation case being used for the study?
A: (RAH) 2010 is a long way off. The path getting there is as important as the end point.

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EXPERT PANEL DISCUSSIONS
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STATIONARY SOURCES: Environmental Regulations

Keith D. Mason – Moderator:

- EPA study to be released late spring comparing CAA required air pollution control levels to those of other countries for auto manufacturing, steel, and electric utility industries.

- Noted that some foreign sites adopted technology with desirable emission levels without any regulatory requirement; e.g., use of water based paints in Japanese and Canadian auto plants.

John H. Jenkins – Worldwide:

- Foreign government and refining relationships are often quite close, especially when government has equity interest in refining.

- In some cases, foreign government takes a much more direct role in emission management; e.g., in Europe, hazardous waste disposal by incineration is often handled by government.

- Federal vs. local authority: varies by topic, area – in Japan local control is frequent.

- New vs. existing: while regulations may be very restrictive for new facilities, existing units are often "grandfathered" in without updating.

- Economy vs. the environment: in developing areas, even with strict environmental regulations, there may be minimal enforcement.

Air-Stationary Sources: on time line relative to U.S. experience:

- Canada, NW Europe, and Japan are about at mid 1980s to U.S., using BACT criteria to meet locally dictated air needs.

- Developing Far East is about 1970 (e.g., Korea developed air standards in 1990) as is Latin America (Argentina started an "EPA" in 1991); Southern Europe is in the late 1970s.

- Standards are source type, of BACT level, dictated by local needs.

Water: on time line relative to U.S. experience, with application:

- For Europe (NW, South) and Canada at the late 1980s for all new facilities, but updates are required for existing units only 50% of the time.

- Developing Far East and Latin America are in the early 1970s, focusing more on municipal rather than industrial/refining concerns.

Land Use/Hazards Wastes: on time line relative to U.S. experience:

- NW Europe and Canada are about 1990, with Southern Europe and Developing Far East close behind; liability rules are different for Europe (vs. U.S.). See EPA paper on European Superfund equivalents.

- In South America, land use is not a critical issue.

Conclusions:

- U.S. EPA is not "writing the rules" for the world, rather local requirements are dictating needs.

- Environmental requirements in the U.S. have a higher degree of uncertainty attached to them, whereas in other areas the requirements are administered more in the manner of utility regulation.

<u>Stephen R. Weil – Worldwide:</u>

- Seeing more refinery capacity developed overseas and less in the U.S. where some refineries at the margin are closing due to environmental regulations.

- Regulations in Europe may be different than in the U.S., but still relatively stringently enforced.

- In developing areas, regulations may be increasing, but implementation is significantly different.

Air Regulations:

- Public communication of risk (e.g., California AB 2588) changes participants in seeking resolution.

- Global Warming and the Climate Change Convention: if U.S. and Europe agree on decisive action, the result could be to drive industrial development to the third world.

Water Regulations:

- Presently technology based on effluent limitations (U.S., Europe), but Clean Water Act in U.S. is driving to water quality based limitations.

Hazardous/Solid Waste and Superfund:

- Favored method in Europe for hazardous wastes in mid-80s was shipping to Eastern Europe, which sought hard currency earnings.

General Observations:

- Total Environmental Cost to U.S. Industry estimated at $17-22 billion.

- Other factors affecting siting decision include relative labor costs, legal system (which can lead to long delays in the U.S.), and tax policies. (Mason: the U.S. Congress's tax research unit has recently completed a study of country-by-country tax policy and how it affects environmental investment.)

- For a specific refinery site, the problem is not all economics, rather a great deal of it arises from the uncertainty of what the U.S. regulatory situation will be versus other countries.

<u>Hugh R. James – Worldwide:</u>

Use case of a developing country with a refinery project intended for export (primarily to North America) or an underdeveloped country planning a refinery to reduce imports. These are as opposed to projects of the majors of the Western world.

- Planning is getting easier because such countries are copying U.S. requirements (e.g., environmental impact statements and hazardous operations requirements as a result of events in Bhopal). In addition, *contractors are being held to liability standards which result from meeting such U.S. standards.*

- Impediments: but regulations are not the same:

    — Countries lack skilled enforcement personnel, and the relationship of government/industry is closer.

    — Countries lack analytical labs to run tests.

    — Financing for investment which does not increase earnings is hard to obtain for these projects.

- On the other hand, export refineries are being specified to be "Cal Com", i.e., to make products capable of meeting California comparable product specs.
  - When this happens, the processing often is such that the refinery can meet U.S. emission requirements. Moreover some developers believe such standards will be required by U.S. legislatures to export to the U.S.
  - Some believe building such new export refineries to meet U.S. environmental regulations will be more economic than remodeling units later if necessary.
  - For OPEC producers, conversion to products skirts crude oil pricing (but not production quotas per Larry Goldstein)
  - Many believe that the U.S. will be shutting down plants, giving markets to export refineries and ensuring financing.
- Import Substitution Refineries (e.g., East Africa, China) are generally small (100-150 mbpd). Capital is limited and environmental expenses minimized.
  - Impact is to free capacity of existing refineries which may periodically compete in U.S. markets.

Conclusion:

- New export refinery projects overseas will probably be able to meet U.S. product specs and cost less than remodeled (U.S.) refineries.

Thomas S. Wyman – Shipping Considerations:

Domestic Issues to note:

- Oil Pollution Act of 1990 controlling many marine activities now: liability limits for vessels coming into U.S. increased (~$100 mil for 150 mdwt vessel) on ship owner; $0.05/bbl fee to refiners on all waterborne receipts.
- Single hulls phased out by 2010/15: cost of double hull +20%.
- Certificate of financial responsibility: as now drafted few would qualify because normal P&I (protection and indemnity insurance) insurers will not allow direct access to them rather than the vessel owner.
- Unlimited liability (for specified situations under OPA) may force higher tanker rates. Likewise state liabilities are increasing level (California level at $500 million now, going to $1,000 million in 2000).
- Hydrocarbon emissions (at loading) – now in effect in San Francisco area and New Jersey.

- Stack emissions: California attempting to control 100 miles and proposing 0.05% sulfur fuel.

International Issues to note (under the direction of the United Nations' established International Maritime Organization – IMO):

- Will the IMO adopt U.S. type double hull requirements for new ships?

- Old ship may require retrofit or light loading (which would decrease industry capacity by 20-25%, and push rates up promptly).

- Emissions – IMO has proposed 50% reduction of sulfur and 70% reduction NOx by 2000.

Questions and Answers

Q: If we are driving capacity abroad, shouldn't product imports be picking up?
A: (Larry Goldstein) At present, import total volume is about the same as it was ten to fifteen years ago (1.8-2.0 mmbpd), but composition has changed – more refined products and less fuel oil.

Q: Any guides on cost ($/bbl) of emission regulations?
A: (JHJ) See CONCAWE studies (gasoil to 0.5% sulfur, improvement in cetane, reducing benzine content to 1%).

Q: Any estimate of cost of regulation, U.S. vs. foreign, existing, new?
A: (HRJ) New jobs are lump sum. Lump sum are ~10% less than cost plus jobs. And retrofit are primarily cost plus jobs. Therefore new jobs could be less than done as retrofit.
(SRW) EPA typically looks at impacts of regulation, new source versus existing source.

Q: Is the U.S. too far ahead in air environmental regulation (and doomed to be the world's high cost producer)?
A: (KDM) Europe is optimizing SO2 and NOx control because of acid rain: Japan is spending a lot of time on toxics. Some other areas would like to focus on ozone. In Germany and Japan, there's a lot of optimization on CO2 control.
(SRW) Europe is favoring control of CO2 and propose a carbon tax which might draw the U.S. in that direction.
(KDM) Should the U.S. consider if it will improve its competitive position by being on stream earlier with environmental investments?
(W. R. Finger) Or, even if offshore plant was less expensive, but shipping much greater, would solution turn in another direction, e.g., alternative fuels?

(SRW) For Third World, decision is between food now or tractor next year, not quality of life some time in the distant future.
(HRJ) For export refineries, it is not local requirements, but U.S. which set the limits; e.g., if lack of compliance was interpreted as a "dumping" situation, could be used as a basis for protective tariff.

Q: Is there an increase in grass roots refinery projects abroad?
A: (HRJ) There has been increased interest in Cal Com facilities for Indonesia, Malaysia, and subsequently in the Mideast and by Taiwanese groups.

Q: Looking 10-20 years out, are there forces moving (state of air technology, world financial community, local environmental concerns) to common level of standards (product quality, refinery facilities) for OECD type countries or any refiner expecting to sell to the U.S.?
A: (HRJ) As previously commented, interest in Cal Com has developed in the last year, starting with product specs.
(KDM) One area, Kuwait, will have air standards meeting the more restrictive regulations.

Q: Do foreign agreements go through any "reg-neg" process?
A: (JHJ) Did not note any public intervention in survey of foreign EPA.

Q: Will Eastern Europe be self-sufficient in crude oil and able to export products?
A: (SRW) Don't see investment in next ten years.
(HRJ) Need new capacity for local consumption, but no capital.

Q: What is the source of the $17-22 billion cost of industry clean up?
A: (KDM) That may have been an API/AD Little study of a few years ago: check with Steve Weil.

Q: What is the status of the Cal Com refineries referred to earlier?
A: (HRJ) Basically in planning stage, with some basic design contracts out: believe Chioda has one advanced design award.

Q: (Clarification of OPEC countries integrating downstream and OPEC quotas.)
A: (Larry Goldstein) OPEC production quotas constrain producers whether the crude oil is processed by local refiners or exported. The question is whether the OPEC producer is insulating himself from crude oil price weakness by integrating downstream.

Q: What is happening to sulfur content of bunker fuel oil?
A: (TSW) The Oil Companies International Marine Form (OCIMF) has presented a study done in conjunction with CONCAWE on ship source sulfur emissions. It reports minimal impact of SOx from ships' bunkers on Northern Europe.

Q: Will tanker liability for product vessels be different than for crude oil?
A: (TSW) There is a distinction between persistent and non-persistent liability. However at present, liability is a function of vessel size.

Q: What are size trends for product vessels?
A: (TSW) Weights for product tankers will be somewhat more equivalent to crude oil tankers. However, discharging a VLCC full of naphtha will be a challenge for the refiner.

