ATTACHMENT 1

PA-65-00853A

STATISTICAL ANALYSIS OF BATTERY TEST RESULTS FROM 1996 THROUGH 2002 MONESSEN COKE PLANT

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STATISTICAL ANALYSIS OF BATTERY TEST RESULTS FROM 1996 THROUGH 2002 MONESSEN COKE PLANT

1. BACKGROUND

A Reasonably Available Control Technology (RACT) based operating permit was issued to Koppers Industries, Inc. (KII), Monessen Coke Plant, Monessen, Pennsylvania in March of 1998. Several of the RACT emission limits set in the permit were based solely on a single emissions stack test performed in 1997. During a subsequent diagnostic test program in April 1998, Air/Compliance Consultants, Inc. (ACCI) determined that some of the previous test results used in the RACT determination were in error.

Due to concerns regarding the RACT emission limits, Koppers initiated an extended emissions testing program. ACCI conducted emissions testing on Coke Battery 1B and Battery 2 Combustion Stacks and the Pushing Emissions Control System (PECS). The extended test program was conducted in conjunction with a compliance test program to estimate the maximum hourly emissions from the facility, to determine variations in process emissions, and to provide a basis for requesting more representative permit limits.

The initial analysis report was completed in October 1998, and included test results from 1996 through 1998. A revised report was prepared to include data from 1999-2001. This newest report includes the 2002 test data. The following sections discuss the method of analysis and the results.

2. STATISTICAL ANALYSIS METHOD

Statistically-derived emission rates were developed by ACCI for Battery 1B and Battery 2 Combustion Stacks and the PECS using the standard methods for a Gaussian distribution. The "lb/hr" emission rates were calculated using the upper bound of the range expected for a next reading, calculated at a 95% and 99% confidence interval. The "ton/yr" emission rate was

calculated using the upper bound of the range expected to contain the mean value of the infinite parent population.

The confidence limit for a sample of "n" measurements of "X" is defined as follows:

$$CLx = tSx$$

Where

CLx = Confidence Limit of Sample

t = "t distribution" value for a specified confidence interval and number of degrees of freedom

Sx = Sample standard deviation

The confidence limit for the mean of an infinite parent population is defined as follows:

$$CLx_{mean} = tSx/\sqrt{n}$$

Where

CLx_{mean} = Confidence Limit of the mean of an infinite parent population

t = "t distribution" value for a specified confidence interval and number of degrees of freedom

Sx = Sample standard deviation

n = number of samples

The confidence limit value is then added to the sample mean (average test result) to establish the upper bound of the confidence interval.

3. COMBUSTION STACKS

ACCI analyzed emissions testing data from the Koppers Industries, Inc., Monessen Coke Plant for the Coke Battery 1B and Battery 2 Combustion Stacks. The data summary and analysis includes compliance and extended tests performed in 2002, 2001, 2000, 1999, and 1998 by ACCI, a 1997 test performed by Advanced Technology Systems, Inc. (ATS), and 1996 tests performed by Optimal Technologies (Optimal). Emissions data for the Battery 1B combustion

stack, collected by ATS and Optimal, was corrected for errors in the measured stack diameter and resubmitted to the Pennsylvania Department of Environmental Protection (PADEP).

Statistical analysis was performed on oxides of nitrogen (NO_x) for data collected during the previously identified emissions tests. Arithmetic mean, variability, standard deviation, coefficient of variation, and range were calculated for each of these data sets. These results are shown in Tables 1 and 2 for each combustion stack.

The NO_x emissions measured for Battery 1B, in parts per million (ppm), were consistent across all tests, with a coefficient of variation of 9.6%. Emissions data collected ranged from 332 to 519 ppm. However, the variation of 33.6 and the standard deviation of 42.3 show some dispersion of the data from the mean of 438.3 ppm.

The NO_x emissions data for Battery 2 was equally consistent, with a coefficient of variation of 13.3% and a range of 235 to 440 ppm. The variation of 33.0 and the standard deviation of 46.4 are consistent with data from Battery 1B.

Statistical analysis was also performed on volatile organic compound (VOC) emissions data collected for both Battery 1B and Battery 2. The emissions data varied considerably over the data set for each battery.

Battery 1B showed the greatest coefficient of variation (111%), indicating emissions that were inconsistent in nature and very broad in range (1.0 to 301 ppm). A variability of 56 and a standard deviation of 78.8 also indicate that the data are widely dispersed about the mean of 70.9 ppm.

Emissions data collected at Battery 2 were only slightly more consistent, with a coefficient of variation of 77.1% and a range of 0 to 98 ppm. A variability of 29.5 and a standard deviation of 33.7 indicate that the emissions at Battery 2 are also irregular and widely dispersed about the mean value of 43.7 ppm.

4. PUSHING EMISSIONS CONTROL SYSTEM

The PECS includes a movable suction hood, which is located above the coke hot car, and a baghouse that collects particulate emissions during the push cycle. Typically, 27 ovens are pushed in an 8-hour turn at the Monessen Coke Plant. Emission measurement data collected at the exhaust stack of the baghouse during the years of 1996 through 2002 is presented in Table 3.

Statistical analysis was performed on both NO_x (ppm) and VOC (ppm) emissions data to obtain an arithmetic mean, variability, standard deviation, coefficient of variation, and minimum and maximum values (range). Emissions data collected by ATS (1996) and Optimal (1997) was analyzed along with the ACCI test data collected from 1998 through 2002.

The variability (3.3) and the coefficient of variation (62.1%) of the NO_x data indicate that the data is consistent in nature and somewhat close in range. The NO_x values ranged from 0 to 25 ppm. The standard deviation of 4.2 suggests that much of the data is close to the mean value of 6.8 ppm.

For VOC, the variability (0.5) and coefficient of variation (55.6%) indicate that the VOC pushing emissions are also consistent in nature and somewhat close in range. The VOC values recorded across all years of testing range from 0 to 4 ppm. The standard deviation of 0.5 indicates that most of the recorded values are close to the mean value of 2 ppm.

It is important to note that the data used to predict the NOx and VOC emission rates for the PECS could be affected by measurement system accuracy. The measurements for both species were measured near the detection limits for the Reference Methods that were used to make the measurements. The statistical method used to predict the emission rate does not account for any measurement system inaccuracy, but this inaccuracy could affect future test results and lead to a false answer.

5. SUMMARY

Table 1 compares the results of the statistical analysis of the test results from the combustion stacks and the PECS to the existing RACT permit limits. ACCI considers the statistically derived limits to be considerably more realistic than the limits in the existing permit.

