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EPA

Evaluation Of Ambient Air Quality

In The State Of Nebraska

Based on Monitoring Data Through 1982

EVALUATION OF AMBIENT AIR QUALITY

IN THE STATE OF NEBRASKA

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EXECUTIVE SUMMARY

This report presents an evaluation of recent ambient air quality in Nebraska based on 1981 and 1982 monitoring data for the criteria pollutants [Total Suspended Particulates (TSP), Sulfur Dioxide (SO_2), Carbon Monoxide (CO), Nitrogen Dioxide (NO_2), Ozone (O_3) and Lead (Pb)]. Trend evaluations are based on five years of data, 1978-1982. All monitoring data used were retrieved from the Storage and Retrieval of Aerometric Data (SAROAD) system.

The report presents the following information in graphical form:

- Recent air quality and trends
- Boundaries of designated non-attainment areas
- Spatial scale of representativeness and data completeness by monitor
- Emissions and stack height relative to monitor locations
- Population within designated non-attainment areas.

Tabular summaries in the Appendices show the numerical data on which the graphics are based.

The findings and recommendations of the evaluation can be summarized in three categories: Attainment/Non-Attainment Designations; Areas of Continuing Air Quality Concern; and Monitor Operation.

A. Attainment/Non-Attainment Designations

The evaluations of ambient air quality based on recent data find the attainment status designations to be generally consistent with recent data for most pollutants in most parts of the State. Recomendations are made in the text for attainment status changes for TSP and CO. The TSP recommendations would consider some redesignations from non-attainment to attainment, and a few redesignations from attainment or unclassified to non-attainment. The CO recommendations would expand the non-attainment area in Lincoln, and would consider reducing the size of the non-attainment area in Omaha.

B. Air Quality Concern Areas

Relatively few serious air quality problems are found in Nebraska, based on the monitoring data available in SAROAD. The areas which pose human health concerns, because the primary standards were exceeded, are summarized as follows:

First Priority - Repeated exceedance of the primary standards including exceedance of the alert level at least once during 1981-1982.

- ° TSP - Louisville
- ° CO - Lincoln (both sites) and Omaha (7425 West Dodge)

Second Priority - Violation of the primary standard during 1981-82, but no exceedance of the alert level.

° TSP - Nebraska City
° TSP - Omaha (11th at Nicholas)
° TSP - South Sioux City (both sites)

Two of the above areas are addressed more extensively in Section XII which summarizes previous studies in the areas, presents pollution roses for monitors in the areas, and evaluates possible causes of the high concentrations observed. While the conclusions of that section generally agree with those of previous studies, the pollution roses provide a different perspective which may be useful in the State's continuing efforts to identify and control the sources of those concentrations.

In recent years, there have been reductions in both the number and the size of areas which exceed the primary standards, especially for particulate matter. Those reductions are encouraging indications of progress made by the State and local agencies.

C. Monitor Operation and Siting

The precision and accuracy data generally reflect conscientious efforts by the State and local agencies to operate the monitors in accordance with the Quality Assurance requirements of the regulations. Recommendations are made for increasing the number of precision checks performed on automated analyzers in Omaha and ensuring that precision and accuracy assessments are performed and reported for all SLAMS data collected after January 1, 1983.

A review of emission source locations and monitor locations finds that the monitoring network generally addresses the most significant sources in the State. Recommendations are made, though not at high priority, for the State to consider establishing SO_2 monitors downwind of two power plants and to consider CO monitoring in Sarpy and Hall Counties.

ACKNOWLEDGEMENTS

This report draws on the work and talents of several people in addition to the author. Jeff Wandtke, of EPA Region VII, who has a special ability to coax useful data and graphic output from reluctant computers, provided data retrievals and map production runs in a consistently timely manner. Carl Hess, of the Computer Sciences Corporation, wrote the software to translate air quality data and emissions data into symbols for the maps in the text. That software is now available from Region VII. Mick Daye, the Regional Meteorologist for EPA Region VII, provided the meteorological data for pollution roses and useful, objective insights into the utility and the limitations of pollution roses. Rob Ireson of Systems Applications, Inc., developed software which we requested for computing population estimates for designated non-attainment areas. Tim Matzke of the Environmental Results Branch, OMSE, EPA Headquarters, provided coordination for the funding of that software. Barbara Nichols of EPA Region VII typed the manuscript.

The unique contributions of each of those individuals to this project are gratefully acknowledged.

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CONTENTS (cont')

I. INTRODUCTION

The Environmental Services Division of EPA Region VII prepares an annual evaluation of ambient air quality for each State within the Region. The evaluation report serves as a basic reference document which summarizes the following information for the State:

- recent monitoring data
- current attainment and non-attainment area designations
- air quality trends
- ambient monitor locations
- emissions
- population
- data completeness
- monitor scales of representativeness
- precision and accuracy estimates

The data summaries are presented both in graphical form (on maps) and in tabular form.

While the format and evaluation methods are similar to the FY-82 report, three new features have been added this year. First, pollution roses have been constructed, subject to data availability, to aid in identifying possible sources of high pollutant concentrations. (The description of analysis procedures in Section III.J of this report highlights the nature and limitations of those roses.) Second, the point source symbols on the maps are keyed to a list of major point sources. Third, population estimates within specific non-attainment areas have been calculated. (The population density maps on which those calculations were based are included as Appendix C).

The evaluation is based on information available as of March 31, 1983. That information includes non-attainment area designation changes which were made during 1982. Emissions data reflect the latest National Emissions Data System (NEDS) update supplied by the State. Ambient monitoring data for 1981 and 1982 are included for all pollutants. In addition, since the ozone standard is based on a three-year average, 1980 data are included for ozone.

- the magnitude of emissions for each source
- the stack height for each source, if available from NEDS
- the locations of ambient monitors
- the monitor type designation--National Air Monitoring Station (NAMS), State and Local Air Monitoring Station (SLAMS) or Special Purpose Monitoring Station (SPMS)--for each monitor

The above items are illustrated in the legends to the maps (Tables 2 and 3), and are explained in detail in the following paragraphs. For convenience in interpreting the maps, an extra copy of the legends, a map with county names, and a map of population density by county are inserted unbound at the back of this report.

A. Monitoring Data Maps

For each monitor, the symbol location on the map shows the monitor location. The symbol size displays the scale of representativeness of the monitor - microscale, middle scale, neighborhood scale, urban scale or regional scale. Symbol shading indicates data completeness. If the data did not meet the completeness criteria described in Section III.F in any one year evaluated an open symbol "0" is shown. If the data met the criteria in each year included in the evaluation, a filled circle is shown. The symbol color presents the comparison of recent monitoring data with the NAAQS's. Green indicates no violation of the standards. Blue depicts violation of the secondary standard, but no violation of the primary standard. Red highlights violation of the primary standard. If the alert level was exceeded during the years evaluated, a red flag is placed on top of the symbol. If any violation of standards was observed, annotations next to the symbol specify which standard(s) was (were) violated. Red annotations specify primary standards, while blue annotations specify secondary standards. Where the primary and secondary standards are identical, only the primary standard is shown. Possible annotations include A, Q24, 8, 3 and 1, signifying annual, quarterly 24-hour, 8-hour, 3-hour and 1-hour standards, respectively.

The boundaries of the designated non-attainment areas and unclassified areas are shown as lines on the map. Red solid lines outline primary non-attainment areas, blue solid lines outline secondary non-attainment areas, and dashed lines show unclassified areas. Consequently, if the attainment status designations are consistent with recent data, red monitor symbols should appear only in red-outlined areas, and blue monitor symbols only in blue-outlined areas.

For monitors which have recorded sufficient data during the five years from 1978 through 1982, trends are presented as an additional annotation. The trend labels and their respective symbols are: increasing trend (↑), probable increasing trend (^), no trend (-), probable decreasing trend (ᵛ), and decreasing trend (↓). For pollutants which have only short-term

TABLE 2

LEGEND FOR AMBIENT MONITORING DATA MAPS

Boundaries

- Primary Nonattainment Area
- Secondary Nonattainment Area
- Unclassified Area

Monitor Symbol Colors and Flag

- No Violation of Standard
- Violation of Secondary Standard
- Violation of Primary Standard
- Exceedance of Alert Level

Annotation for Standards Violated

- A — Annual Primary Standard
- Q — Quarterly Primary Standard
- 24 — 24-hour Primary Standard
- 24 — 24-hour Secondary Standard
- 8 — 8-hour Primary Standard
- 3 — 3-hour Secondary Standard
- 1 — 1-hour Primary Standard

Annotation for Trends

- ↑ Increasing Trend
- ∧ Probable Increasing Trend
- — No Trend
- ∨ Probable Decreasing Trend
- ↓ Decreasing Trend

(Where two trend symbols are shown, the first is for long-term averages, the second for 24-hour observations.)

Monitor Symbol Sizes

- Microscale
- Middle Scale
- Neighborhood Scale
- Urban Scale
- Regional Scale

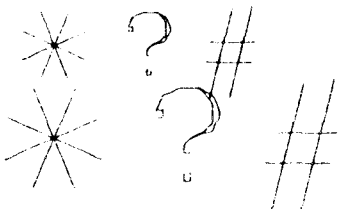
Data Completeness

- Data met completeness criteria each year.
- Data did not meet completeness criteria one or more years.

TABLE 3

LEGEND FOR EMISSIONS DATA MAPS

POINT SOURCE SYMBOL SIZE -- EMISSIONS (TONS/YEAR)



	NON--LEAD	LEAD
? #	100 - 1000	5 - 25
? #	1001 - 5000	26 - 100
? #	OVER 5000	OVER 100

POINT SOURCE SYMBOL COLOR - STACK HEIGHT (METERS)

?	UNKNOWN
	1 - 45
	46 - 120
	OVER 120

AMBIENT MONITOR SYMBOLS

■	NAMS
●	SLAMS
▲	SPMS

software precludes trend analysis at this time. Further details of the trend analysis procedure are given later in this report (Section III. C).

B. Emissions Data Maps

The emissions data maps provide an overview of the monitoring network, showing monitor locations relative to emissions locations. The overview is designed to answer the question: Are monitoring stations located in areas which have large pollutant emissions? Detailed information on specific monitoring sites is contained in the reviews of each of the SLAMS sites which were performed by Jim Kelly of EPA Region VII. The report of those reviews was sent to the State as a separate communication in December of 1981.

The locations of large point sources are shown by an asterisk for sources of particulates, CO, NO_x, SO_2 and Pb. The symbol # is used for hydrocarbon sources. The size of the symbol indicates the magnitude of the emissions in three ranges. For lead, those ranges are 5-25 tons/year, 26-100 tons/year, and over 100 tons/year. For the other pollutants, the ranges are 100-1000 tons/year, 1001-5000 tons/year and over 5000 tons/year. The symbol color indicates the stack height as follows: red for 1-45 meters, blue for 46-120 meters, and green for 121 meters or taller. If the stack height is shown as 0 in NEDS, a red question mark replaces the asterisk or the symbol #.

Ambient monitor locations are shown as squares, circles or triangles indicating NAMS, SLAMS and SPMS monitors, respectively.

Emissions density attributable to area sources is shown by the color of shading for each county. The following colors and ranges are used: no shading for low density, green shading for medium-low density, blue shading for medium-high density, red shading for high density, and double red shading for very high density. The specific limits for these ranges are shown on the individual map legends, and correspond to the limits used in the FY-82 report. Because the NAAQS for lead specifies a much lower concentration than the NAAQS's for other pollutants, correspondingly smaller limits are used for lead emissions ranges.

The map presentations do not include small point sources (less than five tons/year for lead, and less than 100 tons/year for the other pollutants). However, since the county totals for emissions from those sources are a small fraction of the corresponding area source emissions, inclusion of small point source emissions with the area source emissions, as was done in the FY-82 report, would not make substantial changes in the maps.

C. Pollution Roses

In areas where the NAAQS's have been exceeded, pollution roses can be useful in evaluating possible sources of high pollutant concentrations. Those roses show the wind speeds and the directions from which the wind blew when high pollutant concentrations were monitored in the ambient

air. The longest arms of the rose point toward the locations of possible causes of the high concentrations. Section III.J discusses the meaning, construction, and limitations of the roses. Because of their inherent limitations, the roses do not provide positive identifications of the definitive causes of elevated concentrations. They do, however, provide useful indications of possible causes.

The following steps were followed in constructing pollution roses:

1. The times (days or days and hours) when pollutant concentrations exceeded the threshold concentration were identified. That information was obtained from the raw data (daily or hourly concentrations) in SAROAD.

2. The wind speed and wind direction were retrieved for each of the times identified in Step 1. On-site meteorological data is preferred, if available. Otherwise, National Weather Service data from a nearby station may be used, with the understanding that the separation between the weather station and the pollutant monitoring station introduces uncertainty into the interpretation of the pollution rose.

3. The weather data were summarized by ranges of wind speeds (e.g. 1-3 mph) and ranges of wind directions (e.g. 15-45°). The frequency of occurrence was then computed for each combination of speed range and direction range.

4. The rose was plotted, using different bar widths and shading patterns for each wind speed range.

Interpretation of a pollution rose considers not only the wind directions displayed, but also the wind speeds and significant pollutant sources in the vicinity of the monitor. If the rose is strongly directional (one or two arms much longer than the others), influence of a single point source or a small cluster of sources is indicated. A more diverse directional pattern would indicate influence by line or area sources or by several point sources located in various directions from the monitor. As stated earlier, if off-site meteorological data are used, uncertainty in the meaning of the pollution rose is introduced. The following three factors tend to increase that uncertainty:

a) short observation times,

b) large distances between the pollutant monitoring site and the weather station,

c) large variations in terrain between the pollutant monitor and the weather station.

Therefore, due caution should be exercised and the advice of the Regional Meteorologist should be sought in interpreting roses constructed from off-site weather data.

Uncertainty of a different type is introduced where a resultant wind speed and direction are used to represent winds for a 24-hour period for a TSP pollution rose. Wind shifts of more than 90° are common over the course of a day. The high pollutant concentrations may occur during only a part of the day, when the wind direction may be different from the resultant direction. In that case, the time resolution of pollutant

monitoring data is not sufficient to detect that effect. Therefore, these pollution roses can provide only preliminary indications of probable sources of high concentrations.

The following description of the sample pollution rose shown in Figure 1 illustrates the evaluation process. The rose was constructed from on-site weather data for hours during which the CO concentration exceeded 10 mg/m^3. With very few exceptions, wind speeds were low (below 3 mph) when those concentrations were observed. From the spread of the directional pattern, a single point source is probably not the cause of the elevated concentrations. Rather, an area source or a line source would be expected. At the bottom of the diagram, the monitor location is shown, along with the adjacent freeway. Considering the location, wind speeds and wind directions, vehicle traffic on the freeway is indicated as the probable cause of the elevated concentrations.

K. Population Data

Population data are used in two contexts in the report. First, a map of population density by county is provided at the back of the report. That map is based on 1980 population data which was obtained directly from the U.S. Bureau of the Census. Second, population exposure estimates are presented in Section XIII for non-attainment areas, based on 1970 census data which are available at a higher level of spatial resolution. Those estimates were produced by Systems Applications, Inc., using block group and enumeration district population data, and were scaled to approximate 1978 values using county-level growth factors. Appendix C describes the procedures used for those calculations.

Figure 1(a). Sample Pollution Rose

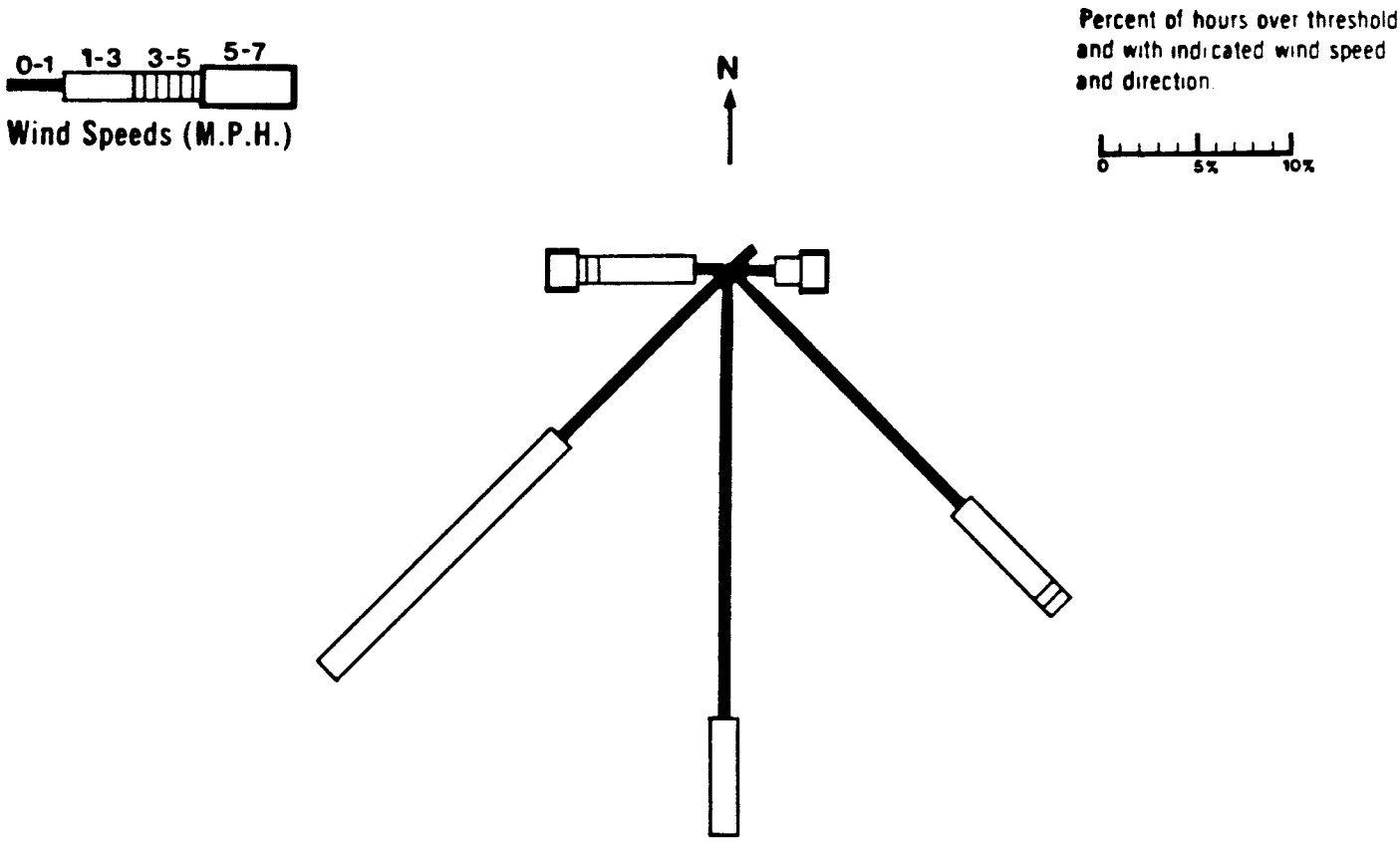
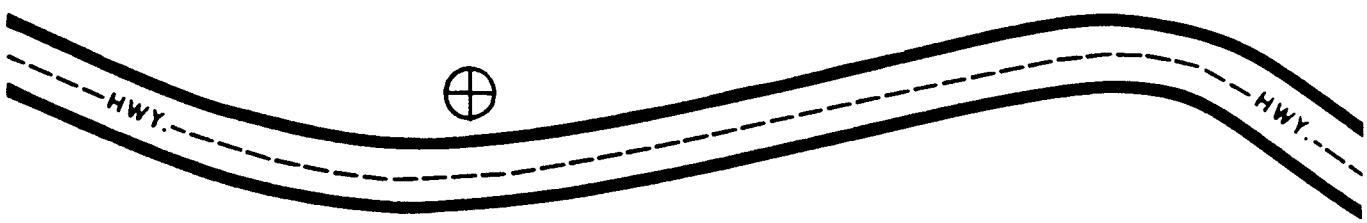


Figure 1(b). Monitor Location for the Rose of Figure 1(a).



IV. TOTAL SUSPENDED PARTICULATES (TSP)

A. Ambient Data and Attainment Status Designations

An extensive TSP monitoring network is maintained in Nebraska. The network includes numerous monitors in Lincoln and Omaha, plus single monitors in many of the smaller cities and towns across the State. The review of monitoring data and attainment status designations will focus first on the outstate areas (where the symbols on the State map are not crowded), and then on the areas with closely spaced multiple monitors (where inset maps are needed to show the detail).

The State has designated non-attainment areas in Omaha, Louisville, and Weeping Water. Unclassified areas are designated in Cass County, Dakota County, and Dawson County.

Approximately half of the monitors in the out-state areas show violation of the 24-hour secondary standard during the period 1981 through 1982. Closer examination of the data in Table A1 show that those apparent violations included two or three exceedances of that standard in a given year, and that in many instances, the violation occurred in one but not both of the two years. Most of the out-state sites which had sufficient data for trend analysis showed decreasing trends over the period 1978 through 1982. Only Nebraska City showed violation of the secondary standard in both years, recording four and three exceedances, respectively, in 1981 and 1982. We recommend that the State consider redesignating that area to secondary non-attainment. That consideration should include an evaluation of whether or not the EPA fugitive dust policy is applicable.

That policy was described in the Federal Register, Volume 3, Number 43 (Friday, March 3, 1978) page 8963.

> "EPA's fugitive dust policy recognizes the generally greater health impact due to fugitive dust in urban areas in contrast to rural areas. In urban areas, the windblown soil contains various man-made toxic pollutants. But, rural windblown dust is usually not significantly contaminated by industrial pollutants. Therefore, for the purposes of these designations [TSP attainment status designations], any rural areas experiencing TSP violations which could be attributed to fugitive dust could claim attainment of the TSP NAAQS. Rural areas for this purpose are defined as those which have: (1) a lack of major industrial development or the absence of significant industrial particulate emissions, and (2) low urbanized population densities."

The following comments highlight the detailed analyses presented on the inset maps.

Cass County - Two areas of the county (the city limits of Louisville and Weeping Water) are designated as primary non-attainment areas. In addition,

B. Emissions Data and Monitor Locations

Numerous particulate point sources are shown on the State map of Particulate Emissions and TSP Monitors. Because of the large number of sources, and because the identifying numbers for those sources are crowded on the State map, five additional maps are provided. The first shows the emission sources without the identifying numbers, and is useful for visualizing monitor locations relative to point sources. The other four show enlargements of the northeast, southeast, south central and southwest sections of the State, and are useful for identifying specific point sources. (The numbers beside the point source symbols refer to the left-most column of Table A4 of Appendix A.)

The following observations are drawn from the emission maps and from Table A4:

- The State has numerous point sources with emissions in the range 100 to 1000 tons/year. Only six plants emit over 1000 tons/year, based on the NEDS estimates, and none emit over 5000 tons/year.

- Stack heights are not available in NEDS for most of the sources.

- A large percentage of the sources are agricultural industries (grain elevators, alfalfa dehydrators, etc.).

- The monitoring network includes monitors in most areas with large emissions.

- While area source emissions are predominant in the Lincoln and Omaha areas, they are less significant in other areas of the State.

- The small number of point sources in Lincoln and Omaha with actual emissions over 100 tons/year demonstrates the progress which the State and local agencies have made in controlling particulate emissions.

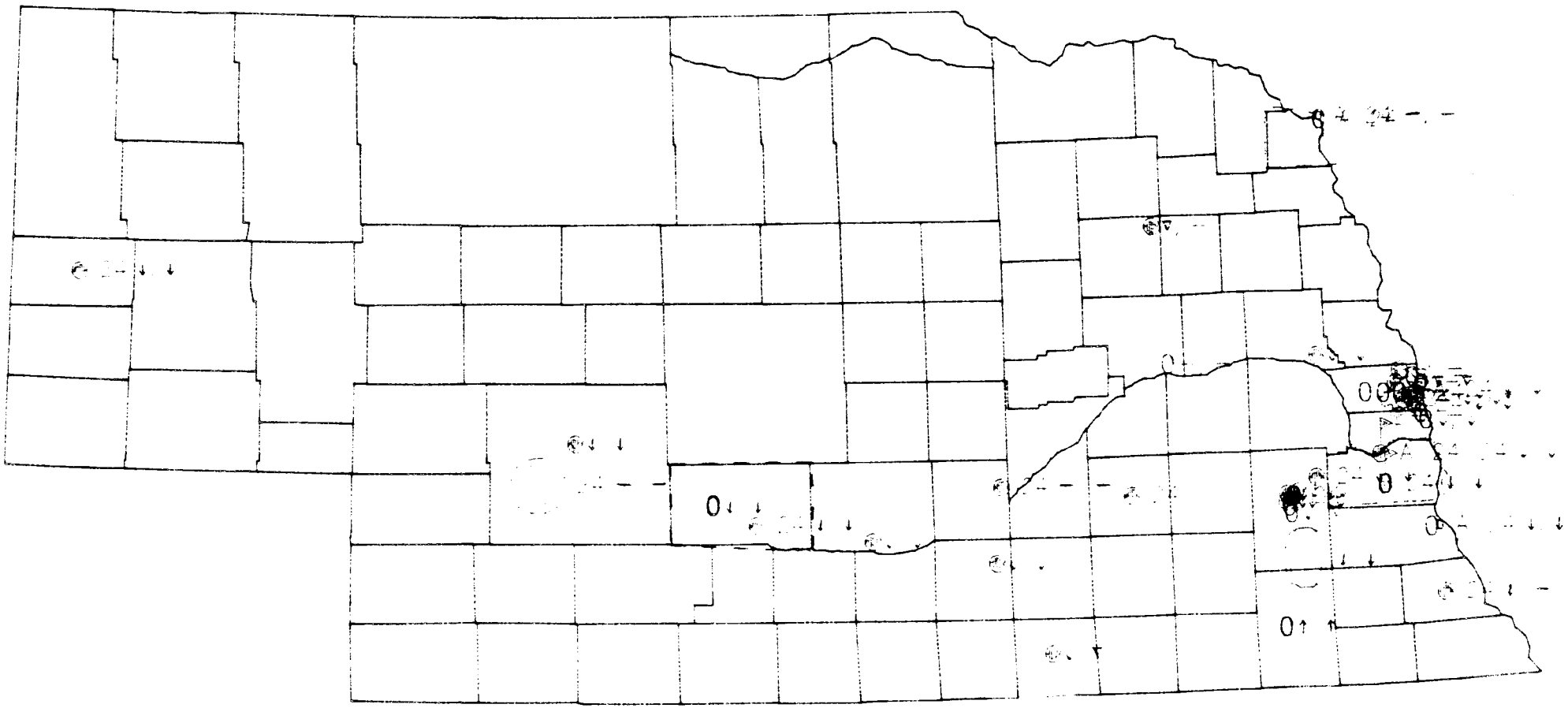
C. TSP Synopsis and Recommendations

The recent TSP monitoring data generally show improvements in air quality in Nebraska. Several recommendations were made in the text for redesignations from primary non-attainment to secondary non-attainment or to attainment. However, in three areas designated as unclassified or attainment, the recent data indicate a possible need to redesignate portions of those areas to non-attainment. Changes in attainment status designation, which we recommend that the State consider, are listed in Table 4. That table is arranged by current designations - primary non-attainment, secondary non-attainment, unclassified, and attainment. The State has recently requested redesignation from primary non-attainment to secondary non-attainment in Weeping Water and around the 24th at "O" Street site in Omaha. Those requests are under review by the Air Branch of EPA, Region VII.

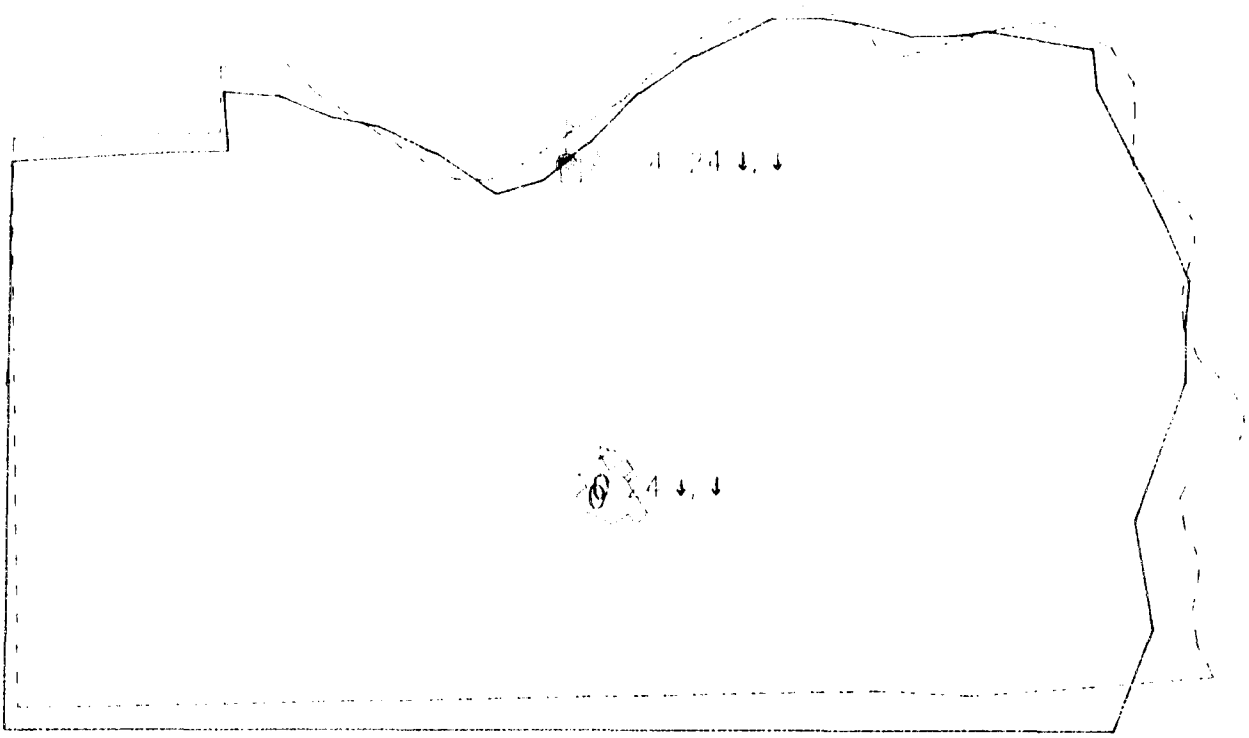
TABLE 4

SUMMARY OF TSP EVALUATION

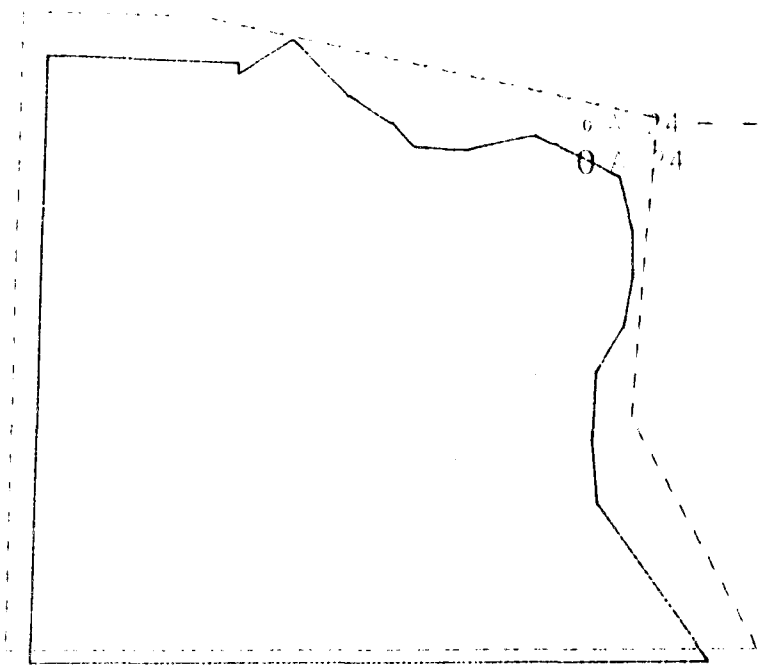
Current Designation	Indicated Changes
Primary Non-Attainment (PNA)	
Omaha	Redesignate the Southern PNA to SNA
Weeping Water	Redesignate to SNA
Secondary Non-Attainment (SNA)	
Omaha	Reduce the size of the area
Unclassified	
Dakota County	Redesignate part of the area to PNA
Attainment	
Lincoln	Redesignate two areas to SNA, if exceedances recur
Nebraska City	Redesignate to SNA



