COMPARISON OF INHALABLE PARTICULATE AND TOTAL SUSPENDED PARTICULATE

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James R. Thompson, Governor
Michael B. Witte, Director

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COMPARISON OF INHALABLE PARTICULATE AND TOTAL SUSPENDED PARTICULATE

by

Robert Z. Muggli [1)]
Principal Investigator

and

Mark E. Pulenik
John A. Brown
Ralph J. Hinch
Carol Rogers

Project No. 90.029

James R. Thompson, Governor
State of Illinois

Michael B. Witte, Director
Department of Energy and
Natural Resources

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NOTE

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Illinois Department of Energy and Natural Resources
Division of Policy and Planning
325 West Adams Street
Springfield, Illinois 62706
(217) 785-2800

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ABSTRACT

An optical and electron optical examination of filters from seven sources showed that the major difference between inhalable and total suspended particulate is the loss of the large mineral, metal and metal oxide particles. As particulate loading of the atmosphere increases, the ratio of fines (<about 2 μm) in the sample also generally increases.

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SUMMARY

A short study by scanning electron microscopy showed that the small particles on the glass fibers of a Hi-vol filter are strongly attracted to the fibers. The examination also indicated that the ratio of small particles in the atmosphere generally increases as the dust loading of the atmosphere increases. As has been shown previously, this total loading typically increases as the sites become more industrial. The makekup of inhalable and total suspended particulate samples are generally quite similar. The major differences are those which result from the loss of the larger mineral, metal and metal oxide particles. Thus total suspended particulate data are still useful and will, in a general way, correlate with data collected on a sampler with a size selective inlet.

COMPARISON OF INHALABLE PARTICULATE AND TOTAL SUSPENDED PARTICULATE

INTRODUCTION

In accord with the 1977 Clean Air Act Amendments, the USEPA is establishing a nation-wide inhalable particulate standard to assess the air quality levels of particles less than 15 micrometers in size. As it appeared that an inhalable standard would be proposed and promulgated within the next two years, the Illinois EPA desired to assess the effect that such a standard would have on Illinois. To support this evaluation the Illinois EPA requested an assessment of the composition, concentration and size range of both total suspended particulate and inhalable particulate. By assessing these particulates the Illinois EPA will be better prepared to intelligently comment on any proposed USEPA inhalable particulate standard and also to be better prepared to assess its impact on Illinois.

Inhalable particulate (IP) monitors were located near total suspended particulate (TSP) monitors at seven sites in Illinois. (One each in East Moline, Peoria, Joliet, Springfield, Rockford; two in Granite City). Some of the filter pairs from these monitors were to be examined with optical and electron microscopy and low temperature ashing to produce data for comparison of the relationship of IP to TSP.

BACKGROUND

The 1977 Clean Air Act Amendments required that ambient pollutant standards be revised in 1980. It was determined that TSP measurements included particles that are inhalable (less than 15 micrometers) and not inhalable (greater than 15 micrometers). To assess those particulates that are a possible health hazard a network of Inhalable Particulate monitoring stations were established. An overview of operations of the Inhalable Particulate network prepared on June 10th 1979 by Charles Rodes of the Environmental Monitoring and Support Laboratory, Research Triangle Park, NC is shown in Figure 1.

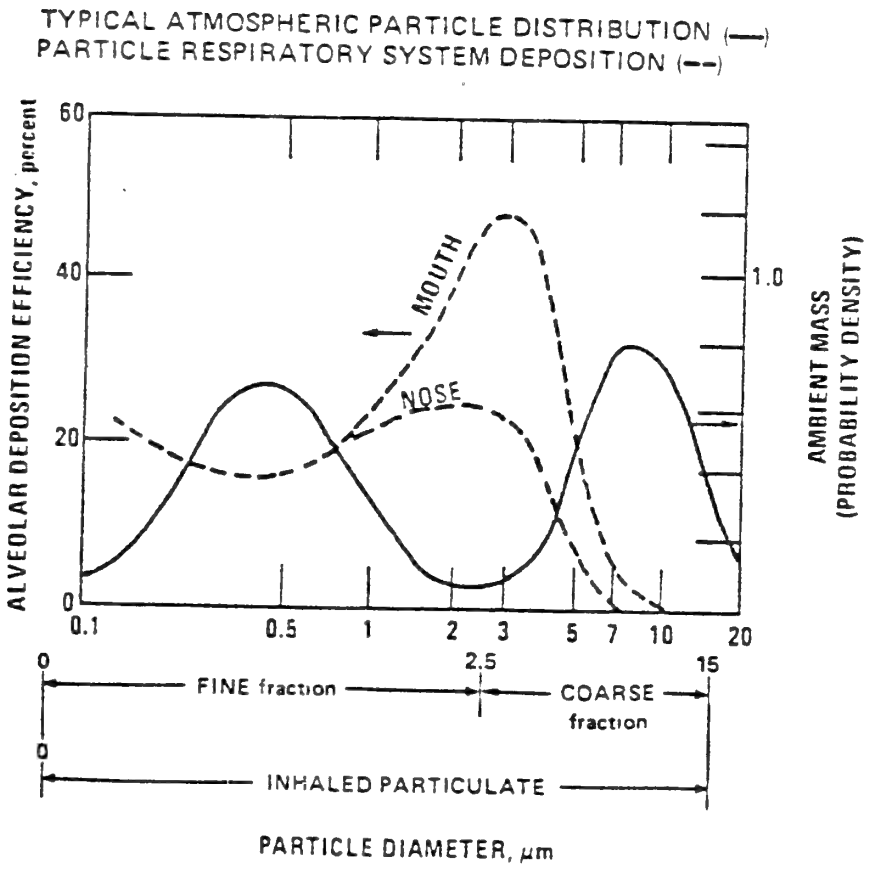


Figure 1

This figure shows that two size fractions are typically present in TSP, a course fraction of about 30 to 2.5 μm with a maxima at about 8 to 10 μm and a fine fraction from 2.5 to 0.1 micrometers with a maxima of about 0.5 μm. The figure also notes that the typical alveolar depositable fraction is generally that portion with particle diameters of less than about 5 to 10 micrometers.

A figure on page A66 of a report of the 146 Air Quality Technical Committee in the American Industrial Hygiene Journal (Vol. 42, May 1981) shows approximately the same data for the alveolar fraction and in addition notes that a tracheobronchial fraction of about 15 or 20 to 2 micrometers also exists.

It was with this data in mind that the 15 μm limit for inhalable particulate was established.

Sample Sources

Samples from seven sources were analyzed. These represented industrial, commercial and residential areas.

Two sites were described as being mainly residential. Both were near some commercial as well as agricultural areas. These were the Springfield and Joliet collection sites.

The other sites are more industrially oriented. The Rockford site is surrounded by a residential area and has many industrial sites nearby (less than one mile). The East Moline site is somewhat simiar, but appears to have more commercial and less industrial sources nearby.

The Peoria site is listed as commercial and residential, but it is near (a few miles) to many rather large industrial sources. The two Granite City sites are mainly industrial with the Fire Station site being under some commercial influence.

Both of the Granite City sites are listed as industrial with the fire station being more influenced by the commercial and residential areas near the site. The Dallas residence in Granite City is noted as industrial although it too does have some element of residential influence. All sites are near moderately traveled roads except for the Peoria site which is near two heavily traveled streets.

All collectors were placed on low buildings with typically minor or no wind obstructions near the collection sites. The filter samples were collected in 1981.

ANALYTICAL PROCEDURES

Polarized Light Microscopy

Polarized light microscopy was employed to identify the types of particles on the filters received for this study. Only a brief description will be presented here as the techniques have been fully explained in The Particle Atlas published by Ann Arbor Science Publishers.

The optical microscope is unique in its ability to allow an individual to identify specific types of chemical entities as to their particular sources for example; diatoms, beach sand, fiberglass, broken glass and crushed quartz. All are silica yet their different sources are apparent. Another example is that of combustion sources. Particles from oil fired boilers, high efficiency coal fired boilers, incinerators, and coal fired boilers all have different properties and thus can be distinguished from one another.

The filters were examined at low power with a stereomicroscope to ascertain that the distribution of the collected sample was uniform. Several samples were then removed from the filter at random, composited and examined with the polarized light microscope. The optical properties such as color, texture, shape, refractive index, birefringence, transparency, crystal class, habit, pleochroism, cleavage and extinction typically yield a unique set of properties for each specific type of particle. Each particle was examined for type and its size was noted.

The size determinations were made by comparing the Martin's diameter of each particle to the circles or rectangles on a Porton graticule. Martin's diameter is the longest horizontal cord through a particle as it randomly lies in the field of view. A Porton graticule is an eyepiece scale containing a series of circles and rectangles increasing in size by the $\sqrt{2}$. This scale was calibrated with a stage micrometer.

When all of the particles in a specific area of the microscopical preparation were identified, another area was chosen and examined in a similar fashion. This continued until 500 to 1000 particles had been identified and sized. The data were then mathematically computed to yield the data sheets attached in the Appendix.

Low Temperature Ashing

Sections of each filter were removed for analysis. A 5.1 x 3.7 cm section was cut for analysis, dessicated for 12 hours and then weighed. They were ashed for at least three hours in Plasmod LTA and then re-weighed. Each sample represented 1/22 of the entire filter area. Weight losses were reproducable to $\pm$0.1 mg on three blanks cut from three different unused filters.

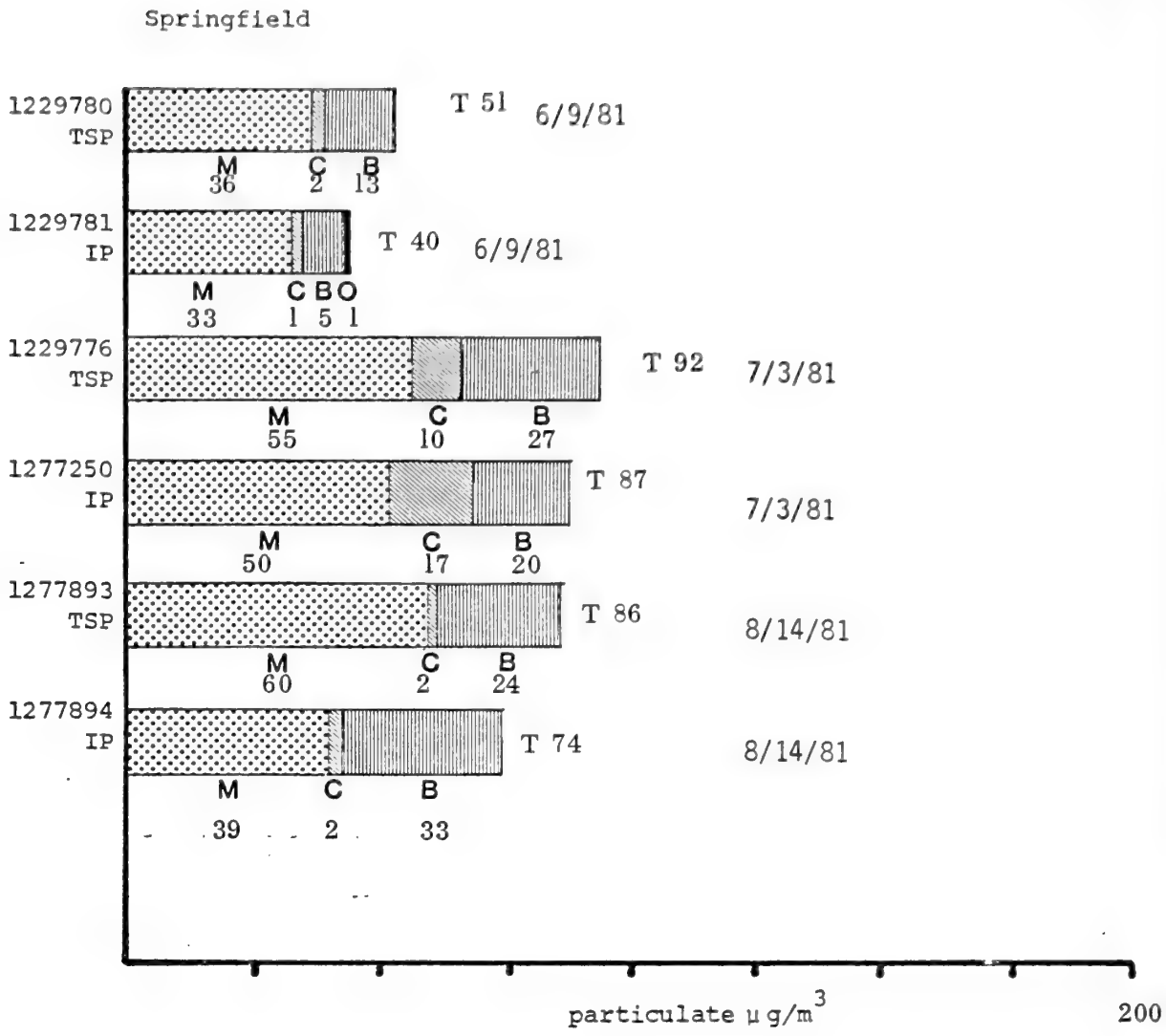
Scanning Electron Micrographs

Small samples were cut from each filter and mounted on aluminum stubs with double-sided tape. The edges of the samples were painted with conductive paint and the samples were coated with gold. The coated specimens were examined with a scanning electron microscope at a variety of magnifications and representative portions were photographed at 1200 and 60000X magnifications. The prints are presented in the Appendix.

A small study of the effectiveness of removal of particulate from Hi-vol filters by solvents and ultrasonification was carried out. Small pieces of Hi-vol filter samples were cut and placed in a test tube with several milliliters of solvent. The tube was placed in an ultrasonic bath for twenty minutes. The piece of filter was retrieved and examined, as above, with a scanning electron microscope. The water layer from the sample extracted with water was filtered through a Nuclepore filter and that was also examined with a scanning electron microscope.

Sample Description

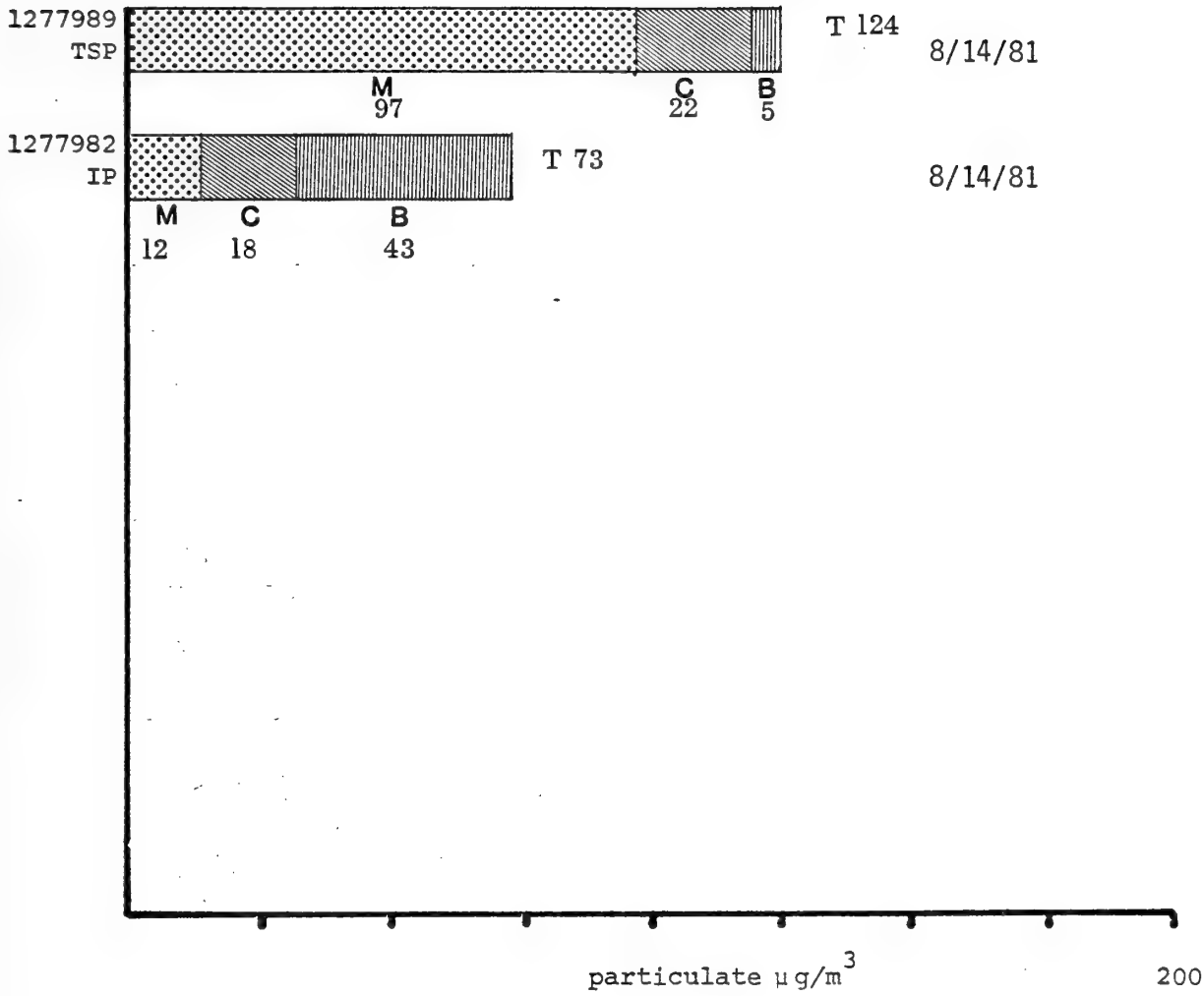
Figures 2-8 show each of the samples and their particle loadings. A graphical presentation which depicts the loading for each sample and the respective loadings per category (M=minerals, C=combustion products, B=biological and O=other, miscellaneous) is shown on the optical microscopy sheets within each Appendix.



These samples were collected during June, July and August. The collection site was rural residential. The loading of the filters is quite low and the major components of the samples were minerals and moderate amounts of biologicals. Compared to the other sites the biological contents were generally higher. There is relatively little difference in the total loading and ratio of particulate types between the total suspended particulate and inhalable particulate. The SEM analyses show that only a few particulates are present in the sub-optical range (<1 to 2 µm).

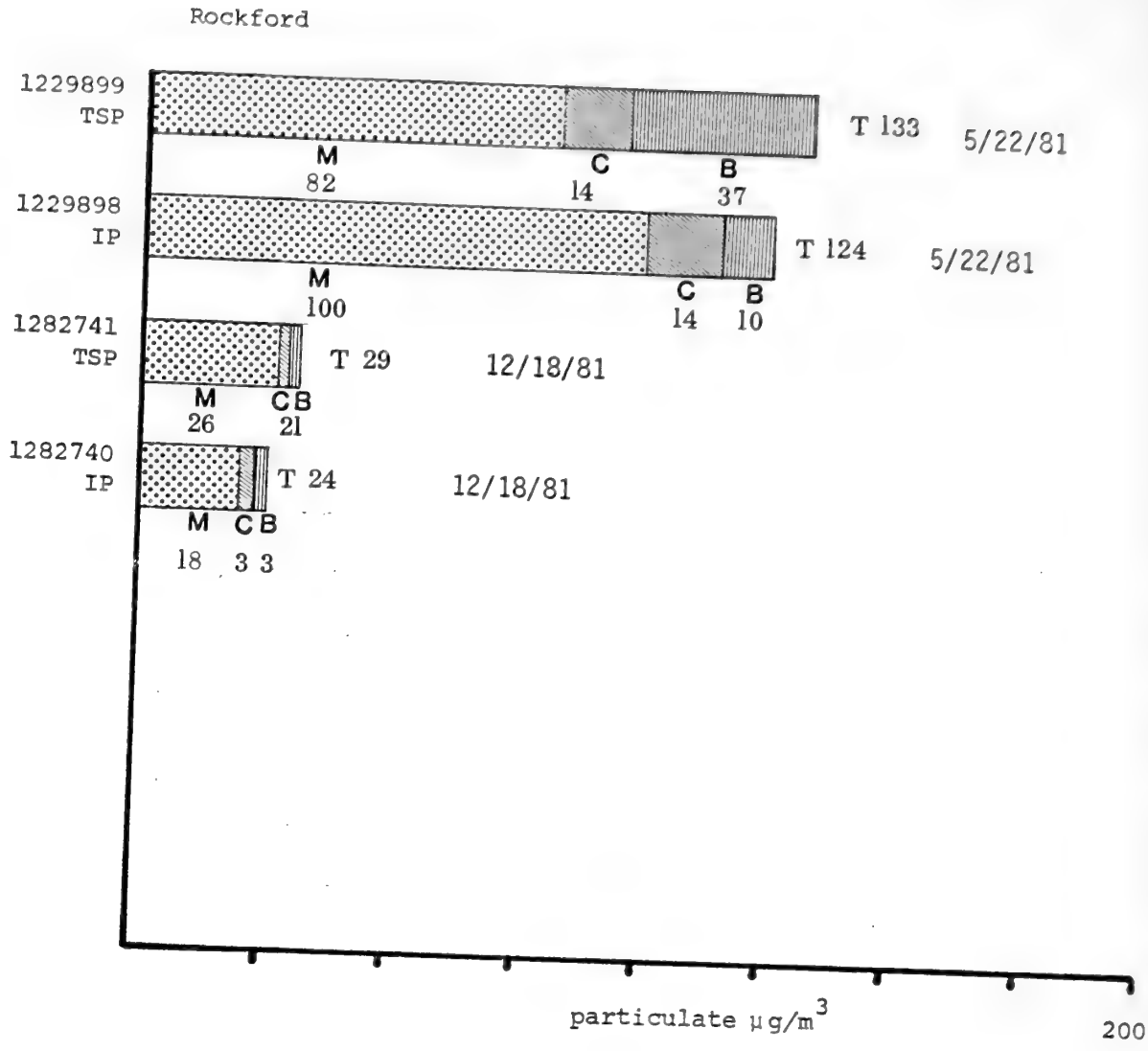
Figure 2

Joliet



The samples were collected during August. Moderate loading of the filters was experienced, consisting mainly of minerals with moderate combustion and biological components. These were typical for the semi-rural residential character of the site. The inhalable particulate was quite a bit lower than the total suspended particulate because of the large size of the mineral particles. The SEM analyses showed that moderate amounts of the particulate was sub-optical.

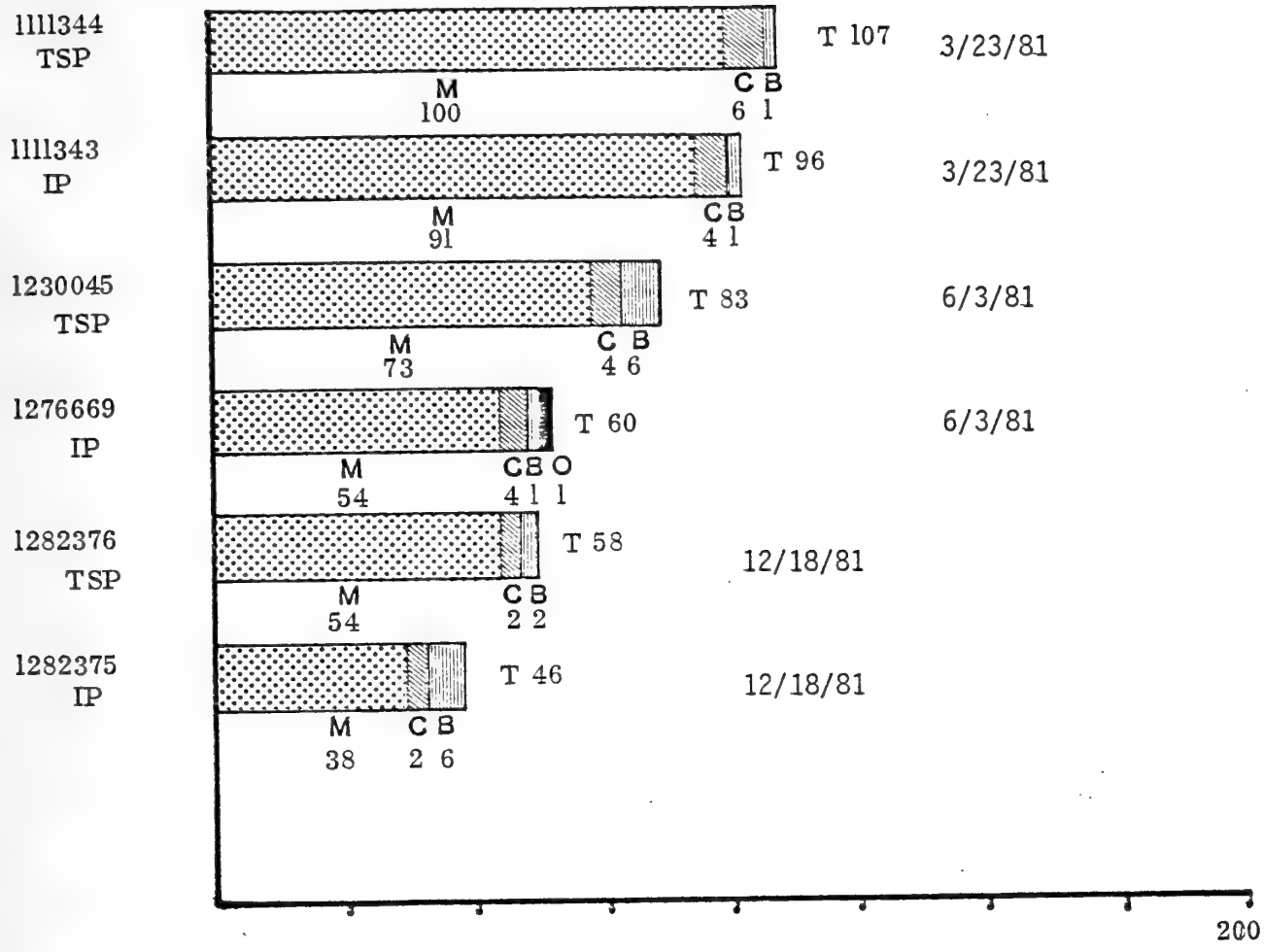
Figure 3



This site was reported as being residential with industry nearby. The May collection showed moderate loading and that from December was very low. Both collections showed relatively little difference in loading and ratio of particulate types between inhalable and total suspended particulate. Summer collection was mostly mineral with moderate amounts of combustion and biological particulates. In the winter the major particulate was mineral. There was a fairly large ratio of sub-optical particles on filter from both the summer and winter collections.

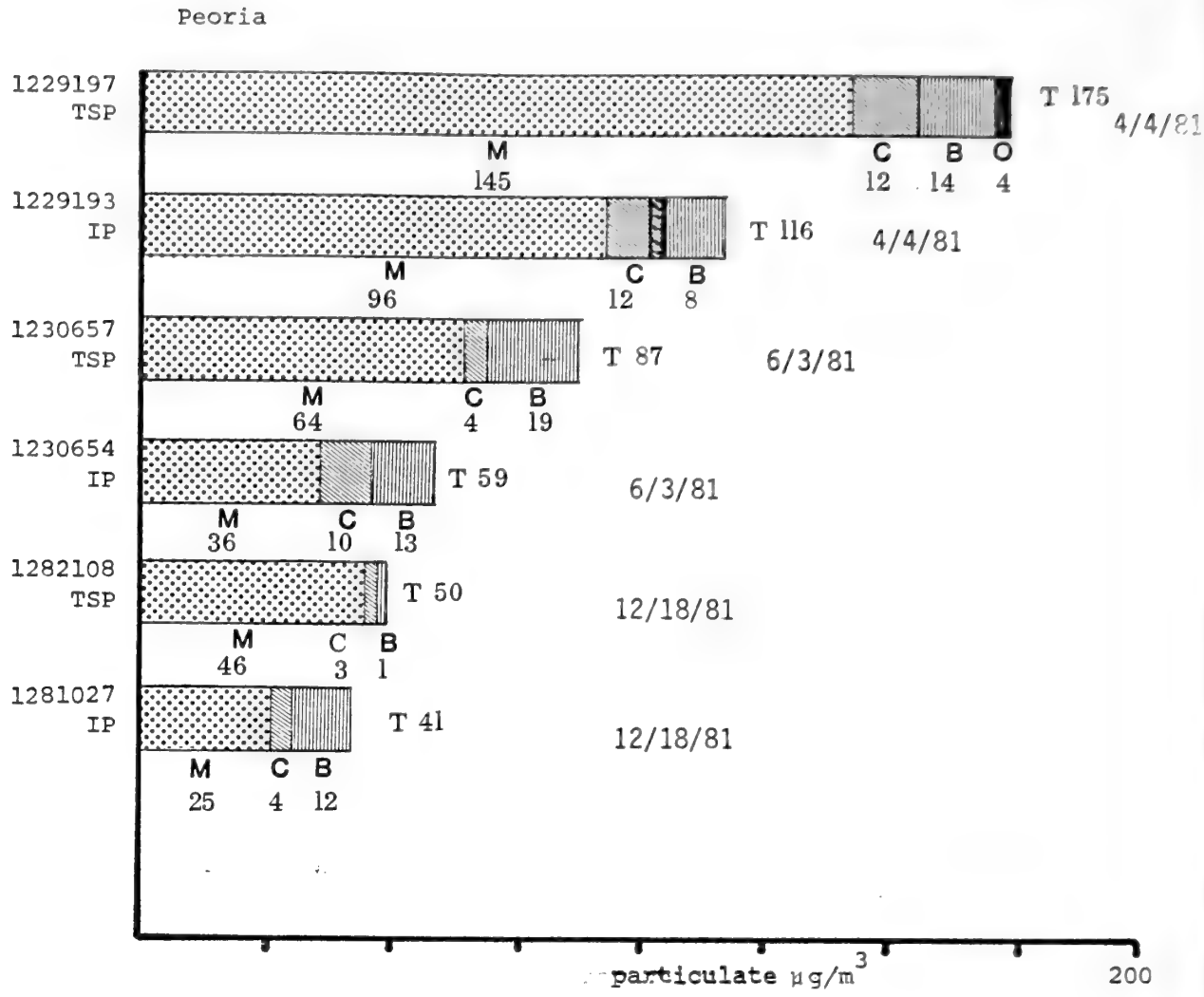
Figure 4

East Moline



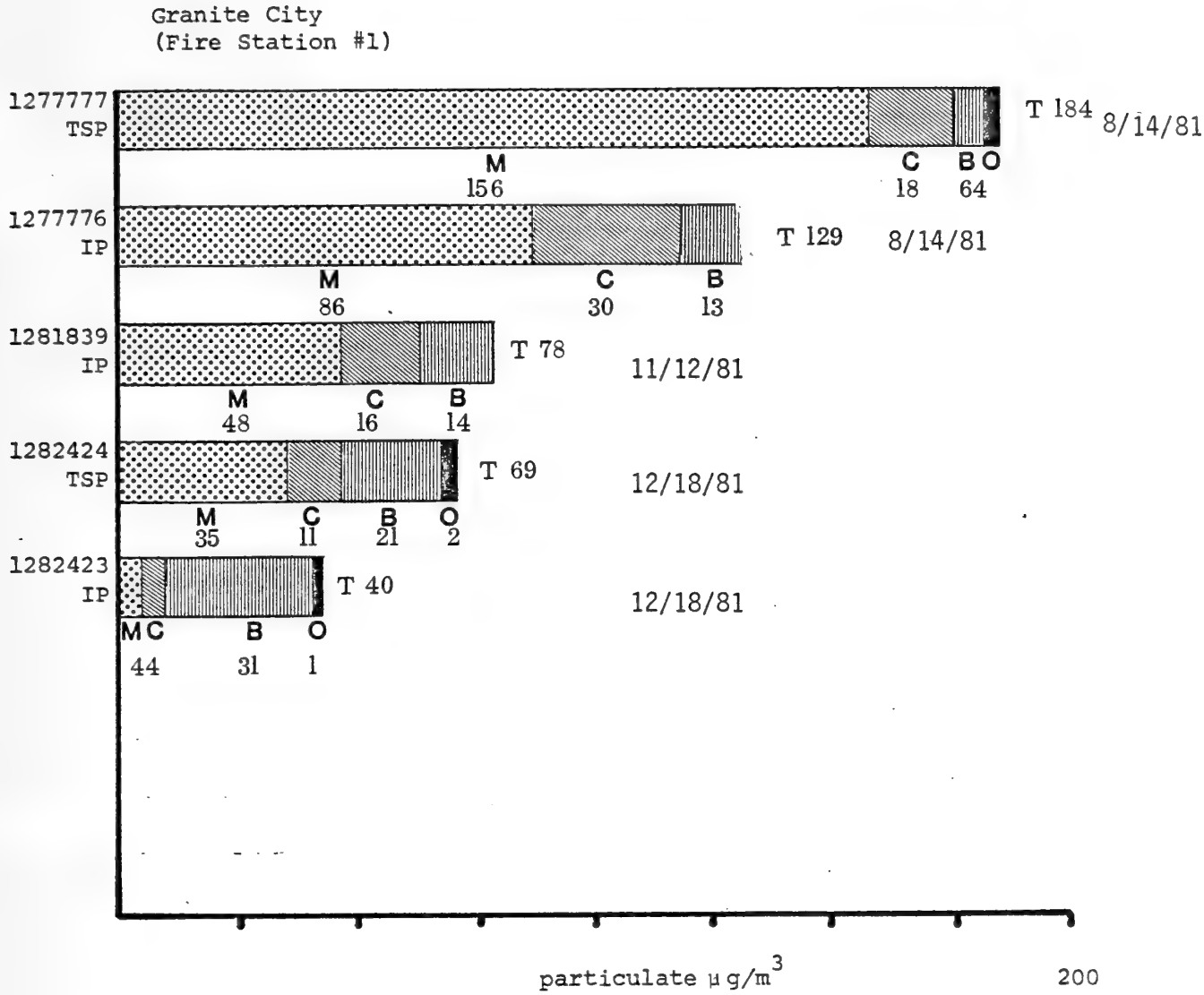
This collection site was at a combination residential and commercial location. The analyzed samples were taken during March, June and December. Moderate loading was observed during March sampling, lower loading for the June sampling and low loading for the December sampling period. In all cases most of the particulate was mineral. Only moderately lower levels of particulate were collected on the filters in the inhalable particulate samplers. Many fines and aggregates of fines were noted during the SEM examination, especially on the spring and summer sample filters.

Figure 5



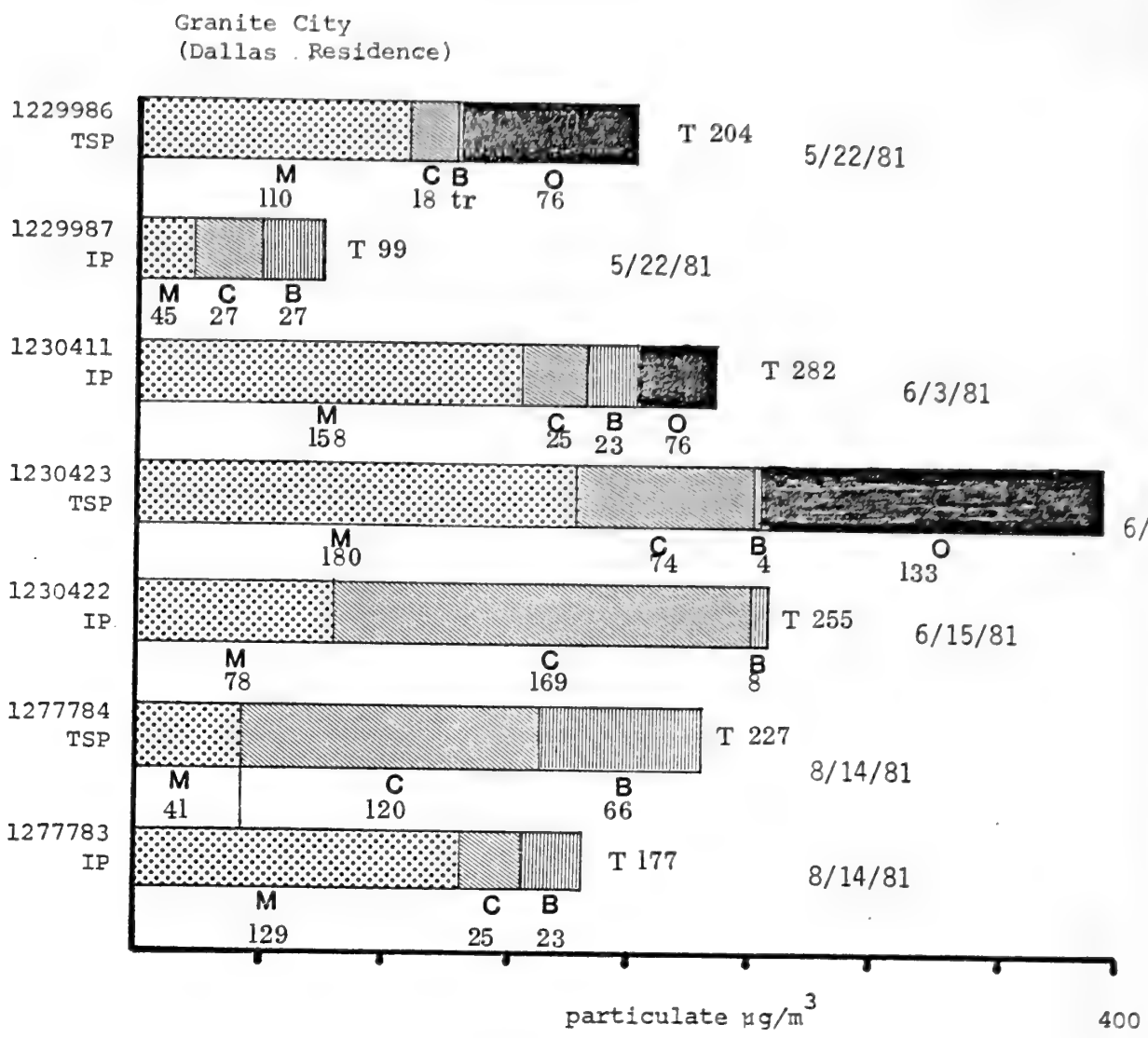
The Peoria site was noted as a residential site, but it is near commercial and industrial installations as well as heavily travelled streets. Samples were analyzed from April, June and December with moderately high, moderate and low dust loadings respectively. Again minerals were the major component. The large size of the minerals in the April and June collection created a large difference between the inhalable and total suspended particulates for those collections. Higher metal and iron oxide levels were noted than in the more residential samples. Combustion product levels are also somewhat more elevated. Moderate to moderately high levels of agglomerates of fines and fines on the sample filters were seen during the SEM examinations.