Table 1. Battery 1B Combustion Stack: Test Results Summary (1996 thru 2002)
Koppers Industries, Inc., Monessen Coke Plant

Test Description		Oxides of Nitrogen (as NO_2) (ppm)	(lb/hr)	(tpy)	VOC (as propane) (ppm)	(lb/hr)	(tpy)
ACCI 2002 Compliance Test	Run 1	421.9	63.3	277	5.4	0.5	2.4
	Run 2	446.0	67.0	293	8.5	0.9	3.7
	Run 3	447.3	67.1	294	7.0	0.7	3.1
ACCI 2001 Compliance Test	Run 1	410.2	57.0	250	26.3	6.6	29
	Run 2	399.9	28.2	124	28.0	7.4	32
	Run 3	407.9	28.4	125	32.3	8.2	36
ACCI 2000 Compliance Test	Run 1	460.2	60.1	263	8.5	1.7	8
	Run 2	481.8	63.4	278	8.9	2.2	10
	Run 3	478.7	62.8	275	8.9	2.1	9
ACCI 1999 Compliance Test	Run 1	495.5	66.7	292	13.6	2.8	12
	Run 2	452.6	61.4	269	10.8	2.4	10
	Run 3	485.3	67.4	295	11.3	2.7	12
ACCI 1998 Compliance Test	Run 1	467.0	118.7	520	68.0	20.0	88
	Run 2	464.1	122.7	537	86.0	26.3	115
	Run 3	468.9	113.7	498	101.0	28.2	124
ACCI 1998 Extended Test	15:38-16:38	442.6	112.3	492	118.6	34.8	152
	17:18-18:18	478.4	121.3	531	112.0	32.8	144
	18:28-19:28	497.6	126.2	553	168.0	49.2	216
	19:38-20:38	506.6	128.5	563	211.0	61.8	271
	20:48-21:48	519.4	131.7	577	301.0	88.2	386
	21:58-22:58	487.6	123.7	542	283.0	82.9	363
	23:08-0:08	492.4	124.9	547	264.0	77.4	339
	0:18-1:18	476.6	120.9	529	239.0	70.0	307
	1:18-2:18	471.4	119.6	524	220.7	64.7	283
ACCI 1998 Diagnostic Test	09:10-10:10	417.0	109.8	481	28.0	8.6	38
	10:10-11:10	442.0	108.9	477	32.0	13.4	59
	11:24-12:24	427.0	105.3	461	37.0	15.5	68
	12:24-13:24	461.0	113.6	497	43.0	18.0	79
	13:24-14:24	439.7	106.9	468	40.6	16.8	73
	14:34-15:24	443.2	99.5	436	52.6	20.0	88
	16:27-17:27	398.0	97.2	426	63.0	26.1	114
	17:27-18:27	459.0	108.5	475	72.0	28.9	126
	18:27-19:27	455.0	105.6	463	70.0	27.6	121
	19:27-20:27	452.0	103.4	453	64.0	24.9	109
	20:27-21:27	476.0	111.0	486	65.0	25.7	113
	21:27-22:27	452.0	103.4	453	64.0	24.9	109
	22:27-23:27	424.0	104.2	456	75.0	31.3	137
	23:27-00:27	432.0	105.7	463	66.0	27.4	120
	00:27-01:27	431.0	100.0	438	58.0	22.8	100
	01:27-02:27	410.0	99.0	434	57.0	23.4	102
	02:27-03:27	435.0	103.3	452	50.0	20.1	88
	03:27-04:27	416.0	95.2	417	81.0	31.4	138
	04:27-05:27	420.0	94.2	413			
	05:27-06:27	380.0	93.4	409			
	06:27-07:27	374.0	87.2	382			
	07:27-08:27	374.0	85.6	375			
	08:27-09:27	379.0	85.0	372			
ATS 1997 Corrected Test	Run1	331.9	88.2	386	7.8	2.4	11
	Run 2	393.3	87.3	382	15.6	4.6	20
	Run 3	333.6	83.1	364	7.8	2.2	10
Optimal 1996 Corrected Test	Run1	364.4	89.1	390	1.0	0.3	1
	Run 2	410.0	97.8	428	8.7	2.3	10
	Run 3	440.2	89.3	391	4.5	1.0	4
Number of Sample Points		53	53	53	48	48	48
Sample Mean		438.3	94.7	414.7	70.9	22.8	99.8
Sample Standard Deviation		42.3	24.2	106.2	78.8	23.2	101.7
Variability		33.6	19.2	83.9	55.8	17.1	74.7
Coefficient of Variability		9.6	25.6	25.6	111.0	101.8	101.8
Sample Minimum		331.9	28.2	123.7	1.0	0.3	1.1
Sample Maximum		519.4	131.7	577.0	301.0	88.2	386.4
Degrees of Freedom		52.0	52.0	52.0	47.0	47.0	47.0
"t" Distribution for 95% Confidence Level		2.000	2.000	2.000	2.000	2.000	2.000
"t" Distribution for 99% Confidence Level		2.660	2.660	2.660	2.660	2.660	2.660
95% Confidence							
Calculation of the upper bound of the range expected if next reading is taken:							
95% Confidence Limit for Sample			48.5			46.4	
95% Confidence Interval for Sample, Upper Bound			143.2			69.2	
Calculation of the upper bound of the range expected to contain the mean value of the parent population (infinite)							
95% Confidence Limit for Mean				29.2			29.3
95% Confidence Interval for Mean, Upper Bound				443.8			129.2
99% Confidence							
Calculation of the upper bound of the range expected if next reading is taken:							
99% Confidence Limit for Sample			64.5			61.7	
99% Confidence Interval for Sample, Upper Bound			159.1			84.5	
Calculation of the upper bound of the range expected to contain the mean value of the parent population (infinite)							
99% Confidence Limit for Mean				38.8			39.0
99% Confidence Interval for Mean, Upper Bound				453.5			138.9

Table 2. Battery 2 Combustion Stack: Test Results Summary (1996 thru 2002)
Koppers Industries, Inc., Monessen Coke Plant

Test Description		Oxides of Nitrogen (as NO_2) (ppm)	(lb/hr)	(tpy)	VOC (as propane) (ppm)	(lb/hr)	(tpy)
ACCI 2002 Compliance Test	Run 1	330.9	41.6	182	20.0	1.4	6
	Run 2	322.9	43.8	192	0.0	0.0	0
	Run 3	315.5	40.6	178	0.0	0.0	0
ACCI 2001 Compliance Test	Run 1	356.6	41.8	183	19.4	4.4	19
	Run 2	356.4	42.8	187	19.9	4.3	19
	Run 3	351.2	42.2	185	21.8	4.4	19
ACCI 2000 Compliance Test	Run 1	434.3	32.8	144	18.7	4.5	20
	Run 2	424.1	32.8	144	20.0	5.1	22
	Run 3	427.8	31.6	139	19.6	4.7	21
ACCI 1999 Compliance Test	Run 1	234.7	37.0	162	14.8	2.6	11
	Run 2	290.5	38.5	168	19.6	3.1	13
	Run 3	299.5	37.7	165	20.0	3.2	14
ACCI 1998 Compliance Test	Run 1	341.5	64.3	282	42.0	8.8	38
	Run 2	327.5	56.9	249	52.9	10.7	47
	Run 3	349.0	61.9	271	60.5	12.2	53
ACCI 1998 Extended Test	16:41-17:41	323.0	58.0	254	51.0	10.4	46
	19:01-19:59	248.0	44.6	195	41.0	8.4	37
	20:09-21:09	345.0	62.0	272	66.0	13.5	59
	21:19-22:19	330.0	59.3	260	82.0	16.7	73
	22:29-23:29	371.0	66.7	292	81.0	16.5	72
	23:39-0:39	332.0	59.7	261	94.0	19.2	84
	0:49-1:49	346.0	62.2	272	96.0	19.6	86
	1:59-2:59	344.0	61.8	271	98.0	20.0	88
	3:09-4:09	346.0	62.2	272	92.0	18.8	82
	4:19-5:19	366.0	65.8	288	95.0	19.4	85
	5:29-6:29	368.0	66.1	290	91.0	18.6	81
	6:39-7:39	371.0	66.7	292	95.0	19.4	85
ATS 1997 Corrected Data	Run 1	331.9	77.6	340	44.7	13.5	59
	Run 2	393.3	80.5	353	19.8	6.0	26
	Run 3	333.6	71.2	312	3.0	0.8	3
Optimal 1996 Corrected Data	Run 1	364.4	46.6	204	15.3	1.9	8
	Run 2	410.0	40.3	177	16.2	1.8	8
	Run 3	440.2	52.2	229	13.0	1.5	7
Number of Sample Points		33	33	33	33	33	33
Sample Mean		349.3	53.0	232.2	43.7	8.9	39.2
Sample Standard Deviation		46.4	13.7	60.1	33.7	7.1	30.9
Variability		33.0	12.2	53.5	29.5	6.3	27.4
Coefficient of Variability		13.3	25.9	25.9	77.1	78.9	78.9
Sample Minimum		234.7	31.6	138.5	0.0	0.0	0.0
Sample Maximum		440.2	80.5	352.6	98.0	20.0	87.6
Degrees of Freedom		32.0	32.0	32.0	32.0	32.0	32.0
"t" Distribution for 95% Confidence Level		2.030	2.030	2.030	2.030	2.030	2.030
"t" Distribution for 99% Confidence Level		2.704	2.704	2.704	2.704	2.704	2.704
95% Confidence							
Calculation of the upper bound of the range expected if next reading is taken:							
95% Confidence Limit for Sample			27.8			14.3	
95% Confidence Interval for Sample, Upper Bound			80.9			23.3	
Calculation of the upper bound of the range expected to contain the mean value of the parent population (infinite)							
95% Confidence Limit for Mean				21.2			10.9
95% Confidence Interval for Mean, Upper Bound				253.4			50.1
99% Confidence							
Calculation of the upper bound of the range expected if next reading is taken:							
99% Confidence Limit for Sample			37.1			19.1	
99% Confidence Interval for Sample, Upper Bound			90.1			28.0	
Calculation of the upper bound of the range expected to contain the mean value of the parent population (infinite)							
99% Confidence Limit for Mean				28.3			14.6
99% Confidence Interval for Mean, Upper Bound				260.5			53.7