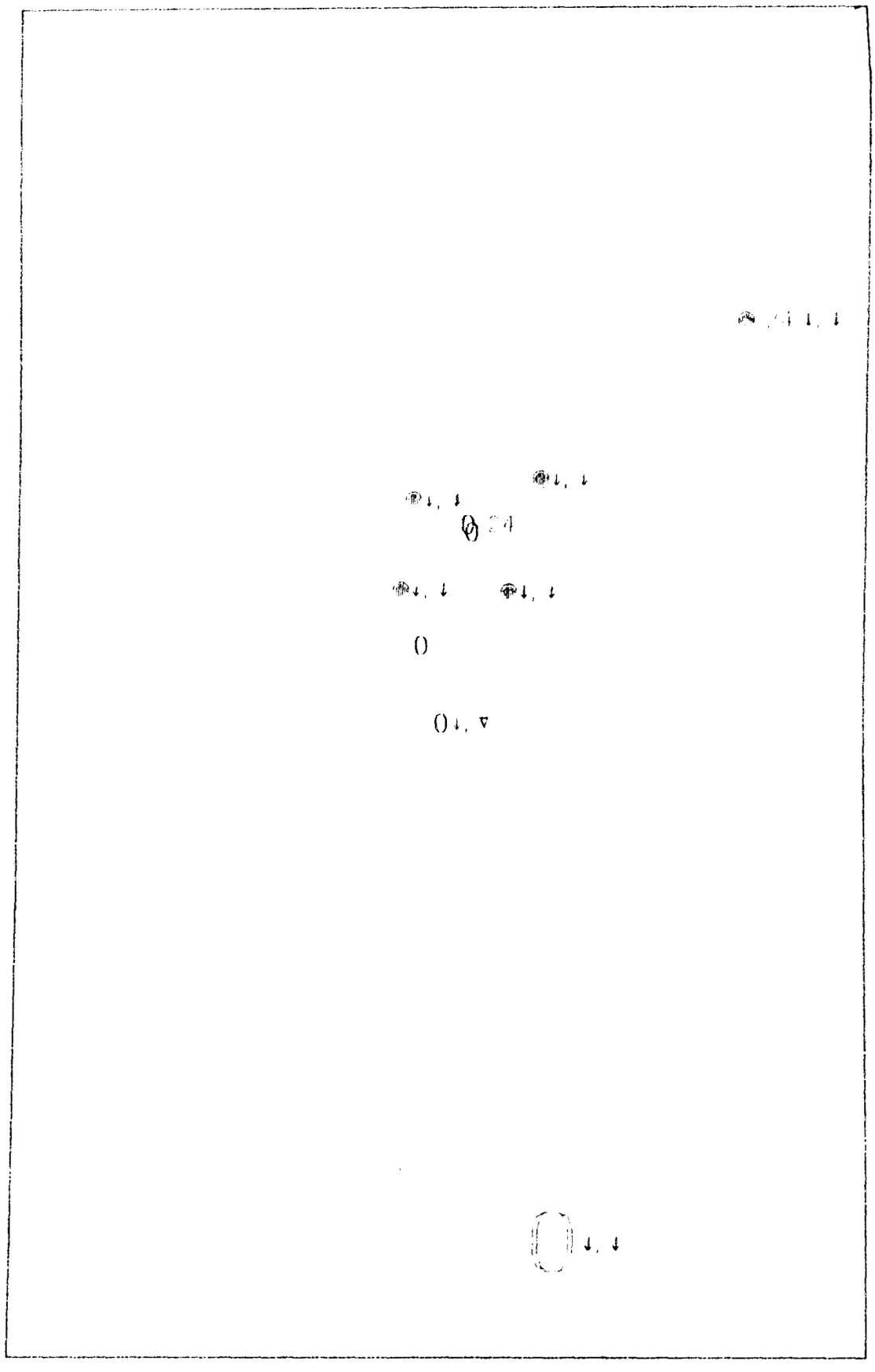
AMBIENT TSP DATA



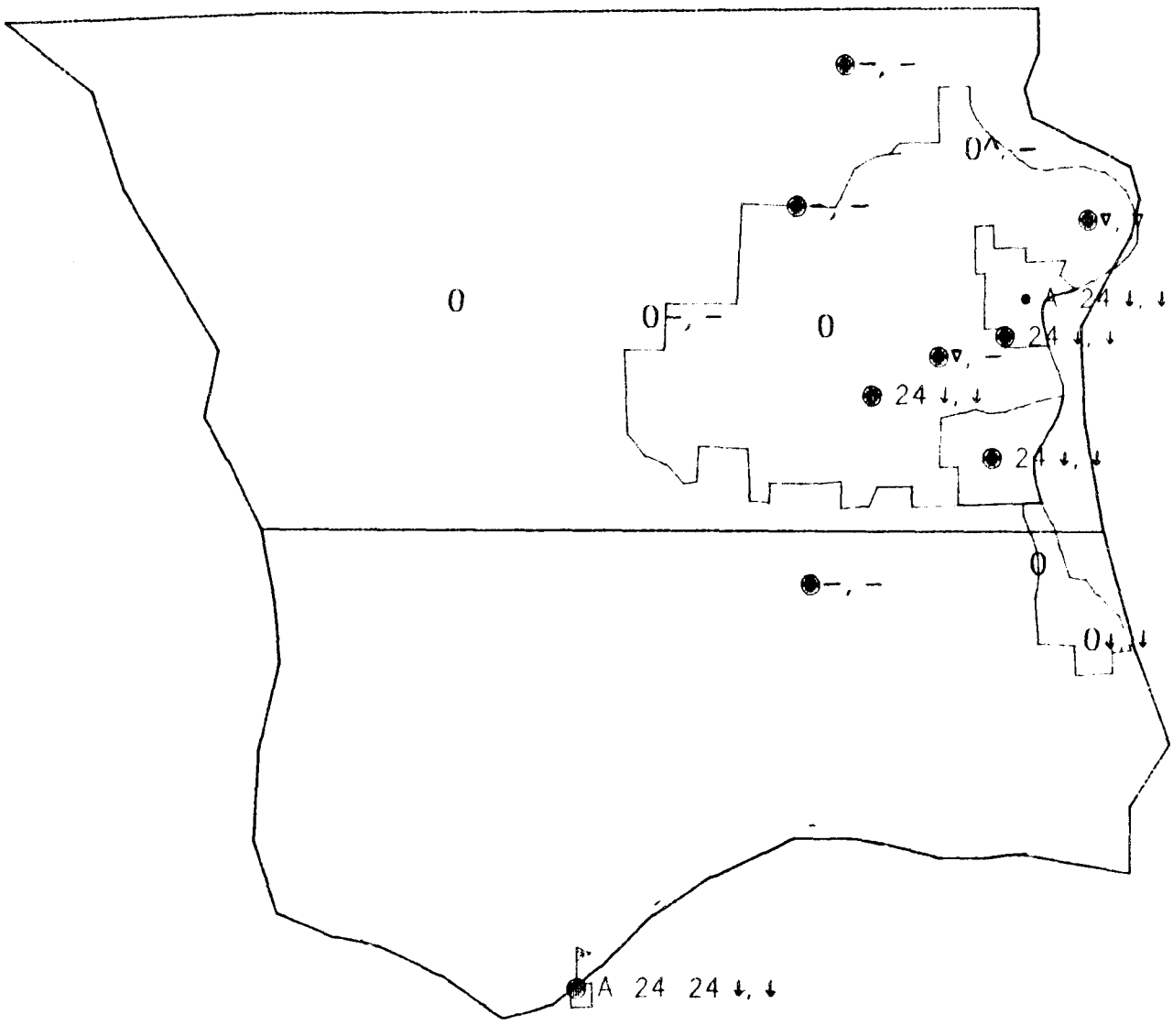
AMBIENT TSP DATA – CASS COUNTY



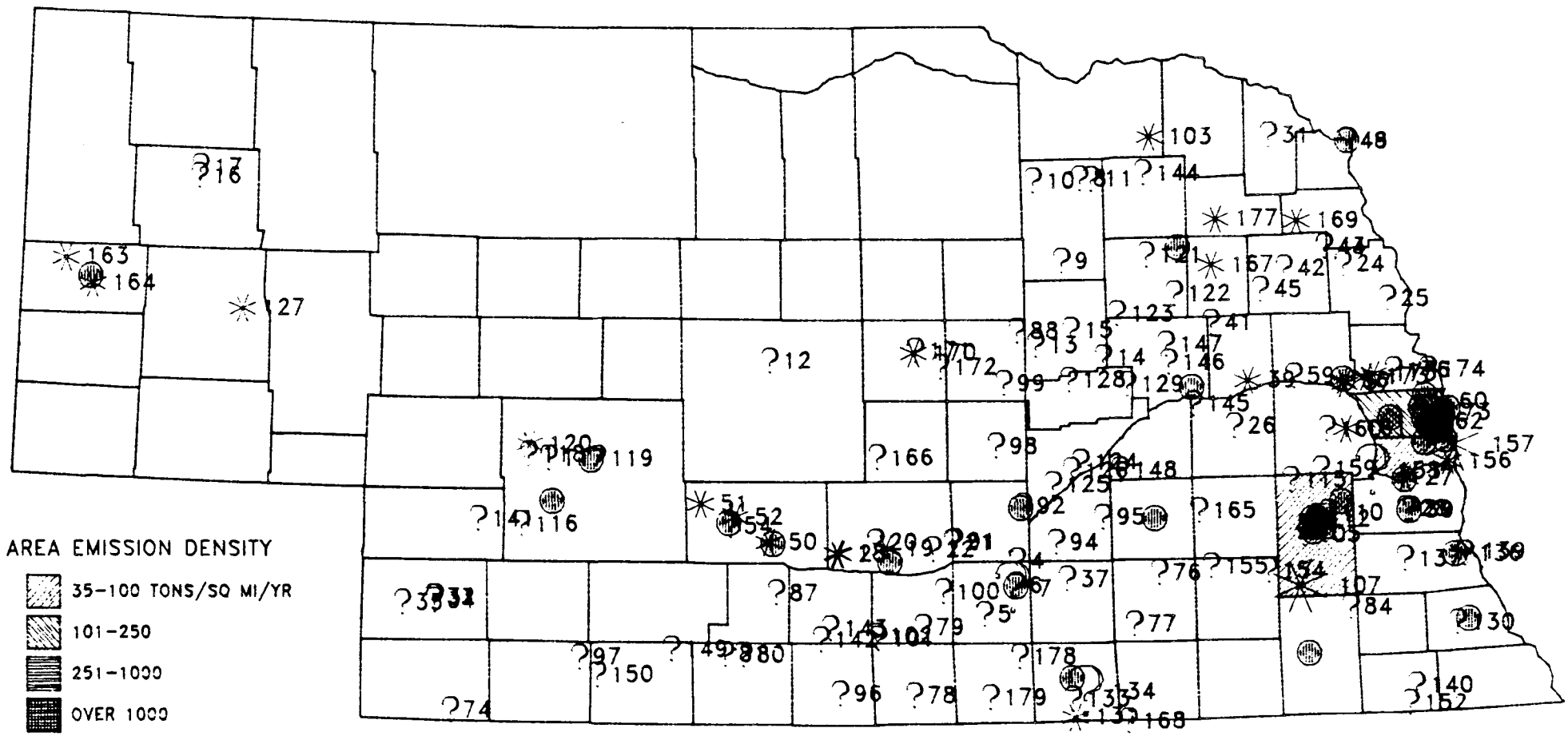
AMBIENT TSP DATA – DAKOTA COUNTY



AMBIENT TSP DATA -- LINCOLN AREA

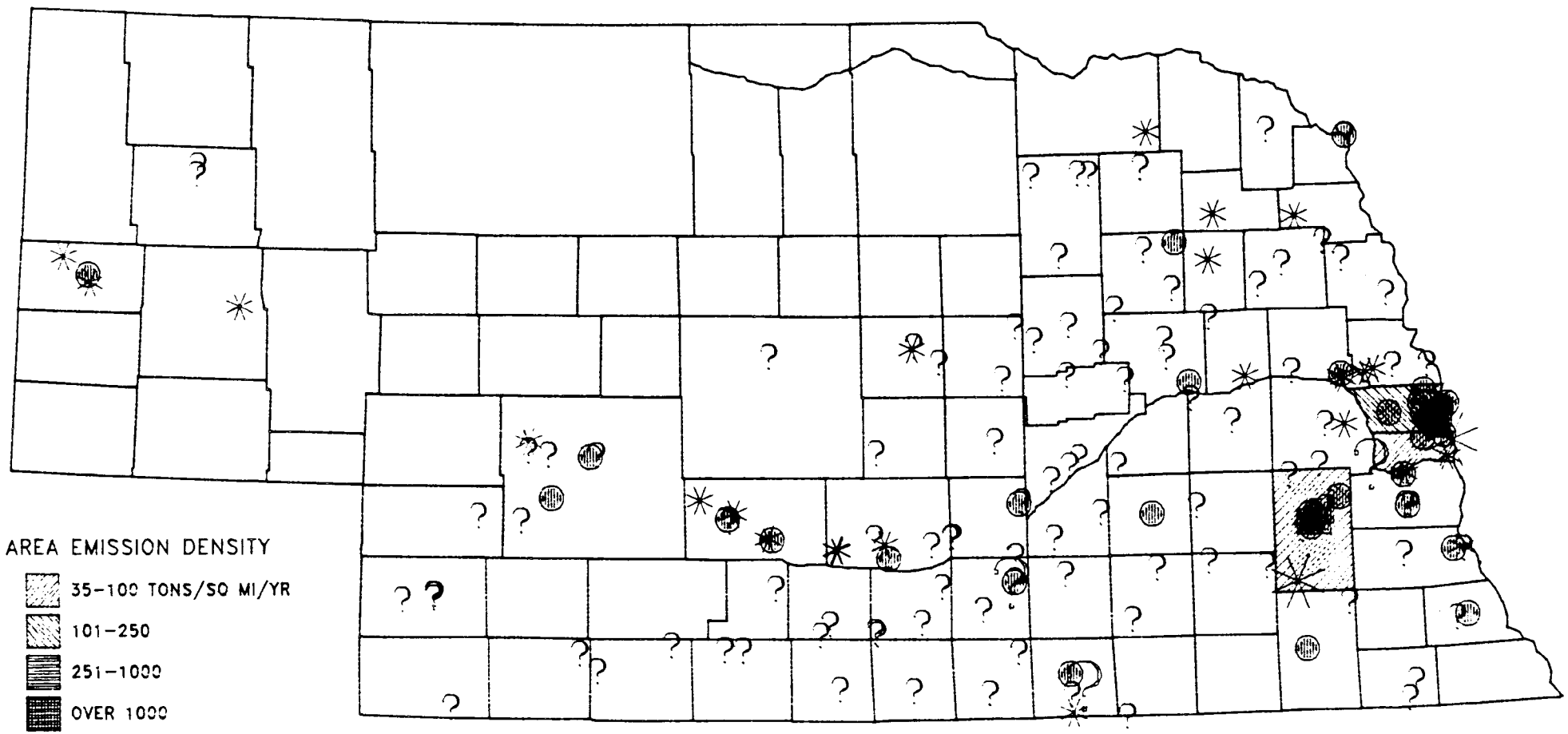


AMBIENT TSP DATA – OMAHA AREA



PARTICULATE EMISSIONS AND TSP MONITORS

C63083



PARTICULATE EMISSIONS AND TSP MONITORS

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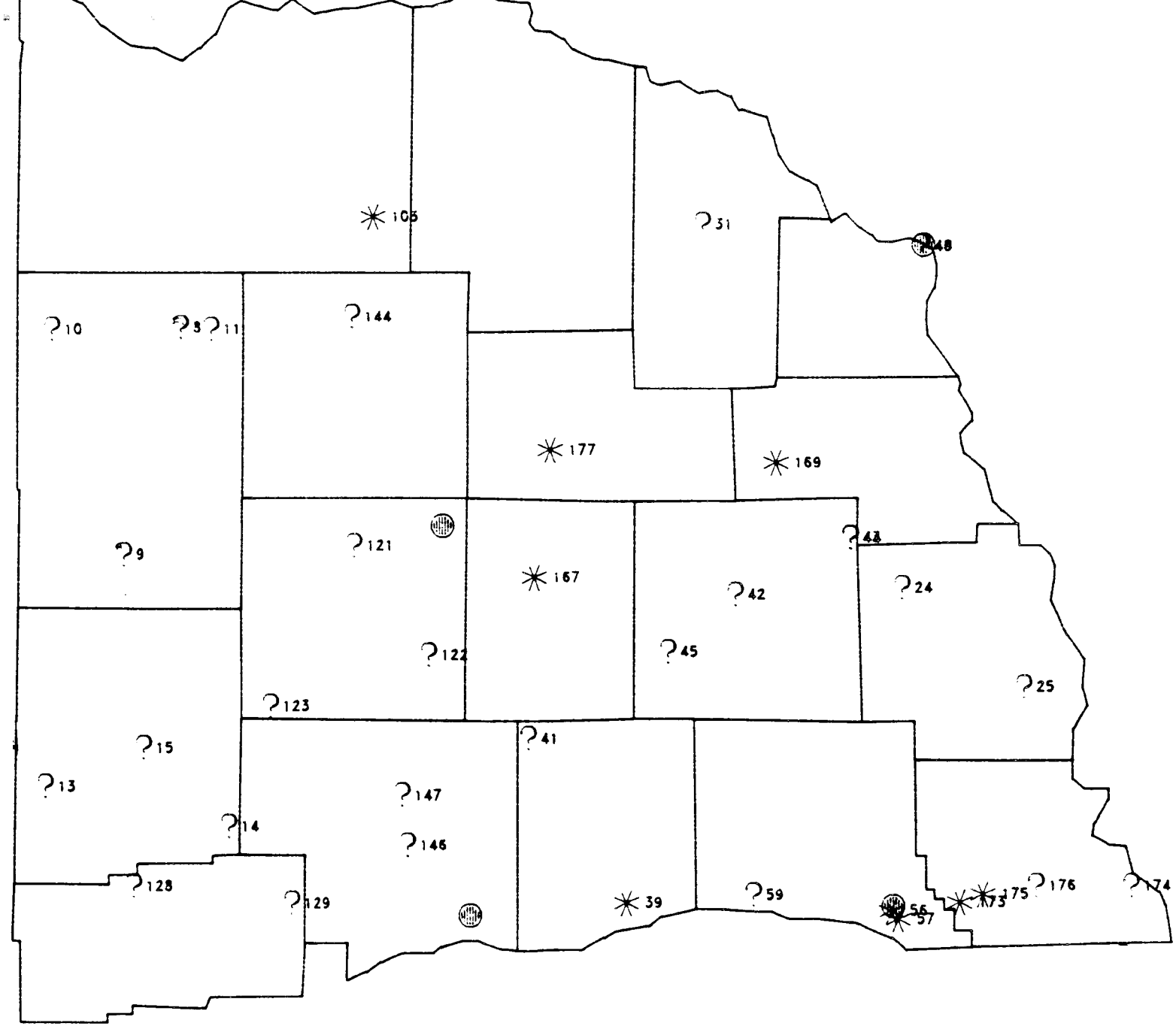
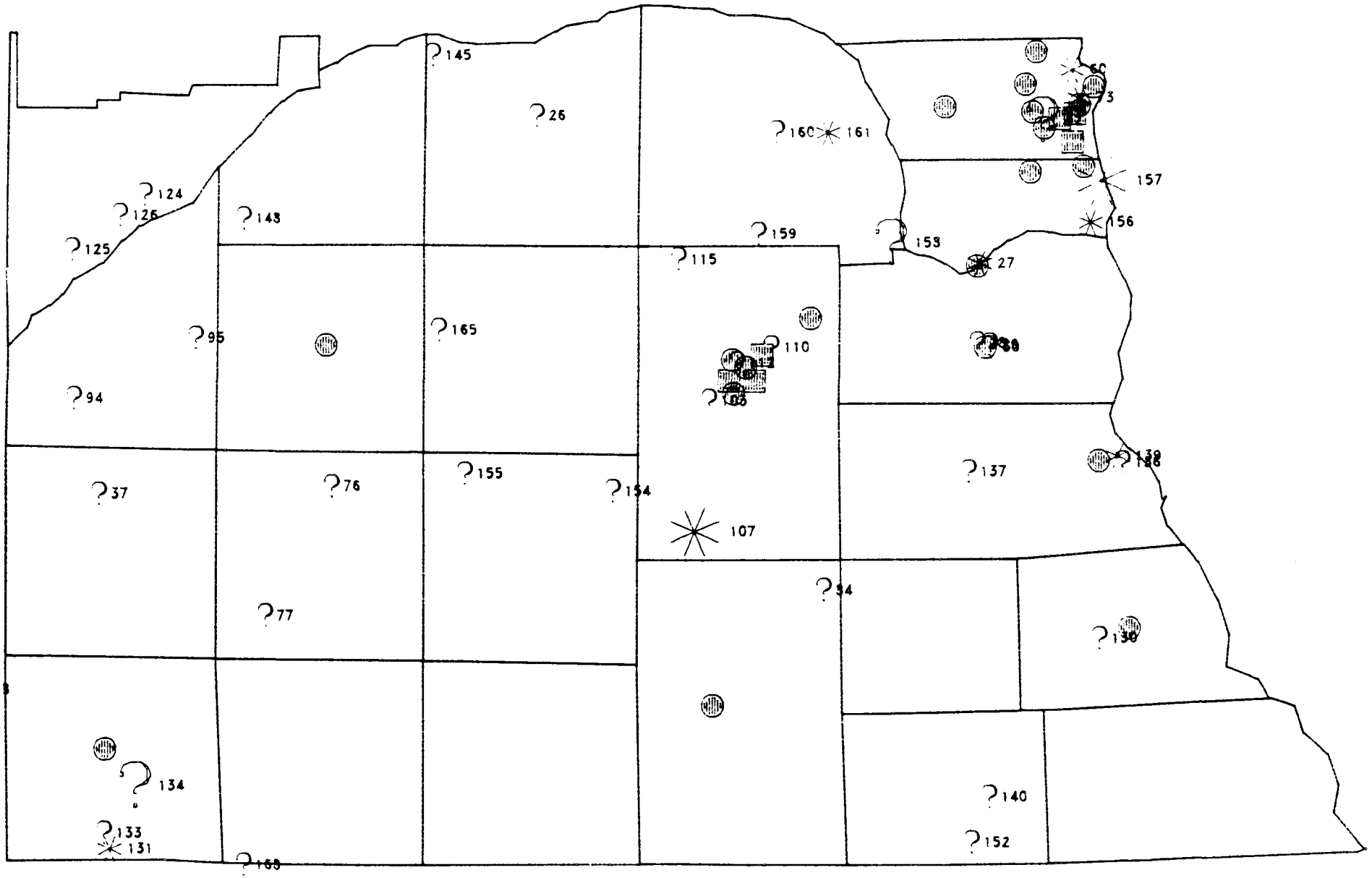


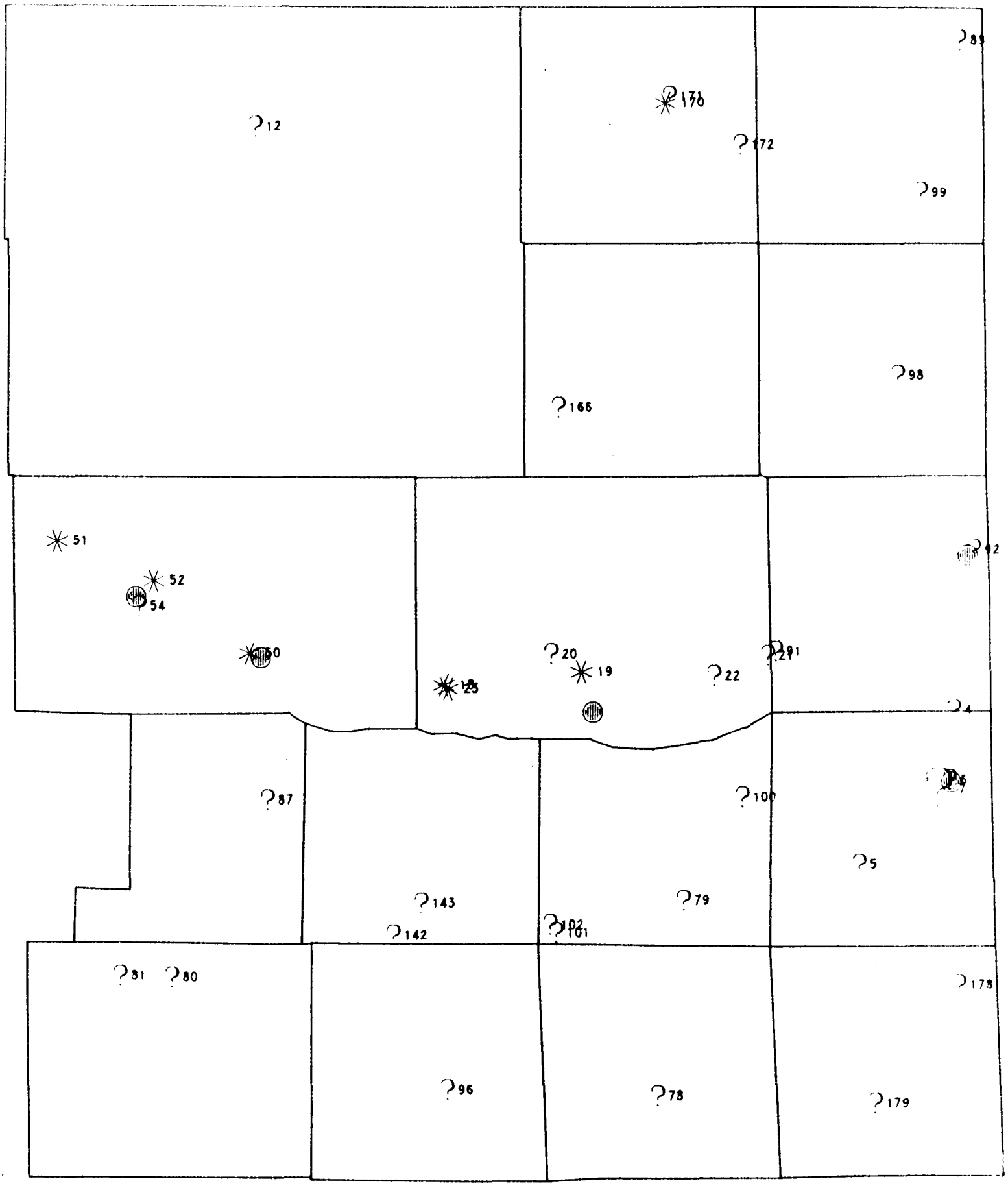
PARTICULATE EMISSIONS AND TSP MONITORS

NORTHEAST NEBRASKA



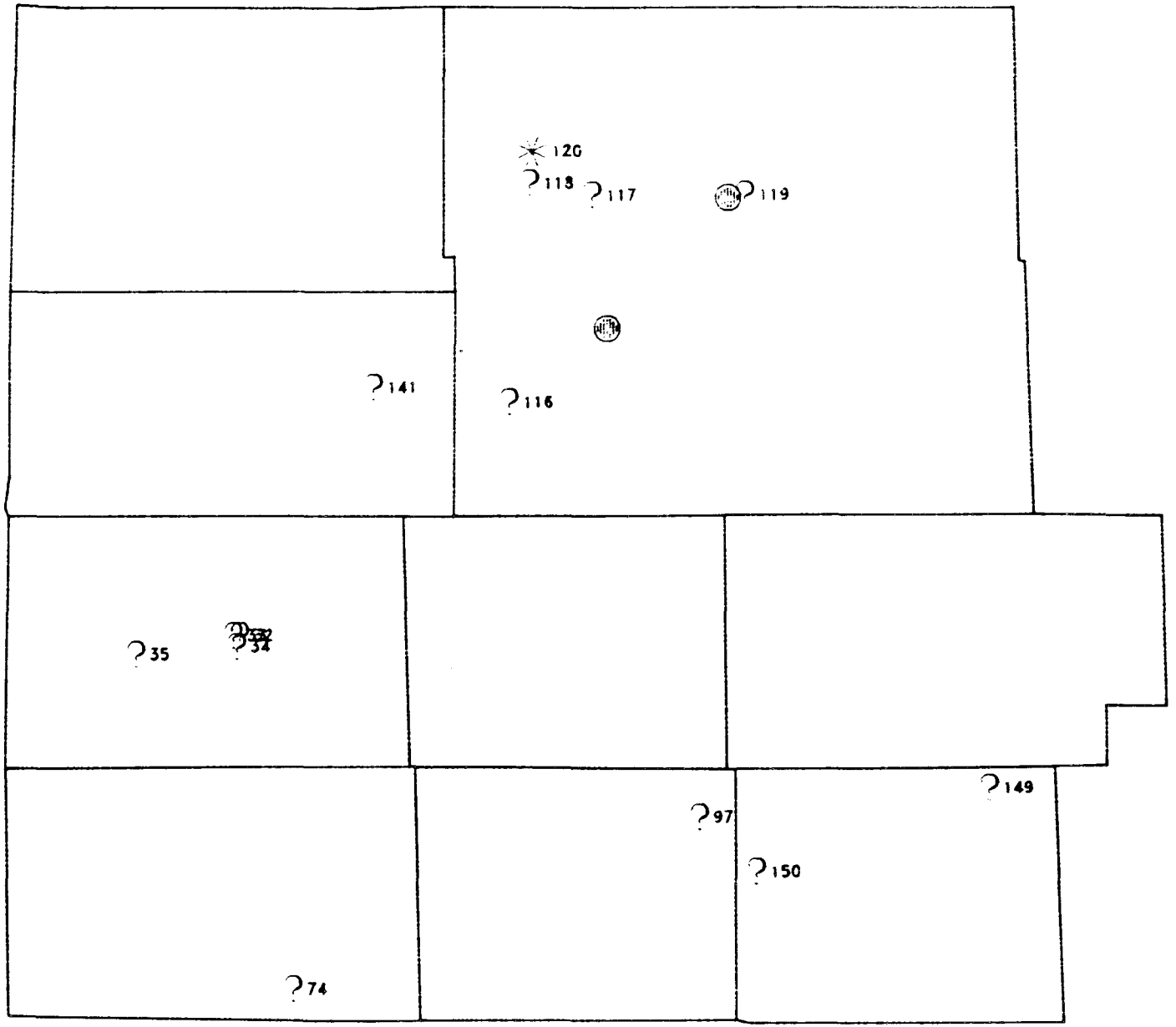
PARTICULATE EMISSIONS AND TSP MONITORS

SOUTHEAST NEBRASKA



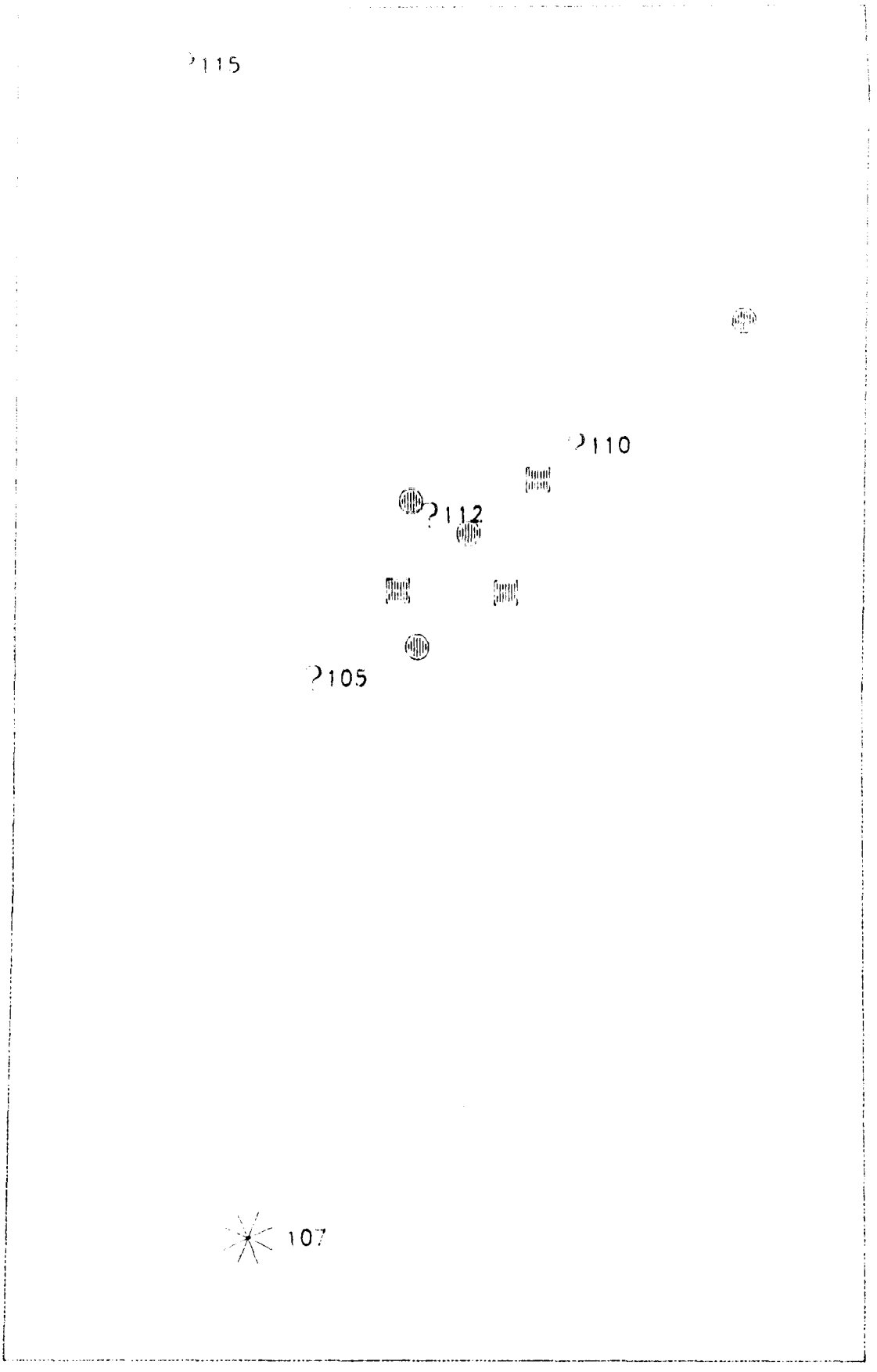
PARTICULATE EMISSIONS AND TSP MONITORS

SOUTH CENTRAL NEBRASKA

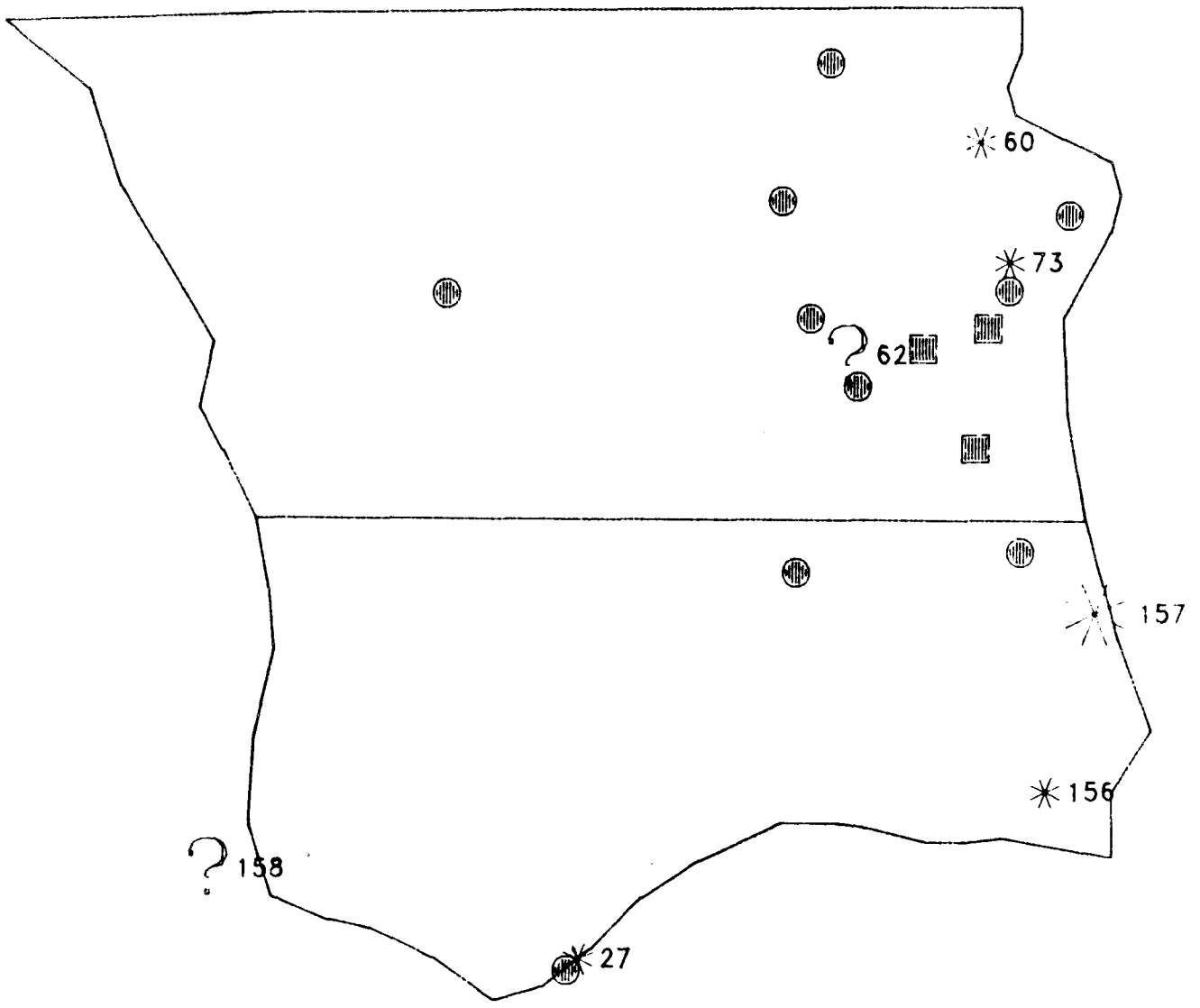


PARTICULATE EMISSIONS AND TSP MONITORS

NORTHWEST NEBRASKA



PARTICULATE EMISSIONS AND TSP MONITORS – LINCOLN AREA.



PARTICULATE EMISSIONS AND TSP MONITORS – OMAHA AREA

06/283

V. SULFUR DIOXIDE (SO_2)

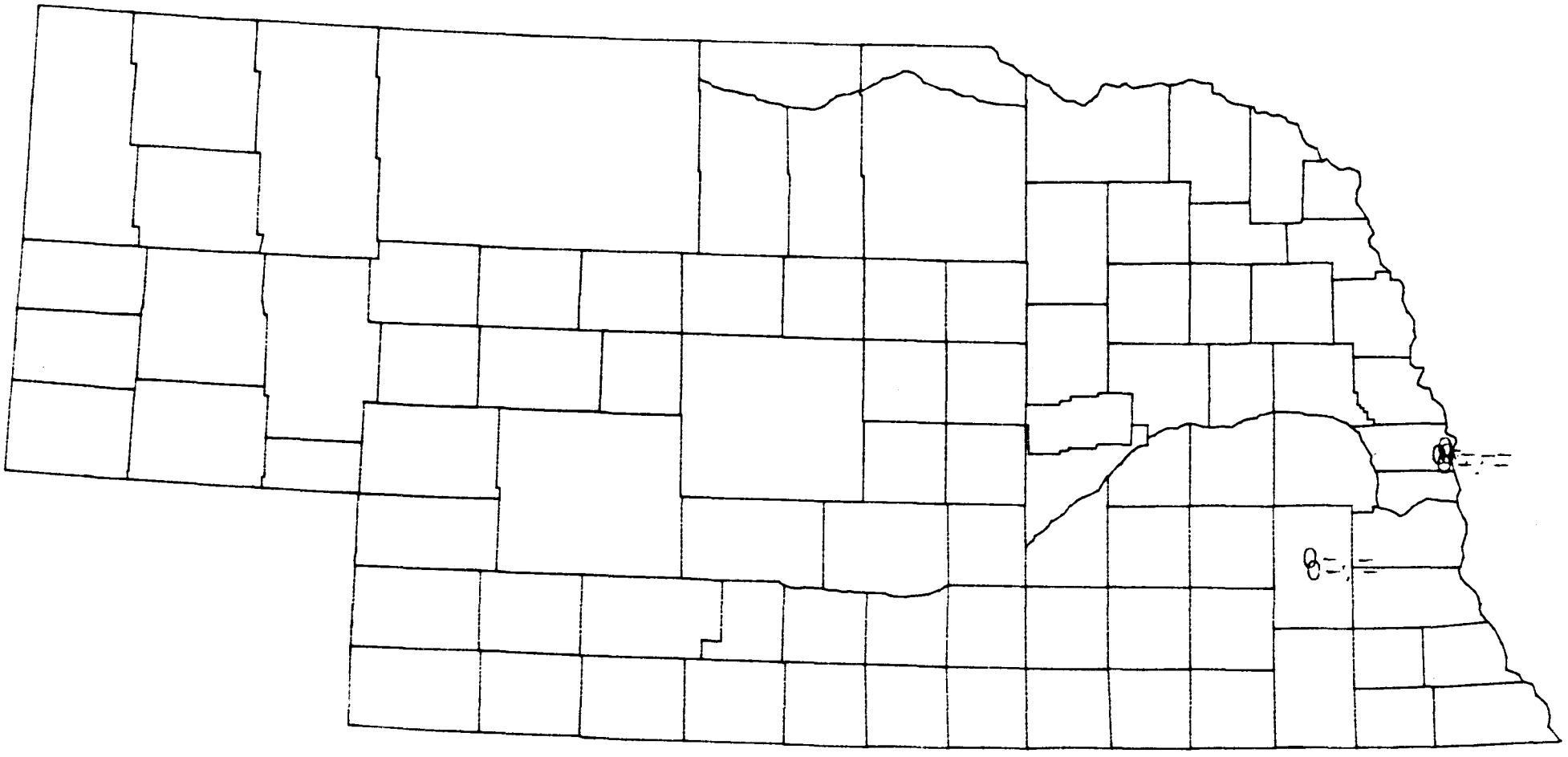
A. Ambient Data and Attainment Status Designations

The entire State of Nebraska is designated as an attainment area for SO_2. Recent monitoring data show maximum concentrations of one-third of the standard or less. Therefore, the attainment designation remains appropriate. Since the observed concentrations were so low, all except one of the monitors have now been discontinued. The one remaining monitor is located at Florence and Burdette Streets in Omaha.

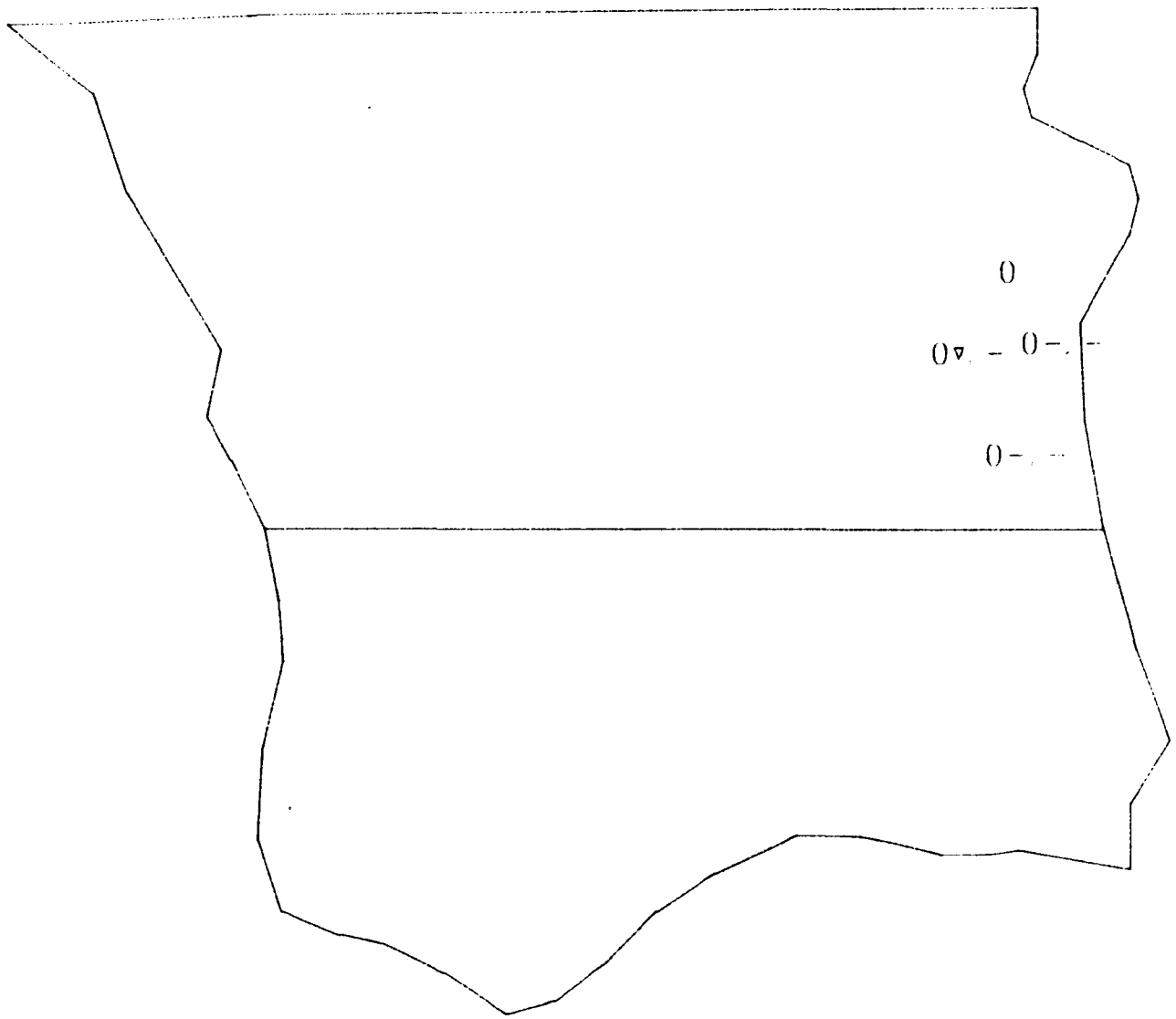
The State map shows widespread incompleteness of data, primarily because most of the monitors were discontinued in mid-1982. However, each of the discontinued monitors were operated for a full year in 1981. For most of the monitors which had enough data for trend evaluations, no statistically significant trends were observed.

B. Emissions Data and Monitor Locations

The SO_2 emissions map shows several point sources of SO_2. Most of those sources have emissions in the range 1000 to 5000 tons/year, and one (Omaha Public Power District, Omaha) emits over 15,000 tons/year. Stack heights are available in NEDS for most of those sources. Area sources for SO_2 are not prevalent in the State. Although the SO_2 monitoring network now includes only one monitor, previous monitoring showed concentrations well below the standard. While monitoring downwind of the OPPD plant in Omaha (source #60 on the map) or downwind of the NPPD plant in Lancaster County (source #107) might be desirable, the priority for establishing those monitors would not be high.

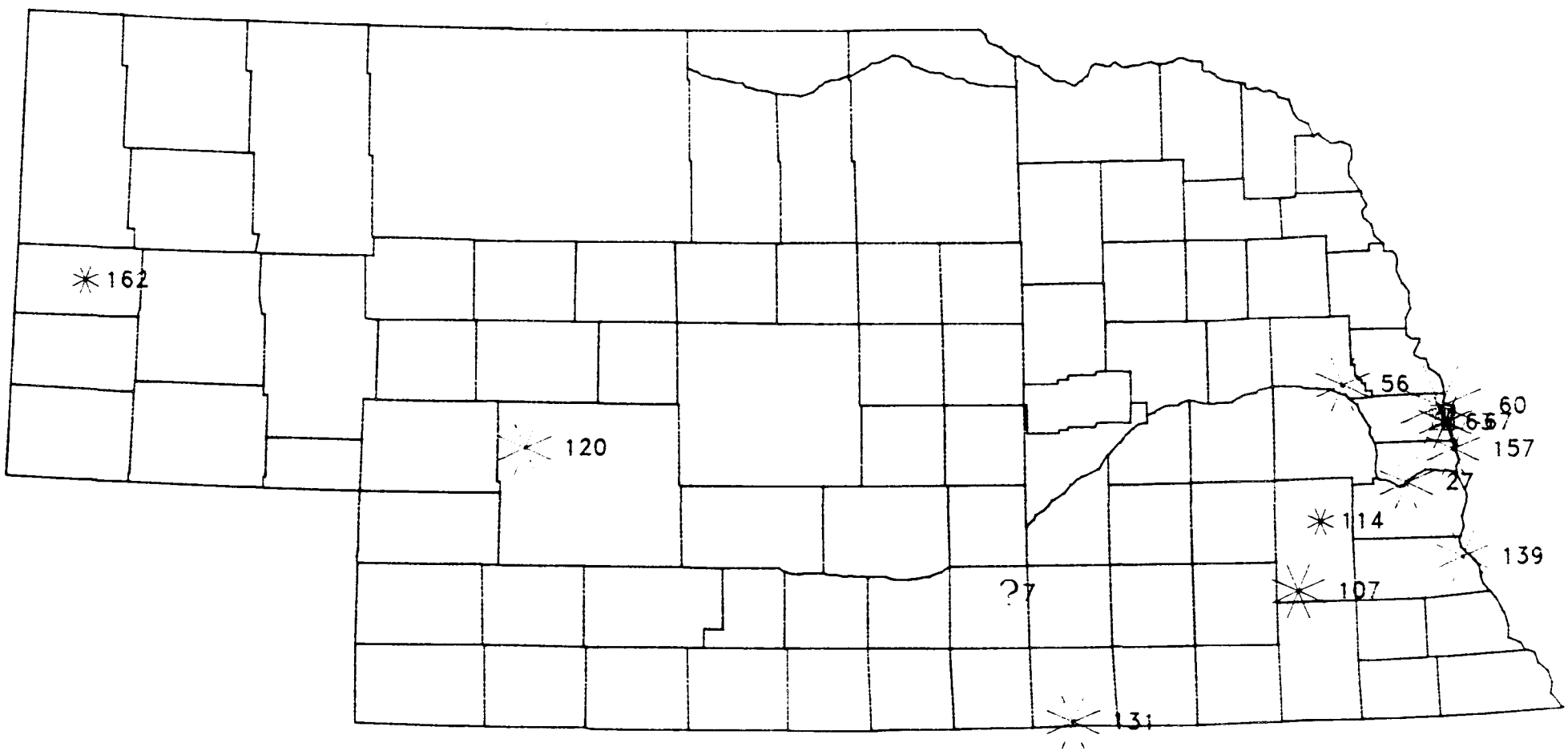


AMBIENT SO2 DATA



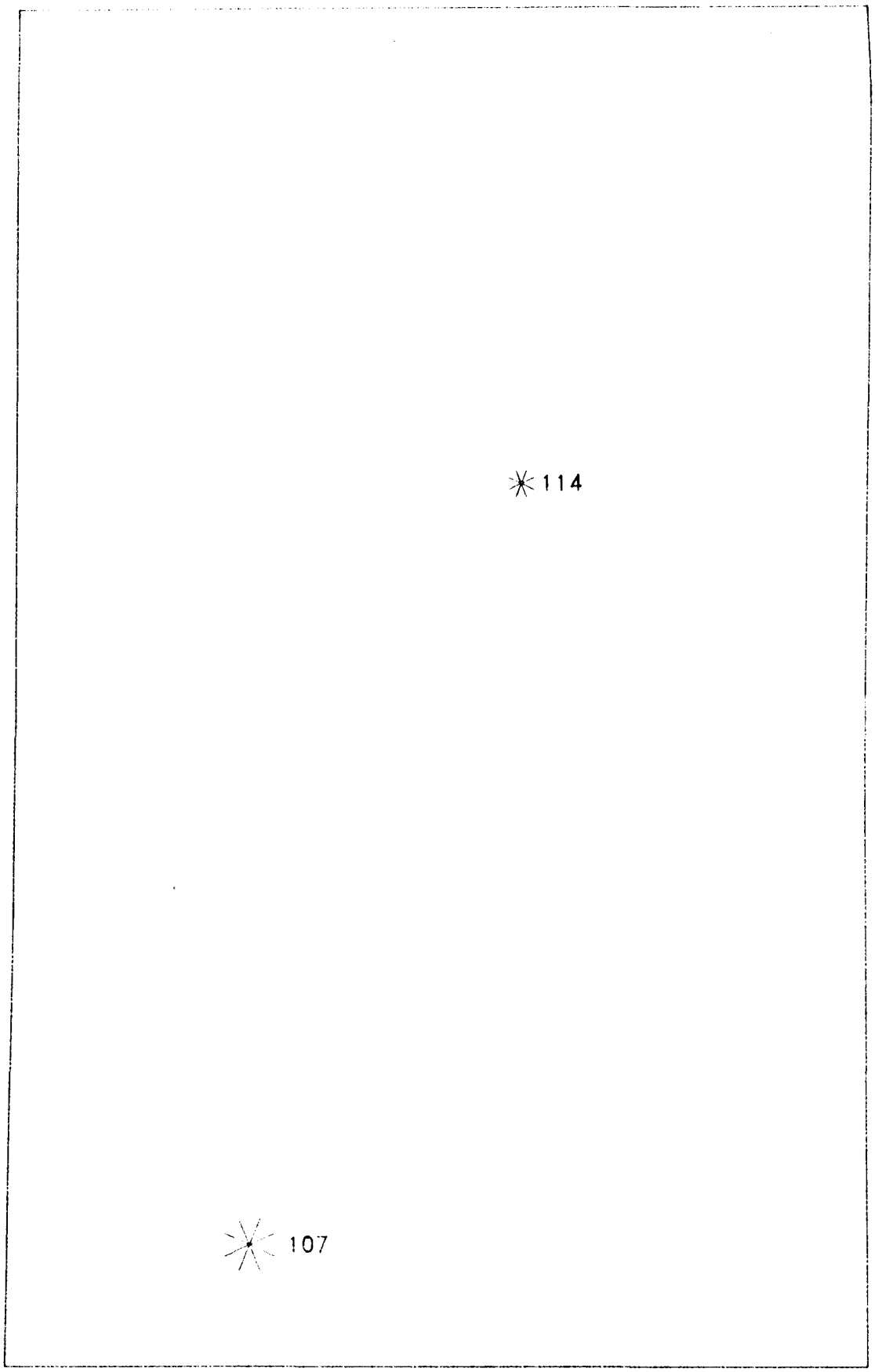
AMBIENT SO2 DATA – OMAHA AREA

052035

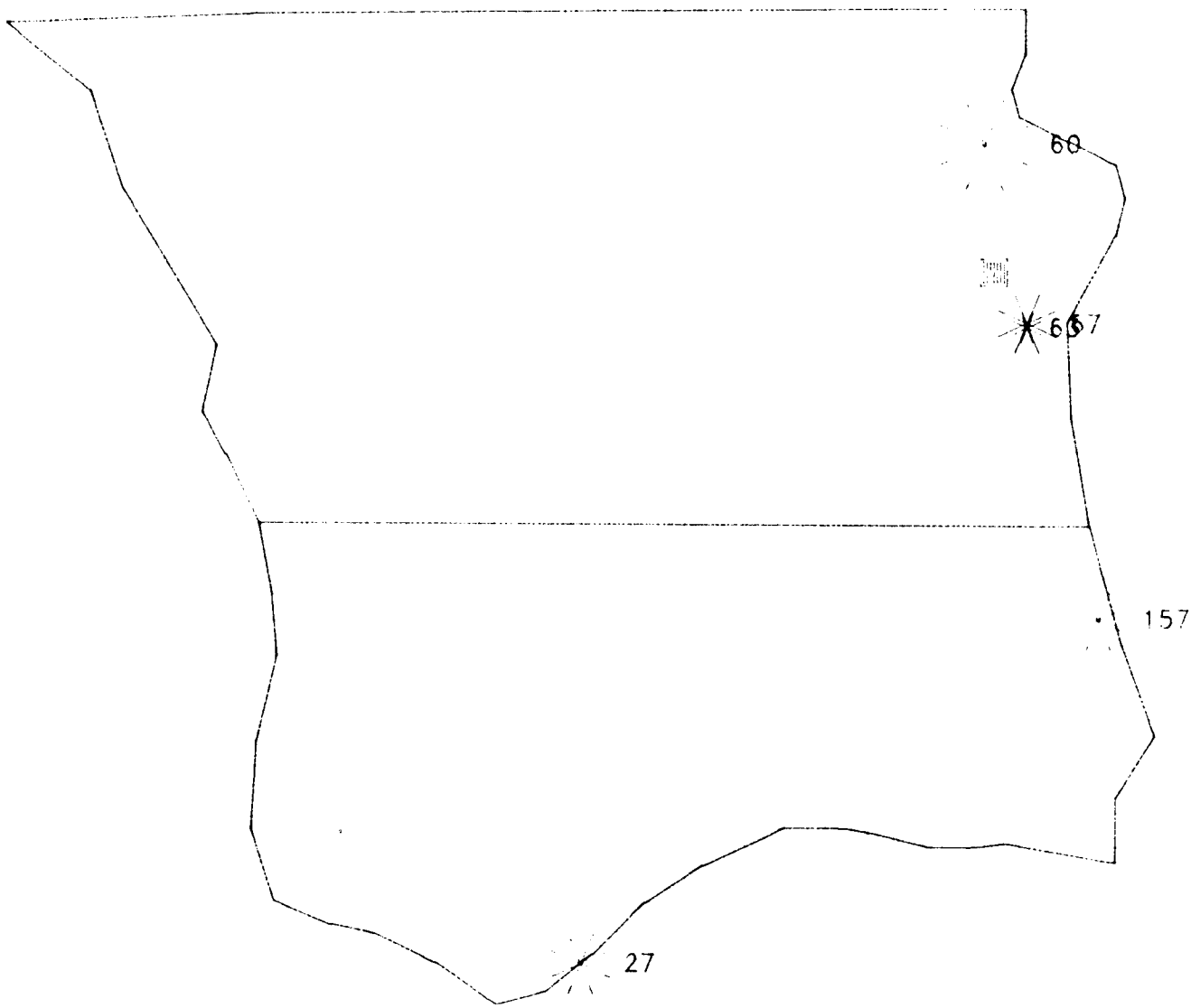


SO2 EMISSIONS AND SO2 MONITORS

050033



SO2 EMISSIONS AND SO2 MONITORS – LINCOLN AREA



SO2 EMISSIONS AND SO2 MONITORS

OMAHA AREA

VI. CARBON MONOXIDE (CO)

A. Ambient Data and Attainment Status Designations

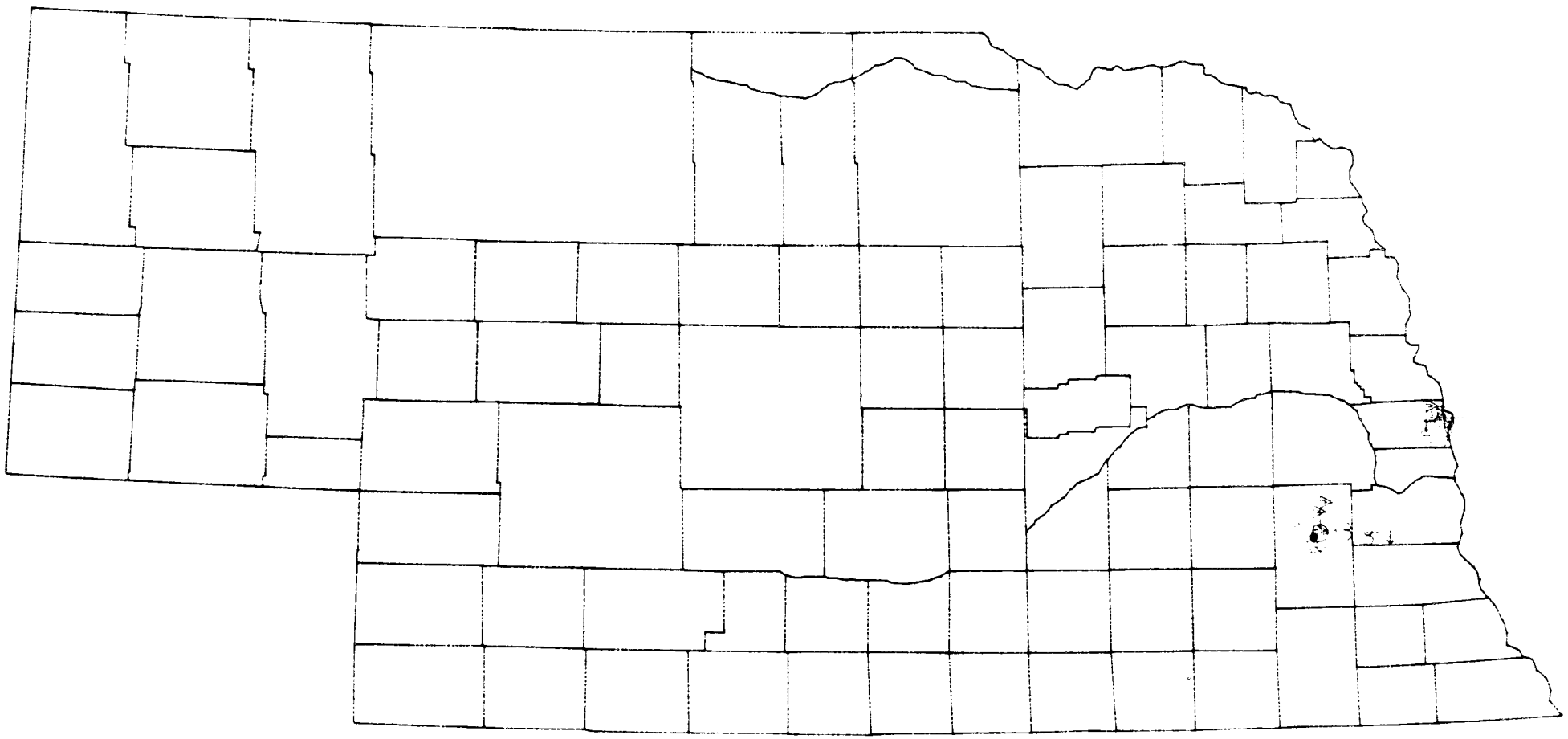
Monitoring for CO is conducted in Lincoln and Omaha. The following comments refer to the detailed analysis presented on the inset maps.