Figure 6



This site was recorded as industrial, but it is also near some commercial and industrial facilities. The studied samples were collected during August, November and December. The data are quite similar to those from Peoria, as one might expect from the similarity of the locations. That is, the August loadings are moderately high and the winter samples show moderate levels of particulate. These samples contain generally higher levels of combustion, metal and iron oxide particulates than most of the other samples. The December samples contain soft coal. The large size of the minerals makes the August inhalable particulate sample smaller than the companion total suspended particulate sample. All samples show a high proportion of fines under SEM examination.

Figure 7



This site is a residential location surrounded by industrial facilities. The samples examined were collected during May, June and August. The samples are moderately to heavily loaded. Little biological particulate is present. Minerals, especially iron oxide, combustion products and metals are the major particulate types. The major differences between the inhalable and total suspended particulate samples are the greatly reduced levels of iron oxides and metals in the inhalable fraction for the May and June samples and the greatly reduced soot levels in the August inhalable particulate sample. All samples show moderately high to high levels of sub-optical particles in the SEM examinations.

Figure 8

DISCUSSION

The samples for polarized light microscopical (PLM) analysis were removed from the filters with a small droplet of Aroclor on a tungsten needle. This has been previously shown to be a reproducible technique. The sample thus obtained has also been found to be representative of the deposit on the filter (see the Particle Atlas, op. cit).

For scanning electron microscopical analysis (SEM) a small portion of the filter is typically removed and after metallization, the particles are examined in situ. It was felt that it might be advantageous to examine the particles on a Nuclepore filter surface so that the glass fibers of the Hi-Vol filter would not be present in the field of view. Such a procedure would be valid only if reproducible and representative samples could be produced.

The SEM micrographs in Appendix H, pages H1 through H6, demonstrate the difficulty of such a procedure. Few particles less than about 10 pm were removed from the filters in any of the solvents tested, even after twenty minutes of ultrasonification. This can be seen by an examination of the micrographs of the various Hi-Vol filter samples and also the deposit on the Nuclepore filter. Additionally, so many small fragments of glass fibers are present on the Nuclepore filter surface, even if the small particles were removed and deposited, the fiber fragments would be even more distracting than fibers of the original filters.

The tenacity of the particles to the fibers in the presence of the solvent and ultrasonification is quite strong. If the "chemical glue" were either organic liquids or inorganic salts such as sulfates, the ultrasonification procedure would be expected to remove the particles. The forces that bind the particles must therefore be more fundamental, e.g., electrostatic attraction.

The examination of the filters by PLM and SEM showed that minerals and biological particulates are most common at the rural and residential sites. As the sites become more commercial and industrial the level of combustion products, iron oxides and metal particulates increase. In general, when large particles of minerals and metals are present, the inhalable particulate levels are lower than the total suspended particulate levels. These two types of particulates most often represent the differences between the two types of fractions.

The biological particulate fraction not only increased in the inhalable particulate because of the loss of minerals and metals, but because the low density of the biologicals allows oversize particles of this type to be collected rather than rejected by the size selective inlet to the sample collector.

The correlation of the low temperature ashing data with the mass of microscopically determined biological fraction is poor. There is only a general correspondence between the two values and at times the percent loss by low temperature ashing is considerably lower or higher than the weight percent of that particular fraction. This may partially be caused by the presence of non-particulate deposits.

Particulate levels increase as the collection sites become more industrial. As the suspended solids increase the ratio of sub-optical particulate also increases in both the inhalable and total suspended fractions.

Solids levels are lowest in the winter and highest in the summer. Often the inhalable and total suspended fractions do not differ greatly either in quantity or ratio of particulate types.

Thus, although it is better to record data that relates more directly to the fraction that is physiologically trapped, the data derived by the previous sampling of total suspended solids are still of value because of the general similarities of the two types of fractions.

A. Site Identification

1. City: Springfield

2. Site Name and Address: IEPA Building, 2200 Churchill Road

3. County: Sangamon Township: Springfield

4. USGS Topographical Map Name and Scale: Springfield West, IL, 1:24,000

5. Site Elevation (Feet): 580

B. Site Classification/Representativeness

1. Dominating Influence on Site: Residential, Undeveloped

C. Source Impact

1. Stationary Sources that may Influence Site:

Name of Source	Location	Direction From Site	Distance From Site	Pollutant	Emissions (tons/yr)
None					

2. Mobile Sources that may Influence the Site:

Names of Roadways:		Churchill	Jefferson
Type:		Arterial Street or Highway	Local Street or Road
Distance of Roadway from Site	(ft)	80	500
Composition of Roadway		Asphalt	Asphalt
Number of Traffic Lanes		2	4
Average Daily Traffic		2000	9900
Average Vehicle Speed (mph)		30	45
One or Two Way Traffic		Two	Two
Number of Parking Lanes		One	None
Are Parking Lanes Used For Traffic Part of Day?		No	N/A
Is Dust Visibility Retained?		No	Yes
Does Roadway Have Curb		Yes	No

3. Area Sources that may Influence the Site:

Type of Source	Direction From Site	Distance From From Site	Pollutant
Agricultural	SW	0.8 mile	TSP
Construction (local)	SSW	100-300 feet	TSP

D. Topograhy/Obstructions

1. General Characteristics Over a 2 Mile Radius From the Site: Smooth

2. Topographic Features that Influence the Site: (types - hills, valleys, depressions, bodies of water, ridges, cliffs)

Type	Size	Direction From Site	Distance From Site
Ravine	50 ft. depth	SSW	350 ft to center

3. Obstructions to Wind Flow
(types - buildings, trees ridges, cliffs)

Type	Size	Direction From Site	Distance From Site
None			

4. Comments

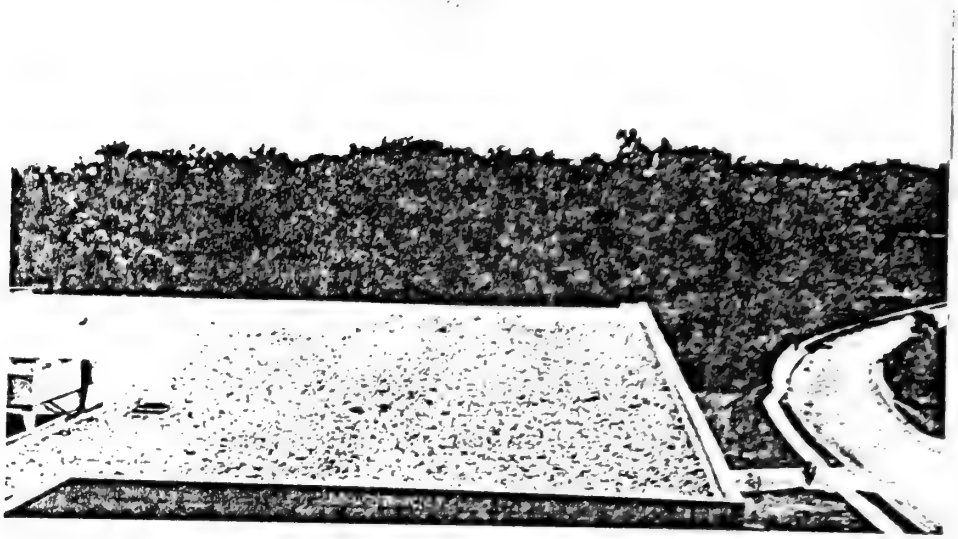
IEPA building is located partly down the ravine note above. The top of the building on which the hi vol is located is probably only 25 feet above terrain to the north.

E. Distance to the nearest National Weather Service (NWS) Site.

Here are the distances and directions to the nearest NWS observing site from the inhalable particulate monitor in Springfield. Distances are in statute miles; directions are degrees from true north.

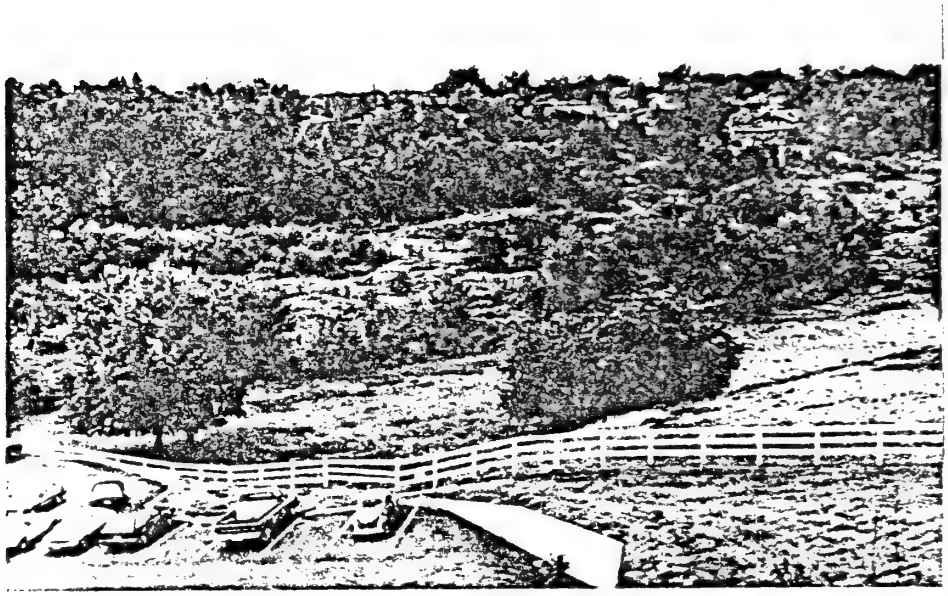
Site Address	Nearest NWS Site	Directions & Distance to NWS
IEPA Bldg. 2200 Churchill Road	Capital Airport/Springfield (SPI)	020° at 3.2 mi. (NNW)

Springfield-IEPA - S



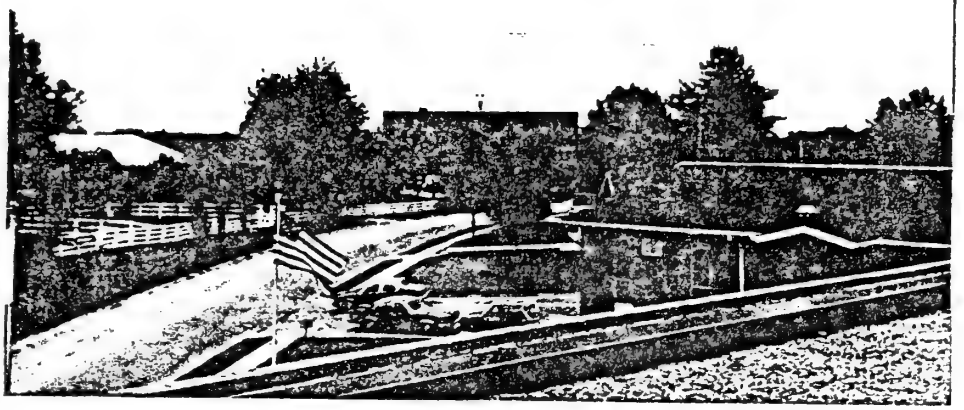
Springfield IEPA - South

Springfield-IEPA - W



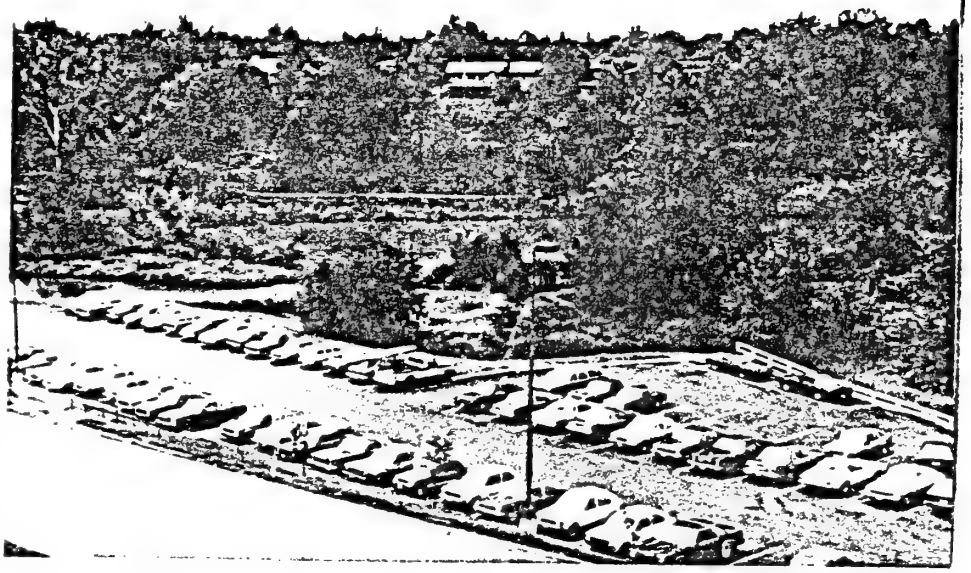
Springfield IEPA - West

Springfield-IEPA - N



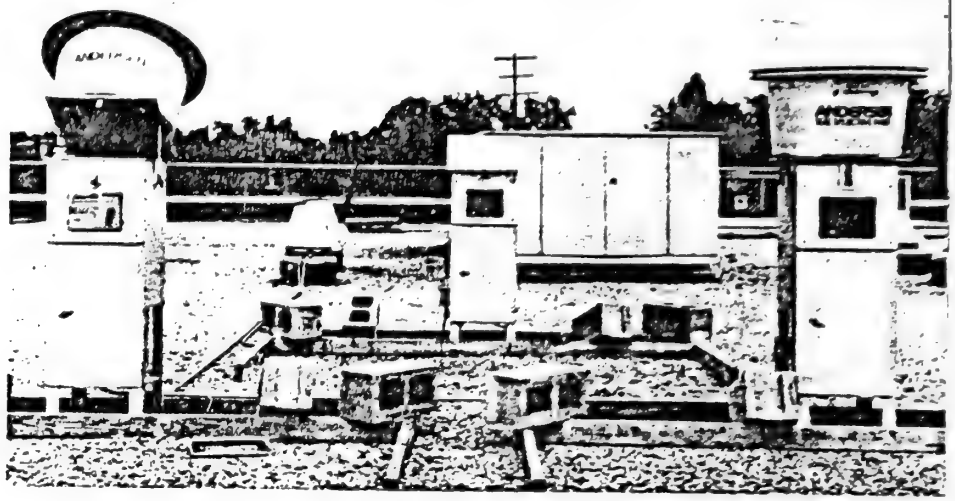
Springfield IEPA - North

Springfield-IEPA - SW



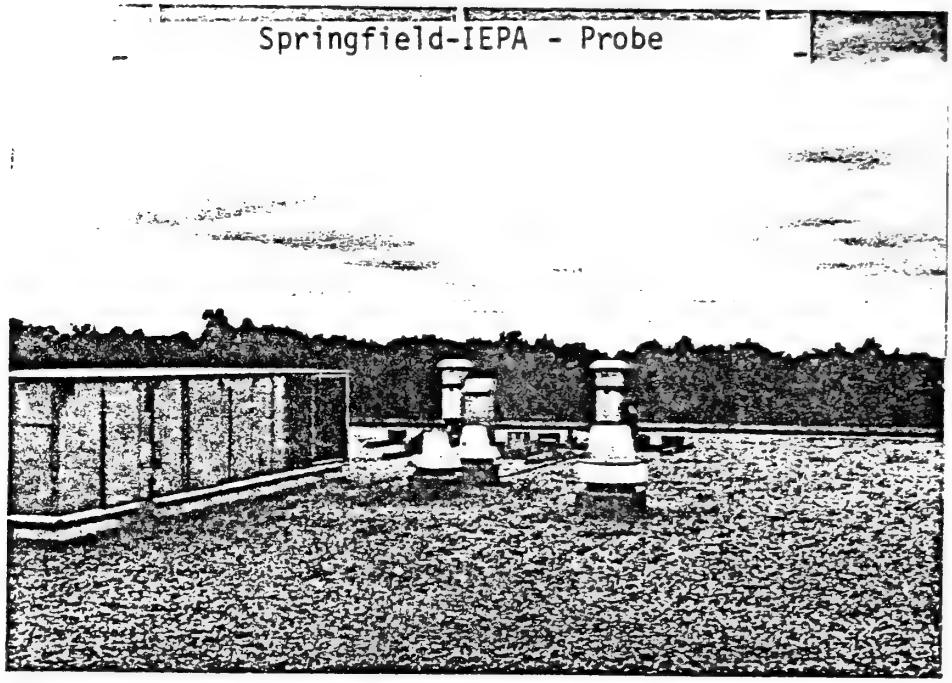
Springfield IEPA - South West

Springfield-IEPA - Probe



Springfield IEPA - Roof

Springfield-IEPA - Probe



Springfield IEPA - Roof

OPTICAL MICROSCOPE ANALYSIS

ILTER NUMBER : 1229780
NETWORK :
SITE : SPRINGFIELD/IEPAHQ
OLLECTION DATE : 06/09/81
OBJECTIVE MAG. : 25

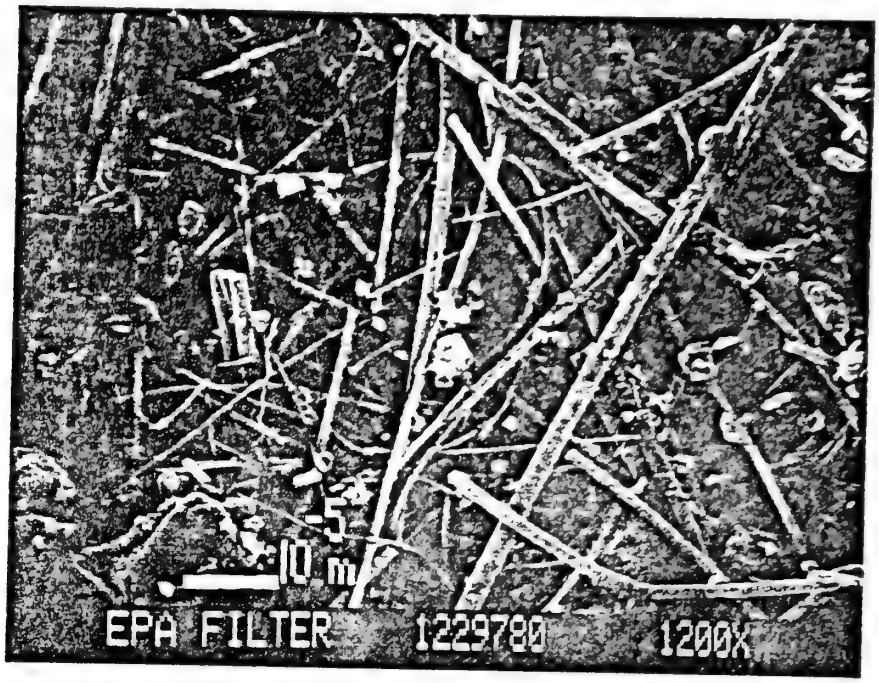
COMPONENT	AVERAGE PART. SIZE	RANGE	WEIGHT PERCENT	Number Percent
MINERALS				
QUARTZ/FELDSPARS	17.3	5.1-40.7	44	19
LIMESTONE	12.6	1.8-40.7	16	62
IRON OXIDES	14.2	2.5-40.7	10	2
OTHER MINERALS			0	0
PLANT OPAL	18.5	10.2-28.8	1	<1
COMBUSTION PRODUCTS				
SOOT	10.9	2.5-28.8	3	13
GLASSY FLYASH SPHERES			0	0
BIOLOGICAL				
POLLEN & SPORES	17.3	5.1-40.7	3	2
PLANT TISSUE	28.6	5.1-115.2	23	2
STARCH	9.3	3.6-20.4	<1	<1
MISCELLANEOUS				
FERROUS METAL			0	0
RUBBER			0	0

PARTICLE SIZE DISTRIBUTION

SIZE RANGE (UM)	NUMBER PERCENT	WEIGHT PERCENT
1.3 - 1.8	0	0
1.8 - 2.5	<1	<1
2.5 - 3.6	50	<1
3.6 - 5.1	7	<1
5.1 - 7.2	11	<1
7.2 - 10.2	12	3
10.2 - 14.4	8	6
14.4 - 20.4	6	11
20.4 - 28.8	4	22
28.8 - 40.7	2	35
40.7 - 57.6	0	0
57.6 - 81.5	0	0
81.5 - 115.2	<1	22
115.2 - 162.9	0	0
162.9 - 230.4	0	0
>230.4	0	0

Filter number 1229780

Total Suspended Particulate ug/m^3			51
Particulate: Minerals	36.2	Combustion	1.5
Biological	13.3	Other	-
Low temperature ashing, % loss			37.0



OPTICAL MICROSCOPE ANALYSIS

LTER NUMBER : 1229781
LLECTION DATE : 06/09/81

NETWORK :
SITE : SPRINGFIELD/IEPAHQ
OBJECTIVE MAG. : 25

COMPONENT	AVERAGE PART. SIZE	RANGE	WEIGHT PERCENT	Number Percent
MINERALS				
QUARTZ/FELDSPARS	12.3	3.6-28.8	37	22
LIMESTONE	12.4	2.5-40.7	44	56
IRON OXIDES	7.6	2.5-14.4	1	1
OTHER MINERALS			0	0
COMBUSTION PRODUCTS				
SOOT	7.9	3.6-14.4	3	13
GLASSY FLYASH SPHERES			0	0
BIOLOGICAL				
POLLEN & SPORES	13.8	5.1-28.8	5	5
PLANT TISSUE	12.8	7.2-20.4	5	2
STARCH	12.8	7.2-20.4	2	1
MISCELLANEOUS				
FERROUS METAL			0	0
RUBBER	14.9	10.2-20.4	2	1

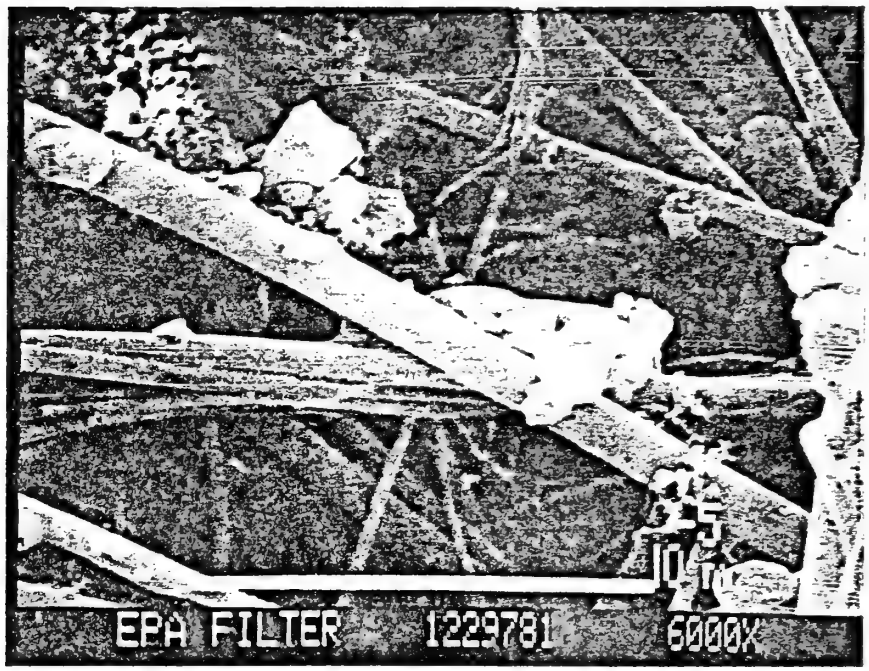
PARTICLE SIZE DISTRIBUTION

SIZE RANGE (UM)	NUMBER PERCENT	WEIGHT PERCENT
1.3 - 1.8	0	0
1.8 - 2.5	0	0
2.5 - 3.6	28	1
3.6 - 5.1	20	2
5.1 - 7.2	15	5
7.2 - 10.2	22	20
10.2 - 14.4	11	29
14.4 - 20.4	4	25
20.4 - 28.8	<1	6
28.8 - 40.7	<1	12
40.7 - 57.6	0	0
57.6 - 81.5	0	0
81.5 - 115.2	0	0
115.2 - 162.9	0	0
162.9 - 230.4	0	0
>230.4	0	0

Filter number	1229781

Inhalable Particulate	40 $\mu g/m^3$

Particulate: Minerals	32.8	Combustion	1.2
Biological	10.4	Other	0.8
Low temperature ashing, % loss			30.0



OPTICAL MICROSCOPE ANALYSIS

LTER NUMBER : 1229776 NETWORK :
SITE : SPRINGFIELD/IEPAHQ
LLECTION DATE : 07/03/81 OBJECTIVE MAG. : 25

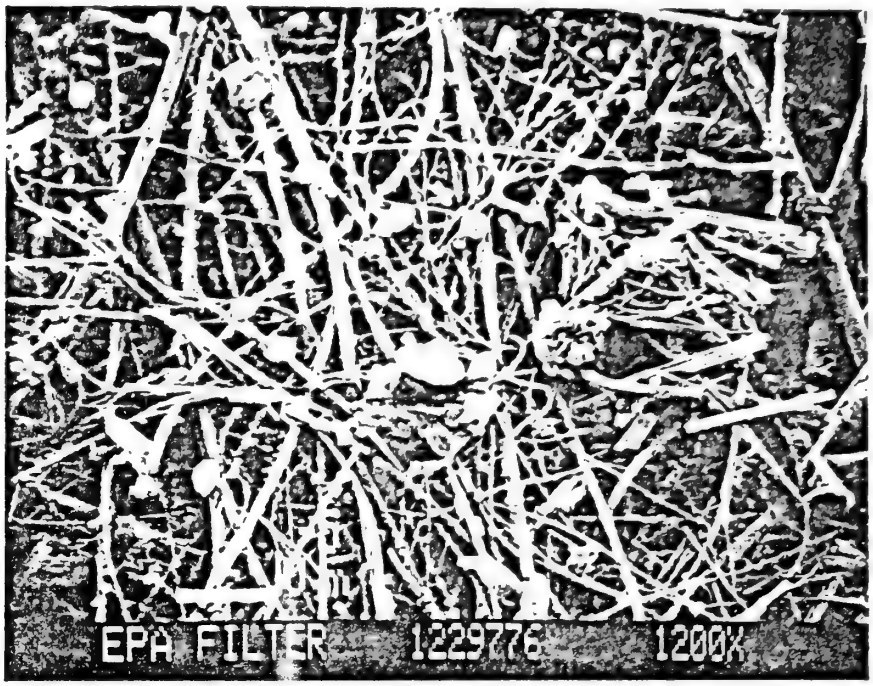
COMPONENT	AVERAGE PART. SIZE	RANGE	WEIGHT PERCENT	Number Percent
MINERALS				
QUARTZ/FELDSPARS	12.3	3.6-28.8	28	16
LIMESTONE	12.7	2.5-28.8	30	13
IRON OXIDES	6.9	2.5-14.4	2	2
OTHER MINERALS			0	0
COMBUSTION PRODUCTS				
SOOT	7.7	1.8-20.4	11	51
GLASSY FLYASH SPHERES			0	0
BIOLOGICAL				
POLLEN & SPORES	13.8	5.1-28.8	14	10
PLANT TISSUE	15.3	2.5-40.7	14	8
STARCH	14.9	10.2-20.4	1	1
MISCELLANEOUS				
FERROUS METAL			0	0
RUBBER			0	0

PARTICLE SIZE DISTRIBUTION

SIZE RANGE (UM)	NUMBER PERCENT	WEIGHT PERCENT
1.3 - 1.8	0	0
1.8 - 2.5	10	<1
2.5 - 3.6	24	<1
3.6 - 5.1	5	<1
5.1 - 7.2	12	1
7.2 - 10.2	16	6
10.2 - 14.4	17	22
14.4 - 20.4	13	40
20.4 - 28.8	3	27
28.8 - 40.7	<1	3
40.7 - 57.6	0	0
57.6 - 81.5	0	0
81.5 - 115.2	0	0
115.2 - 162.9	0	0
162.9 - 230.4	0	0
>230.4	0	0

Filter number	1229776

Total Suspended Particulate $\mu g/m^3$			92
Particulate: Minerals	55.2	Combustion	10.1
Biological	26.7	Other	-
Low temperature ashing, % loss			24.2



OPTICAL MICROSCOPE ANALYSIS

LTER NUMBER : 1277250
NETWORK :
SITE : SPRINGFIELD/IEPAHQ
LLECTION DATE : 07/03/81
OBJECTIVE MAG. : 25

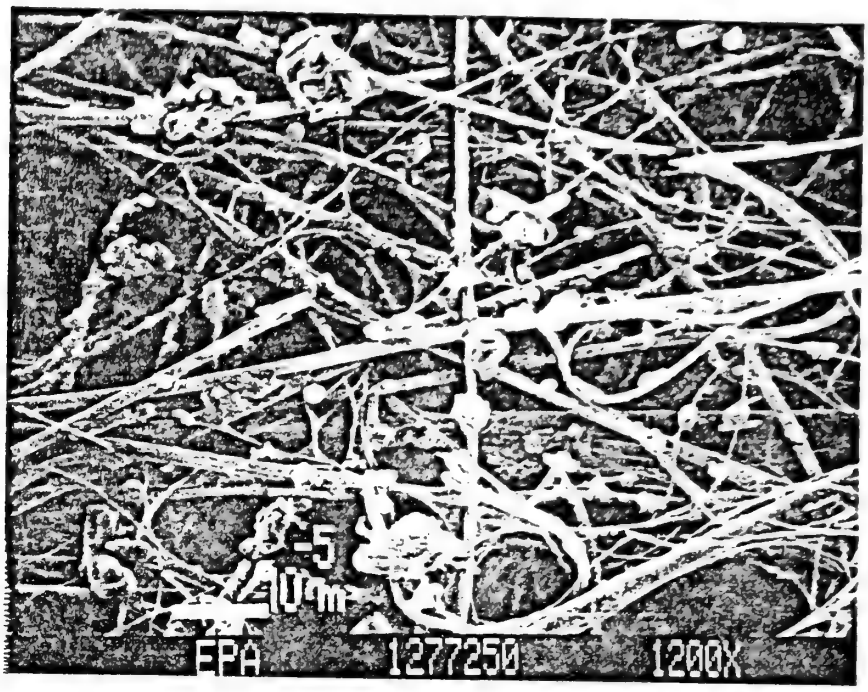
COMPONENT	AVERAGE PART. SIZE	RANGE	WEIGHT PERCENT	Number Percent
MINERALS				
QUARTZ/FELDSPARS	9.8	3.6-20.4	51	40
LIMESTONE	9.8	3.6-20.4	5	11
IRON OXIDES	7.2	1.3-14.4	2	2
OTHER MINERALS			0	0
COMBUSTION PRODUCTS				
SOOT	10.9	2.5-28.8	19	36
GLASSY FLYASH SPHERES			0	0
BIOLOGICAL				
POLLEN & SPORES	19.7	5.1-57.6	15	5
PLANT TISSUE	14.2	5.1-28.8	3	3
STARCH	14.2	5.1-28.8	5	3
MISCELLANEOUS				
FERROUS METAL			0	0
RUBBER			0	0

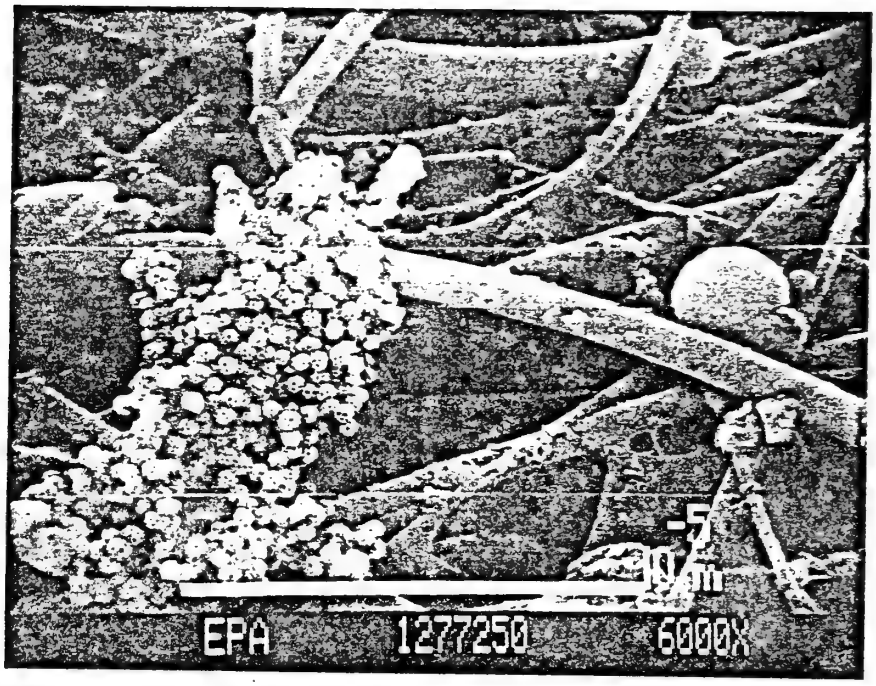
PARTICLE SIZE DISTRIBUTION

SIZE RANGE (UM)	NUMBER PERCENT	WEIGHT PERCENT
1.3 - 1.8	<1	<1
1.8 - 2.5	0	0
2.5 - 3.6	2	<1
3.6 - 5.1	17	<1
5.1 - 7.2	23	3
7.2 - 10.2	20	8
10.2 - 14.4	26	35
14.4 - 20.4	10	33
20.4 - 28.8	2	11
28.8 - 40.7	0	0
40.7 - 57.6	<1	8
57.6 - 81.5	0	0
81.5 - 115.2	0	0
115.2 - 162.9	0	0
162.9 - 230.4	0	0
>230.4	0	0

Filter number	1277250

Inhalable Particulate	$\mu g/m^3$		87
Particulate: Minerals	50.5	Combustion	16.5
Biological	20	Other	-
Low temperature ashing, % loss			20.3





OPTICAL MICROSCOPE ANALYSIS

ILTER NUMBER : 1277893 NETWORK :
SITE : SPRINGFIELD/IEPAHQ
OLLECTION DATE : 08/14/81 OBJECTIVE MAG. : 25

COMPONENT	AVERAGE PART. SIZE	RANGE	WEIGHT PERCENT	Number Percent
MINERALS				
QUARTZ/FELDSPARS	14.1	2.5-40.7	50	38
LIMESTONE	12.3	3.6-28.8	18	6
IRON OXIDES	10.8	5.1-20.4	1	1
OTHER MINERALS			0	0
COMBUSTION PRODUCTS				
SOOT	7.7	1.8-20.4	2	38
GLASSY FLYASH SPHERES			0	0
BIOLOGICAL				
POLLEN & SPORES	17.3	5.1-40.7	14	10
PLANT TISSUE	17.3	5.1-40.7	14	7
STARCH			0	0
MISCELLANEOUS				
FERROUS METAL			0	0
RUBBER			0	0