Table 3. Pushing Emissions Control System, Test Results Summary (1996 Thru 2002)
Koppers Industries, Inc., Monessen Coke Plant

Test Description	Date	Time	Oxides of Nitrogen (NOx)			VOC as propane		
		Time	(ppm)	(lb/hr)	(tpy)	(ppm)	(lb/hr)	(tpy)
ACCI - 2002	**11/11/2002**	16:11:37	12.9	12.18	53.34	2.7	2.44	10.68
		16:12:37	5.2	4.91	21.50	2.5	2.26	9.89
		16:33:37	9.2	8.68	38.04	1	0.90	3.95
		16:34:37	4.6	4.34	19.02	0.7	0.63	2.77
		16:43:37	6.7	6.32	27.70	0.9	0.81	3.56
		16:44:37	0.1	0.09	0.41	0.6	0.54	2.37
		16:52:37	6.3	5.95	26.05	1	0.90	3.95
		16:53:37	4.5	4.25	18.61	0.8	0.72	3.16
		17:36:37	9.3	8.78	38.45	0	0.00	0.00
		17:37:37	5.6	5.29	23.15	0	0.00	0.00
		17:45:37	8.1	7.65	33.49	0	0.00	0.00
		17:46:37	0.2	0.19	0.83	0	0.00	0.00
		17:56:37	9.4	8.87	38.86	0	0.00	0.00
		17:57:37	4.8	4.53	19.85	0	0.00	0.00
		18:50:37	6.1	5.76	25.22	0	0.00	0.00
		18:51:37	0.2	0.19	0.83	0	0.00	0.00
		19:08:37	8.6	8.12	35.56	0	0.00	0.00
		19:09:37	5.2	4.91	21.50	0	0.00	0.00
		19:17:37	6.6	6.23	27.29	0	0.00	0.00
		19:18:37	0	0.00	0.00	0	0.00	0.00
		19:26:37	9	8.50	37.21	0	0.00	0.00
		19:27:37	4.6	4.34	19.02	0	0.00	0.00
		19:35:37	7.7	7.27	31.84	0	0.00	0.00
		19:36:37	0.1	0.09	0.41	0	0.00	0.00
		19:44:37	13.5	12.74	55.82	0	0.00	0.00
		19:45:37	0.1	0.09	0.41	0	0.00	0.00
		20:21:37	16	15.10	66.15	0	0.00	0.00
		20:22:37	0.9	0.85	3.72	0	0.00	0.00
		20:29:37	5.1	4.81	21.09	0	0.00	0.00
		20:30:37	1	0.94	4.13	0	0.00	0.00
		20:39:37	9.4	8.87	38.86	0	0.00	0.00
		20:40:37	0.8	0.76	3.31	0	0.00	0.00
		20:47:37	7.9	7.46	32.66	0	0.00	0.00
		20:48:37	0.2	0.19	0.83	0	0.00	0.00
		21:37:37	5.8	5.47	23.98	0	0.00	0.00
		21:38:37	0.6	0.57	2.48	0	0.00	0.00
		21:57:37	9.6	9.06	39.69	0	0.00	0.00
		21:58:37	2.3	2.17	9.51	0	0.00	0.00
		22:07:37	5.6	5.29	23.15	0	0.00	0.00
		22:08:37	1.1	1.04	4.55	0	0.00	0.00
		22:17:37	10.3	9.72	42.59	0	0.00	0.00
		22:18:37	1.8	1.70	7.44	0	0.00	0.00
		22:25:37	7.4	6.99	30.60	0	0.00	0.00
		22:26:37	0.4	0.38	1.65	0	0.00	0.00
		22:49:37	14.1	13.31	58.30	0	0.00	0.00
		22:50:37	6.1	5.76	25.22	0	0.00	0.00
		22:57:37	9.7	9.16	40.10	0	0.00	0.00
		22:58:37	0.1	0.09	0.41	0	0.00	0.00
ACCI - 2001	11/12/2001	14:17:29	5.20	4.01	17.58	1.43	1.09	4.77
		14:18:29	3.10	2.39	10.48	1.36	1.04	4.54
		14:37:29	3.90	3.01	13.19	1.28	0.98	4.27
		14:38:29	2.10	1.62	7.10	1.23	0.94	4.10
		14:47:29	6.30	4.86	21.30	1.24	0.94	4.14
		14:48:29	4.00	3.09	13.53	1.19	0.91	3.97
		15:42:29	5.40	4.17	18.26	1.12	0.85	3.74
		15:43:29	0.60	0.46	2.03	1.15	0.88	3.84
		15:52:29	3.40	2.63	11.50	1.13	0.86	3.77
		15:53:29	2.90	2.24	9.81	1.18	0.90	3.94
		16:09:29	4.10	3.17	13.86	1.40	1.07	4.67
		16:10:29	3.90	3.01	13.19	1.39	1.06	4.64
		16:25:29	4.20	3.24	14.20	1.10	0.84	3.67
		16:26:29	0.10	0.08	0.34	1.10	0.84	3.67
		16:41:29	0.00	0.00	0.00	1.12	0.85	3.74

Table 3. Pushing Emissions Control System, Test Results Summary (1996 Thru 2002)
Koppers Industries, Inc., Monessen Coke Plant