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<u>PRODUCT SUPPLY: Refinery Capacity and Investment</u>

<u>Dennis J. O'Brien – Moderator:</u>

<u>G. Henry M. Schuler – Caribbean/Latin America:</u>

- Latin American crude and NGL production trends:
  - Major producers/exporters: Mexico and Venezuela.
  - Other crude exporters: Columbia, Ecuador, Trinidad.

- Argentina – production and consumption (1990):
  - Produced 473 mbpd and
  - Consumed 371 mbpd.
  - Switch to natural gas has reduced oil and liquids consumption while production has increased.
  - High energy costs so not much room to reduce demand.
  - Exports 65 mpbd of products.

- Brazil – production and consumption (1990):
  - Produced 700 mbpd but
  - Consumed 1270 mbpd.
  - Consumption will continue to increase as ethanol transportation fleet is phased out.
  - Adding 100 mbpd of conversion capacity to upgrade surplus heavy fuel to light products.

- Mexico (see Williars below) – production and consumption (1990):
  - Produced 2.633 mmbpd and
  - Consumed 1.345 mmbpd,
  - Exporting about 1.2 mmbpd (half to the U.S.).

- Trinidad – production and refining capacity (1990):
  - Production 151 mbpd and
  - Refinery capacity 245 mbpd.

  Will not be able to finance any expansion plans.

- Venezuela – Historical exporter – production and consumption (1990):
  - — Produced 2.249 mmbpd (840 mbpd of light crude, 828 mbpd of medium, 430 mbpd of heavy, 37 mbpd of condensate and 114 natural gas liquids).
  - — Consumed 330 mbpd (of 917 processed)
  - — Exported about 600 mbpd of products, 60% to the U.S.
  - — Exported 1.242 mmbpd of crude.
  - — Have 12,500 bpd TAME plant with ENI
    Plan second world scale plant for 1995.
    Also six refinery MTBE plants (1500 to 3000 mbpd capacities).
  - — Increasing crude capacity by debottlenecking plus 200 mbpd grass-roots plant (Puerto La Cruz) with high conversion by 1997: all products to meet U.S. specs.

- Product prices: regular gasoline lowest in Venezuela ($0.23/gal): $0.02 increase in 11/91 resulted in riots.

- Latin American refinery operations:
  - — National oil company capacity (1990) 6.7 mmbpd: operating utilization - 78%.
  - — Other (mostly Virgin Islands, Puerto Rico and Panama) capacity (1990) 940 mbpd: operating utilization - 87%.

Jaime Williars – Mexico:

- International trade of crude and products: gasoline and fuel oil are primary imports (total, 130 mbpd) in demand of 1395 mbpd (1991).
  - — Gasoline has gone from an export of Mexico in 1988 to a growing import (73 mbpd in 1991): most is brought in on the Gulf of Mexico, some along the northern border. Anticipate '92-94 gasoline imports on the order of 90 to 140 mbpd.
  - — Fuel oil is imported on the Pacific coast.
  - — Plan increased conversion capacity (2 FCC projects are underway for 1992, 1993 startups) as well as expanded crude runs at Salamanca (50 mpbd).
  - — Exporting 1.37 mmbpd of crude with production at levels of 9/90.

- Base projections (1991-2000) on:
  - — 2.6%/yr GDP growth.
  - — International gasoline prices (after 55% and 25% price increases in leaded and unleaded last year): cuts growth rate (1990-2000) to 5.8% from 9.9% in '89-91 period.
  - — Middle distillate growth of 3.6%/yr.
  - — Fuel oil still primary fuel for electricity (growth 4.8%/yr) except for replacement by natural gas along northern border.

- "Other" category primarily LPG (250 mbpd): being studied for fueling fleets in Mexico City.
- No export refinery capacity included.

- Refinery additions to 2000 –
  - 300 mbpd (to a maximum of 450 mbpd) to existing or existing sites plus new plant near Pacific.
  - Will need FCC capacity in north (Monterrey area refinery) with reforming capacity, too.
  - Anticipate MTBE plants at each refinery.
  - Alkylation will also add material to the unleaded pool.
  - Distillate hydrotreating (230 mpbd) will be required for sulfur reduction.

Steven E. Terry – Western Europe:

- Overall, believe that there are distillation bottlenecks, but major cracking capacity deficits.

- In 1990, assuming 85% capacity utilization, the US, NWE and the Far East all ran refined product deficits, while the Middle East, Mediterranean and Caribbean has excess capacity to local needs. In 1990, the Far East was 1 mmbpd short and growing as we move to 1995.

- From 1986, the balance of Far East to Mediterranean product prices has swung west (i.e., Singapore prices have increased relative to Mediterranean prices), indicating that the Med is source of the marginal product.

- Demand for distillation capacity in W. Europe is in balance through 1995, but only by having S. Europe's surplus capacity to cover N. Europe's shortage (HO Table 1).

- Refining margins have steadily improved since 1986 (except for 1990's fourth quarter dip caused by the Middle East crisis).

- But Europe has a very low (but growing) proportion of conversion capacity, with only 13 coking refineries in the total 124 units (HO Table 3). Only a few, maybe three refineries have deep hydrocracking or full resid cat cracking capability.

- For 14 mmbpd crude run capacity, Europe has an overall cracking capacity of 27% (1990), up from a 10% level in 1980. The ratio will increase to 29% in five years, mostly through additions in the Mediterranean area, about 130 mbpd of capacity. (HO Table 2).

- Balances of light product demands, crude runs and cracking capacity indicate W. Europe with almost 370 mbpd fuel oil surplus in the 91-95 period.
    - Europe is not prepared to take on cracking needs, presumably because refiners are reluctant to make investments, see prices weaken and face a rationalization such as occurred in the mid-'80s.
    - Western European refiners may have expressed some hope to use the HSFO to displace lignite in Eastern Europe, but with little probability of doing so.

- As an alternative, refiners have moved to lighter, sweet crudes, with the result that the light/heavy crude differential has widened between Arab Heavy and Saharan Blend (a light sweet crude) from less than a dollar in 1987 to almost seven dollars today.

Fereidun Fesharaki – Far East:

- Continuing from yesterday's Asia-Pacific presentation, demand in the region will go from 12.6 mmbpd (1990) to 18.6 mmbpd (2000).

- Oil imports amounted to 48% of demand in 1990: by 2000 they will be 64%. New discoveries in Indonesia and Malaysia (totaling about 500 mbpd) bringing Asia Pacific production to about 7 mmbpd by the mid 1990's, is crude with high (70 to 80%) high pour - though low sulfur - fuel oil yield.

- Local low sulfur waxy crude's share of runs will decline as high sulfur Middle Eastern crudes increase, prompting resid cracking and direct resid desulfurization (there are already 4 of the latter projects in Taiwan, 1 each in Japan and Korea and 20 to 30 more are expected in the 1990's).

- Cracking/distillation ratio will increase from 18% (1991) to probably 21% (1995) or possibly 23%.

- FCC/RCC will dominate the capacity which also includes hydrocracking, resid desulfurization and coking.

- Profile of capacity (mmbpd):

	Crude Dist	Vsbkr Cking	FCC	HDC	CRU
Current	12.5	0.84	1.7	0.45	1.31
Delta to 1995	2.05	0.17	0.28	0.23	0.43
Possible after 1995 (total)	15.75	1.07	2.29	0.79	1.92

- While there is a clear need for capacity, cost has yet to be constrained: one project Chevron considered for participation was for a 120 mpbd refinery at $3.7 bil! Another case, the Malaysian Malaka refinery which Chinese Petroleum and Caltex were to be participants ran $2.2 bil for 100 mbpd of capacity. These costs are delaying the projects so that planned 1995 startups are now probably 1997 to 1998.

- Do not expect new (uncommitted) Middle East capacity or U.S. west coast exporting to the region leaving the stage set for significant product price increases: totaling distillation capacity for post 1995 at about 15.7 mmbpd, there will be a 2-3 mmbpd gap which prices must close.

- Japan is marketing 4.5 mmbpd, but only 1.5 mmbpd of refining capacity is competitive quality.

- Loss of Kuwaiti refining capacity was one major contributor to slump in fuel oil market:

  — Gulf war price increase – crude going from $15 to $25 didn't affect Japanese economy directly, but product supply loss hurt – so crude runs were increased, utilizing "mothballed" capacity.
  — Such idle capacity appears to be readily available: 210 mbpd were authorized 6/91 to restart and were listed in operation 7/91!
  — Such capacity has a 45-55% HSFO yield: thus total 500 mbpd of authorized restarts produce about 200 mbpd of fuel oil, backing out imports.
  — Coupled with 300 mbpd of new Korean crude capacity started up in this period, there is an added 300-350 mbpd of local supply fuel oil.
  — This backs material into the U.S. Gulf – a situation which will probably not be resolved for three or four years.

- China will continue to export about 70 mbpd of motor gasoline until 1993, but intermediate product exports will start phasing out in 1992. California, destination for some gasoline imports, will have a regulatory wall built around the state.

Edward N. Krapels – Worldwide:

- Study of worldwide crude quality (excluding the C.I.S.) finds trend to higher sulfur, but not heavier material. Later information on C.I.S. does not change conclusion.

- Refining capacity expansion:
  — 6 mmbpd distillation capacity by 1995 (maybe as late as '97) outside the U.S.; in the U.S. - 500 mbpd distillation capacity retirement.

— Upgrading capacity increasing faster than distillation capacity.
— Decline in gravity of crude gravity and increase in sulfur content, the latter of more concern, driven by return of Kuwait and Iraq (31-32 deg API high sulfur crudes).

- Driving forces behind rate of capacity expansion:
  — In U.S., environmental cost continue, decreasing capacity.
  — Producer countries continue interest in increasing access to markets via integration - therefore have interest in "mothballed" capacity.
  — 1980's impression of shortage of world capacity (and subsequent boom) replaced by more selective additions/upgrading in Asia.

- Major uncertainties:
  — Amount of U.S. capacity reduction: 500 mbpd already in 91/92: refining executives at seminar (10/91) guessed could shutdown up to 2000 mbpd: scrapped or mothballed?
  — Will Middle East "ultra-light" crude finds continue, reducing crude quality issue?
  — How fast will producers vertically integrate?
  — What will impact of E. Europe, CIStates be on markets?
    - CIS has ~ 10 mmbpd distillation capacity
      ~ 1 mmbpd upgrading capacity
    - CIS yields (1990):

gasoline	14%
mid dist.	25%
fuel oil	36%
balance	?