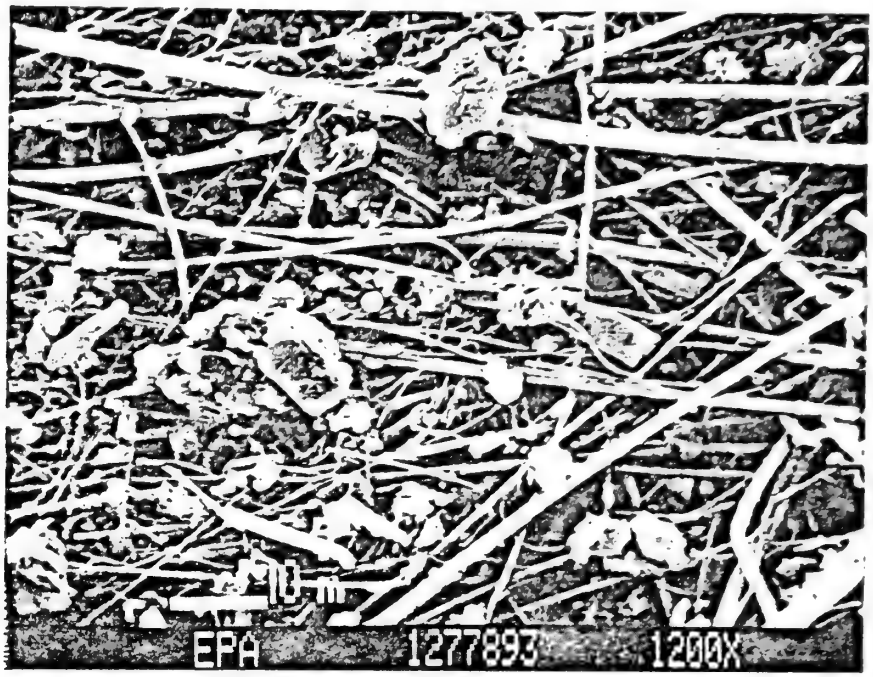
PARTICLE SIZE DISTRIBUTION

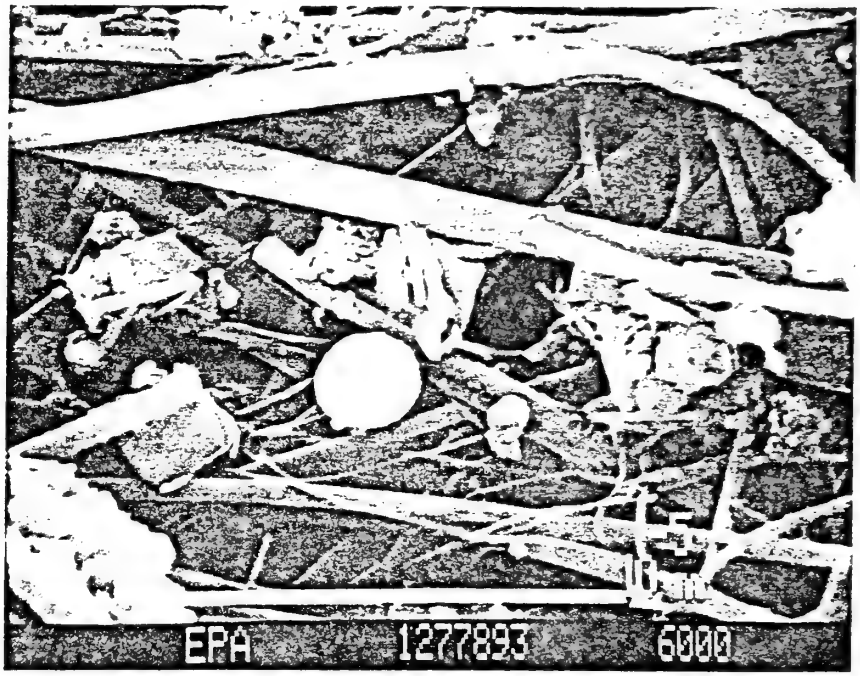
SIZE RANGE (UM)	NUMBER PERCENT	WEIGHT PERCENT
1.3 - 1.8	0	0
1.8 - 2.5	14	<1
2.5 - 3.6	26	<1
3.6 - 5.1	18	<1
5.1 - 7.2	14	2
7.2 - 10.2	8	2
10.2 - 14.4	6	4
14.4 - 20.4	7	17
20.4 - 28.8	5	33
28.8 - 40.7	2	41
40.7 - 57.6	0	0
57.6 - 81.5	0	0
81.5 - 115.2	0	0
115.2 - 162.9	0	0
162.9 - 230.4	0	0
>230.4	0	0

Filter number	1277893

Total Suspended Particulate $\mu g/m^3$	86

Particulate: Minerals	59.3	Combustion	1.7
Biological	24.1	Other	-
Low temperature ashing, % loss			29.9





OPTICAL MICROSCOPE ANALYSIS

ILTER NUMBER : 1277894
NETWORK :
SITE : SPRINGFIELD/IEPAHQ
LLECTION DATE : 08/14/81
OBJECTIVE MAG. : 25

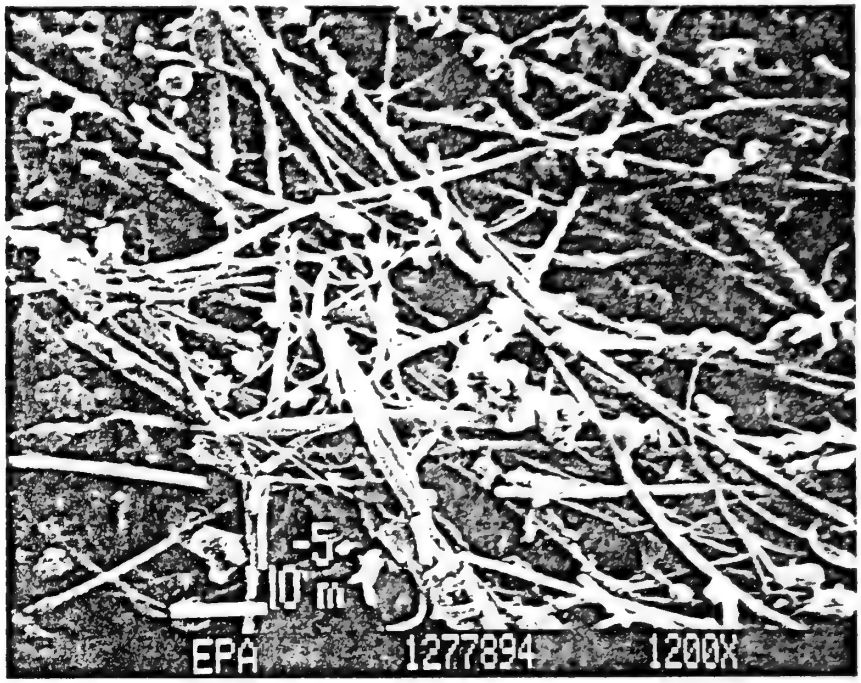
COMPONENT	AVERAGE PART. SIZE	RANGE	WEIGHT PERCENT	Number Percent
MINERALS				
QUARTZ/FELDSPARS	13.8	5.1-28.8	43	24
LIMESTONE	8.7	2.5-20.4	9	44
IRON OXIDES	6.4	3.6-10.2	<1	1
OTHER MINERALS			0	0
COMBUSTION PRODUCTS				
SOOT	9.5	2.5-20.4	3	11
GLASSY FLYASH SPHERES			0	0
BIOLOGICAL				
POLLEN & SPORES	17.3	5.1-40.7	13	7
PLANT TISSUE	17.3	5.1-40.7	31	13
STARCH	17.4	14.4-20.4	<1	<1
MISCELLANEOUS				
FERROUS METAL			0	0
RUBBER			0	0

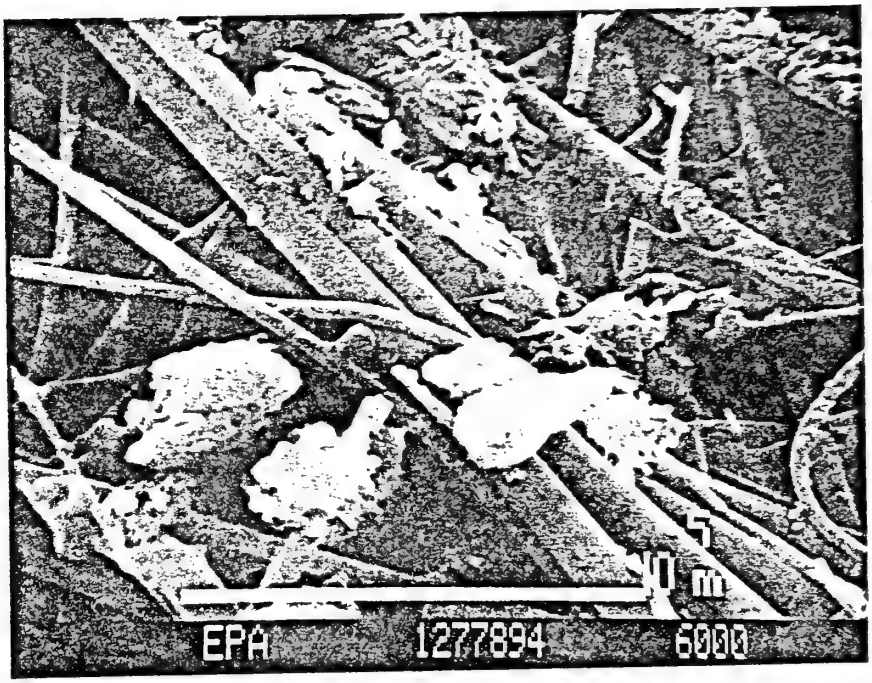
PARTICLE SIZE DISTRIBUTION

SIZE RANGE (UM)	NUMBER PERCENT	WEIGHT PERCENT
1.3 - 1.8	0	0
1.8 - 2.5	0	0
2.5 - 3.6	33	<1
3.6 - 5.1	7	<1
5.1 - 7.2	24	4
7.2 - 10.2	11	3
10.2 - 14.4	9	8
14.4 - 20.4	9	22
20.4 - 28.8	6	47
28.8 - 40.7	<1	14
40.7 - 57.6	0	0
57.6 - 81.5	0	0
81.5 - 115.2	0	0
115.2 - 162.9	0	0
162.9 - 230.4	0	0
>230.4	0	0

Filter number	1277894

Inhalable Particulate	$\mu g/m^3$		74
Particulate: Minerals	38.5	Combustion	2.2
Biological	32.6	Other	-
Low temperature ashing, % loss			24.0





A. Site Identification

1. City: Joliet

2. Site Name and Address: Pershing School, Midland and Campbell

3. County: Will Township: Joliet

4. USGS Topographical Map Name and Scale: Joliet, 1:24000

5. Site Elevation (Feet): 653

B. Site Classification/Representativeness

1. Dominating Influence on Site: Residential

C. Source Impact

1. Stationary Sources that may Influence Site:

Name of Source	Location	Direction From Site	Distance From Site	Pollutant	Emissions (Tons/Yr)
Avery Gravel Co.	I-55 & Renwick Rd., Plainfield	NNW	5.3 mi.	TSP	1106.1
Com Ed-Will Co. Stn.	135th St. Chic. Sancanal, Romeoville	NNE	7.8 mi.	TSP	76121.5
				SO_2	23772.1
				NO_x	41888.9
				CO	1169.4
Union Oil Co.	135th St. & New Ave. Lemont	NE	8.5 mi.	TSP	1322.5
				SO_2	18219.4
				NO_x	2125.7
				HC	2855.0
				CO	4372.0
Texaco, Inc.	2nd & State St. Lockport	NE	5.7 mi.	TSP	45185.7
				SO_2	5612.1
				NO_x	1931.3
				HC	4547.3
				CO	42063.2
GAF Corp.	Theodore & N. Broadway Lockport	NE	2.2 mi.	TSP	2127.0
Stauffer Chem. Co.	Ingalls Ave. @ Bdwy. Joliet	NE	2.2 mi.	TSP	2221.0
GAF -Floor Prod Div.	912 E. Washington Joliet	ESE	3.0 mi.	TSP	1115.0

Vulcan Materials Co.	Mills Rd & Rt 53 Joliet	SE	2.5 mi.	TSP	2413.4
Crown Trygg Corp.	1127 S. Chicago St. Joliet	SE	2.5 mi.	TSP	2029.4
Ceramic Powders	200 Moen Ave. Rockdale	SSE	1.6 mi.	TSP	1729.7
General Refractories	Larkin & Moen Rockdale	S	1.6 mi.	TSP	7536.7
Delta Const. Inc.	1711 Brandon Rd. Joliet	SSE	3.0 mi.	TSP	83275.5
Stepan Chem Co. -Ind Chem. Div.	RR1, Elwood	SSW	6.9 mi.	TSP HC CO	4069.4 4438.7 6303.7
Caterpillar	Box 504 Channahon Joliet	SW	2.8 mi.	TSP SO_2	3056.0 1091.0
Mobil Joliet -Refinery Corp	I-55 & Smith Bridge Rd. Joliet	SW	8.4 mi.	TSP SO_2 NO_x CO	4089 27608 3308 42093
Mobil Chem Co.	I-55 & Old Arsenal Rd. Joliet	SW	8.7 mi.	TSP	34238
Johns Manville Prod Corp.	Rt, 6 Joliet	SW	3.5 mi.	TSP	73266.4
Economic Labs, Inc.	3001 Channahon Rd. Joliet	SW	3.6 mi.	TSP	5380.7
Persico Paving Co.	Moen Ave., Joliet	SW	1.9 mi.	TSP	1575.1
Com Ed-Joliet Sta.	Patterson Rd. Joliet Twp.			TSP SO_2 NO_x CO HC	209,558 71,719 68,883 3,039 909
Olin Corp. -Blackson Works	Patterson & Laraway			TSP	98,472

2. Mobile Sources that may Influence the Site:

Names of Roadways:	Midland	Campbell
Type:	Local Street	Local Street
Distance of Roadway from Site (ft)	~250	115
Composition of Roadway	Asphalt	Asphalt
Number of Traffic Lanes	2	2
Average Daily Traffic	2000	<2000
Average Vehicle Speed (mph)	30	25
One or Two Way Traffic	Two	Two
Number of Parking Lanes	None	None
Are Parking Lanes Used For Traffic Part of Day?	No	No
Is Dust Visibiity Retained	No	No
Does Roadway Have Curb	No	No

3. Area Sources that may Influence the Site:

Type of Source	Direction from Site	Distance from Site	Pollutant
Chicago Metropolitan Area	NE	30 mi	TSP, SO_2, NO_x, CO, O_3
Cornfield	S	1/4 mi	TSP

D. Topography/Obstructions

1. General Characteristics Over a 2 Mile Radius From the Site: Smooth

2. Topographic Features that Influence the Site: (Types - hills, valleys, depressions, bodies of water, ridges, cliffs)

Type	Size	Direction From Site	Distance From Site
None			

3. Obstructions to Wind Flow (Types - buildings, trees, ridges, cliffs)

Type	Size	Direction From Site	Distance From Site
None			

4. Comments

The 2 story section of roof over the gymnasium could prove to be an influence to wind flow.

E. Distance to the nearest National Weather Service (NWS) Site.

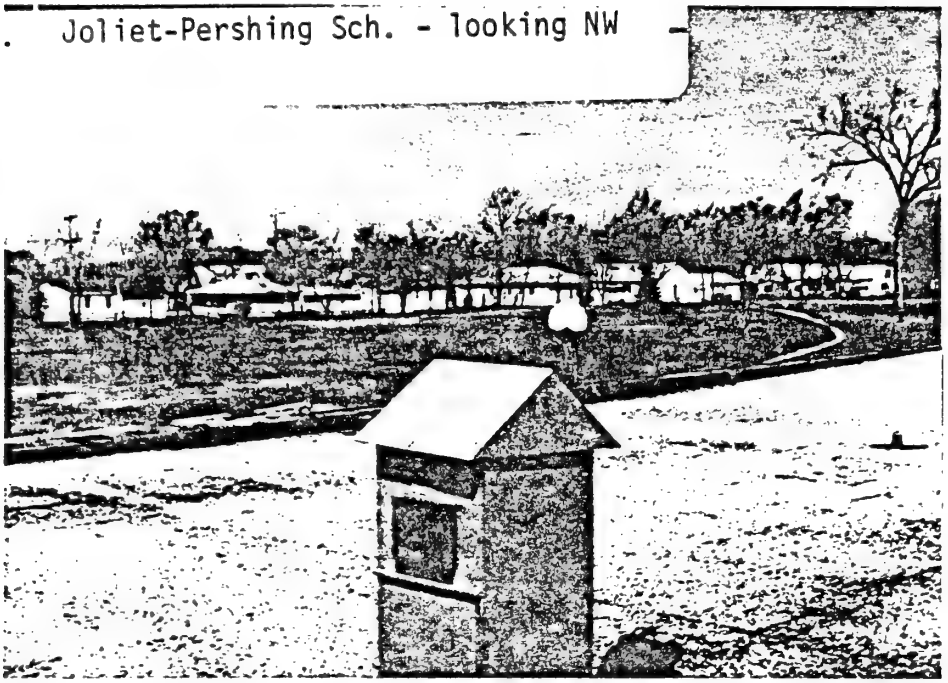
Here are the distances and directions to the nearest NWS observing site from the inhalable particulate monitor in Joliet. Distances are in statute miles; directions are degrees from true north.

Site Address	Nearest NWS Site	Directions & Distances to NWS
Pershing School Midland and Campbell	O'Hare Airport/Chicago (ORD)	020° at 33 mi (NNW)

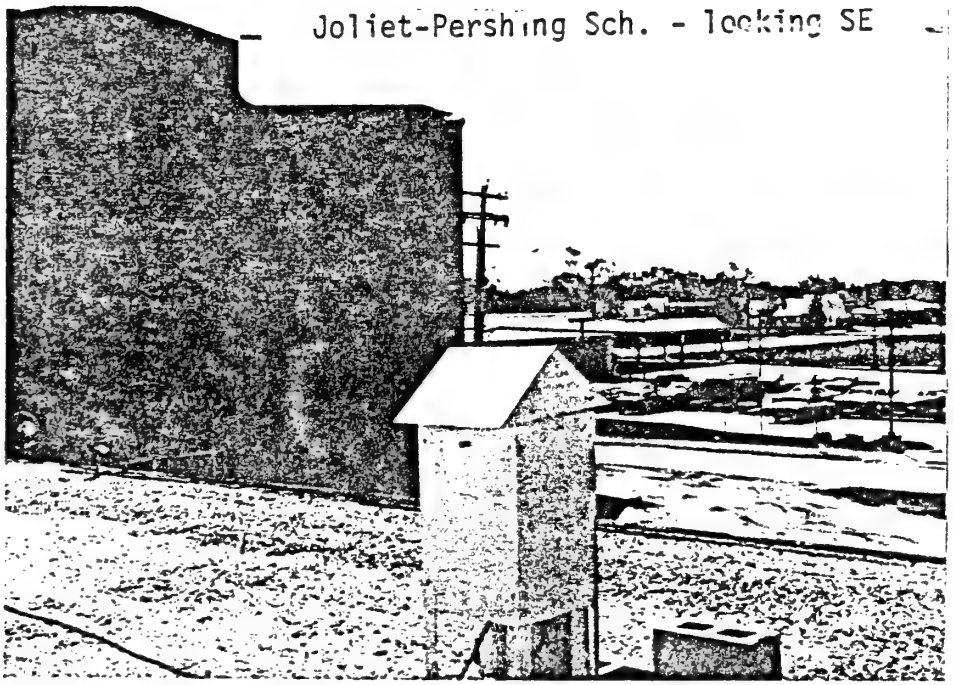
Midway Airport (MDW) is about 25 miles northeast of Joliet (to MDW from Joliet, 050° at 25.5 mi).

Dupage Airport (DPA) is about 28 miles north-northwest of Joliet (to DPA from Joliet, 340° at 28 mi).

Data from both sites are available to the IEPA through Service "A", but neither is a NWS site (though MDW used to be), and no LCDs are issued for them.

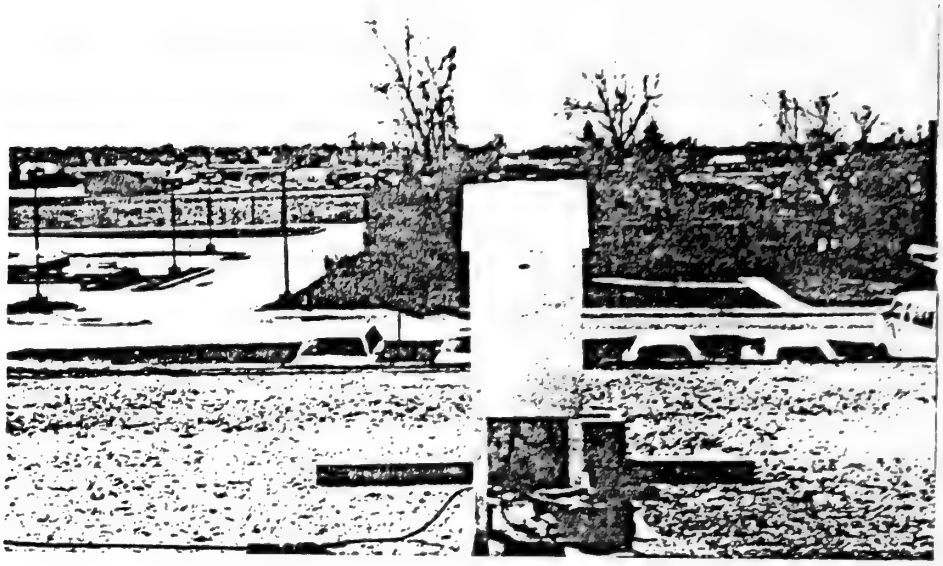


Joliet - North West



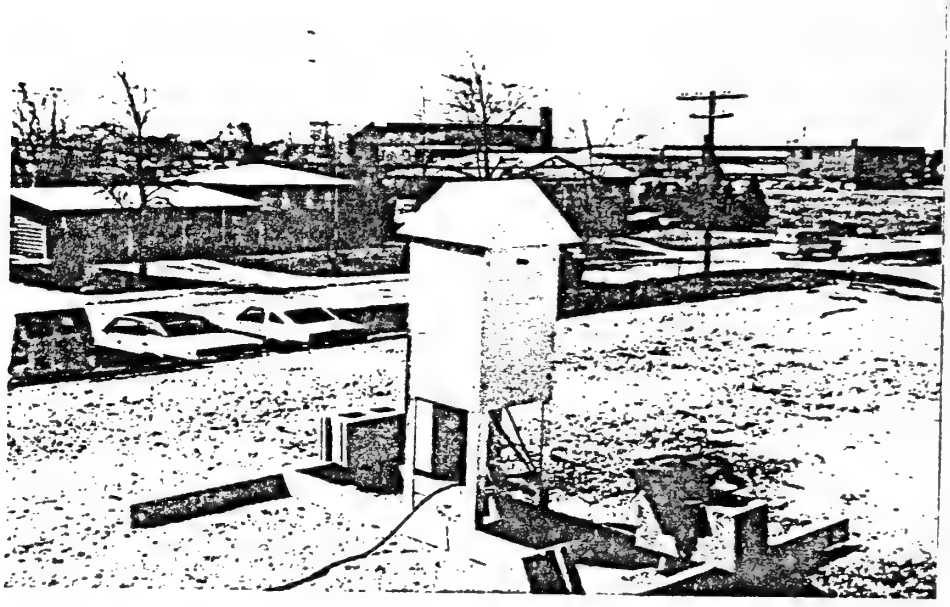
Joliet - South East

Joliet-Pershing Sch. - looking S



Joliet - South

Joliet-Pershing Sch. - looking SW



Joliet - South West

OPTICAL MICROSCOPE ANALYSIS

ILTER NUMBER : 1277989 NETWORK :
SITE : JOLIET/PERSHGSCHOOL
OLLECTION DATE : 08/14/81 OBJECTIVE MAG. : 25

COMPONENT	AVERAGE PART. SIZE	RANGE	WEIGHT PERCENT	Number Percent
MINERALS				
QUARTZ/FELDSPARS	17.3	5.1-40.7	17	10
LIMESTONE	13.9	2.5-40.7	58	54
IRON OXIDES	9.8	3.6-20.4	3	4
OTHER MINERALS			0	0
COMBUSTION PRODUCTS				
SOOT	13.9	2.5-40.7	18	19
GLASSY FLYASH SPHERES			0	0
BIOLOGICAL				
POLLEN & SPORES	11.1	5.1-20.4	2	8
PLANT TISSUE	12.8	7.2-20.4	2	5
STARCH	14.9	10.2-20.4	<1	1
MISCELLANEOUS				
FERROUS METAL			0	0
RUBBER			0	0

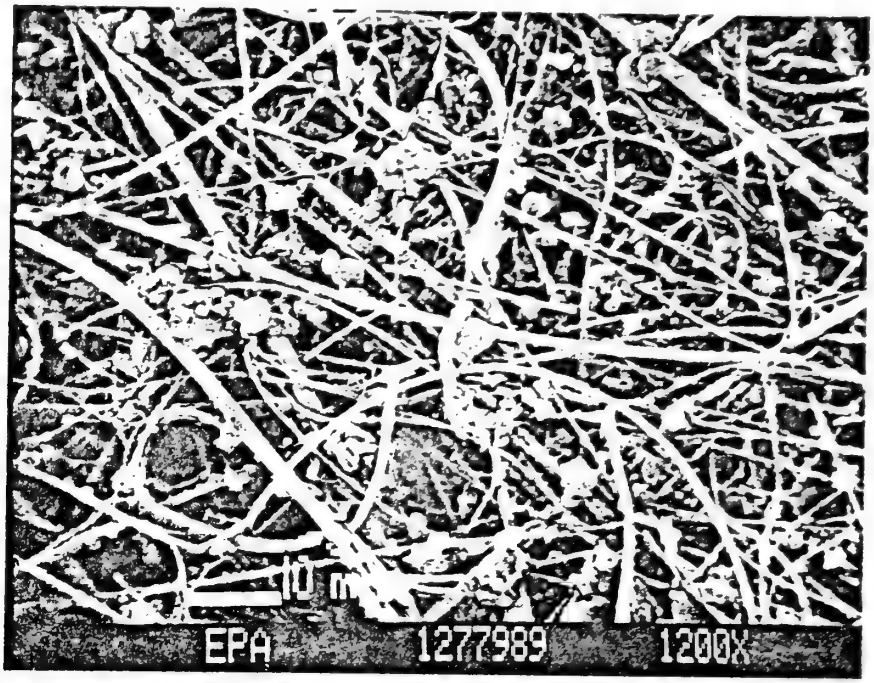
PARTICLE SIZE DISTRIBUTION

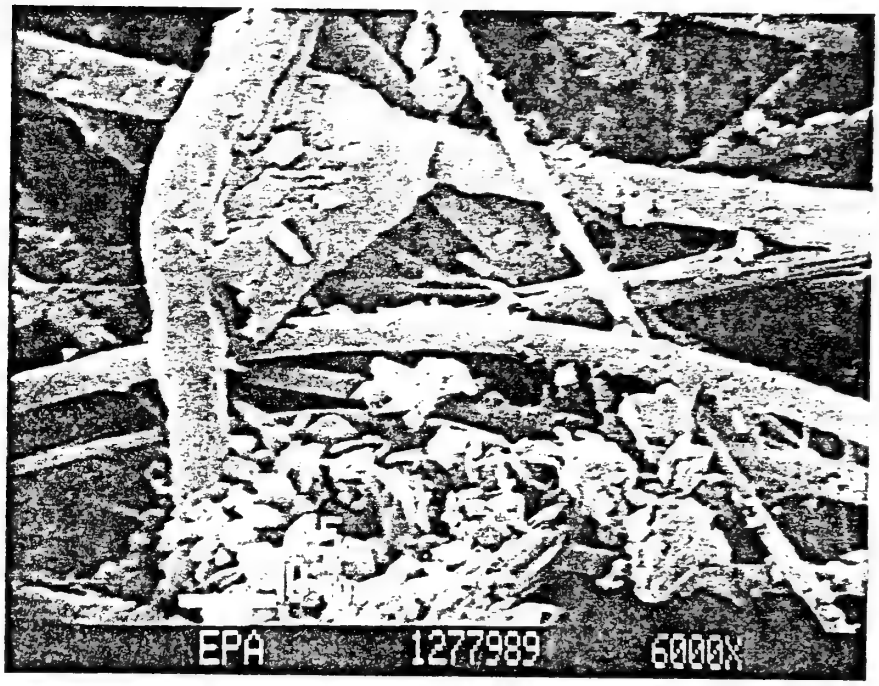
SIZE RANGE (UM)	NUMBER PERCENT	WEIGHT PERCENT
1.3 - 1.8	0	0
1.8 - 2.5	0	0
2.5 - 3.6	6	<1
3.6 - 5.1	12	<1
5.1 - 7.2	15	<1
7.2 - 10.2	17	2
10.2 - 14.4	20	10
14.4 - 20.4	17	20
20.4 - 28.8	7	23
28.8 - 40.7	5	44
40.7 - 57.6	0	0
57.6 - 81.5	0	0
81.5 - 115.2	0	0
115.2 - 162.9	0	0
162.9 - 230.4	0	0
>230.4	0	0

Filter number	1277989

Total Suspended Particulate $\mu g/m^3$	124

Particulate: Minerals	96.7	Combustion	22.3
Biological	5	Other	-
Low temperature ashing, % loss			11.6





OPTICAL MICROSCOPE ANALYSIS

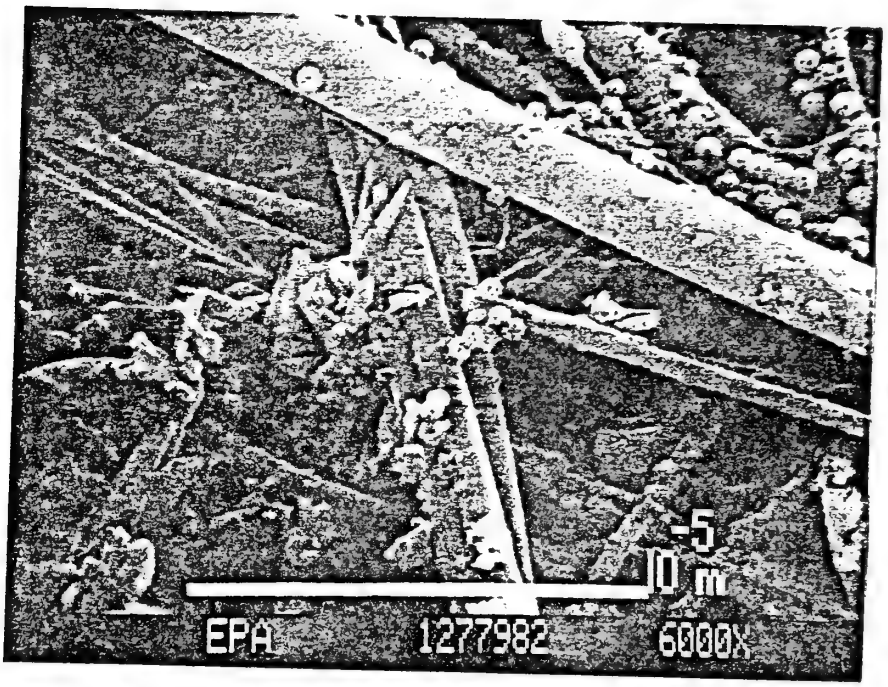
ILTER NUMBER : 1277982 NETWORK :
SITE : JOLIET/PERSHGSCHOOL
OLLECTION DATE : 08/14/81 OBJECTIVE MAG. : 25

COMPONENT	AVERAGE PART. SIZE	RANGE	WEIGHT PERCENT	Number Percent
MINERALS				
QUARTZ/FELDSPARS	7.9	3.6-14.4	4	10
LIMESTONE	9.6	1.8-28.8	29	24
IRON OXIDES	8.4	2.5-20.4	13	6
OTHER MINERALS			0	0
COMBUSTION PRODUCTS				
SOOT	8.7	2.5-20.4	6	40
GLASSY FLYASH SPHERES			0	0
BIOLOGICAL				
POLLEN & SPORES	21.2	5.1-57.6	22	5
PLANT TISSUE	12.3	3.6-28.8	13	6
STARCH	11.1	5.1-20.4	12	9
MISCELLANEOUS				
FERROUS METAL			0	0
RUBBER			0	0

PARTICLE SIZE DISTRIBUTION

SIZE RANGE (UM)	NUMBER PERCENT	WEIGHT PERCENT
1.3 - 1.8	0	0
1.8 - 2.5	1	<1
2.5 - 3.6	23	<1
3.6 - 5.1	23	1
5.1 - 7.2	14	2
7.2 - 10.2	13	5
10.2 - 14.4	10	9
14.4 - 20.4	13	49
20.4 - 28.8	2	18
28.8 - 40.7	0	0
40.7 - 57.6	<1	14
57.6 - 81.5	0	0
81.5 - 115.2	0	0
115.2 - 162.9	0	0
162.9 - 230.4	0	0
>230.4	0	0

Filter number			1277982
Inhalable Particulate	$\mu g/m^3$		73
Particulate: Minerals	12.4	Combustion	17.5
Biological	43.1	Other	-
Low temperature ashing, % loss			31.4



A. Site Identification

1. City: Rockford

2. Site Name and Address: Charles Beyer School, 333 15th Ave.

3. County: Winnebago Township: Rockford

4. USGS Topographical Map Name and Scale, Rockford North,1:24000

5. Site Elevation (Feet): 735

B. Site Classification/Representativeness

1. Dominating Influence on Site: Industrial, Mobile

C. 1. Stationary Sources that may Influence Site:

Name of Source	Location	Direction From Site	Distance From Site	Pollutant	Emissions (Tons/Yr)
Amerock Corp.	4000 Auburn Rockford	NNW	3.0 mi.	TSP NO_x HC	108 93 868
Barber-Colman Co.	1300 Rock St. Rockford	N	1.2 mi.	TSP NO_x HC	299 47 101
Elco Industries	111 Samuelson Rd., Rockford	SSE	3.0 mi.	TSP HC	152 2,184
Estwing Mfg.	2647 8th St. Rockford	SSE	1.2 mi.	TSP	101
Forgings & Stampings	1025 23rd Ave. Rockford	SE	0.9 mi.	TSP	112
Greenlee Bros. Co.	2136 12th St. Rockford	ESE	1.4 mi.	TSP CO	1,671 257
Kelsey-Hayes Co.	302 Peoples Ave. Rockford	S	0.6 mi.	TSP CO	46,510 14,805
Olson Pattern & Foundry	1617-1711 Magnolia Rockford	W	0.2 mi.	TSP	184

Accurate Die Casting	2025 Kishwaukee Rockford	SE	0.4 mi.	TSP	174
Rockford Can Co.	Quaker Rd. Rockford	SSW	0.7 mi.	TSP NO_x	8,844 90
Rockford Prod. Corp.	707 Harrison Ave. Rockford	SSE	0.9 mi.	TSP HC	223 146
Sall Bros. Co.	2320 Kishwaukee Rockford	SSE	0.7 mi.	TSP	128
Weyerhauser	2100 23rd Ave. Rockford	ESE	1.7 mi.	TSP	1,173
Joseph Behr & Sons	110 Seminary St. Rockford	N	0.5 mi.	TSP	378
Mattison Mach. Wks.	2235 Kishwaukee Rockford	SSE	0.8 mi.	TSP CO	146 365
Longview Fibre Co.	1818 Elmwood Rockford	NNE	5.7 mi.	TSP	4,270
Rockford Blacktop	4102 S. Main Rockford	SSW	3.1 mi.	TSP	895
Kent Feeds	1612 S. Bend Rd. Rockford	S	5.0 mi.	TSP	21,406
Rein, Schultz & Dahl	801 Beale Ct. Rockford	SSW	4.5 mi.	TSP	2,765

2. Mobile Sources that may Influence the Site:

Names of Roadways:	15th Ave.	16th Ave.	Seminary
Type:	Arterial Street	Local Street	Local Street
Distance of Roadway from Site (ft)	250	180	600
Composition of Roadway	Asphalt	Asphalt	Asphalt
Number of Traffic Lanes	4	2	2
Average Daily Traffic	8000	<1000	3000
Average Vehicle Speed (mph)	30	15	30
One or Two Way Traffic	Two	Two	Two
Number of Parking Lanes	None	Two	Two
Are Parking Lanes Used For Traffic Part of Day?	N/A	No	West Side
Is Dust Visibiity Retained	No	No	No
Does Roadway Have Curb	Yes	Yes	Yes

3. Area Sources that may Influence the Site:

Type of Source	Direction from Site	Distance from Site	Pollutant
Parking Lot, Paved	E	100'	TSP
Parking Lot, Paved	S	300'	TSP
Parking Lot, Unpaved	SSW	350'	TSP
Parking Surrounding Building	N, S	70-200'	TSP
Truck Yard	SSW	700'	TSP
Misc. Parking, Paved and Unpaved Around Factories	SE-SW	500+	TSP

D. Topography/Obstructions

1. General Characteristics Over a 2 Mile Radius From the Site: Smooth

2. Topographic Features that Influence the Site: (Types - hills, valleys, depressions, bodies of water, ridges, cliffs)

Type	Size	Direction From Site	Distance From Site
Rock River	400-700'	East	2000-2500'

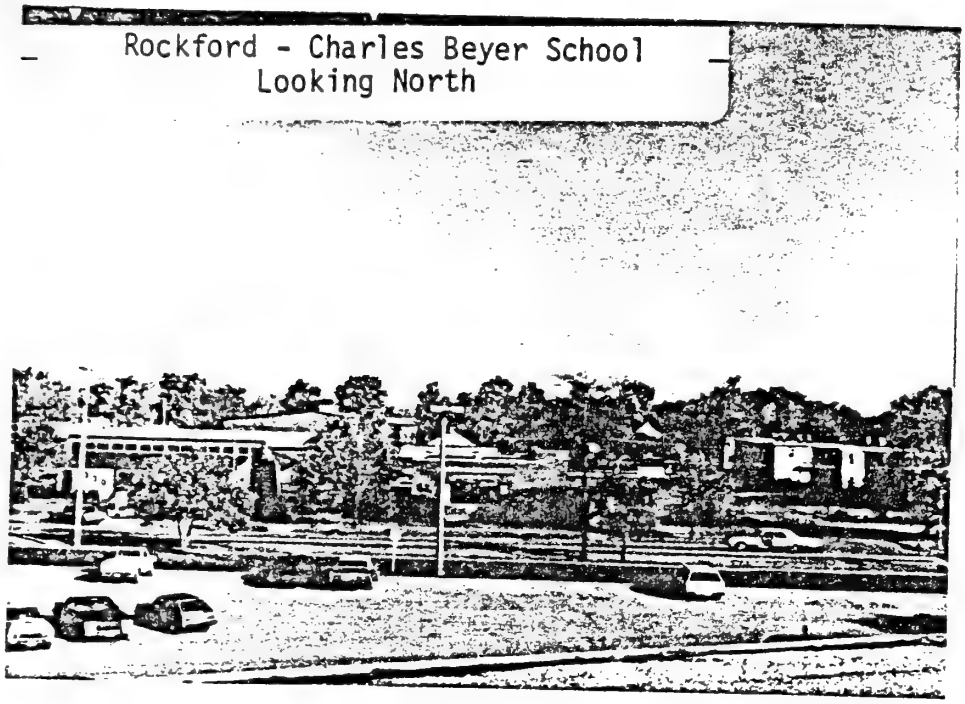
3. Obstructions to Wind Flow (Types - buildings, trees, ridges, cliffs)

Type	Size	Direction From Site	Distance From Site
None			

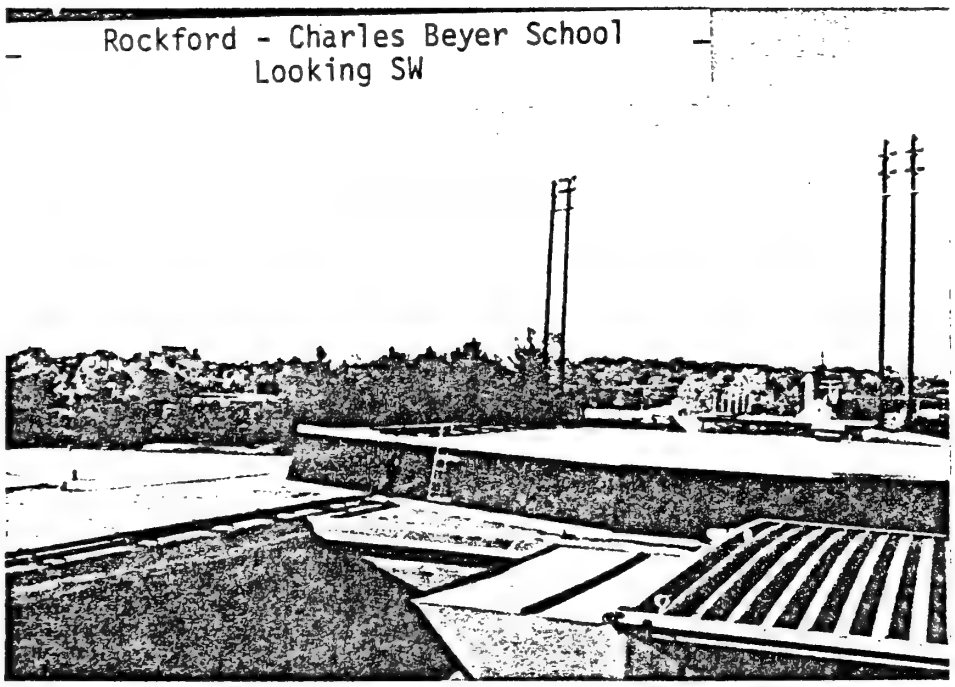
E. Distance to the nearest National Weather Service (NWS) Site.