Lincoln - The Antelope Creek basin is designated as a primary non-attainment area for CO, and the remainder of the city is designated as unclassified. Monitoring is conducted at two locations within the city. One is located in the primary non-attainment area, the other in the northeast part of the city. Monitoring data from each site showed nine exceedances of the eight-hour standard in 1981, and two exceedances in 1982. The 1981 data at both sites also showed multiple exceedences of the alert level. Therefore, the recent data indicate a larger non-attainment area than is currently designated. We recommend that the State consider redesignation of part of the unclassified area to non-attainment.

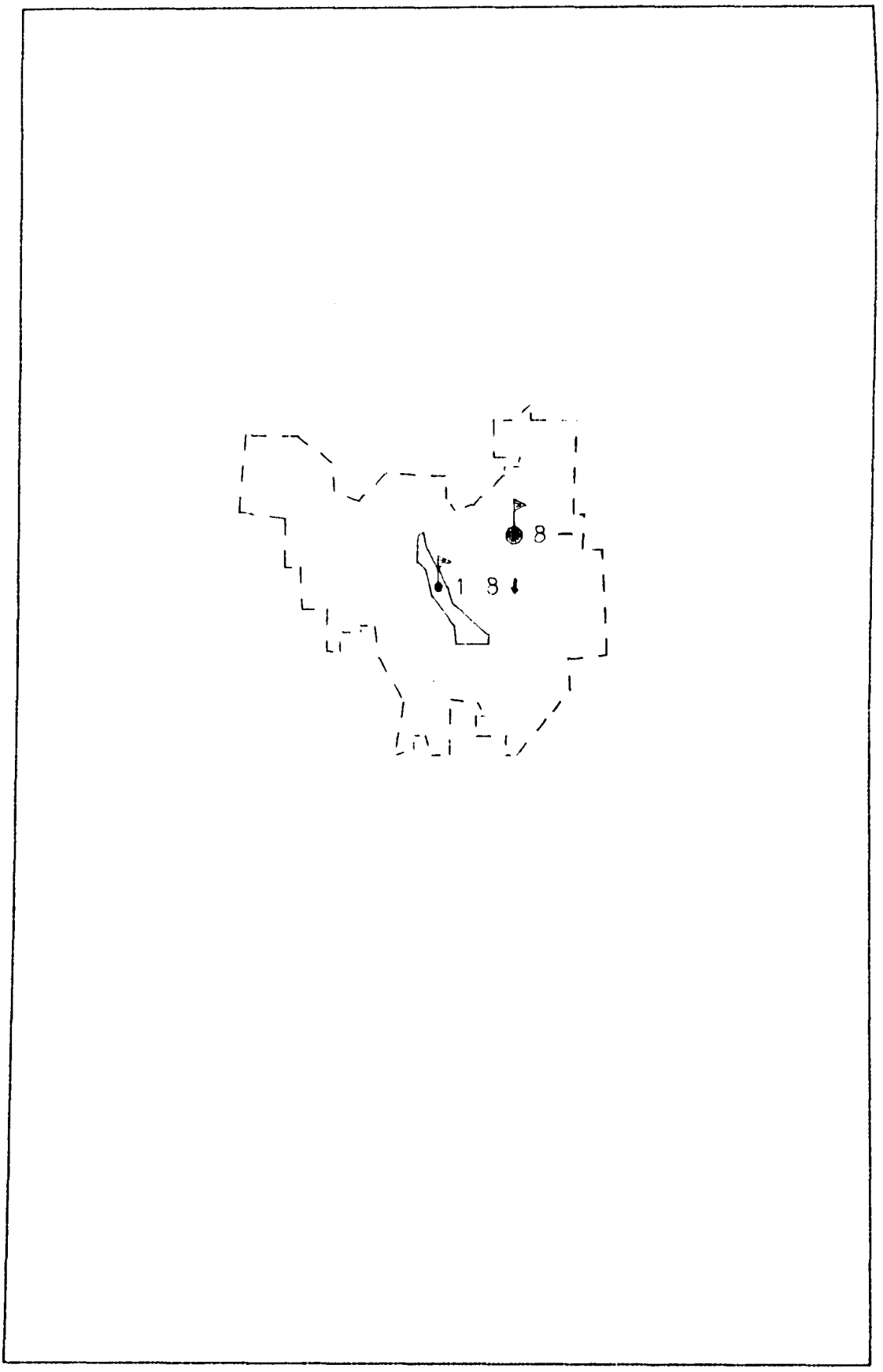
Omaha - The City of Omaha is designated as non-attainment for CO. Monitoring was conducted during 1981 and 1982 at two locations in the city. At one of those sites (Metro-Tech Campus) no violations of the standards were observed. At the other site (7425 West Dodge) numerous exceedances were observed, including some readings above the alert level. The 1982 data showed 24 exceedances of the eight-hour primary standard. Based on the data from the first monitor, some reduction in the size of the non-attainment area might be considered. Because of the large number of exceedances measured in 1982 at the other monitor, we recommend that the State re-evaluate the data, in order to determine the causes of the high observed concentrations.

B. Emissions Data and Monitor Locations

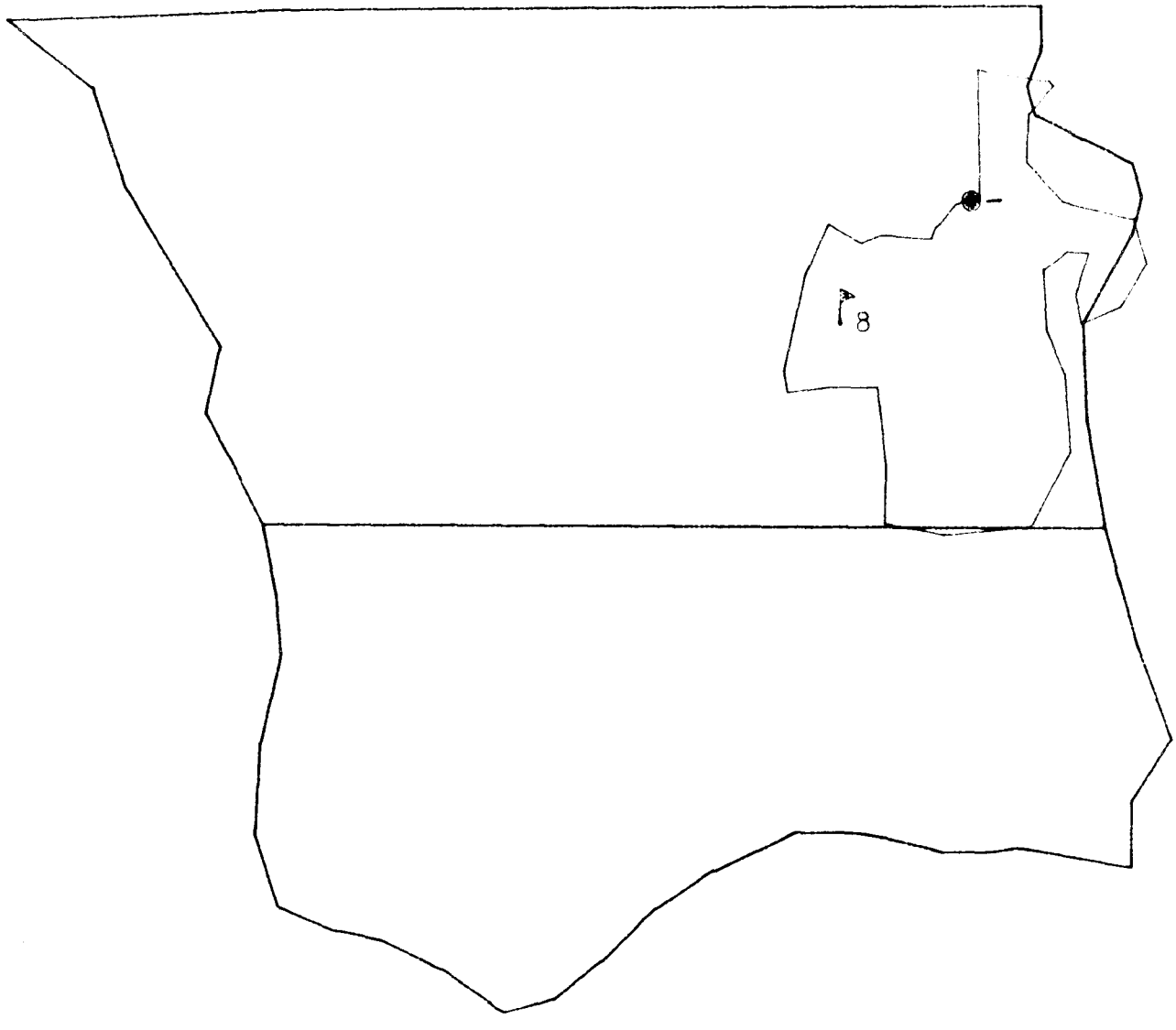
The emissions map shows relatively few point sources of CO in the State. All emit less than 5,000 tons/year, and all except two emit less than 1,000 tons/year. As would be expected for CO, area sources are much more significant than point sources in the largest cities. The monitoring network includes CO monitors in Lincoln and Omaha, and addresses the highest priority monitoring needs. The FY-82 air quality evaluation report recommended that the State consider CO monitoring in Sarpy and Hall Counties, based on the area source emission densities. That recommendation is repeated, with the understanding that those monitors would not have high priority.



AMBIENT CO DATA

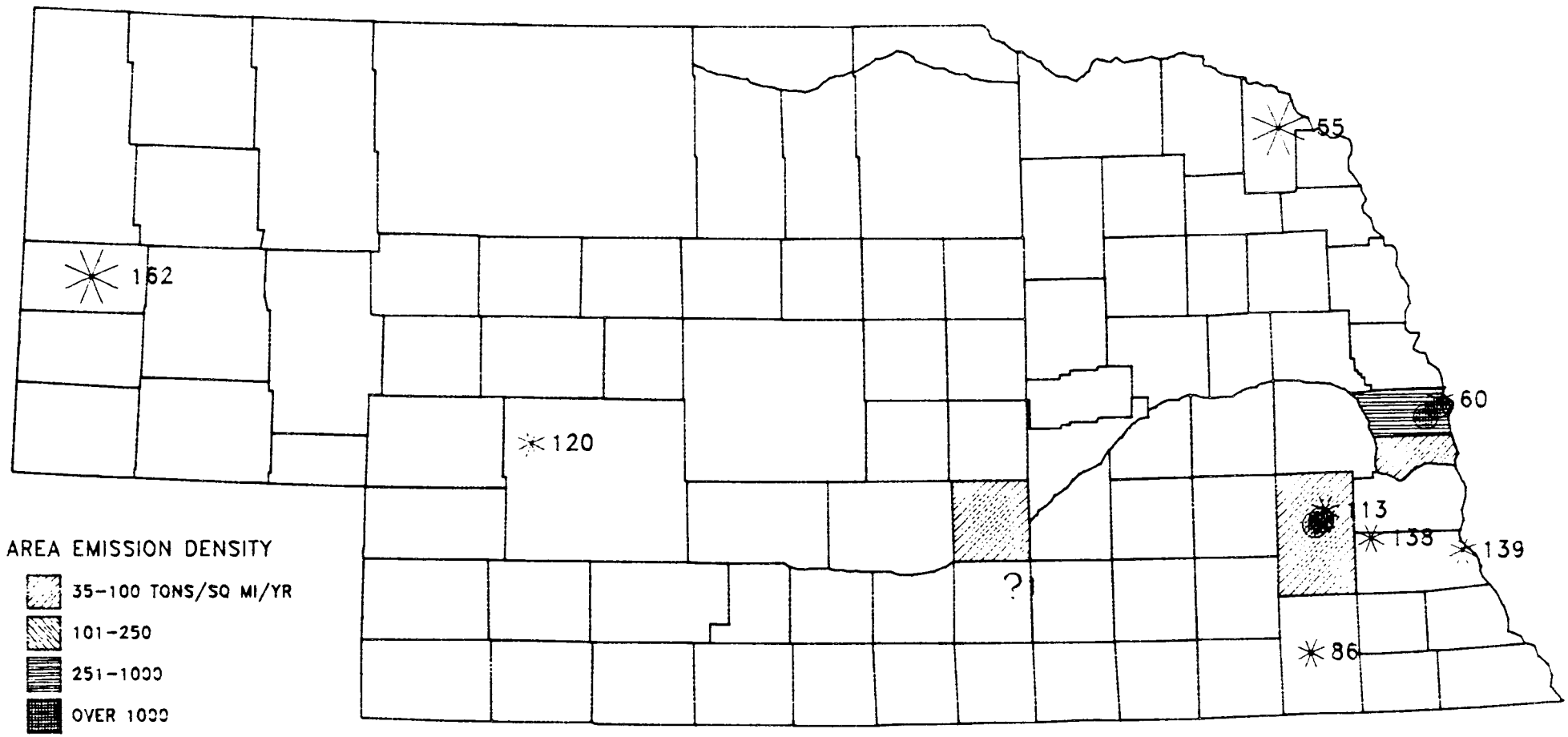


AMBIENT CO DATA – LINCOLN AREA



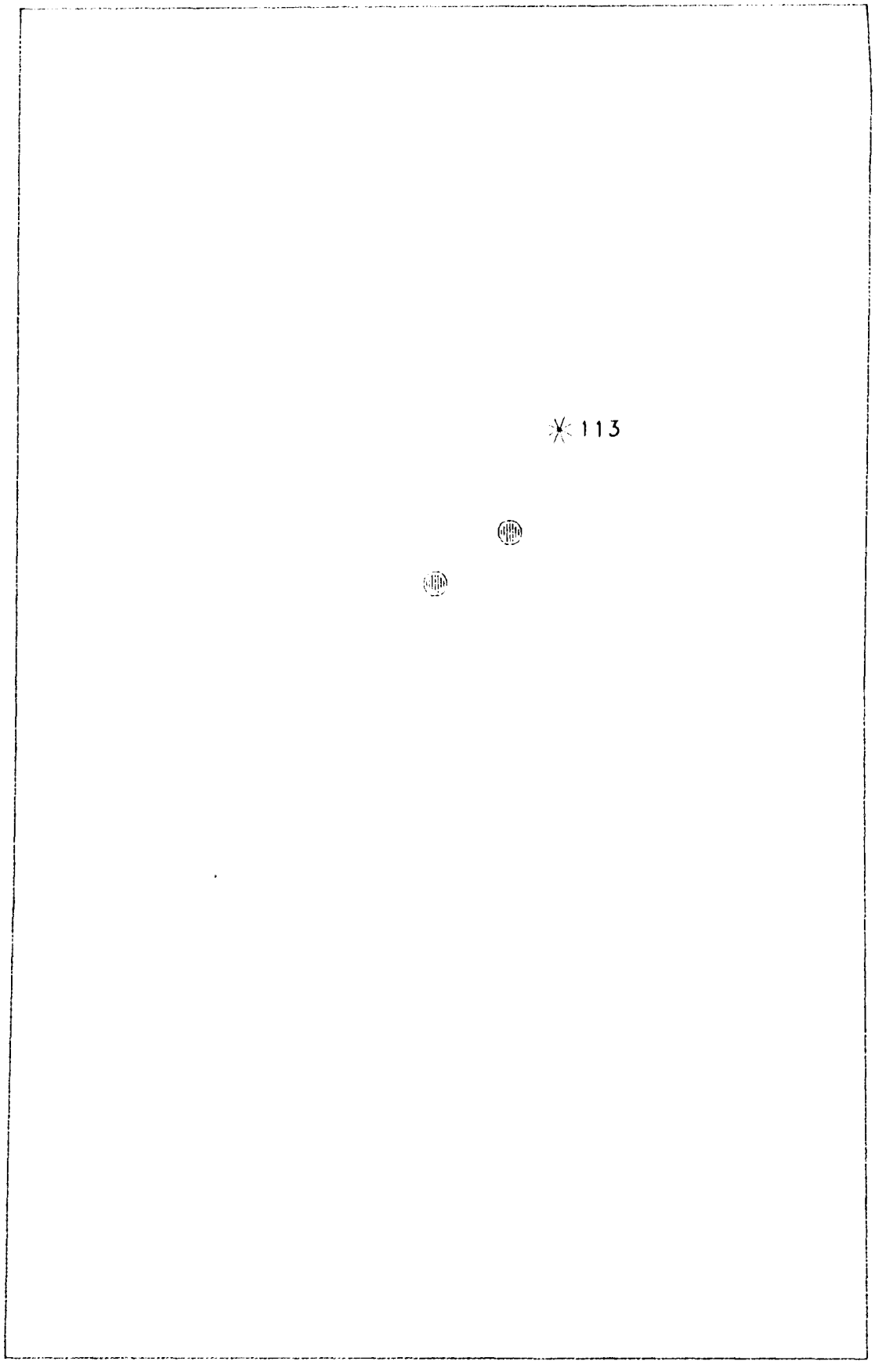
AMBIENT CO DATA — OMAHA AREA

052383

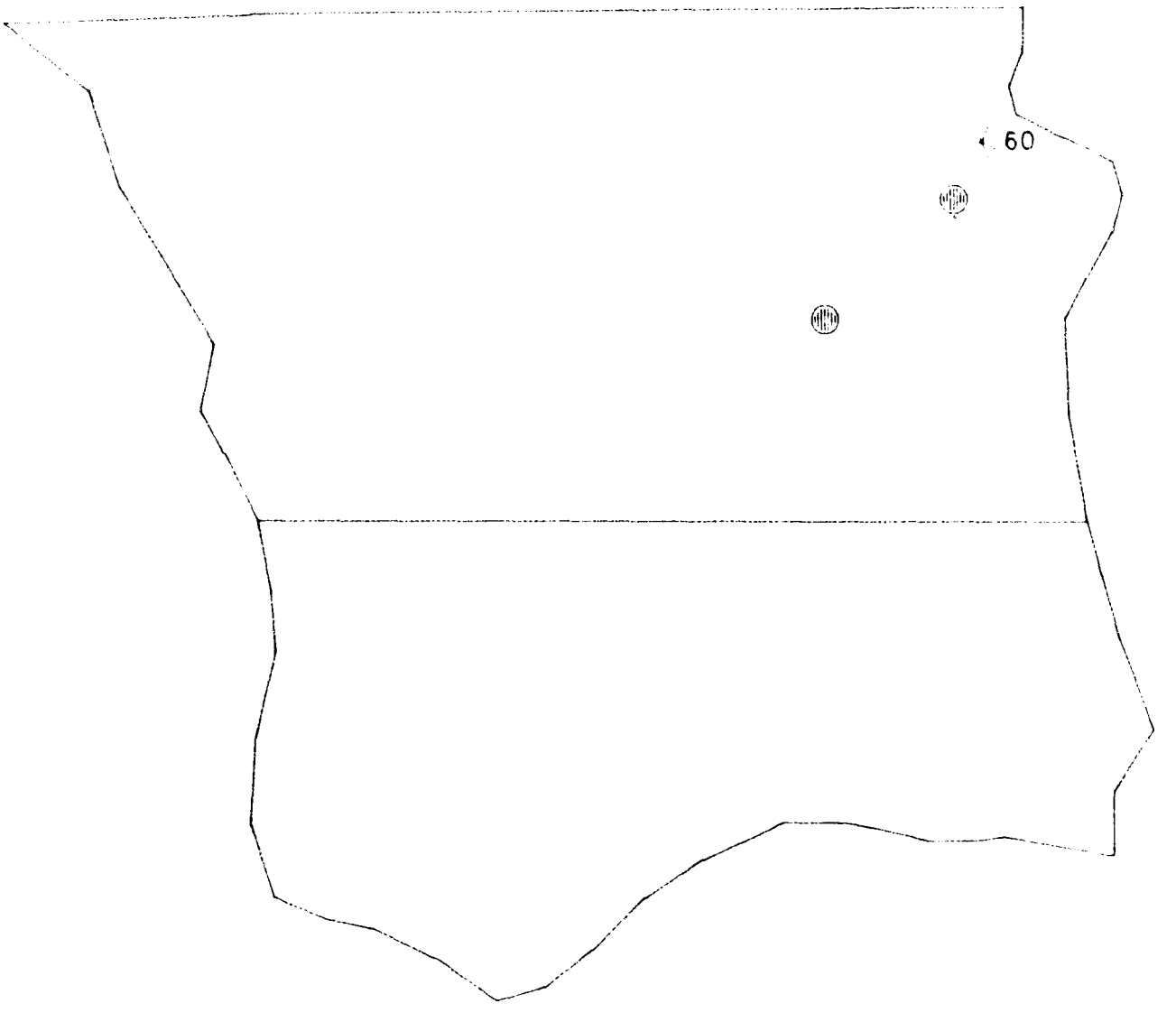


CO EMISSIONS AND CO MONITORS

C6033



CO EMISSIONS AND CO MONITORS – LINCOLN AREA



CO EMISSIONS AND CO MONITORS – OMAHA ARE

VII. NITROGEN DIOXIDE (NO_2)

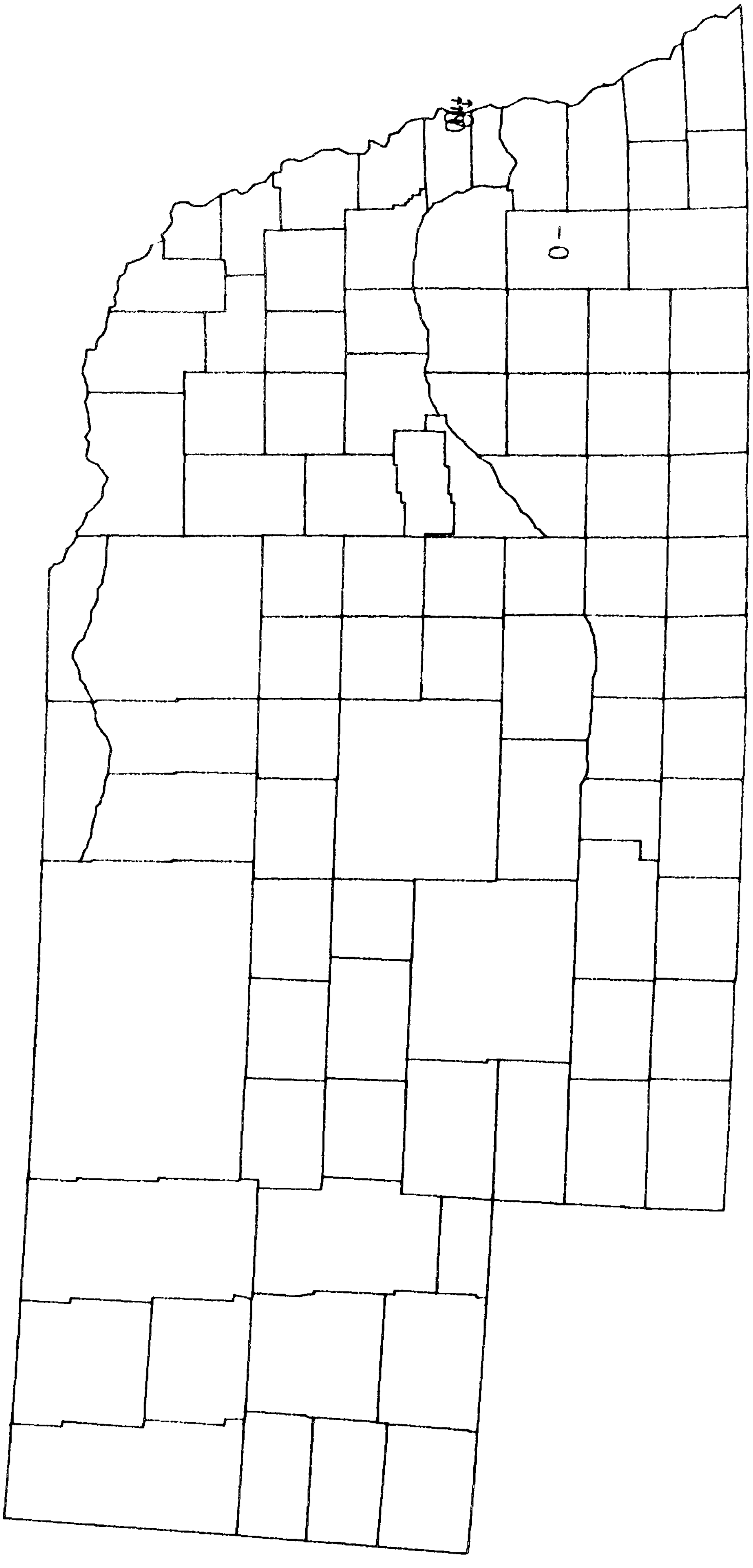
A. Ambient Data and Attainment Status Designations

The entire state is designated as an attainment area for NO_2. Monitoring data for 1981 and 1982 show no violation of the standards, with maximum annual arithmetic mean concentrations running less than half the standard. In addition, all of those sites had sufficient data for trend analysis, and showed decreasing trends or no statistically significant trend. Most of the data shown on the map were collected by bubblers, which have since been discontinued (either at the end of 1981, or in mid-1982). Therefore, the symbols show incomplete data, relative to the potential data collection for the entire two-year period. Given the low concentrations of NO_2 monitored in the past, violation of the NO_2 standard seems unlikely in the near future.

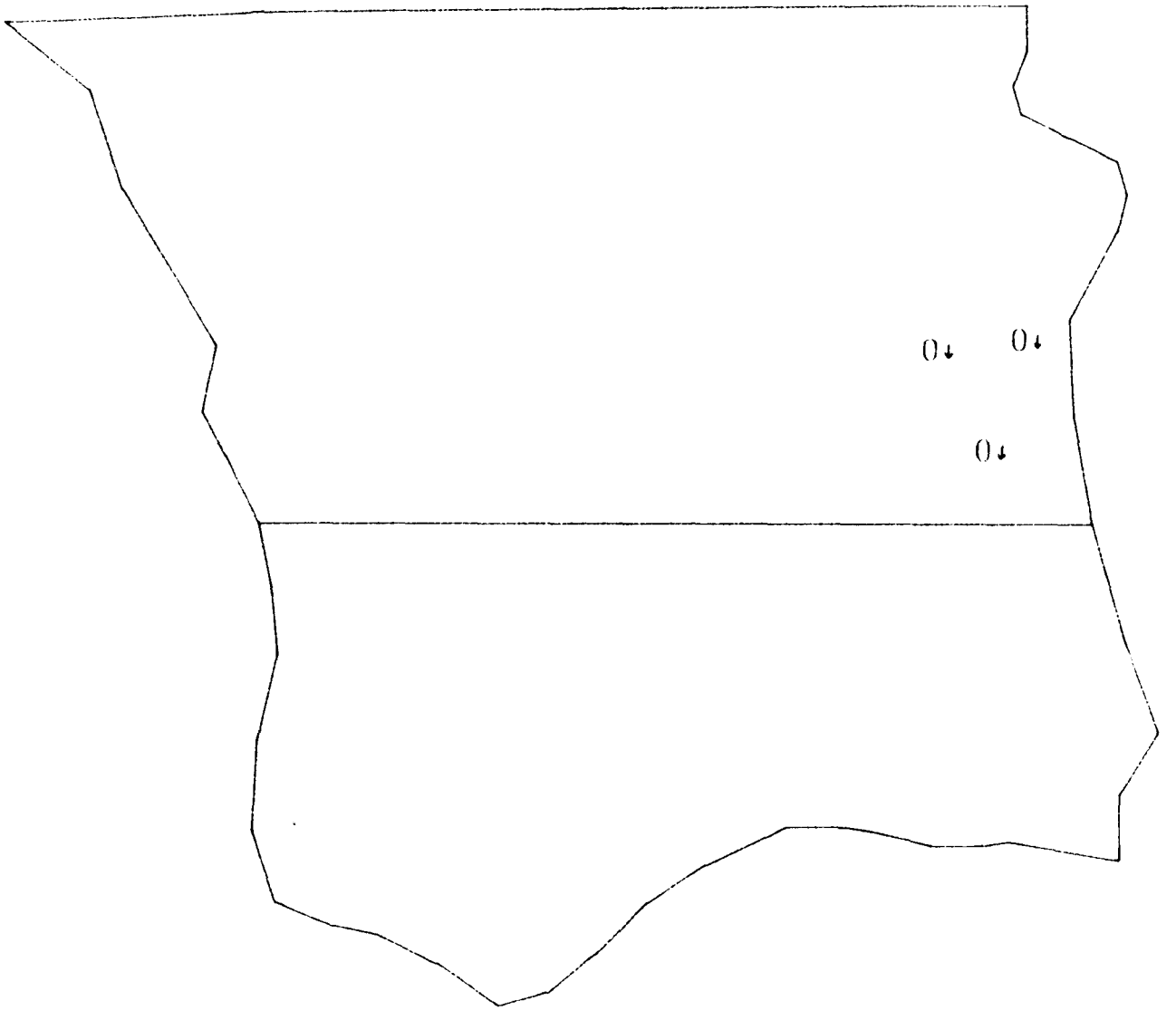
B. Emissions Data and Monitor Locations

The maps of NO_x emissions and Table A4 of the Appendix highlight the following observations:

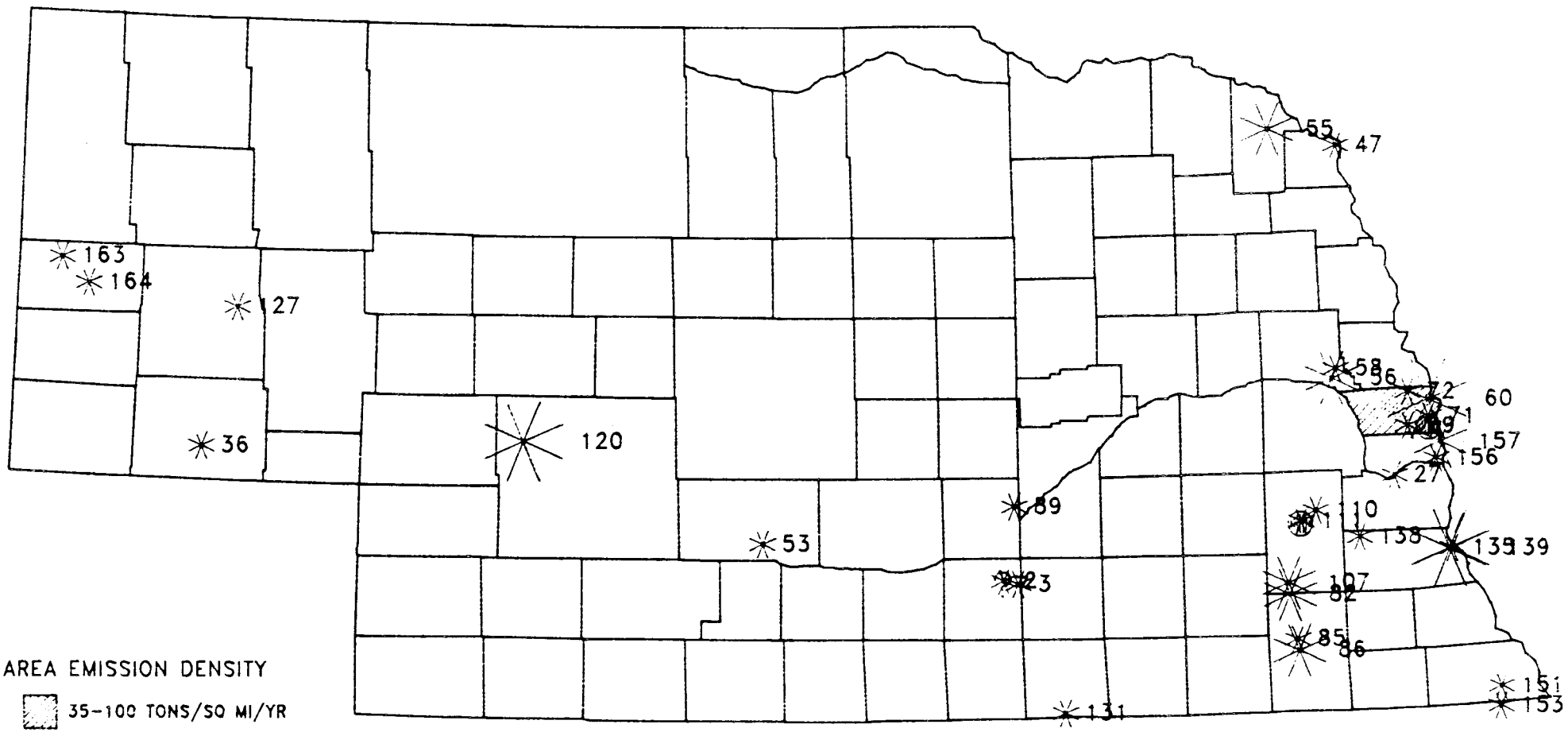
- Both point sources and area sources are significant for NO_x. The area sources are mainly limited to the largest cities, while point sources occur both in those cities and in the outstate areas.
- The largest emissions come from large power plants (plants 60, 120, and 139 on the maps). Other significant emission sources include smaller power plants, natural gas pipeline companies, and agricultural processing plants.
- Stack heights are available in NEDS for nearly all of the major point sources.
- The current NO_2 monitoring network includes monitors in Lincoln and Omaha, and addresses the highest priority NO_2 monitoring needs.



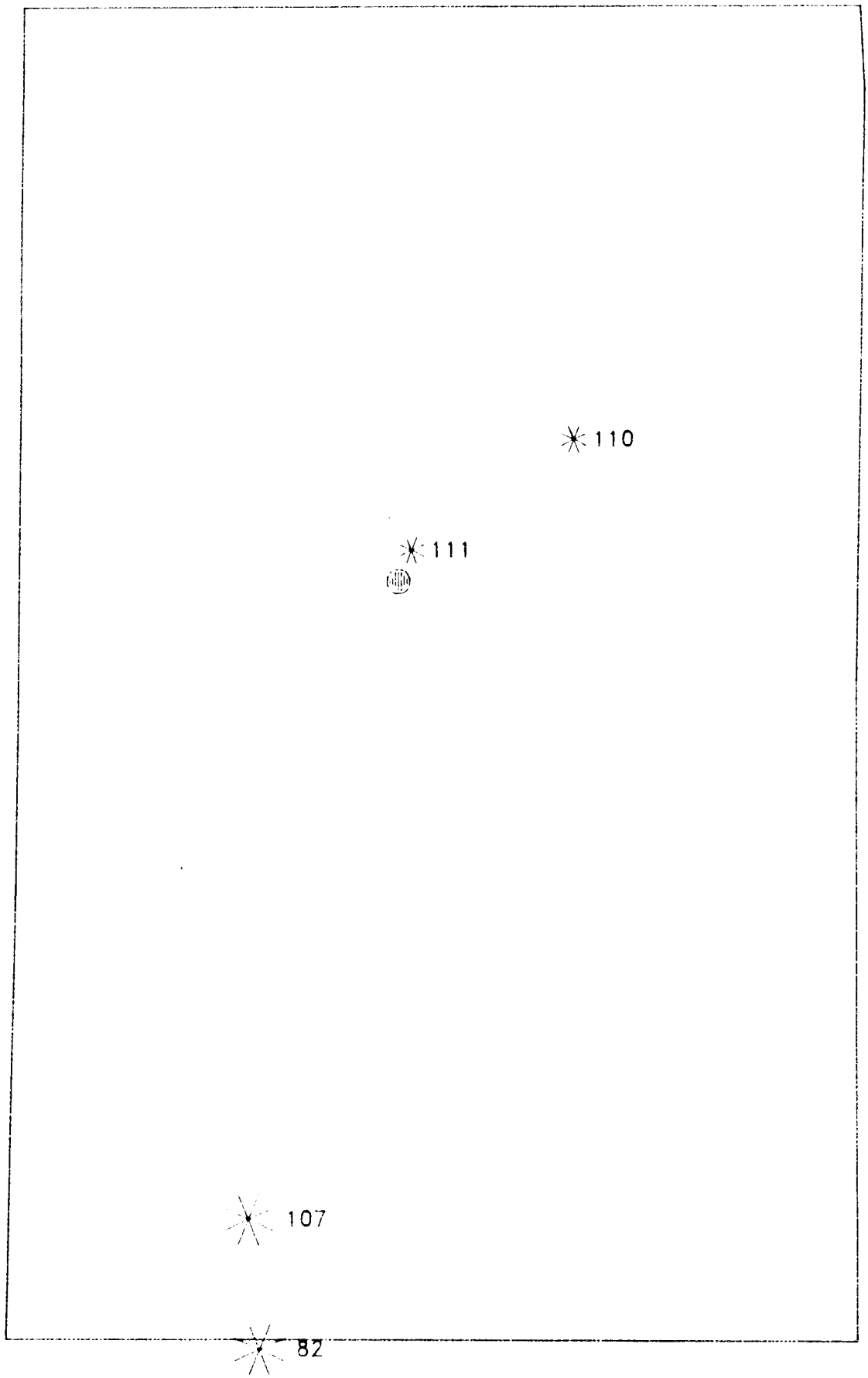
AMBIENT NO2 DATA



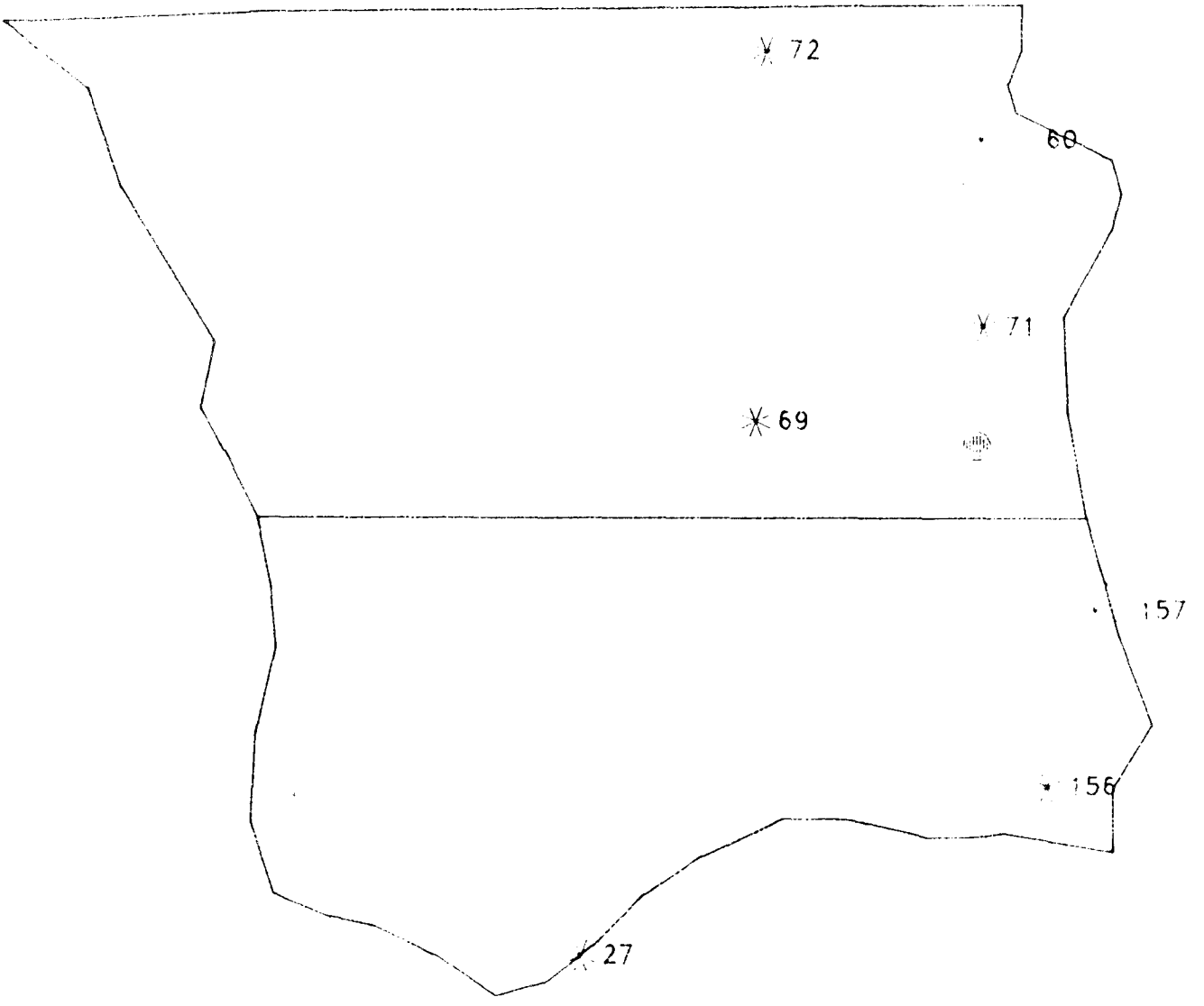
AMBIENT NO2 DATA -- OMAHA AREA



NOX EMISSIONS AND NO2 MONITORS



NOX EMISSIONS AND NO2 MONITORS -- LINCOLN AREA



NOX EMISSIONS AND NO2 MONITORS

OMAHA AREA

VIII. OZONE (O_3)

A. Ambient Data and Attainment Status Designations

Ozone monitoring is included in the SLAMS network in Lincoln and Omaha. With one exception, data for 1980 through 1982 show no violations of the standard. The one exception is a monitor in Omaha, which showed 11 exceedances of the standard in 1980, but none since then. Because possible problems with monitor operation were indicated by monitor audits in 1980, the State and EPA Region VII agreed to base the decision of the appropriate attainment status designation on data from 1981 and 1982. Since no exceedances of the standard were observed during those two years, the area was redesignated to attainment.

