

RA
428.3
.U55
R47
no.73-23
1973



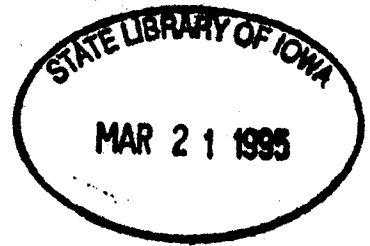
A REPORT FROM

*The State Hygienic
Laboratory*

MEDICAL LABORATORIES BUILDING

THE UNIVERSITY OF IOWA

IOWA CITY, IOWA 52240



AIR QUALITY SURVEY
DUBUQUE, IOWA

December 1972

#73-27
23

STATE LIBRARY COMMISSION OF IOWA
Historical Building
DES MOINES, IOWA 50319

Submitted to the Department of Environmental Quality
and the Iowa Air Quality Control Commission by the
State Hygienic Laboratory
7 March 1973



DUBUQUE AIR QUALITY SURVEY

On 4 December 1972 the mobile air pollution control laboratory, operated by personnel of the State Hygienic Laboratory, was taken to Dubuque, Iowa for a short-term ambient air quality survey. The survey was conducted during a 12-day period from 4 December through 14 December 1972. Sites were selected to be as representative as possible of the general surrounding area and to provide maximum data on industrial emission impact to the city of Dubuque. Three sampling sites were selected for use during the survey. Mr Art Roth, City Health Administrator, cooperated with us in selecting appropriate locations and in obtaining permission for their use during the survey. Two sampling sites had been used in the previous survey conducted in November, 1971. The first collection site at 925 Kerper Boulevard is located in the industrial area very near the electrical generating plant serving the city of Dubuque. The second site at the Kirby Building is located in a commercial and industrial area in the south portion of the business district of Dubuque. A third site, residential in nature, had been selected for use but a heavy snowfall during the sampling period prevented access to that site.

Hi-volume air sampling data indicates suspended particulate levels to be in excess of the Environmental Protection Agency (EPA) 1975 standards. The geometric mean for suspended particulates during the two week survey in Dubuque was 78.7 micrograms per cubic meter which is slightly above the 75 mg/M³ standard set by EPA. However, none of the samples exceeded the 260 mg/M³ maximum 24-hour concentration as established by EPA standards.

Coefficient of haze data (COH) correlated reasonably well with data for suspended particulates. The geometric mean of 0.39 COH is very close to the 0.4 COH per thousand lineal feet, annual geometric mean used by the city of St Louis as a standard. We are using the St Louis standard since there are no federal or Iowa standards for coefficient of haze. COH values for Dubuque were considerably higher than those experienced in the previous survey and higher than what has been found in surveys in different parts of the year in other areas of the state.

Sulfur dioxide was detected occasionally during the survey, but values recorded were well below the primary and secondary standards for oxides of sulfur as established by EPA for 1975. It is anticipated that sulfur dioxide levels would have been considerably higher had wind direction during the time of the survey been blowing the effluent from the power plant and other industries toward the mobile laboratory. During the entire survey the ambient temperature was below 32°F so we assume that solid fossil fuel was being used by most industry in Dubuque for heating and electrical generating purposes. This solid fuel usage should have produced sulfur dioxide levels in the ambient air at higher values than were detected.

The maximum SO₂ concentration recorded was 0.044 parts per million (ppm) or approximate 1/3 of the 0.14 ppm maximum allowed in a 3-hour period by EPA standards. Wind rose data indicates that the air mass movement was away from the sampling site and directly up the river channel, making site relocation to optimize SO₂ pick up virtually impossible.

Carbon monoxide levels were higher in the commercial-industrial location at the Kirby Building than at the industrial site. This is the expected phenomena which occurs due to the heavier traffic concentration in the commercial area of any city. However, none of the carbon monoxide values approached the 1975 EPA standard. The highest 1-hour concentration for carbon monoxide was 25 ppm or about 60% of EPA 1-hour standard of 35 ppm CO. The maximum 8-hour concentration was 6.4 ppm or approximately 75% of the 9 ppm EPA standard. One reason for the low CO values obtained is that air mass movement through Dubuque was fairly constant and of sufficient velocity to cause dispersion and diffusion so that major concentrations could not accumulate.

Ozone levels showed the usual cyclical fluctuation from a minimum of 1 part per billion (ppb) to a maximum of 28 ppb, expressed as 1-hour averages during the day. The 1-hour average of 28 ppb is approximately 35% of the EPA 1975 standard of 80 ppb for photochemical oxidants.

In conclusion, this survey showed that air quality in Dubuque meets the EPA 1975 primary standards except for suspended particulate materials with respect to the parameters measured during this observation segment.