Here are the distances and directions to the nearest NWS observing site from the inhalable particulate monitor in Rockford. Distances are in statute miles; directionsare degrees from true north.

Site Address	Nearest NWS Site	Directions and Distance to NWS
Beyer Elem. School 333 15th Ave.	Rockford Airport (RFD)	185° at 3.4 mi.(s)

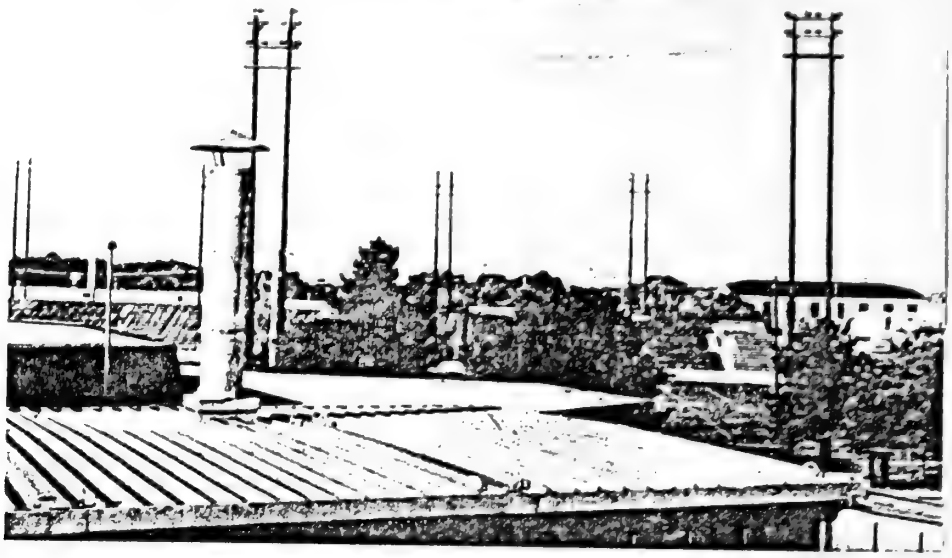


Rockford - North



Rockford - South West

Rockford - Charles Beyer School
Looking West



Rockford - West

Rockford - Charles Beyer School
Looking NW

Rockford - North West

OPTICAL MICROSCOPE ANALYSIS

ILTER NUMBER : 1229899 NETWORK :
SITE : ROCKFORD/BEYERSCHOOL
OLLECTION DATE : 05/22/81 OBJECTIVE MAG. : 25

COMPONENT	AVERAGE PART. SIZE	RANGE	WEIGHT PERCENT	Number Percent
MINERALS				
QUARTZ/FELDSPARS	17.8	2.5-57.6	49	26
LIMESTONE	9.8	1.8-28.8	11	46
IRON OXIDES	10.1	2.5-28.8	2	2
OTHER MINERALS			0	0
COMBUSTION PRODUCTS				
SOOT	19.0	2.5-57.6	11	19
GLASSY FLYASH SPHERES			0	0
BIOLOGICAL				
POLLEN & SPORES	19.6	7.2-40.7	2	1
PLANT TISSUE	33.1	10.2-81.5	26	6
STARCH	12.3	10.2-14.4	<1	1
MISCELLANEOUS				
FERROUS METAL			0	0
RUBBER			0	0

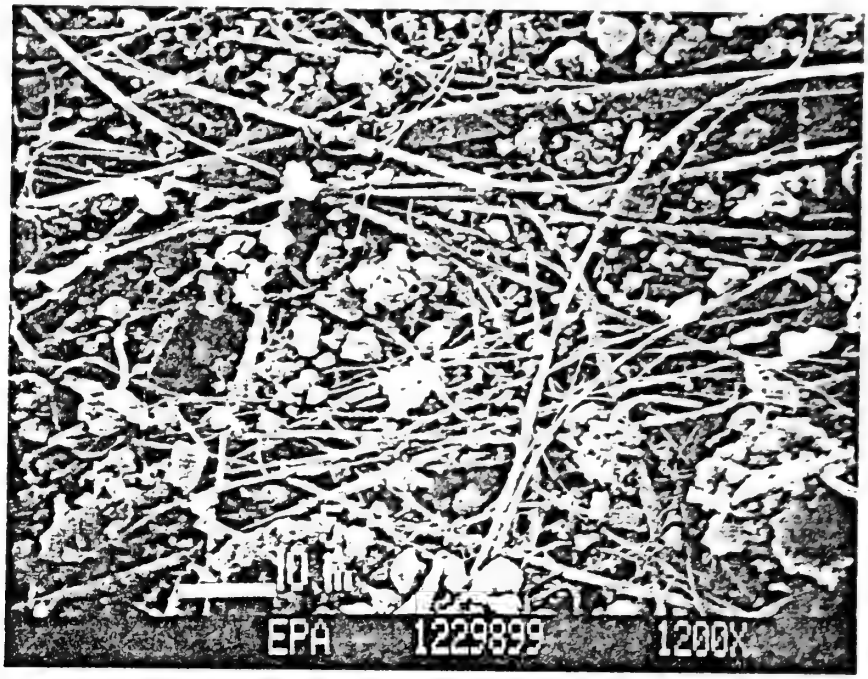
PARTICLE SIZE DISTRIBUTION

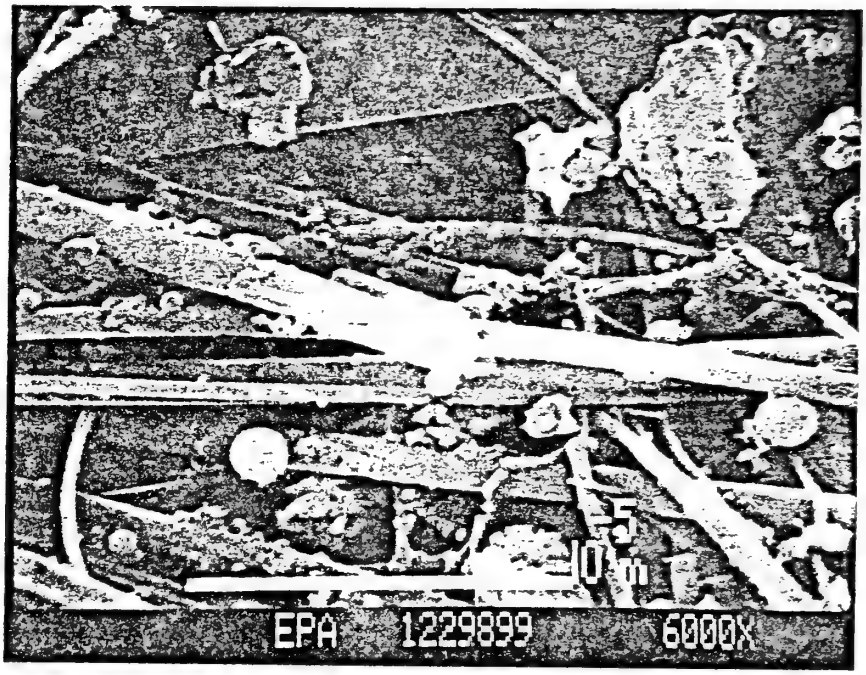
SIZE RANGE (UM)	NUMBER PERCENT	WEIGHT PERCENT
1.3 - 1.8	0	0
1.8 - 2.5	4	<1
2.5 - 3.6	35	<1
3.6 - 5.1	8	<1
5.1 - 7.2	15	<1
7.2 - 10.2	13	3
10.2 - 14.4	13	6
14.4 - 20.4	7	11
20.4 - 28.8	4	16
28.8 - 40.7	<1	4
40.7 - 57.6	<1	33
57.6 - 81.5	<1	25
81.5 - 115.2	0	0
115.2 - 162.9	0	0
162.9 - 230.4	0	0
>230.4	0	0

Filter number	1229899

Total Suspended Particulate $\mu g/m^3$	133

Particulate: Minerals	82.5	Combustion	14.6
Biological	37.2	Other	-
Low temperature ashing, % loss			10.2





OPTICAL MICROSCOPE ANALYSIS

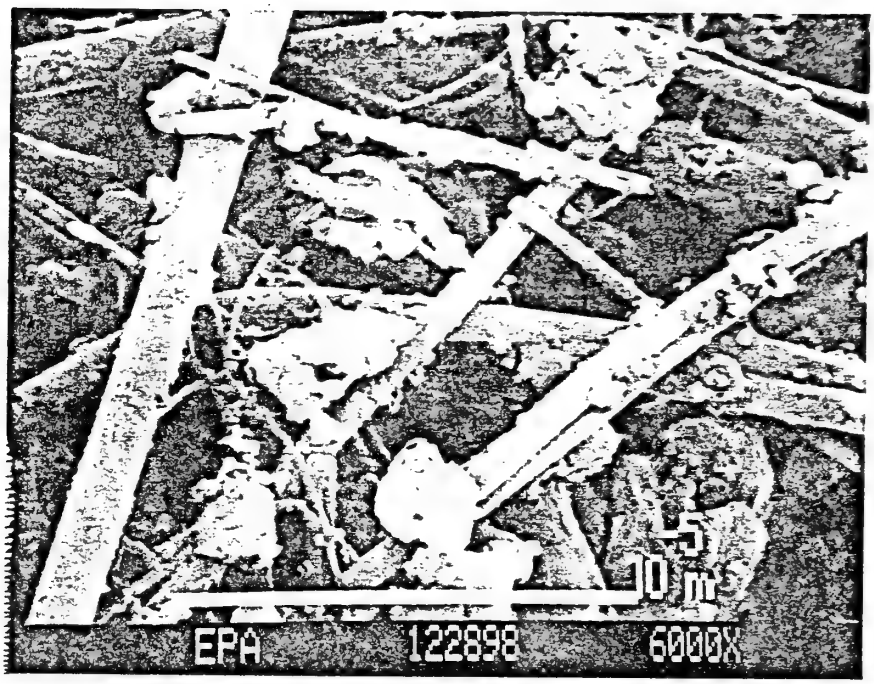
FILTER NUMBER : 1229898
NETWORK :
SITE : ROCKFORD/BEYERSCHOOL
COLLECTION DATE : 05/22/81
OBJECTIVE MAG. : 25

COMPONENT	AVERAGE PART. SIZE	RANGE	WEIGHT PERCENT	Number Percent
MINERALS				
QUARTZ/FELDSPARS	9.8	3.6-20.4	27	33
LIMESTONE	9.8	1.8-28.8	50	34
IRON OXIDES	6.4	3.6-10.2	3	1
OTHER MINERALS			0	0
COMBUSTION PRODUCTS				
SOOT	12.3	3.6-28.8	11	28
GLASSY FLYASH SPHERES			0	0
BIOLOGICAL				
POLLEN & SPORES	15.1	5.1-28.8	2	2
PLANT TISSUE	9.8	3.6-20.4	6	2
STARCH	12.0	5.1-20.4	<1	<1
MISCELLANEOUS				
FERROUS METAL			0	0
RUBBER			0	0

PARTICLE SIZE DISTRIBUTION

SIZE RANGE (UM)	NUMBER PERCENT	WEIGHT PERCENT
1.3 - 1.8	0	0
1.8 - 2.5	5	<1
2.5 - 3.6	17	<1
3.6 - 5.1	26	2
5.1 - 7.2	14	4
7.2 - 10.2	19	16
10.2 - 14.4	14	29
14.4 - 20.4	4	27
20.4 - 28.8	1	20
28.8 - 40.7	0	0
40.7 - 57.6	0	0
57.6 - 81.5	0	0
81.5 - 115.2	0	0
115.2 - 162.9	0	0
162.9 - 230.4	0	0
>230.4	0	0

Filter number	122898		
Inhalable Particulate	ug/m^3		124
Particulate: Minerals	99.2	Combustion	13.6
Biological	9.9	Other	-
Low temperature ashing, % loss			10.6



OPTICAL MICROSCOPE ANALYSIS

ILTER NUMBER : 1282741
NETWORK :
SITE : ROCKFORD/BEYERSCHOOL
OLLECTION DATE : 12/18/81
OBJECTIVE MAG. : 25

COMPONENT	AVERAGE PART. SIZE	RANGE	WEIGHT PERCENT	Number Percent
MINERALS				
QUARTZ/FELDSPARS	15.5	3.6-40.7	26	4
LIMESTONE	12.6	1.8-40.7	55	79
IRON OXIDES	12.3	3.6-28.8	7	3
OTHER MINERALS			0	0
COMBUSTION PRODUCTS				
SOOT	12.3	3.6-28.8	7	10
GLASSY FLYASH SPHERES			0	0
BIOLOGICAL				
POLLEN & SPORES	7.4	5.1-10.2	<1	1
PLANT TISSUE	15.8	7.2-28.8	4	2
STARCH	12.3	10.2-14.4	<1	<1
MISCELLANEOUS				
FERROUS METAL			0	0
RUBBER			0	0

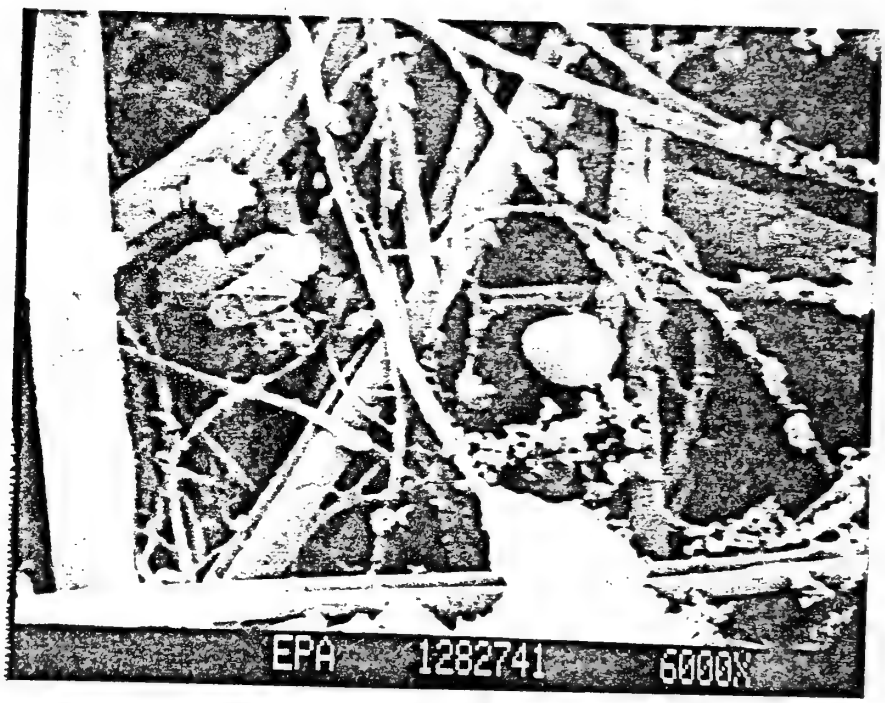
PARTICLE SIZE DISTRIBUTION

SIZE RANGE (UM)	NUMBER PERCENT	WEIGHT PERCENT
1.3 - 1.8	0	0
1.8 - 2.5	29	<1
2.5 - 3.6	16	<1
3.6 - 5.1	13	<1
5.1 - 7.2	11	2
7.2 - 10.2	12	6
10.2 - 14.4	8	11
14.4 - 20.4	8	31
20.4 - 28.8	3	33
28.8 - 40.7	<1	16
40.7 - 57.6	0	0
57.6 - 81.5	0	0
81.5 - 115.2	0	0
115.2 - 162.9	0	0
162.9 - 230.4	0	0
>230.4	0	0

Filter number 1282741

Total Suspended Particulate $\mu g/m^3$ 29

Particulate: Minerals	25.5	Combustion	2.0
Biological	1.2	Other	-
Low temperature ashing, % loss			14.3



OPTICAL MICROSCOPE ANALYSIS

ILTER NUMBER : 1282740 NETWORK :
SITE : ROCKFORD/BEYERSCHOOL
OLLECTION DATE : 12/18/81 OBJECTIVE MAG. : 25

COMPONENT	AVERAGE PART. SIZE	RANGE	WEIGHT PERCENT	Number Percent
MINERALS				
QUARTZ/FELDSPARS	7.9	3.6-14.4	11	8
LIMESTONE	6.9	2.5-14.4	61	72
IRON OXIDES	3.2	1.8-5.1	<1	1
OTHER MINERALS			0	0
COMBUSTION PRODUCTS				
SOOT	6.9	2.5-14.4	14	15
GLASSY FLYASH SPHERES			0	0
BIOLOGICAL				
POLLEN & SPORES	6.9	2.5-14.4	1	1
PLANT TISSUE	21.7	7.2-40.7	12	1
STARCH	9.2	5.1-14.4	<1	1
MISCELLANEOUS				
FERROUS METAL			0	0
RUBBER			0	0

PARTICLE SIZE DISTRIBUTION

SIZE RANGE (UM)	NUMBER PERCENT	WEIGHT PERCENT
1.3 - 1.8	0	0
1.8 - 2.5	<1	<1
2.5 - 3.6	21	2
3.6 - 5.1	41	14
5.1 - 7.2	20	17
7.2 - 10.2	15	34
10.2 - 14.4	4	22
14.4 - 20.4	0	0
20.4 - 28.8	0	0
28.8 - 40.7	<1	10
40.7 - 57.6	0	0
57.6 - 81.5	0	0
81.5 - 115.2	0	0
115.2 - 162.9	0	0
162.9 - 230.4	0	0
>230.4	0	0

Filter number		1282740	
Inhalable Particulate	$\mu g/m^3$		24
Particulate: Minerals	17.3	Combustion	3.4
Biological	3.1	Other	-
Low temperature ashing, % loss			28.4

A. Site Identification

1. City: East Moline Population: 21,000

2. Site Name and Address: John Deere Parts Bldg., 1400 13th St.

3. County: Rock Island Township: Hampton

4. USGS Topographical Map Name and Scale: Silvis, Iowa-Ill, 1:24,000

5. Site Elevation (Feet): 580

B. Site Classification/Representativeness

1. Dominating Influence on Site: Industrial, Commercial

C. Source Impact

1. Stationary Sources that may Influence Site:

Name of Source	Location	Direction From Site	Distance From Site	Pollutant	Emissions (Tons/Yr)
International Harvester	1100 3rd St. E. Moline	WNW	1.7 km	TSP	135
				HC	692
Deere-Harvester	1100 13th Ave. E. Moline	NW	0.4 km	TSP	3,668
				SO_2	2,720
				NO_x	1,233
				HC	1,027
Deere-Foundry	Hwy. 84 & 14th Ave. E. Moline	ENE	1.1 km	TSP	27,053
Deere-Planter	501 3rd Ave. Moline	W	8.6 km	TSP	1,800
				HC	1,956
Strombeck Mfg.	51st & 4th Ave. Moline	WSW	3.0 km	TSP	569

2. Mobile Sources that may Influence the Site:

Names of Roadways:	13th Street
Type:	Local Street
Distance of Roadway from Site (ft)	90
Composition of Roadway	Concrete
Number of Traffic Lanes	2
Average Daily Traffic	5000
Average Vehicle Speed (mph)	25
One or Two Way Traffic	Two
Number of Parking Lanes	None
Are Parking Lanes Used For Traffic Part of Day?	N/A
Is Dust Visibiity Retained	No
Does Roadway Have Curb	Yes

3. Area Sources that may Influence the Site:

Type of Source	Direction From Site	Distance From Site	Pollutant
Silvis Railyard	ESE	1 km	TSP

D. Topography/Obstructions

1. General Characteristics Over a 2 Mile Radius From the Site: Rolling

2. Topographic Features that Influence the Site: (Types - hills, valleys, depressions, bodies of water, ridges, cliffs)

Type	Size	Direction From Site	Distance From Site
Mississippi Bluffs	30 m high	South	0.2 km

3. Obstructions to Wind Flow (Types - buildings, trees, ridges, cliffs)

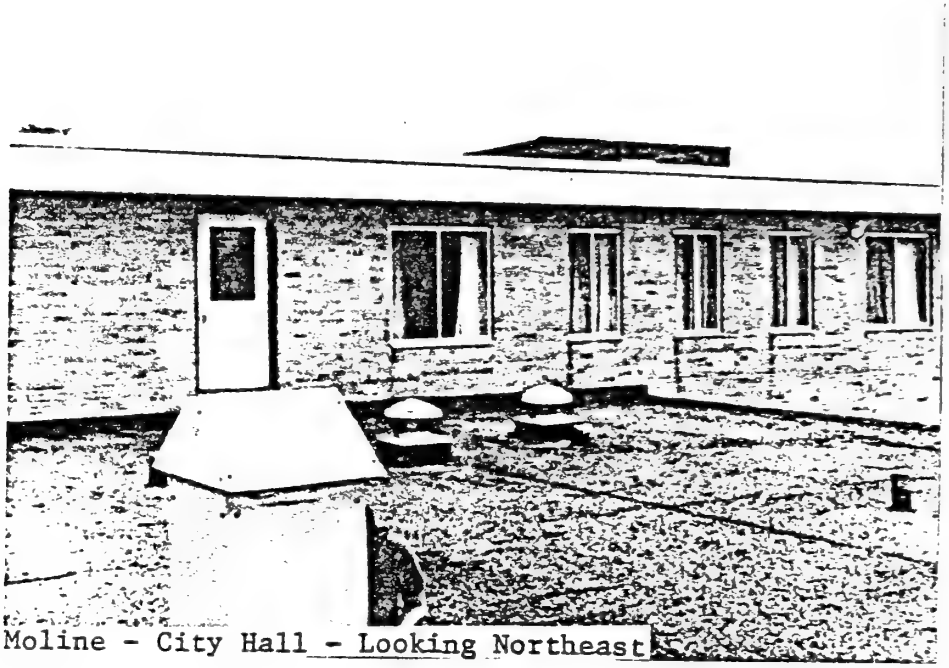
Type	Size	Direction From Site	Distance From Site
None			

E. Distance to the nearest National Weather Service (NWS) Site.

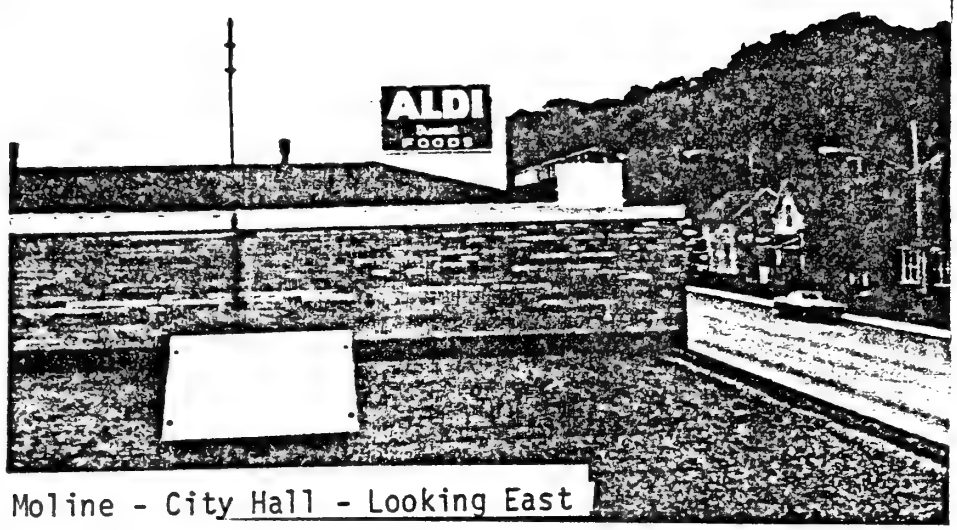
Here are the distances and directions to the nearest NWS observing site from the inhalable particulate monitor in East Moline. Distances are in statute miles; directions are degrees from true north.

Site Address	Nearest NWS Site	Directions & Distance to NWS
1400 S. 13th St.	Quad Cities Airport (MLI)	220° at 5.9 mi. (SW)

East Moline - North

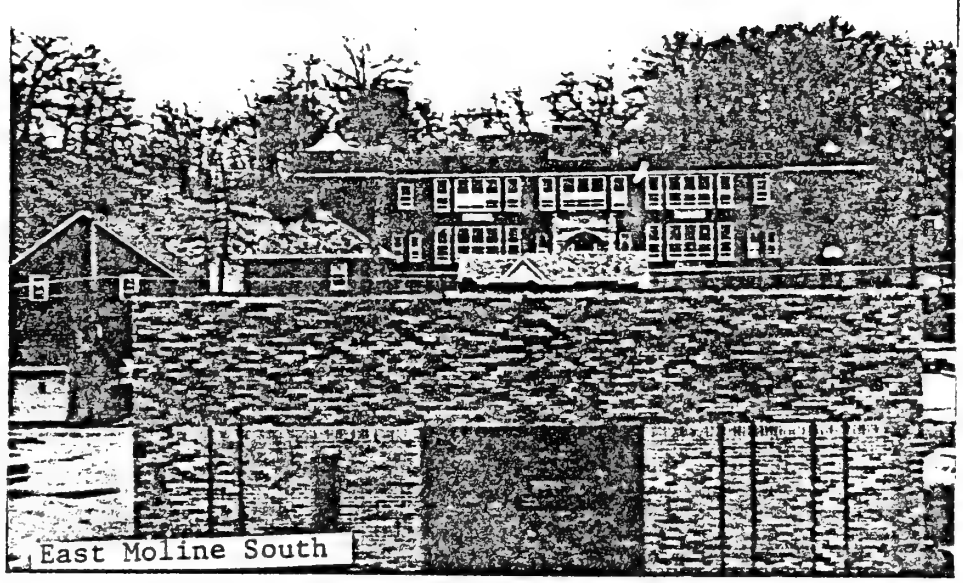


East Moline - North East



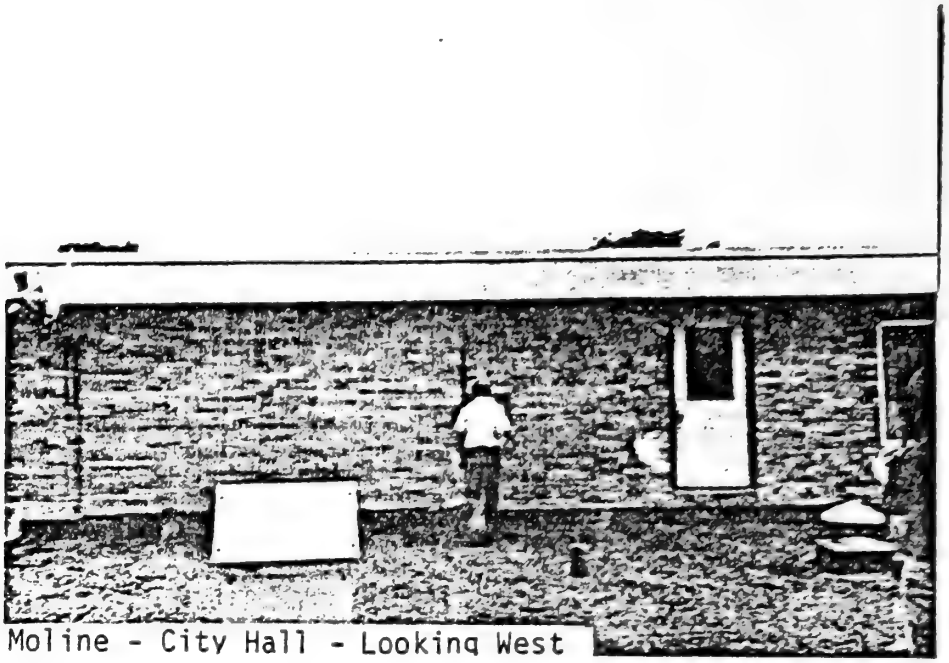
Moline - City Hall - Looking East

East Moline - East



East Moline South

East Moline - South



Moline - City Hall - Looking West

East Moline - West

OPTICAL MICROSCOPE ANALYSIS

ILTER NUMBER : 1111344
NETWORK :
SITE : E. MOLINE/J. DEERE
OLLECTION DATE : 03/23/81
OBJECTIVE MAG. : 25

COMPONENT	AVERAGE PART. SIZE	RANGE	WEIGHT PERCENT	Number Percent
MINERALS				
QUARTZ/FELDSPARS	24.5	7.2-57.6	41	13
LIMESTONE	17.1	1.8-57.6	48	65
IRON OXIDES	13.8	5.1-28.8	4	4
OTHER MINERALS			0	0
COMBUSTION PRODUCTS				
SOOT	12.3	3.6-28.8	6	14
GLASSY FLYASH SPHERES			0	0
BIOLOGICAL				
POLLEN & SPORES	14.9	10.2-20.4	<1	1
PLANT TISSUE	9.1	5.1-14.4	<1	3
STARCH	10.5	7.2-14.4	<1	<1
MISCELLANEOUS				
FERROUS METAL			0	0
RUBBER			0	0

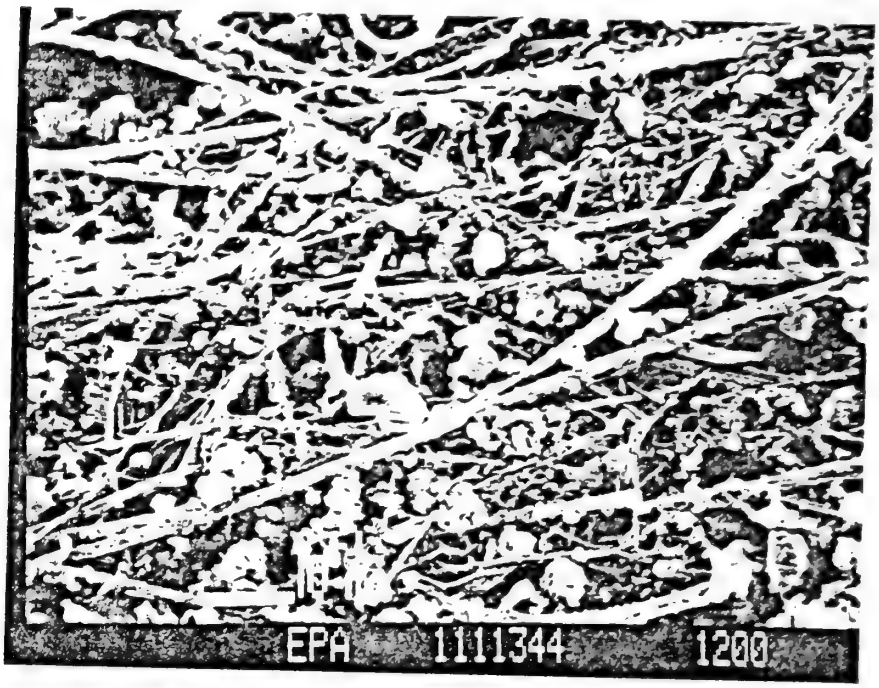
PARTICLE SIZE DISTRIBUTION

SIZE RANGE (UM)	NUMBER PERCENT	WEIGHT PERCENT
1.3 - 1.8	0	0
1.8 - 2.5	11	<1
2.5 - 3.6	14	<1
3.6 - 5.1	17	<1
5.1 - 7.2	24	2
7.2 - 10.2	7	2
10.2 - 14.4	13	10
14.4 - 20.4	6	12
20.4 - 28.8	6	35
28.8 - 40.7	1	24
40.7 - 57.6	<1	15
57.6 - 81.5	0	0
81.5 - 115.2	0	0
115.2 - 162.9	0	0
162.9 - 230.4	0	0
>230.4	0	0

Filter number	1111344

Total Suspended Particulate $\mu g/m^3$	107

Particulate: Minerals	99.5	Combustion	6.4
Biological	1	Other	-
Low temperature ashing, % loss			22.8



OPTICAL MICROSCOPE ANALYSIS

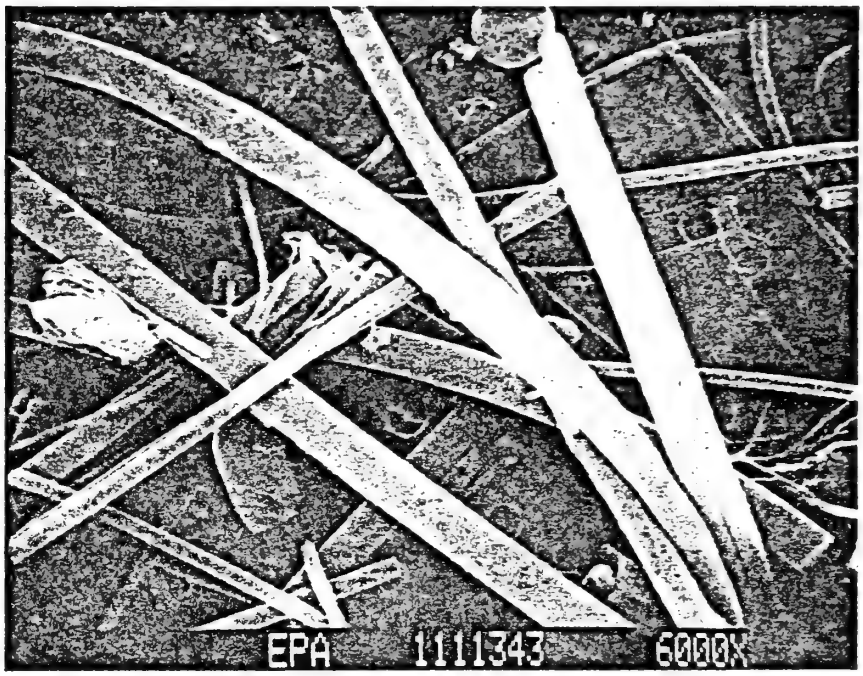
LTER NUMBER : 1111343
NETWORK :
SITE : E. MOLINE/J. DEERE
LLECTION DATE : 03/23/81
OBJECTIVE MAG. : 25