  — Confusion over demand growth rates due to environmental regulation.

- Demand Growth – visible trends:
  — World oil demand stagnant 90/91 due to economic slowdown: growth resumption expected in 92.
  — World middle distillates growth rate highest.
  — Rapidly industrializing countries (e.g., Korea) have growth rates of oil demand greater than economic growth.
  — C.I.S. states demand plummeting (to 6 mmbpd) with economy and market prices in effect.
  — Consensus long-term global demand growth 0.5 to 1.0 mmbpd in 1990s, or about 5 mmbpd from now to 2000 (contrast this to prior speaker's outlook for Asia Pacific alone growth of 6 mmbpd, 1990 to 2000).
  — OECD countries tightening sulfur for FO and diesel: developing countries are a mixed bag, with unequal enforcement.
  — Few if any OECD countries following RFG as an environmental program.

- Driving forces behind demand growth:
  - — World economic growth 1% or 3% average in the '90s?
  - — Relation of elasticities of GNP, energy and oil demand growth of developed countries – say 3:2:1, are upset by countries like Korea where oil demand grows faster than GNP.
  - — Demographics:
    - Europe/Japan population declines in the '90s.
    - US change depends on immigration.
    - Developing countries in a "baby boom".
  - — Local environmental concerns in U.S. to stringent product specs.
  - — Few OECD countries following U.S. lead in RFG.
  - — Small set of countries (not U.S.) driven by global environmental concerns to reduce petroleum demand.
  - — CIStates capitalism means western patterns of oil consumption.
  - — Slowly developing countries have foreign exchange constraints on growth.
  - — Scenarios have fuel oil replaced by gas in many applications: what happens to displaced fuel oil?

- Major uncertainties in demand growth:
  - — Middle East crisis.
  - — Protectionism between industrialized countries.
  - — Hostilities in CIStates.
  - — Purposely constrained demand growth in CIStates?
  - — U.S. immigration policy.
  - — Lower product growth rates?
  - — Impact of environmentalism on demand, refining.
  - — More fragmentation of product groups.

- Planning Scenarios: Mainstream:
  - — Demand
    - No enduring major Middle East crude disruption.
    - Environmental policy doesn't cause discontinuities.
    - LDC oil demand robust - 5 mmbpd in 1990's.
  - — Supply
    - Some U.S. distillation retirement, but not intrusive integration by crude exporters.
    - Far East capacity growth balanced with demand.
    - CIStates not major factor.
    - Environmental requirements, in and out of U.S. are balanced, not intrusive.
    - Product trade – no major new exporters to the U.S.

- Planning Scenarios: "Refiner's Hell" (with probabilities)

— Demand
>.5 - Middle East turmoil revitalizes oil aversion programs.
<.5 - Environmentalist dominate OECD: large gasoline tax in U.S., carbon tax in Europe.
<.5 - Sluggish world economic growth, extends LDC FX problems, restricting oil demand growth.
— Supply
>.5 - Oil exporters buy U.S. refinery capacity.
>.5 - Far East capacity growth exceeds demand growth: the U.S. becomes such an onerous place to do business that added capacity is built abroad.
<.5 - CIStates become product exporters: probably can not get the capital.
>.5 - Middle East products gain guaranteed share of market via vertical integration.
— Other ingredients:
>.5 - Environmental: U.S./foreign disparities increase.
<.5 - Product trade: Middle East, Japan target U.S. as premium market for product exports: hard to believe Japanese would go for such a low value added market.

<u>Anthony A. Churchill - Worldwide - Overview of Financial Issues:</u>

- Capital requirements for energy projects (e.g., electricity, petroleum) for
  - — Developing world (current) $250 bil/yr
  - — CIS states upgrading 75
  - Total ~ $350 bil/yr

  which is about 2% of GNP for non-OECD countries and should be compared to total capital markets of about $3 to 5 tril/yr.

- Energy growth:
  - — OECD growth ~ 1%/yr
  - — Developing countries ~4-7%/yr

    By the turn of the century, half of demand growth will be from developing countries; by 2010, developing countries' demand increase will equal that of developed countries.
  - — Electrical power increasing share of market
    - -- In the U.S. almost all additions are combined cycle gas turbine plants.
    - -- Similarly in most in the rest of the world: reasons:
      - * Construction time: coal - >5 yrs
        combined cycle <2 yrs
      - * Cost: coal - $1300/kwh capacity
        combined cycle <$500/kwh capacity.

- Even with low resid prices, combined cycle will be technology of choice, assuring a soft resid market.
— Expect a spot LNG market by the turn of the century.
  - LNG trains run $5-7 bil, yet market is strong enough for Shell to consider 6 trains at present.

- Transportation markets:
  — Growing rapidly in developing world, with some rates just under 20%/yr.
  — Will be a period of high real interest rates.
  — Pattern of investment changing
    - Had been dominated by government investment in electricity, refining.
    - In future, government funds will not be available, resulting in a turn to private markets, requiring an alteration of doing business.
  — Major companies have been the big source of capital in developing countries' petroleum development.
    - But outlook is for flat or declining oil prices for the next 10-20 years.
    - Developing countries have not been setting market rates for energy projects (e.g., electricity at 40% of today's costs: sub-market gasoline prices – which are very politically sensitive, e.g., the Venezuelan problem with slight price increase).
    - So potential profits seem to be declining.
  — Developing countries will have to share the risk to get more equity capital, new partners. Countries like Mexico, with national oil companies, will have trouble raising capital.

- In the U.S., dependence on foreign sources increases,
  — See a shift of U.S. refining from consuming area to producing area.
  — But why import products? why not import crude, export unneeded part of barrel.

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Comments by the Moderator:

- In the Asia-Pacific area, success of Korea, Taiwan, joined by Thailand and Malaysia and now Indonesia illustrates the benefits of open economies to the point that India is talking about following suit.

- But development may bring additional quality requirements: 12 of the 25 largest metropolitan areas are in the Asia subcontinent, all with environmental problems like Mexico City and Los Angeles. Limits on refinery expansion in these areas may place constraints on growth.

Questions and Answers

Q: Will limited natural gas avails in North America lead to demand for low sulfur fuel oil?

A: (AAC) Don't see gas being limited. Even if it were, technology progress on combined coal gasification and combined cycle power generation appears to make the re-emergence of fuel oil fire power generation unlikely.

(FF) Liquefied natural gas in the Far East is growing rapidly - currently there are 35 million tons capacity in Japan, 5 million in Korea and an estimated 80 million by 2010. Hence there is a growing international market which will constrain local gas prices eventually. Asia Pacific projects include Exxon and Pertamina in Indonesia, an Alaskan project, and a Sakhalin Island project as well as the Qatar project for supply to the Far East.

Q: What are the main factors in rising costs of refinery construction?

A: (FF) I can only say that Indonesia has an area factor of 25% (i.e., cost are 25% higher than the base area).

Q: Given environmental constraints in the US and NW Europe, where can additional refining capacity be built - in traditional export refining areas?

A: (FF) Singapore is running out of space to expand, it can add only 300-400 mbpd of capacity.
(ENK) CIStates and E. Europe have objectives to maximize hard currency earnings. Therefore they are looking to upgrade coastal refineries.
(HMS) Caribbean needs investment capital to increase capacity.

Q: At what price in NW Europe will resid conversion capacity be added?

A: (SET) The current price differentials justify additions, but refiners, recalling the overcapacity of the 1980's, are satisfied to earn excellent returns and not expand.
(Larry Goldstein) We have been seeing some inquiries into the role of swap markets to lock in the proper pricing signals (as incentives to invest).
(SET) We have suggested to people an environmental swap is the only way around uncertainties in regulation. For example, Helsinki, a city without an apparent air problem, has gasoline of RFG quality: possibly those anticipating regulation in one area can swap product with those short of capacity to meet regulation in another.
(AAC) The CIStates, with only oil and gas exports, look at the NWE markets and expect aggressive movement by major companies into partnerships in refining and transportation.

Q: What is the outlook for Orinoco production?

A: (GHMS) Venezuela has considered Orinco development a strategic objective.

However it is not clear there is commercial interest. Orimulsion completes with coal: Florida Power and Light is testing the material.

Q: Will new Mexican power plants have pollution control problems burning high sulfur fuel oil or coal?
A: (JMW) As discussed yesterday, Mexico intends to stackgas scrub power plants flue gas and believes it economic as compared to fuel oil desulfurization.

Q: Might lack of capital slow capacity growth in the Asia Pacific region and raise margins?
A (FF) It is not likely that lack of supply will lower demand because money will be available. Moreover, if Asia Pacific margins are high, product will be drawn from the Middle East or elsewhere to bring them into equilibrium.

Q: What happened to ethanol in Brazil?
A: (GHMS) The government is phasing out the aggressive use of ethanol to one which is primarily for periods of high oil prices and low sugar prices.
(AAC) Subsidies to maintain the ethanol program in Brazil were estimated at $9-10 bil/yr, approximately equal to the interest payments on Brazil's foreign debt.

Q: What is the likely capacity decline in the US?
A: (ENK) The estimates given (500 to 2000 mbpd by 2000) are not at all certain. But any reduction is assumed to take out the most inefficient capacity.
(SET) Certainly in Europe, it was the marginal plant which was retired. Looking at RFG specs, see that US refiners with cat reforming capacity will have excess aromatics. Rather than shutting capacity down, the aromatics might be shipped to Europe for the gasoline pool.

Q: If environmental and financial conditions are going to make energy investments more difficult, will the situation become impossible for the independent refiners and marketers?
A (AAC) Will see strategic partnerships - producers with refiners; in E. Europe, developers must be willing to take risk. There will probably be more opportunities for small or medium size firms willing to spend the time on the $10-20 mil investment than for the major firm, unwilling to take the risk of the $2-3 bil project.

Q: What real rates of return are required for major projects in LDC's?
A: (AAC) Returns must be relatively high - 18-24% (nominal, on leveraged equity).
(FF) One project by Shell in southern China will have prices of Singapore plus freight, giving returns of that order.