B. Emissions Data and Monitor Locations

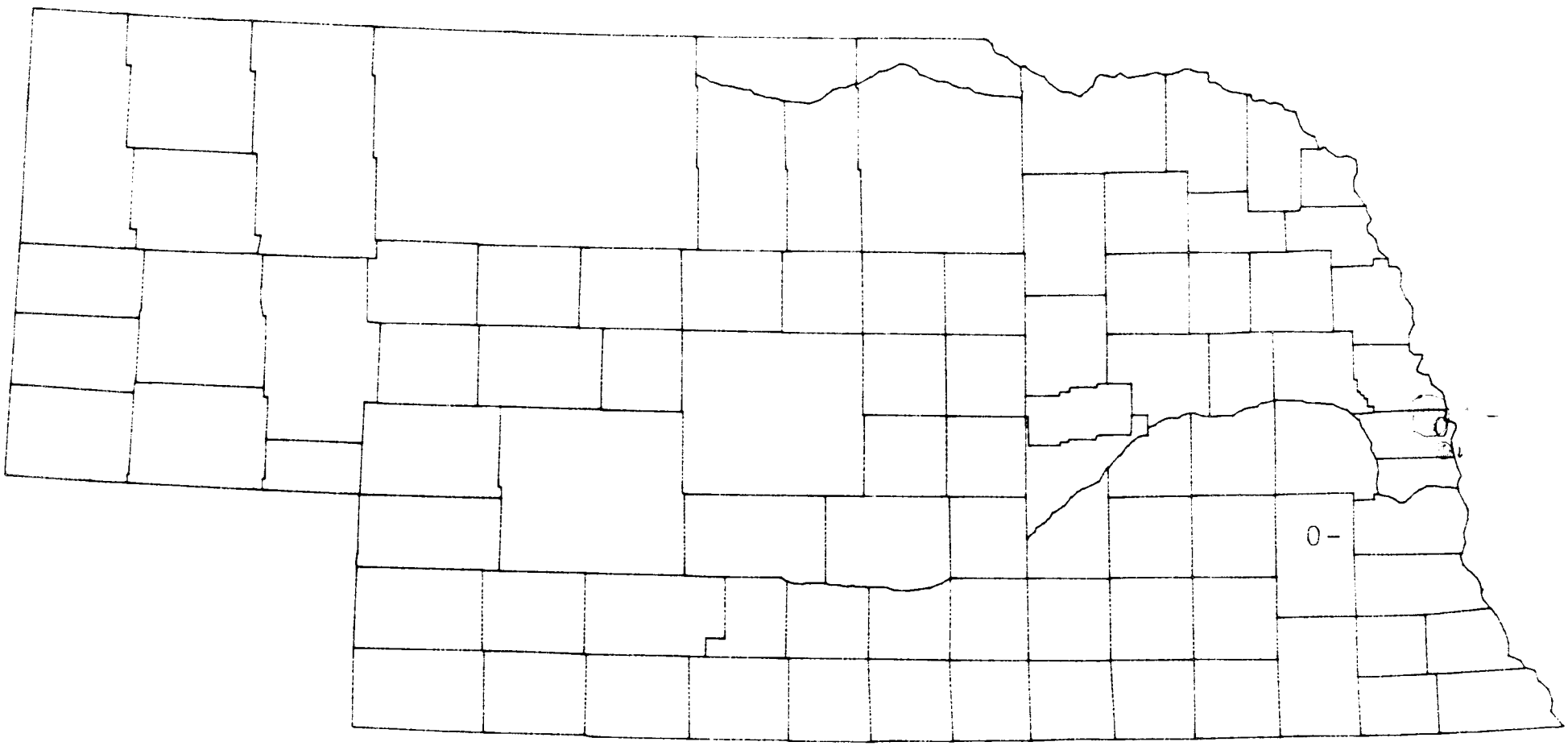
Ozone is formed in the atmosphere by a complex photochemical reaction involving hydrocarbons, oxides of nitrogen, oxygen and sunlight. The reaction may take several hours, resulting in maximum concentrations well downwind of the locations where the precursors were emitted. Therefore, the overview of the ozone monitoring network should include both hydrocarbon emissions and nitrogen oxide emissions.

In the map of hydrocarbon emissions and ozone monitor locations, the point source locations are shown by the symbol #, rather than by an asterisk. The following observations are highlighted by that map:

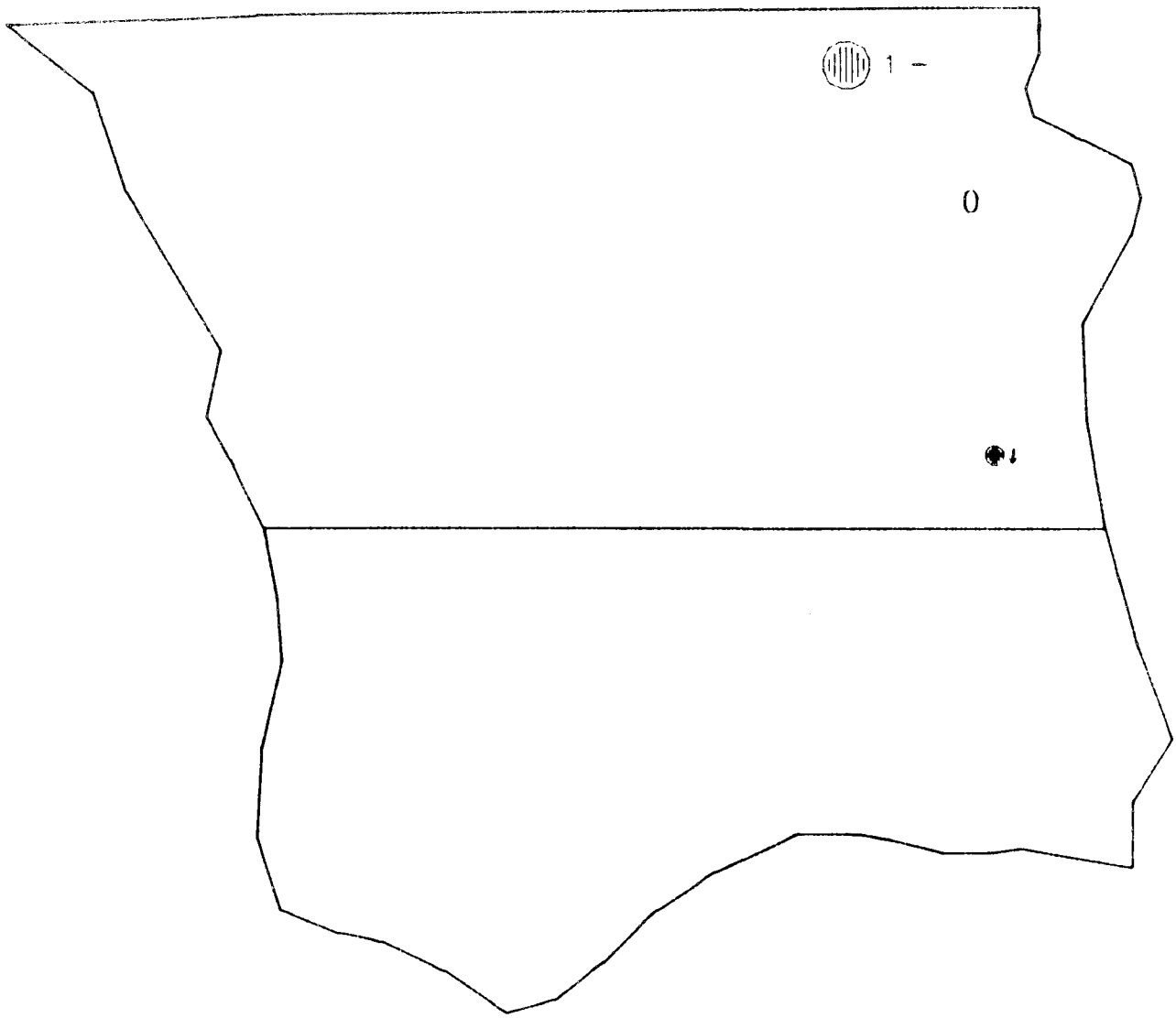
- Area source hydrocarbon emissions are large only in the Omaha area.
- Large point sources are located primarily in the eastern part of the State.

An additional map is shown, which displays the point sources for hydrocarbons, the point sources for NO_x and the ozone monitors. On that composite map, NO_x sources are shown by asterisks (*) and hydrocarbon sources by the symbols ? or #. That map shows where both of the precursors of ozone are emitted, and displays monitor locations relative to those sources. The following comments are highlighted by that map:

- The ozone monitoring network in Omaha includes monitors both near the emission sources and downwind of most sources, based on the prevailing summer winds.
- The monitor in Lincoln is located at the downwind edge of the city. If that monitor begins observing high concentrations, additional monitoring farther downwind should be considered in order to detect maximum concentrations.

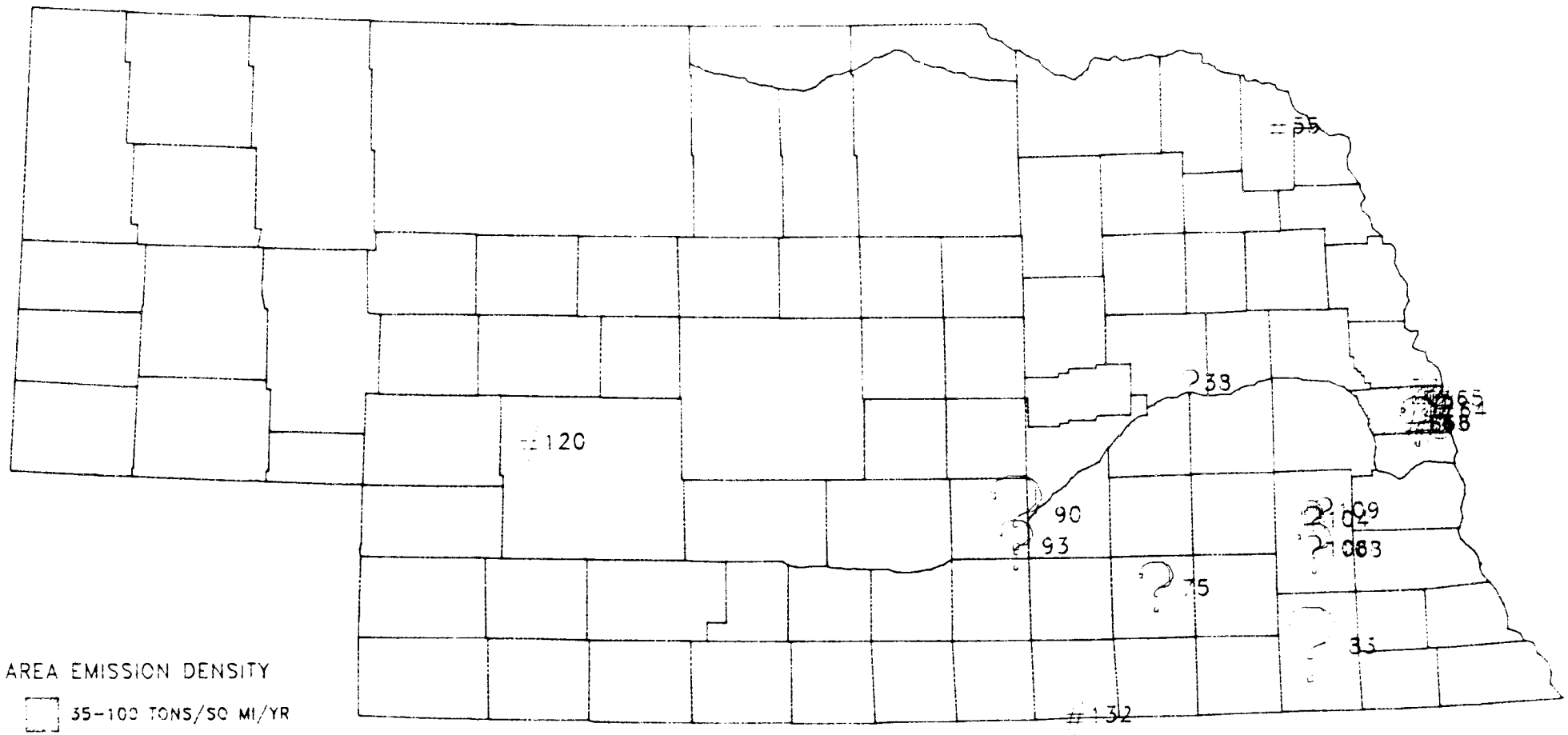


AMBIENT O3 DATA

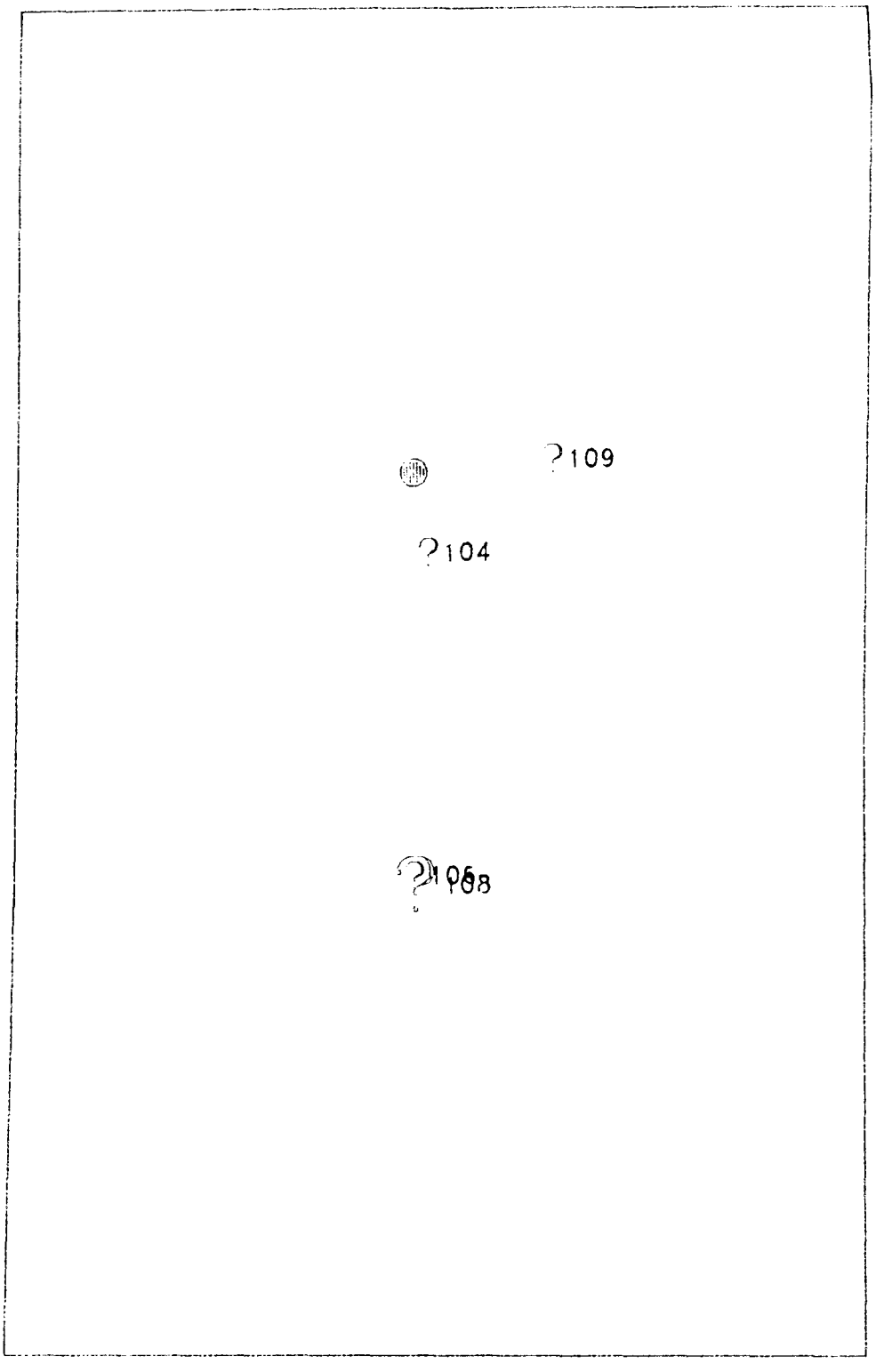


AMBIENT O3 DATA – OMAHA AREA

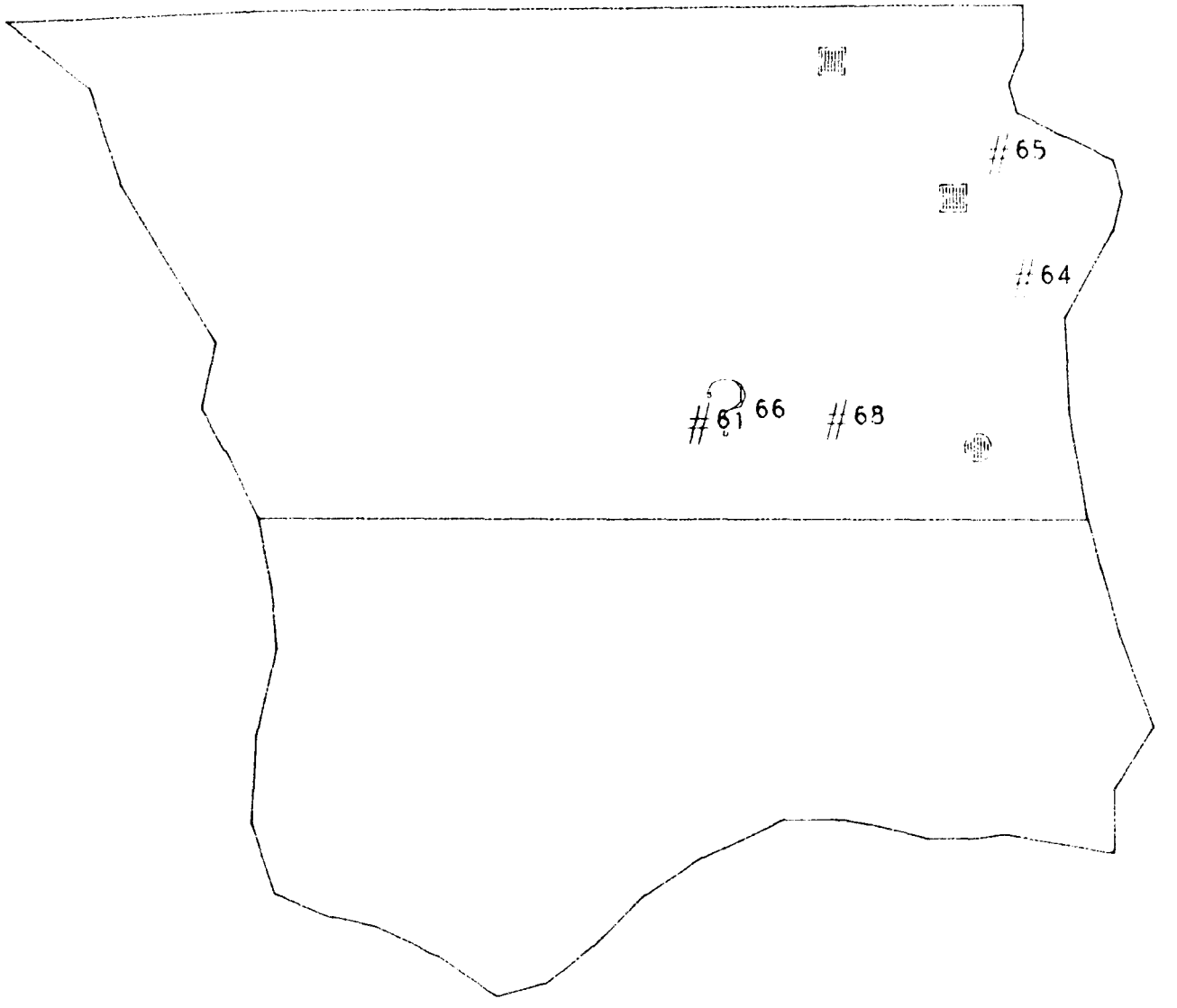
052383



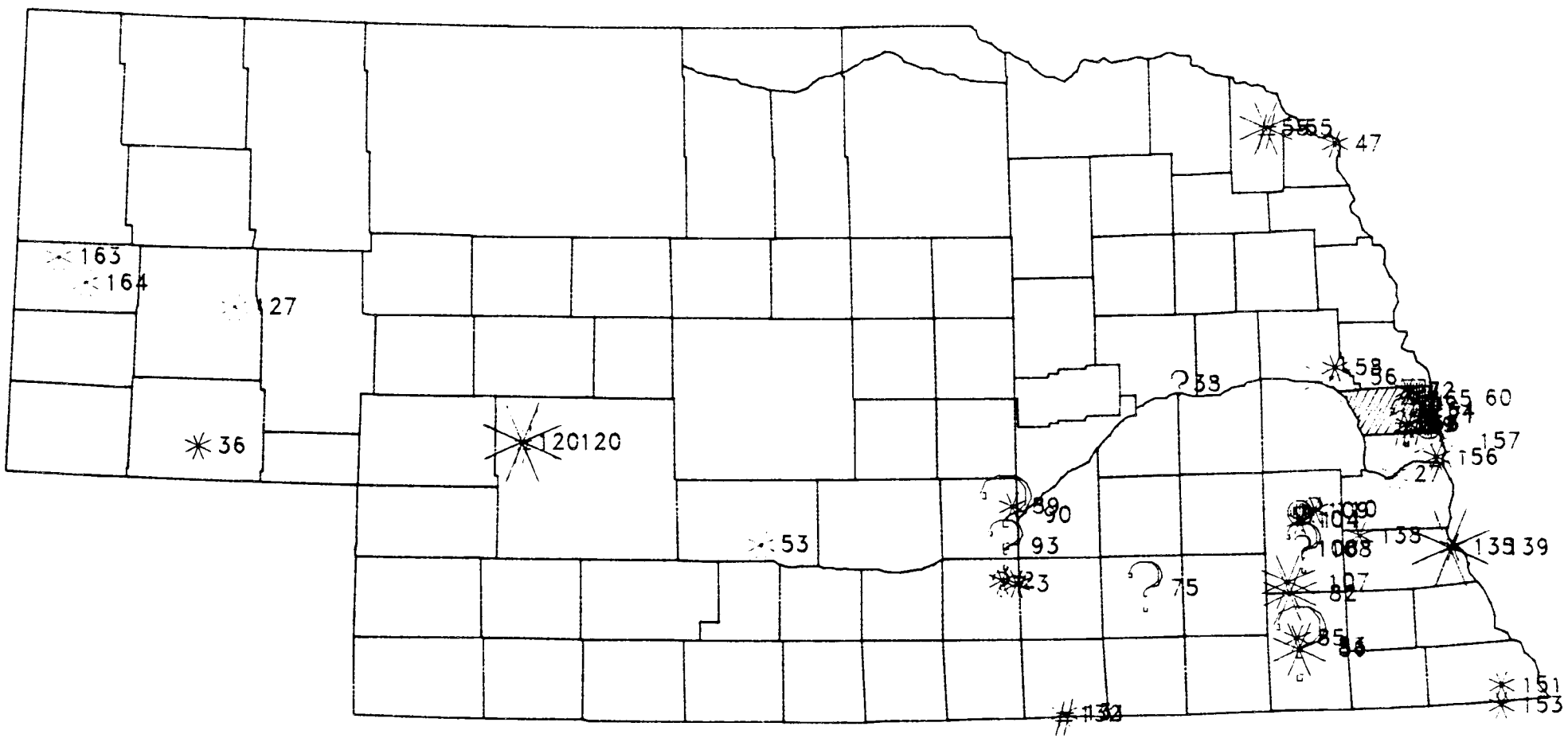
HYDROCARBON EMISSIONS AND O3 MONITORS



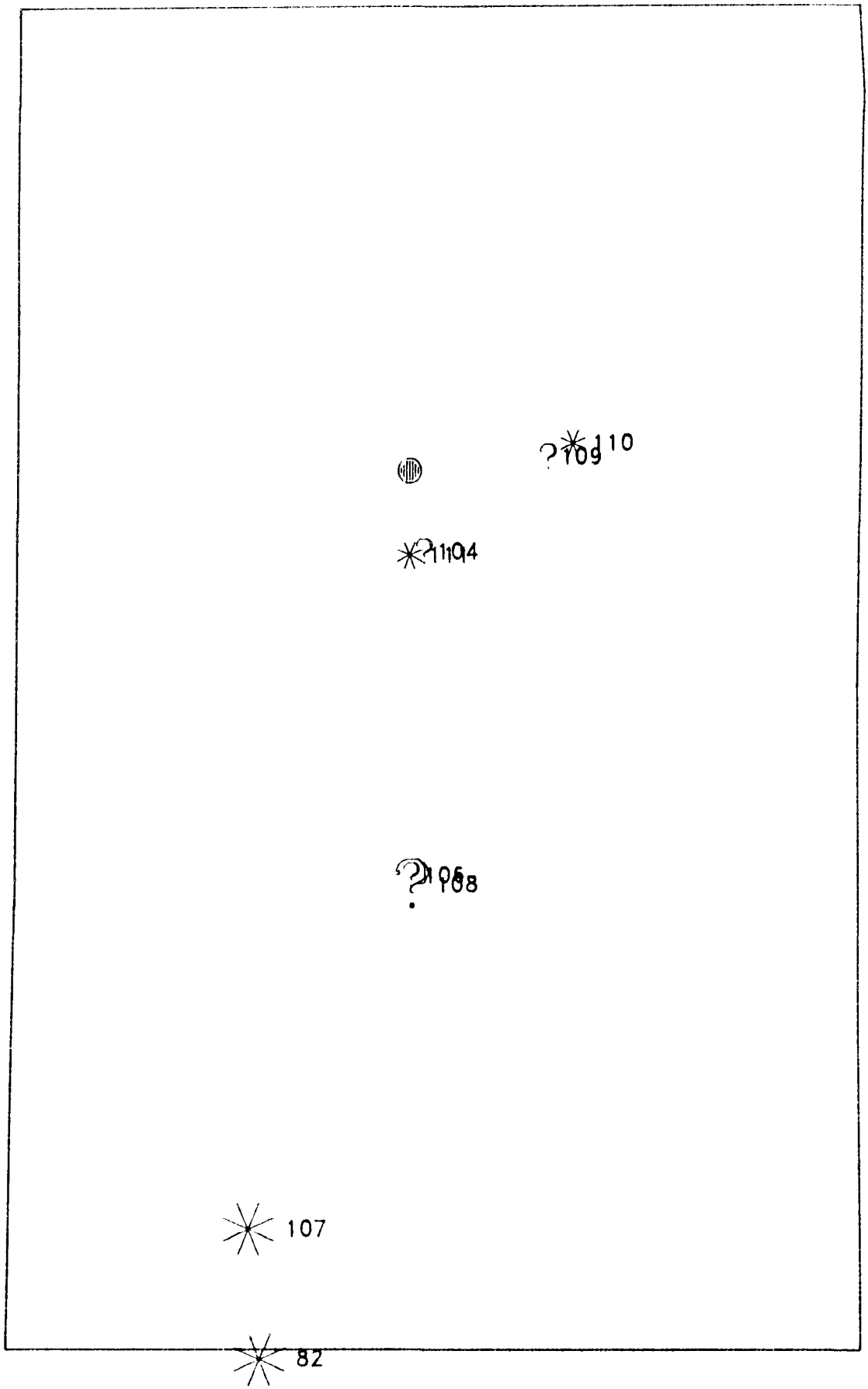
HYDROCARBON EMISSIONS AND 03 MONITORS LINCOLN AREA



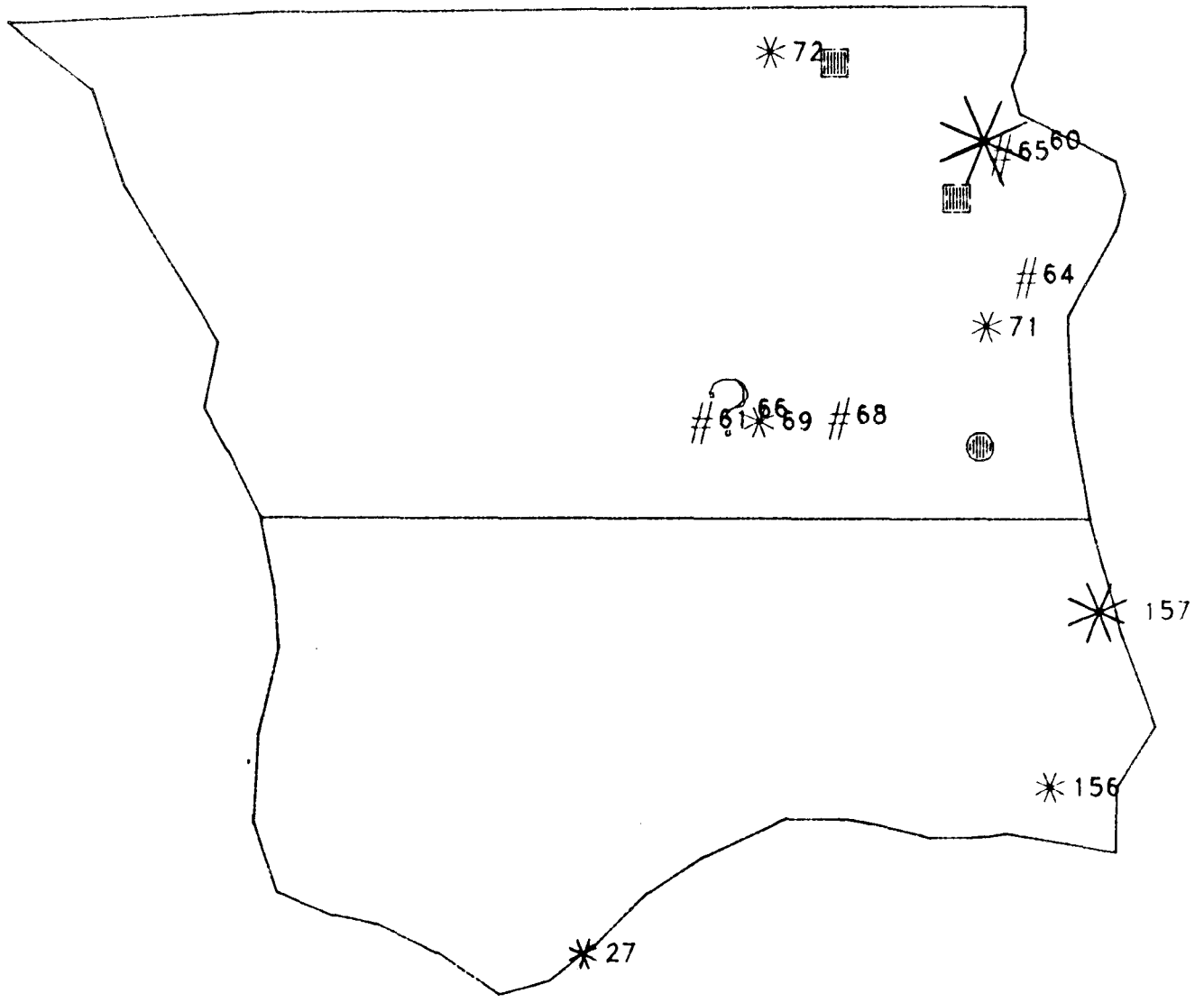
HYDROCARBON EMISSIONS AND O3 MONITORS
OMAHA AREA



HC EMISSIONS, NOX EMISSIONS AND O3 MONITORS



HC EMISSIONS, NOX EMISSIONS AND 03 MONITORS LINCOLN AREA



HC EMISSIONS, NOX EMISSIONS AND 03 MONITOR
OMAHA AREA

IX. LEAD (Pb)

A. Ambient Data

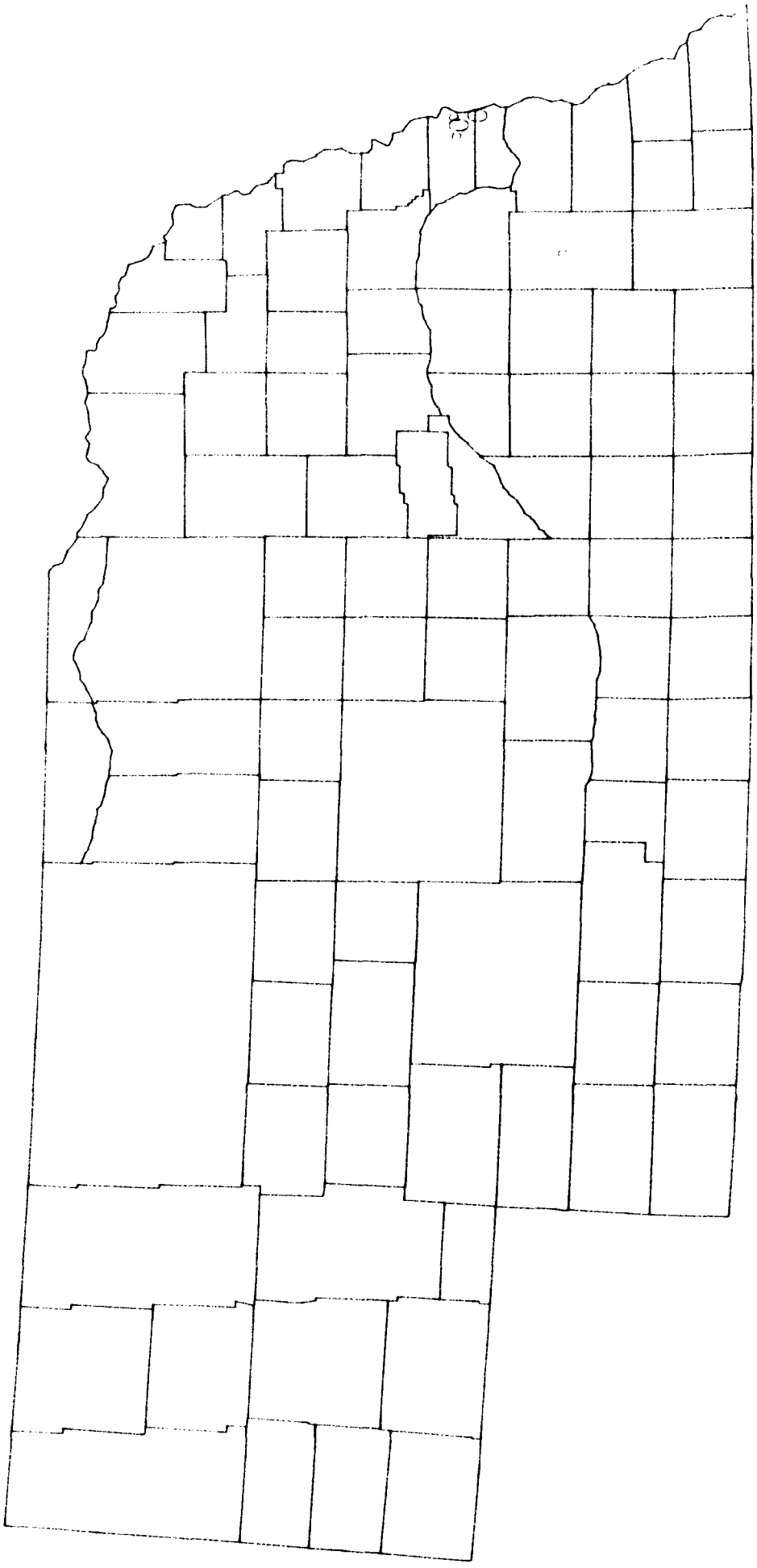
The State map for lead monitoring data shows no recorded violations of the standard in SAROAD in 1981 or 1982. Special purpose monitoring for lead is conducted at three sites. However, the data from those sites have not been entered into SAROAD. Data for approximately half of the sites shown on the map were obtained from lead analyses performed on TSP hi-vol filters by the EPA as part of the national filter analysis network. Those sites are identified by the suffix A01 at the end of the site identification code in the listing of Table A1 of Appendix A. Since the State and local agencies have now established monitors specifically sited for lead monitoring, the representativeness of the data for lead is expected to increase.

B. Emissions Data and Monitor Locations

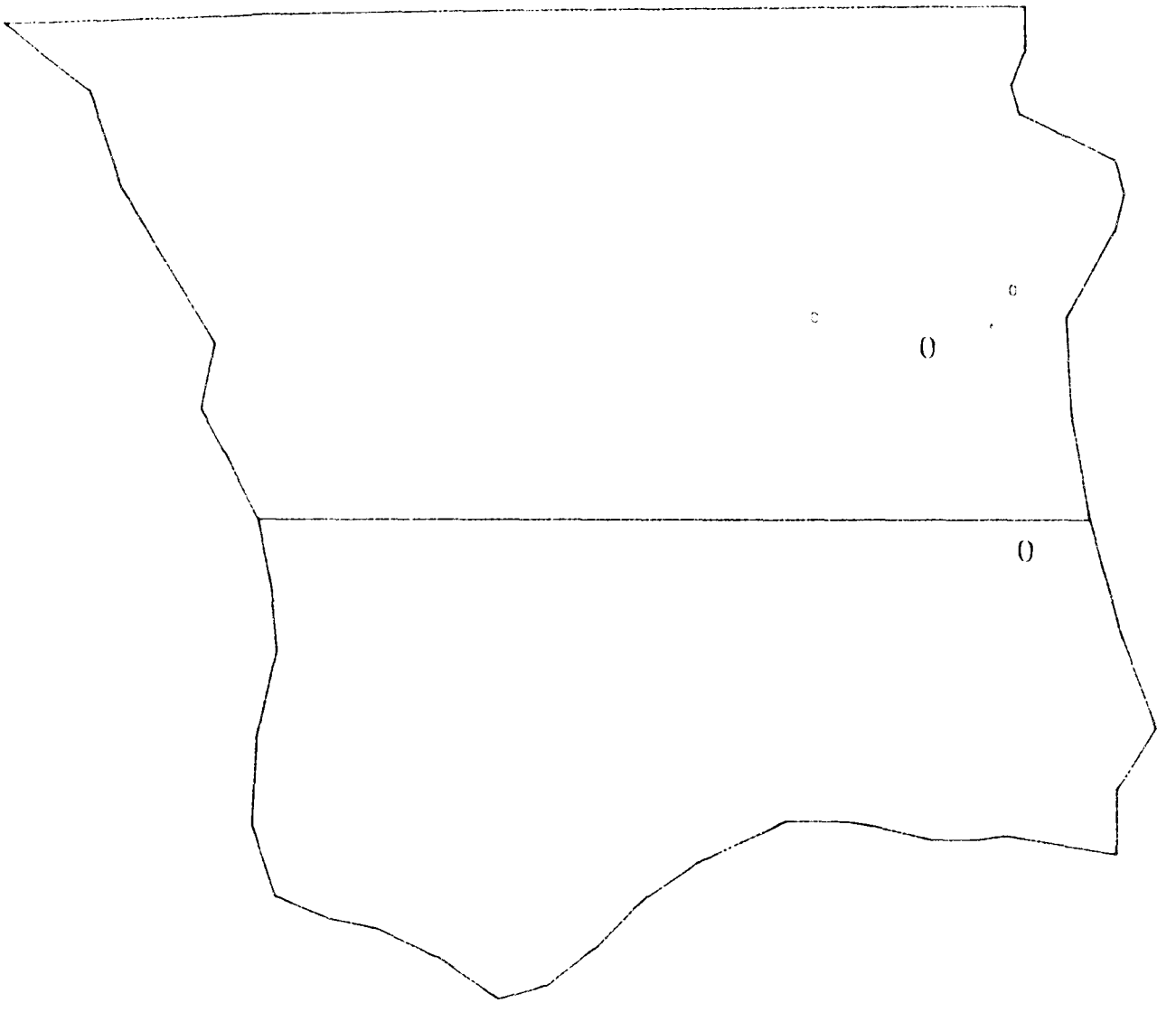
The map of Pb emissions and Table A4 of the Appendix illustrate the following observations:

- Area source emissions are more significant than point source emissions in most parts of the State.
- Point sources are limited to one small area of Omaha, where two lead smelters are located.
- The Pb monitoring network includes monitors in each area of the State which have large area source emission density (based on county-level emissions and areas.)
- The network also includes monitors in the vicinity of the two significant point sources.

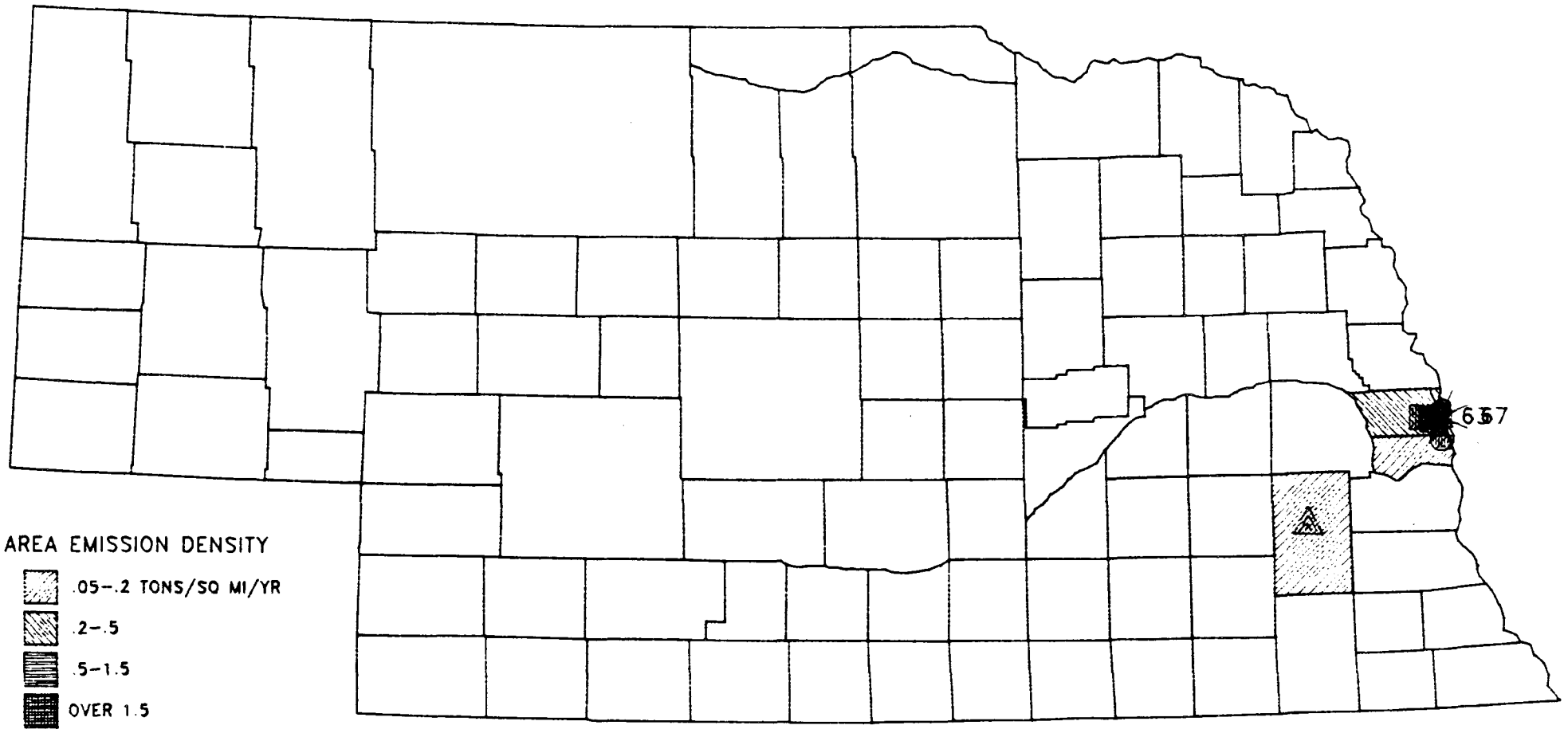
In summary, the monitoring network is designed to address the most significant lead emission in the State.