COMPONENT	AVERAGE PART. SIZE	RANGE	WEIGHT PERCENT	Number Percent
MINERALS				
QUARTZ/FELDSPARS	7.7	1.8-20.4	4	14
LIMESTONE	7.7	1.8-20.4	15	58
IRON OXIDES	28.1	5.1-81.5	77	<1
OTHER MINERALS			0	0
COMBUSTION PRODUCTS				
SOOT	8.5	1.8-20.4	4	28
GLASSY FLYASH SPHERES			0	0
BIOLOGICAL				
POLLEN & SPORES			0	0
PLANT TISSUE			0	0
STARCH	9.1	5.1-14.4	<1	<1
MISCELLANEOUS				
FERROUS METAL			0	0
RUBBER			0	0

PARTICLE SIZE DISTRIBUTION

SIZE RANGE (UM)	NUMBER PERCENT	WEIGHT PERCENT
1.3 - 1.8	0	0
1.8 - 2.5	39	<1
2.5 - 3.6	20	<1
3.6 - 5.1	16	1
5.1 - 7.2	13	3
7.2 - 10.2	7	6
10.2 - 14.4	2	3
14.4 - 20.4	2	9
20.4 - 28.8	0	0
28.8 - 40.7	0	0
40.7 - 57.6	0	0
57.6 - 81.5	<1	77
81.5 - 115.2	0	0
115.2 - 162.9	0	0
162.9 - 230.4	0	0
>230.4	0	0

Filter number			1111343
Inhalable Particulate	$\mu g/m^3$		96
Particulate: Minerals	92.2	Combustion	3.8
Biological	1	Other	-
Low temperature ashing, % loss			25.5



OPTICAL MICROSCOPE ANALYSIS

LTER NUMBER : 1230045
NETWORK :
SITE : E. MOLINE/J. DEERE
LLECTION DATE : 06/03/81
OBJECTIVE MAG. : 25

COMPONENT	AVERAGE PART. SIZE	RANGE	WEIGHT PERCENT	Number Percent
MINERALS				
QUARTZ/FELDSPARS	17.3	5.1-40.7	38	9
LIMESTONE	13.1	1.8-40.7	46	77
IRON OXIDES	11.1	5.1-20.4	4	2
OTHER MINERALS			0	0
COMBUSTION PRODUCTS				
SOOT	13.8	5.1-28.8	5	8
GLASSY FLYASH SPHERES			0	0
BIOLOGICAL				
POLLEN & SPORES	11.1	5.1-20.4	2	2
PLANT TISSUE	18.1	10.2-28.8	4	2
STARCH	17.4	14.4-20.4	1	1
MISCELLANEOUS				
FERROUS METAL			0	0
RUBBER			0	0

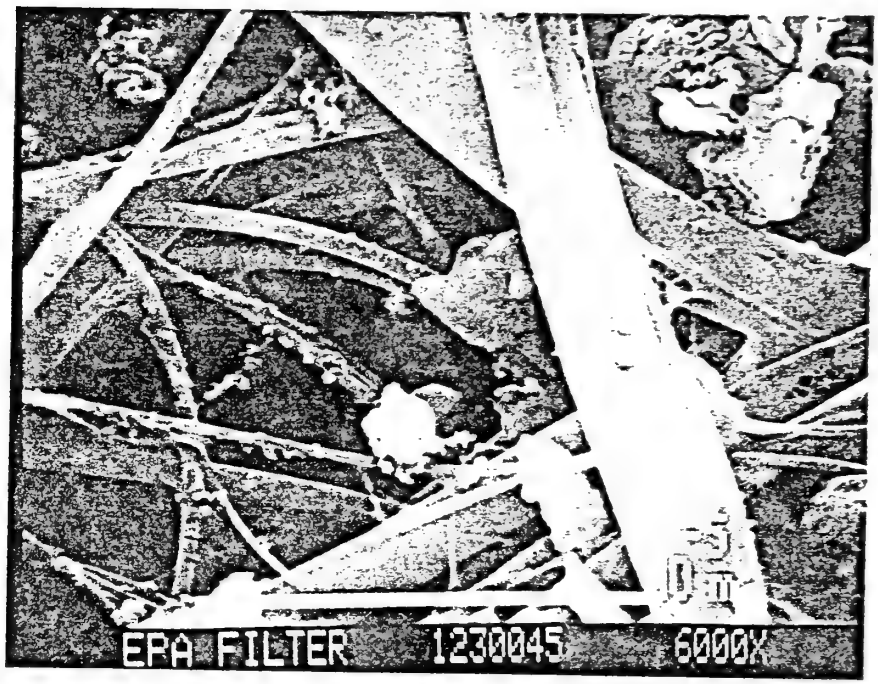
PARTICLE SIZE DISTRIBUTION

SIZE RANGE (UM)	NUMBER PERCENT	WEIGHT PERCENT
1.3 - 1.8	0	0
1.8 - 2.5	26	<1
2.5 - 3.6	20	<1
3.6 - 5.1	9	<1
5.1 - 7.2	17	3
7.2 - 10.2	6	3
10.2 - 14.4	12	17
14.4 - 20.4	8	27
20.4 - 28.8	2	23
28.8 - 40.7	<1	25
40.7 - 57.6	0	0
57.6 - 81.5	0	0
81.5 - 115.2	0	0
115.2 - 162.9	0	0
162.9 - 230.4	0	0
>230.4	0	0

Filter number	1230045

Total Suspended Particulate $\mu g/m^3$	83

Particulate: Minerals	73	Combustion	4.2
Biological	5.8	Other	-
Low temperature ashing, % loss			10.6



OPTICAL MICROSCOPE ANALYSIS

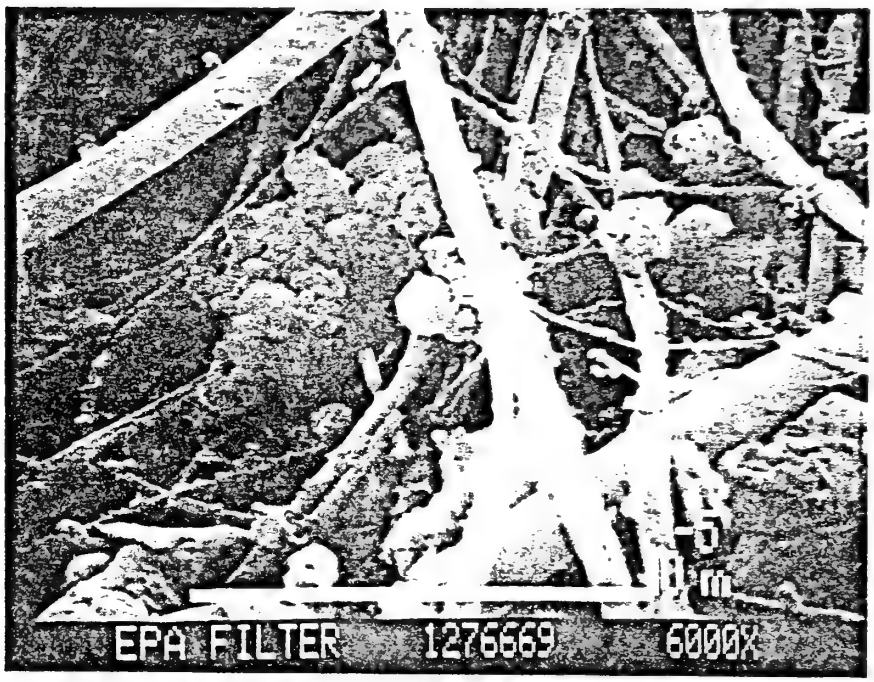
LTER NUMBER : 1276669
NETWORK :
SITE : E. MOLINE/J. DEERE
LLECTION DATE : 06/03/81
OBJECTIVE MAG. : 25

COMPONENT	AVERAGE PART. SIZE	RANGE	WEIGHT PERCENT	Number Percent
MINERALS				
QUARTZ/FELDSPARS	8.5	1.8-20.4	24	15
LIMESTONE	9.8	1.8-28.8	65	69
IRON OXIDES	5.1	1.8-10.2	<1	1
OTHER MINERALS			0	0
COMBUSTION PRODUCTS				
SOOT	7.7	1.8-20.4	6	13
GLASSY FLYASH SPHERES			0	0
BIOLOGICAL				
POLLEN & SPORES	10.5	7.2-14.4	2	2
PLANT TISSUE			0	<1
STARCH			0	<1
MISCELLANEOUS				
FERROUS METAL			0	0
RUBBER			0	0
SOFT COAL	12.8	7.2-20.4	2	1

PARTICLE SIZE DISTRIBUTION

SIZE RANGE (UM)	NUMBER PERCENT	WEIGHT PERCENT
1.3 - 1.8	0	0
1.8 - 2.5	15	<1
2.5 - 3.6	19	1
3.6 - 5.1	20	4
5.1 - 7.2	23	14
7.2 - 10.2	16	24
10.2 - 14.4	5	19
14.4 - 20.4	2	21
20.4 - 28.8	<1	15
28.8 - 40.7	0	0
40.7 - 57.6	0	0
57.6 - 81.5	0	0
81.5 - 115.2	0	0
115.2 - 162.9	0	0
162.9 - 230.4	0	0
>230.4	0	0

Inhalable Particulate	$\mu g/m^3$		60
Particulate: Minerals	54	Combustion	3.6
Biological	1.2	Other	1.2
Low temperature ashing, % loss			0.0



OPTICAL MICROSCOPE ANALYSIS

.TER NUMBER : 1282376 NETWORK :
SITE : E. MOLINE/J. DEERE
.LECTION DATE : 12/18/81 OBJECTIVE MAG. : 25

COMPONENT	AVERAGE PART. SIZE	RANGE	WEIGHT PERCENT	Number Percent
MINERALS				
QUARTZ/FELDSPARS	13.9	2.5-40.7	16	7
LIMESTONE	13.9	2.5-40.7	76	83
IRON OXIDES	5.6	2.5-10.2	<1	1
OTHER MINERALS			0	0
COMBUSTION PRODUCTS				
SOOT	13.0	3.6-28.8	4	7
GLASSY FLYASH SPHERES			0	0
BIOLOGICAL				
POLLEN & SPORES			0	0
PLANT TISSUE	17.0	3.6-40.7	4	3
STARCH			0	0
MISCELLANEOUS				
FERROUS METAL			0	0
RUBBER			0	0

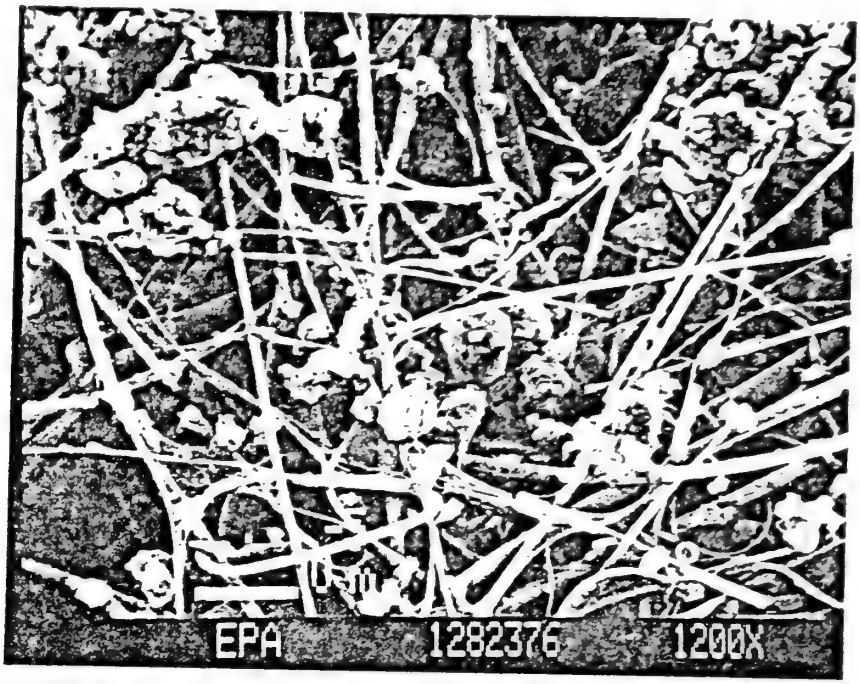
PARTICLE SIZE DISTRIBUTION

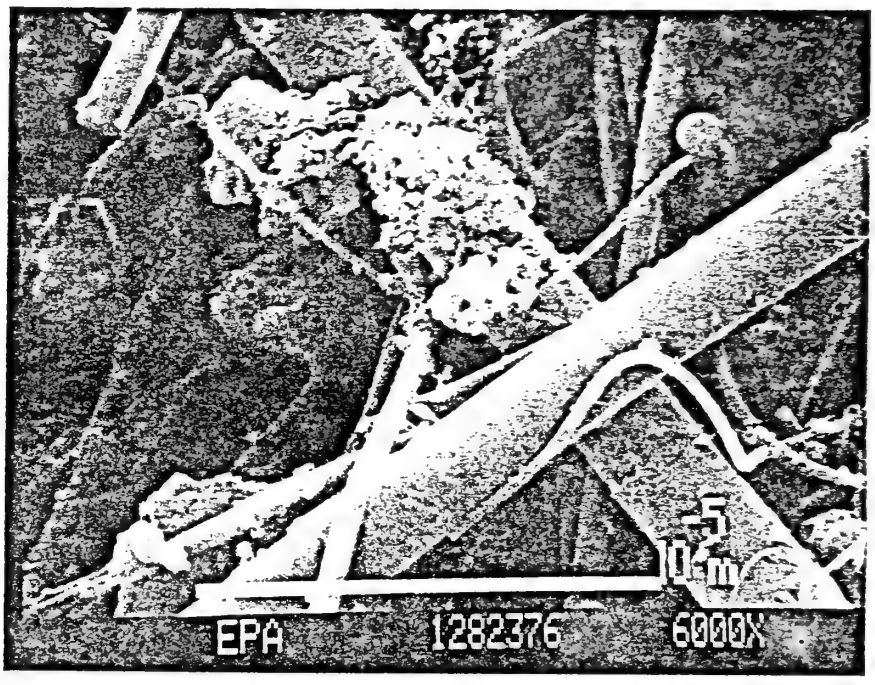
SIZE RANGE (UM)	NUMBER PERCENT	WEIGHT PERCENT
1.3 - 1.8	0	0
1.8 - 2.5	0	0
2.5 - 3.6	16	<1
3.6 - 5.1	36	2
5.1 - 7.2	19	4
7.2 - 10.2	12	7
10.2 - 14.4	9	12
14.4 - 20.4	4	18
20.4 - 28.8	2	25
28.8 - 40.7	<1	32
40.7 - 57.6	0	0
57.6 - 81.5	0	0
81.5 - 115.2	0	0
115.2 - 162.9	0	0
162.9 - 230.4	0	0
>230.4	0	0

Filter number	1282376

Total Suspended Particulate $\mu g/m^3$	58

Particulate: Minerals	53.4	Combustion	2.3
Biological	2.3	Other	-
Low temperature ashing, % loss			0.0





OPTICAL MICROSCOPE ANALYSIS

LTER NUMBER : 1282375
NETWORK :
SITE : E. MOLINE/J. DEERE
LLECTION DATE : 12/18/81
OBJECTIVE MAG. : 25

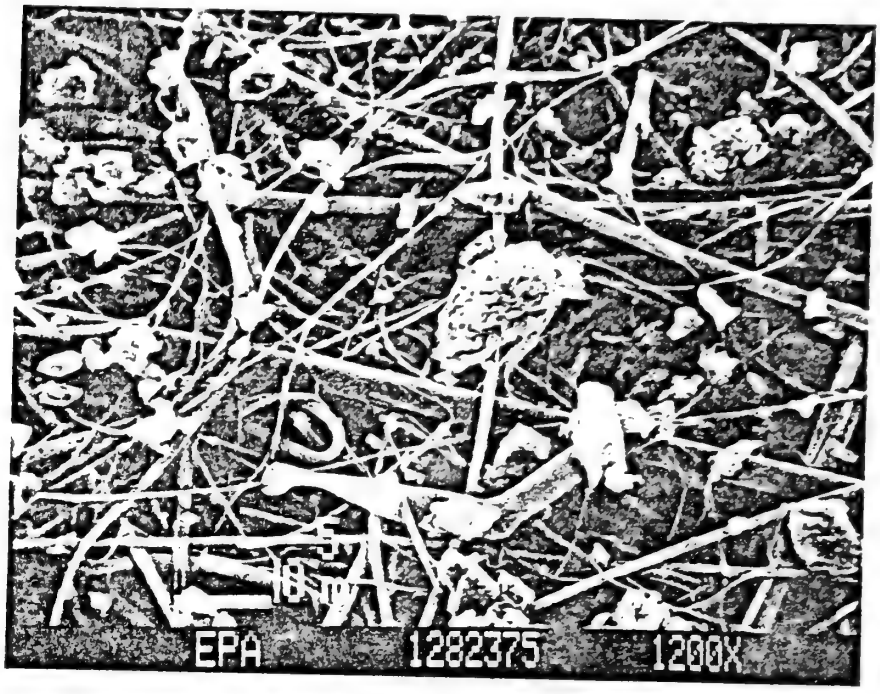
COMPONENT	AVERAGE PART. SIZE	RANGE	WEIGHT PERCENT	Number Percent
MINERALS				
QUARTZ/FELDSPARS	9.8	3.6-20.4	3	2
LIMESTONE	8.7	2.5-20.4	77	85
IRON OXIDES	11.1	5.1-20.4	4	1
OTHER MINERALS			0	0
COMBUSTION PRODUCTS				
SOOT	9.5	2.5-20.4	4	9
GLASSY FLYASH SPHERES			0	0
BIOLOGICAL				
POLLEN & SPORES	18.1	10.2-28.8	3	1
PLANT TISSUE	19.6	7.2-40.7	9	2
STARCH	14.9	10.2-20.4	1	<1
MISCELLANEOUS				
FERROUS METAL			0	0
RUBBER			0	0

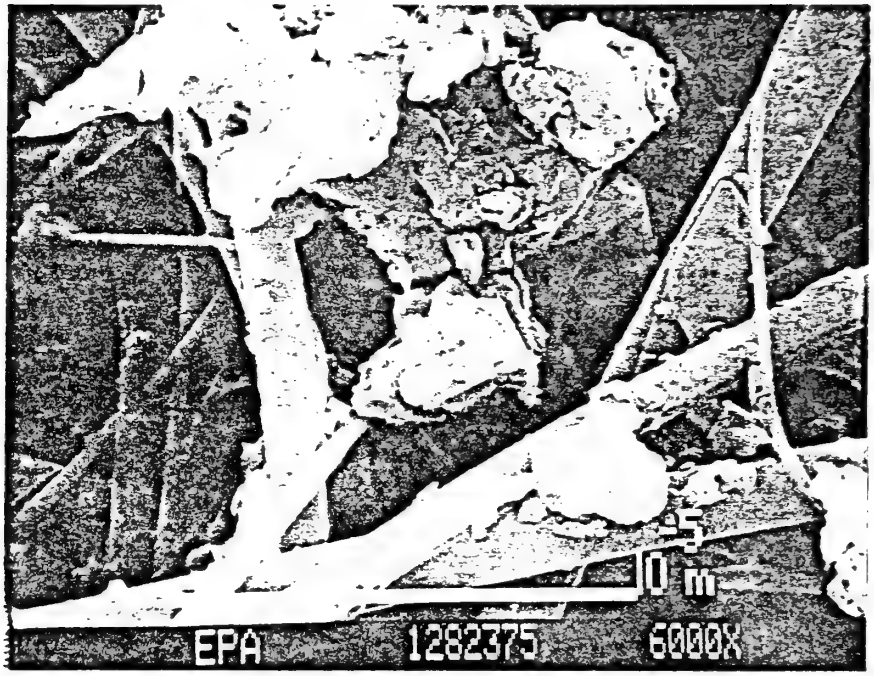
PARTICLE SIZE DISTRIBUTION

SIZE RANGE (UM)	NUMBER PERCENT	WEIGHT PERCENT
1.3 - 1.8	0	0
1.8 - 2.5	0	0
2.5 - 3.6	16	<1
3.6 - 5.1	25	4
5.1 - 7.2	24	9
7.2 - 10.2	21	24
10.2 - 14.4	11	32
14.4 - 20.4	3	22
20.4 - 28.8	<1	4
28.8 - 40.7	<1	4
40.7 - 57.6	0	0
57.6 - 81.5	0	0
81.5 - 115.2	0	0
115.2 - 162.9	0	0
162.9 - 230.4	0	0
>230.4	0	0

Filter number	1282375

Inhalable Particulate	$\mu g/m^3$		46
Particulate: Minerals	38.7	Combustion	1.8
Biological	6.0	Other	-
Low temperature ashing, % loss			2.0





A. Site Identification

1. City: Peoria

2. Site Name and Address: State Welfare Office, 610 N.E. Jefferson

3. County: Peoria Township: Peoria

4. USGS Topographical Map Name and Scale: Peoria-East, 1:24000

5. Site Elevation (Feet): 510

B. Site Classification/Representativeness

1. Dominating Influence on Site: Commercial, Residential

C. Source Impact

1. Stationary Sources that may Influence Site:

Name of Source	Location	Direction From Site	Distance From Site	Pollutant	Emissions (Tons/Yr)
Peoria Brick & Tile	Cole St. E. Peoria	S	2.4 mi	TSP	664
CILCO - Wallace Sta.	1126 W. Camp St. E. Peoria	S	.9 mi	TSP	5,661
				SO_2	3,751
				NO_x	2,348
				CO	131
Gulf Coast Grain, Inc.	Altoffer Lane E. Peoria	S	.9 mi	TSP	790
Asphalt Assoc. Inc.	500 W. Camp St. E. Peoria	S	1.6 mi	TSP	7,875
Corn Products	1300 S. Second St., Pekin	SSW	10.4 mi	TSP	265,338
				SO_2	3,825
				NO_x	1,893
				CO	105
Com-Ed Powerton	Box 158 Pekin	SSW	11.8 mi	TSP	188,235
				SO_2	67,566
				NO_x	136,221
				HC	743
				CO	2,482

Caterpillar Tractor Co.	2400 S.W. Washington, Peoria	SW	2.1 mi	TSP HC	714 115
ADM Riverside	Edmund St. Peoria	SSW	1.6 mi	TSP	3,743
Keystone Steel & Wire Div.	2000 S. Adams St., Peoria	SW	4.9 mi	TSP NO_x	3,902 458
Peoria Blacktop	3300 W. Southport Rd., Peoria	WNW	4.2 mi	TSP	2,960
Bemis Co. Inc.	Ft. of Sloan St. Peoria	NE	1.5 mi	TSP SO_2 NO_x	1,639 1,301 381
Celotex Corp	2226 W. Clarke St., Peoria	SW	4.1 mi	TSP SO_2 NO_x	5,392 2,307 794
George E. Hoffman & Sons	94 S. Sanger St. Peoria	SW	2.5 mi	TSP	1,834
United Ready Mix, Inc.	Ft. of Green St. Peoria	SE	.2 mi	TSP	134
Wahlfeld Mfg. Co.	1100 SW Washington Peoria	SW	1.4 mi	TSP	156
Hiram Walker & Son	Ft. of Edmund Peoria	SW	1.6 mi	TSP NO_x HC	45,453 112 2,979
Pabst Brewing Co.	709 N.E. Water St. Peoria	S	.3 mi	TSP SO_2	1,662 146
Seneca Petroleum Co.	11 Sanger St. Peoria	SSW	2.9 mi	TSP	1,176
Allied Mills Inc.	7501 S. Adams St., Bartonville	SW	5.7 mi	TSP	407,969
CILCO Edwards	Rural Bartonville	SW	8.1 mi	TSP SO_2 NO_x HC	169,975 28,276 17,239 958
Pabst Brewing Co.	4541 N. Prospect Peoria Heights	N	3.2 mi	TSP NO_x	29,451 194
Peoria Barge Terminal	1925 Darst St. St., Peoria	SW	3.2 mi	TSP	265

llied Iron & Steel o.	2900 W. Clarke St., Peoria	SW	4.0 mi	TSP	12,740
ork Foundry Supply o.	2424 W. Clarke St., Peoria	SW	3.9 mi	TSP	2,057
aterpillar	600 W. Washington East Peoria	SSW	1.6 mi	TSP SO_2 NO_x HC CO	5,108 6,959 929 567 131
aterpillar Tractor	Route 24 Mapleton	SW	12.2 mi	TSP SO_2 NO_x HC	243,324 8,858 1,094 3,565
aterpillar Tractor	2411 W. Clarke St., Peoria	SW	3.8 mi	TSP	1,664

2. Mobile Sources that may Influence the Site:

Names of Roadways:	Jefferson	Adams	Hancock	Green
Type:	Arterial Street	Arterial	Local	Local
Distance of Roadway from Site (ft)	100	290	220	165
Composition of Roadway	Asphalt	Asphalt	Asphalt	Asphalt
Number of Traffic Lanes	3	3	2	2
Average Daily Traffic	1560	15500	1000	1000
Average Vehicle Speed (mph)	35	35	25-30	25-30
One or Two Way Traffic	One	One	Two	Two
Number of Parking Lanes	Two	None	None	None
Are Parking Lanes Used For Traffic Part of Day?	No	N/A	N/A	N/A
Is Dust Visibiity Retained	No	No	No	No
Does Roadway Have Curb	Yes	Yes	Yes	Yes

3. Area Sources that may Influence the Site:

Type of Source	Direction from Site	Distance from Site	Pollutant
Parking lot (gravel)	NW	153'	TSP
Parking lot (cinder & gravel)	NE	93'	TSP
Alley (asphalt & gravel)	SE	65'	TSP
Parking lot (cement & gravel)	SE & S	Directly by building	TSP
Rail yards	SE - E	.5 mi	TSP
Parking lot	SW	180'	TSP
Vacant lot	SE	90'	TSP

D. Topography/Obstructions

1. General Characteristics Over a 2 Mile Radius From the Site: Rolling

2. Topographic Features that Influence the Site: (Types - hills, valleys, depressions, bodies of water, ridges, cliffs)

Type	Size	Direction From Site	Distance From Site
River	.3 mi wide	S	.5 mi
Peoria Lake	1.7 mi across	E	.5 mi
River Valley	Elevation: 450'	S,E	Sloping from 510' t 450' within .5 mi
Hill	600' elevation	WNW	.8 mi

3. Obstructions to Wind Flow
(Types - buildings, trees, ridges, cliffs)

Type	Size	Direction From Site	Distance From Site
None			

4. Comments

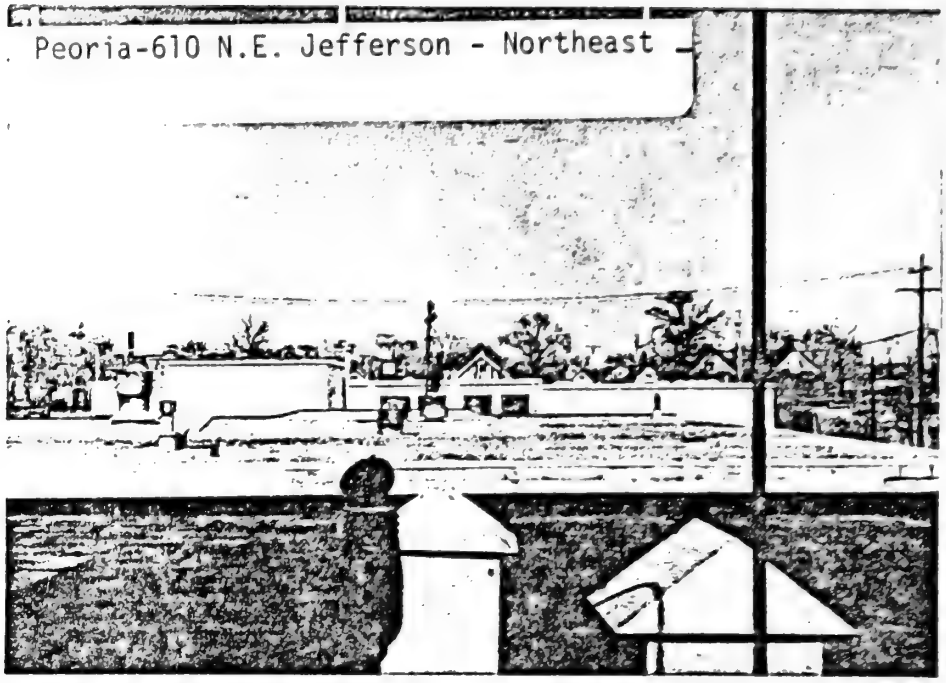
Site (ele. 510') located N + NW of river valley (ele. 450'). Approximately 8/10 mi to the WNW, the elevation rises to 600'.

E. Distance to the nearest National Weather Service (NWS) Site.

Here are the distances and directions to the nearest NWS observing site from the inhalable particulate monitor in Peoria. Distances are in statute miles; directions are degrees from true north.

Site Address	Nearest NWS Site	Directions and Distance to NWS
610 NE Jefferson	Peoria Airport (PIA)	245^{o} at 5.6 mi. (WSW)

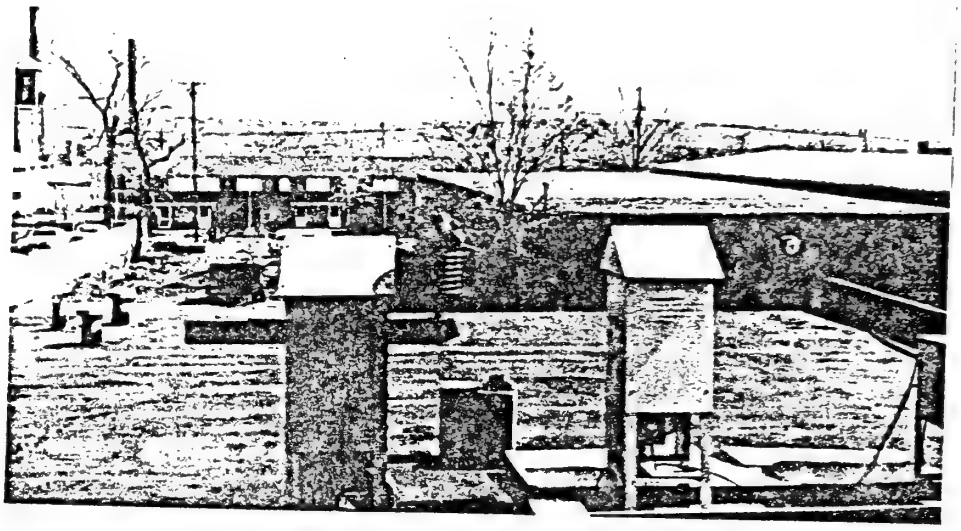
Peoria-610 N.E. Jefferson - Northeast



Peoria - North East

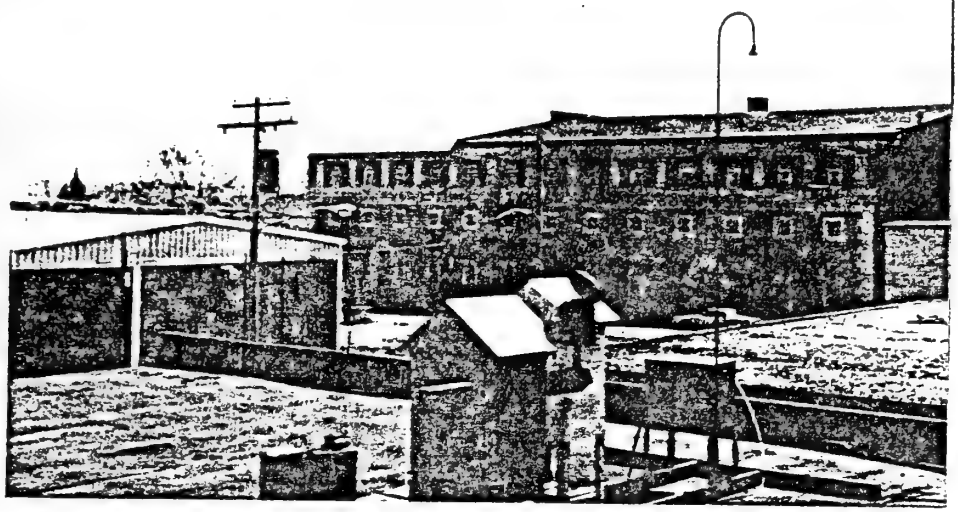
- A 36 -

Peoria-610 N.E. Jefferson - Southeast



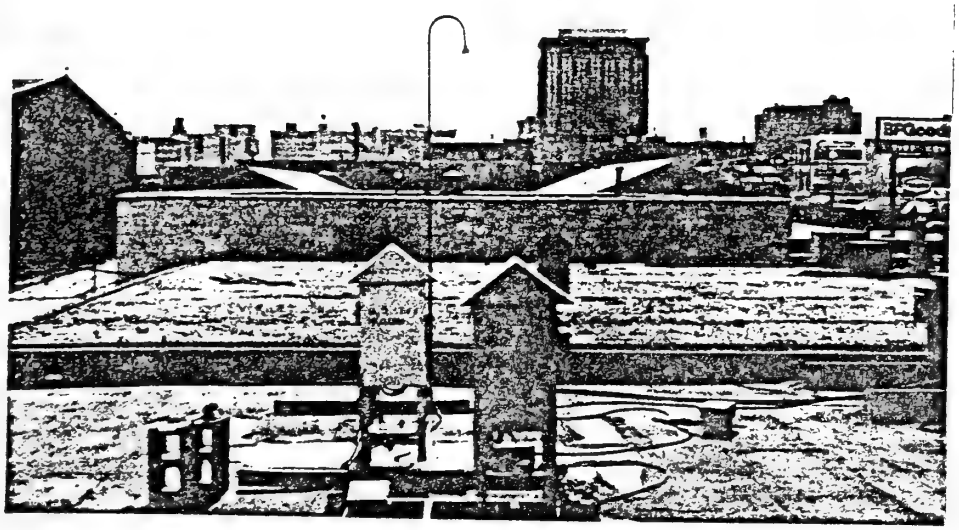
Peoria - South East

Peoria-610 N.E. Jefferson - South



Peoria - South

Peoria-610 N.E. Jefferson - Southwest

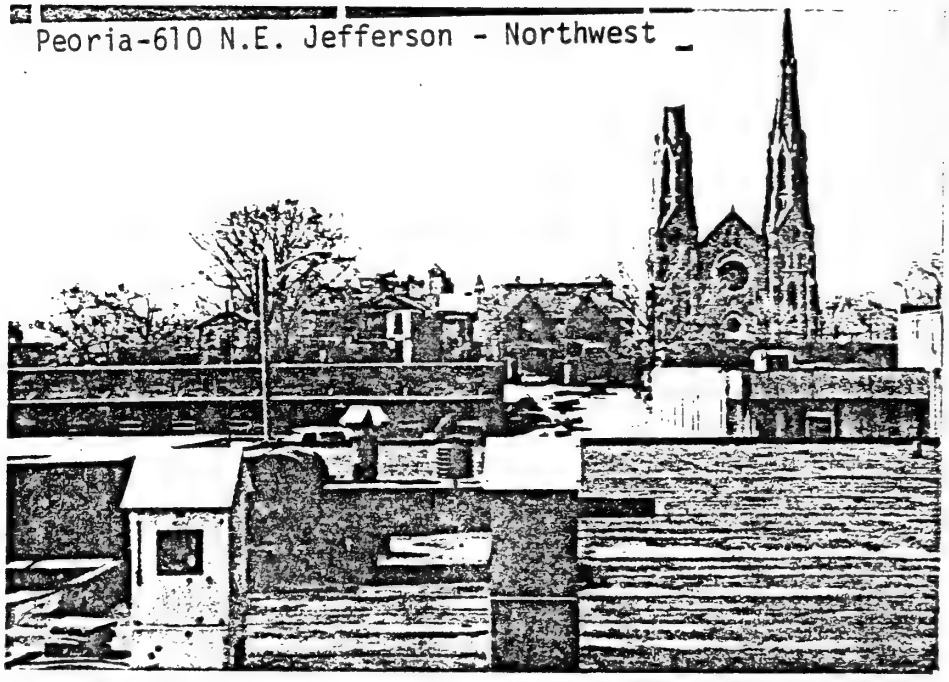


Peoria - South West

Peoria-610 N.E. Jefferson - West

Peoria - West

Peoria-610 N.E. Jefferson - Northwest



Peoria - North West

OPTICAL MICROSCOPE ANALYSIS

LTER NUMBER : 1229197 NETWORK :
SITE : PEORIA
LLECTION DATE : 04/04/81 OBJECTIVE MAG. : 10

COMPONENT	AVERAGE PART. SIZE	RANGE	WEIGHT PERCENT	Number Percent
MINERALS				
QUARTZ/FELDSPARS	17.4	6.4-36.2	40	27
LIMESTONE	16.9	4.5-36.2	37	40
IRON OXIDES	22.7	12.8-36.2	5	1
OTHER MINERALS			0	0
COMBUSTION PRODUCTS				
SOOT	23.9	6.4-51.1	7	13
GLASSY FLYASH SPHERES			0	0
BIOLOGICAL				
POLLEN & SPORES	26.4	18.1-36.2	5	3
PLANT TISSUE	11.4	6.4-18.1	2	15
STARCH	18.7	12.8-25.6	1	2
MISCELLANEOUS				
FERROUS METAL	21.9	18.1-25.6	2	<1
RUBBER			0	0