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Appendix L, Section VII-4

Product Quality Specifications (Foreign)

U.S. product specifications for this modeling effort are described in Appendix L, Section VII-2. Detailed U.S. product specifications are discussed in Chapter Four.

The 1989 product quality specifications used in the Pace LP studies of Foreign regions generally were taken from the Pace historical data base, which in turn is based upon actual market surveys. Certain specifications for gasolines and automotive diesel were taken from Associated Octel and Ethyl historical data.

The Foreign Survey results generally have been the source of data for determining the product quality specifications which will be assumed to apply for the Pace LP studies for 1995 onwards. The attached Executive Summary provides the general basis for interpretation of the Survey results to prepare the projections for future specifications.

Referring to the results of the survey, it will be noted that survey tables are constructed to show the number of respondents by country who believe that the future specification will fall within an indicated range. Separate tables are shown for each product category and critical property. The responses by country then are weighted to prepare a regional average.

In order to obtain a finite number (rather than as a specification for input into the LP, it has been necessary to select a regional average for each survey range, then calculate an overall weighted regional average specification for all ranges in that category. Note 6 of the detailed tabulation provides a listing of assumed specific survey averages used for each reported range, which average in turn was used in the calculation of a regional weighted average for each critical property.

Each calculated weighted average specification (CWAS) then was adjusted or rounded as necessary to the nearest standard unit as shown in the Executive Summary. This standardized number then was taken as the specification for that product for the reference year. Referring to Note 4, more restrictive manufacturing specifications then were established for input into the LP for certain critical properties, to reflect standard testing tolerances. These testing tolerances were taken from the Turner & Mason assumptions used in their US studies.

CAN, NWE and MED generally had the same specifications for 2000 carry over to 2010, on the premise that these regions are fully developed and fairly mature markets. On the other hand, ME, LAT and PAC regions, each with a large number of non-OECD countries having developing markets and economies, year 2010 specifications may be more restrictive than year 2000.

EXECUTIVE SUMMARY
FOREIGN REGION PRODUCT QUALITY PROJECTIONS
(Refer to tabulation for details)

GENERAL GUIDELINES

MOGAS Octane - Use (C)calc. pool (W)wt. (A)avg. from 1995/2000 (S)survey results (CWAS) rounded to nearest 0.5 Octane, with grade vol % rounded to nearest 5%.
RVP - Use CWAS rounded to nearest 0.5.
TEL - Use CWAS rounded to nearest 2.5, 1.5 or 0.6 gm/USG. Assume MMT at 0.03 used in Canada.
Sulfur - Use CWAS rounded to nearest 50 ppm. Over 1000 ppm taken as No Reqmnt.
Dist 90% - Use CWAS rounded to nearest 25 F. Over 375F taken as No Reqmnt.
Aromatics - Use CWAS rounded to nearest 5%. Over 35% taken as No Reqmnt.
Benzene - Use CWAS rounded to nearest 1.0%. Over 5% taken as No Reqmnt.
Olefins - Use CWAS rounded to nearest 1.0%. Over 15% taken as No Reqmnt.
Oxygen - Use CWAS rounded to nearest 5 % of pool, with oxygen content at 2.1% min. averaged over total unleaded pool.

JET/KERO Sulfur - Assume IATA will adopt EEC 1996 gasoil/kero/jet sulfur specs., which then would be applicable for all regions (00+).

DIESEL Cetane - Assume unchanged for time period.
Pour - Assume unchanged from present quality, with additive used in NWE/MED as required.
Sulfur - Use CWAS rounded to nearest 0.05 % S.
Aromatics - Use CWAS greater than 30 as No Reqmnt.

HOME HEATING OIL Sulfur - (Not included in survey) Use same as Diesel.

RESID FUEL Sulfur - Apportion demand volumes to standard grades of HSFO/Bunkers at 3.5%, MSFO 2.0%, LSFO at 1.0% and VLSFO at 0.3%, to obtain pool equal to CWAS forecast for Stationary Fuel, rounded to nearest 5 vol %.

NOTES:

1. Consider NWE and MED as similar markets with EEC approaching uniform specs. for all products by 2000.
2. For ME, LAT AM and PAC RIM regions with non-OECD countries having developing markets and economies, year 2010 some specifications may be more restrictive than year 2000.

FIG. 1

PRODUCT QUALITY TIME-LINE

DLF
06/30/92

MOGAS (RVP/Dist90%)
(%Pool-Oxy/-Leaded)

NOTE: MOST GRADE OCTANES UNCHANGED FOR ALL YEARS.

REGION	1989 REGS/(PACE EST.)	1995	2000	2010
USA RFG	8.7 / 330 0 / 0 BASELINE	8.1 / NR 30 / 0	8.0 / 300 30 / 0	8.0 / 300 30 / 0
CAN	11.6-15.5 / 375 NR / (16)	10.0 / 375 25 / 0	9.5 / 350 30 / 0	9.5 / 350 30 / 0
NWE	6.5-14.5 / 360 NR / (74)	10.5 / NR 10 / 20	10.0 / 350 20 / 5	10.0/ 350 20 / 0
MED	6.0-12.0 / 375 NR / (99)	10.5 / NR 10 / 60	9.5 / 350 20 / 25	9.5 / 350 20 / 0
ME	(10.9) / NR NR / 100	9.5 / NR NR / 50	9.5 / 350 NR / 5	9.5 / 350 NR / 5
LAT	(10.9) / NR NR / (95)	9.5 / NR 30 / 50	9.5 / NR 35 / 25	9.5 / 350 35 / 10
PAC	(10.9) / NR NR / (43)	10.0 / NR 10 / 20	10.0 / NR 20 / 5	10.0 / 350 20 / 5

YEAR

NR=NO RQMNT

FIG. 2

PRODUCT QUALITY TIME-LINE

DLF
06/30/92

MOGAS (%Benz./%Aromat.)
(ppmSulfur/%Olefins)

REGION	1989 REGS/(PACE EST.)	1995	2000	2010
USA RFG	1.5 / 32 339 / 92	1.0 / 27.9 NR / NR	1.0 / 25 100 / 10	1.0 / 25 100 / 10
CAN	NR / NR 1500 / NR	3.0 / NR 1500 / NR	2.0 / 35 500 / NR	2.0 / 35 500 / NR
NWE	NR / NR 1000 / NR	3.0 / NR 500 / NR	2.0 / 35 250 / NR	2.0 / 35 250 / NR
MED	NR / NR 2000 / NR	4.0 / NR 500 / NR	3.0 / 35 250 / NR	2.0 / 35 250 / NR
ME	NR / NR NR / NR	5.0 / NR 1000 / NR	3.0 / NR 500 / NR	3.0 / NR 250 / NR
LAT	NR / NR NR / NR	NR / NR 1000 / NR	5.0 / 35 500 / NR	5.0 / 35 250 / NR
PAC	NR / NR NR / NR	4.0 / NR 1000 / NR	3.0 / 35 250 / NR	3.0 / 30 250 / 15

NR=NO RQMNT

YEAR

APP L.VII.4-4

APP L.VII.4-5

DLF
06/30/92

FIG. 3

PRODUCT QUALITY TIME-LINE

DIESEL (CI / Dist95%) (%Sulfur/%Arom.)

REGION	1989 REGS/(PACE EST.)	1995	2000	2010
USA	40 / NR 0.2 / NR	47 / 620 0.05 / 28	47 / 620 0.05 / 28	47 / 620 0.05 / 28
CAN	(42.7) / NR 0.2 / (25)	46.0 / NR 0.2 / NR	46.0 / NR 0.05 / NR	46.0 / NR 0.05 / NR
NWE	(50) / NR 0.2 / NR	48.0 / 710 0.2 / NR	48.0 / 680 0.05 / NR	48.0 / 680 0.05 / NR
MED	50.8 / NR 0.28 / NR	48.0 / 710 0.2 / NR	48.0 / 680 0.05 / NR	48.0 / 680 0.05 / NR
ME	49 / NR (0.9) / NR	48.0 / 710 0.5 / NR	48.0 / 680 0.3 / NR	48.0 / 680 0.2 / NR
LAT	(43) / NR (0.15) / NR	46.0 / NR 0.5 / NR	48.0 / NR 0.3 / NR	48.0 / NR 0.2 / NR
PAC	(51.5) / NR (0.37) / NR	48.0 / 710 0.3 / NR	50.0 / 680 0.2 / NR	50.0 / 680 0.15 / NR