		Time	Oxides of Nitrogen (NOx)			VOC as propane		
Test Description	Date	Time	(ppm)	(lb/hr)	(tpy)	(ppm)	(lb/hr)	(tpy)
		16:42:29	4.30	3.32	14.54	1.20	0.91	4.00
		17:02:29	4.40	3.40	14.88	1.14	0.87	3.80
		17:03:29	0.20	0.15	0.68	1.14	0.87	3.80
		17:12:29	1.00	0.77	3.38	1.60	1.22	5.34
		17:13:29	4.10	3.17	13.86	1.53	1.17	5.11
		17:22:29	2.20	1.70	7.44	1.24	0.94	4.14
		17:23:29	2.60	2.01	8.79	1.33	1.01	4.44
		17:35:29	5.30	4.09	17.92	1.47	1.12	4.91
		17:36:29	1.30	1.00	4.40	1.58	1.20	5.27
		18:16:04	0.30	0.23	1.01	1.37	1.04	4.57
		18:17:04	4.40	3.40	14.88	1.36	1.04	4.54
		18:25:04	4.70	3.63	15.89	1.39	1.06	4.64
		18:26:04	2.10	1.62	7.10	1.40	1.07	4.67
		18:50:04	3.60	2.78	12.17	1.32	1.01	4.40
		18:51:04	1.10	0.85	3.72	1.31	1.00	4.37
		19:00:04	4.70	3.63	15.89	1.44	1.10	4.81
		19:01:04	2.20	1.70	7.44	1.45	1.10	4.84
		19:15:04	4.50	3.47	15.22	1.41	1.07	4.70
		19:16:04	0.60	0.46	2.03	1.42	1.08	4.74
		19:36:04	2.70	2.08	9.13	1.42	1.08	4.74
		19:37:04	3.50	2.70	11.84	1.38	1.05	4.60
		19:54:04	0.40	0.31	1.35	1.46	1.11	4.87
		19:55:04	4.30	3.32	14.54	1.44	1.10	4.81
		20:03:04	2.30	1.78	7.78	1.50	1.14	5.01
		20:04:04	2.60	2.01	8.79	1.49	1.14	4.97
		21:05:04	4.00	3.09	13.53	1.62	1.23	5.41
		21:06:04	0.70	0.54	2.37	1.64	1.25	5.47
		21:14:04	0.60	0.46	2.03	1.68	1.28	5.61
		21:15:04	4.80	3.71	16.23	1.63	1.24	5.44
		21:24:04	3.00	2.32	10.14	1.58	1.20	5.27
		21:25:04	2.40	1.85	8.12	1.66	1.26	5.54
		21:34:04	0.80	0.62	2.71	1.65	1.26	5.51
		21:35:04	4.60	3.55	15.56	1.64	1.25	5.47
ACCI - 2000	10/23/2000	16:17:08	9.10	6.78	29.71	1.20	0.87	3.82
		16:18:08	4.30	3.21	14.04	1.60	1.16	5.09
		16:45:08	11.20	8.35	36.56	0.70	0.51	2.23
		16:46:08	0.20	0.15	0.65	2.20	1.60	7.00
		16:54:08	4.70	3.50	15.34	1.20	0.87	3.82
		16:55:08	4.40	3.28	14.36	1.50	1.09	4.77
		17:02:08	3.80	2.83	12.41	1.20	0.87	3.82
		17:03:08	3.00	2.24	9.79	2.30	1.67	7.32
		17:11:08	7.90	5.89	25.79	1.20	0.87	3.82
		17:12:08	4.20	3.13	13.71	1.10	0.80	3.50
		17:20:08	4.90	3.65	16.00	2.20	1.60	7.00
		17:21:08	0.00	0.00	0.00	1.50	1.09	4.77
		17:29:08	5.10	3.80	16.65	1.30	0.94	4.14
		17:30:07	4.40	3.28	14.36	1.70	1.24	5.41
		18:27:08	4.90	3.65	16.00	1.20	0.87	3.82
		18:28:08	0.90	0.67	2.94	1.30	0.94	4.14
		18:36:08	8.60	6.41	28.08	1.40	1.02	4.46
		18:37:08	4.20	3.13	13.71	1.30	0.94	4.14
		18:44:08	2.70	2.01	8.81	1.60	1.16	5.09
		18:45:08	2.40	1.79	7.84	1.50	1.09	4.77
		20:22:08	6.30	4.70	20.57	1.40	1.02	4.46
		20:23:08	4.10	3.06	13.39	1.30	0.94	4.14
		20:31:08	5.30	3.95	17.30	1.50	1.09	4.77
		20:32:08	0.00	0.00	0.00	1.40	1.02	4.46
		20:39:08	6.20	4.62	20.24	2.10	1.53	6.68
		20:40:08	3.60	2.68	11.75	2.30	1.67	7.32
		20:48:08	4.20	3.13	13.71	1.20	0.87	3.82
		20:49:08	0.00	0.00	0.00	1.60	1.16	5.09
		20:55:08	9.00	6.71	29.38	2.20	1.60	7.00

Table 3. Pushing Emissions Control System, Test Results Summary (1996 Thru 2002)
Koppers Industries, Inc., Monessen Coke Plant

Test Description	Date	Time	Oxides of Nitrogen (NOx)			VOC as propane		
		Time	(ppm)	(lb/hr)	(tpy)	(ppm)	(lb/hr)	(tpy)
		20:56:08	4.80	3.58	15.67	2.30	1.67	7.32
		21:03:08	6.40	4.77	20.89	3.10	2.25	9.87
		21:04:08	2.70	2.01	8.81	2.10	1.53	6.68
		21:10:08	4.50	3.35	14.69	2.30	1.67	7.32
		21:11:08	1.00	0.75	3.26	2.20	1.60	7.00
		21:19:08	6.00	4.47	19.59	1.10	0.80	3.50
		21:20:08	0.80	0.60	2.61	1.30	0.94	4.14
		21:27:08	4.50	3.35	14.69	1.20	0.87	3.82
		21:28:08	0.20	0.15	0.65	1.30	0.94	4.14
		21:34:08	13.70	10.21	44.73	1.40	1.02	4.46
		21:35:08	0.30	0.22	0.98	1.30	0.94	4.14
		21:41:08	5.70	4.25	18.61	1.20	0.87	3.82
		21:42:08	0.20	0.15	0.65	1.30	0.94	4.14
		21:48:08	11.60	8.65	37.87	1.60	1.16	5.09
		21:49:08	0.40	0.30	1.31	1.40	1.02	4.46
		21:55:08	9.00	6.71	29.38	1.30	0.94	4.14
		21:56:08	0.10	0.07	0.33	1.80	1.31	5.73
		22:03:08	5.10	3.80	16.65	1.40	1.02	4.46
		22:04:08	0.20	0.15	0.65	1.30	0.94	4.14
		22:10:08	10.30	7.68	33.63	1.90	1.38	6.05
		22:11:08	0.40	0.30	1.31	1.50	1.09	4.77
		22:19:08	14.90	11.11	48.64	1.40	1.02	4.46
		22:20:08	0.50	0.37	1.63	1.90	1.38	6.05
		22:29:08	9.60	7.16	31.34	1.60	1.16	5.09
		22:30:08	0.30	0.22	0.98	1.90	1.38	6.05
		23:38:08	6.60	4.92	21.55	2.30	1.67	7.32
		23:39:08	4.70	3.50	15.34	2.60	1.89	8.28
		23:47:08	7.00	5.22	22.85	2.20	1.60	7.00
		23:48:08	0.10	0.07	0.33	2.60	1.89	8.28
		23:56:08	10.50	7.83	34.28	1.10	0.80	3.50
		23:57:08	4.80	3.58	15.67	1.30	0.94	4.14
		0:25:08	9.10	6.78	29.71	0.80	0.58	2.55
		0:26:08	0.10	0.07	0.33	0.80	0.58	2.55
		0:35:08	12.30	9.17	40.16	0.80	0.58	2.55
		0:36:07	5.70	4.25	18.61	0.80	0.58	2.55
		0:44:08	8.60	6.41	28.08	0.80	0.58	2.55
		0:45:07	0.20	0.15	0.65	0.80	0.58	2.55
		0:53:08	12.00	8.94	39.18	0.70	0.51	2.23
		0:54:08	4.80	3.58	15.67	0.80	0.58	2.55
		1:02:07	7.90	5.89	25.79	0.80	0.58	2.55
		1:03:07	0.10	0.07	0.33	0.80	0.58	2.55
		1:11:08	6.00	4.47	19.59	0.80	0.58	2.55
		1:12:08	5.60	4.17	18.28	0.80	0.58	2.55
		1:19:08	18.80	14.01	61.38	0.80	0.58	2.55
		1:20:08	0.40	0.33	1.45	0.80	0.74	3.23
		2:16:08	5.30	4.38	19.18	0.80	0.74	3.23
		2:17:08	5.00	4.13	18.10	0.80	0.74	3.23
ACCI - 1999	12/12/1999	14:08:41	6.00	4.96	21.72	2.60	2.39	10.49
		14:09:41	8.60	7.11	31.13	1.40	1.29	5.65
		14:10:41	4.00	3.31	14.48	1.20	1.11	4.84
		14:34:41	2.30	1.90	8.32	1.00	0.92	4.03
		14:35:41	4.30	3.55	15.56	1.00	0.92	4.03
		14:36:41	0.20	0.17	0.72	1.10	1.01	4.44
		14:42:41	9.90	8.18	35.83	2.00	1.84	8.07
		14:43:41	4.80	3.97	17.37	1.20	1.11	4.84
		15:40:41	6.30	5.21	22.80	1.10	1.01	4.44
		15:41:41	0.10	0.08	0.36	1.10	1.01	4.44
		15:48:41	11.40	9.42	41.26	2.00	1.84	8.07
		15:49:41	4.50	3.72	16.29	1.10	1.01	4.44
		15:50:41	4.60	3.80	16.65	1.10	1.01	4.44
		15:56:41	-0.10	-0.08	-0.36	1.00	0.92	4.03
		15:57:41	9.10	7.52	32.94	1.10	1.01	4.44