Surveys at other times of the year and under different meteorological conditions would undoubtedly produce slightly different results, with sulfur dioxide and ozone probably being higher than those demonstrated in this survey.

Because of the short-term nature of this study, data should not be considered as a comprehensive treatment of overall air quality in Dubuque, but rather as an evaluation of those specific parameters under conditions existing during the survey.

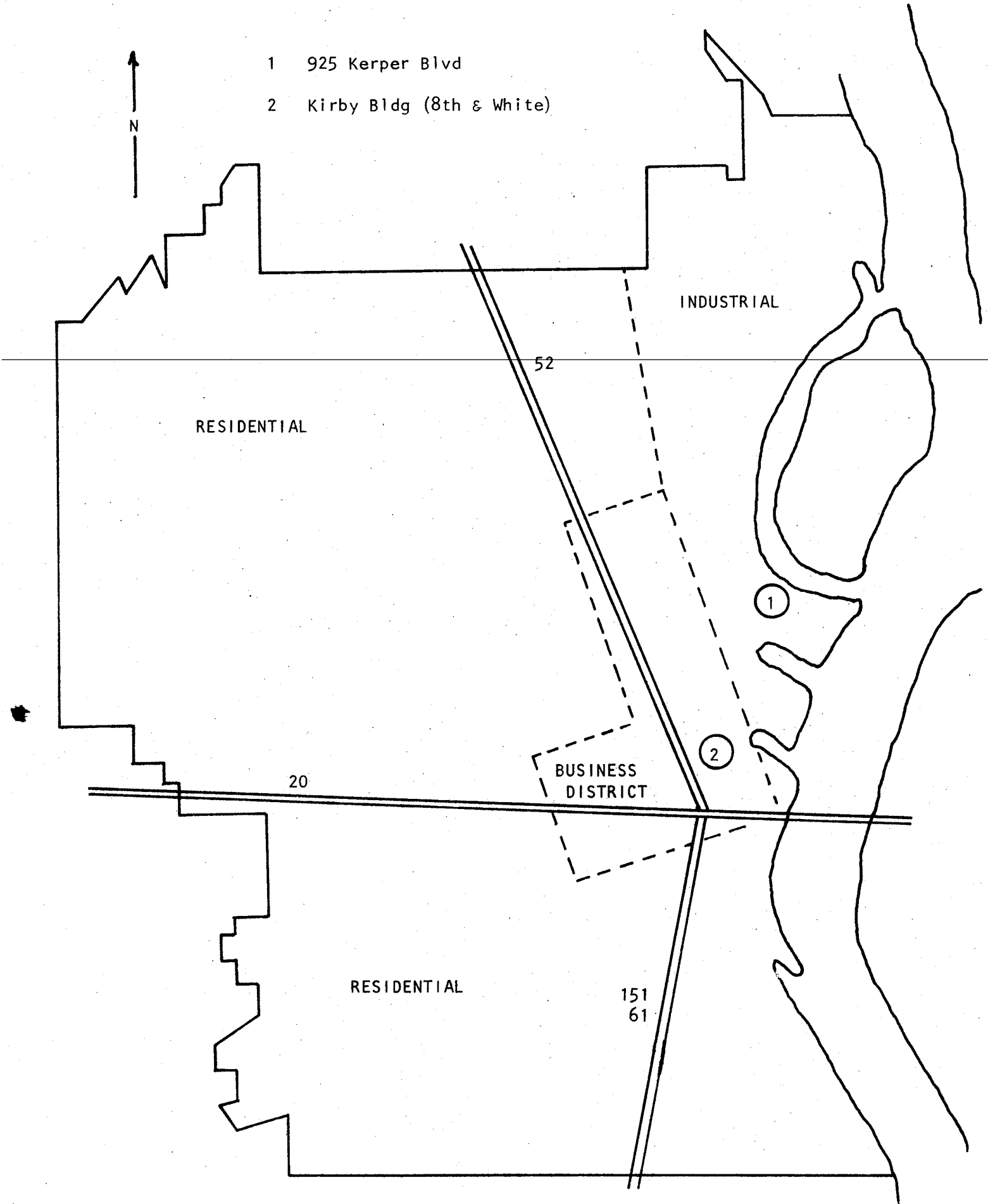


I A Schwabbauer
Senior Chemist



R L Morris, PhD
Associate Director & Principal Chemist

- 1 925 Kerper Blvd
- 2 Kirby Bldg (8th & White)



RESIDENTIAL

INDUSTRIAL

52

1

2

BUSINESS
DISTRICT

20

RESIDENTIAL

151
61

NATIONAL PRIMARY AND SECONDARY
AMBIENT AIR QUALITY STANDARDS

Primary Standard - level of air quality necessary, with an adequate margin of safety, to protect the public health.

Secondary Standard - levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.