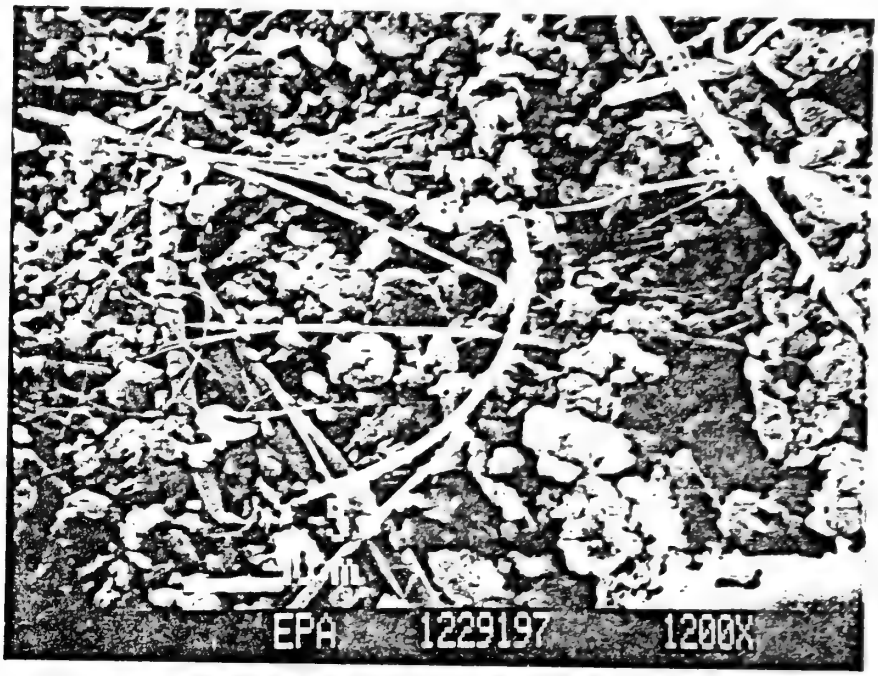
PARTICLE SIZE DISTRIBUTION

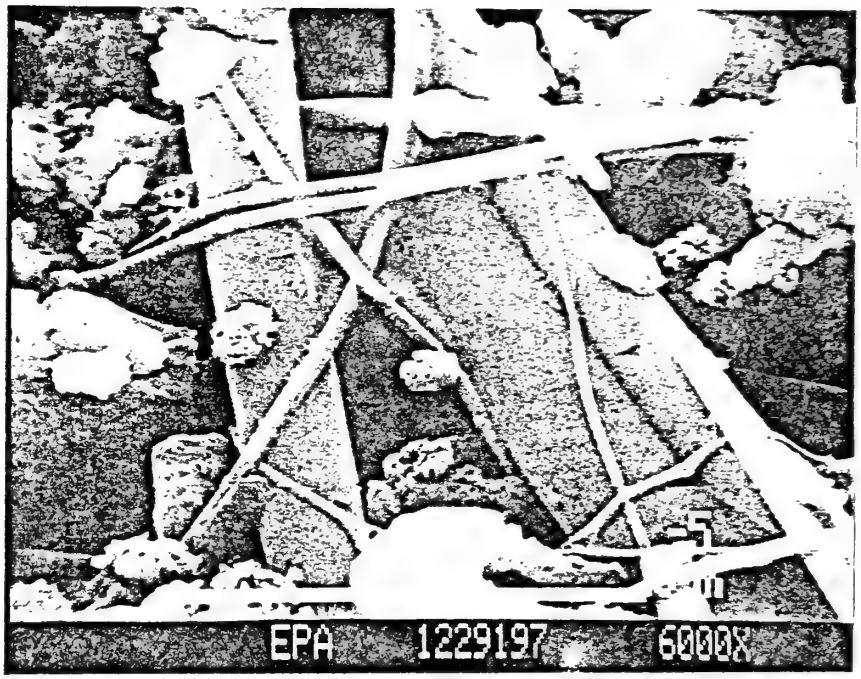
SIZE RANGE (UM)	NUMBER PERCENT	WEIGHT PERCENT
3.2 - 4.5	0	0
4.5 - 6.4	16	<1
6.4 - 9.0	10	<1
9.0 - 12.8	23	5
12.8 - 18.1	23	11
18.1 - 25.6	21	42
25.6 - 36.2	8	38
36.2 - 51.1	<1	3
51.1 - 72.3	0	0
72.3 - 102.3	0	0
102.3 - 144.6	0	0
144.6 - 204.6	0	0
204.6 - 289.3	0	0
289.3 - 409.1	0	0
409.1 - 578.6	0	0
>578.6	0	0

Filter number	1229197

Total Suspended Particulate $\mu g/m^3$	175

Particulate: Minerals	143.5	Combustion	12.3
Biological	14	Other	3.5
Low temperature ashing, % loss			2.2





OPTICAL MICROSCOPE ANALYSIS

FILTER NUMBER : 1229193
COLLECTION DATE : 04/04/81

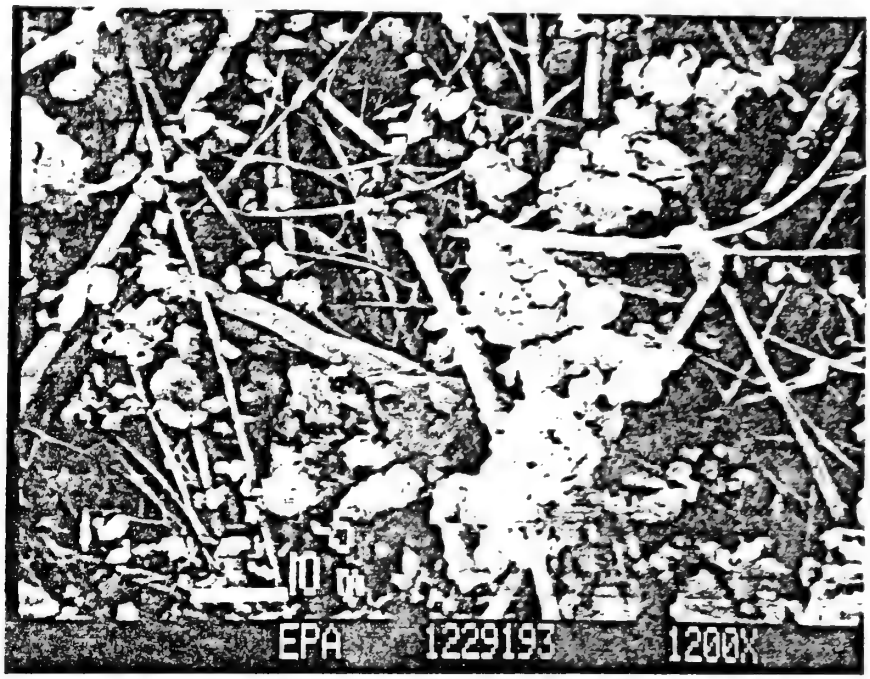
NETWORK :
SITE : PEORIA
OBJECTIVE MAG. : 10

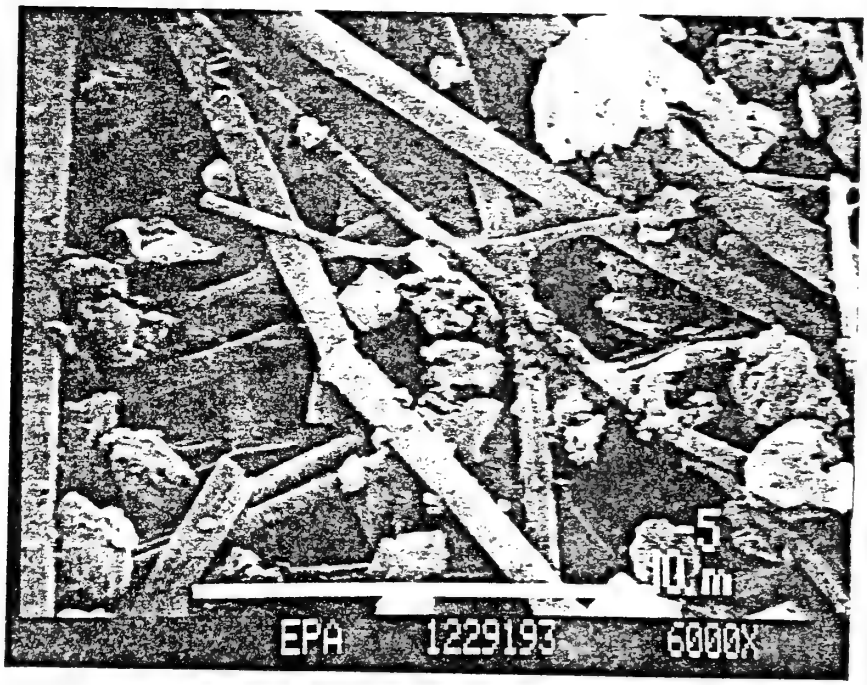
COMPONENT	AVERAGE PART. SIZE	RANGE	WEIGHT PERCENT	Number Percent
MINERALS				
QUARTZ/FELDSPARS	24.6	9.0-51.1	49	17
LIMESTONE	14.7	3.2-36.2	17	32
IRON OXIDES	28.0	12.8-51.1	16	4
OTHER MINERALS			0	0
COMBUSTION PRODUCTS				
SOOT	27.5	6.4-72.3	10	18
GLASSY FLYASH SPHERES			0	0
BIOLOGICAL				
POLLEN & SPORES	28.0	12.8-51.1	7	6
PLANT TISSUE	11.4	6.4-18.1	<1	22
STARCH	13.2	9.0-18.1	<1	1
MISCELLANEOUS				
FERROUS METAL			0	0
RUBBER			0	0

PARTICLE SIZE DISTRIBUTION

SIZE RANGE (UM)	NUMBER PERCENT	WEIGHT PERCENT
3.2 - 4.5	5	<1
4.5 - 6.4	3	<1
6.4 - 9.0	19	<1
9.0 - 12.8	16	2
12.8 - 18.1	28	10
18.1 - 25.6	17	19
25.6 - 36.2	6	14
36.2 - 51.1	5	52
51.1 - 72.3	<1	2
72.3 - 102.3	0	0
102.3 - 144.6	0	0
144.6 - 204.6	0	0
204.6 - 289.3	0	0
289.3 - 409.1	0	0
409.1 - 578.6	0	0
>578.6	0	0

Filter number			1229193
Inhalable Particulate	$\mu g/m^3$		116
Particulate: Minerals	95.1	Combustion	11.6
Biological	8.1	Other	-
Low temperature ashing, % loss			0.0





OPTICAL MICROSCOPE ANALYSIS

ILTER NUMBER : 1230657
OLLECTION DATE : 06/03/81

NETWORK :
SITE : PEORIA
OBJECTIVE MAG. : 25

COMPONENT	AVERAGE PART. SIZE	RANGE	WEIGHT PERCENT	Number Percent
MINERALS				
QUARTZ/FELDSPARS	21.9	5.1-57.6	38	8
LIMESTONE	16.3	1.8-57.6	35	62
IRON OXIDES	6.9	2.5-14.4	<1	1
OTHER MINERALS			0	0
COMBUSTION PRODUCTS				
SOOT	8.7	2.5-20.4	5	26
GLASSY FLYASH SPHERES			0	0
BIOLOGICAL				
POLLEN & SPORES	24.5	7.2-57.6	8	3
PLANT TISSUE	44.5	20.4-81.5	14	1
STARCH			0	0
MISCELLANEOUS				
FERROUS METAL			0	0
RUBBER			0	0

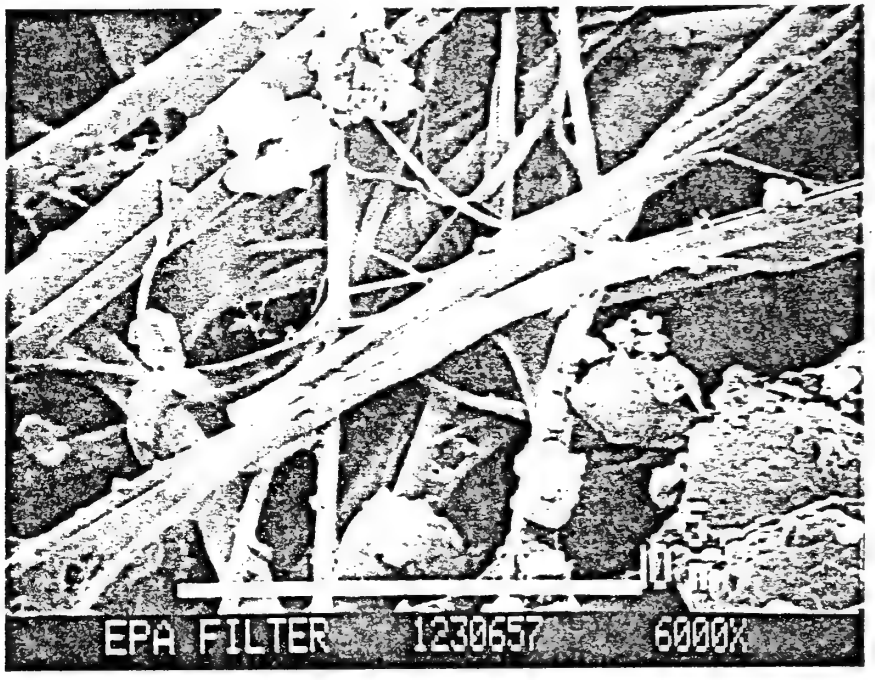
PARTICLE SIZE DISTRIBUTION

SIZE RANGE (UM)	NUMBER PERCENT	WEIGHT PERCENT
1.3 - 1.8	0	0
1.8 - 2.5	11	<1
2.5 - 3.6	20	<1
3.6 - 5.1	13	<1
5.1 - 7.2	9	<1
7.2 - 10.2	27	8
10.2 - 14.4	11	8
14.4 - 20.4	6	13
20.4 - 28.8	2	12
28.8 - 40.7	<1	10
40.7 - 57.6	<1	38
57.6 - 81.5	<1	9
81.5 - 115.2	0	0
115.2 - 162.9	0	0
162.9 - 230.4	0	0
>230.4	0	0

Filter number	1230657

Total Suspended Particulate $\mu g/m^3$	87

Particulate: Minerals	63.5	Combustion	4.4
Biological	19.1	Other	-
Low temperature ashing, % loss			59.2



OPTICAL MICROSCOPE ANALYSIS

FILTER NUMBER : 1230654
NETWORK :
SITE : PEORIA
COLLECTION DATE : 06/03/81
OBJECTIVE MAG. : 25

COMPONENT	AVERAGE PART. SIZE	RANGE	WEIGHT PERCENT	Number Percent
MINERALS				
QUARTZ/FELDSPARS	10.9	2.5-28.8	37	35
LIMESTONE	7.7	1.8-20.4	21	44
IRON OXIDES	9.8	3.6-20.4	3	2
OTHER MINERALS			0	0
COMBUSTION PRODUCTS				
SOOT	10.9	2.5-28.8	17	18
GLASSY FLYASH SPHERES			0	0
BIOLOGICAL				
POLLEN & SPORES	24.3	5.1-81.5	20	2
PLANT TISSUE	18.1	10.2-28.8	2	1
STARCH	13.1	7.2-20.4	<1	1
MISCELLANEOUS				
FERROUS METAL			0	0
RUBBER			0	0

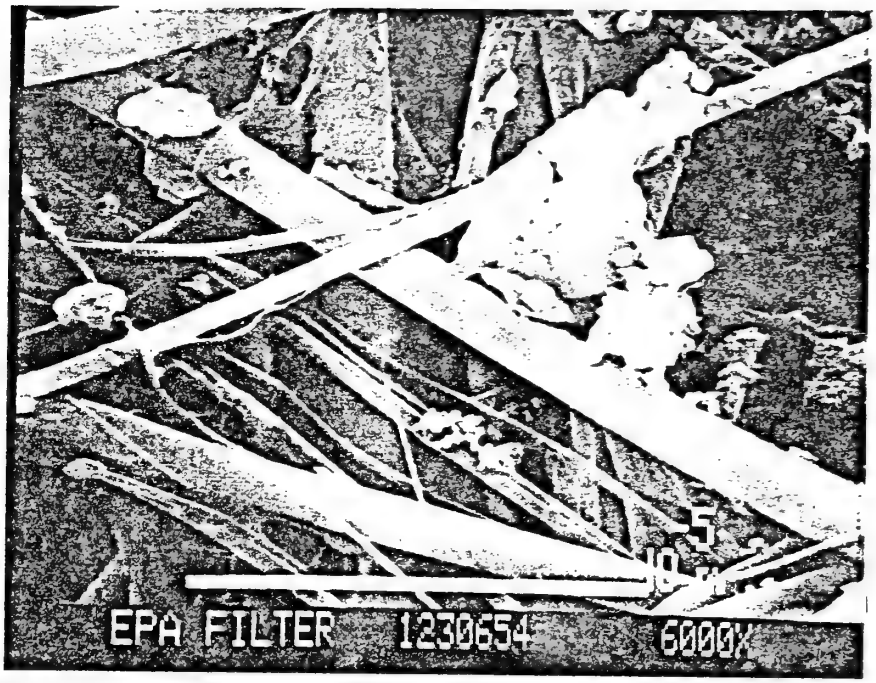
PARTICLE SIZE DISTRIBUTION

SIZE RANGE (UM)	NUMBER PERCENT	WEIGHT PERCENT
1.3 - 1.8	0	0
1.8 - 2.5	2	<1
2.5 - 3.6	17	<1
3.6 - 5.1	11	<1
5.1 - 7.2	25	5
7.2 - 10.2	18	9
10.2 - 14.4	20	28
14.4 - 20.4	3	13
20.4 - 28.8	3	26
28.8 - 40.7	0	0
40.7 - 57.6	0	0
57.6 - 81.5	<1	19
81.5 - 115.2	0	0
115.2 - 162.9	0	0
162.9 - 230.4	0	0
>230.4	0	0

Filter number	1230654

Inhalable Particulate	$\mu g/m^3$ 59

Particulate: Minerals	36	Combustion	10
Biological	13	Other	-
Low temperature ashing, % loss			24.1



OPTICAL MICROSCOPE ANALYSIS

ILTER NUMBER : 1282108 NETWORK :
SITE : PEORIA
OLLECTION DATE : 12/18/81 OBJECTIVE MAG. : 25

COMPONENT	AVERAGE PART. SIZE	RANGE	WEIGHT PERCENT	Number Percent
MINERALS				
QUARTZ/FELDSPARS	8.7	2.5-20.4	8	8
LIMESTONE	12.4	2.5-40.7	83	49
IRON OXIDES	6.4	3.6-10.2	<1	1
OTHER MINERALS			0	0
COMBUSTION PRODUCTS				
SOOT	6.9	2.5-14.4	5	37
GLASSY FLYASH SPHERES			0	0
BIOLOGICAL				
POLLEN & SPORES	10.1	3.6-20.4	<1	1
PLANT TISSUE	11.1	5.1-20.4	1	2
STARCH	10.5	7.2-14.4	2	2
MISCELLANEOUS				
FERROUS METAL			0	0
RUBBER			0	0

PARTICLE SIZE DISTRIBUTION

SIZE RANGE (UM)	NUMBER PERCENT	WEIGHT PERCENT
1.3 - 1.8	0	0
1.8 - 2.5	0	0
2.5 - 3.6	24	<1
3.6 - 5.1	22	2
5.1 - 7.2	22	6
7.2 - 10.2	18	14
10.2 - 14.4	8	16
14.4 - 20.4	6	39
20.4 - 28.8	0	0
28.8 - 40.7	<1	22
40.7 - 57.6	0	0
57.6 - 81.5	0	0
81.5 - 115.2	0	0
115.2 - 162.9	0	0
162.9 - 230.4	0	0
>230.4	0	0

Filter number	1282108

Total Suspended Particulate $\mu g/m^3$	50

Particulate: Minerals	45.5	Combustion	2.5
Biological	15	Other	-
Low temperature ashing, % loss			33.9

OPTICAL MICROSCOPE ANALYSIS

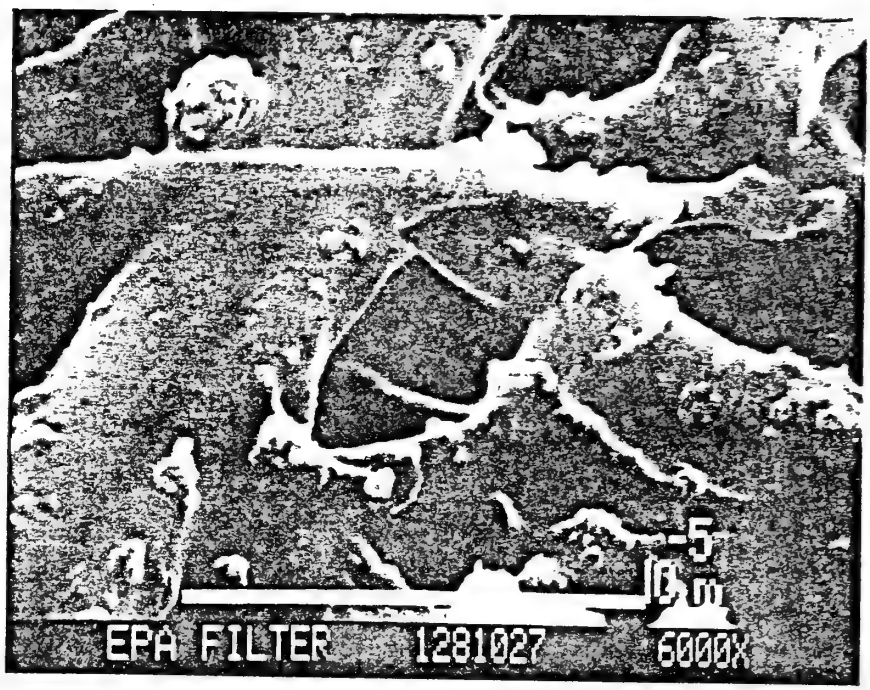
ILTER NUMBER : 1281027 NETWORK :
SITE : PEORIA
OLLECTION DATE : 12/18/81 OBJECTIVE MAG. : 25

COMPONENT	AVERAGE PART. SIZE	RANGE	WEIGHT PERCENT	Number Percent
MINERALS				
QUARTZ/FELDSPARS	15.5	3.6-40.7	34	10
LIMESTONE	11.6	2.5-40.7	27	54
IRON OXIDES	4.4	3.6-5.1	<1	<1
OTHER MINERALS			0	0
COMBUSTION PRODUCTS				
SOOT	12.0	1.8-40.7	9	33
GLASSY FLYASH SPHERES			0	0
BIOLOGICAL				
POLLEN & SPORES	8.7	7.2-10.2	<1	<1
PLANT TISSUE	29.8	5.1-81.5	30	2
STARCH	10.5	7.2-14.4	<1	<1
MISCELLANEOUS				
FERROUS METAL			0	0
RUBBER	8.7	7.2-10.2	<1	<1

PARTICLE SIZE DISTRIBUTION

SIZE RANGE (UM)	NUMBER PERCENT	WEIGHT PERCENT
1.3 - 1.8	0	0
1.8 - 2.5	10	<1
2.5 - 3.6	31	<1
3.6 - 5.1	18	1
5.1 - 7.2	16	3
7.2 - 10.2	17	8
10.2 - 14.4	7	10
14.4 - 20.4	<1	2
20.4 - 28.8	<1	8
28.8 - 40.7	1	40
40.7 - 57.6	0	0
57.6 - 81.5	<1	26
81.5 - 115.2	0	0
115.2 - 162.9	0	0
162.9 - 230.4	0	0
>230.4	0	0

Inhalable Particulate	$\mu g/m^3$		41
Particulate: Minerals	25	Combustion	3.7
Biological	12.3	Other	-
Low temperature ashing, % loss			3.3



A. Site Identification

1. City: Granite City

2. Site Name and Address: Fire Station #1, 23rd & Madison

3. County: Madison Township: Granite City

4. USGS Topographical Map Name and Scale: Granite City, IL-MO 1:24000

5. Site Elevation (Feet): 420

B. Site Classification/Representativeness

1. Dominating Influence on Site: Industrial, Commercial

C. Source Impact

1. Stationary Sources that may Influence Site:

Name of Source	Location	Direction From Site	Distance From Site	Pollutant	Emissions (Tons/Yr)
American Steel Foundaries	1700 Walnut	W	1.0 mi	TSP	11,588
U.S. Army Support Cntr.	Niedring-haus	WSW	1.7 mi	SO2	111
Nestle Co.	2101 Adams	WNW	0.6 mi	TSP SO2	1,232 324
Reilly Tar & Chemical	19th & Edwardsville	S	1.2 mi	TSP Hc	620 7,800
American Colloid	1601 Walnut	W	1.1 mi	TSP	2,409
National Lead	16th & Cleveland	WSW	1.1 mi	TSP SO2	8,227 526
ADM-Granite City	3601 Cargill	ENE	3.3 mi	TSP	14,291

Granite City Steel (BOF)	20th & State (20th & Madison)	SSW-SW	0.7 mi	TSP SO_2	159,943 9,201
(Sinter Plant)	(20th & Edwardsville)	SSE	0.9 mi	NO_x	2,843
(Coke Plant)	(Nameoki & Edwardsville)	ESE	1.0 mi	CO Hc	92,283 1,284
Tri-State Regional Port District	2801 Rock Rd.	W	2.1 mi	TSP	3,844
International Mill Service	22nd & Edwardsville Rd.	SE	0.5 mi	TSP	799

2. Mobile Sources that may Influence the Site:

Names of Roadways:	Madison	23rd	Iowa
Type:	Arterial Street	Local Street	Local
Distance of Roadway from Site (ft)	140	155	120
Composition of Roadway	Asphalt	Asphalt	Asphalt
Number of Traffic Lanes	4	2	1
Average Daily Traffic	19,300	6000	1000
Average Vehicle Speed (mph)	25	20	20
One or Two Way Traffic	Two	Two	One (NE)
Number of Parking Lanes	None	None	Two
Are Parking Lanes Used For Traffic Part of Day?	N/A	N/A	Yes
Is Dust Visibiity Retained	No	No	No
Does Roadway Have Curb	Yes	Yes	Yes

3. Area Sources that may Influence the Site:

Type of Source	Direction From Site	Distance From Site	Pollutant
St. Louis Met area	SSW		Part. as well as SO_2, HC, NO_x, and O_3

D. Topography/Obstructions

1. General Characteristics Over a 2 Mile Radius From the Site: Smooth

2. Topographic Features that Influence the Site: (Types - hills, valleys, depressions, bodies of water, ridges, cliffs)

Type	Size	Direction From Site	Distance From Site
None			

3. Obstructions to Wind Flow (Types - buildings, trees, ridges, cliffs)

Type	Size	Direction From Site	Distance From Site
None			

E. Distance to the nearest National Weather Service (NWS) Site. Here are the distances and directions to the nearest NWS observing site from the inhalable particulate monitor in Granite City. Distances are in statute miles; directions are degrees from true north.

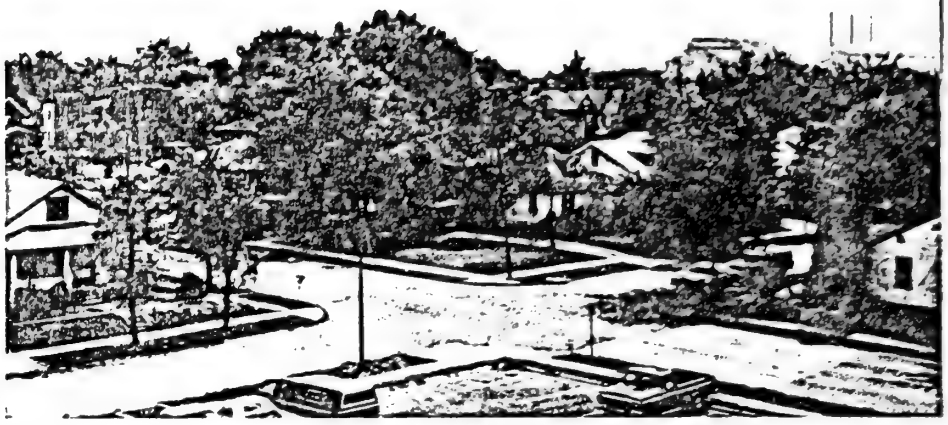
Site Address	Nearest NWS Site	Directions and Distance to NWS
Fire Station #1 23rd and Madison	Lambert Airport/ St. Louis (STL)	280° at 13 mi. (W)

Bi-State Airport (CPS) is about 8 miles south of Granite City (to CPS from FS#1, 190° at 8.9 mi; from E 20th, 190° at 8.3 mi.).
Alton Airport (ALN) is about 14 miles north of Granite City (to ALN from FS#1, 020° at 14 mi; from E 20th, 020° at 14.8 mi).
Scott AFB (BLV) is about 19 miles southeast of Granite City (to BLV from FS#1, 130° at 19 mi; from E 20th, 125° at 19 mi).

Data from all of these sites are available to the IEPA through WSI, but only ALN appears on our Service "A" teletype circuit. None of these sites is a NWS site, and no Local Climatological Data (LCDs) are issued for them.

Granite City
23rd & Madison

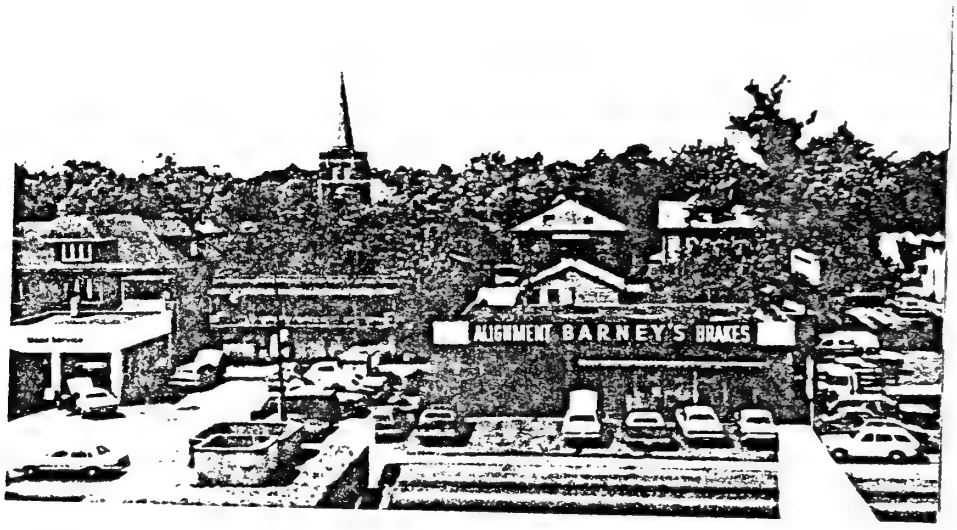
Looking S



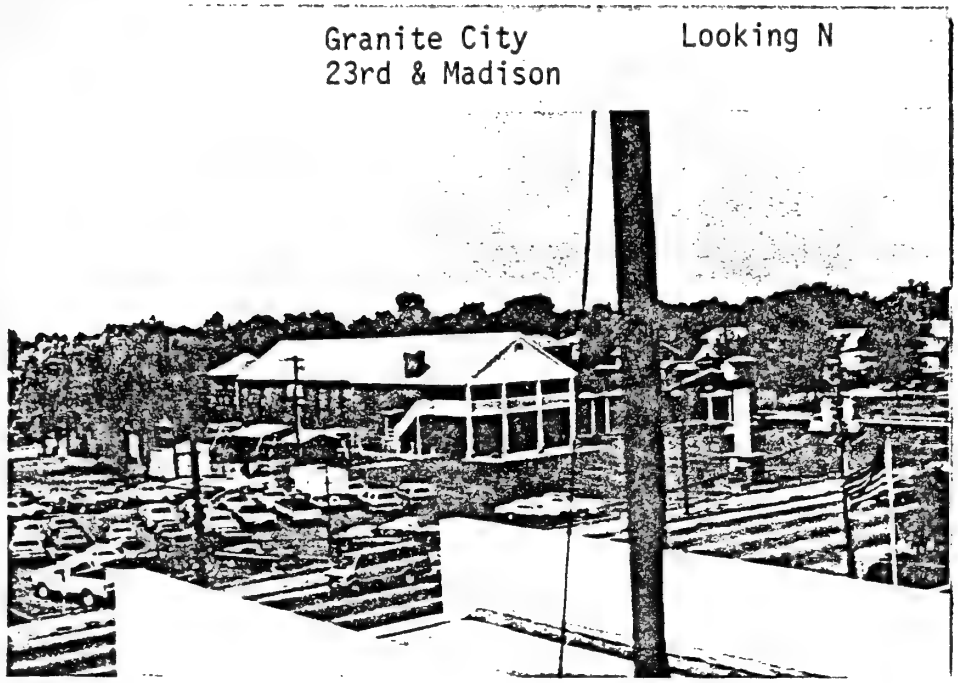
Granite City (Fire Station No. 1) - South

Granite City
23rd & Madison

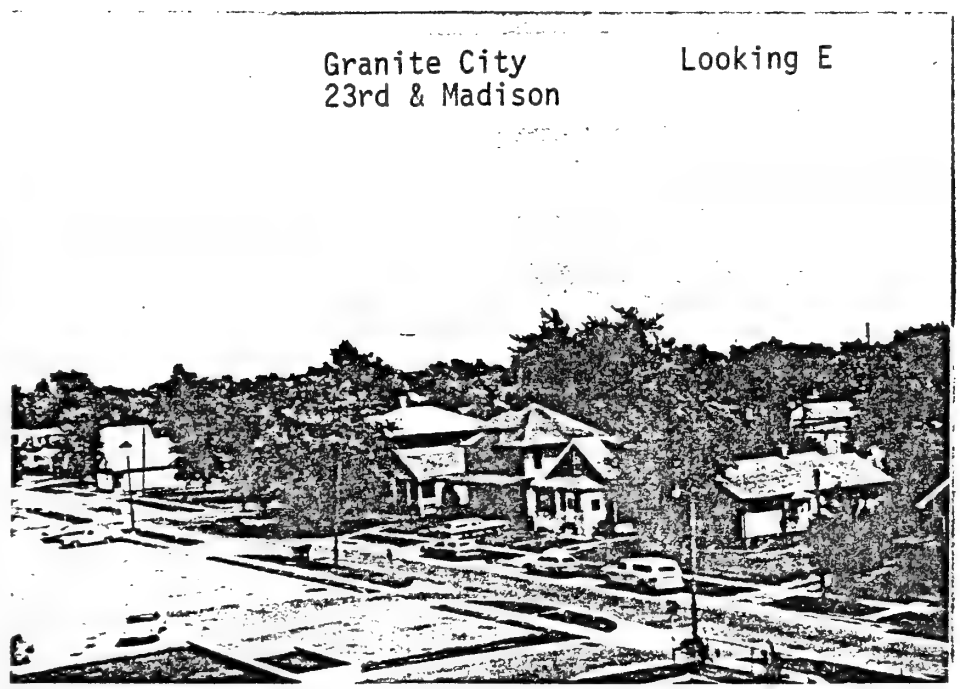
Looking NW



Granite City (Fire Station No. 1) North West



Granite City (Fire Station No. 1) North



Granite City (Fire Station No. 1) - East

OPTICAL MICROSCOPE ANALYSIS

FILTER NUMBER : 1277777
NETWORK :
SITE : GRANITECITY/FIREST. 1
COLLECTION DATE : 08/14/81
OBJECTIVE MAG. : 25

COMPONENT	AVERAGE PART. SIZE	RANGE	WEIGHT PERCENT	Number Percent
MINERALS				
QUARTZ/FELDSPARS	24. 8	5. 1-81. 5	59	7
LIMESTONE	23. 0	2. 5-81. 5	22	60
IRON OXIDES	13. 3	3. 6-40. 7	5	8
OTHER MINERALS			0	0
COMBUSTION PRODUCTS				
SOOT	21. 4	5. 1-57. 6	10	17
GLASSY FLYASH SPHERES			0	0
BIOLOGICAL				
POLLEN & SPORES			0	0
PLANT TISSUE	28. 4	10. 2-57. 6	3	1
STARCH	12. 3	10. 2-14. 4	<1	<1
MISCELLANEOUS				
FERROUS METAL	6. 4	3. 6-10. 2	2	8
RUBBER			0	0