YEAR

NR=NO REQMNT

APP L.VII.4-6

	FOREIGN REGION PRODUCT QUALITY PROJECTIONS								Page 1
	Note 2)	Note 2)	Note 6)	Note 5)	Note 4)	Note 6)	Note 5)	Note 6)	Note 5)
	1989	1989	1989	1995	1995	1995	2000	2000	2010
MOTOR GASOLINE	PACE Stdy Spe	PACE LP	NPC Survey	Prop Prod Spec	Prop Mfg Spec	NPC Survey	Prop Prod Spec	NPC Survey	Prop Prod Spec
CANADA	CAN (6/08)								
,Oct. R+M/2 UP	91.2 Min	91.2		91.2 Min	91.3 Min		91.2 Min		91.2 Min
,Oct. R+M/2 UR	86.1 Min	86.1		86.1 Min	86.2 Min		86.1 Min		86.1 Min
,Oct. R+M/2 LR	88.5 Min	88.5							
,OctPool R+M/2 TEL/Cl	87.4/87.4	87.4/87.4		89.3 / -		89.3 / -	89.3 / -	89.3 / -	89.3 / -
,RVP	12.3 Max	12.3		10.0 Max	9.7 Max	10.0 Avg	9.5 Max	9.3 Avg	9.5 Max
,TEL/MMT (%Pool)	0.11/0.03 Max	0.0 (16%)/ -		0 / 0.03(50%)	0.03 Max		0 / 0.03(50%)		0 / 0.03(50%)
,ppm Sulfur	1500 Max	370 - 450	567	1500 Max	1200 Max	NA	500 Max	350 Avg	500 Max
,90% Dist F	(375 Max)		327	375 Max	370 Max		350 Max	356 Avg	350 Max
,% Benzene	NO RQMT	1.1 - 0.2		3.0 Max	2.7 Max	2.6 Avg	2.0 Max	2.0 Avg	2.0 Max
,% Aromatics	NO RQMT	34 - 19		NO RQMT	NO RQMT	36 Avg	35 Max	34 Avg	35 Max
,% Olefin	NO RQMT	8 - 5	NA	NO RQMT	NO RQMT		NO RQMT	15.5 Avg	NO RQMT
,% Oxygen	NO RQMT	0		>2.0 (25%)	2.1 Min	>2.0(25%)	>2.0 (30%)	<2.0(25%)	>2.0 (30%)
								>2.0(25%)	
NW EUROPE	NWE (06/11)								
,Oct. RON US/UP/UR	98.1/ - /91.1	98.1/ - /91.1		98.1/ - /91.1	98.2/ - /91.2		98.1/ - /91.1		98.1/ - /91.1
,Oct. MON US/UP/UR	88.1/ - /82.6	88.1/ - /82.6		88.1/ - /82.6	88.2/ - /82.7		88.1/ - /82.6		88.1/ - /82.6
,Oct. RON LP/LR	97.5/88.8 Min	97.5/89.1		97.5/89.1 Min	97.6/89.2 Min		97.5/89.1 Min		0
,OctPool R+M/2 TEL/Cl	91.6 / -	91.6/88.6		90.5 / -		90.4 / -	90.5 / -	90.6 / -	90.5 / -
,RVP	11.7 - 11.0	11.7 - 11.0		10.5 Max	10.2 Max	10.7 Avg	10.0 Max	10.2 Avg	10.0 Max
,TEL gm/USG(%Pool)	0.7 - 1.0 Max	0.7 - 0.6 (74%)		0.6 (20%)	0.6 (20%)	0.6(22%)	0.6 (5%)	0.6(4%)	0
,ppm Sulfur	1000 Max	260 - 10	647	500 Max	480 Max	NA	250 Max	274 Avg	250 Max
,90% Dist F	NO RQMT		349	NO RQMT	NO RQMT		350 Max	348 Avg	350 Max
,% Benzene	NO RQMT	1.7 - 0.1		3.0 Max	2.7 Max	3.4 Avg	2.0 Max	2.4 Max	2.0 Max
,% Aromatics	NO RQMT	53 - 33		NO RQMT	NO RQMT	39 Avg	35 Max	34 Avg	35 Max
,% Olefin	NO RQMT	15 - 1	12	NO RQMT	NO RQMT		NO RQMT	16.2 Max	NO RQMT
,% Oxygen	NO RQMT	0		>2.0 (10%)	2.1 Min	>2.0(8%)	>2.0 (20%)	<2.0(16%)	>2.0 (20%)
								>2.0(8%)	
MEDITERRANEAN	MED (06/25)								
,Oct. RON US/UP/UR	- /95.0/ - Min	- /95.0/ -		- /95.0/ -	- /95.1/ -		98.1/ - /91.1		98.1/ - /91.1
,Oct. MON US/UP/UR	- /85.0/ - Min	- /85.0/ -		- /85.0/ -	- /85.1/ -		88.1/ - /82.6		88.1/ - /82.6
,Oct. RON LP/LR	97.0/88.6 Min	97.0/88.6		97.0/88.6	97.1/88.7		97.5/88.6 Min		0
,OctPool R+M/2 TEL/Cl	91.4 / -	91.4/87.7		90.5 / -		90.3/ -	90.5 / -	90.5/ -	90.5 / -
,RVP	11.6 - 10.9 Max	11.6 - 10.9		10.5 Avg	10.2 Avg	10.4 Avg	9.5 Avg	9.7 Avg	9.5 Avg
,TEL gm/USG(%Pool)	1.3 Max	0.3 - 0.1 (99%)		0.6 (60%)	0.6 (60%)	0.6(58%)	0.6 (25%)	0.6(25%)	0
,ppm Sulfur	1000 Max	650 - 1000	966	500 Max	480 Max	NA	250 Max	316 Avg	250 Max
,90% Dist F	NO RQMT		345	NO RQMT	NO RQMT		350 Max	353 Avg	350 Max
,% Benzene	NO RQMT	1.6 - 0		4.0 Max	3.7 Max	3.5 Avg	3.0 Max	3.4 Avg	2.0 Max
,% Aromatics	NO RQMT	46 - 43		NO RQMT	NO RQMT	38 Avg	35 Max	35 Avg	35 Max
,% Olefin	NO RQMT	19 - 9	12	NO RQMT	NO RQMT		NO RQMT	16.6 Avg	NO RQMT
,% Oxygen	NO RQMT	0		>2.0 (10%)	2.1 Min	>2.0(9%)	>2.0 (20%)	<2.0(21%)	>2.0 (20%)
									DLF
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	Note 2)	Note 2)	Note 6)		Note 4)	Note 6)		Note 6)	
	1989	1989	1989	1995	1995	1995	2000	2000	2010
MOTOR GASOLINE (Cor	PACE Stdy Spe	PACE LP	NPC Survey	Prop Prod Spec	Prop Mfg Spec	NPC Survey	Prop Prod Spec	NPC Survey	Prop Prod Spec
MIDDLE EAST	MID EAST(06/17)								
,Oct. RON UP/UR	0 / 0	0 / 0		95.0/90.0 Min	95.1/90.1 Min		95.0/90.0 Min	NA	95.0/90.0 Min
,Oct. MON UP/UR	0 / 0	0 / 0		85.0/79.0 Min	85.1/79.1 Min		85.0/79.0 Min	NA	85.0/79.0 Min
,Oct. RON LP/LR	97.5/90.0	97.5/90.0		97.5/90.0	97.6/90.1		97.5/90.0		97.5/90.0
,OctPool R+M/2 TEL/Cl	87.2 / -	87.2/82.3		89.5 / -		89.3/ -	89.5 / -		90.0 / -
,RVP	10.8 - 10.9 Max	10.8 - 10.9		9.5 Avg	9.2 Avg	9.7 Avg	9.5 Avg	9.3 Avg	9.5 Avg
,TEL gm/USG(%Pool)	2.6 - 2.0 Max	0.6 - 1.1 (100%)		0.6 (50%)	0.6 (50%)	0.8(48%)	0.6 (5%)	0	0.6 (5%)
,ppm Sulfur	2000 Max	20 - 920	599	1000 Max	980 Max	NA	350 Max	330 Avg	250 Max
,90% Dist F	NO RQMT		302	NO RQMT	NO RQMT		350 Max	349 Avg	350 Max
,% Benzene	NO RQMT	0.6 - 0.7		5.0 Max	4.7 Max	4.6 Avg	3.0 Max	3.2 Avg	3.0 Max
,% Aromatics	NO RQMT	49 - 25		NO RQMT	NO RQMT	39 Avg	NO RQMT	36 Avg	NO RQMT
,% Olefin	NO RQMT	1 - 8	NA	NO RQMT	NO RQMT		NO RQMT	16.7 Avg	NO RQMT
,% Oxygen	NO RQMT	0		NO RQMT	NO RQMT	NR	NO RQMT	NR	NO RQMT
LATIN AMERICA	LAT AM (06/10)								
,Oct. RON UP/UR	92.0/ - Min	92.0/ -		92.0/88.0 Min	92.1/88.1 Min		93.0/88.0 Min		93.0/88.0 Min
,Oct. MON UP/UR	83.4/ - Min	83.4/ -		82.0/78.0 Min	82.1/78.1 Min		83.0/78.0 Min		83.0/78.0 Min
,Oct. RON LP/LR	94.6/81.9 Min	94.9/86.7		94.6/81.9 Min	94.7/82.0 Min		94.6/81.9 Min		94.6/81.9 Min
,OctPool R+M/2 TEL/Cl	86.0 / -	86.0/81.5		85.5 / -		85.2/ -	87.5 / -	87.2/ -	88.0 / -
,RVP	10.9 - 10.8 Max	10.9 - 10.8 Max		9.5 Avg	9.2 Avg	9.5 Avg	9.5 Avg	9.4 Avg	9.5 Avg
,TEL gm/USG(%Pool)	2.4 - 2.5 Max	1.4 - 1.1 (95%)		1.5 (50%)	1.5 (50%)	1.4(50%)	0.6 (25%)	0.9(25%)	0.6 (10%)
,ppm Sulfur	2000 Max	140 - 70	868	1000 Max	980 Max	NA	400 Max	406 Avg	250 Max
,90% Dist F	NO RQMT	356	369	NO RQMT	NO RQMT		NO RQMT	366 Avg	NO RQMT
,% Benzene	NO RQMT	0.7 - 1.0		NO RQMT	NO RQMT	4.4 Avg	5.0 Max	4.4 Avg	5.0 Max
,% Aromatics	NO RQMT	37 - 17		NO RQMT	NO RQMT	36 Avg	35 Max	35 Avg	35 Max
,% Olefin	NO RQMT	12 - 20	10	NO RQMT	NO RQMT	NA	NO RQMT	16.7 Avg	NO RQMT
,% Oxygen	NO RQMT	0		>2.0 (30%)	2.1 Min	<2.0(19%)	>2.0 (30%)	<2.0(24%)	>2.0 (30%)
						>2.0(19%)		>2.0(19%)	
PACIFIC RIM	PAC RIM (06/21)								
,Oct. RON UP/UM/UR	96/91/89.2 Min	96/91/89.2		96/91/89 Min	96.1/91.1/89.1		96/91/89 Min		96/91/89 Min
,Oct. MON UP/UM/UR	86/70/70 Min	86.0/81.5/80.2		86/81/79 Min	86.1/81.1/79.1		86/81/79 Min		86/81/79 Min
,Oct. RON LP/LR	97/87.9 Min	97/87.9		97/90 Min	97.1/90.1 Min		97/90 Min		97/90 Min
,Oct. MON LP/LR	87/77.9 Min	89.3/82.8		87/80 Min	87.1/80.1 Min		87/80 Min		87/80 Min
,OctPool R+M/2 TEL/Cl	85.7 / -	85.7/84.5		88.1 / -		88.1/ -	88.5 / -	88.3/ -	89.0 / -