AMBIENT PB DATA

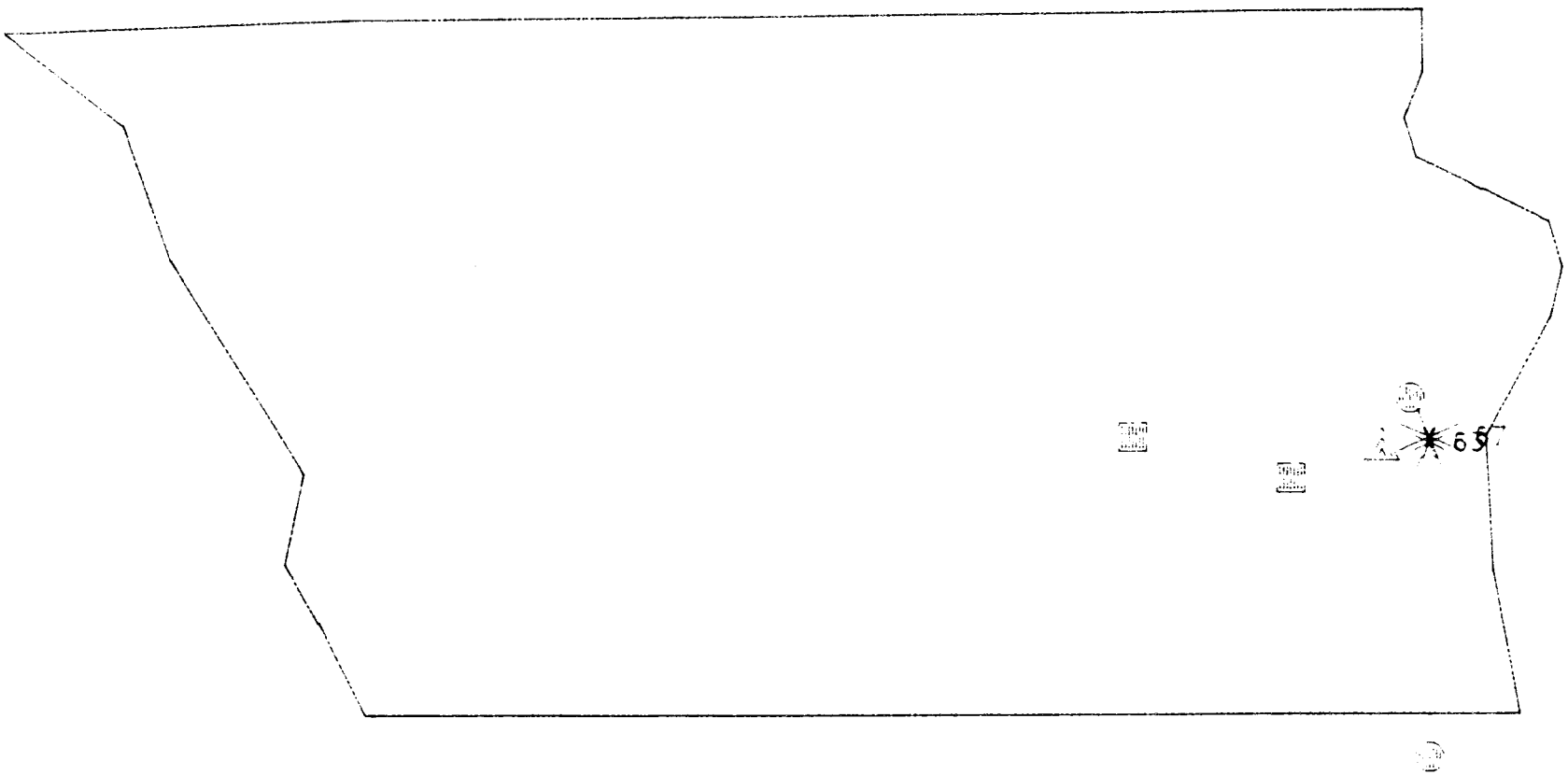


AMBIENT PB DATA – OMAHA AREA



PB EMISSIONS AND PB MONITORS

C65093



65

PB EMISSIONS AND PB MONITORS – OMAHA AREA

X. PRECISION AND ACCURACY

For continuous monitors (CO, SO_2, NO_2, and O_3), the regulations of 40 CFR Part 58, Appendix A require precision checks in order to assess precision for each pollutant, and audits in order to assess accuracy.

Precision checks are performed by introducing a gas of known concentration into the analyzer, and comparing the concentration reading from the monitor with the known concentration of the gas. The checks are required every two weeks, and involve one gas concentration. Audits likewise involve comparison of known gas concentrations with the analyzer readings. Audits are more extensive than precision checks, requiring at least three different concentrations of gases. Audit of each analyzer is required annually, and audit of at least 25% of the SLAMS analyzers for each pollutant is required each quarter.

For manual methods (TSP, Pb, SO_2 bubblers and NO_2 bubblers), the regulations require duplicate (collocated) sampling to assess precision and audits to assess accuracy.

Each collocated sampler is operated at the same time and in the same manner as the SLAMS monitor at the same site. The percent difference between the two sample concentrations forms the basis for precision estimates. For lead, analysis of duplicate portions of a single Hi-vol filter may be substituted for collocated sampling. Audits for manual methods differ by method. For TSP, the audits are performed by comparing the flow rate indicated by the Hi-vol sampler to the true flow rate determined from a flow standard. The audit frequency required for Hi-vol samplers is the same as that required for continuous monitors. Audit procedures for SO_2 bubblers, NO_2 bubblers and Pb require that the analytical measurement process be audited. Details of those procedures are found in 40 CFR Part 58, Appendix A.

Use of specific equations is required for the calculation of precision and accuracy. Each organization which reports data is required to calculate and report precision and accuracy estimates for all NAMS data collected after January 1, 1981, and for all SLAMS data collected after January 1, 1983.

Table A2 of Appendix A summarizes the precision and accuracy estimates reported by the State during 1981 and 1982. The numbers under the heading "YR-Q" near the left of each printout refer to the year and calendar quarter to which the precision and accuracy data apply. (For example, 82-2 refers to the second quarter of 1982.) Composite data for the entire year are identified as quarter number 5, (for example, 81-5 gives the estimates for the full calendar year 1981).

The accuracy estimates are arranged by concentration levels L1 (low concentration) through L4 (high concentration). Specific ranges for the concentration levels are required by 40 CFR 58, Appendix A, as follows:

	NO_2, O_3, SO_2 (ppm)	CO (ppm)	TSP (cfm)	Pb (ug/strip)
L1	.03 to .08	3 to 8	---	100-300
L2	.15 to .20	15 to 20	40-60	600-1000
L3	.40 to .45	40 to 45	---	---
L4	.80 to .90	80 to 90	---	---

The precision and accuracy estimates are expressed as 95% probability limits, as required by the same regulations. The meaning of those limits is illustrated by the following three examples taken from Table A2.

a. The precision data for CO in Omaha show composite limits of -16 and +06 for calendar year 1982 (line 82-5), based on a total of 29 precision checks. Therefore, 95% of the precision checks would be expected to fall between 16% below and 6% above the known concentration of the test gas used for the precision checks.

b. The accuracy data for O_3 in Omaha show limits of -21 and -01 for the audits performed at concentration level 2 (column L2) during the fourth quarter of 1981 (line 81-4). Therefore, 95% of the audits performed at that time at that concentration level would be expected to fall between 21% below and 1% below the known concentration of the audit gas.

c. The precision data for TSP for the State agency show probability limits of -07 and +18 for the first quarter of 1982 (line 82-1), based on 33 valid collocated data pairs. Therefore, 95% of the concentrations measured by the collocated sampler would be expected to fall between 7% lower and 18% higher than the corresponding concentration, measured at the same time by the SLAMS monitor at the same site.

The following observations are drawn from Table A2.

Lincoln - The precision and accuracy data for Lincoln show that the agency has performed at least the minimum number of audits required each quarter for TSP monitors, and that collocated sampling for TSP has been conducted. The number of collocated data pairs appears low in the table for the third and fourth quarters of 1982 due to a reporting error. The local agency has, in fact, conscientiously performed the required collocated sampling and precision assessment. Since none of the CO, NO_2 or O_3 monitors operated by the agency are designated as NAMS monitors, precision and accuracy estimates were not required until January 1, 1983.

Omaha - Manual Methods - The data for Omaha show that the agency met the requirements for TSP audits and collocated sample collection. Audits were performed for SO_2 and NO_2 bubblers in 1981, after which those monitors were discontinued. No precision and accuracy data were reported for lead.

Automated analyzers - The precision data show that precision checks were performed in 1982 for CO, SO_2 and O_3, and in 1981 for CO and O_3. The number of precision checks in each case is somewhat lower than the biweekly schedule for precision checks would produce. The accuracy data show that the required number of audits were performed for O_3 in both years, and for SO_2 in the last half of 1982. Accuracy estimates were not reported for CO. However, those were not required in 1981 or 1982 because the monitors are not part of the NAMS network.

State of Nebraska - The precision and accuracy data for TSP show that the agency has performed both audits and collocated sampling in 1981 and 1982. With 19 SLAMS monitors, the schedule of five audits per quarter meets the requirement to audit 25% of the monitors each quarter. Since none of the sites are designated as NAMS, the precision and accuracy assessment was begun well ahead of the deadline of January 1, 1983.

In summary, the precision and accuracy data generally reflect conscientious efforts by the State and local agencies toward meeting the data assessment requirements of 40 CFR 58, Appendix A. Two items may need attention in order to fully meet those requirements on a continuing basis. First, the number of precision checks performed on the automated analyzers in Omaha should be increased to meet the biweekly schedule specified in the regulations. The agency has committed to conduct those checks at the required frequency. Second, precision and accuracy assessments should be performed and reported for all SLAMS data collected after January 1, 1983. We encourage the State and local agency personnel to continue their efforts to provide timely assessments of precision and accuracy.

XI. TRENDS

The results of trend analyses were presented graphically in the preceding sections for each monitor whose data met the required completeness criteria (described in Section III.C). The following table gives a summary of the trend evaluations, with the last column designed to highlight areas of immediate and urgent concern.

Pollutant	Total Monitors	Monitors with Sufficient Data for Trend Analysis	Monitors with Decreasing or Probable Decreasing Trend	Monitors with Increasing or Probable Increasing Trend	Monitors with Violations and Increasing or Probable Increasing Trend
TSP	49	37	27	2	0
SO_2	6	5	1	0	0
CO	4	3	1	0	0
O_3	4	3	1	0	0
NO_2	4	4	3	0	0
Pb	6	0	0	0	0

In summary, the trend analyses show more sites with improving trends than with worsening trends. For the first time in recent years, no monitors which showed violations of the standards also showed statistically significant increasing concentration trends, (i.e., no identified problem areas were shown statistically to be getting progressively worse).

XII. FURTHER EVALUATION OF SELECTED PROBLEM AREAS

The following subsections examine in greater detail two areas where recent pollutant concentrations have exceeded the primary (health-related) standards. For both areas, pollution roses are presented and evaluated, and the results of any previous special studies are summarized, in an attempt to understand the causes of the high concentrations. At the time the pollution rose preparation was begun, available meteorological data included 1980 and 1981, but not 1982. Therefore, the roses are based on air quality data and meteorological data for 1980 and 1981. Consequently, any significant new pollutant sources or any recent pollution abatements are not reflected in the roses. Because of the limitations discussed in Section III.J, the roses provide indications of possible causes, rather than concrete identifications of definite causes.

A. TSP in Omaha

The TSP monitor at 11th and Nicholas in Omaha has historically recorded high concentrations. Annual geometric mean concentrations show a decreasing trend, with values of 118, 106, 91 and 64 ug/m^3 recorded in 1979, 1980, 1981 and 1982, respectively. The site has shown violations of the 24-hour secondary standard each year, with 22, 16, 10 and 4 exceedances, respectively, in those same years. The monitor is located in an industrial district which has much open, unpaved area.

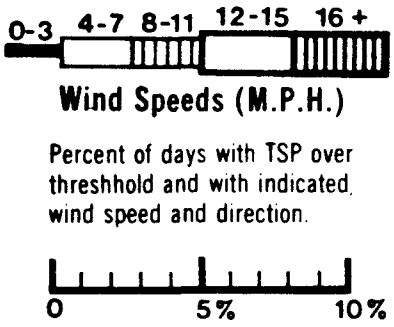
Figure 2 shows a pollution rose for the area, based on wind speeds and directions observed on days when the TSP concentrations exceeded 75 ug/m^3. Figure 3 shows the corresponding rose for TSP concentrations over 150 ug/m^3.

A different kind of meteorological rose, a wind rose, is shown in Figure 4. Two essential differences distinguish the wind rose from the pollution roses shown in Figures 2 and 3.

- First, the wind rose includes all wind observations, regardless of the pollutant concentrations. The pollution roses included only the wind observations recorded when the pollutant concentrations exceeded a specified threshold.

- Second, since the data summaries used to construct the wind rose classify wind directions in 16 directional sectors, the rose includes 16 arms, each representing a 22.5° sector. By contrast, the wind data used for constructing pollution roses were reported by the National Weather Service in 10° increments. Those roses present 12 arms, each representing a 30° sector (three of the 10° directional increments). Conversion formulas are not available for transforming a 12-arm rose to a 16-arm rose or vice versa. Therefore, comparisons between the wind roses and the pollution roses are qualitative, rather than quantitative.

Figure 2. TSP in Omaha



Met. Station: Eppley Airfield
Air Quality Site: 11th & Nicholas
TSP > 75 ug/m^3
75 Observations
1980 and 1981 data

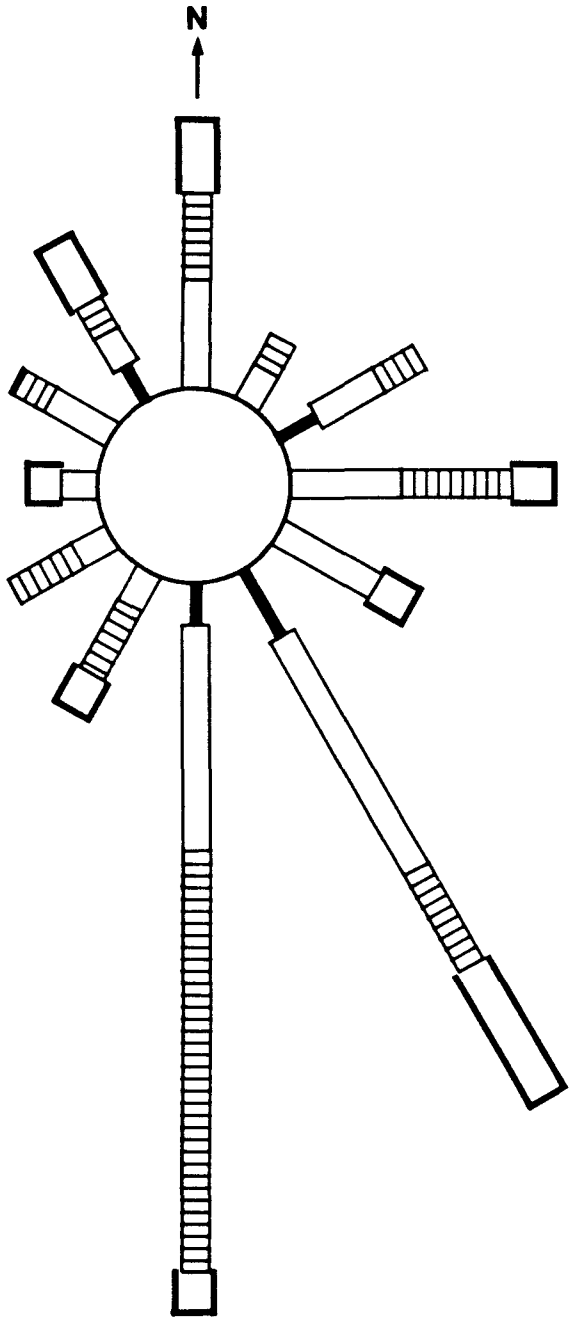
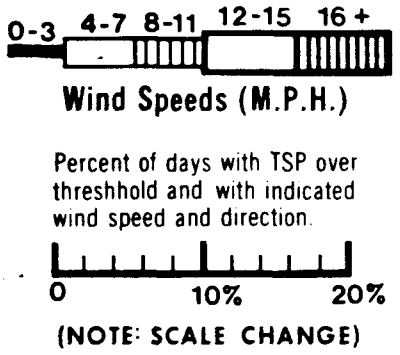


Figure 3. TSP in Omaha



Met. Station: Eppley Airfield
Air Quality Site: 11th & Nicholas
TSP >150 $\mu g/m^3$
15 Observations
1980 and 1981 data

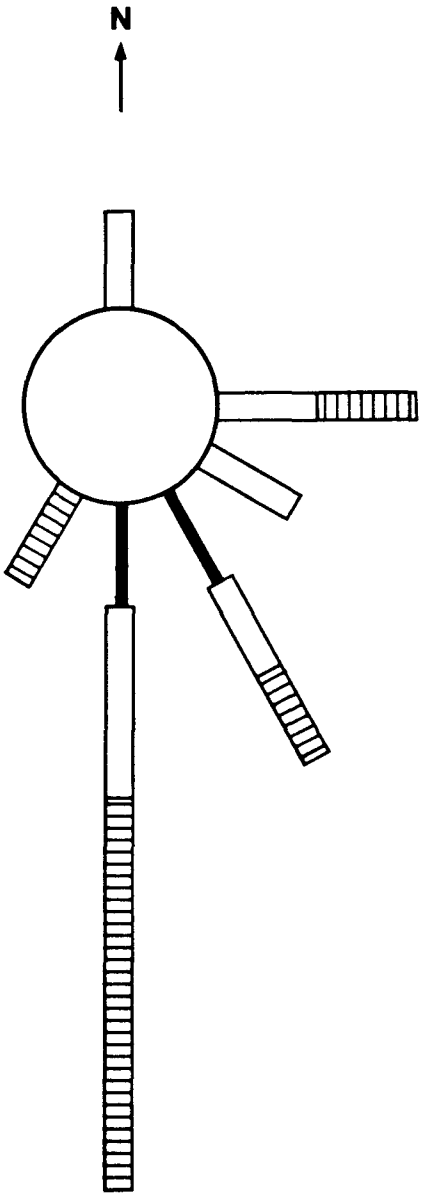
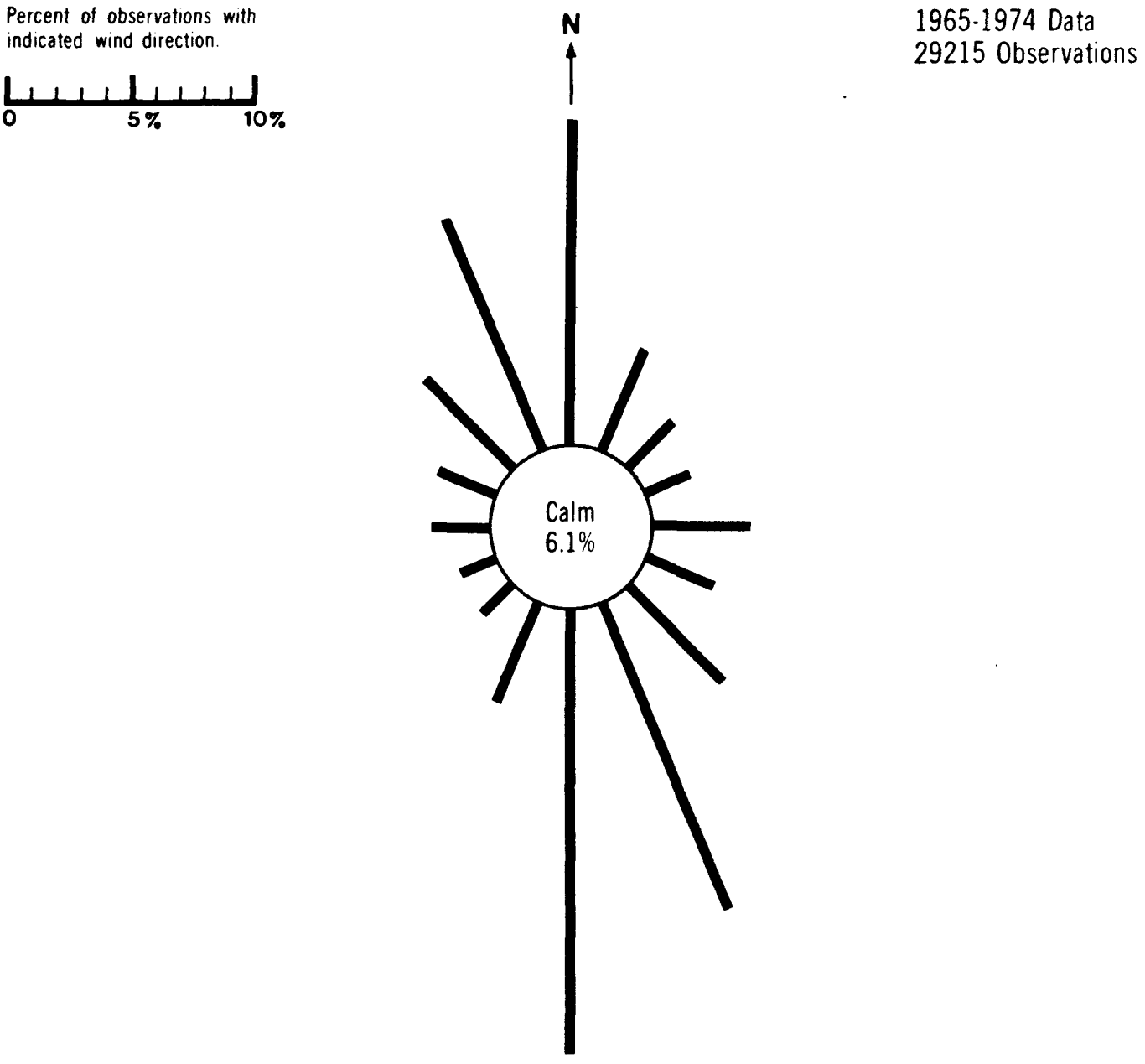


Figure 4. Historical Wind Rose-Eppley Airfield, Omaha



If all of the pollutant sources were equally spaced around the monitor, the wind rose and the pollution rose would approximately coincide.

Figure 2 indicates that contributions to annual averages over the primary standard occur most frequently with winds from the south and south-southeast. Comparison of Figures 2 and 4 indicate that those contributions are larger than would be expected from the historical wind distribution and evenly distributed emission sources.

Figure 3 indicates that exceedances of the 24-hour secondary standard (150 ug/m^3) occurred most often with southerly winds. In order to fit that diagram on the page, a scale change was necessary. If it were drawn at the same scale as Figure 2, each arm of Figure 3 would be doubled in length.

Since both pollution roses show high concentrations for a wide variety of wind directions, area sources likely contribute significantly to the observed concentrations. Since the major arms of both roses point south and south-southeast, a greater concentration of emission sources would be expected south and south-southeast of the monitor.

Figure 5 is a copy of a topographical map of the area. That figure shows the monitor location (indicated by the symbol ⊕), as well as the location of the airport where the wind data were collected. Since those locations are close together and have very similar terrain, and since 24-hour averages of the wind data are used, the pollution roses should be reasonably accurate.

Figure 6 shows the locations of point sources near the monitor. Those sources are listed in Table 5. While some impact from point sources may be indicated from comparison of Figure 6 with Figures 2 and 3, the point source locations and emissions alone are not sufficient to account for all of the features of the roses.

If the high concentrations recorded in recent years persist, and if further emission reductions are needed, we recommend that point and area sources south and east of the monitor be re-evaluated.

B. CO in Lincoln

The status of CO monitoring and control in Lincoln was described in the Region VII Environmental Management Report, as follows:

> The City of Lincoln is not currently attaining the federal air quality standard of 9ppm (10 mg/m^3) for carbon monoxide (CO), Originally, the problem was thought to be restricted to the Antelope Creek Basin, but recent data indicate a city-wide problem.

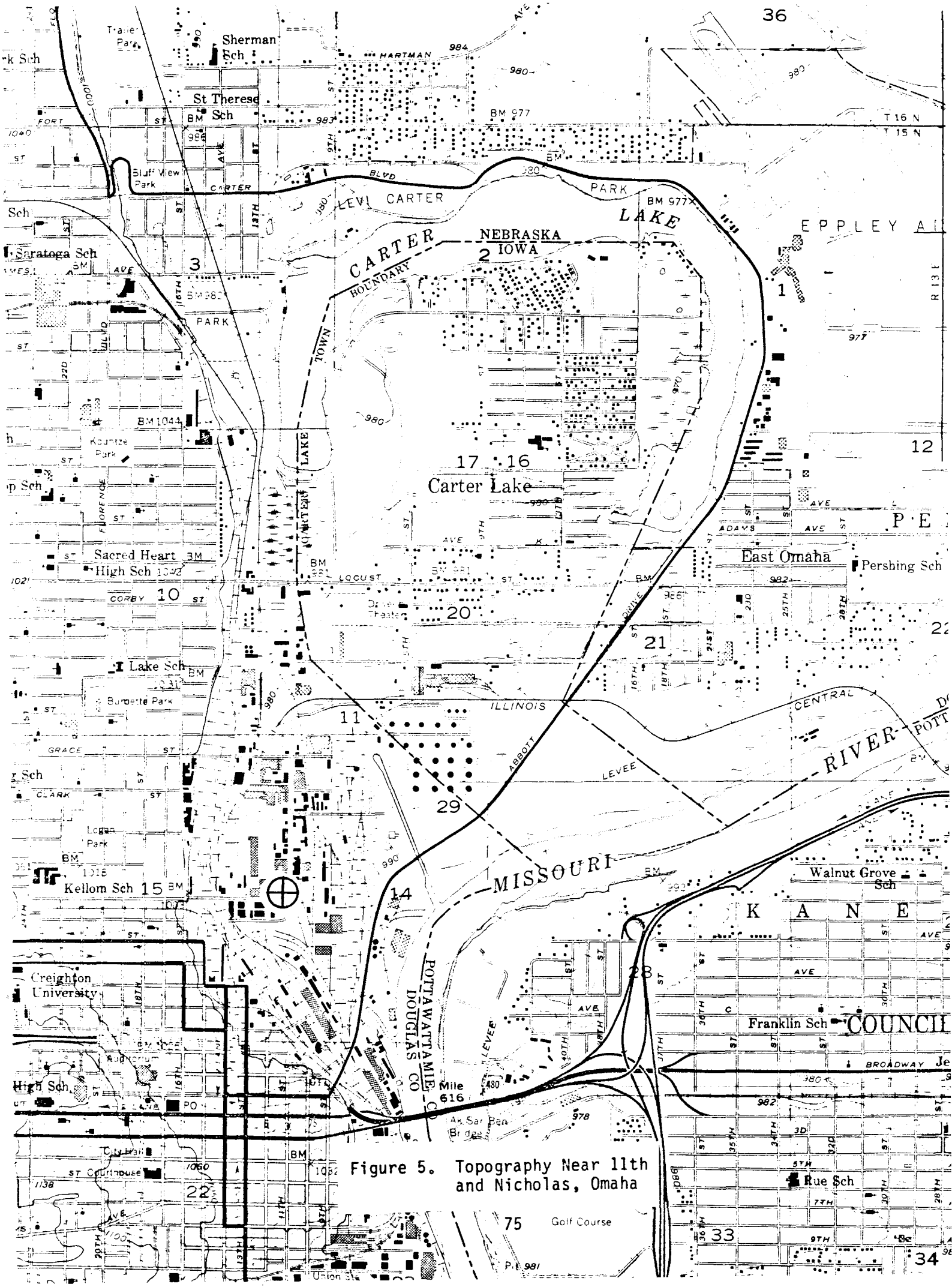


Figure 5. Topography Near 11th and Nicholas, Omaha

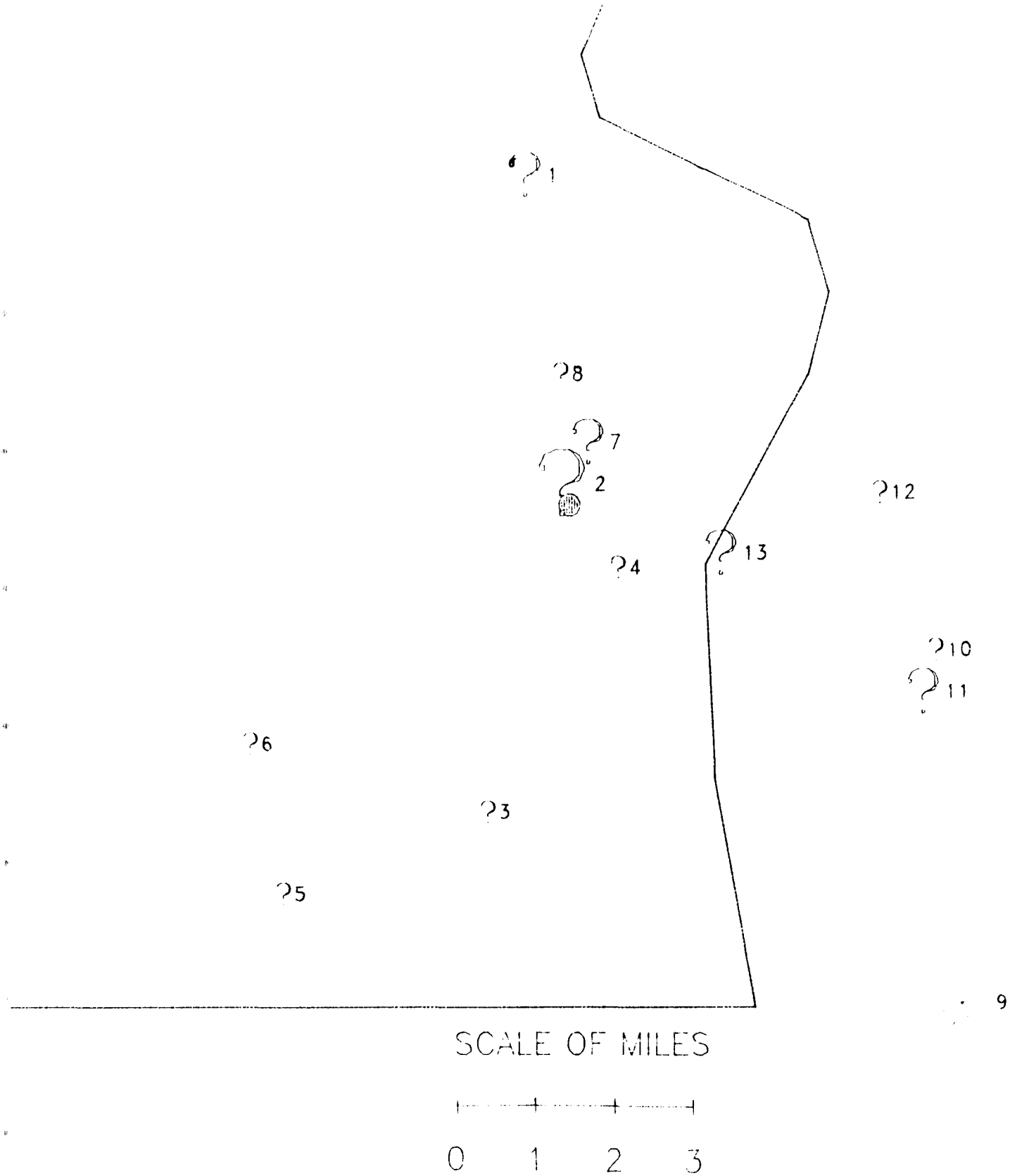


FIGURE 6. PARTICULATE POINT SOURCES OVER 12 TONS/YEAR NEAR 11TH AND NICHOLAS

TABLE 5

Particulate Point Sources Over 25 Tons/Year Near 11th and Nicholas, Omaha

Source	Emissions Tons/Year	UTM Easting (km)	UTM Northing (km)	UTM Zone
1. Omaha Public Power District	280	253.5	4579.3	15
2. Conagra	1470	254.0	4573.1	15
3. Conagra-Nixon Feeds	98	252.3	4566.6	15
4. ASARCO	56	255.1	4571.4	15
5. Asphalt Paving Company	81	751.2	4565.1	14
6. Flinn Paving	45	750.4	4568.1	14
7. ADM Grain Company	106	254.6	4573.9	15
8. Scouler Welsh Grain	47	254.1	4575.3	15
9. IH Power and Light	462	261.8	4562.4	15
10. Midwest Walnut	75	261.5	4569.5	15
11. Pillsbury Company	250	261.2	4568.7	15
12. Bartlett and Company	42	260.5	4572.7	15
13. Scoular-Welsh	173	257.2	4571.6	15
Monitor Location = 11th and Nicholas		254.2	4572.7	15

Monitoring data collected at the 51st and Colby site recorded the following second-highest 8-hour concentrations in 1979, 1980, 1981, and 1982, respectively: 12.6, 8.4, 22.2 and 13.0 mg/m^3. Those same years showed 3, 0, 9 and 2 exceedances, respectively, of the primary standard. Data collected at 2215 O Street showed second-highest 8-hour concentrations of 10.8, 11.4, 20.0 and 12.4 mg/m^3 in those same years, with 3, 3 and 9 and 2 exceedances, respectively.

Figure 7 shows a pollution rose for the 51st and Colby site, based on hours with CO concentrations over 10 mg/m^3 (the eight-hour primary standard). Only those hours would contribute to eight-hour exceedances of the standard. Wind data from the municipal airport (about seven miles west) were used for preparation of the rose. That rose indicates that elevated CO concentrations occurred when winds were light, and predominantly included a range of directions from north-northwest to north-northeast. Figure 8 shows an historical wind rose for the airport. Comparison of Figures 7 and 8 indicates that the CO sources are not uniformly distributed around the monitor. The traffic map shown in Figure 9 and the topographic map in Figure 10 show the pollutant monitoring location and the surrounding area.

Because of the distance between the pollutant monitoring station and the weather station, and because the prevalence of light winds makes the correlation of wind directions uncertain between the two sites, any conclusions drawn from this pollution rose should be regarded as tentative indications, and not as established facts.

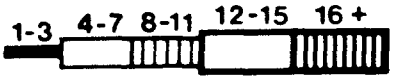
With that caution in mind, traffic along 48th Street in the vicinity of the shopping center and traffic in the parking lot of the shopping center would be possible contributors to the high concentrations. A point source emitting over 250 tons/year of CO is located approximately three miles to the north-northeast of the monitor. It was shown on a Lincoln inset map in Section VI of this report. That source might be a partial contributor to the concentrations measured, under certain wind conditions. Such contribution would be consistent with the second longest arm of the pollution rose. However, area sources closer to the monitor could alternatively account for that arm.

The pollution rose for the 2215 O Street site is shown in Figure 11. Comparison with the wind rose in Figure 7 indicates little localization of CO sources around this monitor. Topographic features and traffic densities near the monitor are shown in Figures 12 and 13, respectively. (The monitor location is again shown by the symbol ⊕ in each figure.) The same cautions stated for interpretation of the previous CO pollution rose also apply at this site. Based on the distance and direction of the nearest large point source from the monitor, minimal point source impact is expected. Since the pollution rose shows high concentrations with diverse wind directions, vehicle traffic is again the probable cause of those concentrations. The wide diversity of wind directions at this site indicates contributions from traffic throughout some part

of the downtown area. Data from the Special Purpose Monitor which the local agency has established in the downtown area will help to better define the extent of the area which contributes to the high concentrations.

At both sites, modeling and on-site meteorological monitoring would be useful components of future studies to determine contributing sources.

Figure 7. CO in Lincoln



Wind Speeds (Kts.)

Percent of hours over threshold and with indicated wind speed and direction.

Met. Station: Airport
Air Quality Site: 51st. and Colby
CO>10mg/m^3
62 Observations 1980 and 1981 Data

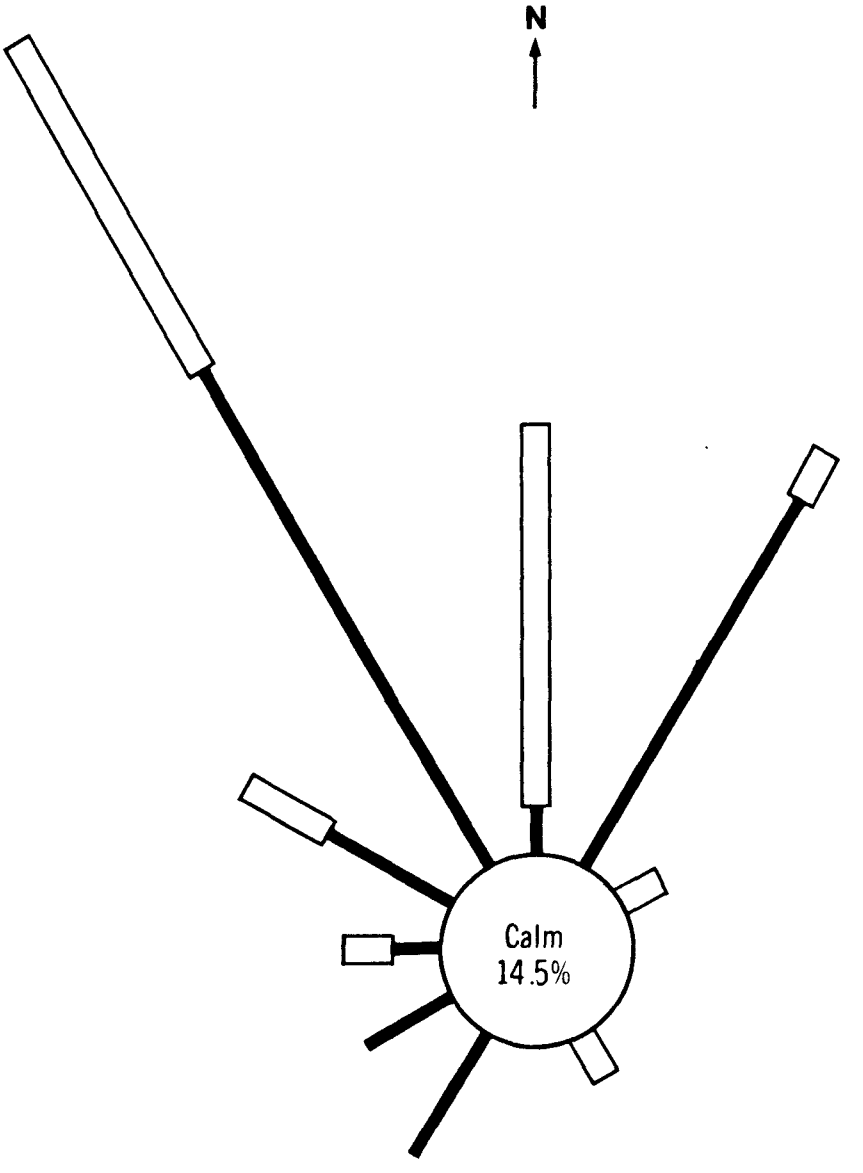


Figure 8. Historical Wind Rose-Lincoln Airport

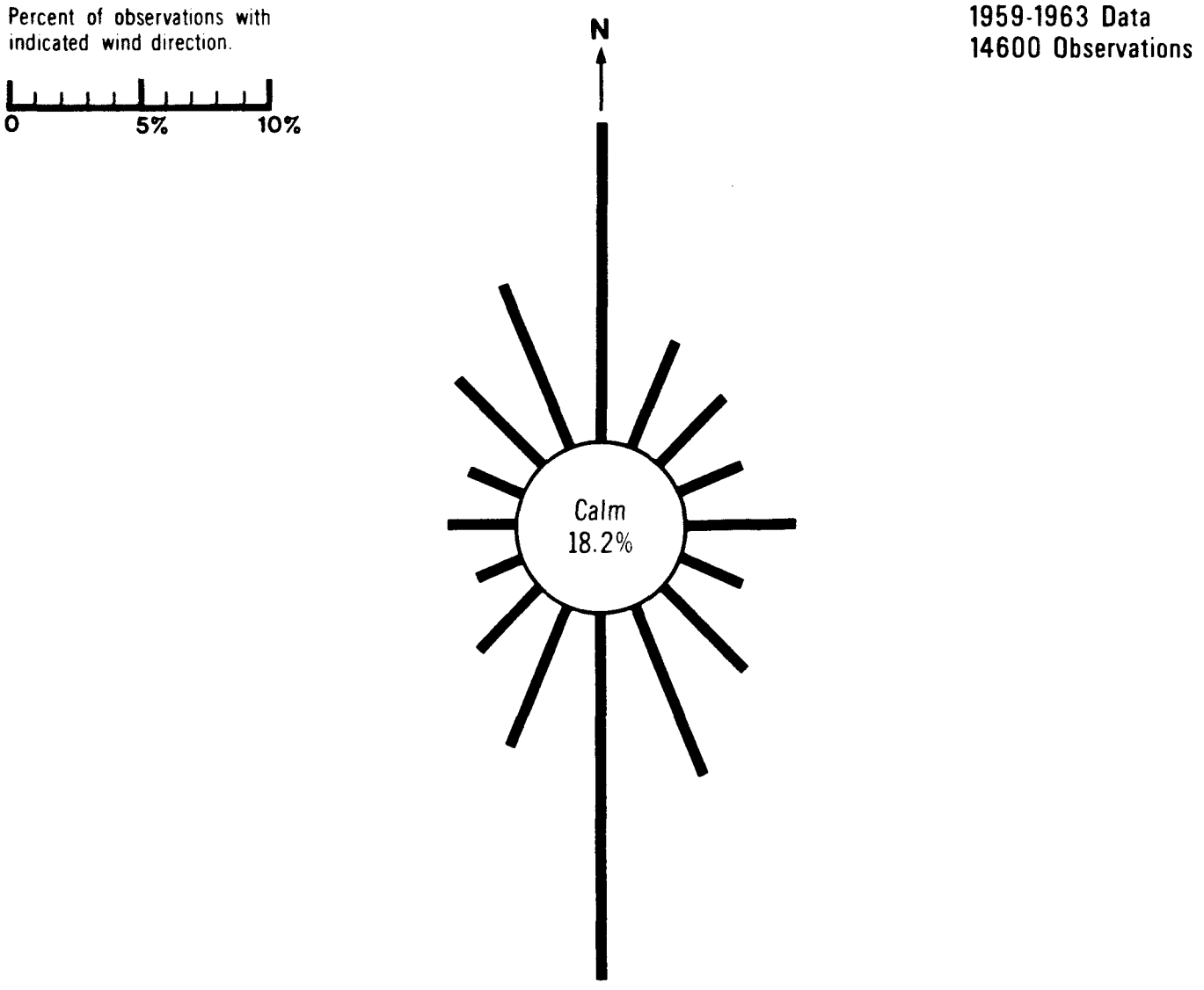
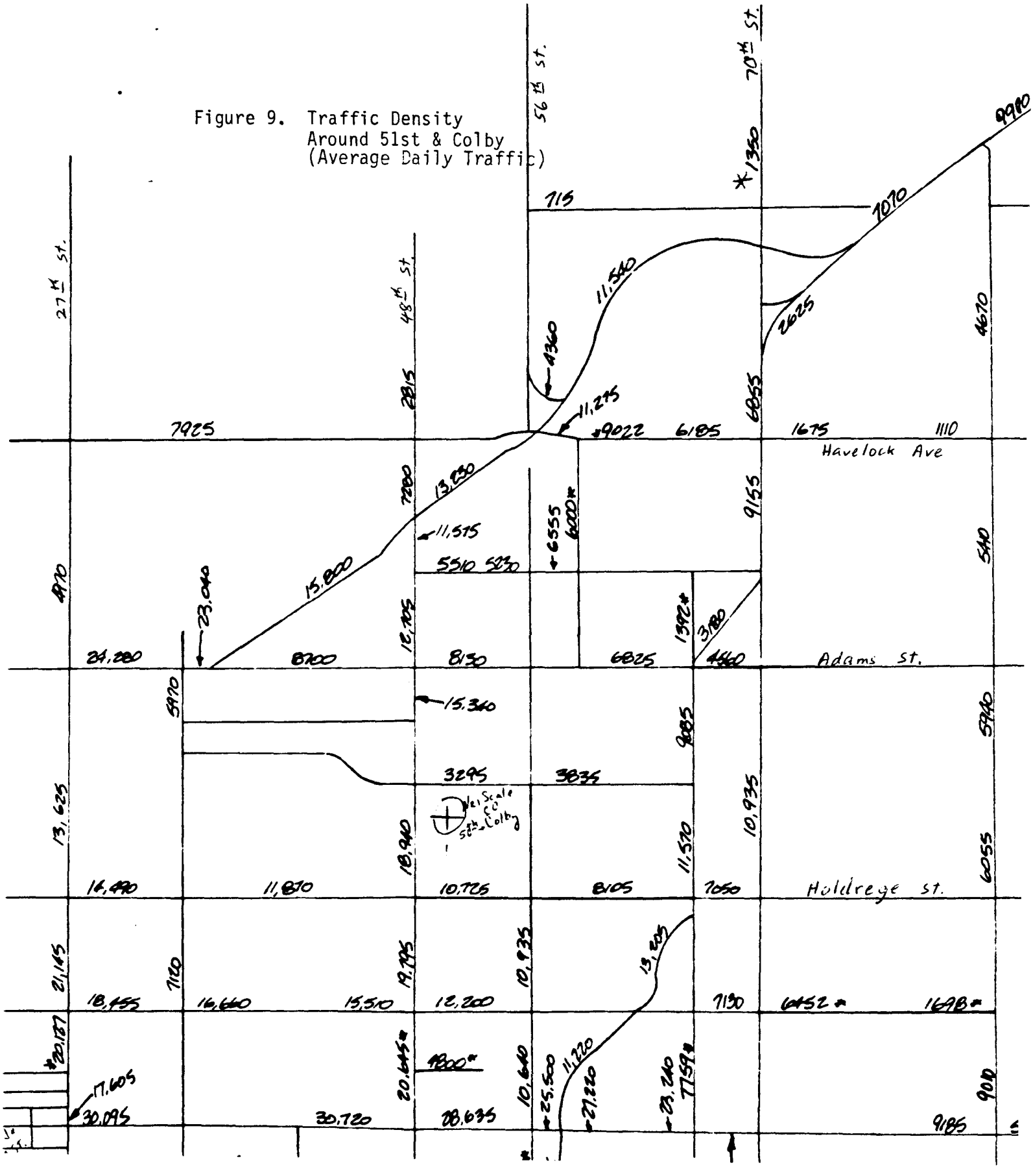