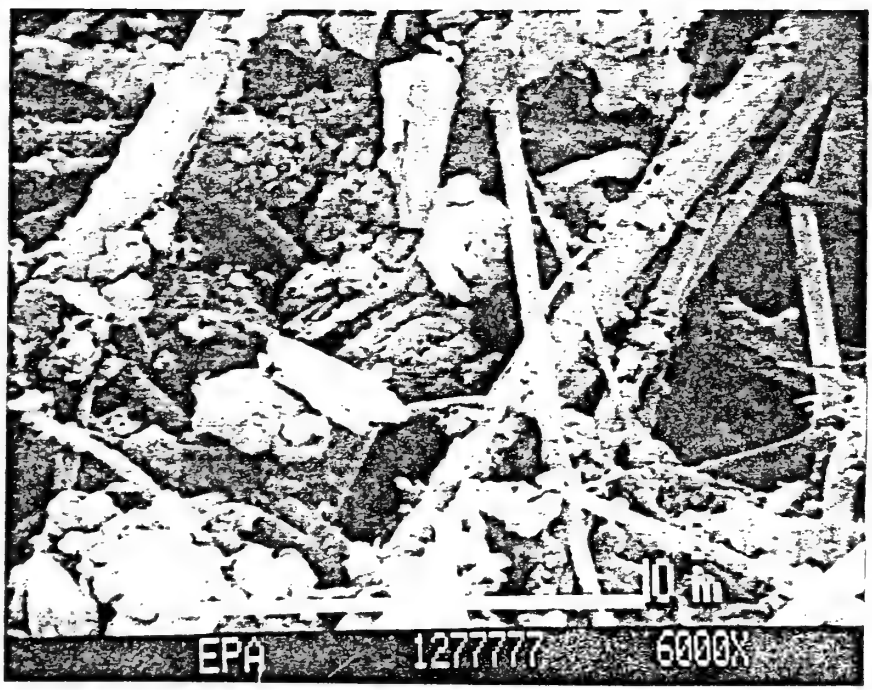
PARTICLE SIZE DISTRIBUTION

SIZE RANGE (UM)	NUMBER PERCENT	WEIGHT PERCENT
1. 3 - 1. 8	0	0
1. 8 - 2. 5	0	0
2. 5 - 3. 6	14	<1
3. 6 - 5. 1	17	<1
5. 1 - 7. 2	32	2
7. 2 - 10. 2	17	3
10. 2 - 14. 4	9	4
14. 4 - 20. 4	5	4
20. 4 - 28. 8	2	5
28. 8 - 40. 7	2	15
40. 7 - 57. 6	<1	7
57. 6 - 81. 5	<1	60
81. 5 - 115. 2	0	0
115. 2 - 162. 9	0	0
162. 9 - 230. 4	0	0
>230. 4	0	0

Filter number	1277777

Total Suspended Particulate $\mu g/m^3$	184

Particulate: Minerals	158.2	Combustion	18.4
Biological	5.5	Other	3.7
Low temperature ashing, % loss			11.3



OPTICAL MICROSCOPE ANALYSIS

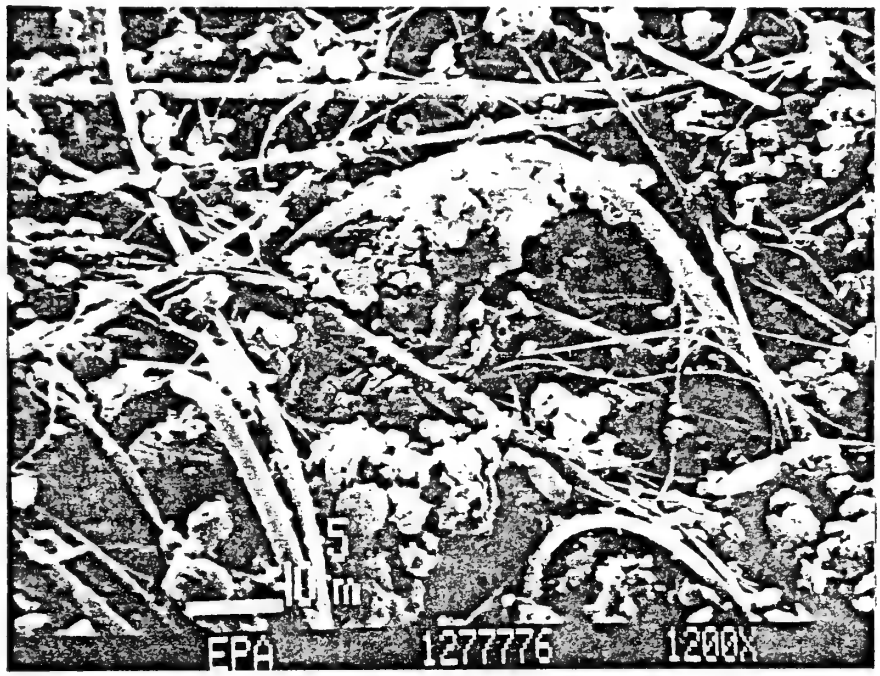
FILTER NUMBER : 1277776
NETWORK :
SITE : GRANITECITY/FIREST. 1
COLLECTION DATE : 08/14/81
OBJECTIVE MAG. : 25

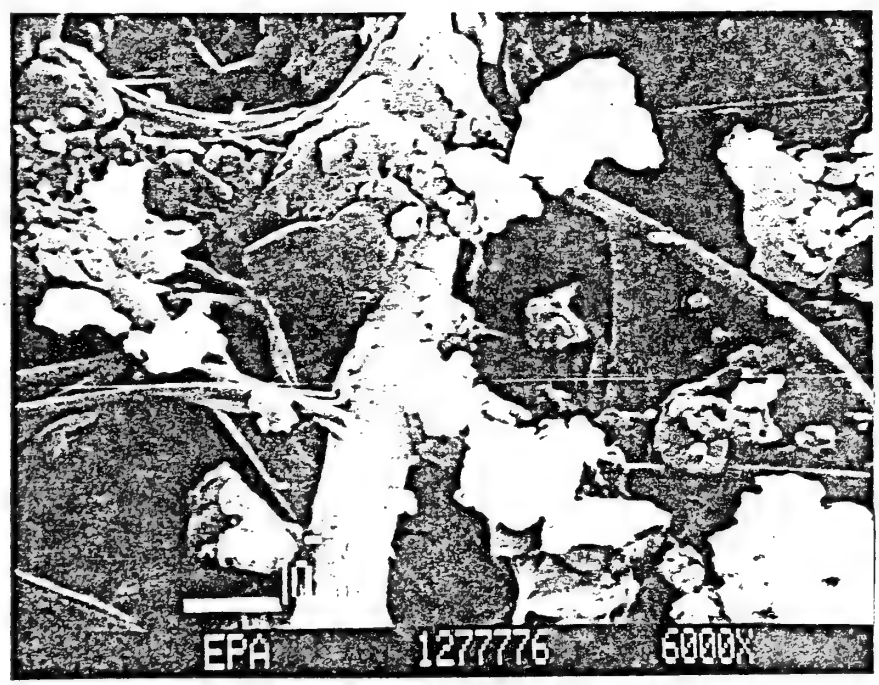
COMPONENT	AVERAGE PART. SIZE	RANGE	WEIGHT PERCENT	Number Percent
MINERALS				
QUARTZ/FELDSPARS	10.9	2.5-28.8	32	15
LIMESTONE	7.7	1.8-20.4	26	42
IRON OXIDES	7.9	3.6-14.4	10	6
OTHER MINERALS			0	0
COMBUSTION PRODUCTS				
SOOT	9.8	3.6-20.4	19	29
GLASSY FLYASH SPHERES			0	0
BIOLOGICAL				
POLLEN & SPORES	9.1	5.1-14.4	<1	1
PLANT TISSUE	11.1	5.1-20.4	10	4
STARCH			0	0
MISCELLANEOUS				
FERROUS METAL	7.2	2.5-14.4	3	3
RUBBER			0	0

PARTICLE SIZE DISTRIBUTION

SIZE RANGE (UM)	NUMBER PERCENT	WEIGHT PERCENT
1.3 - 1.8	0	0
1.8 - 2.5	<1	<1
2.5 - 3.6	18	1
3.6 - 5.1	26	4
5.1 - 7.2	29	17
7.2 - 10.2	14	20
10.2 - 14.4	10	34
14.4 - 20.4	3	21
20.4 - 28.8	<1	4
28.8 - 40.7	0	0
40.7 - 57.6	0	0
57.6 - 81.5	0	0
81.5 - 115.2	0	0
115.2 - 162.9	0	0
162.9 - 230.4	0	0
>230.4	0	0

Filter number		1277776	
Inhalable Particulate	$\mu g/m^3$		129
Particulate: Minerals	86.4	Combustion	29.7
Biological	12.9	Other	-
Low temperature ashing, % loss			16.0





OPTICAL MICROSCOPE ANALYSIS

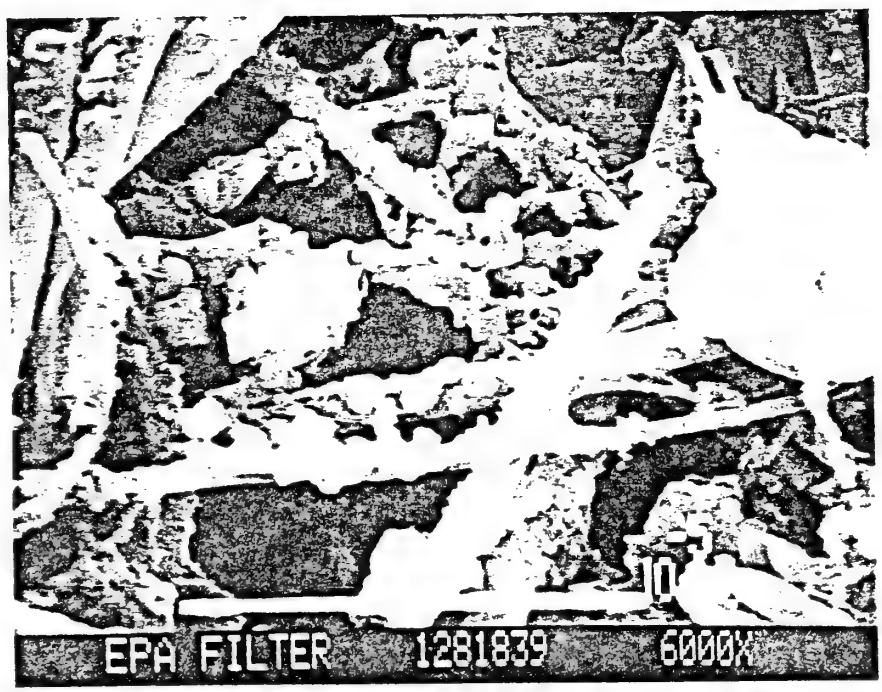
FILTER NUMBER : 1281839
NETWORK :
SITE : GRANITECITY/FIREST. 1
COLLECTION DATE : 11/12/81
OBJECTIVE MAG. : 25

COMPONENT	AVERAGE PART. SIZE	RANGE	WEIGHT PERCENT	Number Percent
MINERALS				
QUARTZ/FELDSPARS	9.8	3.6-20.4	22	7
LIMESTONE	8.7	2.5-20.4	25	33
IRON OXIDES	5.6	2.5-10.2	2	3
OTHER MINERALS			0	<1
MICA	34.8	28.8-40.7	11	
COMBUSTION PRODUCTS				
SOOT	11.1	1.8-40.7	21	49
GLASSY FLYASH SPHERES			0	0
BIOLOGICAL				
POLLEN & SPORES	13.8	5.1-28.8	8	4
PLANT TISSUE	11.1	5.1-20.4	7	3
STARCH	12.8	7.2-20.4	3	2
MISCELLANEOUS				
FERROUS METAL			0	0
RUBBER			0	0

PARTICLE SIZE DISTRIBUTION

SIZE RANGE (UM)	NUMBER PERCENT	WEIGHT PERCENT
1.3 - 1.8	0	0
1.8 - 2.5	8	<1
2.5 - 3.6	38	2
3.6 - 5.1	10	2
5.1 - 7.2	16	7
7.2 - 10.2	17	20
10.2 - 14.4	8	28
14.4 - 20.4	3	21
20.4 - 28.8	<1	2
28.8 - 40.7	<1	17
40.7 - 57.6	0	0
57.6 - 81.5	0	0
81.5 - 115.2	0	0
115.2 - 162.9	0	0
162.9 - 230.4	0	0
>230.4	0	0

Filter number		1281839	
Inhalable Particulate	$\mu g/m^3$		78
Particulate: Minerals	46.8	Combustion	16.4
Biological	14.0	Other	-
Low temperature ashing, % loss			33.0



OPTICAL MICROSCOPE ANALYSIS

FILTER NUMBER : 1282424
NETWORK :
SITE : GRANITECITY/FIREST. 1
COLLECTION DATE : 12/18/81
OBJECTIVE MAG. : 25

COMPONENT	AVERAGE PART. SIZE	RANGE	WEIGHT PERCENT	Number Percent
MINERALS				
QUARTZ/FELDSPARS	13.8	5.1-28.8	15	3
LIMESTONE	6.9	2.5-14.4	7	15
IRON OXIDES	13.9	3.6-40.7	30	4
OTHER MINERALS			0	0
COMBUSTION PRODUCTS				
SOOT	9.8	1.8-28.8	16	74
GLASSY FLYASH SPHERES			0	0
BIOLOGICAL				
POLLEN & SPORES	14.9	10.2-20.4	2	1
PLANT TISSUE	22.3	10.2-40.7	26	3
STARCH	14.9	10.2-20.4	2	1
MISCELLANEOUS				
FERROUS METAL			0	0
RUBBER			0	0
SOFT COAL	18.5	10.2-28.8	3	1

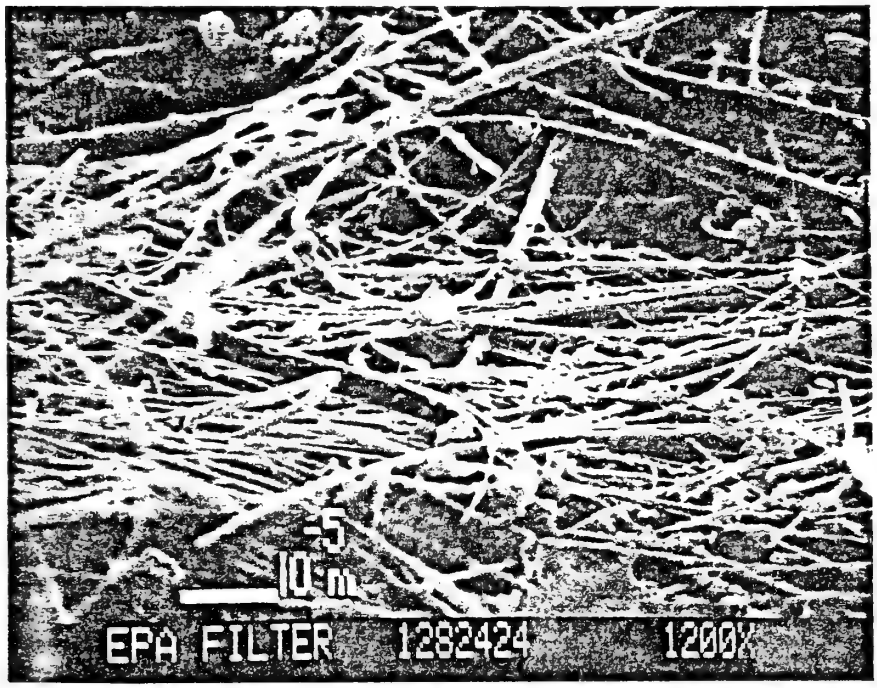
PARTICLE SIZE DISTRIBUTION

SIZE RANGE (UM)	NUMBER PERCENT	WEIGHT PERCENT
1.3 - 1.8	0	0
1.8 - 2.5	6	<1
2.5 - 3.6	39	1
3.6 - 5.1	25	2
5.1 - 7.2	10	2
7.2 - 10.2	7	6
10.2 - 14.4	7	16
14.4 - 20.4	5	25
20.4 - 28.8	1	15
28.8 - 40.7	<1	33
40.7 - 57.6	0	0
57.6 - 81.5	0	0
81.5 - 115.2	0	0
115.2 - 162.9	0	0
162.9 - 230.4	0	0
>230.4	0	0

Filter number 1282424

Total Suspended Particulate $\mu g/m^3$ 69

Particulate: Minerals	35.9	Combustion	11.04
Biological	20.7	Other	2.1
Low temperature ashing, % loss			33.2



OPTICAL MICROSCOPE ANALYSIS

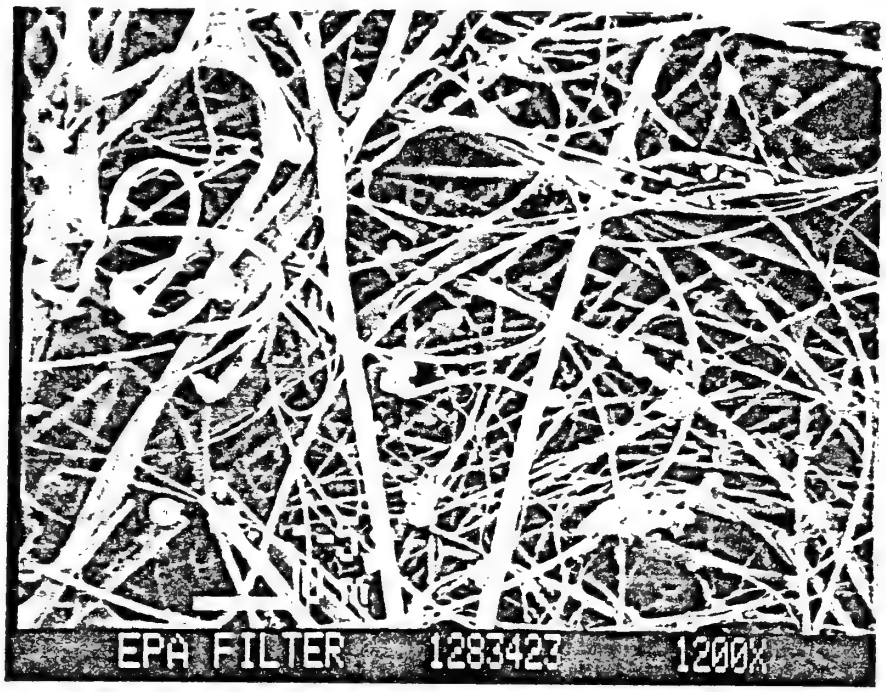
FILTER NUMBER : 1282423
NETWORK :
SITE : GRANITECITY/FIREST. 1
COLLECTION DATE : 12/18/81
OBJECTIVE MAG. : 25

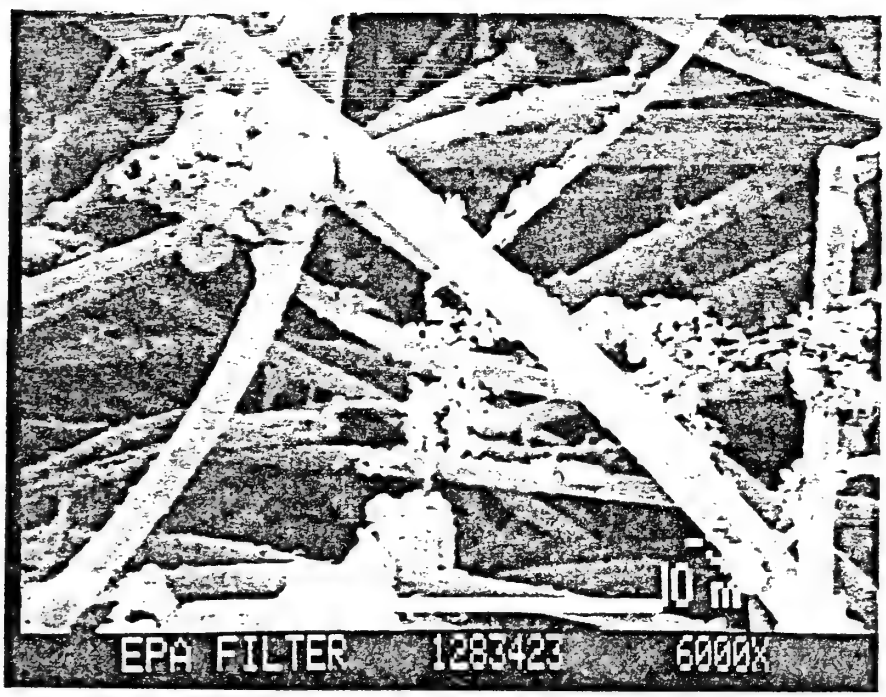
COMPONENT	AVERAGE PART. SIZE	RANGE	WEIGHT PERCENT	Number Percent
MINERALS				
QUARTZ/FELDSPARS	6.9	2.5-14.4	2	5
LIMESTONE	9.8	1.8-28.8	8	22
IRON OXIDES	7.9	3.6-14.4	1	3
OTHER MINERALS			0	0
COMBUSTION PRODUCTS				
SOOT	8.7	2.5-20.4	10	43
GLASSY FLYASH SPHERES			0	0
BIOLOGICAL				
POLLEN & SPORES	18.3	7.2-40.7	8	2
PLANT TISSUE	19.6	7.2-40.7	69	23
STARCH	12.3	10.2-14.4	<1	1
MISCELLANEOUS				
FERROUS METAL			0	0
RUBBER			0	0
SOFT COAL				
SOFT COAL	17.4	14.4-20.4	2	1

PARTICLE SIZE DISTRIBUTION

SIZE RANGE (UM)	NUMBER PERCENT	WEIGHT PERCENT
1.3 - 1.8	0	0
1.8 - 2.5	4	<1
2.5 - 3.6	23	<1
3.6 - 5.1	23	1
5.1 - 7.2	10	1
7.2 - 10.2	10	4
10.2 - 14.4	8	7
14.4 - 20.4	15	31
20.4 - 28.8	7	43
28.8 - 40.7	<1	12
40.7 - 57.6	0	0
57.6 - 81.5	0	0
81.5 - 115.2	0	0
115.2 - 162.9	0	0
162.9 - 230.4	0	0
>230.4	0	0

Filter number	1282423		
Inhalable Particulate	$\mu g/m^3$		40
Particulate: Minerals	4.4	Combustion	4.0
Biological	30.8	Other	0.8
Low temperature ashing, % loss			21.4





A. Site Identification

1. City: Granite City

2. Site Name and Address: Dallas Residence, 2001 E. 20th St..

3. County: Madisongo Township: Granite City

4. USGS Topographical Map Name and Scale: Granite City, IL-MO, 1:24000

5. Site Elevation (Feet): 415

B. Site Classification/Representativeness

1. Dominating Influence on Site: Industrial

C. Source Impact

1. Stationary Sources that may Influence Site

Name of Source	Location	Direction From Site	Distance From Site	Pollutant	Emissions (Tons/Yr)
American Steel Foundaries	1700 Walnut	WNW	1.1 mi	TSP	9,697
U.S. Army Support Center	Niedringhaus Ave.	W	1.6 mi	SO_2	158
Nestle Co.	2101 Adams	NW	0.8 mi	TSP	2,553
				SO_2	392
Reeves Concrete Prod.	2801 Circle	N	1.7 mi	TSP	14,723
Reilly Tar & Chemical	19th & Edwardsville	SSE	0.8 mi	TSP	362
National Lead	16th & Cleveland	W	0.9 mi	TSP	2,783
Union Electric-Venice	Main St.	SW	2.8 mi	SO_2	624
				TSP	790
				SO_2	6,649
				NOx	4,434
ADM-Granite City	3601 Cargill	ENE	3.5 mi	TSP	15,141
				SO_2	204
Granite City Steel	20th & State			TSP	218,649
(BOF)	(20th & Madison	SW-W	0.1 mi	SO_2	6,678
(Sinter Plant)	(20th & Edwardsville)	ESE	0.6 mi	NOx	4,436
(Coke Plant)	(Nameoki & Edwardsville)	E	1.0 mi	CO	18,630
Tri-State Regional Port District	2801 Rock Rd.	WNW	2.1 mi	TSP	2,700

2. Mobile Sources that may Influence the Site:

Names of Roadways:	20th St.	Omaha
Type:	Arterial Street	Local Street
Distance of Roadway from Site (ft)	15m	12m
Composition of Roadway	Asphalt	Asphalt
Number of Traffic Lanes	4	4
Average Daily Traffic	8800	<1000
Average Vehicle Speed (mph)	30	20
One or Two Way Traffic	Two	Two
Number of Parking Lanes	None	One
Are Parking Lanes Used For Traffic Part of Day?	N/A	Yes
Is Dust Visibiity Retained	Yes	No
Does Roadway Have Curb	Yes	No

3. Area Sources that may Influence the Site:

Type of Source	Direction From Site	Distance From Site	Pollutant
Gravel Parking Lot	NW	50-75 ft.	TSP
St. Louis Area	SW	5 miles	All

D. Topography/Obstructions

1. General Characteristics Over a 2 Mile Radius From the Site: Smooth

2. Topographic Features that Influence the Site: (Types - hills, valleys, depressions, bodies of water, ridges, cliffs)

Type	Size	Direction From Site	Distance From Site
None			

3. Obstructions to Wind Flow (Types - buildings, trees, ridges, cliffs)

Type	Size	Direction From Site	Distance From Site
Trees	30 ft.	North	20 m
Trees	40 ft.	NE,E	25 m

4. Comments

In general, a number of trees scattered throughout the residential area.

E. Distance to the nearest National Weather Service (NWS) Site.

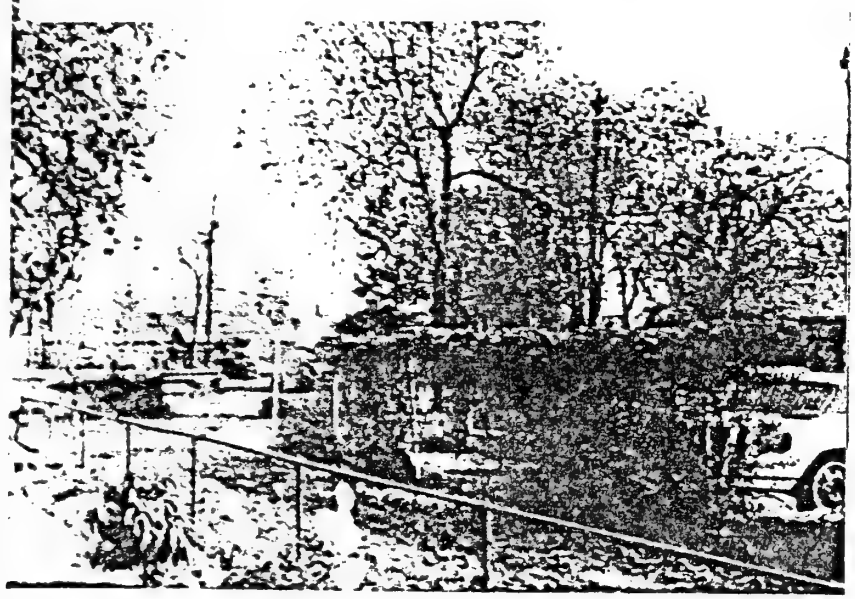
Here are the distances and directions to the nearest NWS observing site from the inhalable particulate monitors in Granite City. Distances are in statute miles; directions are degrees from true north.

Site Address	Nearest NWS Site	Direction and Distance to NWS
2001 East 20th	Lambert Airport/ St. Louis (STL)	285^{o} at 13 mi. (W)

Granite City-2001 E. 20th - North

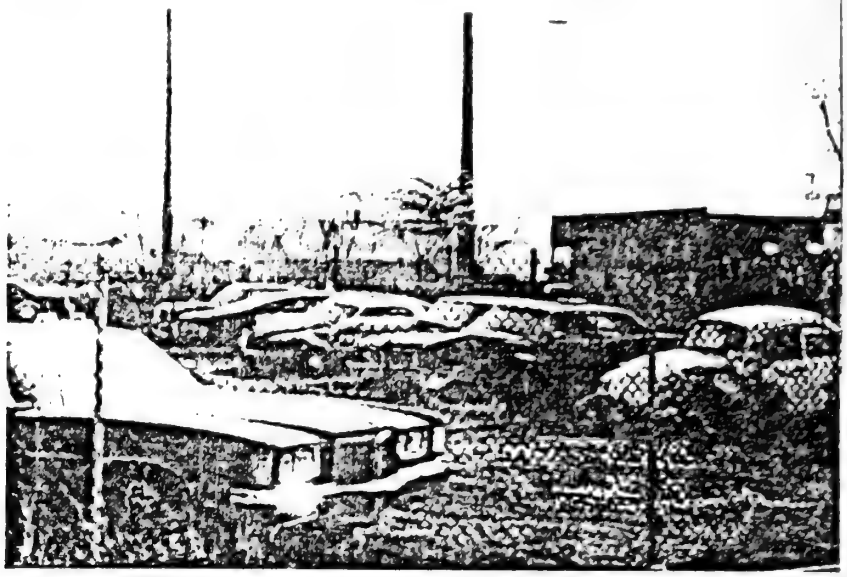
Granite City (Dallas Res.) North

Granite City-2001 E. 20th - East



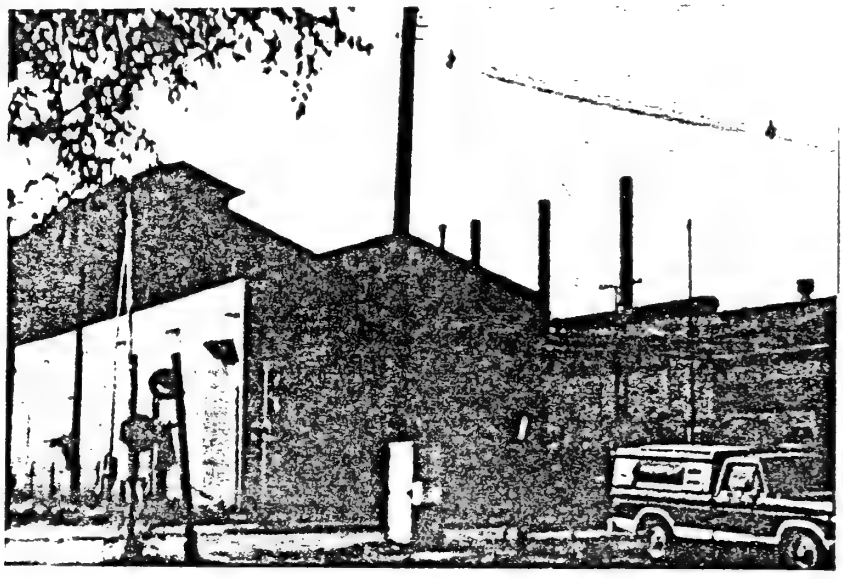
Granite City (Dallas Res.) East

Granite City-2001 E. 20th - South



Granite City (Dallas Res.) South

Granite City-2001 E. 20th - West



Granite City (Dallas Res.) West

OPTICAL MICROSCOPE ANALYSIS

ILTER NUMBER : 1229986
OLLECTION DATE : 05/22/81

NETWORK :
SITE : GRANICITY/DALLASRES
OBJECTIVE MAG. : 25

COMPONENT	AVERAGE PART. SIZE	RANGE	WEIGHT PERCENT	Number Percent
MINERALS				
QUARTZ/FELDSPARS	17.3	5.1-40.7	33	10
LIMESTONE	8.7	2.5-20.4	13	57
IRON OXIDES	12.3	3.6-28.8	8	3
OTHER MINERALS			0	0
COMBUSTION PRODUCTS				
SOOT	12.3	3.6-28.8	9	26
GLASSY FLYASH SPHERES			0	0
BIOLOGICAL				
POLLEN & SPORES	9.1	5.1-14.4	<1	1
PLANT TISSUE	4.5	2.5-7.2	<1	1
STARCH			0	0
MISCELLANEOUS				
FERROUS METAL	13.9	2.5-40.7	37	3
RUBBER			0	0

PARTICLE SIZE DISTRIBUTION

SIZE RANGE (UM)	NUMBER PERCENT	WEIGHT PERCENT
1.3 - 1.8	0	0
1.8 - 2.5	0	0
2.5 - 3.6	22	<1
3.6 - 5.1	25	1
5.1 - 7.2	19	3
7.2 - 10.2	19	9
10.2 - 14.4	9	14
14.4 - 20.4	4	14
20.4 - 28.8	2	36
28.8 - 40.7	<1	23
40.7 - 57.6	0	0
57.6 - 81.5	0	0
81.5 - 115.2	0	0
115.2 - 162.9	0	0
162.9 - 230.4	0	0
>230.4	0	0

Filter number	1229986

Total Suspended Particulate $\mu g/m^3$	204

Particulate:	Minerals	110.2	Combustion 18.4
	Biological trace		Other 75.5
Low temperature ashing, % loss			8.4

OPTICAL MICROSCOPE ANALYSIS

FILTER NUMBER : 1229987
NETWORK :
SITE : GRANICITY/DALLASRES
COLLECTION DATE : 05/22/81
OBJECTIVE MAG. : 25

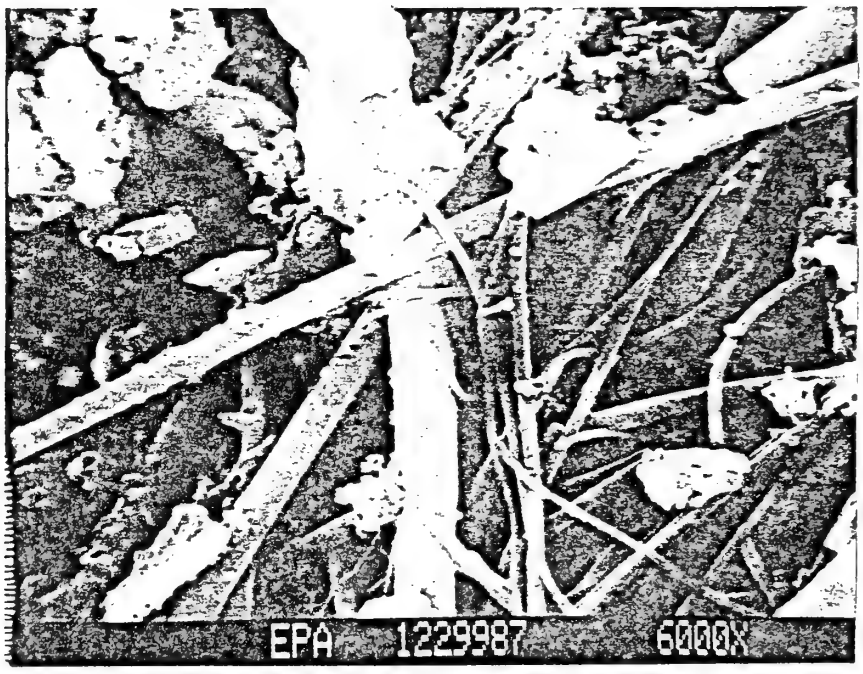
COMPONENT	AVERAGE PART. SIZE	RANGE	WEIGHT PERCENT	Number Percent
MINERALS				
QUARTZ/FELDSPARS	17.0	2.5-57.6	29	19
LIMESTONE	13.9	2.5-40.7	14	31
IRON OXIDES	7.0	1.8-20.4	3	7
OTHER MINERALS			0	0
COMBUSTION PRODUCTS				
SOOT	19.1	2.5-81.5	28	31
GLASSY FLYASH SPHERES			0	0
BIOLOGICAL				
POLLEN & SPORES	11.1	5.1-20.4	2	3
PLANT TISSUE	23.5	3.6-81.5	25	9
STARCH	12.3	10.2-14.4	<1	<1
MISCELLANEOUS				
FERROUS METAL			0	0
RUBBER			0	0

PARTICLE SIZE DISTRIBUTION

SIZE RANGE (UM)	NUMBER PERCENT	WEIGHT PERCENT
1.3 - 1.8	0	0
1.8 - 2.5	<1	<1
2.5 - 3.6	28	<1
3.6 - 5.1	15	<1
5.1 - 7.2	21	2
7.2 - 10.2	19	4
10.2 - 14.4	8	6
14.4 - 20.4	6	12
20.4 - 28.8	<1	3
28.8 - 40.7	<1	10
40.7 - 57.6	<1	16
57.6 - 81.5	<1	45
81.5 - 115.2	0	0
115.2 - 162.9	0	0
162.9 - 230.4	0	0
>230.4	0	0

COMMENTS: IRON AND/OR STEEL IS PRESENT BUT IS ASSOCIATED WITH THE IRON OXIDE AND NOT PRESENT AS DISCRETE PARTICLES.