Particulate Matter (primary)

- a. $75 \mu\text{g}/\text{m}^3$ - annual geometric mean
 - b. $260 \mu\text{g}/\text{m}^3$ - maximum 24-hour concentration not to be exceeded more than once per year.
-

Particulate Matter (secondary)

- a. $60 \mu\text{g}/\text{m}^3$ - annual geometric mean
- b. $150 \mu\text{g}/\text{m}^3$ - maximum 24-hour concentration not to be exceeded more than once per year.

Sulfur Oxides (primary)

- a. $80 \mu\text{g}/\text{m}^3$ (0.03 ppm) - annual arithmetic mean
- b. $365 \mu\text{g}/\text{m}^3$ (0.14 ppm) - maximum 24-hour concentration not to be exceeded more than once per year.

Sulfur Oxides (secondary)

- a. $60 \mu\text{g}/\text{m}^3$ (0.02 ppm) - annual arithmetic mean
- b. $260 \mu\text{g}/\text{m}^3$ (0.1 ppm) - maximum 24-hour concentration not to be exceeded more than once per year.
- c. $1,300 \mu\text{g}/\text{m}^3$ (0.5 ppm) - maximum 3-hour concentration not to be exceeded more than once per year.

Carbon Monoxide (primary and secondary)

- a. $10 \text{mg}/\text{m}^3$ (9 ppm) - maximum 8-hour concentration not to be exceeded more than once per year.
- b. $40 \text{mg}/\text{m}^3$ (35 ppm) - maximum 1-hour concentration not to be exceeded more than once per year.

Ozone Standard (primary and secondary)

160 $\mu\text{g}/\text{m}^3$ (0.080 ppm or 80 ppb) - maximum 1-hour concentration not to be exceeded more than once per year.

Non-methane Hydrocarbons (primary and secondary)

0.24 ppm - maximum 3-hour concentration (6 am to 9 am) not to be exceeded more than once per year.

Oxides of Nitrogen (primary and secondary)

0.05 ppm annual arithmetic mean

Coefficient of Haze

St Louis Soiling Index - 0.4 COH/1000 lineal feet, annual geometric mean.

SUSPENDED PARTICULATES
24-Hour Samples

<u>DATE</u>	<u>LOCATION</u>	<u>SUSPENDED PARTICULATE ($\mu\text{g}/\text{m}^3$)</u>
12/4/72	Kerper Blvd	87.1
12/5/72		60.8
12/7/72	Kirby Bldg	126
12/8/72		30.1
12/11/72		108
12/12/72		55.5
12/14/72		156

AVERAGE 89.1
GEOMETRIC MEAN 78.7

Particulate Matter (primary)

- a. $75 \mu\text{g}/\text{m}^3$ - annual geometric mean
- b. $260 \mu\text{g}/\text{m}^3$ - maximum 24-hour concentration not to be exceeded more than once per year.

Particulate Matter (secondary)

- a. $60 \mu\text{g}/\text{m}^3$ - annual geometric mean
- b. $150 \mu\text{g}/\text{m}^3$ - maximum 24-hour concentration not to be exceeded more than once per year.

SULFUR DIOXIDE
DUBUQUE

(Values in Parts per Million)

AVERAGE
MAXIMUM CONCENTRATION

<u>DATE</u>	<u>LOCATION</u>	<u>TIME</u>	<u>PEAK</u>	<u>3 Hours</u>	<u>24 Hours</u>
12/5/72	Kerper Blvd	1501-1800	0.02	.003	-----
		-2100	0.02	.003	-----
12/7/72	Kirby Bldg	0600-0900	0.02	N11	-----
		-1200	0.02	N11	-----
12/8/72	Kirby Bldg	0301-0600	0.02	N11	-----
		-0900	N11	N11	-----
		-1200	N11	N11	-----
		-1500	N11	N11	-----
		-1800	0.03	.014	0.0017
		-2100	N11	.014	0.0017
		-2400	N11	.014	0.0017
12/11/72	Kirby Bldg	0001-0300	0.14	.044	0.0072
		-0600	0.02	.003	0.0076
		-0900	0.03	.003	0.0080
		-1200		N11	0.0080
		-1500		N11	0.0080
		-1800		N11	0.0059
		-2100		N11	0.0059
		-2400		N11	0.0059
12/12/72	Kirby Bldg	0001-0300	N11	N11	0.0007
		-0600	0.08	.028	0.0039
		-0900	0.11	.028	0.0070
		-1200	0.04	.008	0.0080
		-1500		N11	0.0080
		-1800		N11	0.0080
		-2100		N11	0.0080
		-2400		N11	0.0080
12/13/72	Kirby Bldg	0001-0300		N11	0.0080
		-0600		N11	0.0080
		-0900		N11	0.0045
		-1200		N11	0.0010
		-1500		N11	-----
		-1800		N11	N11
		-2100		N11	N11
		-2400		N11	N11