,RVP	10.9 Max	10.9		10.0 Avg	9.7 Avg	10.0 Avg	10.0 Avg	10.0 Avg	10.0 Avg
,TEL gm/USG(%Pool)	1.63/2.35 Max	0.5/0.8 (43%)		0.6 (20%)	0.6 (20%)	0.8(19%)	0.6 (5%)	0.8 (5%)	0.6 (5%)
,ppm Sulfur	1000 Max	10 - 210	387	1000 Max	980 Max	NA	350 Max	364 Avg	250 Max
,90% Dist F	NO RQMT		315	NO RQMT	NO RQMT		NO RQMT	338 Avg	350 Max
,% Benzene	NO RQMT	1.1 - 1.6		4.0 Max	3.7 Max	4.1 Avg	3.0 Max	3.3 Avg	3.0 Max
,% Aromatics	NO RQMT	52 - 31		NO RQMT	NO RQMT	37 Avg	35 Max	34 Avg	35 Max
,% Olefin	NO RQMT	0 - 189	14	NO RQMT	NO RQMT	NA	NO RQMT	15.6 Avg	15 Max
,% Oxygen	NO RQMT	0		>2.0 (10%)	2.1 Min	<2.0(10%)	>2.0 (20%)	<2.0(18%)	>2.0 (20%)
						>2.0(1%)		>2.0(2%)	DLF
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	FOREIGN REGION PRODUCT QUALITY PROJECTIONS								Page 3
	Note 2)	Note 2)	Note 6)		Note 4)	Note 6)		Note 6)	
	1989	1989	1989	1995	1995	1995	2000	2000	2010
JET FUEL/KEROSENE	PACE Stdy Spe	PACE LP	NPC Survey	Prop Prod Spec	Prop Mfg Spec	NPC Survey	Prop Prod Spec	NPC Survey	Prop Prod Spec
IATA SPEC									
,Flash Pt. F	100 Min			110 Min			110 Min		110 Min
,Freeze Pt. F	-53 Max			-53 Max			-53 Max		-53 Max
,Smoke Pt. mm.	25 Min			25 Min			25 Min		25 Min
,% Olefins	5 Max			5 Max			5 Max		5 Max
,% Sulfur	0.30 Max			0.30 Max			0.05 Max		0.05 Max
,% Aromatics	20 Max			20 Max			20 Max		20 Max
CANADA	CAN (06/08)								
,Flash Pt. F	110 Min	110		110 Min	110 Min*		110 Min		110 Min
,Freeze Pt. F				-47 Pour	-52 Pour		-47 Pour		-47 Pour
,Smoke Pt. mm.	20 Min	23		23 Min	23 Min*		23 Min		23 Min
,% Sulfur	0.15 Max	0.15		0.15 Max	0.12 Max		0.05 Max		0.05 Max
,% Aromatics	22 Max	22		20 Max	20 Max*		25 Max		25 Max
NW EUROPE	NWE (06/11)								
,Flash Pt. F	110 Min	110		110 Min	110 Min*		110 Min		110 Min
,Freeze Pt. G				-47 Pour	-52 Pour		-47 Pour		-47 Pour
,Smoke Pt. mm.	20 Min	21		23 Min	23 Min*		23 Min		23 Min
,% Sulfur	0.15 Max	0.15		0.15 Max	0.12 Max		0.05 Max		0.05 Max
,% Aromatics	22 Max	20		20 Max	20 Max*		20 Max		20 Max
MEDITERRANEAN	MED (06/25)								
,Flash Pt. F	110 Min	110		110 Min	110 Min*		110 Min		110 Min
,Freeze Pt. F				-47 Pour	-52 Pour		-47 Pour		-47 Pour
,Smoke Pt. mm.	20 Min	27		23 Min	23 Min*		23 Min		23 Min
,% Sulfur	0.15 Max	0.15		0.15 Max	0.12 Max		0.05 Max		0.05 Max
,% Aromatics	22 Max	17		20 Max	20 Max*		20 Max		20 Max
MIDDLE EAST	MID EAST(06/17)								
,Flash Pt. F	110 Min	113		110 Min	110 Min*		110 Min		110 Min
,Freeze Pt. F				-47 Pour	-52 Pour		-47 Pour		-47 Pour
,Smoke Pt. mm.	20 Min	26		23 Min	23 Min*		23 Min		25 Min
,% Sulfur	0.15 Max	0.15		0.15 Max	0.12 Max		0.05 Max		0.05 Max
,% Aromatics	22 Max	19		20 Max	20 Max*		20 Max		25 Max
									DLF
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	FOREIGN REGION PRODUCT QUALITY PROJECTIONS								Page 4
	Note 2)	Note 2)	Note 6)		Note 4)	Note 6)		Note 6)	
	1989	1989	1989	1995	1995	1995	2000	2000	2010
JET FUEL/KEROSENE (	PACE Stdy Spe	PACE LP	NPC Survey	Prop Prod Spec	Prop Mfg Spec	NPC Survey	Prop Prod Spec	NPC Survey	Prop Prod Spec
LATIN AMERICA	LAT AM (06/10)								
,Flash Pt. F	110 Min	110		110 Min	110 Min*		100 Min		100 Min
,Freeze Pt. F				-47 Pour	-52 Pour		-47 Pour		-47 Pour
,Smoke Pt. mm.	20 Min	22		23 Min	23 Min*		23 Min		23 Min
,% Sulfur	0.15 Max	0.15		0.15 Max	0.12 Max		0.05 Max		0.05 Max
,% Aromatics	22 Max	22		20 Max	20 Max*		20 Max		20 Max
PACIFIC RIM	PAC RIM (06/21)								
,Flash Pt. F	110 Min	110		110 Min	110 Min*		100 Min		100 Min
,Freeze Pt. F				-47 Pour	-52 Pour		-47 Pour		-47 Pour
,Smoke Pt. mm.	23 Min	25		23 Min	23 Min*		23 Min		23 Min
,% Sulfur	0.15 Max	0.08		0.15 Max	0.12 Max		0.05 Max		0.05 Max
,% Aromatics	22 Max	21.2		20 Max	20 Max*		20 Max		20 Max
									DLF
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	FOREIGN REGION PRODUCT QUALITY PROJECTIONS								Page 5
	Note 2)	Note 2)	Note 6)		Note 4)	Note 6)		Note 6)	
	1989	1989	1989	1995	1995	1995	2000	2000	2010
AUTO DIESEL	PACE Stdy Spe	PACE LP	NPC Survey	Prop Prod Spec	Prop Mfg Spec	NPC Survey	Prop Prod Spec	NPC Survey	Prop Prod Spec
CANADA	CAN (6/08)								
,Cetane Index	42.7 Min	44.3	43.7	46 Min	47 Min		46 Min		46 Min
,Flash Pt. F	140 Max	140		140 Max	140 Max*		140 Max		140 Max
,Pour Pt. F	-20 Max	-25		-20 Max	-25 Max		-20 Max		-20 Max
,Dist. 95% F	NO RQMT			NO RQMT	NO RQMT		NO RQMT		NO RQMT
,% Sulfur	0.20 Max	0.2		0.2 Max	0.16 Max	0.21 Avg	0.05 Max	0.07 Avg	0.05 Max
,% Aromatics	NO RQMT		25	NO RQMT	NO RQMT		NO RQMT	34 Avg	NO RQMT
NW EUROPE	NWE (06/11)								
,Cetane Index	50 Min	50	50.2	48 Min	49 Min		48 Min		48 Min
,Flash Pt. F	140 Max	204		140 Max	140 Max*		140 Max		140 Max
,Pour Pt. F (w/addit)	+7 Max	+4		+7 Max	+2 Max		+7 Max		+7 Max
,Dist. 95% F	NO RQMT			710 Max	700 Max		680 Max		680 Max
,% Sulfur	0.2 Max	0.2		0.2 Max (100%)	0.16 Max (100%	0.13 Avg	0.05 Max (100%	0.06 Avg	0.05 Max (100%
,% Aromatics	NO RQMT		26.5	NO RQMT	NO RQMT		NO RQMT	33 Avg	NO RQMT
MEDITERRANEAN	MED (06/25)								
,Cetane Index	50.8 Min	51.6	51.5	48 Min	49 Min		48 Min		48 Min
,Flash Pt. F	140 Max	204		140 Max	140 Max*		140 Max		140 Max
,Pour Pt. F (w/addit)	+11 Max	+11		+7 Max	+2 Max		+7 Max		+7 Max
,Dist. 95% F	NO RQMT			710 Max	700 Max		680 Max		680 Max
,% Sulfur	0.28 Max	0.28		0.2 Max (100%)	0.16 Max (100%	0.15 Avg	0.05 Max (100%	0.06 Avg	0.05 Max (100%
,% Aromatics	NO RQMT		27	NO RQMT	NO RQMT		NO RQMT	34 Avg	NO RQMT
MIDDLE EAST	MID EAST(06/17)								
,Cetane Index	49 Min	49	51	48 Min	49 Min		48 Min		48 Min
,Flash Pt. F	140 Max	143		140 Max	140 Max*		140 Max		140 Max
,Pour Pt. F	+15 Max	+15		+15 Max	+10 Max		+15 Max		+15 Max
,Dist. 95% F	NO RQMT			710 Max	700 Max		680 Max		680 Max
,% Sulfur	0.9 Max	0.9		0.5 Max (100%)	0.4 Max (100%)	0.46 Avg	0.3 Max (100%)	0.22 Avg	0.2 Max (100%)
,% Aromatics	NO RQMT		NA	NO RQMT	NO RQMT		NO RQMT	NR	NO RQMT
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	FOREIGN REGION PRODUCT QUALITY PROJECTIONS								Page 6
	Note 2)	Note 2)	Note 6)		Note 4)	Note 6)		Note 6)	
	1989	1989	1989	1995	1995	1995	2000	2000	2010
AUTO DIESEL (Cont)	PACE Stdy Spe	PACE LP	NPC Survey	Prop Prod Spec	Prop Mfg Spec	NPC Survey	Prop Prod Spec	NPC Survey	Prop Prod Spec
LATIN AMERICA	LAT AM (06/10)								
,Cetane Index	43 Min	43	48.9	46 Min	47 Min		47 Min		47 Min
,Flash Pt. F	140 Max	160		140 Max	140 Max*		140 Max		140 Max
,Pour Pt. F	0 Max	0		0 Max	-5 Max		0 Max		0 Max