Table 3. Pushing Emissions Control System, Test Results Summary (1996 Thru 2002)
Koppers Industries, Inc., Monessen Coke Plant

Test Description	Date	Time	Oxides of Nitrogen (NOx)			VOC as propane		
		Time	(ppm)	(lb/hr)	(tpy)	(ppm)	(lb/hr)	(tpy)
		15:58:41	0.30	0.25	1.09	1.10	1.01	4.44
		15:59:41	12.40	10.25	44.88	2.00	1.84	8.07
		16:00:41	7.20	5.95	26.06	1.00	0.92	4.03
	12/13/1999	8:04:37	4.50	3.72	16.29	1.00	0.92	4.03
		8:05:37	6.70	5.54	24.25	0.80	0.74	3.23
		8:15:37	25.00	20.66	90.49	2.70	2.49	10.89
		8:16:37	16.20	13.39	58.64	0.90	0.83	3.63
		8:26:37	15.30	12.64	55.38	0.90	0.83	3.63
		8:27:37	0.80	0.66	2.90	0.80	0.74	3.23
		9:07:37	18.20	15.04	65.87	1.00	0.92	4.03
		9:08:37	8.80	7.27	31.85	0.50	0.46	2.02
		9:18:37	15.20	12.56	55.02	1.00	0.92	4.03
		9:19:37	2.00	1.65	7.24	0.30	0.28	1.21
		10:08:37	12.00	9.92	43.43	0.70	0.64	2.82
		10:09:37	6.30	5.21	22.80	0.40	0.37	1.61
		10:21:37	11.40	9.42	41.26	0.50	0.46	2.02
		10:22:37	5.70	4.71	20.63	0.30	0.28	1.21
		10:38:37	9.40	7.77	34.02	0.30	0.28	1.21
		10:39:37	0.60	0.50	2.17	0.30	0.28	1.21
		10:48:37	9.90	8.18	35.83	0.30	0.28	1.21
		10:49:37	1.80	1.49	6.52	0.20	0.18	0.81
		10:59:37	7.10	5.87	25.70	0.30	0.28	1.21
		11:00:37	2.00	1.65	7.24	0.30	0.28	1.21
		11:09:37	2.20	1.82	7.96	0.30	0.28	1.21
		11:10:37	7.50	6.20	27.15	0.20	0.18	0.81
		11:22:37	8.50	7.02	30.77	0.20	0.18	0.81
		11:23:37	0.70	0.58	2.53	0.20	0.18	0.81
		11:36:37	12.00	9.92	43.43	0.20	0.18	0.81
		11:37:37	2.10	1.74	7.60	0.10	0.09	0.40
		11:53:37	3.10	2.56	11.22	0.10	0.09	0.40
		11:54:37	7.10	5.87	25.70	0.30	0.28	1.21
		12:17:37	9.70	8.02	35.11	0.00	0.00	0.00
		12:18:37	1.70	1.40	6.15	0.00	0.00	0.00
		13:12:10	5.60	4.63	20.27	0.00	0.00	0.00
		13:13:10	2.80	2.31	10.13	0.00	0.00	0.00
		13:23:10	7.50	6.20	27.15	1.80	1.66	7.26
		13:24:10	6.80	5.62	24.61	0.40	0.37	1.61
ACCI - 1998		9:28:00-9:29:50	7.83	6.05	26.49	1.76	1.34	5.87
		10:25:00-10:26:50	4.25	3.28	14.37	1.53	1.16	5.09
		10:09:53-10:11:43	2.28	1.76	7.72	0.98	0.74	3.25
		10:19:33-10:21:22	4.90	3.78	16.57	0.92	0.70	3.06
		10:30:42-10:32:32	3.70	2.86	12.51	0.89	0.68	2.98
		10:43:23-10:45:13	6.68	5.15	22.57	0.90	0.69	3.00
		10:56:08-10:57:58	5.45	4.21	18.43	0.90	0.69	3.00
		11:17:37-11:19:28	4.25	3.28	14.37	0.80	0.61	2.67
		11:30:42-11:32:32	6.83	5.28	23.11	0.81	0.62	2.70
		11:37:48-11:39:38	6.60	5.10	22.32	0.80	0.61	2.67
		11:49:57-11:51:47	6.96	5.37	23.53	0.90	0.69	3.00
		12:02:03-12:04:53	6.66	5.14	22.52	1.17	0.89	3.89
		13:03:14-13:05:04	6.97	5.38	23.56	0.90	0.69	3.00
		13:13:04-13:14:54	4.71	3.64	15.92	0.80	0.61	2.67
		13:23:22-13:25:11	7.55	5.83	25.53	0.92	0.70	3.06
		13:35:16-13:37:06	8.20	6.33	27.73	0.81	0.62	2.70
		13:44:21-13:46:11	7.12	5.49	24.07	0.91	0.69	3.03
		13:50:21-13:52:11	6.73	5.19	22.74	0.81	0.62	2.70
		14:01:25-14:03:15	9.43	7.28	31.87	0.80	0.61	2.67
		14:10:32-14:12:22	8.36	6.45	28.27	0.80	0.61	2.67
		14:33:32-14:35:22	8.57	6.61	28.97	0.80	0.61	2.67
		14:45:32-14:47:22	9.58	7.40	32.41	1.25	0.95	4.17
		14:53:32-14:55:22	7.42	5.73	25.08	1.00	0.76	3.34
		16:29:32-16:30:42	7.75	5.98	26.21	1.04	0.79	3.48
		16:36:32-16:31:42	7.83	6.05	26.49	1.00	0.76	3.34