<u>DATE</u>	<u>LOCATION</u>	<u>TIME</u>	<u>PEAK</u>	<u>AVERAGE</u>	
				<u>3 Hours</u>	<u>24 Hours</u>
12/14/72	Kirby Bldg	0001-0300	.09	.015	0.0018
		-0600	.02	Nil	0.0018
		-0900		Nil	0.0018
		-1200		Nil	0.0018
		-1500		Nil	0.0018
		-1800		Nil	0.0018
		-2100		Nil	0.0018
		-2400		Nil	0.0018
					Nil

Sulfur Oxides (primary)

- a. $80 \mu\text{g}/\text{m}^3$ (0.03 ppm) - annual arithmetic mean
- b. $365 \mu\text{g}/\text{m}^3$ (0.14) - maximum 24-hour concentration not to be exceeded more than once per year.

Sulfur Oxides (secondary)

- a. $60 \mu\text{g}/\text{m}^3$ - annual arithmetic mean
- b. $260 \mu\text{g}/\text{m}^3$ (0.1 ppm) - maximum 24-hour concentration not to be exceeded more than once per year.
- c. $1,300 \mu\text{g}/\text{m}^3$ (0.5 ppm) - maximum 3-hour concentration not to be exceeded more than once per year.

CARBON MONOXIDE
DUBUQUE

(Values in Parts per Million)

<u>DATE</u>	<u>LOCATION</u>	<u>TIME</u>	<u>PEAK</u>	<u>AVERAGE</u>			
				<u>1 Hour</u>	<u>8 Hour</u>		
12/4/72	925 Kerper Blvd	1601-1700	6	2	---		
		-1800	4	2	---		
		-1900	5	2	---		
		-2000	6	2	---		
		-2100	5	2	---		
		-2200	7	3	---		
		-2300	3	2	---		
		-2400	4	2	2.1		
		12/5/72	925 Kerper Blvd	0001-0100	3	2	2.1
				-0200	3	2	2.1
-0300	4			2	2.1		
-0400	10			3	2.2		
-0500	4			1	2.1		
-0600	3			1	2.1		
-0700	2			1	2.0		
-0800	3			1	1.9		
-0900	6			2	1.9		
-1000	2			1	1.8		
12/6/72	925 Kerper Blvd	0001-0100	1	1	1.5		
		-0200	1	1	1.5		
		-0300	1	1	1.2		
		-0400	1	1	1.1		
		-0500	1	1	1.0		
		-0600	1	1	1.0		
		-0700	1	1	1.0		
		-0800	1	1	1.0		
		-0900	1	1	1.0		
		-1000	1	1	1.0		

AVERAGE
MAXIMUM CONCENTRATION

<u>DATE</u>	<u>LOCATION</u>	<u>TIME</u>	<u>PEAK</u>	<u>1 Hour</u>	<u>8 Hours</u>		
12/6/72	925 Kerper Blvd	1000-1100	1	1	1.0		
		-1200	9	1	1.0		
		-1300	6	2	1.1		
		-1400	7	2	1.2		
		-1500	10	3	1.4		
		-1600	7	3	1.8		
		-1700	3	1	1.8		
		-1800	1	1	1.8		
		-1900	12	4	2.1		
		-2000	11	2	2.2		
		-2100	9	2	2.2		
		-2200	11	3	2.4		
		-2300	10	3	2.4		
		-2400	12	3	2.4		
12/7/72	925 Kerper Blvd	0001-0100	13	4	2.8		
		-0200	19	5	3.2		
		-0300	17	4	3.2		
		-0400	9	3	3.4		
		-0500	8	2	3.4		
		-0600	1	1	3.1		
		-0700	7	2	3.0		
		-0800	6	2	2.9		
		-0900	17	2	2.6		
		-1000	14	2	2.2		
		-1100	4	1	1.9		
		-1200	6	2	1.8		
		-1300	19	4	2.0		
		12/7/72	Kirby Bldg	1530-1600	16	3	---
-1700	10			3	---		
-1800	72			4	---		
-1900	10			2	---		
-2000	17			2	---		
-2100	15			2	---		
-2200	17			3	---		
-2300	9			2	2.6		
-2400	15			3	2.6		
12/8/72	Kirby Bldg			0001-0100	13	2	2.5
				-0200	24	2	2.2
				-0300	25	2	2.2
				-0400	2	1	2.1
				-0500	80	20	4.4
		-0600	65	10	5.2		
		-0700	7	2	5.2		
		-0800	9	2	5.1		
		-0900	19	2	5.1		
		-1000	7	2	5.1		
		-1100	18	4	5.4		
-1200	20	4	5.8				