,Dist. 95% F	NO RQMT			NO RQMT	NO RQMT		NO RQMT		NO RQMT
,% Sulfur	0.15 Max	0.15		0.5 Max (100%)	0.4 Max (100%)	0.46 Avg	0.3 Max (100%)	0.43 Avg	0.2 Max (100%)
,% Aromatics	NO RQMT		NA	NO RQMT	NO RQMT		NO RQMT	38 Avg	NO RQMT
PACIFIC RIM	PAC RIM (06/21)								
,Cetane Index	51.5 Min	51.5	49	48 Min	49 Min		50 Min		50 Min
,Flash Pt. F	140 Max	167		140 Max	140 Max*		140 Max		140 Max
,Pour Pt. F	+25 Max	+15		+25 Max	+20 Max		+25 Max		+25 Max
,Dist. 95% F	NO RQMT			710 Max	700 Max		680 Max		680 Max
,% Sulfur	0.37 Max	0.37		0.3 Max (100%)	0.26 Max (100%	0.29 Avg	0.2 Max (100%)	0.2 Avg	0.15 Max (100%
,% Aromatics	NO RQMT		25	NO RQMT	NO RQMT		NO RQMT	33 Avg	NO RQMT
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	FOREIGN REGION PRODUCT QUALITY PROJECTIONS								Page 7
	Note 2)	Note 2)	Note 6)		Note 4)	Note 6)		Note 6)	
	1989	1989	1989	1995	1995	1995	2000	2000	2010
HOME HEATING OIL	PACE Stdy Spe	PACE LP	NPC Survey	Prop Prod Spec	Prop Mfg Spec	NPC Survey	Prop Prod Spec	NPC Survey	Prop Prod Spec
CANADA	CAN (06/08)								
,Flash Pt. F	140 Min	140		140 Min	140 Min*		140 Min		140 Min
,Pour Pt. F	-20 Max	-25		-20 Max	-25 Max		-20 Max		-20 Max
,Vis, cs @ 122F	2.1 Max	2.1		4.6 Max	4.6 Max*		4.6 Max		4.6 Max
,% Sulfur	0.2 Max	0.2		0.2 Max	0.16 Max		0.05 Max		0.05 Max
NW EUROPE	NWE (06/11)								
,Flash Pt. F	140 Min	140		140 Min	140 Min*		140 Min		140 Min
,Pour Pt. F (w/addit)	11 Max	<11		0 Max	-5 Max		0 Max		0 Max
,Vis, cs @ 122F	2.8 Max	2.2		4.6 Max	4.6 Max*		4.6 Max		4.6 Max
,% Sulfur	0.2 Max	0.2		0.2 Max	0.16 Max		0.05 Max		0.05 Max
MEDITERRANEAN	MED (06/25)								
,Flash Pt. F	140 Min	170		140 Min	140 Min*		140 Min		140 Min
,Pour Pt. F (w/addit)	13 Max	<13		+9 Max	+4 Max		+9 Max		+9 Max
,Vis, cs @ 122F	2.8 Max	2.2		4.6 Max	4.6 Max*		4.6 Max		4.6 Max
,% Sulfur	0.28 Max	0.28		0.2 Max	0.16 Max		0.05 Max		0.05 Max
MIDDLE EAST	MID EAST(06/17)								
,Flash Pt. F	140 Min	140		140 Min	140 Min*		140 Min		140 Min
,Pour Pt. F	+15 Max	+15		+9 Max	+4 Max		+9 Max		+9 Max
,Vis, cs @ 122F	3.0 Max	2.5		4.6 Max	4.6 Max*		4.6 Max		4.6 Max
,% Sulfur	0.90 Max	0.9		0.5 Max	0.4 Max		0.3 Max		0.2 Max
LATIN AMERICA	LAT AM ((06/10)								
,Flash Pt. F	140 Min	140		140 Min	140 Min*		140 Min		140 Min
,Pour Pt. F	0 Max	0		0 Max	-5 Max		0 Max		0 Max
,Vis, cs @ 122F	4.0 Max	2.7		4.6 Max	4.6 Max*		4.6 Max		4.6 Max
,% Sulfur	0.4 Max	0.4		0.5 Max	0.4 Max		0.3 Max		0.2 Max
PACIFIC RIM	PAC RIM (06/21)								
,Flash Pt. F	140 Min			140 Min	140 Min*		140 Min		140 Min
,Pour Pt. F	25 Max	-3		25 Max	20 Max		25 Max		25 Max
,Vis, cs @ 122F	4.0 Max	1.8		4.6 Max	4.6 Max*		4.6 Max		4.6 Max
,% Sulfur	0.37 Max	0.26		0.3 Max	0.26 Max		0.2 Max		0.2 Max
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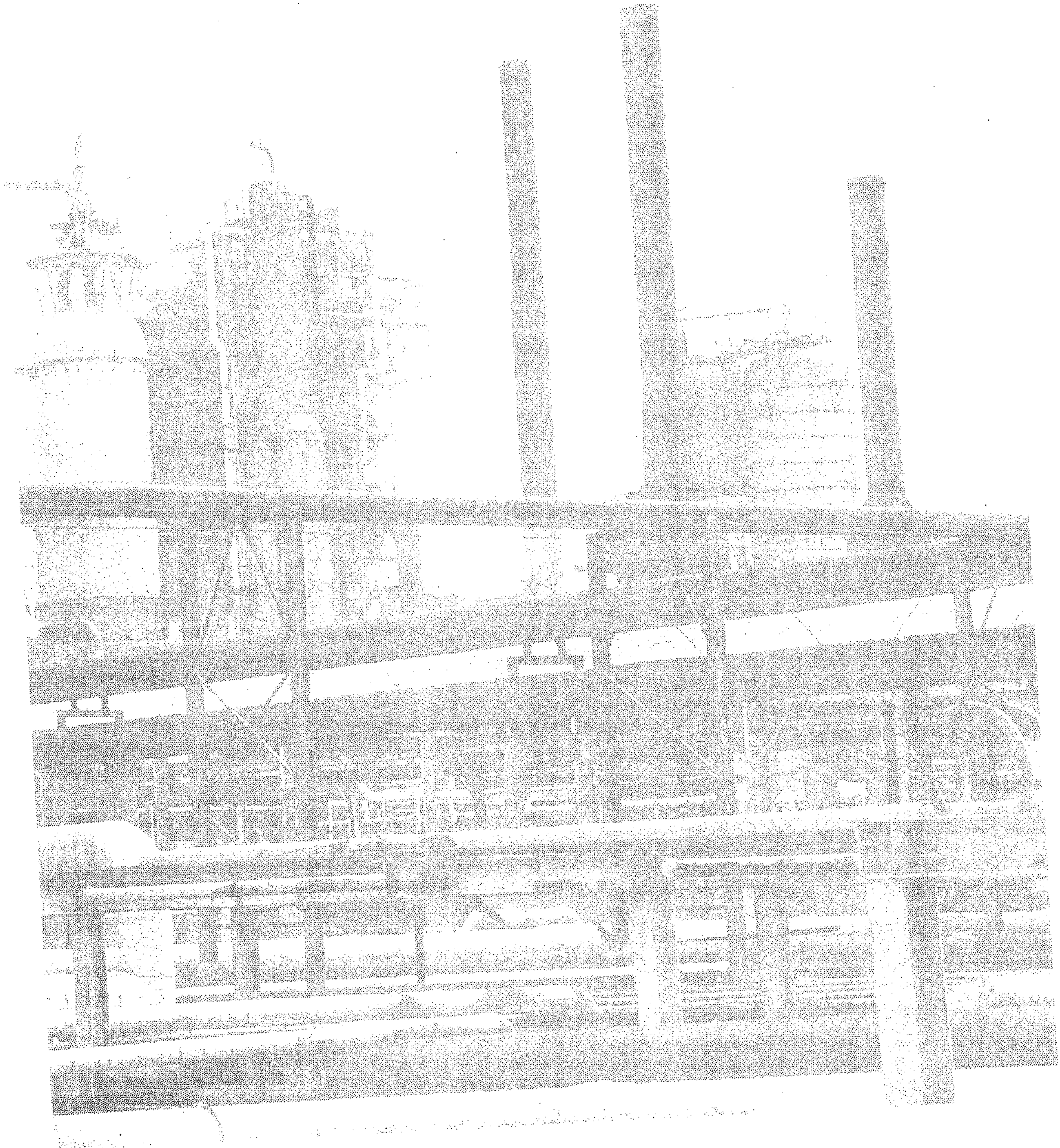
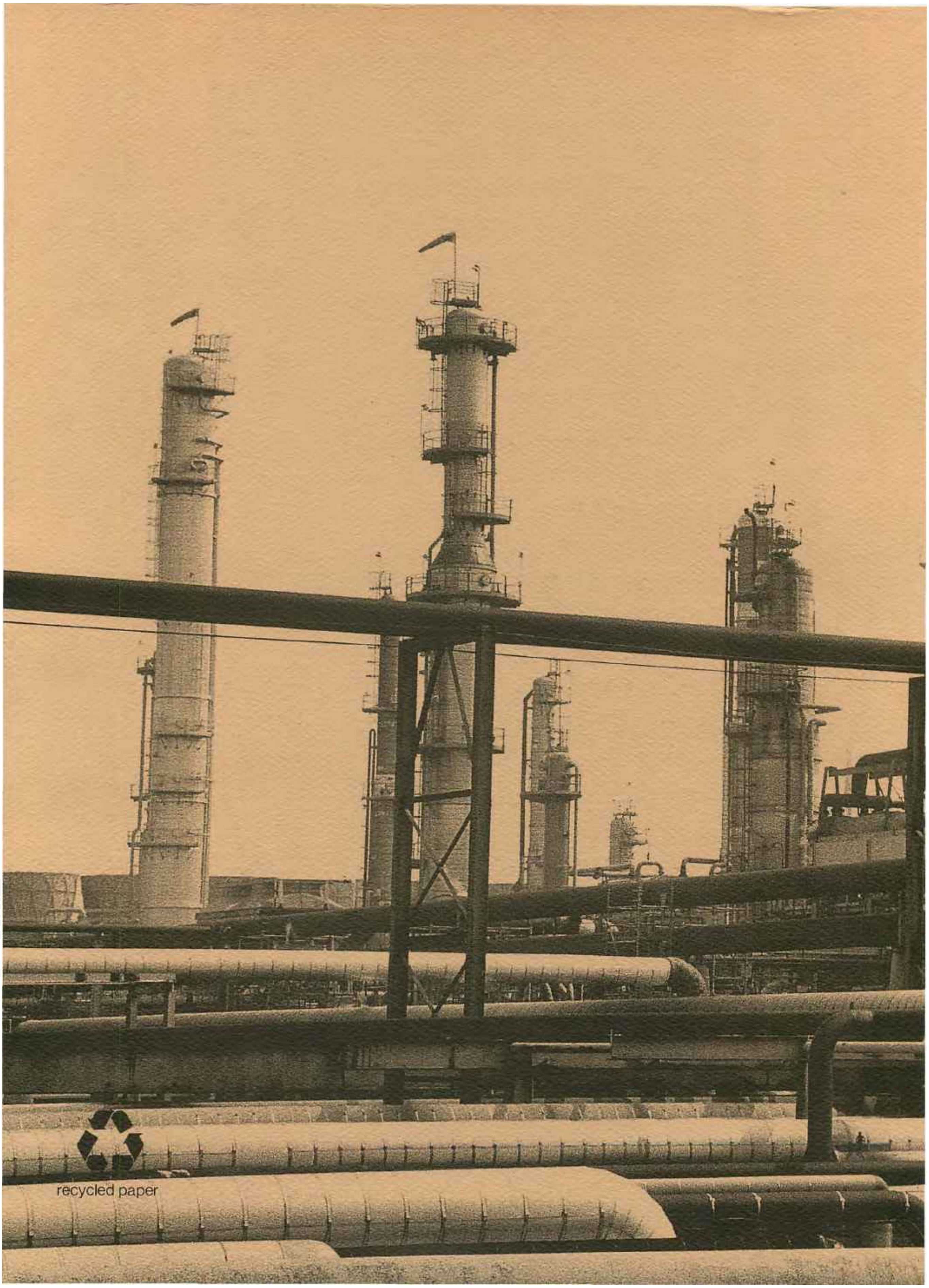
	FOREIGN REGION PRODUCT QUALITY PROJECTIONS								Page 8
	Note 2)	Note 2)	Note 6)		Note 4)	Note 6)		Note 6)	
	1989	1989	1989	1995	1995	1995	2000	2000	2010
RESIDUAL FUEL OIL	PACE Stdy Spe	PACE LP	NPC Survey	Prop Prod Spec	Prop Mfg Spec	NPC Survey	Prop Prod Spec	NPC Survey	Prop Prod Spec
CANADA	CAN (06/08)								
,Flash Pt. F	160 Min	160 Min		160 Min	160 Min*		160 Min		160 Min
,Vis, cs @122F	380 Max	160		380 Max	380 Max*		380 Max		380 Max
,% Sulfur, HSFO+Bnkr	3.0 Max(100%)	2.4 (100%)		3.5/3.0Max(20%	3.5 Max(20%)*		3.5/3.0Max(10%		3.5/3.0Max(10%
,% Sulfur, MSFO				2.0 Max(60%)	2.0 Max(60%)*		2.0 Max(60%)		2.0 Max(60%)
,% Sulfur, LSFO				1.0 Max(20%)	1.0 Max(20%)*		1.0 Max(30%)		1.0 Max(30%)
,% Slfr, Avg w/wo Bnkr				2.0 / 2.0		- / 2.0	1.8 / 1.8	- / 1.8	1.8 /1.8
NW EUROPE	NWE (06/11)								
,Flash Pt. F	160 Min	160 - 400		160 Min	160 Min*		160 Min		160 Min
,Vis, cs @122F	380 Max	380 - 95		380 Max	380 Max*		380 Max		380 Max
,% Sulfur, HSFO+Bnkr	3.5 Max(59%)	1.8 (59%)		3.5 Max(50%)	3.5 Max(50%)*		3.5 Max(45%)		3.5 Max(35%)
,% Sulfur, MSFO				2.0 Max(10%)	2.0 Max(10%)*		2.0 Max(5%)		2.0 Max(5%)
,% Sulfur, LSFO	0.95 Max(41%)	0.95 (41%		1.0 Max(40%)	1.0 Max(40%)*		1.0 Max(50%)		1.0 Max(60%)
,% Slfr, Avg w/wo Bnkr				2.4 / 1.8		- / 1.8	2.2 / 1.6	- / 1.4	1.9 / 1.2
,ppm Nickel				25 Max	22 Max		25 Max		25 Max
MEDITERRANEAN	MED (06/25)								
,Flash Pt. F	160 Min	160 - 390		160 Min	160 Min*		160 Min		160 Min
,Vis, cs @122F	380 Max	380 - 70		380 Max	380 Max*		380 Max		380 Max
,% Sulfur, HSFO+Bnkr	3.5 Max(80%)	3.0 (73%)		3.5 Max(40%)	3.5 Max(40%)*		3.5 Max(20%)		3.5 Max(20%)
,% Sulfur, MSFO	1.0 Max(20%)	0.8 (27%)		2.0 Max(20%)	2.0 Max(20%)*		2.0 Max(20%)		2.0 Max(15%)
,% Sulfur, LSFO				1.0 Max(40%)	1.0 Max(40%)*		1.0 Max(60%)		1.0 Max(65%)
,% Slfr, Avg w/wo Bnkr				2.2 / 2.0		- / 2.0	1.7 / 1.5	- / 1.5	1.7 / 1.4
,ppm Nickel				20 Max	18 Max		20 Max		20 Max
MIDDLE EAST	MID EAST(06/17)								
,Flash Pt. F	120 Min	120		160 Min	160 Min*		160 Min		160 Min
,Vis, cs @122F	380 Max	380		380 Max	380 Max*		380 Max		380 Max
,% Sulfur, HSFO+Bnkr	3.5 Max(100%)	3.5 (100%)		3.5 Max(100%)	3.5 Max(100%)*		3.5 Max(85%)		3.5 Max(75%)
,% Sulfur, MSFO							2.0 Max(15%)		2.0 Max(25%)
,% Sulfur, LSFO							1.0 Max(0%)		1.0 Max(0%)
,% Slfr, Avg w/wo Bnkr				3.5 / 3.5		- / 3.5	3.3 / 3.2	- / 3.2	3.1 / 3.0
LATIN AMERICA	LAT AM (06/10)								
,Flash Pt. F	160 Min	160 Min		160 Min	160 Min*		160 Min		160 Min
,Vis, cs @122F	380 Max	380		380 Max	380 Max*		380 Max		380 Max
,% Sulfur, HSFO+Bnkr	3.5 Max(100%)			3.5 Max(70%)	3.5 Max(70%)*		3.5 Max(45%)		3.5 Max(35%)
,% Sulfur, MSFO		2.6 (100%)		2.0 Max(5%)	2.0 Max(5%)*		2.0 Max(15%)		2.0 Max(20%)
,% Sulfur, LSFO				1.0 Max(25%)	1.0 Max(25%)*		1.0 Max(40%)		1.0 Max(45%)
,% Slfr, Avg w/wo Bnkr				2.8 / 2.8		- / 2.8	2.3 / 2.2	- / 2.1	2.1 / 2.0
PACIFIC RIM	PAC RIM (06/21								
,Flash Pt. F	160 Min	160 Min		160 Min	160 Min*		160 Min		160 Min
,Vis, cs @122F	380 Max	380 - 60		380 Max	380 Max*		380 Max		380 Max
,% Sulfur, HSFO+Bnkr	3.5 Max(74%)	2.1 (74%)		3.5-3.0Max(37%	3.5 Max(37%)*		3.5 Max(33%)		3.5 Max(30%)
,% Sulfur, MSFO				2.0 Max(10%)	2.0 Max(10%)*		2.0 Max(7%)		2.0 Max(5%)
,% Sulfur, LSFO	0.7 Max(26%)	0.7 (26%)		1.0 Max(28%)	1.0 Max(28%)*		1.0 Max(30%)		1.0 Max(35%)
,% Sulfur, VLSFO				0.3 Max(25%)	0.3 Max(25%)*		0.3 Max(30%)		0.3 Max(30%)
,% Slfr, Avg w/wo Bnkr				1.8 / 1.4		- / 1.4		- / 1.1	1.5 / 1.1
									DLF
									REV. 07/20/92