Figure 9. Traffic Density
Around 51st & Colby
(Average Daily Traffic)



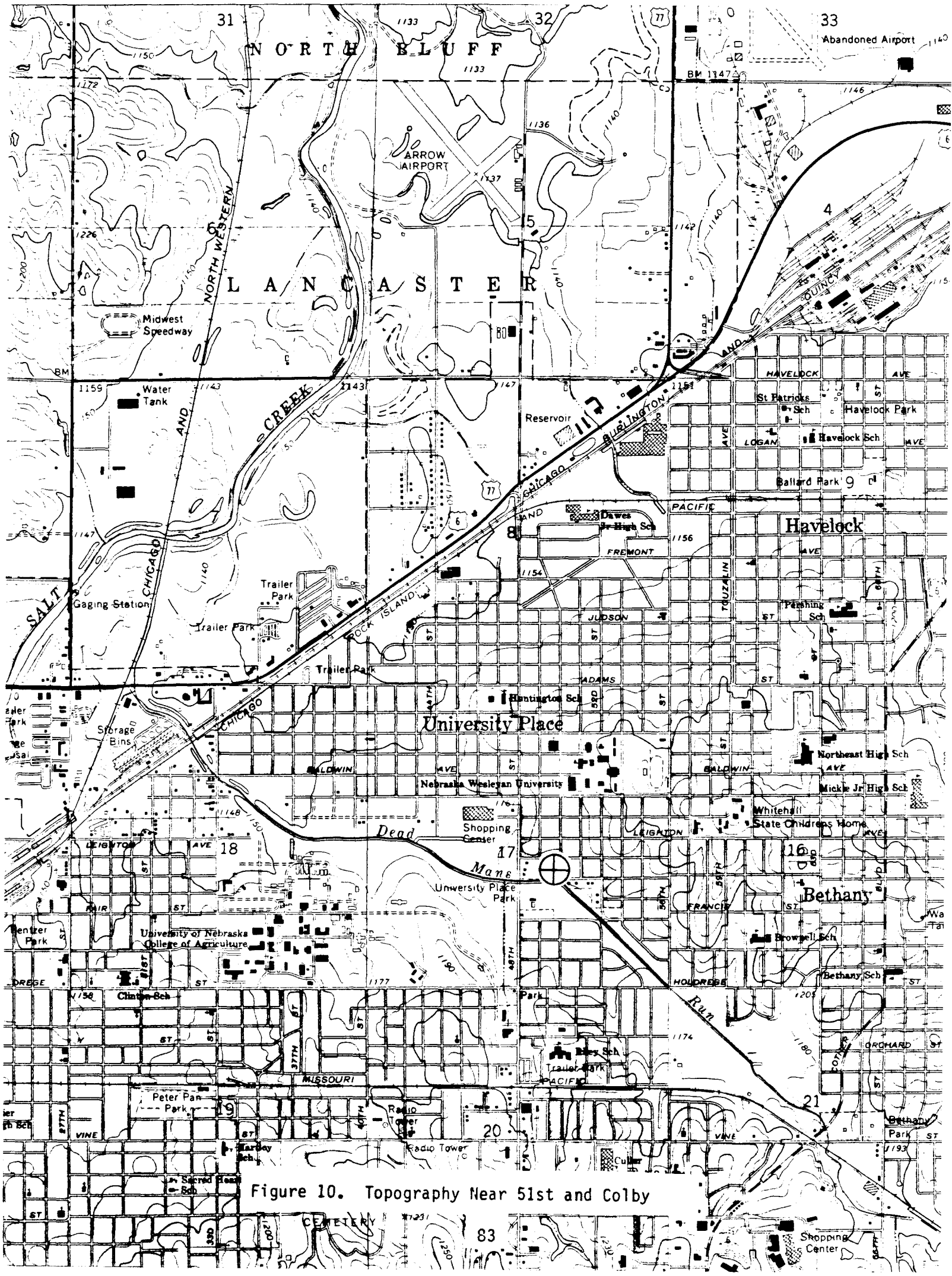
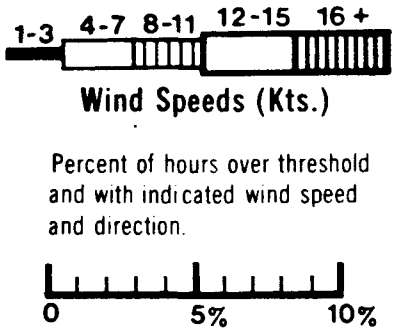
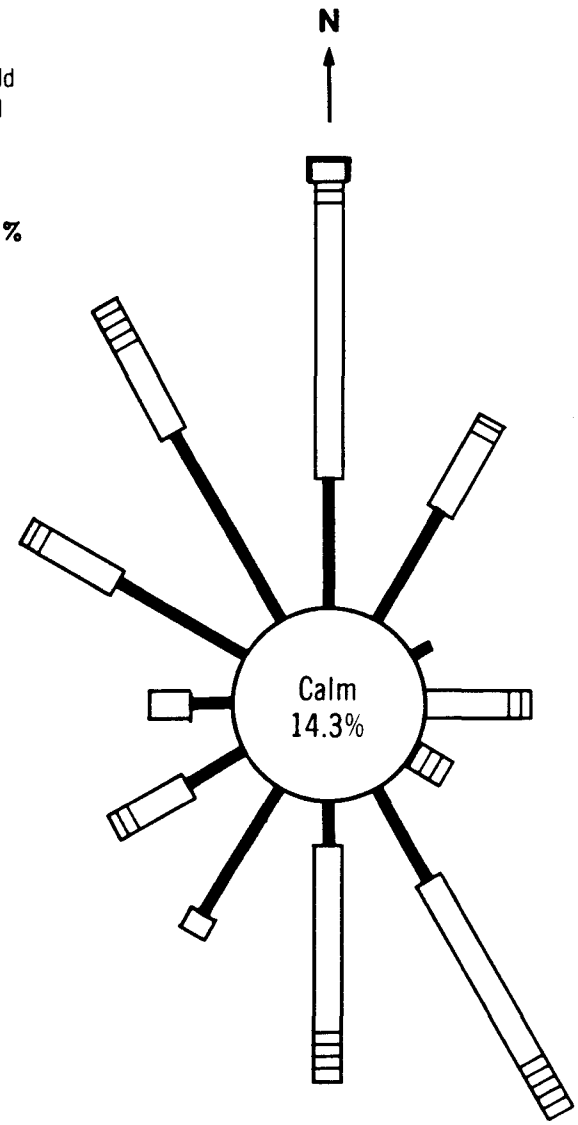


Figure 10. Topography Near 51st and Colby

Figure 11. CO in Lincoln





Met. Station: Municipal Airport
Air Quality Site: 2215 "O" Street
CO>10 mg/m^3
140 Observations
1980 and 1981 data

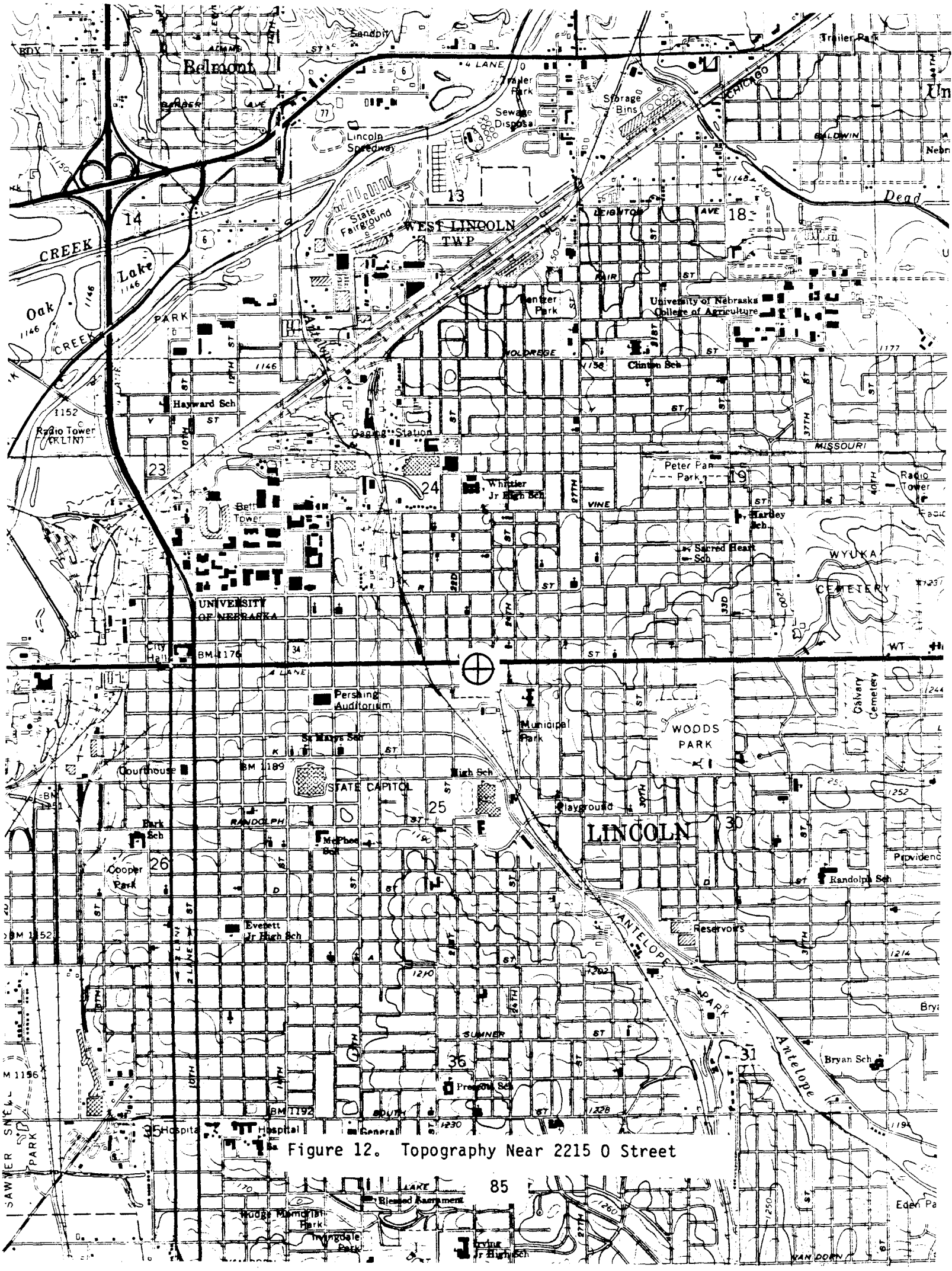


Figure 12. Topography Near 2215 O Street

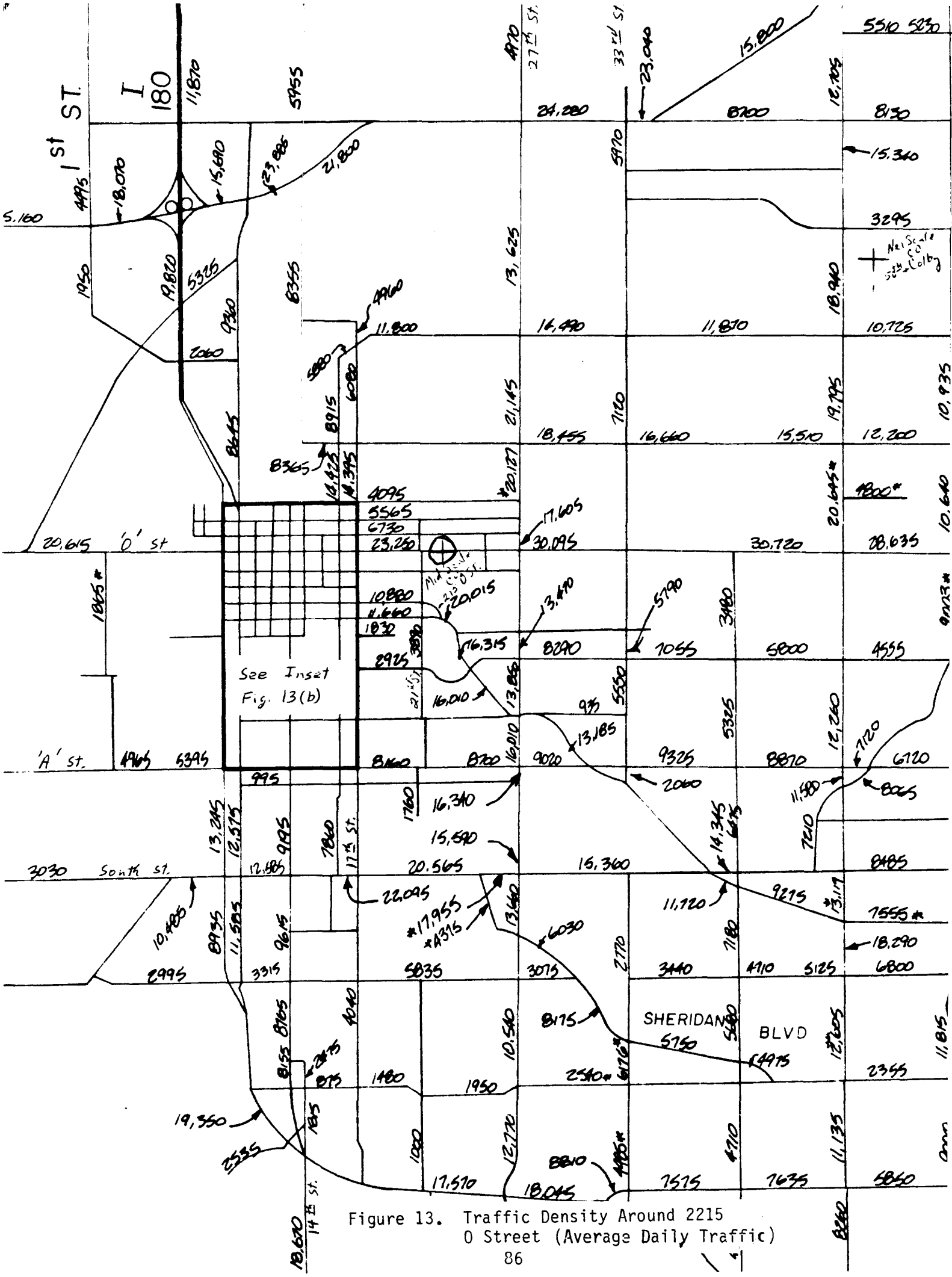


Figure 13. Traffic Density Around 2215 O Street (Average Daily Traffic)

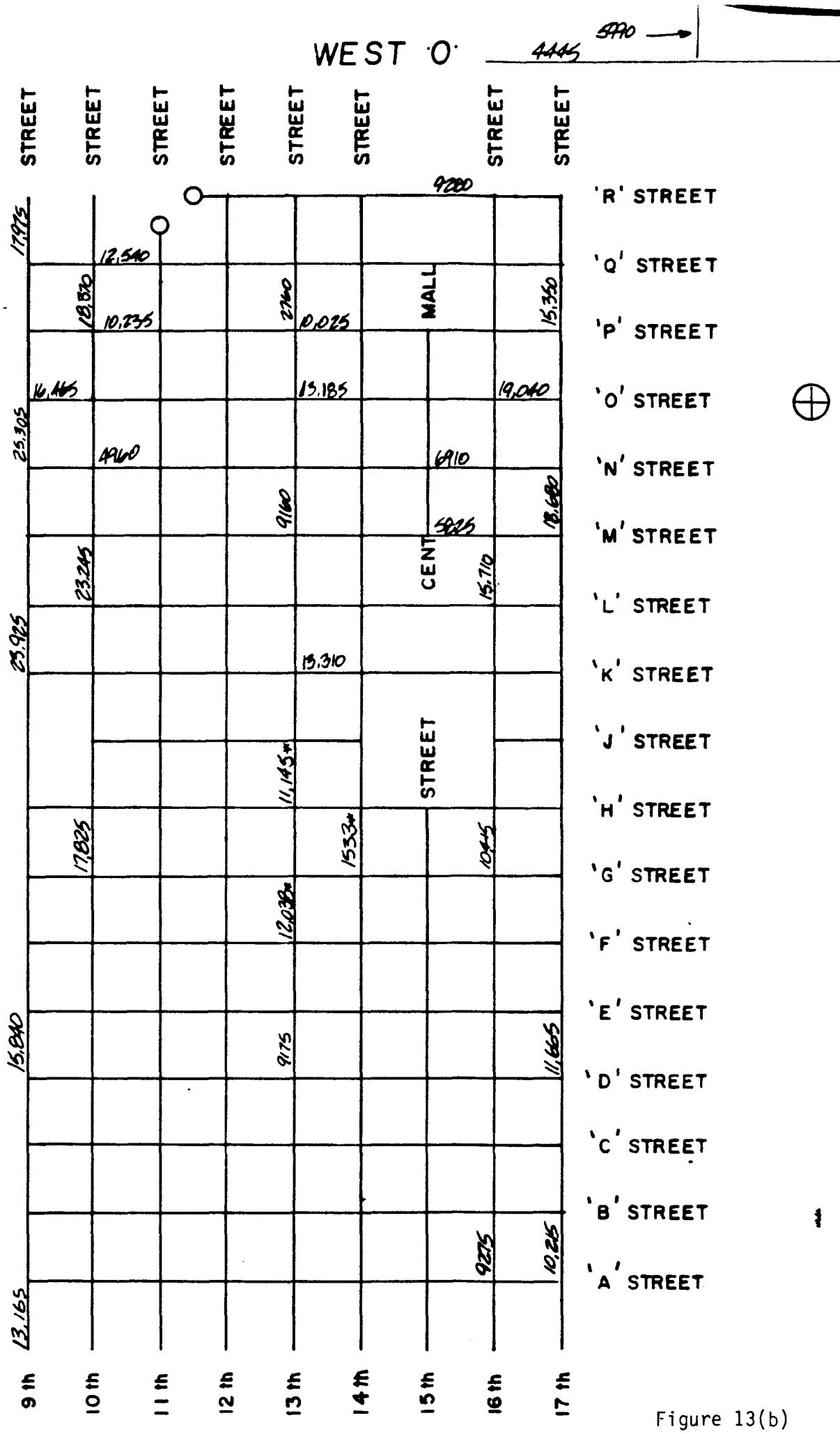

WEST 'O'
4445
5990
12,47
STREET
STREET
STREET
STREET
STREET
STREET
STREET
STREET
9280
'R' STREET
'Q' STREET
'P' STREET
'O' STREET
'N' STREET
'M' STREET
'L' STREET
'K' STREET
'J' STREET
'H' STREET
'G' STREET
'F' STREET
'E' STREET
'D' STREET
'C' STREET
'B' STREET
'A' STREET
17,875
12,540
10,830
10,735
2760
10,025
MALL
15,350
16,465
13,185
19,040
25,305
4960
6910
9160
5825
18,680
CENT
23,245
15,710
25,925
13,310
STREET
11,145±
17,825
1533±
10445
12,038±
9175
11,665
15,840
9275
10,265
13,165
9 th
10 th
11 th
12 th
13 th
14 th
15 th
16 th
17 th

Figure 13(b)

XIII. POPULATION EXPOSURE

Population exposure to elevated pollutant concentrations is difficult to measure accurately. (People spend varying amounts of time in different parts of a city which may have localized areas with high pollutant concentrations. Population estimates within such localized areas are difficult to compute manually because that calculation requires locating and summing the populations of numerous small, detailed geographical areas.) Previous attempts to estimate population exposure have focused on populations of entire counties or metropolitan areas, even though the designated non-attainment areas were only portions of those counties or cities. While such approximations are understandable, given the difficulty of obtaining and using population data with more detailed spatial resolution, they may greatly overestimate the populations exposed to elevated pollutant concentrations. A better approximation of exposed population would be a determination of just that segment of the population living within the designated non-attainment areas. (For O_3, while that number may over-estimate the population actually exposed to high ozone concentrations, it should closely approximate the population affected by pollution control measures.) At our request, Systems Applications, Inc. (SAI) has developed software to estimate the population within any given closed polygon, using the detailed census Block Group/Enumeration District data in their computer data base. The non-attainment areas shown on the maps in Sections IV through VIII of this report were sent to SAI for computation of the enclosed populations. Table 6 summarizes the results of those calculations. The population density maps from which the table was prepared are shown in Appendix C. That appendix also describes the calculation procedure more fully.

It should be noted that redesignations were recommended which would reduce the size of some non-attainment areas. The populations in the table show that significant numbers of people have benefitted from the recent reductions in pollutant concentrations.

TABLE 6

POPULATION ESTIMATES WITHIN DESIGNATED NON-ATTAINMENT AND UNCLASSIFIED AREAS

TSP	Primary	Secondary	Unclassified
Cass County			20,000 (includes PNA and SNA's)
Louisville	1,000	1,000 (incl. PNA)	
Weeping Water	1,000	1,000 (incl. PNA)	
Dakota County			17,000
Dawson County			22,000
Omaha-Metropolitan Area	44,000	400,000 (incl. PNA)	

CO	Primary & Secondary	Unclassified
Lincoln	7,000	158,000 (includes PNA)
Omaha	283,000	

XIV. SUMMARY AND RECOMMENDATIONS

A. Attainment Status Designations

The evaluations of ambient air quality based on recent data found the attainment status designations to be generally consistent with recent data for most pollutants in most parts of the State. Recommendations were made in the text for attainment status changes for TSP and CO. The TSP recommendations, which were summarized in Table 4, encourage consideration of some redesignations from non-attainment to attainment, and a few redesignations from attainment or unclassified to non-attainment. In each case, we encourage the State to review the monitoring data and any supplemental information available (including the EPA fugitive dust policy) in order to determine whether or not redesignation is needed. The recommendations for CO encourage expansion of the non-attainment area in Lincoln, and encourage consideration of a reduction in the size of the non-attainment area in Omaha.

B. Air Quality Concern Areas

Relatively few serious air quality problems were found in Nebraska, based on the monitoring data available in SAROAD. The areas which pose human health concerns, because the primary standards were exceeded, are summarized in the following paragraphs. The specific criteria for assignment of priorities are also described in those paragraphs.

First Priority - Some sites have shown repeated exceedance of the primary standards and also have exceeded the alert level during the period evaluated. These sites include:

- TSP - Louisville
- CO - Lincoln (both sites) and Omaha (7425 West Dodge)

These areas have been the subject of previous investigations by the State. We encourage the State personnel to continue their efforts to identify and address the causes of those high concentrations.

Second Priority - Some TSP monitoring sites showed violation of the primary standard during the period evaluated, but did not exceed the alert level. Those sites include Nebraska City, Omaha (11th at Nicholas) and South Sioux City (both sites). We recommend that the State evaluate these areas to determine whether or not long-term problems are indicated, and, if so, identify and address the causes of those high concentrations.

Two of the areas listed above were addressed more extensively in Section XII, which included pollution roses to indicate possible sources of the elevated concentrations. The information in that section of the report may be useful in the State's efforts to identify and control the sources of those concentrations.

In recent years, there have been reductions in both the number and the size of areas which exceed the primary standards, especially for particulate matter. Those reductions are encouraging indications of progress made by the State and local agencies.

C. Monitor Operation and Siting

The precision and accuracy data generally reflect conscientious efforts by the State and local agencies to operate the monitors in accordance with the quality assurance requirements of the regulations. Two recommendations were made in order to fully satisfy those requirements. Those recommendations would increase the number of precision checks performed on automated analyzers in Omaha and ensure that precision and accuracy assessments are performed and reported for all SLAMS data collected after January 1, 1983.

Recommendations were made, though at low priority, for the State to consider: establishing SO_2 monitors downwind of two power plants; establishing CO monitors in Sarpy and Hall Counties; and placing an additional ozone monitor farther downwind of Lincoln if the existing monitor begins measuring high ozone concentrations.

APPENDIX A

Tabular Summaries of Data

Table	Description
A1	Ambient Air Monitoring Data
A2	Precision and Accuracy Estimates for Ambient Air Monitoring Data
A3	Attainment Status Designations
A4	Emissions Data

ABBREVIATIONS AND SYMBOLS USED IN TABLE A1

SITE ID	Site identification number
YR	Year
REP ORG	Reporting organization
# OBS	Number of observations
MAX 24-HR 1ST	Highest value recorded in a 24-hour period
MAX 24-HR 2ND	Second highest value recorded in a 24-hour period
OBS >260	Number of observations greater than 260
OBS >150	Number of observations greater than 150
ARIT MEAN	Arithmetic mean
GEO MEAN	Geometric mean
GSD	Geometric standard deviation
METH	Method
QTRLY ARITH MEAN 1ST	First quarter arithmetic mean
QTRLY ARITH MEAN 2ND	Second quarter arithmetic mean
QTRLY ARITH MEAN 3RD	Third quarter arithmetic mean
QTRLY ARITH MEAN 4TH	Fourth quarter arithmetic mean
MEANS >1.5	Number of quarterly means greater than 1.5
MAX VALUES 1ST	Highest value recorded for the year
MAX VALUES 2ND	Second highest value recorded for the year
MAX 1-HR 1ST	Highest value recorded in a one-hour period
MAX 1-HR 2ND	Second highest value recorded in a one-hour period
OBS >40	Number of observations greater than 40
MAX 8-HR 1ST	Highest value recorded in an eight-hour period
MAX 8-HR 2ND	Second highest value recorded in an eight-hour period
OBS >10	Number of observations greater than 10
OBS >365	Number of observations greater than 365
MAX 3-HR 1ST	Highest value recorded in a three-hour period
MAX 3-HR 2ND	Second highest value recorded in a three-hour period
OBS >1300	Number of observations greater than 1300
DAILY MAX 1-HR 1ST	Maximum hourly ozone value for a day
DAILY MAX 1-HR 2ND	Second maximum hourly ozone value for a day
DAILY MAX 1-HR 3RD	Third maximum hourly ozone value for a day

ABBREVIATIONS AND SYMBOLS USED IN TABLE A1 (Continued)

VALS >.125 MEAS	Number of measured values greater than .125
VALS >.125 EST	Number of expected violations
NBR VALID DAILY MAX	Number of valid daily maximum values
MISS DAYS ASS < STD	Number of missing days assumed to be less than the standard
?	The mean does not satisfy summary criteria

SUSPENDED PARTICULATE MATTER (UG/M3) NEBRASKA 81-82

METHOD: GRAVIMETRIC, 24-HOUR HI-VOLUME FILTER SAMPLE-91

SITE ID	LOCATION	COUNTY	ADDRESS	YR	REP ORG	#OBS	MAX 24-HR 1ST	MAX 24-HR 2ND	OBS> 260	OBS> 150	ARIT MEAN	GEO MEAN	GSD
280100001F01	AUBURN	NEMAHA CO	1208 J ST	81	001	58	194	143		1	73	66	1.6
280100001F01	AUBURN	NEMAHA CO	1208 J ST	82	001	56	206	205		3	73	64	1.7
280160001F01	BEATRICE	GAGE CO	310 ELLA ST	81	001	14	123	102			79?	74?	1.5
280160002F01	BEATRICE	GAGE CO	510 ELK ST BEATR	81		32	123	117			61?	55?	1.6
280160002F01	BEATRICE	GAGE CO	510 ELK ST BEATR	82		49	146	144			61	55	1.6
280180002F01	BELLEVUE	SARPY CO	22ND AND WASHING	81	001	42	142	121			62?	57?	1.5
280180003G01	BELLEVUE	SARPY CO	FAIRVIEW AT GALV	81	003	5	109	83			65?	58?	1.8
280180003G01	BELLEVUE	SARPY CO	FAIRVIEW AT GALV	82	003	55	129	126			55	49	1.7
280400002F01	CASS CO	CASS CO	CITY SANITATION	82		7	94	84			62?	58?	1.6
280400003F01	CASS CO	CASS CO	WEEPING WATER	82		14	130	80			50?	41?	1.9
280400004F01	CASS CO	CASS CO	WEEPING WATER NE	81	001	46	486	228	1	7	93	75	1.9
280400004F01	CASS CO	CASS CO	WEEPING WATER NE	82	001	38	449	147	1	1	78?	63?	1.8
280400005F01	CASS CO	CASS CO	LOUISVILLE NE	81	001	55	446	289	2	9	103	88	1.7
280400005F01	CASS CO	CASS CO	LOUISVILLE NE	82	001	57	295	221	1	8	92	78	1.8
280400005F09	CASS CO	CASS CO	645 MAIN ST LOU	81	001	44	374	308	2	6	100	85	1.8
280400005F09	CASS CO	CASS CO	645 MAIN ST LOU	82	001	52	277	266	2	10	101	85	1.9
280560001F01	COLUMBUS	PLATTE CO	14TH & 26TH AVE	81	001	51	128	125			59	53	1.6
280560001F01	COLUMBUS	PLATTE CO	14TH & 26TH AVE	82	001	13	83	79			49?	44?	1.7
280580001F01	COZAD	DAWSON CO	H & 8TH STREETS	81	001	32	166	140		1	60?	53?	1.7
280580002F01	COZAD	DAWSON CO	16TH ST & AVENUE	81		18	81	77			39?	34?	1.6
280580002F01	COZAD	DAWSON CO	16TH ST & AVENUE	82		44	136	107			44	37	1.9
280660001J05	DAKOTA CO	DAKOTA CO	NEBRASKA SITE	81		18	152	82		1	44?	37?	1.7
280780002G01	DOUGLAS CO	DOUGLAS CO	711 VETERANS DR.	82		24	115	87			35?	27?	2.1
280900002F01	FREMONT	DODGE CO	415 EAST 16TH ST	81	001	52	116	108			57	52	1.5
280900002F01	FREMONT	DODGE CO	415 EAST 16TH ST	82	001	52	137	133			51	46	1.6
281080001F01	GRAND ISLAND	HALL CO	2ND AND PINE STS	81	001	57	187	155		3	66	58	1.7
281080001F01	GRAND ISLAND	HALL CO	2ND AND PINE STS	82	001	58	159	144		1	54	48	1.7
281200002F01	HASTINGS	ADAMS CO	109 WEST 2ND	81	001	59	128	121			63	57	1.6
281200002F01	HASTINGS	ADAMS CO	109 WEST 2ND	82	001	50	140	139			61	53	1.7
281380001F01	KEARNEY	BUFFALO CO	18 EAST 22ND	81	001	52	127	127			64	58	1.6
281380001F01	KEARNEY	BUFFALO CO	18 EAST 22ND	82	001	51	152	123		1	56	47	1.8
281380001F09	KEARNEY	BUFFALO CO	18 E.22ND CITY	81	001	47	127	122			64	58	1.6
281380001F09	KEARNEY	BUFFALO CO	18 E.22ND CITY	82	001	57	187	154		2	66	55	1.8
281520001G01	LANCASTER CO	LANCASTER CO	NORRIS SCH DIST	81	002	61	87	82			38	33	1.7
281520001G01	LANCASTER CO	LANCASTER CO	NORRIS SCH DIST	82	002	38	95	83			36?	31?	1.7
281520002G01	LANCASTER CO	LANCASTER CO	21ST AVE & HWY 6	81	002	61	198	192		3	77	67	1.7
281520002G01	LANCASTER CO	LANCASTER CO	21ST AVE & HWY 6	82	002	55	197	148		1	78	67	1.8
281520002G09	LANCASTER CO	LANCASTER CO	FIRE STA 21ST &	81	002	60	205	195		4	81	72	1.6
281520002G09	LANCASTER CO	LANCASTER CO	FIRE STA 21ST &	82	002	58	212	161		3	82	71	1.7

? INDICATES THAT THE MEAN DOES NOT SATISFY SUMMARY CRITERIA

QUICK LOOK REPORT

SUSPENDED PARTICULATE MATTER (UG/M3) NEBRASKA 81-82

METHOD: GRAVIMETRIC, 24-HOUR HI-VOLUME FILTER SAMPLE-91

SITE ID	LOCATION	COUNTY	ADDRESS	YR	REP ORG	#OBS	MAX 24-HR 1ST	MAX 24-HR 2ND	OBS> 260	OBS> 150	ARIT MEAN	GEO MEAN	GSD
281540001F01	LEXINGTON	DAWSON CO	406 E 6TH ST	81	001	45	111	103			47	41	1.7
281540001F01	LEXINGTON	DAWSON CO	406 E 6TH ST	82	001	49	170	153		2	54	45	1.8
281560003G01	LINCOLN	LANCASTER CO	300 SO 48TH	81	002	58	103	82			46	42	1.5
281560003G01	LINCOLN	LANCASTER CO	300 SO 48TH	82	002	56	103	81			40	35	1.7
281560005G01	LINCOLN	LANCASTER CO	3325 NO 14TH ST	81	002	60	116	102			49	44	1.6
281560005G01	LINCOLN	LANCASTER CO	3325 NO 14TH ST	82	002	56	100	82			39	33	1.8
281560006G01	LINCOLN	LANCASTER CO	6224 LOGAN	81	002	59	130	106			58	53	1.6
281560006G01	LINCOLN	LANCASTER CO	6224 LOGAN	82	002	56	102	90			43	39	1.6
281560008G01	LINCOLN	LANCASTER CO	5230 TIPPERARY T	81	002	61	81	81			44	40	1.6
281560008G01	LINCOLN	LANCASTER CO	5230 TIPPERARY T	82	002	40	103	84			43?	38?	1.7
281560012G01	LINCOLN	LANCASTER CO	POLICE STATION	81	002	58	153	142		1	72	67	1.5
281560012G01	LINCOLN	LANCASTER CO	POLICE STATION	82	002	58	146	144			68	61	1.6
281560012G09	LINCOLN	LANCASTER CO	POLICE STA 10TH	81	002	60	172	153		2	73	67	1.6
281560012G09	LINCOLN	LANCASTER CO	POLICE STA 10TH	82	002	57	146	137			66	59	1.6
281560013G01	LINCOLN	LANCASTER CO	2435 NORTH 33RD	81		59	223	200		7	85	74	1.7
281560013G01	LINCOLN	LANCASTER CO	2435 NORTH 33RD	82		41	146	146			78?	70?	1.6
281560014G01	LINCOLN	LANCASTER CO	HEALTH DEPT	82		16	89	80			41?	37?	1.6
281560015G01	LINCOLN	LANCASTER CO	GAME AND PARKS C	82		15	72	71			36?	32?	1.7
281580001F01	LINCOLN CO	LINCOLN CO	FREDERICK SITE	81	001	54	238	155		2	33	25	2.0
281580001F01	LINCOLN CO	LINCOLN CO	FREDERICK SITE	82	001	43	111	109			32	23	2.2
281760002F01	NEBRASKA CITY	OTOE CO	714 CENTRAL AVE	81	001	53	185	165		4	85	77	1.5
281760002F01	NEBRASKA CITY	OTOE CO	714 CENTRAL AVE	82	001	32	245	190		3	75?	63?	1.8
281760003F01	NEBRASKA CITY	OTOE CO	905 3RD, NEBRASK	82		24	127	95			59?	55?	1.5
281800001F01	NORFOLK	MADISON CO	7TH AND BROSH	81	001	46	189	146		1	69	61	1.6
281800001F01	NORFOLK	MADISON CO	7TH AND BROSH	82	001	48	157	133		1	63	58	1.6
281820001F01	NORTH PLATTE	LINCOLN CO	211 W 3RD ST	81	001	56	364	97	1	1	54	45	1.7
281820001F01	NORTH PLATTE	LINCOLN CO	211 W 3RD ST	82	001	53	143	118			53	47	1.6
281820001F09	NORTH PLATTE	LINCOLN CO	211 W 3RD ST. C	81	001	55	327	95	1	1	52	44	1.7
281820001F09	NORTH PLATTE	LINCOLN CO	211 W 3RD ST. C	82	001	53	122	115			55	50	1.6
281880011G01	OMAHA	DOUGLAS CO	11TH & NICHOLAS	81	003	60	258	239		10	103	91	1.7
281880011G01	OMAHA	DOUGLAS CO	11TH & NICHOLAS	82	003	59	195	176		4	74	64	1.7
281880015G01	OMAHA	DOUGLAS CO	EPPLEY FIELD	81	003	57	151	149		1	72	66	1.5
281880015G01	OMAHA	DOUGLAS CO	EPPLEY FIELD	82	003	48	123	111			53	47	1.6
281880018G01	OMAHA	DOUGLAS CO	30TH & HANOVER	81	003	53	152	113		1	67	63	1.5
281880019G01	OMAHA	DOUGLAS CO	41ST & WOOLWORTH	81	003	61	132	131			59	55	1.5
281880019G01	OMAHA	DOUGLAS CO	41ST & WOOLWORTH	82	003	57	114	102			48	42	1.7
281880020G01	OMAHA	DOUGLAS CO	63RD & FREDERICK	81	003	60	178	163		2	76	68	1.6
281880020G01	OMAHA	DOUGLAS CO	63RD & FREDERICK	82	003	57	153	144		1	63	55	1.7
281880020G09	OMAHA	DOUGLAS CO	63RD & FREDRICK	81	003	45	151	138		1	74?	67?	1.6

? INDICATES THAT THE MEAN DOES NOT SATISFY SUMMARY CRITERIA

SUSPENDED PARTICULATE MATTER (UG/M3) NEBRASKA 81-82

METHOD: GRAVIMETRIC, 24-HOUR HI-VOLUME FILTER SAMPLE-91

SITE ID	LOCATION	COUNTY	ADDRESS	YR	REP ORG	#OBS	MAX 24-HR 1ST	MAX 24-HR 2ND	OBS> 260	OBS> 150	ARIT MEAN	GEO MEAN	GSD
281880020G09	OMAHA	DOUGLAS CO	63RD & FREDRICK	82	003	59	160	140		1	60	52	1.7
281880023G01	OMAHA	DOUGLAS CO	140TH & WEST DOD	81	003	55	89	88			48	45	1.5
281880028G01	OMAHA	DOUGLAS CO	2411 O ST	81	003	61	180	162		2	78	73	1.4
281880028G01	OMAHA	DOUGLAS CO	2411 O ST	82	003	59	134	109			60	55	1.5
281880029G01	OMAHA	DOUGLAS CO	8801 FORT STREET	81	003	59	121	114			65	60	1.5
281880029G01	OMAHA	DOUGLAS CO	8801 FORT STREET	82	003	55	116	112			54	48	1.7
281880032G01	OMAHA	DOUGLAS CO	11414 N 72ND ST	81	003	60	128	108			55	50	1.6
281880032G01	OMAHA	DOUGLAS CO	11414 N 72ND ST	82	003	58	117	104			42	35	1.9
281880034G01	OMAHA	DOUGLAS CO	426 19TH AVE.	81	003	61	169	163		2	79	73	1.5
281880034G01	OMAHA	DOUGLAS CO	426 19TH AVE.	82	003	51	147	137			67	61	1.5
281880034G09	OMAHA	DOUGLAS CO	19TH AVE & HOWAR	81	003	45	146	142			78?	74?	1.4
281880034G09	OMAHA	DOUGLAS CO	19TH AVE & HOWAR	82	003	53	153	141		1	70	64	1.5
281880038G01	OMAHA	DOUGLAS CO	78TH & DODGE	82		26	120	98			57?	52?	1.5
281930002G01	PAPILLION	SARPY CO	122 E 3RD STREET	81		53	136	133			76	71	1.5
281930002G01	PAPILLION	SARPY CO	122 E 3RD STREET	82		55	144	134			58	52	1.6
282240001F01	SCOTTSBLUFF	SCOTTS BLUFF CO	1818 AVE A	81	001	45	155	117		1	69	64	1.5
282240001F01	SCOTTSBLUFF	SCOTTS BLUFF CO	1818 AVE A	82	001	43	159	152		2	76	67	1.7
282400002F01	SOUTH SIOUX CITY	DAKOTA CO	CITY MAINTENANC	81	001	17	216	163		2	102?	95?	1.5
282400003F01	SOUTH SIOUX CITY	DAKOTA CO	2101 DAKOTA S.S	81		42	147	125			83?	79?	1.4
282400003F01	SOUTH SIOUX CITY	DAKOTA CO	2101 DAKOTA S.S	82		53	164	156		2	86	78	1.6
282440002F01	SUPERIOR	NUCKOLLS CO	5TH & NATIONAL S	81	001	59	146	134			59	52	1.7
282440002F01	SUPERIOR	NUCKOLLS CO	5TH & NATIONAL S	82	001	53	149	143			54	47	1.7
282720001F01	YORK CO	YORK CO	8TH & GRANT	81	001	39	183	164		3	79	69	1.7
282720001F01	YORK CO	YORK CO	8TH & GRANT	82	001	54	240	147		1	70	63	1.6

? INDICATES THAT THE MEAN DOES NOT SATISFY SUMMARY CRITERIA

SULFUR DIOXIDE (UG/M3) NEBRASKA 81-82

METHODS: HOURLY VALUES WEST-GAEKE COLORIMETRIC-11, CONDUCTIMETRIC-13, COULOMETRIC-14, FLAME PHOTOMETRIC-16, HYDROGEN PEROXIDE NAOH TITRATION-18, CATALYST FLAME PHOTOMETRIC-19, PULSED FLUORESCENT-20, SECOND DERIVATIVE SPECTROSCOPY-21, CONDUCTANCE ASARCO-22, ULTRA VIOLET STIMULATED FLUORESCENCE-23,SEQUENTIAL CONDUCTIMETRIC-33, 24-HOUR GAS BUBBLERS PARAROSANILINE-SULFAMIC ACID-91, PARAROSANILINE SULFAMIC ACID TEMPERATURE CONTROLLED-97