AVERAGE
MAXIMUM CONCENTRATION

<u>DATE</u>	<u>LOCATION</u>	<u>TIME</u>	<u>PEAK</u>	<u>1 Hour</u>	<u>8 Hour</u>		
12/8/72	Kirby Bldg	1200-1300	33	2	3.5		
		-1400	10	2	2.5		
		-1500	3	1	2.4		
		-1600	36	2	2.4		
		-1700	10	3	2.5		
		-1800	5	2	2.5		
		-1900	2	1	2.1		
		-2000	2	1	1.8		
		-2100	3	1	1.6		
		-2200	6	2	1.6		
		-2300	18	1	1.6		
		-2400	10	1	1.5		
		12/9/72	Kirby Bldg	0001-0100	25	1	1.2
				-0200	1	1	1.1
-0300	5			1	1.1		
-0400	1			1	1.1		
-0500	1			1	1.1		
-0600	44			2	1.1		
-0700	2			1	1.1		
-0800	34			2	1.2		
-0900	8			2	1.4		
-1000	2			1	1.4		
-1100	2			1	1.4		
-1200	9			1	1.4		
-1300	6			2	1.5		
-1400	2			1	1.4		
-1500	4			1	1.4		
-1600	4			1	1.2		
-1700	3			1	1.1		
-1800	2			1	1.1		
-1900	3			1	1.1		
-2000	2			1	1.1		
-2100	2			1	1.0		
-2200	13	1	1.0				
-2300	1	1	1.0				
-2400	64	2	1.1				
12/10/72	Kirby Bldg	0001-0100	4	1	1.1		
		-0200	1	1	1.1		
		-0300	1	1	1.1		
		-0400	5	1	1.1		
		-0500	1	1	1.1		
		-0600	1	1	1.1		
		-0700	15	2	1.2		
		-0800	20	3	1.4		
		-0900	2	1	1.4		
		-1000	1	1	1.4		
		-1100	1	1	1.4		

AVERAGE
MAXIMUM CONCENTRATION

<u>DATE</u>	<u>LOCATION</u>	<u>TIME</u>	<u>PEAK</u>	<u>1 Hour</u>	<u>8 Hour</u>
12/10/72	Kirby Bldg	1100-1200	1	1	1.4
		-1300	1	1	1.4
		-1400	7	2	1.5
		-1500	9	3	1.6
		-1600	11	2	1.5
		-1700	1	1	1.5
		-1800	5	2	1.6
		-1900	3	1	1.6
		-2000	1	1	1.6
		-2100	7	1	1.6
		-2200	24	3	1.8
		-2300	1	1	1.5
		-2400	2	1	1.4
		12/11/72	Kirby Bldg	0001-0100	100+
-0200	2			1	1.4
-0300	4			1	1.4
-0400	2			1	1.4
-0500	27			2	1.5
-0600	100+			3	1.5
-0700	6			2	1.6
-0800	3			2	1.8
-0900	10			3	1.9
-1000	10			2	2.0
-1100	4			2	2.1
-1200	10			2	2.2
-1300	6			2	2.2
-1400	7			2	2.1
-1500	20			3	2.2
-1600	7			3	2.4
-1700	38			4	2.5
-1800	14			3	2.6
-1900	38			3	2.8
-2000	12			2	2.8
-2100	14	2	2.8		
-2200	10	2	2.8		
-2300	7	3	2.8		
-2400	9	2	2.6		
12/12/72	Kirby Bldg	0001-0100	6	2	2.4
		-0200	7	2	2.2
		-0300	6	2	2.1
		-0400	6	2	2.1
		-0500	30	4	2.4
		-0600	17	5	2.8
		-0700	100+	8	3.4
		-0800	20	4	3.6
		-0900	87	5	4.0
		-1000	24	4	4.2

AVERAGE
MAXIMUM CONCENTRATION

<u>DATE</u>	<u>LOCATION</u>	<u>TIME</u>	<u>PEAK</u>	<u>1 Hour</u>	<u>8 Hour</u>		
12/12/72	Kirby Bldg	1000-1100	39	4	4.5		
		-1200	85	5	4.9		
		-1300	48	5	5.0		
		-1400	14	3	4.8		
		-1500	100+	5	4.4		
		-1600	75	6	4.6		
		-1700	63	8	5.1		
		-1800	41	6	5.4		
		-1900	12	3	5.2		
		-2000	9	3	5.1		
		-2100	16	2	4.5		
		-2200	40	5	4.8		
		-2300	92	3	4.5		
		-2400	36	2	4.0		
		12/13/72	Kirby Bldg	0001-0100	9	1	3.1
				-0200	20	2	2.6
				-0300	8	2	2.5
				-0400	100	4	2.6
				-0500	100	4	2.9
				-0600	100	3	2.6
				-0700	15	4	2.8
				-0800	9	3	2.9
				-0900	42	5	3.4
				-1000	11	3	3.5
-1100	39			4	3.8		
-1200	17			3	3.6		
-1300	10			3	3.5		
-1400	14			3	3.5		
-1500	6			2	3.2		
-1600	26			4	3.4		
-1700	27			5	3.4		
-1800	86			6	3.8		
-1900	59			4	3.8		
-2000	100+			7	4.2		
-2100	10			2	4.1		
-2200	15			2	4.0		
-2300	100+			7	4.6		
-2400	15			3	4.5		
12/14/72	Kirby Bldg	0001-0100	3	2	4.1		
		-0200	8	2	3.6		
		-0300	9	2	3.4		
		-0400	6	2	2.8		
		-0500	17	3	2.9		
		-0600	8	2	2.9		
		-0700	23	3	2.4		
		-0800	32	11	3.4		
		-0900	53	8	4.1		
		-1000	40	10	5.1		