Table 3. Pushing Emissions Control System, Test Results Summary (1996 Thru 2002)
Koppers Industries, Inc., Monessen Coke Plant

Test Description	Date	Time	Oxides of Nitrogen (NOx)			VOC as propane		
		Time	(ppm)	(lb/hr)	(tpy)	(ppm)	(lb/hr)	(tpy)
		16:46:32-16:48:22	9.17	7.08	31.00	1.17	0.89	3.89
		16:57:32-16:59:22	7.25	5.60	24.52	1.19	0.91	3.98
		17:08:32-17:10:22	6.83	5.28	23.11	1.05	0.80	3.50
		17:16:32-17:18:22	6.75	5.21	22.83	1.00	0.76	3.34
		17:29:32-17:31:22	6.25	4.83	21.14	1.00	0.76	3.34
		17:38:32-17:40:22	6.08	4.70	20.57	1.15	0.88	3.84
		18:29:32-18:31:22	5.00	3.86	16.91	1.00	0.76	3.34
		18:26:32-18:38:22	6.58	5.08	22.26	1.00	0.76	3.34
		18:46:32-18:48:22	5.58	4.31	18.88	1.00	0.76	3.34
		18:52:32-18:54:22	6.08	4.70	20.57	1.00	0.76	3.34
		19:25:32-19:27:22	4.50	3.47	15.22	1.00	0.76	3.34
		19:32:32-19:34:22	6.08	4.70	20.57	1.58	1.21	5.28
		19:41:32-19:43:22	2.92	2.25	9.86	1.20	0.91	4.00
		19:50:32-19:52:22	8.75	6.76	29.59	2.42	1.84	8.06
		20:01:32-20:03:22	7.33	5.66	24.80	2.21	1.68	7.37
		21:11:32-21:13:22	5.08	3.92	17.19	2.53	1.92	8.43
		21:22:23-21:24:22	5.33	4.12	18.04	2.05	1.56	6.84
		21:34:32-21:36:22	6.50	5.02	21.98	2.18	1.66	7.29
		21:44:32-21:46:22	5.17	3.99	17.47	2.13	1.62	7.09
		21:53:32-21:55:22	5.50	4.25	18.60	2.17	1.65	7.23
		22:02:32-22:04:22	4.67	3.60	15.78	2.00	1.52	6.67
		22:25:32-22:27:22	5.08	3.92	17.19	1.97	1.50	6.56
		22:34:23-22:36:22	8.42	6.50	28.46	2.08	1.59	6.95
		22:43:32-22:45:22	9.00	6.95	30.43	1.89	1.44	6.31
		23:40:32-23:42:22	6.25	4.83	21.14	1.38	1.05	4.62
		23:49:32-23:51:22	8.08	6.24	27.34	1.81	1.38	6.03
		0:01:32-0:03:22	6.75	5.21	22.83	1.36	1.03	4.53
		0:10:32-0:12:22	9.58	7.40	32.41	1.93	1.47	6.45
		0:34:32-0:36:22	5.33	4.12	18.04	1.49	1.14	4.98
		0:46:32-0:48:22	9.33	7.21	31.56	2.36	1.80	7.87
		0:58:32-1:00:22	5.58	4.31	18.88	1.70	1.30	5.67
		1:07:32-1:09:22	5.75	4.44	19.44	1.54	1.17	5.14
		1:19:32-1:21:22	7.58	5.85	25.64	2.03	1.55	6.78
		1:28:32-1:30:22	4.00	3.09	13.53	1.46	1.11	4.87
		2:28:32-2:30:22	4.42	3.41	14.94	1.85	1.41	6.17
		2:37:32-2:39:22	3.83	2.96	12.96	1.31	1.00	4.37
		2:46:32-2:48:22	6.83	5.28	23.11	1.89	1.44	6.31
		2:55:32-2:57:22	5.17	3.99	17.47	1.92	1.46	6.40
		3:22:32-3:24:22	3.83	2.96	12.96	1.77	1.35	5.90
		3:34:32-3:36:22	6.08	4.70	20.57	1.49	1.14	4.98
		3:40:32-3:42:22	6.83	5.28	23.11	1.80	1.37	6.01
		3:52:32-3:54:22	6.67	5.15	22.54	1.52	1.16	5.06
		4:04:32-4:06:22	4.42	3.41	14.94	1.33	1.02	4.45
		5:04:32-5:06:22	3.08	2.38	10.43	1.09	0.83	3.64
		5:13:32-5:15:22	4.58	3.54	15.50	1.20	0.91	4.00
		5:22:32-5:24:22	3.50	2.70	11.84	1.20	0.91	4.00
		5:34:32-5:36:22	6.67	5.15	22.54	1.13	0.86	3.78
		5:46:32-5:48:22	6.75	5.21	22.83	1.18	0.90	3.95
		5:55:32-5:57:22	9.75	7.53	32.97	1.53	1.16	5.09
		6:07:32-6:09:22	5.67	4.38	19.16	1.20	0.91	4.00
		6:34:32-6:36:22	10.33	7.98	34.94	1.93	1.47	6.42
		6:43:32-6:45:22	6.67	5.15	22.54	1.63	1.24	5.45
		7:37:32-7:39:22	3.58	2.77	12.12	1.22	0.93	4.06
		7:49:32-5:51:22	3.00	2.32	10.14	1.25	0.95	4.17
ATS - 1997	4/29/1997	09:12-09:13	11.40	8.50	37.22	2.85	2.07	9.07
		09:30-09:31	8.80	6.56	28.73	2.40	1.74	7.64
		09:42-09:43	4.50	3.35	14.69	1.95	1.42	6.21
		09:56-09:57	9.00	6.71	29.38	1.80	1.31	5.73
		10:48-10:49	5.05	3.76	16.49	1.25	0.91	3.98
		10:59-11:00	9.70	7.23	31.67	1.30	0.94	4.14
		11:07-11:08	4.80	3.58	15.67	1.05	0.76	3.34
		11:17-11:18	16.35	12.19	53.38	1.90	1.38	6.05

Table 3. Pushing Emissions Control System, Test Results Summary (1996 Thru 2002)
Koppers Industries, Inc., Monessen Coke Plant