Filter number			1229987
Inhalable Particulate	$\mu g/m^3$		99
Particulate: Minerals	45.5	Combustion	27.7
Biological	26.7	Other	-
Low temperature ashing, % loss			16.5



OPTICAL MICROSCOPE ANALYSIS

ILTER NUMBER : 1230411
NETWORK :
SITE : GRANICITY/DALLASRES
OLLECTION DATE : 06/03/81
OBJECTIVE MAG. : 10

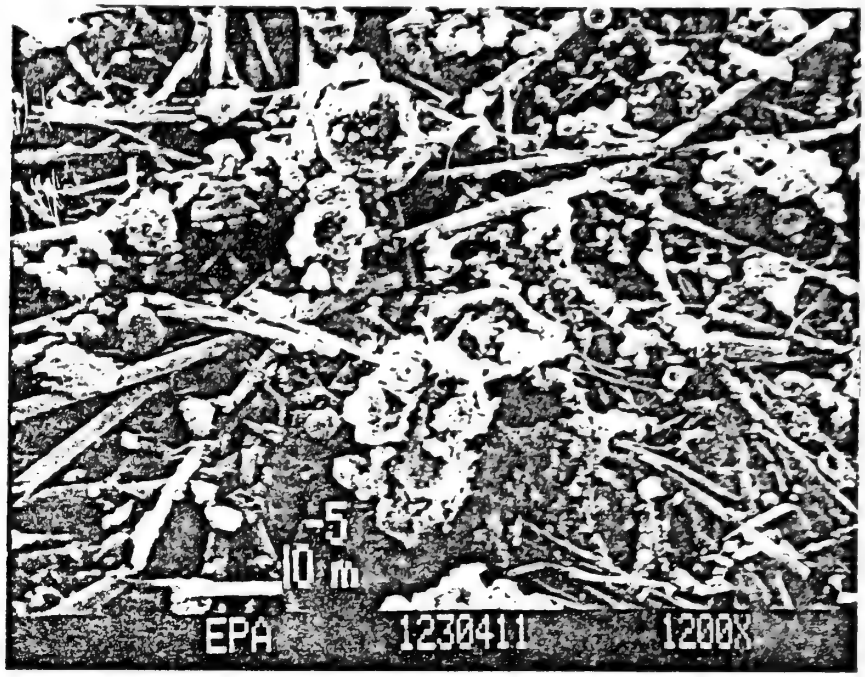
COMPONENT	AVERAGE PART. SIZE	RANGE	WEIGHT PERCENT	Number Percent
MINERALS				
QUARTZ/FELDSPARS	89.0	9.0-289.3	41	21
LIMESTONE	45.8	6.4-204.6	4	29
IRON OXIDES	91.5	9.0-289.3	11	1
OTHER MINERALS			0	0
COMBUSTION PRODUCTS				
SOOT	84.7	9.0-289.3	9	41
GLASSY FLYASH SPHERES			0	0
BIOLOGICAL				
POLLEN & SPORES	30.9	25.6-36.2	<1	<1
PLANT TISSUE	167.1	72.3-289.3	8	1
STARCH			0	
MISCELLANEOUS				
FERROUS METAL	85.0	12.8-289.3	27	6
RUBBER			0	0

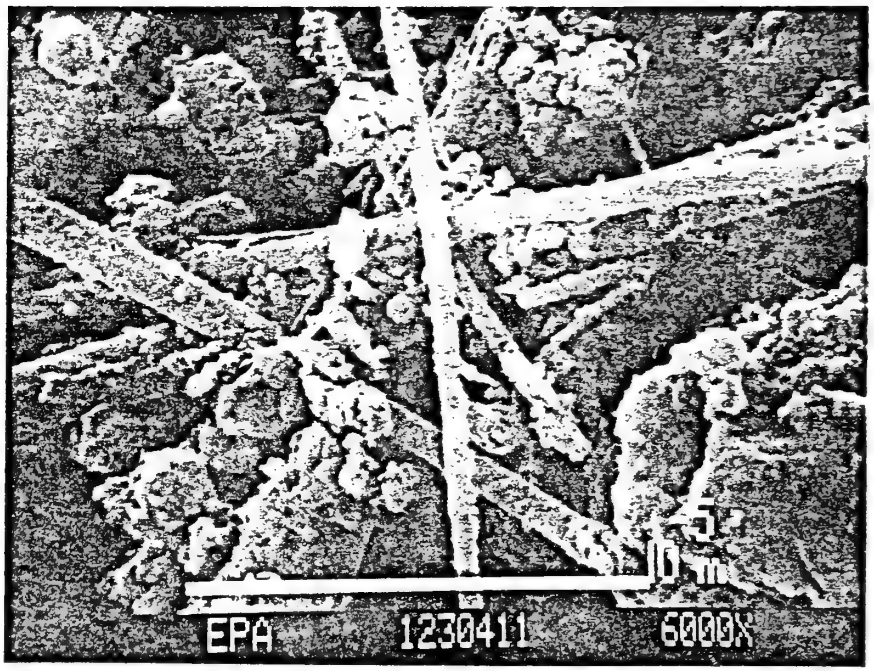
PARTICLE SIZE DISTRIBUTION

SIZE RANGE (UM)	NUMBER PERCENT	WEIGHT PERCENT
3.2 - 4.5	0	0
4.5 - 6.4	0	0
6.4 - 9.0	4	<1
9.0 - 12.8	30	<1
12.8 - 18.1	9	<1
18.1 - 25.6	18	<1
25.6 - 36.2	6	<1
36.2 - 51.1	8	<1
51.1 - 72.3	14	3
72.3 - 102.3	2	<1
102.3 - 144.6	<1	<1
144.6 - 204.6	4	23
204.6 - 289.3	5	71
289.3 - 409.1	0	0
409.1 - 578.6	0	0
>578.6	0	0

Filter Number 1230411

Inhalable Particulate	$\mu g/m^3$		282
Particulate: Minerals	157.9	Combustion	25.4
Biological	22.6	Other	76.1
Low temperature ashing, % loss			6.5





OPTICAL MICROSCOPE ANALYSIS

FILTER NUMBER : 1230423
NETWORK :
SITE : GRANICITY/DALLASRES
COLLECTION DATE : 06/15/81
OBJECTIVE MAG. : 25

COMPONENT	AVERAGE PART. SIZE	RANGE	WEIGHT PERCENT	Number Percent
MINERALS				
QUARTZ/FELDSPARS	16.3	3.6-57.6	33	14
LIMESTONE	7.9	2.5-20.4	5	47
IRON OXIDES	7.7	1.8-20.4	7	8
OTHER MINERALS			0	0
COMBUSTION PRODUCTS				
SOOT	10.9	2.5-28.8	19	26
GLASSY FLYASH SPHERES			0	0
BIOLOGICAL				
POLLEN & SPORES	13.1	7.2-20.4	<1	0
PLANT TISSUE			0	0
STARCH			0	0
MISCELLANEOUS				
FERROUS METAL	11.1	5.1-20.4	33	5
RUBBER			0	0
SOFT COAL	24.6	20.4-28.8	1	<1

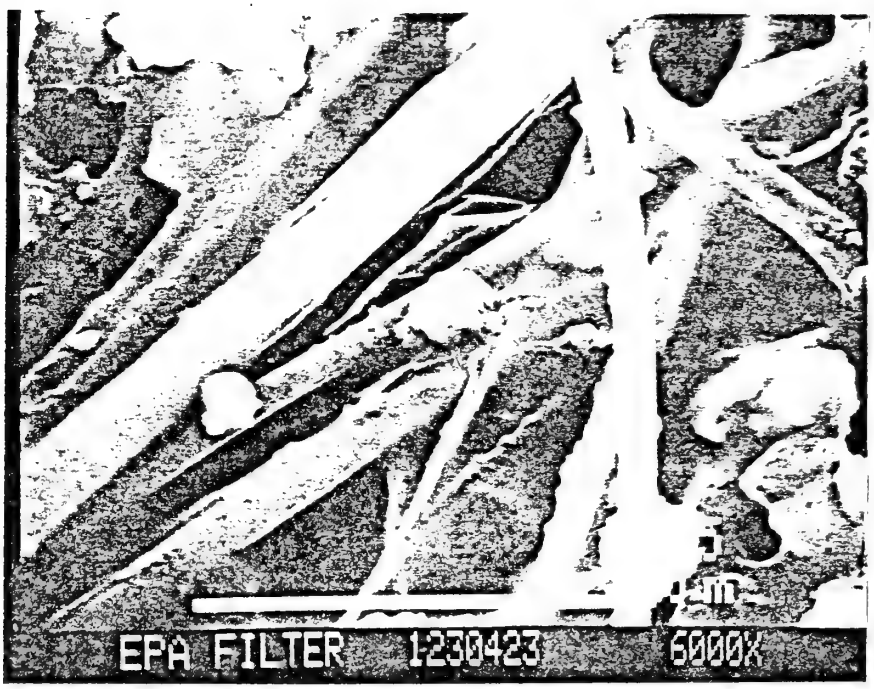
PARTICLE SIZE DISTRIBUTION

SIZE RANGE (UM)	NUMBER PERCENT	WEIGHT PERCENT
1.3 - 1.8	0	0
1.8 - 2.5	<1	<1
2.5 - 3.6	40	1
3.6 - 5.1	16	1
5.1 - 7.2	16	4
7.2 - 10.2	14	9
10.2 - 14.4	6	14
14.4 - 20.4	6	39
20.4 - 28.8	2	11
28.8 - 40.7	0	0
40.7 - 57.6	<1	22
57.6 - 81.5	0	0
81.5 - 115.2	0	0
115.2 - 162.9	0	0
162.9 - 230.4	0	0
>230.4	0	0

Filter number	1230423

Total Suspended Particulate $\mu g/m^3$ 391

Particulate: Minerals	176	Combustion	74.3
Biological	8	Other	132.9
Low temperature ashing, % loss			4.0



OPTICAL MICROSCOPE ANALYSIS

ILTER NUMBER : 1230422
NETWORK :
SITE : GRANICITY/DALLASRES
OLLECTION DATE : 06/15/81
OBJECTIVE MAG. : 25

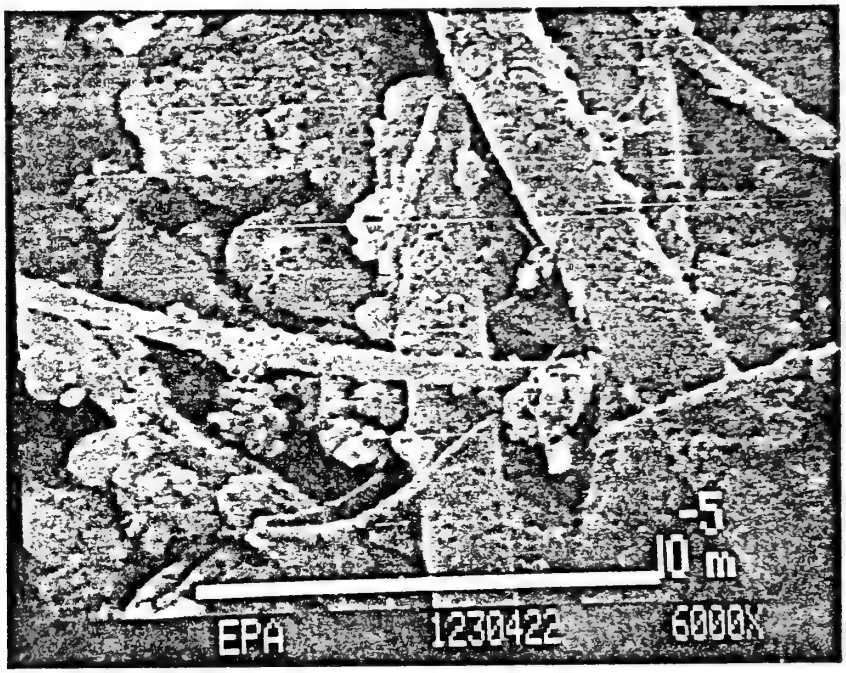
COMPONENT	AVERAGE PART. SIZE	RANGE	WEIGHT PERCENT	Number Percent
MINERALS				
QUARTZ/FELDSPARS	15.7	2.5-57.6	36	12
LIMESTONE	9.8	1.8-28.8	22	62
IRON OXIDES	11.6	2.5-40.7	13	4
OTHER MINERALS			0	0
COMBUSTION PRODUCTS				
SOOT	20.1	2.5-81.5	25	17
GLASSY FLYASH SPHERES			0	
BIOLOGICAL				
POLLEN & SPORES	11.1	5.1-20.4	<1	1
PLANT TISSUE	12.3	3.6-28.8	2	2
STARCH			0	0
MISCELLANEOUS				
FERROUS METAL	12.6	2.5-57.6	2	3
RUBBER			0	0

PARTICLE SIZE DISTRIBUTION

SIZE RANGE (UM)	NUMBER PERCENT	WEIGHT PERCENT
1.3 - 1.8	0	0
1.8 - 2.5	33	<1
2.5 - 3.6	30	<1
3.6 - 5.1	10	<1
5.1 - 7.2	10	2
7.2 - 10.2	2	<1
10.2 - 14.4	10	16
14.4 - 20.4	3	9
20.4 - 28.8	2	27
28.8 - 40.7	<1	11
40.7 - 57.6	<1	13
57.6 - 81.5	<1	19
81.5 - 115.2	0	0
115.2 - 162.9	0	0
162.9 - 230.4	0	0
>230.4	0	0

Filter number

Inhalable Particulate	$\mu g/m^3$		255
Particulate: Minerals	76.5	Combustion	168.3
Biological	7.7	Other	-
Low temperature ashing, % loss			4.8



OPTICAL MICROSCOPE ANALYSIS

FILTER NUMBER : 1277784
NETWORK :
SITE : GRANICITY/DALLASRES
COLLECTION DATE : 08/14/81
OBJECTIVE MAG. : 25

COMPONENT	AVERAGE PART. SIZE	RANGE	WEIGHT PERCENT	Number Percent
MINERALS				
QUARTZ/FELDSPARS	17.3	5.1-40.7	8	9
LIMESTONE	12.4	2.5-40.7	3	27
IRON OXIDES	12.3	3.6-28.8	7	9
OTHER MINERALS			0	0
COMBUSTION PRODUCTS				
SOOT	25.3	1.8-162.9	53	53
GLASSY FLYASH SPHERES			0	0
BIOLOGICAL				
POLLEN & SPORES			0	0
PLANT TISSUE	39.1	14.4-81.5	29	2
STARCH			0	0
HAIR			0	0
MISCELLANEOUS				
FERROUS METAL			0	0
RUBBER			0	0

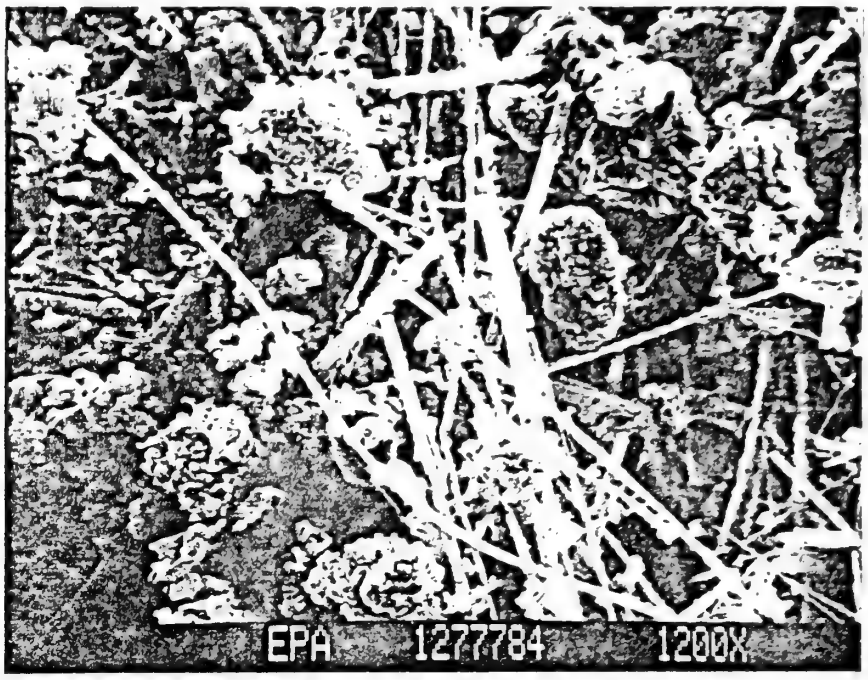
PARTICLE SIZE DISTRIBUTION

SIZE RANGE (UM)	NUMBER PERCENT	WEIGHT PERCENT
1.3 - 1.8	0	0
1.8 - 2.5	13	<1
2.5 - 3.6	35	<1
3.6 - 5.1	12	<1
5.1 - 7.2	13	<1
7.2 - 10.2	12	2
10.2 - 14.4	5	2
14.4 - 20.4	4	5
20.4 - 28.8	4	12
28.8 - 40.7	1	9
40.7 - 57.6	<1	4
57.6 - 81.5	<1	22
81.5 - 115.2	0	0
115.2 - 162.9	<1	44
162.9 - 230.4	0	0
>230.4	0	0

Filter number	1277784

Total Suspended Particulate $\mu g/m^3$	227

Particulate: Minerals	40.9	Combustion	120.3
Biological	65.8	Other	-
Low temperature ashing, % loss			8.8



OPTICAL MICROSCOPE ANALYSIS

FILTER NUMBER : 1277783
NETWORK :
SITE : GRANICITY/DALLASRES
COLLECTION DATE : 08/14/81
OBJECTIVE MAG. : 25

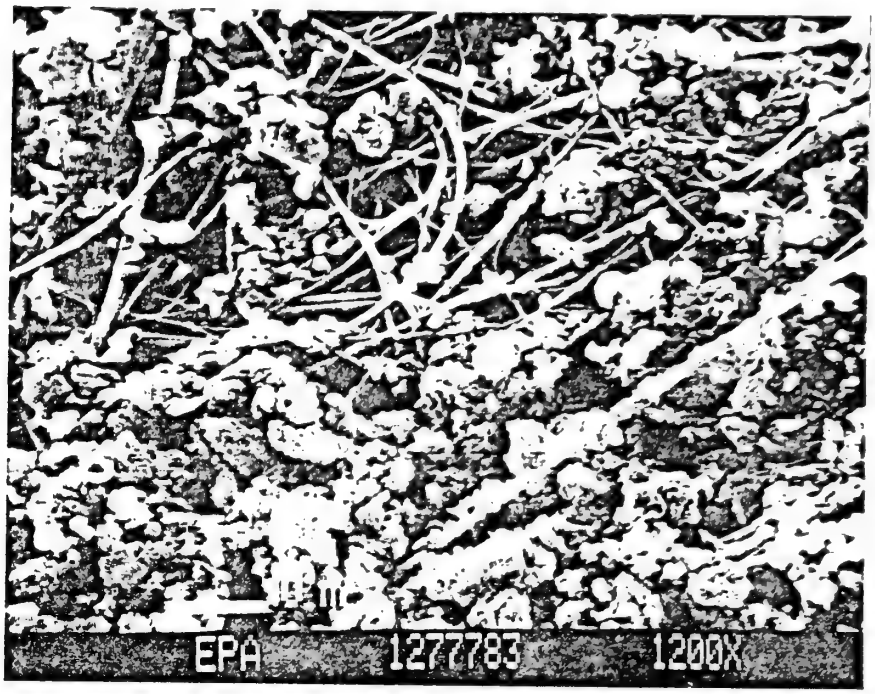
COMPONENT	AVERAGE PART. SIZE	RANGE	WEIGHT PERCENT	Number Percent
MINERALS				
QUARTZ/FELDSPARS	11.1	5.1-20.4	19	7
LIMESTONE	10.9	2.5-28.8	41	40
IRON OXIDES	7.9	3.6-14.4	13	6
OTHER MINERALS			0	0
COMBUSTION PRODUCTS				
SOOT	6.9	2.5-14.4	14	44
GLASSY FLYASH SPHERES			0	0
BIOLOGICAL				
POLLEN & SPORES			0	0
PLANT TISSUE	15.9	5.1-40.7	13	3
STARCH			0	0
MISCELLANEOUS				
FERROUS METAL			0	0
RUBBER			0	0

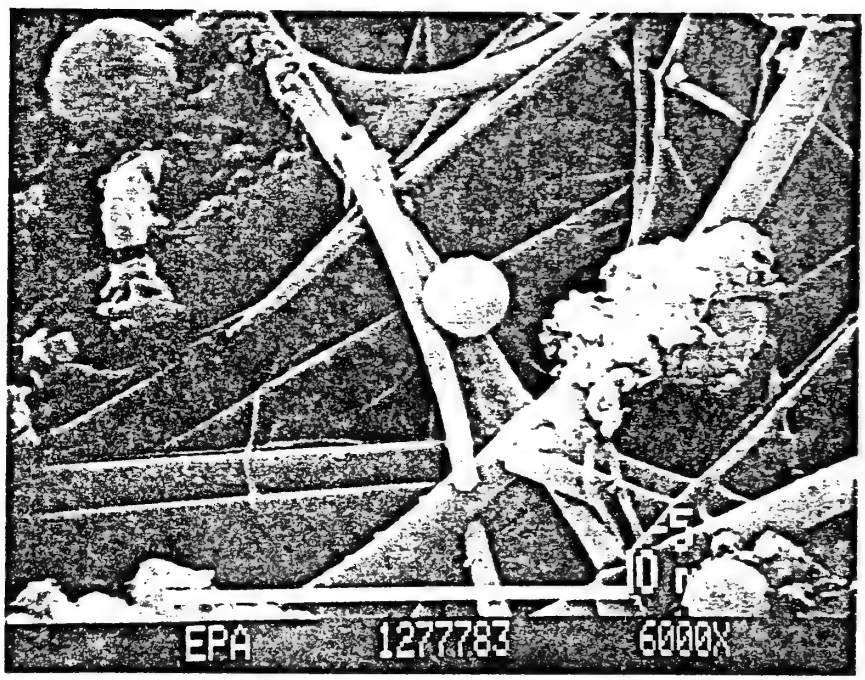
PARTICLE SIZE DISTRIBUTION

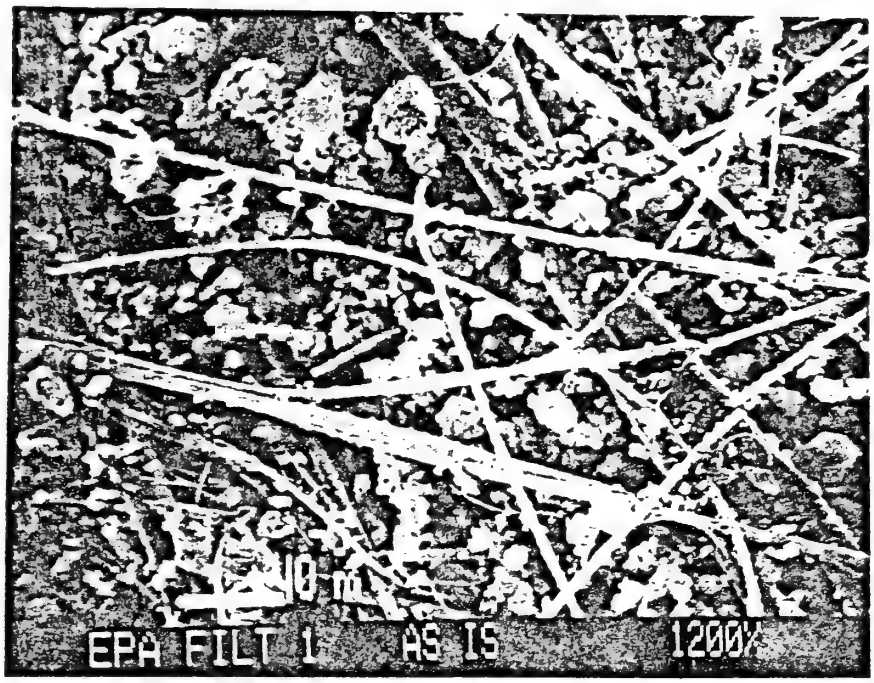
SIZE RANGE (UM)	NUMBER PERCENT	WEIGHT PERCENT
1.3 - 1.8	0	0
1.8 - 2.5	0	0
2.5 - 3.6	27	2
3.6 - 5.1	41	7
5.1 - 7.2	16	10
7.2 - 10.2	10	16
10.2 - 14.4	4	20
14.4 - 20.4	2	28
20.4 - 28.8	<1	7
28.8 - 40.7	<1	9
40.7 - 57.6	0	0
57.6 - 81.5	0	0
81.5 - 115.2	0	0
115.2 - 162.9	0	0
162.9 - 230.4	0	0
>230.4	0	0

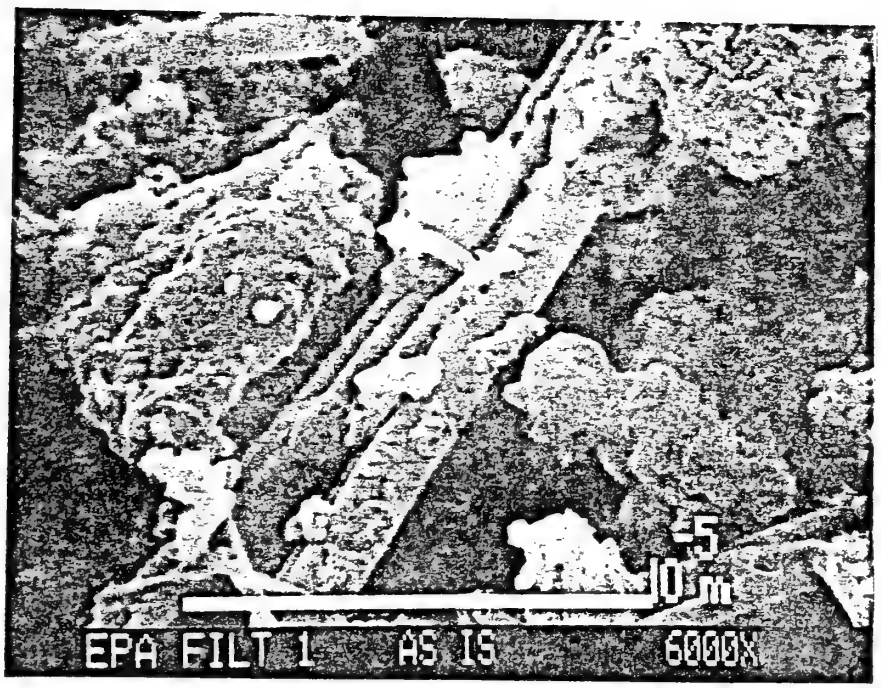
Filter number	1277783

Inhalable Particulate	$\mu g/m^3$		177
Particulate: Minerals	129.2	Combustion	24.8
Biological	23	Other	-
Low temperature ashing, % loss			15.1

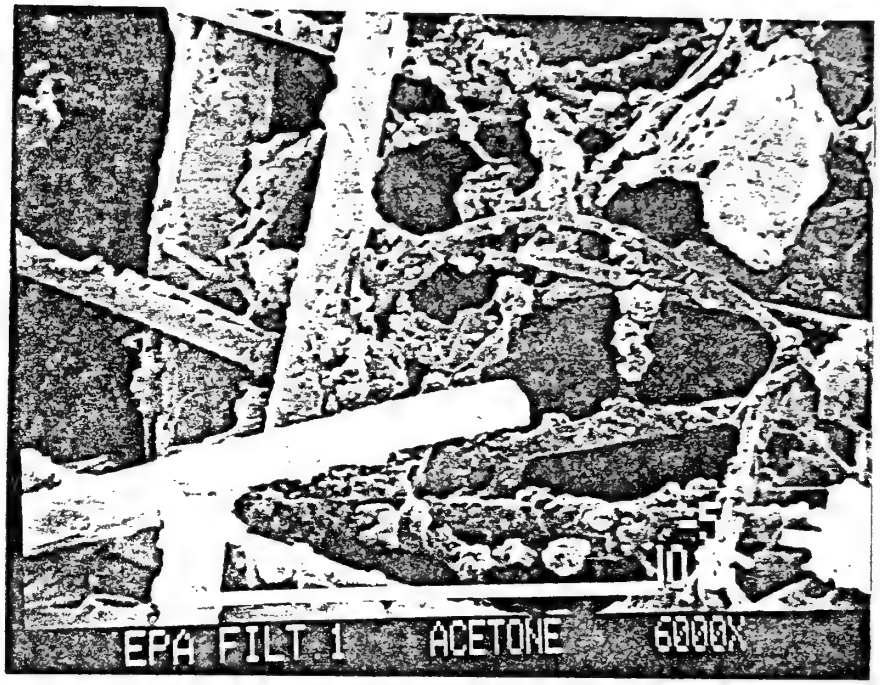




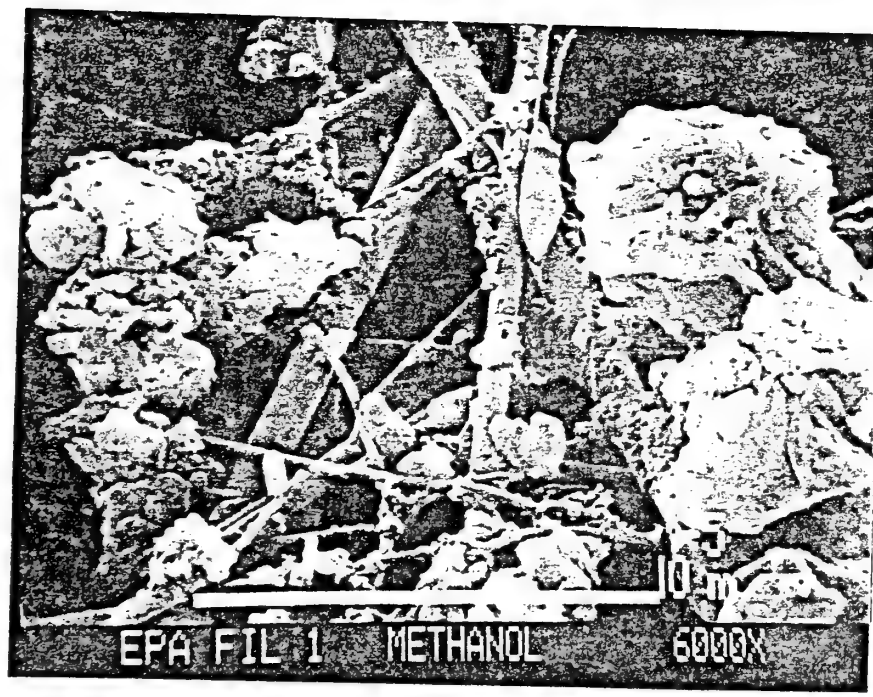




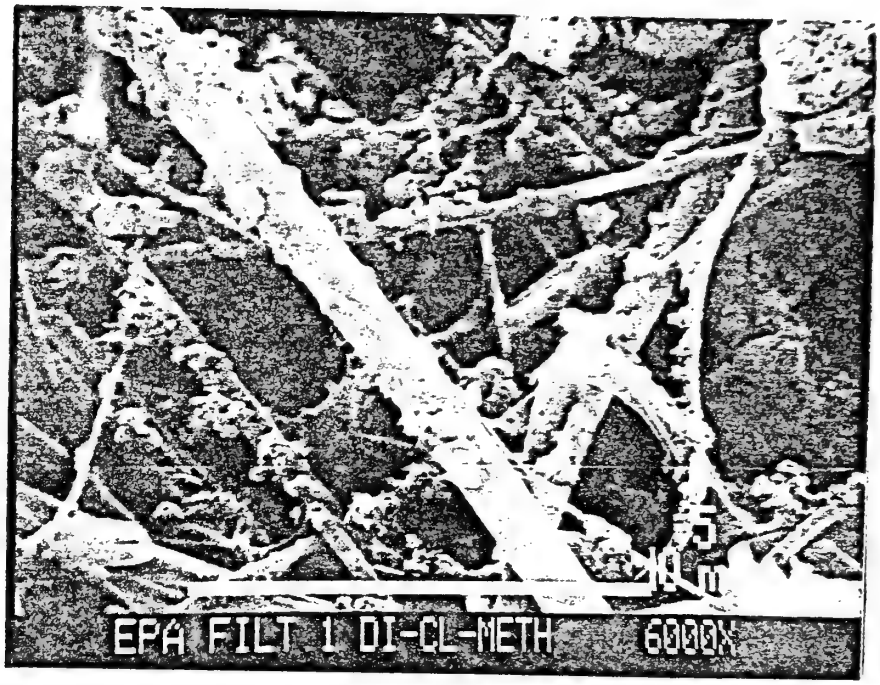
Filter 1229986



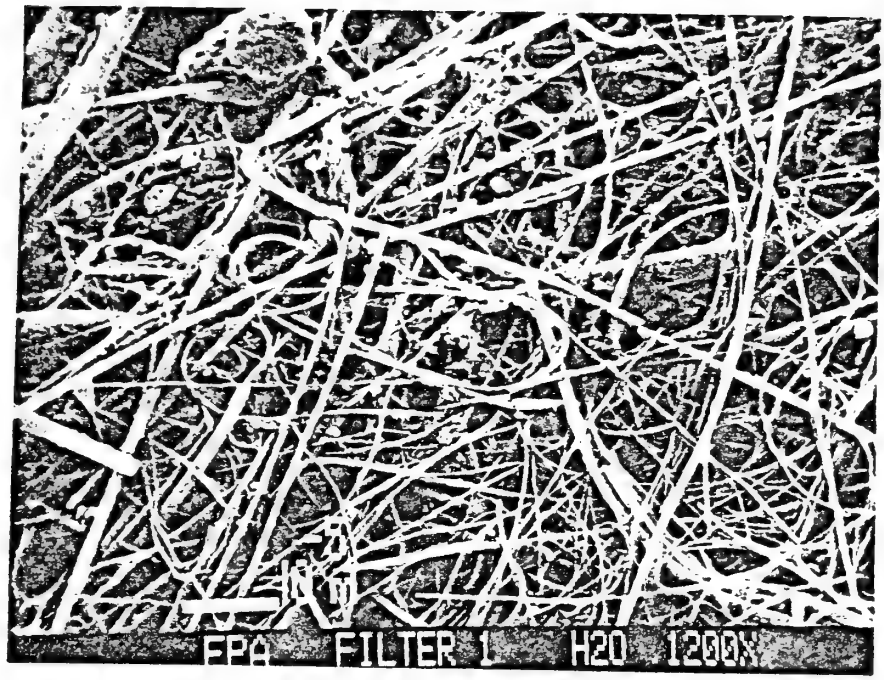
Filter 1229986 after ultrasonification in acetone

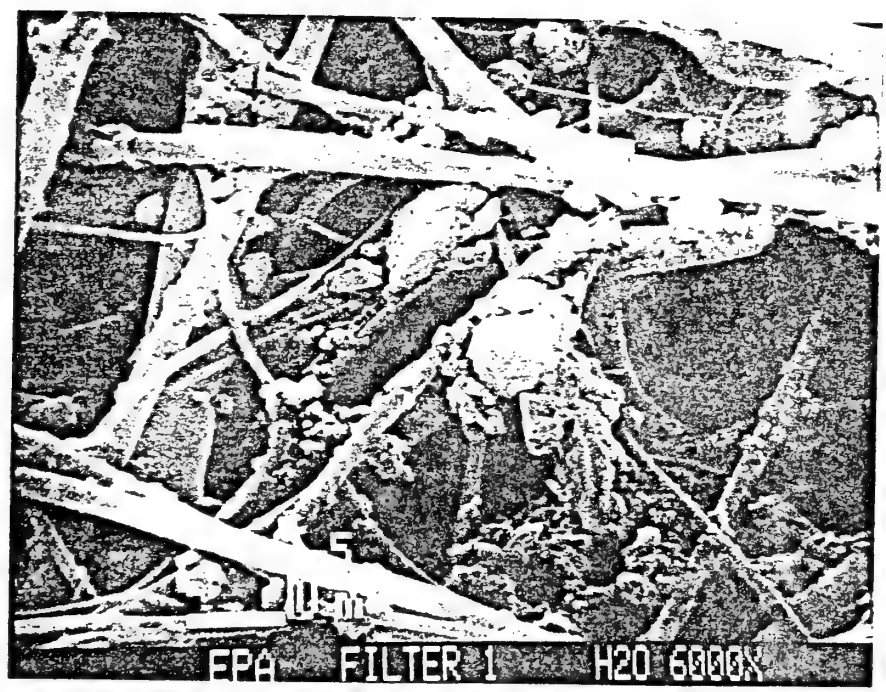


Filter 1229986 after ultrasonification in methanol



Filter 1229986 after ultrasonfication in dichtoromethane





Filter 1229986 after ultrasonification in water

Solids collected on Nuclepore filter from ultrasonification water layer

50272-101

REPORT DOCUMENTATION PAGE	1. REPORT NO. 83/12	2.	3. Recipient's Accession No.

4. Title and Subtitle

Comparison of Inhalable Particulate and Total Suspended Particulate

5. Report Date

6.

7. Author(s) Robert Z. Muggli, Mark E. Pulenik, John A. Brown, Ralph J. Hinch, Carol Rogers

8. Performing Organization Rept. No.

9. Performing Organization Name and Address

Walter C. McCrone Associates, Inc.
2820 South Michigan Ave.
Chicago, IL 60616

10. Project/Task/Work Unit No. 90.029

11. Contract(C) or Grant(G) No.

(C)

(G)

12. Sponsoring Organization Name and Address

Illinois Department of Energy and Natural Resources
325 W. Adams
Springfield, IL 62706

13. Type of Report & Period Covered

14.

15. Supplementary Notes

16. Abstract (Limit: 200 words)

In accord with the 1977 Clean Air Act Amendments, the USEPA is establishing a nation-wide inhalable particulate standard to assess the air quality levels of particles. As it appeared that an inhalable standard would be proposed and promulgated by USEPA, the Illinois EPA desired to assess the effect that such a standard would have on Illinois. To support this evaluation, the Illinois EPA requested an assessment of the composition, concentration and size range of both total suspended particulate and inhalable particulate. This report assesses the filter pairs from seven Inhalable and Total Suspended Particulate Monitors in Illinois. (One each in Springfield, Joliet, Rockford, East Moline, Peoria, two in Granite City). Some of the filter pairs from these monitors were to be examined with optical and electron microscopy and low temperature ashing to produce data for comparison of the relationship of IP to TSP.

17. Document Analysis a. Descriptors

Inhalable Particulates
Total Suspended Particulates
Illinois

b. Identifiers/Open-Ended Terms

Polarized Light Microscopy
Low Temperature Ashing
Scanning Election Micrographs

c. COSATI Field/Group

18. Availability Statement: No restriction on distribution. Available at the IL depository libraries or from the National Technical Information Service, Springfield, VA 22161	**19. Security Class (This Report)** Unclassified	**21. No. of Pages** 136
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(See ANSI-Z39.18)

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