AVERAGE
MAXIMUM CONCENTRATION

<u>DATE</u>	<u>LOCATION</u>	<u>TIME</u>	<u>PEAK</u>	<u>1 Hour</u>	<u>8 Hour</u>
12/14/72	Kirby Bldg	1000-1100	10	3	5.2
		-1200	15	5	5.9
		-1300	9	2	5.8
		-1400	13	3	5.9
		-1500	100+	9	6.4
		-1600	20	5	5.6
		-1700	100	10	5.9
		-1800	20	3	5.0
		-1900	100	12	6.1
		-2000	15	3	5.9
		-2100	46	5	6.2
		-2200	27	4	6.4
		-2300	11	4	5.5
		-2400	13	3	5.2
12/15/72	Kirby Bldg	0001-0100	4	2	4.5
		-0200	27	3	4.5
		-0300	5	1	3.1
		-0400	61	4	3.2
		-0500	55	4	3.1
		-0600	42	3	3.0
		-0700	10	3	2.9
		-0800	8	3	2.9
		-0900	13	6	3.4
		-1000	6	3	3.4
		-1100	48	3	3.6
		-1200	9	2	3.4

Carbon Monoxide (primary and secondary)

- a. 10 mg/m³ (9 ppm) - maximum 8-hour concentration not to be exceeded more than once per year.
- b. 40 mg/m³ (35 ppm) - maximum 1-hour concentration not to be exceeded more than once per year.

OZONE
DUBUQUE

(Values in Parts per Billion)

AVERAGE
MAXIMUM CONCENTRATION

<u>DATE</u>	<u>LOCATION</u>	<u>TIME</u>	<u>PEAK</u>	<u>1 Hour</u>		
12/4/72	925 Kerper Blvd	1301-1400	22	17		
		-1500	21	19		
		-1600	22	18		
		-1700	23	19		
		-1800	25	20		
		-1900	26	23		
		-2000	29	25		
		-2100	30	26		
		-2200	29	26		
		-2300	30	27		
		-2400	30	26		
		12/5/72	Kerper Blvd	0001-0100	31	28
				-0200	31	24
-0300	32			27		
-0400	29			22		
-0500	29			25		
-0600	27			24		
-0700	24			13		
-0800	21			11		
-0900	16			9		
-1000	15			9		
-1100	14			10		
-1200	14			9		
-1300	15			9		
-1400	15			12		
-1500	16			11		
-1600	12			8		
-1700	16			10		
-1800	13	7				
-1900	17	11				
-2000	19	14				
-2100	21	14				
-2200	24	18				
-2300	19	14				
-2400	15	9				
12/6/72	925 Kerper Blvd	0001-0100	22	17		
		-0200	28	22		
		-0300	27	25		
		-0400	28	24		
		-0500	30	24		
		-0600	26	23		

AVERAGE
MAXIMUM CONCENTRATION

<u>DATE</u>	<u>LOCATION</u>	<u>TIME</u>	<u>PEAK</u>	<u>1 Hour</u>		
12/6/72	925 Kerper Blvd	0600-0700	24	19		
		-0800	23	19		
		-0900	25	21		
		-1000	27	23		
		-1100	27	25		
		-1200	31	27		
		-1300	32	26		
		-1400	32	27		
		-1500	31	25		
		-1600	31	26		
		-1700	30	22		
		-1800	28	24		
		-1900	23	17		
		-2000	22	18		
		-2100	25	17		
		-2200	23	14		
		-2300	26	17		
		-2400	28	24		
		12/7/72	925 Kerper Blvd	0001-0100	26	21
				-0200	26	17
-0300	26			16		
-0400	24			19		
-0500	25			16		
-0600	14			8		
-0700	19			11		
-0800	15			9		
-0900	16			12		
-1000	21			16		
-1100	27			20		
-1200	26			20		
-1300	21			18		
12/7/72	Kirby Bldg			1500-1600	17	11
		-1700	11	6		
		-1800	6	4		
		-1900	6	5		
		-2000	12	8		
		-2100	12	7		
		-2200	17	9		
		-2300	18	14		
		-2400	17	14		
		12/8/72	Kirby Bldg	0001-0100	14	11
-0200	12			9		
-0300	10			7		
-0400	9			6		
-0500	7			4		
-0600	6			3		
-0700	5			3		