SITE ID	LOCATION	COUNTY	ADDRESS	YR	REP ORG	#OBS	MAX 24-HR 1ST	MAX 24-HR 2ND	OBS> 365	MAX 3-HR 1ST	MAX 3-HR 2ND	OBS> 1300	MAX 1-HR 1ST	MAX 1-HR 2ND	ARIT MEAN	MTH
280660001J05	DAKOTA CO	DAKOTA CO	NEBRASKA SITE	81		2696	32	23		82	80		189	186	5?	20
281560008G01	LINCOLN	LANCASTER CO	5230 TIPPERARY T	81	002	60	18	18							6	97
281560008G01	LINCOLN	LANCASTER CO	5230 TIPPERARY T	82	002	29	13	5							6?	97
281560012G01	LINCOLN	LANCASTER CO	POLICE STATION	81	002	61	18	18							6	97
281560012G01	LINCOLN	LANCASTER CO	POLICE STATION	82	002	30	13	5							6?	97
281880019G01	OMAHA	DOUGLAS CO	41ST & WOOLWORTH	81	003	57	29	21							7	97
281880028G01	OMAHA	DOUGLAS CO	2411 O ST	81	003	61	31	18							7	97
281880033G01	OMAHA	DOUGLAS CO	10TH & MARCY	81	003	60	52	42							11	97
281880036G01	OMAHA	DOUGLAS CO	FLORENCE & BURDE	82	003	7646	100	87		179	176		236	223	10	20
281880036G01	OMAHA	DOUGLAS CO	FLORENCE & BURDE	81	003	2879	126	48		197	184		210	202	9?	23

? INDICATES THAT THE MEAN DOES NOT SATISFY SUMMARY CRITERIA

NITROGEN DIOXIDE (UG/M3) NEBRASKA 81-82

METHODS: HOURLY VALUES COLORIMETRIC-LYSHKOW-11, COLORIMETRIC-GRIESS-SALTZMAN-12, COULOMETRIC-13, CHEMILUMINESCENCE-14, 24-HOUR GAS BUBBLERS NASN SODIUM ARSENITE ORIFICE-84, NASN SODIUM ARSENITE FRIT-94, TEA METHOD-95, TGS METHOD-96

SITE ID	LOCATION	COUNTY	ADDRESS	YR	REP ORG	#OBS	MAX 1-HR 1ST	MAX 1-HR 2ND	MAX 24-HR 1ST	MAX 24-HR 2ND	ARIT MEAN	METH
280660001J05	DAKOTA CO	DAKOTA CO	NEBRASKA SITE	81		2730	85	75			7?	14
281560012G01	LINCOLN	LANCASTER CO	POLICE STATION	81	002	58			97	86	43	84
281560012G01	LINCOLN	LANCASTER CO	POLICE STATION	82	002	30			80	60	41?	84
281880019G01	OMAHA	DOUGLAS CO	41ST & WOOLWORTH	81	003	57			62	58	31	84
281880028G01	OMAHA	DOUGLAS CO	2411 O ST	81	003	59			77	73	38	84
281880033G01	OMAHA	DOUGLAS CO	10TH & MARCY	81	003	60			64	62	34	84

? INDICATES THAT THE MEAN DOES NOT SATISFY SUMMARY CRITERIA

QUICK LOOK REPORT

OZONE (PARTS PER MILLION) NEBRASKA 80-82

METHODS: HOURLY VALUES CHEMILUMINESCENCE-11, ULTRA VIOLET DASIBI CORPORATION-14, CHEMILUMINESCENCE RHODAMINE B DYE-15

SITE ID	LOCATION	COUNTY	ADDRESS	YR	REP ORG	#OBS	DAILY MAX 1-HR 1ST	2ND	3RD	VALS > .125 MEAS	EST	NBR VALID DAILY MAX	MISS DAYS ASS < STD	ME
280640001J03	CUSTER CO	CUSTER CO	COMSTOCK HWY 106	80		674	.038	.037	.035	0	0.0	29	0	11
280660001J05	DAKOTA CO	DAKOTA CO	NEBRASKA SITE	80		3116	.093	.081	.079	0	0.0	123	5	14
281560011G01	LINCOLN	LANCASTER CO	14TH AND SUPERIO	80		6362	.088	.075	.074	0	0.0	265	0	14
281560011G01	LINCOLN	LANCASTER CO	14TH AND SUPERIO	81	002	8682	.073	.068	.066	0	0.0	361	0	14
281560011G01	LINCOLN	LANCASTER CO	14TH AND SUPERIO	82	002	8011	.083	.071	.070	0	0.0	335	0	14
281880028G01	OMAHA	DOUGLAS CO	2411 O ST	80		7868	.110	.095	.085	0	0.0	327	7	11
281880028G01	OMAHA	DOUGLAS CO	2411 O ST	81	003	7759	.065	.055	.055	0	0.0	327	3	11
281880028G01	OMAHA	DOUGLAS CO	2411 O ST	82	003	7932	.055	.050	.050	0	0.0	332	1	11
281880032G01	OMAHA	DOUGLAS CO	11414 N 72ND ST	80		8514	.170	.145	.145	11	11.2	354	4	11
281880032G01	OMAHA	DOUGLAS CO	11414 N 72ND ST	81	003	8341	.082	.075	.075	0	0.0	347	2	11
281880032G01	OMAHA	DOUGLAS CO	11414 N 72ND ST	82	003	8462	.090	.087	.072	0	0.0	352	6	11
281880035G01	OMAHA	DOUGLAS CO	METRO-TECH CAMPU	81	003	5301	.085	.077	.077	0	0.0	222	3	11
281880035G01	OMAHA	DOUGLAS CO	METRO-TECH CAMPU	82	003	6445	.075	.075	.067	0	0.0	267	5	14

QUICK LOOK REPORT

LEAD (UG/M3) NEBRASKA 81-82

METHODS: JARRELL-ASH EMISSION SPECTRA ICAP-90, EMISSION SPECT MUFFLE FURNACE-91, ATOMIC ABSORPTION-92, DITHIOZONE METHOD-93
EMISSION SPECT (LOW TEMP ASH)-95, X-RAY FLUORESCENCE-96, FLAMELESS ATOMIC ABSORPTION-97

SITE ID	LOCATION	COUNTY	ADDRESS	YR	REP ORG	#OBS	METH	QTRLY ARITH 1ST	2ND	3RD	MEAN 4TH	MEANS> 1.5	MAX VALUES 1ST	2ND
280180003G01	BELLEVUE	SARPY CO	FAIRVIEW AT GALV	82		15	92				.14		.42	.26
281560012A01	LINCOLN	LANCASTER CO	POLICE STATION	81		28	90	.21	.18	.14	.15		.41	.39
281880011G01	OMAHA	DOUGLAS CO	11TH & NICHOLAS	82		16	92				1.21		7.17	3.51
281880019G01	OMAHA	DOUGLAS CO	41ST & WOOLWORTH	82		16	92				.10		.19	.15
281880034A01	OMAHA	DOUGLAS CO	19TH AVE. OMAHA	81		30	90	.34	.08	.26	.35		1.11	.97
281880034A01	OMAHA	DOUGLAS CO	19TH AVE. OMAHA	82		19	90	.38	.24	.31			1.17	.74
281880038G01	OMAHA	DOUGLAS CO	78TH & DODGE	82		16	92				.23		.54	.51

NEBRASKA
STATE OF NEBRASKA
MANUAL METHODS

NATIONAL AEROMETRIC DATA BANK
ENVIRONMENTAL PROTECTION AGENCY
SAROAD/PRECISION-ACCURACY REPORT

TABLE A2. PRECISION AND ACCURACY ESTIMATES FOR AMBIENT AIR MONITORING DATA

PRECISION-ACCURACY DATA KEY		PRECISION DATA						ACCURACY DATA			
RG ST RO TYP POLL	YR-Q	# OF SAMPLRS	COLLOC SITES	PROB LIM LO	PROB LIM UP	COLL SAMP BELOW LIM	VAL COLL DATA PRS	# AUDITS LEV 1-3	PROB LIM LO-L1-UP	PROB LIM LO-L2-UP	PROB LIM LO-L3-UP
07 28 001 I 11101	81-2	6	3	-22	+14	0		006		-11 +17	
**** PARTICULATE ****	81-3	6	3	-11	+15	0		008		-21 +12	
	81-4	21	3	-14	+25	1		005		-01 +04	
	81-5	11	3	-16	+18	1	0	0019		-11 +11	
	82-1	22	3	-07	+18	0	33	005		-05 +08	
	82-2	22	3	-13	+23	0	35	005		-20 +15	
	82-3	6	3	-11	+17	0	39	000			
	82-4	22	3	-28	+58	0	41	010		-08 +19	
	82-5	18	3	-15	+29	0	148	0020		-11 +14	

PRECISION-ACCURACY DATA KEY		PRECISION DATA						ACCURACY DATA			
RG ST RO TYP POLL	YR-Q	# OF SAMPLRS	COLLOC SITES	PROB LIM LO	PROB LIM UP	COLL SAMP BELOW LIM	VAL COLL DATA PRS	# AUDITS LEV 1-3	PROB LIM LO-L1-UP	PROB LIM LO-L2-UP	PROB LIM LO-L3-UP
07 28 002 I 11101	81-1	4	2	+04	+15	0		003		-01 +02	
**** PARTICULATE ****	81-2	4	2	-12	+17	0		003		-00 +00	
	81-3	8	2	-03	+08	0		003		-00 +03	
	81-4	8	2	-07	+08	0		003		-04 +01	
	81-5	6	2	-05	+12	0	0	0012		-01 +02	
	82-1	8	2	-15	+14	1	22	003		-13 +13	
	82-2	8	2	-06	+08	0	29	003		-06 +03	
	82-3	8	2	-09	+12	0	14	003		-06 +05	
	82-4	8	2	-13	+18	1	16	002		-18 +19	
	82-5	8	2	-11	+13	2	81	0011		-11 +10	

PRECISION-ACCURACY DATA KEY		PRECISION DATA				ACCURACY DATA											
RG ST RO TYP POLL	YR-Q	# OF ANLYZRS	PRECIS CHECKS	PROB LIM LO	PROB LIM UP	SOURCE AUD	GAS TRACE ABLTY	# AUDITS L1-3	# AUDITS L4	PROB LIM LO-L1-UP		PROB LIM LO-L2-UP		PROB LIM LO-L3-UP		PROB LIM LO-L4-UP	
07 28 003 C 42101	81-1	001	0007	-05	-02												
** CARBON MONOXIDE **	81-4	002	0006	-07	+02												
	81-5	002	0013	-06	+00			0000	0000								
	82-1	002	0008	-08	+02												
	82-2	002	0009	-11	-02												
	82-3	002	0010	-14	+06												
	82-4	002	0002	-29	+18												
	82-5	002	0029	-16	+06			0000	0000								
07 28 003 C 42401	82-1	001	0003	-20	-01												
** SULFUR DIOXIDE ***	82-2	001	0004	-15	+15												
	82-3	001	0005	-19	+06												
	82-4	001	0005	-09	+18	A	2	002	000	-20	+07	-04	+01	-03	+09		
	82-5	001	0017	-16	+10			0002	0000	-20	+07	-04	+01	-03	+09		
07 28 003 C 44201	81-1	002	0006	-06	+06	E		001									
******* OZONE *******	81-2	003	0008	-16	+15			001		-09	+23	-16	+28	-17	+35	-12	+23
	81-3	003	0019	-10	+11												
	81-4	003	0010	-09	+22	E		002		-30	-03	-21	-01	-13	-02	-13	-03
	81-5	003	0043	-10	+14			0004	0000	-20	+10	-19	+14	-15	+17	-13	+10
	82-1	003	0012	-04	+07												
	82-2	003	0012	-14	+13	D		002	000	-16	-05	-16	-06	-13	-09		
	82-3	003	0015	-08	+12												
	82-4	003	0010	-17	+16	D	2	002	000	-06	-04	-07	-02	-05	+02		
	82-5	003	0049	-11	+12			0004	0000	-11	-05	-12	-04	-09	-04		

PRECISION-ACCURACY DATA KEY		PRECISION DATA						ACCURACY DATA							
RG ST RO TYP POLL	YR-Q	# OF SAMPLRS	COLLOC SITES	PROB LIM LO	UP	COLL SAMP BELOW LIM	VAL COLL DATA PRS	# AUDITS LEV 1-3	PROB LIM LO-L1-UP		PROB LIM LO-L2-UP		PROB LIM LO-L3-UP	
07 28 003 I 11101	81-1	11	2	-04	+12	0		004			-08	+06		
**** PARTICULATE ****	81-2	14	2	-08	+20	0		023			-07	+17		
	81-3	16	2	-05	+11	0		005			-08	+01		
	81-4	18	2	-02	+09	0	15	005			-10	-03		
	81-5	15	2	-05	+13	0	15	0037			-08	+05		
	82-1	18	2	-10	+10	0	28	005			-10	+05		
	82-2	18	2	-08	+06	0	25	005			-06	+02		
	82-3	20	2	-07	+07	2	24	005			-12	+07		
	82-4	21	2	-13	+14	1	29	005			-06	+06		
	82-5	19	2	-10	+09	3	106	0020			-09	+05		
07 28 003 I 42401	81-1							015	-21	+36	-12	+14	-14	+10
** SULFUR DIOXIDE ***	81-2							015	-19	+30	-18	+23	-15	+22
	81-3								-36	+15	-20	+08	-17	+09
	81-4							015	-27	+10	-17	+04	-14	+06
	81-5	0	0			0	0	0045	-26	+23	-17	+12	-15	+12
07 28 003 I 42602	81-1							014	-04	+09	-06	+07	-06	+07
** NITROGEN DIOXIDE *	81-2							015	-07	+09	-06	+06	-02	+07
	81-3								-03	+04	-04	+01	-03	+02
	81-4							015	-04	+04	-05	+01	-04	+01
	81-5	0	0			0	0	0044	-05	+07	-05	+04	-04	+04

Montana—O_3

Designated area	Does not meet primary standards	Cannot be classified or better than national standards
Yellowstone County		[1]X
Rest of State		X

[1]EPA designation replaces State designation.

Montana—CO

Designated area	Does not meet primary standards	Cannot be classified or better than national standards
City of Billings	[1]X	
City of Missoula	X	
Great Falls designated area	X	
Rest of State		X

[1]EPA designation replaces State designation.

Montana—NO_2

Designated area	Does not meet primary standards	Cannot be classified or better than national standards
Entire State		X

(Sec. 110 of the Clean Air Act as amended)

[43 FR 8964, Mar. 3, 1978, as amended at 43 FR 40427, Sept. 11, 1978; 45 FR 59317, Sept. 9, 1980; 45 FR 62985, Sept. 23, 1980]

§ 81.328 Nebraska.

Nebraska—TSP

Designated area	Does not meet primary standards	Does not meet secondary standards	Cannot be classified	Better than national standards
AQCR 085 (Douglas and Sarpy Counties):				
Douglas County:				
Omaha—24th and O Street site [1]	X			
Omaha—11th and Nicholas Street site [1]	X			
Remainder of Omaha		X		
Remainder of Douglas County				X
Sarpy County:				
Bellevue		X [2]		
Remainder of Sarpy County				X
AQCR 086			X [2]	
AQCR 145				X
AQCR 146:				
Cass County:				
Louisville (municipal boundaries)	X			
Weeping Water (municipal boundaries)	X			
Remainder of Cass County			X [2]	
Dawson County			X [2]	

Nebraska—TSP

Designated area	Does not meet primary standards	Does not meet secondary standards	Cannot be classified	Better than national standards
Remainder of AQCR 146				X

[1]As described in the State implementation plan.
[2]EPA designation replaces State designation.

Nebraska—SO_2

Designated area	Does not meet primary standards	Does not meet secondary standards	Cannot be classified	Better than national standards
Entire State				X

Nebraska—O_3

Designated area	Does not meet primary standards	Cannot be classified	Better than national standard
Douglas and Sarpy Counties		X	
Remainder of State			X

Nebraska—CO

Designated area	Does not meet primary standards	Cannot be classified	Better than national standards
City of Lincoln:			
Antelope Creek basin [1]	X		
Rest of city of Lincoln		X	
City of Omaha	X		
Remainder of State			X

[1]As described in the State implementation plan.

Nebraska—NO_2

Designated area	Does not meet primary standards	Cannot be classified or better than national standards
Entire State		

[43 FR 8964, Mar. 3, 1978, as amended at 46 FR 57046, Nov. 20, 1981; 47 FR 10210, Mar. 10, 1982]

TABLE A3. ATTAINMENT STATUS DESIGNATIONS

NO.	NAME	COUNTY	PLANT	PART. EMISS.	AVG. HT.	SO2 EMISS	AVG. HT.	CO EMISS.	AVG. HT	NOX EMISS.	AVG. HT	VOC EMISS.	AVG. HT	PB EMISS.	AVG. HT
1	WESTERN LAND ROLLER	0020	0001	2.	.0	1.	.0	251.	.0	0.	.0	0.	.0	0	.0
2	HASTINGS UTILITIES S	0020	0002	1.	37.4	6.	38.2	21.	37.6	302.	37.6	0.	.0	0	.0
3	FARMLAND INDUSTRIES	0020	0007	11.	.0	0.	.0	22.	8.3	499.	1.5	1.	.0	0	.0
4	TRUMBULL COOP @HANSN	0020	0019	205.	.0	0.	.0	0.	.0	0.	.0	0.	.0	0	.0
5	ROSELAND COOP	0020	0026	166.	.0	0.	.0	0.	.0	0.	.0	0.	.0	0	.0
6	WERNER CONST-DM 70	0020	0043	186.	.0	0.	.0	0.	.0	0.	.0	0.	.0	0	.0
7	CITY OF HASTINGS/HAS	0020	P001	3550.	.0	290.	.0	21.	.0	745.	.0	2.	.0	0	.0
8	J.E. MEURET GRAIN CO	0060	0002	176.	.0	0.	.0	0.	.0	0.	.0	0.	.0	0	.0
9	ELGIN FARMERS COOP	0060	0006	211.	.0	0.	.0	0.	.0	0.	.0	0.	.0	0	.0
10	GORDON DRAYTON ELEV	0060	0010	131.	.0	0.	.0	0.	.0	0.	.0	0.	.0	0	.0
11	SCOULAR BISHOP-COPEN	0060	0016	273.	.0	0.	.0	0.	.0	0.	.0	0.	.0	0	.0
12	CEDAR VALLEY COOP CO	0240	0005	156.	.0	0.	.0	0.	.0	0.	.0	0.	.0	0	.0
13	CEDAR VALLEY-PRIMRSE	0240	0007	123.	.0	0.	.0	0.	.0	0.	.0	0.	.0	0	.0
14	J. W. GRAIN CO	0240	0009	206.	.0	0.	.0	0.	.0	0.	.0	0.	.0	0	.0
15	CARGILL INC @ALBION	0240	0013	533.	.0	0.	.0	0.	.0	0.	.0	0.	.0	0	.0
16	HEMINGFORD COOP #2	0260	0006	126.	.0	0.	.0	0.	.0	0.	.0	0.	.0	0	.0
17	FRMRS COOP ELEV CO	0260	0008	347.	.0	0.	.0	0.	.0	0.	.0	0.	.0	0	.0
18	WESTERN ALFALFA	0340	0002	110.	14.6	0.	.0	0.	.0	0.	.0	0.	.0	0	.0
19	WESTERN ALFALFA CORP	0340	0003	160.	4.3	0.	.0	0.	.0	0.	.0	0.	.0	0	.0
20	SCOULAR BISHOP-RIVER	0340	0037	273.	.0	0.	.0	0.	.0	0.	.0	0.	.0	0	.0
21	TURNER GRAIN -SHELTN	0340	0038	225.	.0	0.	.0	0.	.0	0.	.0	0.	.0	0	.0
22	FOX GRAIN	0340	0040	343.	.0	0.	.0	0.	.0	0.	.0	0.	.0	0	.0
23	ELM CREEK DE-HY IN B	0340	0043	412.	17.6	0.	.0	0.	.0	0.	.0	0.	.0	0	.0
24	HOLMQUIST GR -LYONS	0360	0002	127.	.0	0.	.0	0.	.0	0.	.0	0.	.0	0	.0
25	BURT CO COOP OIL CO	0360	0008	176.	.0	0.	.0	0.	.0	0.	.0	0.	.0	0	.0
26	DAVID CTY FMRS ANNEX	0380	0024	439.	.0	0.	.0	0.	.0	0.	.0	0.	.0	0	.0
27	ASH GROVE CEMENT CO	0400	0002	783.	8.7	1261.	76.1	0.	.0	321.	76.1	0.	.0	0	.0
28	KERFORD LIMESTONE CO	0400	0006	487.	.0	0.	.0	0.	.0	0.	.0	0.	.0	0	.0

NO.	NAME	COUNTY	PLANT	PART. EMISS.	AVG. HT.	SO2 EMISS	AVG. HT.	CO EMISS.	AVG. HT	NOX EMISS.	AVG. HT	VOC EMISS.	AVG. HT	PB EMISS.	AVG. HT
29	MARTIN MARI -NEHAWKA	0400	0026	192.	.0	0.	.0	0.	.0	0.	.0	0.	.0	0	.0
30	MARTIN MARI -W WATER	0400	0029	814.	.0	0.	.0	0.	.0	0.	.0	0.	.0	0	.0
31	COLERIDGE ELEV CO	0420	0008	233.	.0	0.	.0	0.	.0	0.	.0	0.	.0	0	.0
32	FRENCHMAN VALLEY	0460	0001	151.	.0	0.	.0	0.	.0	0.	.0	0.	.0	0	.0
33	SALINE VAL TER@IMPER	0460	0002	163.	.0	0.	.0	0.	.0	0.	.0	0.	.0	0	.0
34	IMPERIAL GRAIN CO	0460	0006	145.	.0	0.	.0	0.	.0	0.	.0	0.	.0	0	.0
35	TRI-GRN INC	0460	0009	154.	.0	0.	.0	0.	.0	0.	.0	0.	.0	0	.0
36	MARATHON OIL CO	0500	0019	0.	.0	0.	.0	35.	3.2	284.	3.2	5.	3.4	0	.0
37	NE-KAN-COL -HARVARD	0520	0010	105.	.0	0.	.0	0.	.0	0.	.0	0.	.0	0	.0
38	CHAMPLAIN PETRO CO	0540	0001	0.	.0	0.	.0	0.	.0	0.	.0	198.	.0	0	.0
39	HIGGINS MILLING DEHY	0540	0004	178.	9.2	0.	.0	0.	.0	0.	.0	0.	.0	0	.0
40	WAGNER MILLS INC	0540	0005	99.	.0	0.	.0	0.	.0	0.	.0	0.	.0	0	.0
41	FARMERS COOP MERK CO	0540	0015	104.	.0	0.	.0	0.	.0	0.	.0	0.	.0	0	.0
42	FRMRS ELEV INC	0620	0003	174.	.0	0.	.0	0.	.0	0.	.0	0.	.0	0	.0
43	HOLMQUIST GR -BANCRO	0620	0009	155.	.0	0.	.0	0.	.0	0.	.0	0.	.0	0	.0
44	BANCROFT FARMERS ELE	0620	0010	123.	.0	0.	.0	0.	.0	0.	.0	0.	.0	0	.0
45	PRINZ GRAIN & FEED	0620	0012	421.	.0	0.	.0	0.	.0	0.	.0	0.	.0	0	.0
46	BROKEN BOW MN UT 145	0640	0003	1.	9.7	0.	.0	13.	9.6	99.	9.6	0.	.0	0	.0
47	IOWA BEEF PROCESSORS	0660	0001	0.	.0	8.	22.8	11.	21.7	142.	22.3	0.	.0	0	.0
48	O'NEILL ELEV/DIV SCO	0660	0007	130.	.0	0.	.0	0.	.0	0.	.0	0.	.0	0	.0
49	SOUTH SIOUX GRAIN	0660	0008	859.	.0	0.	.0	0.	.0	0.	.0	0.	.0	0	.0
50	DAWSON COUNTY FEED	0700	0003	102.	11.2	0.	.0	0.	.0	0.	.0	0.	.0	0	.0
51	GOTHENBERG FEED PROD	0700	0016	138.	9.5	0.	.0	0.	.0	0.	.0	0.	.0	0	.0
52	CONSOLIDATED BLENDER	0700	0026	139.	6.0	0.	.0	0.	.0	0.	.0	0.	.0	0	.0
53	CNTRL NE PUBLIC PWR	0700	0035	3.	50.9	13.	50.9	28.	50.9	401.	50.9	1.	50.9	0	.0
54	BELAMY GRAIN COOP	0700	0037	172.	.0	0.	.0	0.	.0	0.	.0	0.	.0	0	.0
55	EIGHT-12 PARTNERSHIP	0740	0007	8.	15.2	0.	.0	1252.	15.2	3041.	15.2	384.	15.2	0	.0
56	FREMONT UTILITIES	0760	0001	128.	47.2	1488.	50.1	42.	50.1	1583.	50.1	3.	50.1	0	.0

NO.	NAME	COUNTY	PLANT	PART. EMISS.	AVG. HT.	SO2 EMISS	AVG. HT.	CO EMISS.	AVG. HT	NOX EMISS.	AVG. HT	VOC EMISS.	AVG. HT	PB EMISS.	AVG. HT
57	FARLEY METALS, INC	0760	0006	135.	10.3	0.	.0	0.	.0	0.	.0	0.	.0	0	.0
58	C F INDUSTRIES INC	0760	0012	0.	.0	0.	.0	9.	11.5	708.	15.2	2.	7.6	0	.0
59	NO BEND GRAIN CO INC	0760	0027	145.	.0	0.	.0	0.	.0	0.	.0	0.	.0	0	.0
60	OMAHA PUBLIC PWR DIS	0780	0002	280.	62.1	15965.	62.1	235.	62.1	8296.	62.1	25.	62.1	0	.0
61	WESTERN ELECTRIC 12	0780	0004	0.	.0	0.	.0	1.	17.9	20.	17.9	269.	5.2	0	.0
62	CONAGRA 1521 N16TH S	0780	0007	1470.	.0	0.	.0	0.	.0	0.	.0	0.	.0	0	.0
63	GOULD INC METALS DI	0780	0008	13.	30.4	426.	30.4	0.	.0	0.	.0	0.	.0	20	20.0
64	WILLIAMS BROS PIPEL	0780	0010	0.	.0	0.	.0	0.	.0	0.	.0	2442.	6.0	0	.0
65	MOBIL OIL CORP 7202	0780	0011	0.	.0	8.	9.1	0.	.0	2.	9.1	2918.	7.6	0	.0
66	NASHUA CORP 3838 SO	0780	0013	0.	.0	0.	.0	0.	.0	0.	.0	3500.	.0	0	.0
67	AMERICAN SMELT & RE	0780	0020	54.	17.7	3064.	25.1	16.	23.1	0.	.0	0.	.0	29	18.0
68	CONTINENTAL CAN CO	0780	0032	0.	.0	0.	.0	1.	10.6	7.	10.6	6362.	12.1	0	.0
69	KELLOGG CO 9601 F S	0780	0061	0.	.0	6.	15.2	8.	15.2	113.	15.2	0.	.0	0	.0
70	UNIV NEBR MED CENTER	0780	0064	0.	.0	2.	45.7	7.	45.7	99.	45.7	0.	.0	0	.0
71	ENERGY SYSTEMS DIV 2	0780	0076	0.	.0	0.	.0	26.	27.4	376.	27.4	0.	.0	0	.0
72	WILLIAMS PIPE-IRVING	0780	0138	0.	.0	0.	.0	13.	7.6	117.	7.6	2.	7.6	0	.0
73	A.D.M. GRAIN CO 13T	0780	0142	106.	9.1	0.	.0	0.	.0	0.	.0	0.	.0	0	.0
74	INDEPENDENT ELEVATOR	0800	0002	217.	.0	0.	.0	0.	.0	0.	.0	0.	.0	0	.0
75	KANEB PIPELINE-GENEV	0860	0003	0.	.0	0.	.0	0.	.0	0.	.0	3165.	.0	0	.0
76	NE-KAN-COL -FAIRMONT	0860	0010	156.	.0	0.	.0	0.	.0	0.	.0	0.	.0	0	.0
77	SHICKLEY GRAIN CO	0860	0019	112.	.0	0.	.0	0.	.0	0.	.0	0.	.0	0	.0
78	MIDWEST AGRI SER-FRA	0880	0001	392.	.0	0.	.0	0.	.0	0.	.0	0.	.0	0	.0
79	UPLAND GRN CO	0880	0007	112.	.0	0.	.0	0.	.0	0.	.0	0.	.0	0	.0
80	SALINE VAL INV@ARAPA	0940	0003	230.	.0	0.	.0	0.	.0	0.	.0	0.	.0	0	.0
81	EDISON NON-STK -HOLB	0940	0009	109.	.0	0.	.0	0.	.0	0.	.0	0.	.0	0	.0
82	PHILLIPS PETROLEUM	0960	0001	16.	22.3	1.	21.6	80.	21.6	1100.	21.6	2.	21.6	0	.0
83	STORE-CRAFT MFG CO	0960	0014	0.	.0	0.	.0	0.	.0	0.	.0	14940.	.0	0	.0
84	FRMRS ELEV CO	0960	0016	115.	.0	0.	.0	0.	.0	0.	.0	0.	.0	0	.0

NO.	NAME	COUNTY	PLANT	PART. EMISS.	AVG. HT.	SO2 EMISS	AVG. HT.	CO EMISS.	AVG. HT	NOX EMISS.	AVG. HT	VOC EMISS.	AVG. HT	PB EMISS.	AVG. HT
85	NORTHER NATURAL GAS	0960	0036	0.	.0	0.	.0	25.	9.3	119.	9.1	0.	.0	0	.0
86	NATURAL GAS PIPELINE	0960	0037	6.	7.5	0.	.0	332.	7.2	2634.	7.2	62.	7.2	0	.0
87	BERTRAN COOP EX-SMTH	1040	0003	100.	.0	0.	.0	0.	.0	0.	.0	0.	.0	0	.0
88	SPALDING COOP ELEV	1120	0004	119.	.0	0.	.0	0.	.0	0.	.0	0.	.0	0	.0
89	GRAND IS WTR & LGHT.	1140	0001	0.	.0	9.	24.5	32.	26.7	469.	26.5	0.	.0	0	.0
90	SPERRY NEW HOLLAND	1140	0010	0.	.0	0.	.0	0.	.0	0.	.0	20439.	.0	0	.0
91	CONTINENTAL GRN-SHEL	1140	0025	179.	.0	0.	.0	0.	.0	0.	.0	0.	.0	0	.0
92	GRAND ISLAND FARMERS	1140	0029	109.	.0	0.	.0	0.	.0	0.	.0	0.	.0	0	.0
93	WILLIAMS PIPE-DONIP	1140	0030	0.	.0	0.	.0	0.	.0	0.	.0	1208.	.0	0	.0
94	CARGILL INC @GILTNER	1160	0005	122.	.0	0.	.0	0.	.0	0.	.0	0.	.0	0	.0
95	HAMPTON COOP ELEV	1160	0006	201.	.0	0.	.0	0.	.0	0.	.0	0.	.0	0	.0
96	ALMA COOP EQUITY EXC	1180	0003	277.	.0	0.	.0	0.	.0	0.	.0	0.	.0	0	.0
97	BEVERLY GRAIN CO	1240	0001	255.	.0	0.	.0	0.	.0	0.	.0	0.	.0	0	.0
98	LOUP VALLEY ELEVATOR	1320	0001	312.	.0	0.	.0	0.	.0	0.	.0	0.	.0	0	.0
99	LOUP VALLEY ELEVATOR	1320	0002	143.	.0	0.	.0	0.	.0	0.	.0	0.	.0	0	.0
100	NORMN HRTWLL GN-HRTW	1400	0006	157.	.0	0.	.0	0.	.0	0.	.0	0.	.0	0	.0
101	CONTINNTL GRN -WILCX	1400	0012	105.	.0	0.	.0	0.	.0	0.	.0	0.	.0	0	.0
102	WILCOX COOP ASSN	1400	0013	148.	.0	0.	.0	0.	.0	0.	.0	0.	.0	0	.0
103	CONSOLIDATED BLENDRS	1500	0001	144.	14.4	0.	.0	0.	.0	0.	.0	0.	.0	0	.0
104	CUSHMAN MOTORS 1401	1520	0001	0.	.0	0.	.0	0.	.0	0.	.0	138.	.0	0	.0
105	YANKEE HILL BRICK CO	1520	0002	266.	.0	0.	.0	0.	.0	2.	10.9	0.	.0	0	.0
106	TEXACO INC BOX 81467	1520	0004	0.	.0	0.	.0	0.	.0	0.	.0	436.	.0	0	.0
107	NEBRASKA PUB PWR DIS	1520	0005	1138.	34.5	4388.	33.3	78.	33.3	4898.	33.3	8.	33.3	0	.0
108	CONTINENTAL OIL CO B	1520	0006	0.	.0	0.	.0	0.	.0	0.	.0	2528.	.0	0	.0
109	BURL NORTH HAVLK 66T	1520	0008	0.	.0	0.	.0	11.	60.9	48.	60.9	208.	.0	0	.0
110	ARCHERS DANIELS MID	1520	0011	585.	.0	4.	7.6	22.	7.6	207.	7.6	0.	.0	0	.0
111	U OF N POWER PLANT 1	1520	0012	0.	.0	2.	22.8	12.	21.0	146.	21.3	0.	.0	0	.0
112	LINC ELEV & FEED 280	1520	0015	154.	.0	0.	.0	0.	.0	0.	.0	0.	.0	0	.0

NO.	NAME	COUNTY	PLANT	PART. EMISS.	AVG. HT.	SO2 EMISS	AVG. HT.	CO EMISS.	AVG. HT	NOX EMISS.	AVG. HT	VOC EMISS.	AVG. HT	PB EMISS.	AVG. HT
113	DEETER FOUNDRY 5945	1520	0018	4.	12.8	1.	12.8	255.	12.8	0.	.0	0.	.0	0	.0
114	GOODYEAR TIRE 4021 N	1520	0019	8.	24.3	107.	24.3	7.	24.3	45.	24.3	0.	.0	0	.0
115	FARMERS COOP AGNEW	1520	0094	129.	.0	0.	.0	0.	.0	0.	.0	0.	.0	0	.0
116	WALLACE ELEVATOR	1580	0009	352.	.0	0.	.0	0.	.0	0.	.0	0.	.0	0	.0
117	HERSHEY FARMERS COOP	1580	0011	278.	.0	0.	.0	0.	.0	0.	.0	0.	.0	0	.0
118	SHOUP & SONS	1580	0015	105.	.0	0.	.0	0.	.0	0.	.0	0.	.0	0	.0
119	FARMLND SERV COOP IN	1580	0017	335.	.0	0.	.0	0.	.0	0.	.0	0.	.0	0	.0
120	NPPD - GENTLEMAN I	1580	0019	288.	167.6	1297.	167.6	256.	167.6	25616.	167.6	853.	167.6	0	.0
121	BATTLE CREEK FRMS	1680	0003	109.	.0	0.	.0	0.	.0	0.	.0	0.	.0	0	.0
122	MADISON FARMERS COOP	1680	0017	157.	.0	0.	.0	0.	.0	0.	.0	0.	.0	0	.0
123	NEWMAN GROVE FARMERS	1680	0021	347.	.0	0.	.0	0.	.0	0.	.0	0.	.0	0	.0
124	CARGILL INC @CEN CTY	1700	0002	100.	.0	0.	.0	0.	.0	0.	.0	0.	.0	0	.0
125	CHAPMAN COOP	1700	0005	202.	.0	0.	.0	0.	.0	0.	.0	0.	.0	0	.0
126	CENTRAL GRAIN CO INC	1700	0008	456.	.0	0.	.0	0.	.0	0.	.0	0.	.0	0	.0
127	GREAT WEST SUGAR@BAY	1720	0001	260.	68.0	47.	76.8	81.	76.8	101.	76.8	0.	.0	0	.0
128	BELGRADE GRAIN CO	1740	0001	107.	.0	0.	.0	0.	.0	0.	.0	0.	.0	0	.0
129	WHITE GRAIN CO	1740	0006	149.	.0	0.	.0	0.	.0	0.	.0	0.	.0	0	.0
130	MARTIN MARI -AUBURN	1780	0001	182.	.0	0.	.0	0.	.0	0.	.0	0.	.0	0	.0
131	IDEAL CEMENT CO	1840	0001	160.	87.2	1048.	91.4	0.	.0	267.	91.4	0.	.0	0	.0
132	CHAMPLAIN PETRO CO	1840	0002	0.	.0	0.	.0	0.	.0	0.	.0	5697.	30.4	0	.0
133	COOP ELEV-SUPERIOR	1840	0005	121.	.0	0.	.0	0.	.0	0.	.0	0.	.0	0	.0
134	CADAMS GR & LUMBER	1840	0010	1274.	.0	0.	.0	0.	.0	0.	.0	0.	.0	0	.0
135	NEBR CTY UTILITIES	1920	0003	0.	.0	0.	.0	63.	9.1	503.	9.1	9.	9.1	0	.0
136	GRAIN SERV CO-NE CTY	1920	0012	206.	.0	0.	.0	0.	.0	0.	.0	0.	.0	0	.0
137	FARMERS ELEV INC	1920	0022	175.	.0	0.	.0	0.	.0	0.	.0	0.	.0	0	.0
138	NORTHERN NAT GAS CO	1920	0029	2.	10.6	0.	.0	111.	8.9	302.	8.9	1.	10.6	0	.0
139	OPPD NEBR CITY	1920	0036	203.	213.3	1167.	213.3	593.	213.3	33577.	213.3	69.	213.3	0	.0
140	MARTIN MARI -PAWNEE	1940	0001	270.	.0	0.	.0	0.	.0	0.	.0	0.	.0	0	.0

NO.	NAME	COUNTY	PLANT	PART. EMISS.	AVG. HT.	SO2 EMISS	AVG. HT.	CO EMISS.	AVG. HT	NOX EMISS.	AVG. HT	VOC EMISS.	AVG. HT	PB EMISS.	AVG. HT
141	ELSIE ELEVATOR	1960	0005	112.	.0	0.	.0	0.	.0	0.	.0	0.	.0	0	.0
142	SLATER BROS GRAIN CO	1980	0006	180.	.0	0.	.0	0.	.0	0.	.0	0.	.0	0	.0
143	MCCLYMONT ARMSTRONG	1980	0009	103.	.0	0.	.0	0.	.0	0.	.0	0.	.0	0	.0
144	COLESON-HOLMQUIST CO	2000	0005	200.	.0	0.	.0	0.	.0	0.	.0	0.	.0	0	.0
145	FARMERS COOP GR CO	2020	0014	137.	.0	0.	.0	0.	.0	0.	.0	0.	.0	0	.0
146	FARMERS COOP OIL CO	2020	0020	106.	.0	0.	.0	0.	.0	0.	.0	0.	.0	0	.0
147	FARMERS COOP GRAIN	2020	0021	170.	.0	0.	.0	0.	.0	0.	.0	0.	.0	0	.0
148	UNITED COOP INC-POLK	2060	0005	143.	.0	0.	.0	0.	.0	0.	.0	0.	.0	0	.0
149	BARTLEY EQTY COOPRTV	2100	0008	107.	.0	0.	.0	0.	.0	0.	.0	0.	.0	0	.0
150	PERRY GRAIN CO	2100	0012	127.	.0	0.	.0	0.	.0	0.	.0	0.	.0	0	.0
151	CITY OF FALLS CITY	2120	0005	0.	.0	0.	.0	43.	9.1	393.	9.1	6.	9.1	0	.0
152	FALLS CITY GRAIN	2120	0008	370.	.0	0.	.0	0.	.0	0.	.0	0.	.0	0	.0
153	WILLIAMS PIPE-FALLS	2120	0016	5.	7.6	5.	7.6	34.	7.6	218.	7.6	8.	7.6	0	.0
154	CRETE MILLS	2160	0002	132.	.0	0.	.0	0.	.0	0.	.0	0.	.0	0	.0
155	FRIEND GRAIN CO	2160	0009	116.	.0	0.	.0	0.	.0	0.	.0	0.	.0	0	.0
156	ALLIED CHEMICAL CORP	2180	0001	270.	15.0	0.	.0	8.	15.8	126.	15.8	0.	.0	0	.0
157	NPPD @ KRAMER	2180	0002	1448.	57.6	1020.	57.6	32.	57.6	1168.	57.6	0.	.0	0	.0
158	MARTIN MARI -ASHLAND	2200	0001	1012.	.0	0.	.0	0.	.0	0.	.0	0.	.0	0	.0
159	CERESCO FARMERS COOP	2200	0010	188.	.0	0.	.0	0.	.0	0.	.0	0.	.0	0	.0
160	KRUMEL GR & STORAGE	2200	0019	180.	.0	0.	.0	0.	.0	0.	.0	0.	.0	0	.0
161	CONSOLIDATED BLENDRS	2200	0025	252.	16.2	0.	.0	0.	.0	0.	.0	0.	.0	0	.0
162	CRA INC	2260	0003	3.	42.6	202.	35.8	4453.	42.6	81.	23.3	45.	42.6	0	.0
163	GREAT WEST SUG@MITCH	2260	0005	263.	76.8	57.	76.8	98.	76.8	123.	76.8	1.	76.8	0	.0
164	GREAT WEST SUG@GERIN	2260	0006	187.	52.1	58.	76.8	83.	76.8	234.	76.8	1.	76.8	0	.0
165	UTICA COOP GRAIN	2300	0001	226.	.0	0.	.0	0.	.0	0.	.0	0.	.0	0	.0
166	LINCOLN GRN -LITCHFD	2340	0004	143.	.0	0.	.0	0.	.0	0.	.0	0.	.0	0	.0
167	CONSOLIDATED BLENDRS	2420	0005	221.	12.2	0.	.0	0.	.0	0.	.0	0.	.0	0	.0
168	BYRON FARMERS COOP	2460	0010	112.	.0	0.	.0	0.	.0	0.	.0	0.	.0	0	.0

NO.	NAME	COUNTY	PLANT	PART. EMISS.	AVG. HT.	SO2 EMISS	AVG. HT.	CO EMISS.	AVG. HT	NOX EMISS.	AVG. HT	VOC EMISS.	AVG. HT	PB EMISS.	AVG. HT
169	MORRISON & QUIRK INC	2500	0001	297.	12.9	0.	.0	0.	.0	0.	.0	0.	.0	0	.0
170	CONSOLIDATED BLENDRS	2540	0002	321.	14.5	0.	.0	0.	.0	0.	.0	0.	.0	0	.0
171	ORD FARMERS COOP	2540	0004	116.	.0	0.	.0	0.	.0	0.	.0	0.	.0	0	.0
172	NO LOUP FRMRS COOP	2540	0006	126.	.0	0.	.0	0.	.0	0.	.0	0.	.0	0	.0
173	CONSOLIDATED BLENDRS	2580	0003	121.	15.2	0.	.0	0.	.0	0.	.0	0.	.0	0	.0
174	FORT CALHOUN STONE	2580	0007	240.	.0	0.	.0	0.	.0	0.	.0	0.	.0	0	.0
175	BRAM INC	2580	0008	138.	10.1	0.	.0	0.	.0	0.	.0	0.	.0	0	.0
176	LAURITSEN GRN -KENNA	2580	0015	375.	.0	0.	.0	0.	.0	0.	.0	0.	.0	0	.0
177	WINSIDE DEHY INC	2620	0003	109.	18.2	0.	.0	0.	.0	0.	.0	0.	.0	0	.0
178	GARVEY INC - ROSEMNT	2640	0009	126.	.0	0.	.0	0.	.0	0.	.0	0.	.0	0	.0
179	LEWIS GRAIN CO.	2640	0020	150.	.0	0.	.0	0.	.0	0.	.0	0.	.0	0	.0