Test Description	Date	Time	Oxides of Nitrogen (NOx)			VOC as propane		
		Time	(ppm)	(lb/hr)	(tpy)	(ppm)	(lb/hr)	(tpy)
		11:28-11:29	5.50	4.10	17.96	1.05	0.76	3.34
		11:40-11:41	7.60	5.66	24.81	1.20	0.87	3.82
		11:50-11:51	9.85	7.34	32.16	1.70	1.24	5.41
		12:02-12:03	12.10	9.02	39.50	3.95	2.87	12.57
		13:04-13:05	5.70	4.25	18.61	1.05	0.76	3.34
		13:20-13:21	9.05	6.75	29.55	1.10	0.80	3.50
		13:32-13:33	5.35	3.99	17.47	1.00	0.73	3.18
		13:44-13:45	10.65	7.94	34.77	1.25	0.91	3.98
		13:54-13:55	6.50	4.84	21.22	1.45	1.05	4.62
		14:04-14:05	11.20	8.35	36.56	1.45	1.05	4.62
		14:13-14:14	5.90	4.40	19.26	1.20	0.87	3.82
		14:33-14:34	15.65	11.66	51.09	1.80	1.31	5.73
		14:45-14:46	7.55	5.63	24.65	1.80	1.31	5.73
		14:57-14:58	10.55	7.86	34.44	1.55	1.13	4.93
		15:48-15:49	7.20	5.37	23.51	1.55	1.13	4.93
		15:58-15:59	10.70	7.98	34.93	1.55	1.13	4.93
	4/30/1997	8:15-8:16	9.70	7.23	31.67	2.20	1.60	7.00
		8:29-8:30	11.30	8.42	36.89	2.20	1.60	7.00
		8:46-8:47	18.40	13.71	60.07	2.65	1.93	8.43
		8:59-9:00	11.50	8.57	37.54	2.15	1.56	6.84
		9:13-9:14	16.80	12.52	54.85	3.40	2.47	10.82
		9:25-9:26	9.80	7.30	31.99	2.10	1.53	6.68
		9:38-9:39	15.15	11.29	49.46	2.35	1.71	7.48
		10:37-10:38	11.70	8.72	38.20	2.05	1.49	6.52
		10:48-10:49	5.35	3.99	17.47	1.80	1.31	5.73
		11:01-11:02	10.45	7.79	34.12	1.65	1.20	5.25
		11:19-11:20	6.35	4.73	20.73	1.60	1.16	5.09
		11:33-11:34	7.85	5.85	25.63	1.15	0.84	3.66
		12:56-12:57	8.75	6.52	28.57	1.75	1.27	5.57
		13:08-13:09	12.85	9.58	41.95	2.35	1.71	7.48
		13:20-13:21	9.10	6.78	29.71	1.40	1.02	4.46
		13:48-13:49	8.05	6.00	26.28	1.25	0.91	3.98
		13:55-13:56	15.45	11.52	50.44	1.20	0.87	3.82
		14:06-14:07	9.60	7.16	31.34	1.35	0.98	4.30
		14:17-14:18	6.20	4.62	20.24	1.60	1.16	5.09
		14:28-14:29	15.85	11.81	51.75	2.10	1.53	6.68
		14:40-14:41	7.60	5.66	24.81	1.45	1.05	4.62
		14:49-14:50	12.00	8.94	39.18	2.35	1.71	7.48
		14:58-14:59	12.55	9.35	40.97	1.80	1.31	5.73
		15:38-15:39	13.15	9.80	42.93	1.00	0.73	3.18
	5/1/1997	08:16-08:17	11.25	8.39	36.73	1.50	1.09	4.77
		8:28-8:29	13.25	9.88	43.26	1.65	1.20	5.25
		8:42-8:43	10.85	8.09	35.42	1.40	1.02	4.46
		8:57-8:58	10.10	7.53	32.97	1.25	0.91	3.98
		9:15-9:16	10.35	7.71	33.79	1.10	0.80	3.50
		9:28-9:29	8.10	6.04	26.44	0.85	0.62	2.71
		10:27-10:28	7.80	5.81	25.46	1.30	0.94	4.14
		10:41-10:42	7.40	5.52	24.16	1.05	0.76	3.34
		11:06-11:07	7.30	5.44	23.83	1.05	0.76	3.34
		11:19-11:20	8.45	6.30	27.59	0.85	0.62	2.71
		11:29-11:30	8.95	6.67	29.22	1.10	0.80	3.50
		11:42-11:43	10.55	7.86	34.44	0.95	0.69	3.02
		11:51-11:52	11.95	8.91	39.01	1.05	0.76	3.34
		12:06-12:07	10.65	7.94	34.77	1.20	0.87	3.82
		12:17-12:18	6.15	4.58	20.08	0.80	0.58	2.55
		13:08-13:09	8.60	6.41	28.08	1.30	0.94	4.14
		13:17-13:18	5.40	4.02	17.63	0.95	0.69	3.02
		13:39-13:40	6.25	4.66	20.40	0.95	0.69	3.02
		13:50-13:51	8.65	6.45	28.24	0.90	0.65	2.86
		13:59-14:00	7.05	5.25	23.02	0.85	0.62	2.71
		14:09-14:10	12.40	9.24	40.48	1.65	1.20	5.25
		14:18-14:19	11.00	8.20	35.91	1.50	1.09	4.77

Table 3. Pushing Emissions Control System, Test Results Summary (1996 Thru 2002)
Koppers Industries, Inc., Monessen Coke Plant