AVERAGE
MAXIMUM CONCENTRATION

<u>DATE</u>	<u>LOCATION</u>	<u>TIME</u>	<u>PEAK</u>	<u>1 Hour</u>
12/8/72	Kirby Bldg	0700-0800	5	2
		-0900	4	3
		-1000	4	3
		-1100	5	3
		-1200	5	3
		-1300	6	4
		-1400	6	3
		-1500	6	3
		-1600	4	2
		-1700	4	2
		-1800	4	2
		-1900	4	1
		-2000	3	2
		-2100	4	2
		-2200	5	3
		-2300	5	4
		-2400	5	4
		12/9/72	Kirby Bldg	0001-0100
-0200	4			2
-0300	4			3
-0400	5			2
-0500	4			2
-0600	5			3
-0700	5			2
-0800	5			3
-0900	7			4
-1000	12			5
-1100	11			7
-1200	9			6
-1300	12			7
-1400	10			7
-1500	10			4
-1600	6			4
-1700	9			4
-1800	6			4
-1900	6	3		
-2000	10	6		
-2100	11	8		
-2200	11	8		
-2300	14	9		
-2400	15	7		
12/10/72	Kirby Bldg	0001-0100	12	8
		-0200	15	10
		-0300	14	11
		-0400	16	13
		-0500	18	15
		-0600	17	14
-0700	17	15		

AVERAGE
MAXIMUM CONCENTRATION

<u>DATE</u>	<u>LOCATION</u>	<u>TIME</u>	<u>PEAK</u>	<u>1 Hour</u>
12/10/72	Kirby Bldg	0700-0800	18	9
		-0900	20	15
		-1000	21	17
		-1100	22	19
		-1200	21	18
		-1300	22	19
		-1400	25	21
		-1500	20	16
		-1600	20	14
		-1700	17	9
		-1800	7	4
		-1900	7	4
		-2000	6	3
		-2100	6	3
		-2200	6	2
		-2300	4	2
		-2400	3	1
12/11/72	Kirby Bldg	0001-0100	Instrument Malfunction	
		-0200	-	-
		-0300	-	-
		-0400	-	-
		-0500	-	-
		-0600	-	-
		-0700	-	-
		-0800	-	-
		-0900	7	4
		-1000	7	3
		-1100	7	5
		-1200	17	8
		-1300	18	11
		-1400	-	-
		-1500	-	-
		-1600	16	12
		-1700	20	11
-1800	16	11		
-1900	12	7		
-2000	12	9		
-2100	12	10		
-2200	17	11		
-2300	22	17		
-2400	21	11		
12/12/72	Kirby Bldg	0001-0100	24	20
		-0200	25	19
		-0300	22	14
		-0400	8	5
		-0500	5	3
		-0600	4	3
		-0700	5	3

AVERAGE
MAXIMUM CONCENTRATION

<u>DATE</u>	<u>LOCATION</u>	<u>TIME</u>	<u>PEAK</u>	<u>1 Hour</u>		
12/12/72	Kirby Bldg	0700-0800	4	3		
		-0900	7	4		
		-1000	7	5		
		-1100	10	6		
		-1200	8	3		
		-1300	6	4		
		-1400	5	3		
		-1500	4	2		
		-1600	2	1		
		-1700	4	1		
		-1800	2	1		
		-1900	3	1		
		-2000	9	4		
		-2100	11	6		
		-2200	13	7		
		-2300	14	9		
		-2400	14	8		
		12/13/72	Kirby Bldg	0001-0100	3	1
				-0200	2	1
				-0300	5	2
-0400	5			2		
-0500	6			3		
-0600	5			2		
-0700	2			1		
-0800	2			1		
-0900	5			2		
-1000	6			4		
-1100	12			7		
-1200	13			9		
-1300	15			9		
-1400	14			9		
-1500	14			8		
-1600	6			3		
-1700	4			2		
-1800	3			1		
-1900	3			2		
-2000	3			2		
-2100	2	1				
-2200	2	1				
-2300	2	1				
-2400	2	1				
12/14/72	Kirby Bldg	0001-0100	4	2		
		-0200	2	1		
		-0300	1	1		
		-0400	2	1		
		-0500	2	1		
		-0600	3	1		