NOTES:									Page 9
1) FORECASTS OF PRODUCT QUALITY INTENDED FOR USE IN PACE SINGLE REFINERY REGIONAL MODELS.									
2) 1989 DATA TAKEN FROM MOST RECENT PACE REGIONAL CALIBRATION MODELS.									
3) PACE LP RESULTS SHOULD REFLECT APPROX. 1989 AVG. PRODUCT QUALITIES FOR THE REGION.									
4) 1995 MANUFACTURING SPECS. FOR PACE LP INPUT INCLUDE COMPLIANCE MARGINS USED IN PQ/TM									
STUDY FOR USA. APPLY SAME MARGINS TO OBTAIN MFG. SPECS FOR OTHER YEARS. WHERE NOTED WITH									
(*) COMPLIANCE MARGINS HAVE BEEN OMITTED TO CONFORM WITH USA PQ ASSUMPTIONS.									
- FOR MOGAS, USE MARGINS SPECIFIED IN TURNER,MASON TABLE A-24.									
- FOR OTHER PRODUCTS USE MARGINS SPECIFIED IN TURNER,MASON TABLE A-16.									
5) COUNTRY FORECASTS HAVE BEEN PREPARED USING GENERAL GUIDELINES SHOWN IN EXEC. SUMMARY.									
6) NPC SURVEY WEIGHTED AVERAGE PROPERTIES HAVE BEEN CALCULATED FROM REGIONAL SURVEY									
1995 AND 2000 FORECASTS USING FOLLOWING ASSUMPTIONS FOR RANGE COMPOSITIONS:									
RANGE	1	2	3	4	5				
MOGAS TEL gm/gal	0.6	1.5	2.5						
gm/liter	0.15	0.4	0.65						
MOGAS BENZENE	1.0	2.0	3.5	5.0					
MOGAS AROMATIC	25	30	35	40					
MOGAS RVP	9.0	10.0	11.0	12.5					
MOGAS SULFUR	50	150	375	500	750				
MOGAS OLEFIN	5	8	13	18					
MOGAS DIST.90%	275	300	325	350	375				
DIESEL SULFUR	0.05	0.125	0.25	0.4	0.7				
DIESEL AROMATICS	10	15	25	35	40				
RESID SULFUR	0.3	1.0	2.0	3.5					

NOTES




recycled paper