Test Description	Date	Time	Oxides of Nitrogen (NOx)			VOC as propane		
		Time	(ppm)	(lb/hr)	(tpy)	(ppm)	(lb/hr)	(tpy)
		14:41-14:42	7.20	5.37	23.51	0.85	0.62	2.71
Optimal - 1996	11/18/1996	08:23:51-08:25:31	4.67	3.86	16.90	3.00	2.76	12.10
		08:58:37-09:00:17	8.50	7.02	30.77	2.67	2.46	10.77
		09:08:57-09:10:37	6.00	4.96	21.72	2.00	1.84	8.07
		09:21:57-09:23:37	7.33	6.06	26.53	1.50	1.38	6.05
		09:35:17-09:36:57	6.50	5.37	23.53	1.16	1.07	4.68
		09:49:57-09:51:37	7.67	6.34	27.76	2.00	1.84	8.07
		09:59:17-10:00:57	5.00	4.13	18.10	2.00	1.84	8.07
		10:43:09-10:44:49	8.00	6.61	28.96	1.16	1.07	4.68
		10:54:29-10:56:09	7.33	6.06	26.53	1.00	0.92	4.03
		11:15:34-11:17:14	9.00	7.44	32.58	1.00	0.92	4.03
		11:27:29-11:29:09	8.33	6.88	30.15	1.16	1.07	4.68
		11:39:04-11:40:44	8.33	6.88	30.15	1.16	1.07	4.68
		11:49:32-11:51:12	8.33	6.88	30.15	1.00	0.92	4.03
		12:01:45-12:03:25	10.33	8.54	37.39	2.50	2.30	10.08
		12:11:22-12:13:02	8.50	7.02	30.77	1.33	1.22	5.36
		13:01:20-13:03:00	8.67	7.16	31.38	1.33	1.22	5.36
		13:11:27-13:13:07	8.17	6.75	29.57	1.16	1.07	4.68
		13:23:31-13:25:11	10.00	8.26	36.19	1.16	1.07	4.68
		13:34:37-13:36:17	8.50	7.02	30.77	1.00	0.92	4.03
		13:44:57-13:46:37	9.83	8.12	35.58	2.00	1.84	8.07
		13:55:43-13:57:23	8.50	7.02	30.77	1.00	0.92	4.03
		14:06:29-14:08:09	9.67	7.99	35.00	1.00	0.92	4.03
		14:15:48-14:17:28	10.00	8.26	36.19	1.16	1.07	4.68
		14:36:12-14:37:52	5.83	4.82	21.10	1.00	0.92	4.03
	11/19/1996	07:53:42-07:55:22	6.67	5.51	24.14	1.00	0.92	4.03
		08:13:06-08:14:46	18.33	15.15	66.35	1.00	0.92	4.03
		08:28:50-08:30:30	6.70	5.54	24.25	1.16	1.07	4.68
		08:50:20-08:52:00	10.17	8.40	36.81	1.16	1.07	4.68
		09:07:40-09:09:20	10.50	8.68	38.00	1.16	1.07	4.68
		09:25:05-09:26:45	17.50	14.46	63.34	1.67	1.54	6.74
		09:37:08-09:38:48	8.33	6.88	30.15	1.00	0.92	4.03
		09:47:09-09:48:49	10.50	8.68	38.00	0.33	0.30	1.33
		09:57:17-09:58:57	17.00	14.05	61.53	1.00	0.92	4.03
		10:06:47-10:08:27	18.00	14.87	65.15	1.00	0.92	4.03
		11:08:43-11:10:23	9.50	7.85	34.39	0.50	0.46	2.02
		11:33:04-11:34:44	12.67	10.47	45.86	1.00	0.92	4.03
		11:43:04-11:44:44	11.67	9.64	42.24	0.50	0.46	2.02
		11:51:55-11:53:35	12.50	10.33	45.24	0.50	0.46	2.02
		12:02:20-12:04:00	9.50	7.85	34.39	0.33	0.30	1.33
		12:11:49-12:13:29	12.00	9.92	43.43	1.16	1.07	4.68
		12:20:29-12:22:09	17.67	14.60	63.96	1.50	1.38	6.05
		13:08:50-13:10:30	10.50	8.68	38.00	0.33	0.30	1.33
		13:20:27-13:22:07	18.17	15.02	65.77	1.83	1.69	7.38
		13:30:38-13:32:18	14.50	11.98	52.48	0.67	0.62	2.70
		13:41:09-13:42:49	12.00	9.92	43.43	0.50	0.46	2.02
		13:51:28-13:53:08	14.83	12.26	53.68	1.33	1.22	5.36
		14:01:37-14:03:17	12.33	10.19	44.63	0.33	0.30	1.33
		14:12:00-14:13:40	7.00	5.78	25.34	0.17	0.15	0.67
	11/20/1996	07:36:56-07:38:36	7.33	6.06	26.53	2.00	1.84	8.07
		07:47:46-07:49:26	4.83	3.99	17.48	1.00	0.92	4.03
		08:01:03-08:02:43	8.00	6.61	28.96	1.50	1.38	6.05
		08:11:47-08:13:27	5.17	4.27	18.71	1.33	1.22	5.36
		08:29:00-08:30:40	11.50	9.50	41.62	2.00	1.84	8.07
		08:44:58-08:46:38	5.50	4.55	19.91	2.00	1.84	8.07
		08:55:41-08:57:21	10.17	8.40	36.81	2.16	1.99	8.71
		09:05:55-09:07:35	5.33	4.40	19.29	2.00	1.84	8.07
		09:16:55-09:18:35	14.17	11.71	51.29	2.00	1.84	8.07
		09:26:14-09:27:54	4.83	3.99	17.48	1.33	1.22	5.36
		10:31:45-10:33:25	9.00	7.44	32.58	2.17	2.00	8.75
		10:41:10-10:42:50	4.83	3.99	17.48	1.00	0.92	4.03
		10:51:33-10:53:13	8.33	6.88	30.15	1.00	0.92	4.03

Table 3. Pushing Emissions Control System, Test Results Summary (1996 Thru 2002)
Koppers Industries, Inc., Monessen Coke Plant

Test Description	Date	Time	Oxides of Nitrogen (NOx) (ppm)	(lb/hr)	(tpy)	VOC as propane (ppm)	(lb/hr)	(tpy)
		11:01:50-11:03:30	5.67	4.69	20.52	1.33	1.22	5.36
		11:13:53-11:15:33	10.83	8.95	39.20	1.50	1.38	6.05
		11:23:55-11:25:35	12.50	10.33	45.24	1.16	1.07	4.68
		11:36:40-11:38:20	9.17	7.58	33.19	1.00	0.92	4.03
		11:46:58-11:48:38	6.50	5.37	23.53	2.00	1.84	8.07
		13:06:59-13:08:39	8.33	6.88	30.15	1.00	0.92	4.03
		13:17:30-13:19:10	9.17	7.58	33.19	1.50	1.38	6.05
		13:28:13-13:29:53	9.33	7.71	33.77	1.00	0.92	4.03
		13:38:10-13:39:50	7.17	5.93	25.95	2.00	1.84	8.07
		13:50:12-13:51:52	11.33	9.36	41.01	2.17	2.00	8.75
		14:00:19-14:01:59	21.67	17.91	78.43	1.83	1.69	7.38
Number of Sample Points			446	446	446	446	446	446
Sample Mean			6.8	5.4	23.6	1.2	1.0	4.2
Sample Standard Deviation			4.2	3.4	14.9	0.7	0.5	2.3
Variability			3.3	2.6	11.5	0.5	0.4	1.7
Coefficient of Variability			62.1	63.1	63.1	55.6	55.7	55.7
Sample Minimum			-0.1	-0.1	-0.4	0.0	0.0	0.0
Sample Maximum			25.0	20.7	90.5	4.0	2.9	12.6
Degrees of Freedom			445.0	445.0	445.0	445.0	445.0	445.0
"t" Distribution for 95% Confidence Level			1.960	1.960	1.960	1.960	1.960	1.960
"t" Distribution for 99% Confidence Level			2.580	2.580	2.580	2.580	2.580	2.580
95% Confidence								
Calculation of the upper bound of the range expected if next reading is taken:								
95% Confidence Limit for Sample				6.7			1.0	
95% Confidence Interval for Sample, Upper Bound				12.1			2.0	
Calculation of the upper bound of the range expected to contain the mean value of the parent population (infinite)								
95% Confidence Limit for Mean					1.4			0.2
95% Confidence Interval for Mean, Upper Bound					25.0			4.4
99% Confidence								
Calculation of the upper bound of the range expected if next reading is taken:								
99% Confidence Limit for Sample				8.8			1.4	
99% Confidence Interval for Sample, Upper Bound				14.2			2.3	
Calculation of the upper bound of the range expected to contain the mean value of the parent population (infinite)								
99% Confidence Limit for Mean					1.8			0.3
99% Confidence Interval for Mean, Upper Bound					25.5			4.5

Table 4. Comparison of Statistical Analysis Results to RACT Permit Limits
Koppers Industries, Inc., Monessen Coke Plant.

	NOx Emissions				VOC Emissions			
	RACT Permit Limits		Statistical Analysis Results Requested Permit Limits		RACT Permit Limits		Statistical Analysis Results Requested Permit Limits	
Emission Source	lb/hr	TPY	lb/hr[1]	TPY[2]	lb/hr	TPY	lb/hr[1]	TPY[2]
Battery 1B Combustion Stack	60.7	286.0	159.1	453.5	0.3	1.0	84.5	138.9
Battery 2 Combustion Stack	55.4	246.0	90.1	260.5	0.5	1.9	28.0	53.7
PECS	7.8	4.8	14.2	25.5	1.1	0.6	2.3	4.5

[1] The "lb/hr" value from the statistical analysis is the upper bound of the range expected if a next reading is taken, at a 99% confidence interval.

[2] The "TPY" value from the statistical analysis is the upper bound of the range expected to contain the mean value of the infinite parent population. For future actual inventories, annual emissions will be calculated using an average emission factor from all of the previous tests.