AVERAGE
MAXIMUM CONCENTRATION

<u>DATE</u>	<u>LOCATION</u>	<u>TIME</u>	<u>PEAK</u>	<u>1 Hour</u>
12/14/72	Kirby Bldg	0600-0700	2	1
		-0800	2	1
		-0900	2	1
		-1000	4	2
		-1100	6	3
		-1200	7	4
		-1300	11	7
		-1400	12	7
		-1500	10	6
		-1600	10	4
		-1700	11	5
		-1800	10	5
		-1900	11	6
		-2000	9	4
		-2100	7	4
		-2200	5	3
		-2300	Instrument Malfunction	
		-2400	-	-

Ozone Standard (primary and secondary)

160 $\mu\text{g}/\text{m}^3$ (0.080 ppm or 80 ppb) - maximum 1-hour concentration not to be exceeded more than once per year.

COEFFICIENT OF HAZE
DUBUQUE

COH Values - 2 Hour Samples

<u>DATE</u>	<u>LOCATION</u>	<u>TIME</u>	<u>COH</u>
12/4/72	925 Kerper	1300-1400	1.82
		-1600	2.62
		-1800	0.16
		-2000	0.16
		-2200	0.16
		-2400	0.04
		AVG	0.83
12/5/72	925 Kerper	0001-0200	0.16
		-0400	0.04
		-0600	0.04
		-0800	0.24
		-1000	0.20
		-1200	0.04
		-1400	0.04
		-1600	0.20
		-1800	0.20
		-2000	0.16
		-2200	0.16
		-2400	0.40
		AVG	0.12
12/6/72	925 Kerper	0001-0200	0.08
		-0400	0.08
		-0600	0.16
		-0800	0.12
		-1000	0.16
		-1200	0.16
		-1400	0.12
		-1600	0.16
		-1800	0.24
		-2000	0.28
		-2200	0.65
		-2400	0.65
		AVG	0.24
12/7/72	925 Kerper	0001-0200	0.16
		-0400	0.16
		-0600	0.12
		-0800	0.20
		-1000	0.20
		-1200	0.24
		-1400	0.20
AVG	0.18		

<u>DATE</u>	<u>LOCATION</u>	<u>TIME</u>	<u>COH</u>
12/7/72	Kirby Building	1500-1600	0.32
		-1800	0.28
		-2000	0.40
		-2200	0.40
		-2400	0.48
		AVG	<u>0.38</u>
		12/8/72	Kirby Building
		-0400	0.24
		-0600	0.32
		-0800	0.48
		-1000	0.48
		-1200	0.74
		-1400	0.44
		-1600	0.53
		-1800	0.44
		-2000	0.36
		-2200	0.32
		-2400	0.36
		AVG	<u>0.41</u>
12/9/72	Kirby Building	0001-0200	0.28
		-0400	0.24
		-0600	0.36
		-0800	0.28
		-1000	0.28
		-1200	0.24
		-1400	0.40
		-1600	0.28
		-1800	0.36
		-2000	0.28
		-2200	0.24
		-2400	0.24
		AVG	<u>0.29</u>
12/11/72	Kirby Building	1300-1400	0.24
		-1600	0.36
		-1800	0.61
		-2000	0.36
		-2200	0.28
		-2400	0.16
		AVG	<u>0.34</u>
12/12/72	Kirby Building	0001-0200	0.24
		-0400	0.36
		-0600	0.48
		-0800	1.00
		-1000	0.48
		-1200	0.74
		-1400	1.36

<u>DATE</u>	<u>LOCATION</u>	<u>TIME</u>	<u>COH</u>
12/12/72	Kirby Building	1400-1600	0.57
		-1800	0.69
		-2000	0.61
		-2200	0.16
		-2400	<u>0.32</u>
		AVG	0.58
12/13/72	Kirby Building	0001-0200	0.28
		-0400	0.82
		-0600	1.00
		-0800	0.40
		-1000	0.82
		-1200	0.32
		-1400	<u>0.32</u>
		-1600	0.48
		-1800	0.65
		-2000	0.40
		-2200	0.28
		-2400	<u>0.53</u>
		AVG	0.53
12/14/72	Kirby Building	0001-0200	0.28
		-0400	0.28
		-0600	0.48
		-0800	0.44
		-1000	0.78
		-1200	0.53
		-1400	0.57
		-1600	0.44
		-1800	0.40
		-2000	0.40
		-2200	0.40
		-2400	<u>0.65</u>
		AVG	0.47
12/15/72	Kirby Building	0001-0200	0.48
		-0400	0.32
		-0600	0.44
		-0800	0.48
		-1000	0.65
		-1200	0.24
		-1400	<u>0.28</u>
AVG	0.41		

Average COH for Survey 0.39
 Geometric mean for Survey 0.35

St Louis Soiling Index - 0.4 COH/1000 lineal feet, annual geometric mean.