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NEBRASKA — NEDS POINT AND AREA SOURCE EMISSIONS

ST	CNTY	AQR	YR		PARTIC	SO2	NOX	VOC	CO	NUMBER PLANTS PAR	SO2	NOX	VOC	CO
28	0020			POINT	4407	301	1317	6	338	4	1	2	0	1
		146	80	AREA	14646	254	2174	2423	10640					
				TOTAL	19052	555	3491	2428	10978					
28	0060			POINT	975	0	0	0	0	4	0	0	0	0
		146	80	AREA	14990	80	859	596	2761					
				TOTAL	15965	80	859	596	2761					
28	0080			POINT	0	0	0	0	0	0	0	0	0	0
		146	80	AREA	1965	5	67	95	491					
				TOTAL	1965	5	67	95	491					
28	0140			POINT	0	0	0	0	0	0	0	0	0	0
		146	80	AREA	5153	11	147	162	1298					
				TOTAL	5153	11	147	162	1298					
28	0200			POINT	0	0	0	0	0	0	0	0	0	0
		146	80	AREA	1774	8	120	109	639					
				TOTAL	1774	8	120	109	639					
28	0240			POINT	1148	0	0	0	0	4	0	0	0	0
		146	80	AREA	10881	56	689	430	2174					
				TOTAL	12030	56	689	430	2174					
28	0260			POINT	595	7	75	0	5	2	0	0	0	0
		146	80	AREA	11793	81	764	1314	7081					
				TOTAL	12389	88	839	1314	7086					
28	0280			POINT	21	0	0	0	0	0	0	0	0	0
		146	80	AREA	5926	42	391	261	1125					
				TOTAL	5948	42	391	261	1125					
28	0320			POINT	111	0	0	0	0	0	0	0	0	0
		146	80	AREA	6442	39	409	345	1707					
				TOTAL	6554	39	409	345	1707					
28	0340			POINT	2043	1	5	1	3	6	0	0	0	0
		146	80	AREA	23158	280	3003	3734	14746					
				TOTAL	25201	281	3009	3735	14749					
28	0360			POINT	635	0	0	0	0	2	0	0	0	0
		146	80	AREA	8403	77	813	577	2864					
				TOTAL	9038	77	813	577	2864					
28	0380			POINT	865	0	0	0	0	1	0	0	0	0
		146	80	AREA	12053	82	880	627	3484					
				TOTAL	12918	82	880	627	3484					
28	0400			POINT	2940	1897	484	0	0	4	1	1	0	0
		146	80	AREA	11620	117	1501	1328	7318					
				TOTAL	14560	2014	1984	1328	7318					
28	0420			POINT	533	0	0	0	0	1	0	0	0	0
		146	80	AREA	14130	81	953	689	3611					
				TOTAL	14663	81	953	689	3611					
28	0460			POINT	710	0	0	0	0	4	0	0	0	0
		146	80	AREA	7523	56	565	363	2053					
				TOTAL	8232	56	565	363	2053					
28	0480			POINT	97	1	0	1	0	0	0	0	0	0
		146	80	AREA	16010	68	770	794	3704					
				TOTAL	16106	68	770	795	3705					

NEBRASKA ST CNTY AQR YR		NEDS POINT AND AREA SOURCE EMISSIONS PARTIC	SO2	NOX	VOC	CO	NUMBER PLANTS>100TONS PAR	SO2	NOX	VOC	CO
** **** *** **		*********	*********	*********	*********	*********	***	***	***	***	***
28 0500	POINT	116	0	317	8	40	0	0	1	0	0
146 80	AREA	15419	109	1087	1096	7928					
	TOTAL	15535	110	1404	1104	7968					
28 0520	POINT	534	0	0	0	0	1	0	0	0	0
146 80	AREA	10008	63	799	529	2820					
	TOTAL	10542	63	799	529	2820					
28 0540	POINT	754	0	27	200	7	3	0	0	1	0
146 80	AREA	8291	69	775	547	3112					
	TOTAL	9045	69	802	746	3119					
28 0620	POINT	1019	5	17	0	4	4	0	0	0	0
146 80	AREA	11368	102	1141	717	3304					
	TOTAL	12388	107	1159	718	3308					
28 0640	POINT	254	1	135	4	19	0	0	0	0	0
146 80	AREA	24597	112	1365	972	4813					
	TOTAL	24851	113	1500	976	4832					
28 0660	POINT	1101	9	194	2	22	2	0	1	0	0
086 80	AREA	5199	164	1484	1264	4316					
	TOTAL	6300	173	1678	1266	4338					
28 0680	POINT	59	0	0	0	0	0	0	0	0	0
146 80	AREA	9756	53	513	684	4950					
	TOTAL	9815	53	513	684	4950					
28 0700	POINT	1838	26	432	2	36	4	0	1	0	0
146 80	AREA	11732	206	2369	2516	10403					
	TOTAL	13570	232	2801	2518	10439					
28 0720	POINT	110	0	0	0	0	0	0	0	0	0
146 80	AREA	5525	47	462	507	4042					
	TOTAL	5634	47	462	507	4042					
28 0740	POINT	131	7	3050	384	1254	0	0	1	1	1
146 80	AREA	8194	45	553	407	2041					
	TOTAL	8325	52	3602	792	3295					
28 0760	POINT	1221	1490	2330	15	64	3	1	2	0	0
146 80	AREA	15890	288	2702	2296	11035					
	TOTAL	17111	1777	5032	2310	11099					
28 0780	POINT	2443	19589	9132	15591	399	3	3	3	5	1
085 80	AREA	33939	3363	28143	29529	147836					
	TOTAL	36382	22952	37275	45121	148235					
28 0800	POINT	346	0	0	0	0	1	0	0	0	0
146 80	AREA	6956	25	319	248	1470					
	TOTAL	7302	25	319	248	1470					
28 0860	POINT	733	0	0	3165	0	2	0	0	1	0
146 80	AREA	12766	88	938	500	2748					
	TOTAL	13500	88	938	3666	2748					
28 0880	POINT	631	0	0	0	0	2	0	0	0	0
146 80	AREA	8860	29	399	298	1732					
	TOTAL	9491	29	399	298	1732					
28 0920	POINT	162	0	0	0	0	0	0	0	0	0
146 80	AREA	9659	28	377	363	1668					
	TOTAL	9820	28	377	363	1668					

NEBRASKA — NEDS POINT AND AREA SOURCE EMISSIONS

ST	CNTY	AQR	YR		PARTIC	SO2	NOX	VOC	CO	NUMBER PLANTS PAR	SO2	NOX	VOC	CO
28	0940			POINT	691	0	0	0	0	2	0	0	0	0
		146	80	AREA	11824	52	584	481	2499					
				TOTAL	12515	52	584	481	2499					
28	0960			POINT	853	4	3875	15012	449	1	0	3	1	1
		145	80	AREA	21667	195	1983	1684	7921					
				TOTAL	22519	199	5858	16696	8369					
28	0980			POINT	139	0	0	0	0	0	0	0	0	0
		146	80	AREA	7040	30	336	454	2050					
				TOTAL	7179	30	336	454	2050					
28	1000			POINT	49	0	0	0	0	0	0	0	0	0
		146	80	AREA	2962	18	223	178	1001					
				TOTAL	3012	18	224	178	1002					
28	1040			POINT	162	0	0	0	0	1	0	0	0	0
		146	80	AREA	6191	18	254	188	1036					
				TOTAL	6353	18	254	188	1036					
28	1100			POINT	0	0	0	0	0	0	0	0	0	0
		146	80	AREA	940	9	105	178	1199					
				TOTAL	940	9	105	178	1199					
28	1120			POINT	183	0	0	0	0	1	0	0	0	0
		146	80	AREA	6030	29	362	248	1317					
				TOTAL	6213	29	362	248	1317					
28	1140			POINT	571	14	495	21652	41	2	0	1	2	0
		146	80	AREA	16382	398	3975	4274	20368					
				TOTAL	16954	412	4470	25927	20408					
28	1160			POINT	630	0	0	0	0	2	0	0	0	0
		146	80	AREA	11357	99	1250	936	5032					
				TOTAL	11986	99	1250	936	5032					
28	1180			POINT	402	4	8	0	2	1	0	0	0	0
		146	80	AREA	8850	52	482	420	1987					
				TOTAL	9252	56	491	420	1989					
28	1220			POINT	95	0	0	0	0	0	0	0	0	0
		146	80	AREA	6107	13	163	162	1115					
				TOTAL	6202	13	163	162	1115					
28	1240			POINT	523	0	0	0	0	1	0	0	0	0
		146	80	AREA	7608	34	435	360	1885					
				TOTAL	8131	34	435	360	1885					
28	1280			POINT	136	0	0	0	0	0	0	0	0	0
		146	80	AREA	28002	135	1394	878	4174					
				TOTAL	28138	135	1394	878	4174					
28	1300			POINT	0	0	0	0	0	0	0	0	0	0
		146	80	AREA	1277	14	127	118	661					
				TOTAL	1277	14	127	118	661					
28	1320			POINT	564	0	0	0	0	2	0	0	0	0
		146	80	AREA	9145	47	623	473	2574					
				TOTAL	9709	47	623	473	2574					
28	1340			POINT	292	0	9	1	2	0	0	0	0	0
		145	80	AREA	11051	146	1024	749	3398					
				TOTAL	11342	146	1033	750	3400					

NEBRASKA — NEDS POINT AND AREA SOURCE EMISSIONS

ST	CNTY	AQR	YR		PARTIC	SO2	NOX	VOC	CO	NUMBER PLANTS PAR	≥100TONS SO2	NOX	VOC	CO
28	1360			POINT	163	0	9	1	2	0	0	0	0	0
		146	80	AREA	6829	36	432	318	1628					
				TOTAL	6992	36	441	319	1630					
28	1400			POINT	614	0	0	0	0	3	0	0	0	0
		146	80	AREA	9579	54	704	553	2910					
				TOTAL	10193	54	704	553	2910					
28	1420			POINT	151	0	14	0	1	0	0	0	0	0
		146	80	AREA	9579	90	1194	1493	6678					
				TOTAL	9730	90	1207	1493	6679					
28	1440			POINT	11	0	0	0	0	0	0	0	0	0
		146	80	AREA	5595	14	172	139	803					
				TOTAL	5606	14	172	139	803					
28	1480			POINT	162	0	0	0	0	0	0	0	0	0
		146	80	AREA	11216	42	529	742	5226					
				TOTAL	11379	42	529	742	5226					
28	1500			POINT	388	0	0	0	0	1	0	0	0	0
		146	80	AREA	17383	89	964	700	3260					
				TOTAL	17771	89	964	700	3260					
28	1520			POINT	2961	4600	5751	3347	473	5	2	3	4	1
		145	80	AREA	64002	994	10128	13093	72686					
				TOTAL	66963	5594	15879	16440	73159					
28	1580			POINT	1485	12369	29062	855	258	5	1	1	1	1
		146	80	AREA	24105	208	2799	2907	16348					
				TOTAL	25590	12576	31861	3762	16606					
28	1600			POINT	15	0	0	0	0	0	0	0	0	0
		146	80	AREA	2364	10	133	111	652					
				TOTAL	2379	10	133	111	652					
28	1620			POINT	0	0	0	0	0	0	0	0	0	0
		146	80	AREA	2264	9	118	96	512					
				TOTAL	2264	9	118	96	512					
28	1660			POINT	0	0	0	0	0	0	0	0	0	0
		146	80	AREA	2209	6	86	104	541					
				TOTAL	2209	6	86	104	541					
28	1680			POINT	760	1	37	3	8	3	0	0	0	0
		146	80	AREA	13282	326	2584	2111	8993					
				TOTAL	14043	327	2620	2113	9001					
28	1700			POINT	1072	3	2	4	2	3	0	0	0	0
		146	80	AREA	9214	72	868	712	3494					
				TOTAL	10285	75	869	715	3496					
28	1720			POINT	450	48	102	1	81	1	0	1	0	0
		146	80	AREA	7068	59	636	748	5769					
				TOTAL	7517	106	738	749	5850					
28	1740			POINT	452	0	0	0	0	2	0	0	0	0
		146	80	AREA	7176	34	429	306	1504					
				TOTAL	7627	34	429	306	1504					
28	1780			POINT	617	0	41	71	7	1	0	0	0	0
		146	80	AREA	7936	66	642	565	2498					
				TOTAL	8554	66	684	636	2505					

NEBRASKA — NEDS POINT AND AREA SOURCE EMISSIONS

ST	CNTY	AQR	YR		PARTIC	SO2	NOX	VOC	CO	NUMBER PLANTS≥100TONS PAR	SO2	NOX	VOC	CO
28	1840			POINT	1881	1049	272	5698	1	3	1	1	1	0
		146	80	AREA	11342	55	560	459	2128					
				TOTAL	13223	1103	831	6158	2129					
28	1920			POINT	1089	13111	34618	98	840	3	1	3	0	2
		146	80	AREA	13390	115	1214	1221	5838					
				TOTAL	14479	13226	35832	1319	6678					
28	1940			POINT	366	0	0	0	0	1	0	0	0	0
		146	80	AREA	7247	28	380	284	1455					
				TOTAL	7614	28	380	284	1455					
28	1960			POINT	318	0	0	0	0	1	0	0	0	0
		146	80	AREA	12330	33	418	301	1642					
				TOTAL	12649	33	418	301	1642					
28	1980			POINT	409	0	0	0	0	2	0	0	0	0
		146	80	AREA	10558	72	800	834	4025					
				TOTAL	10967	72	800	834	4025					
28	2000			POINT	459	0	4	0	1	1	0	0	0	0
		146	80	AREA	11601	63	771	496	2679					
				TOTAL	12061	63	776	496	2680					
28	2020			POINT	760	0	3	60	1	3	0	0	0	0
		146	80	AREA	15993	278	2402	2424	8267					
				TOTAL	16753	278	2405	2484	8268					
28	2060			POINT	273	0	0	0	0	1	0	0	0	0
		146	80	AREA	7905	57	590	385	1957					
				TOTAL	8177	57	590	385	1957					
28	2100			POINT	513	0	3	0	1	2	0	0	0	0
		146	80	AREA	10307	78	829	1242	4542					
				TOTAL	10820	78	832	1242	4543					
28	2120			POINT	630	8	615	20	89	1	0	2	0	0
		146	80	AREA	10694	75	833	744	3653					
				TOTAL	11324	83	1448	764	3742					
28	2140			POINT	52	0	0	0	0	0	0	0	0	0
		146	80	AREA	6008	32	320	251	1311					
				TOTAL	6060	32	320	251	1311					
28	2160			POINT	421	5	33	1	5	2	0	0	0	0
		146	80	AREA	13204	133	1223	868	3744					
				TOTAL	13625	138	1256	869	3749					
28	2180			POINT	1814	1034	1371	15	48	2	1	2	0	0
		085	80	AREA	9358	341	3701	3809	21727					
				TOTAL	11172	1376	5072	3824	21775					
28	2200			POINT	2156	0	0	0	0	4	0	0	0	0
		146	80	AREA	17099	127	1455	1154	5506					
				TOTAL	19255	127	1455	1154	5506					
28	2260			POINT	703	320	467	49	4642	2	1	2	0	1
		146	80	AREA	14773	271	2548	3265	22510					
				TOTAL	15475	591	3015	3314	27151					
28	2300			POINT	604	0	4	4	9	1	0	0	0	0
		146	80	AREA	13191	126	1548	1251	6507					
				TOTAL	13794	126	1551	1255	6516					

NEBRASKA				NEDS POINT AND AREA SOURCE EMISSIONS					NUMBER PLANTS>100TONS				
ST	CNTY	AQR	YR	PARTIC	SO2	NOX	VOC	CO	PAR	SO2	NOX	VOC	CO
**	****	***	**	*********	*********	*********	*********	*********	***	***	***	***	***
28	2320		POINT	115	0	0	0	0	0	0	0	0	0
		146	80 AREA	14044	79	747	812	5021					
			TOTAL	14159	79	747	812	5021					
28	2340		POINT	195	0	0	0	0	1	0	0	0	0
		146	80 AREA	13261	34	410	321	1557					
			TOTAL	13456	34	410	321	1557					
28	2380		POINT	0	0	0	0	0	0	0	0	0	0
		146	80 AREA	7393	19	220	218	1577					
			TOTAL	7393	19	220	218	1577					
28	2420		POINT	382	0	55	0	0	1	0	0	0	0
		146	80 AREA	7234	44	547	348	1885					
			TOTAL	7616	44	602	348	1885					
28	2460		POINT	569	1	8	1	2	1	0	0	0	0
		145	80 AREA	11598	73	761	636	2775					
			TOTAL	12167	73	769	637	2777					
28	2480		POINT	0	0	0	0	0	0	0	0	0	0
		146	80 AREA	1469	9	134	132	747					
			TOTAL	1469	9	134	132	747					
28	2500		POINT	472	0	0	0	0	1	0	0	0	0
		146	80 AREA	6799	43	508	473	1992					
			TOTAL	7271	43	508	473	1992					
28	2540		POINT	599	0	0	0	0	3	0	0	0	0
		146	80 AREA	6678	45	504	384	1846					
			TOTAL	7277	45	504	384	1846					
28	2580		POINT	1144	0	10	0	1	4	0	0	0	0
		146	80 AREA	7384	106	1099	904	4311					
			TOTAL	8528	106	1110	905	4312					
28	2620		POINT	310	0	12	0	2	1	0	0	0	0
		146	80 AREA	9605	51	591	519	2577					
			TOTAL	9915	51	603	519	2579					
28	2640		POINT	500	0	0	0	0	2	0	0	0	0
		146	80 AREA	9906	39	446	332	1861					
			TOTAL	10406	39	446	332	1861					
28	2680		POINT	0	0	0	0	0	0	0	0	0	0
		146	80 AREA	3406	11	143	103	572					
			TOTAL	3406	11	143	103	572					
28	2720		POINT	282	0	0	0	0	0	0	0	0	0
		146	80 AREA	13115	162	1733	1351	6797					
			TOTAL	13396	162	1733	1351	6797					
28	9900		POINT	1664	64	32	70	33	8	0	0	0	0
		***	** AREA	*** NOT APPLICABLE FOR AREA SOURCES ***									
			TOTAL	1664	64	32	70	33					
STATE TOTALS:													
			POINT	59802	55968	94426	66344	9190	145	13	31	17	9
			AREA	1017748	12129	120702	118322	602640					
			TOTAL	1077551	68098	215128	184666	611830					

AEROS ST	AEROS CNTY	FIPS ST	FIPS CNTY	AQCR	COUNTY NAME	STATE NAME
28	0020	31	001	146	ADAMS	NEBRASKA
28	0060	31	003	146	ANTELOPE	NEBRASKA
28	0080	31	005	146	ARTHUR	NEBRASKA
28	0140	31	007	146	BANNER	NEBRASKA
28	0200	31	009	146	BLAINE	NEBRASKA
28	0240	31	011	146	BOONE	NEBRASKA
28	0260	31	013	146	BOX BUTTE	NEBRASKA
28	0280	31	015	146	BOYD	NEBRASKA
28	0320	31	017	146	BROWN	NEBRASKA
28	0340	31	019	146	BUFFALO	NEBRASKA
28	0360	31	021	146	BURT	NEBRASKA
28	0380	31	023	146	BUTLER	NEBRASKA
28	0400	31	025	146	CASS	NEBRASKA
28	0420	31	027	146	CEDAR	NEBRASKA
28	0460	31	029	146	CHASE	NEBRASKA
28	0480	31	031	146	CHERRY	NEBRASKA
28	0500	31	033	146	CHEYENNE	NEBRASKA
28	0520	31	035	146	CLAY	NEBRASKA
28	0540	31	037	146	COLFAX	NEBRASKA
28	0620	31	039	146	CUMING	NEBRASKA
28	0640	31	041	146	CUSTER	NEBRASKA
28	0660	31	043	086	DAKOTA	NEBRASKA
28	0680	31	045	146	DAWES	NEBRASKA
28	0700	31	047	146	DAWSON	NEBRASKA
28	0720	31	049	146	DEUEL	NEBRASKA
28	0740	31	051	146	DIXON	NEBRASKA
28	0760	31	053	146	DODGE	NEBRASKA
28	0780	31	055	085	DOUGLAS	NEBRASKA
28	0800	31	057	146	DUNDY	NEBRASKA
28	0860	31	059	146	FILLMORE	NEBRASKA
28	0880	31	061	146	FRANKLIN	NEBRASKA
28	0920	31	063	146	FRONTIER	NEBRASKA
28	0940	31	065	146	FURNAS	NEBRASKA
28	0960	31	067	146	GAGE	NEBRASKA
28	0980	31	069	146	GARDEN	NEBRASKA
28	1000	31	071	146	GARFIELD	NEBRASKA
28	1040	31	073	146	GOSPER	NEBRASKA
28	1100	31	075	146	GRANT	NEBRASKA
28	1120	31	077	146	GREELEY	NEBRASKA
28	1140	31	079	146	HALL	NEBRASKA
28	1160	31	081	146	HAMILTON	NEBRASKA
28	1180	31	083	146	HARLAN	NEBRASKA
28	1220	31	085	146	HAYES	NEBRASKA
28	1240	31	087	146	HITCHCOCK	NEBRASKA
28	1280	31	089	146	HOLT	NEBRASKA
28	1300	31	091	146	HOOKER	NEBRASKA
28	1320	31	093	146	HOWARD	NEBRASKA
28	1340	31	095	145	JEFFERSON	NEBRASKA
28	1360	31	097	146	JOHNSON	NEBRASKA
28	1400	31	099	146	KEARNEY	NEBRASKA
28	1420	31	101	146	KEITH	NEBRASKA
28	1440	31	103	146	KEYA PAHA	NEBRASKA
28	1480	31	105	146	KIMBALL	NEBRASKA
28	1500	31	107	146	KNOX	NEBRASKA
28	1520	31	109	145	LANCASTER	NEBRASKA
28	1580	31	111	146	LINCOLN	NEBRASKA
28	1600	31	113	146	LOGAN	NEBRASKA
28	1620	31	115	146	LOUP	NEBRASKA

AEROS ST	AEROS CNTY	FIPS ST	FIPS CNTY	AQCR	COUNTY NAME	STATE NAME
28	1660	31	117	146	MCPHERSON	NEBRASKA
28	1680	31	119	146	MADISON	NEBRASKA
28	1700	31	121	146	MERRICK	NEBRASKA
28	1720	31	123	146	MORRILL	NEBRASKA
28	1740	31	125	146	NANCE	NEBRASKA
28	1760	31	127	146	NEMAHA	NEBRASKA
28	1880	31	129	146	NUCKOLLS	NEBRASKA
28	1920	31	131	146	OTOE	NEBRASKA
28	1940	31	133	146	PAWNEE	NEBRASKA
28	1960	31	135	146	PERKINS	NEBRASKA
28	1980	31	137	146	PHELPS	NEBRASKA
28	2000	31	139	146	PIERCE	NEBRASKA
28	2020	31	141	146	PLATTE	NEBRASKA
28	2060	31	143	146	POLK	NEBRASKA
28	2100	31	145	146	RED WILLOW	NEBRASKA
28	2120	31	147	146	RICHARDSON	NEBRASKA
28	2140	31	149	146	ROCK	NEBRASKA
28	2160	31	151	146	SALINE	NEBRASKA
28	2180	31	153	095	SARPY	NEBRASKA
28	2200	31	155	146	SAUNDERS	NEBRASKA
28	2260	31	157	146	SCOTTS BLUFF	NEBRASKA
28	2300	31	159	146	SEWARD	NEBRASKA
28	2320	31	161	146	SHERIDAN	NEBRASKA
28	2340	31	163	146	SHERMAN	NEBRASKA
28	2380	31	165	146	SIOUX	NEBRASKA
28	2420	31	167	146	STANTON	NEBRASKA
28	2460	31	169	145	THAYER	NEBRASKA
28	2480	31	171	146	THOMAS	NEBRASKA
28	2500	31	173	146	THURSTON	NEBRASKA
28	2540	31	175	146	VALLEY	NEBRASKA
28	2580	31	177	146	WASHINGTON	NEBRASKA
28	2620	31	179	146	WAYNE	NEBRASKA
28	2640	31	181	146	WEBSTER	NEBRASKA
28	2680	31	183	146	WHEELER	NEBRASKA
28	2720	31	185	146	YORK	NEBRASKA
29	0080	32	510	148	CARSON CITY	NEVADA
29	0060	32	001	147	CHURCHILL	NEVADA
29	0080	32	003	013	CLARK	NEVADA
29	0100	32	005	148	DOUGLAS	NEVADA
29	0140	32	007	147	ELKO	NEVADA
29	0180	32	009	147	ESMERALDA	NEVADA
29	0200	32	011	147	EUREKA	NEVADA
29	0280	32	013	147	HUMBOLDT	NEVADA
29	0300	32	015	147	LANDER	NEVADA
29	0340	32	017	147	LINCOLN	NEVADA
29	0360	32	019	148	LYON	NEVADA
29	0380	32	021	147	MINERAL	NEVADA
29	0420	32	023	147	NYE	NEVADA
29	0460	32	027	147	PERSHING	NEVADA
29	0520	32	029	148	STOREY	NEVADA
29	0540	32	031	148	WASHOE	NEVADA
29	0560	32	033	147	WHITE PINE	NEVADA
30	0020	33	001	121	BELKNAP	NEW HAMPSHIRE
30	0060	33	003	149	CARROLL	NEW HAMPSHIRE
30	0080	33	005	121	CHESHIRE	NEW HAMPSHIRE
30	0140	33	007	107	COOS	NEW HAMPSHIRE
30	0240	33	009	149	GRAFTON	NEW HAMPSHIRE

APPENDIX B
Statistical Evaluation of Trends

The trend evaluation procedure used in the air quality evaluation is based on the Sen non-parametric statistic. The procedure was recommended by Vector Research, Incorporated, in a study performed under contract with the U.S. Environmental Protection Agency. It was selected over other candidate methods as the method which gives the highest probability of detecting real trends. Essential advantages of the method include the following:

1. It takes the seasonality of data into account.

2. It deals with autocorrelation effects in data collected at frequent intervals e.g., hourly. (Autocorrelation is the tendency for data measured at nearby times to be more similar than data measured at more distant times).

3. It does not assume that the data are normally distributed.

4. It identifies continuing trends, even if there is some oscillation around the trend line.

The latest draft report of the study, "Methods for Classifying Changes in Environmental Conditions" [VRI-EPA 7.4-FR80-1(R)] describes in more detail the other candidate methods and the advantages of the Sen statistical test.

A step-by-step summary of the trend evaluation procedure is given in the following paragraphs, which were adapted from the above report.

1. Compute one data value for each month of each year. For high-frequency data series in which autocorrelation may be present (e.g., continuous monitor data), a monthly average will correct for that autocorrelation. Alternatively, if trends in high pollutant concentrations at a site are of greater interest, the 90th percentile concentration for each month is used. (The 90th percentile concentration produces a more stable statistical estimate than would the maximum concentration.)

2. Compute the seasonal average of the data for each calendar month, (i.e., compute the average of all January values, the average of all February values, etc.). Subtract the appropriate seasonal average from the value for each month to obtain seasonally adjusted data.

3. Rank the seasonally adjusted data. Replace each adjusted datum with its rank. (This step makes the procedure non-parametric. It eliminates the requirement for different statistical methods for different series of data with different distributional laws governing their random behavior. It also limits the potential error-producing effects of outliers.)

4. Compute the Sen test statistic, S, from the formula

$$S = \sqrt{\frac{12\,T^2}{Y(Y+1)\sum_{y=1}^{Y}\sum_{t=1}^{T}(R_{yt} - R_{.t})^2}} \sum_{y=1}^{Y}\left(y - \frac{Y+1}{2}\right)\left(R_{y.} - \frac{TY+1}{2}\right)$$

where

Y = number of years
y = the index of the year (the index of first year is 1, of the second year, 2, etc.)
T = number of periods per year (12)
t = the index of the month (the index for January is 1, for February 2, etc.)
R_{yt} = the rank of the seasonally adjusted value for month t of year y
$R_{.t}$ = the mean rank for month t over all the years
$R_{y.}$ = the mean rank over all months for year y

The significance of the individual parts of that formula is described as follows.

a) For each year, $R_{y.}$ is computed by averaging the ranks of the seasonally adjusted data for that year. This will be large if the data in that year are higher than that in other years, small if the data are smaller. Thus, an increasing trend in this mean rank indicates an increasing trend in the data through the years. Likewise, a decreasing trend in the mean ranks indicates a decreasing trend in the data.

b) The term

$$\sum_{y=1}^{Y} \left(y - \frac{Y+1}{2}\right)\left(R_{y.} - \frac{TY+1}{2}\right)$$

represents the covariance between the mean rank for a year and the index of that year. When large annual mean ranks ($R_{y.}$ - (TY + 1)/2 positive) occur in late years (y-(Y+1)/2 positive) or small annual mean ranks ($R_{y.}$ - (TY + 1)/2 negative) occur in early years (y-(Y+1)/2 negative) a positive product will result. Thus, an accumulation of positive products, and therefore, a large positive result, is associated with a positive trend. Similarly, an accumulation of negative products, and a large negative result, is associated with a negative trend.

c) The first term of the equation is a scale factor which normalizes the covariance calculated above. It is a data-based estimate of the expected standard deviation of the covariance statistic if there were no trend. The scaling adjusts the covariance statistic so that it may be compared with tabulated percentile values of the normal probability distribution, rather than requiring the generation of special tables uniquely applicable to this statistic.

5. If the statistic exceeds (in either direction) the appropriate percentile values of the tabulated normal probability distribution, a statistically significant trend is present. If it does not exceed those values, no statistically significant trend is present.

Specifically, if the Sen statistic exceeds ± 1.645 (the 90th percentile values of the normal distribution for a two-tailed test), we conclude that the data show a trend. If the statistic does not exceed those limits, but does exceed ±1.28 (the 80th percentile values), we conclude that the data show a probable trend. Otherwise, we conclude that no statistically significant trend is shown by the data.

The following example illustrates the above process. While the trend calculations are usually performed by a computer, and include five years of data, the example shows how the calculations can be done manually. The example uses only three years of data, so that the calculation can be more easily followed.

Monthly geometric mean TSP data provide the starting point for the calculation. The monthly values and the seasonal averages are:

Year	Jan	Feb	Mar	Apr	May	Jun
1	102	126	142	150	92	112
2	136	107	144	68	80	100
3	70	67	84	125	112	83
Monthly (Seasonal) Average	102.67	100.0	123.33	114.33	94.67	98.33

Year	Jul	Aug	Sep	Oct	Nov	Dec
1	124	122	126	117	93	136
2	90	104	125	125	102	63
3	95	105	107	101	68	98
Monthly (Seasonal) Average	103.0	110.33	119.33	114.33	87.67	99.0

The seasonally adjusted data are obtained by subtracting the appropriate seasonal average from each monthly value.

Year	Jan	Feb	Mar	Apr	May	Jun
1	-.67	26	18.67	35.67	-2.67	13.67
2	33.33	7	20.67	-46.33	-14.67	1.67
3	-32.67	-33.0	-39.33	10.67	17.33	-15.33

Year	Jul	Aug	Sep	Oct	Nov	Dec
1	21.0	11.67	6.67	2.67	5.33	37.0
2	-13.0	-6.33	5.67	10.67	14.33	-36.0
3	-8.0	-5.33	-12.33	-13.33	-19.67	-1.0

The seasonally adjusted data are ranked from lowest to highest and replaced by the ranks R_{yt}, as shown in the next table. Ties are handled by assigning the same average rank to each of the tied values. (Ranks 24 and 25 are tied, so both months are ranked as 24.5). The mean rank for each season ($R_{.t}$) and the mean rank for each year ($R_{y.}$) are also shown.

Year	Jan	Feb	Mar	Apr	May	Jun
1	17	33	30	35	15	27
2	34	23	31	1	8	18
3	5	4	2	24.5	29	7
$R_{.t}$	18.67	20	21	20.17	17.33	17.33

Year	Jul	Aug	Sep	Oct	Nov	Dec	$R_{y.}$
1	32	26	22	19	20	36	26.0
2	10	13	21	24.5	28	3	17.875
3	12	14	11	9	6	16	11.625
$R_{.t}$	18	17.67	18	17.5	18	18.33	

The individual terms $(R_{yt}-R_{.t})^2$ in the summation of the scale factor are listed in the following table. The summation over all three years for each individual month, is shown in the last line of the table.

Year	Jan	Feb	Mar	Apr	May	Jun
1	2.8	169	81	219.9	5.4	93.5
2	235.1	9	100	367.5	87.0	0.4
3	186.8	256	361	18.7	136.2	106.7
$\sum_{y=1}^{3}(R_{yt}-R_{.t})^2$	424.7	434	542	606.1	228.7	200.6

Year	Jul	Aug	Sep	Oct	Nov	Dec
1	196	69.4	16	2.25	4	312.2
2	64	21.8	9	49.	100	235.0
3	36	13.5	49	72.25	144	5.4
$\sum_{y=1}^{3}(R_{yt}-R_{.t})^2$	296	104.7	74	123.5	248	552.6

Summing across the last line of the table, we have

$$\sum_{t=1}^{12} \sum_{y=1}^{3} (R_{yt} - R_{.t})^2 = 3834.9$$

Substituting into the formula for the Sen statistic, we have

$$S = \sqrt{\frac{12\ (12)^2}{3(4)\ (3834.9)}} \left[(1 - \tfrac{4}{2})\ (26.0 - \tfrac{37}{2}) + (2 - \tfrac{4}{2})\ (17.875 - \tfrac{37}{2}) + (3 - \tfrac{4}{2})\ (11.65 - \tfrac{37}{2}) \right]$$

$$= .1938\ [\ -\ 7.50 + 0\ -6.85\ ] = -2.78$$

Since the test statistic is below the range $\pm$ 1.645 (the 90th percentile values of the normal distribution), we conclude (with greater than 90% confidence) that the data show a decreasing trend.

APPENDIX C
Population Exposure Estimates

As Section XIII of this report described, previous estimates of population exposure to elevated concentrations have focused on county-level populations in areas where all or portions of a county had been designated as not meeting the NAAQS's for specific pollutants. Those approximations tend to overestimate, and sometimes greatly so, the population exposure. In order to refine those estimates, populations within the designated non-attainment areas were desired. Systems Applications, Inc. (SAI), of San Rafael, California has written the software necessary to compute population estimates within any arbitrary closed polygon at any location in the United States. The procedure used is based in part on the high resolution population gridding program used in the SHEAR model for estimating population exposure to air pollutants (Anderson and Lundberg, 1983). Robert G. Ireson was the SAI project manager for the current study. Funding for the project came through EPA Headquarters. Tim Matzke (Environmental Results Branch, OMSE) provided the necessary coordination. The assistance of both of those individuals is gratefully acknowledged.

This Appendix gives a general description of the software, and provides copies of the program outputs, including population density maps. Since those maps show approximate population densities by square kilometer, they may be useful as a reference for other analyses, in addition to the population exposure estimates. The abbreviations "PNA," "SNA," and "Unclass" in the map titles stand for "Primary Non-Attainment Area," "Secondary Non-Attainment Area," and "Unclassified Area," respectively.

The starting point for the population estimation is a set of points which define a closed polygon (the non-attainment area). These points were initially obtained by digitizing the outline of each non-attainment area from appropriate maps. Those points were used both in constructing the non-attainment area boundaries shown in the body of the report, and as input to the population estimation software.

The SAI software checks each polygon to verify closure, and selects a cell size which is appropriate to the size of the non-attainment area of interest. For all Nebraska areas shown, the selected cell size is 1 km x 1 km. Map scale is also adjusted according to the size of the area. Comparison of the Lincoln CO maps of the PNA and the unclassified area illustrates that effect. Maps are plotted with Universal Transverse Mercator coordinate axes, and include a border extending four cell widths beyond the boundary of the area of interest.

The program searches the population data file, which contains the locations of the centroids of all census block groups and enumeration districts (BG/ED's), and the population of each BG/ED. It assigns each centroid to the appropriate cell in the final grid, and distributes the population for each BG/ED according to the density of centroids and the size of the cells. It then calculates the population density for each cell. Individual cells are classified as being inside the polygon, outside

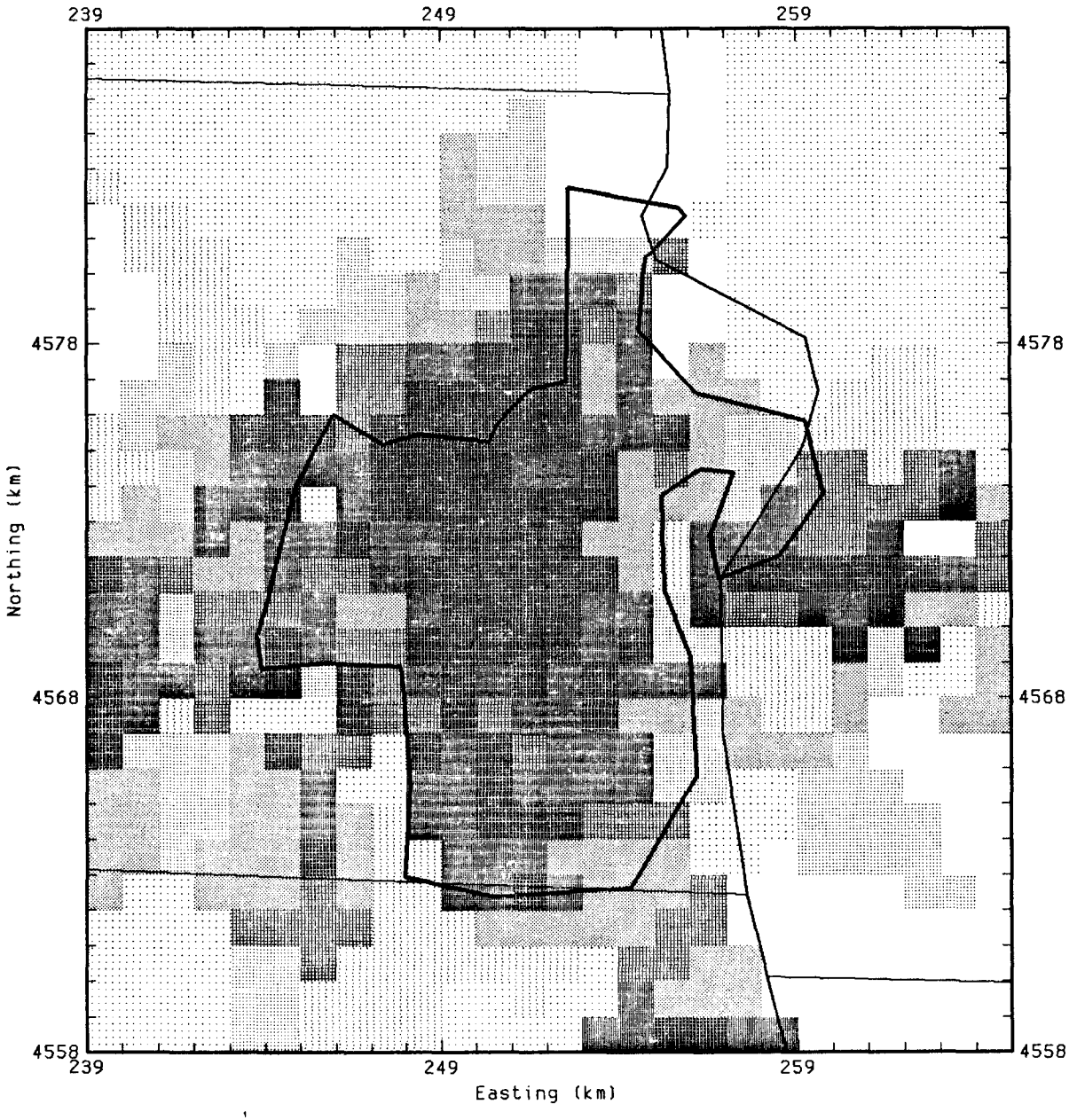
the polygon, or divided by the polygon. The population within the polygon is estimated by adding up the populations of all cells in the polygon. For cells divided by the polygon, the relative areas inside and outside are used to estimate the population inside.

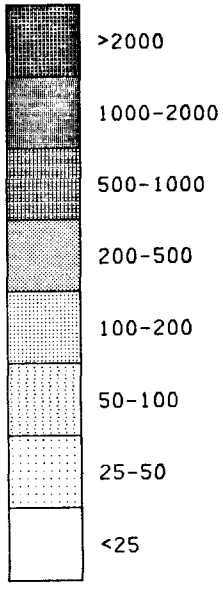
The population extraction and gridding program produces a listing, by county, of the number and total population of the BG/ED's extracted for the grid. For completeness, those listings are also included. Where the geographical density of the BG/ED's centroids is low, the populations may be spread over a large number of cells, especially near the edges of the final grid. In those cases, (which appear on the map as large areas with uniform low density), population density estimates may be shifted into or out of the polygon. If the total population is small, that effect may significantly change the estimate for population within the polygon.

Because of the approximations discussed above, the population estimates in the text were rounded to the nearest 1000. Where total population was low, and the non-attainment area boundary coincides with the city limits, the city population from census tables was used, rather than the estimate from the computer-produced population density map.

Reference

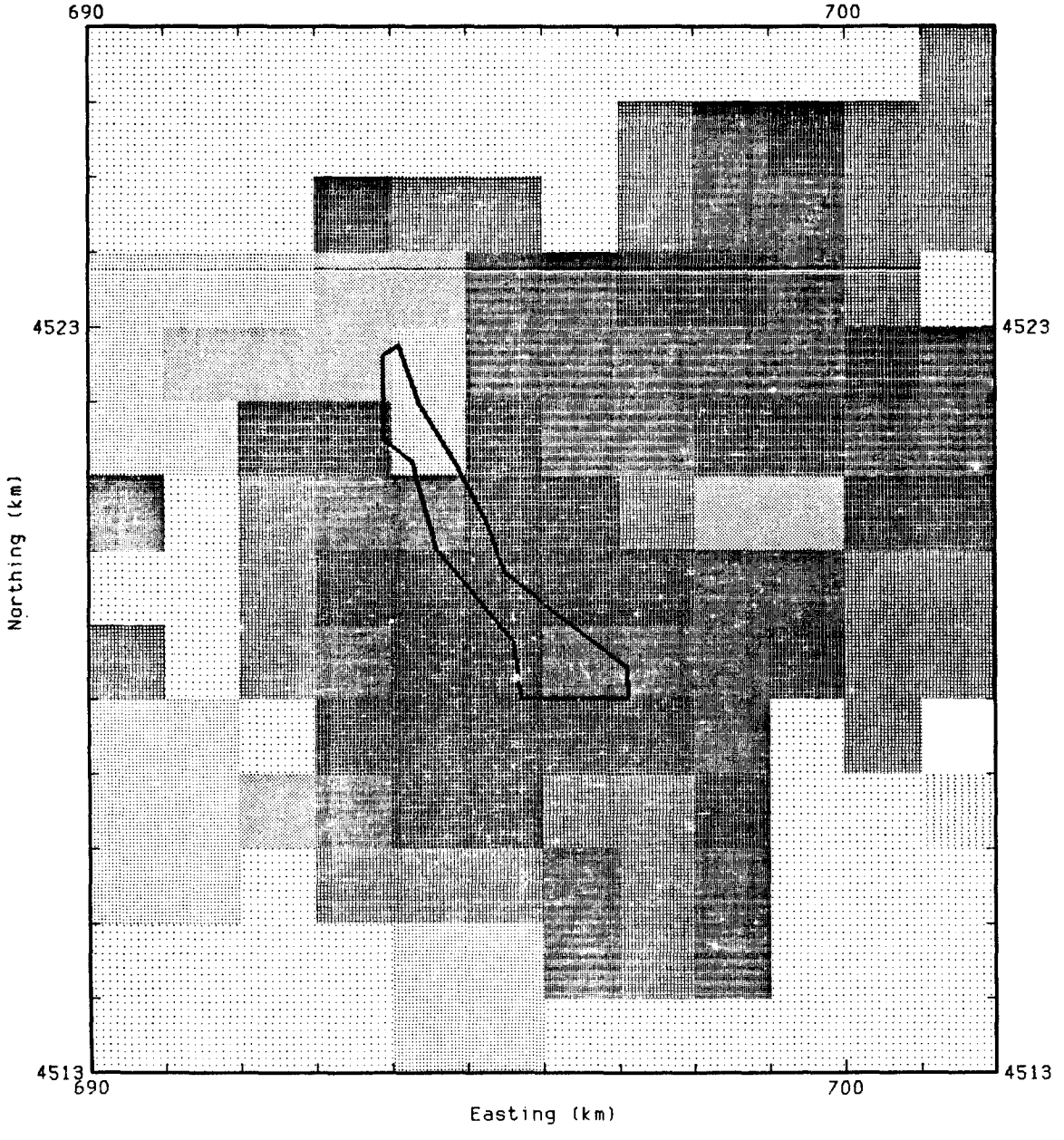
Anderson, Gerald E., and Lundberg, Gary W. 1983. User's Manual for SHEAR. A Computer Code for Modeling Human Exposure and Risk from Multiple Hazardous Air Pollutants in Selected Regions. Report SYSAPP-83/124, Systems Applications, Inc., San Rafael, California.

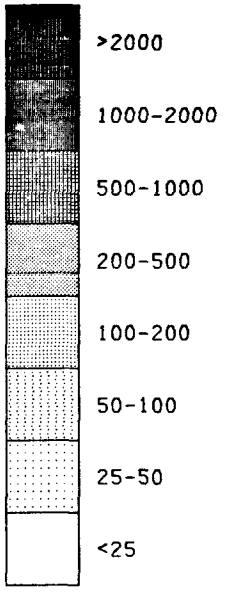




Enclosed Population is 283,000

Omaha CO PNA
Population Density Map for Polygon 55

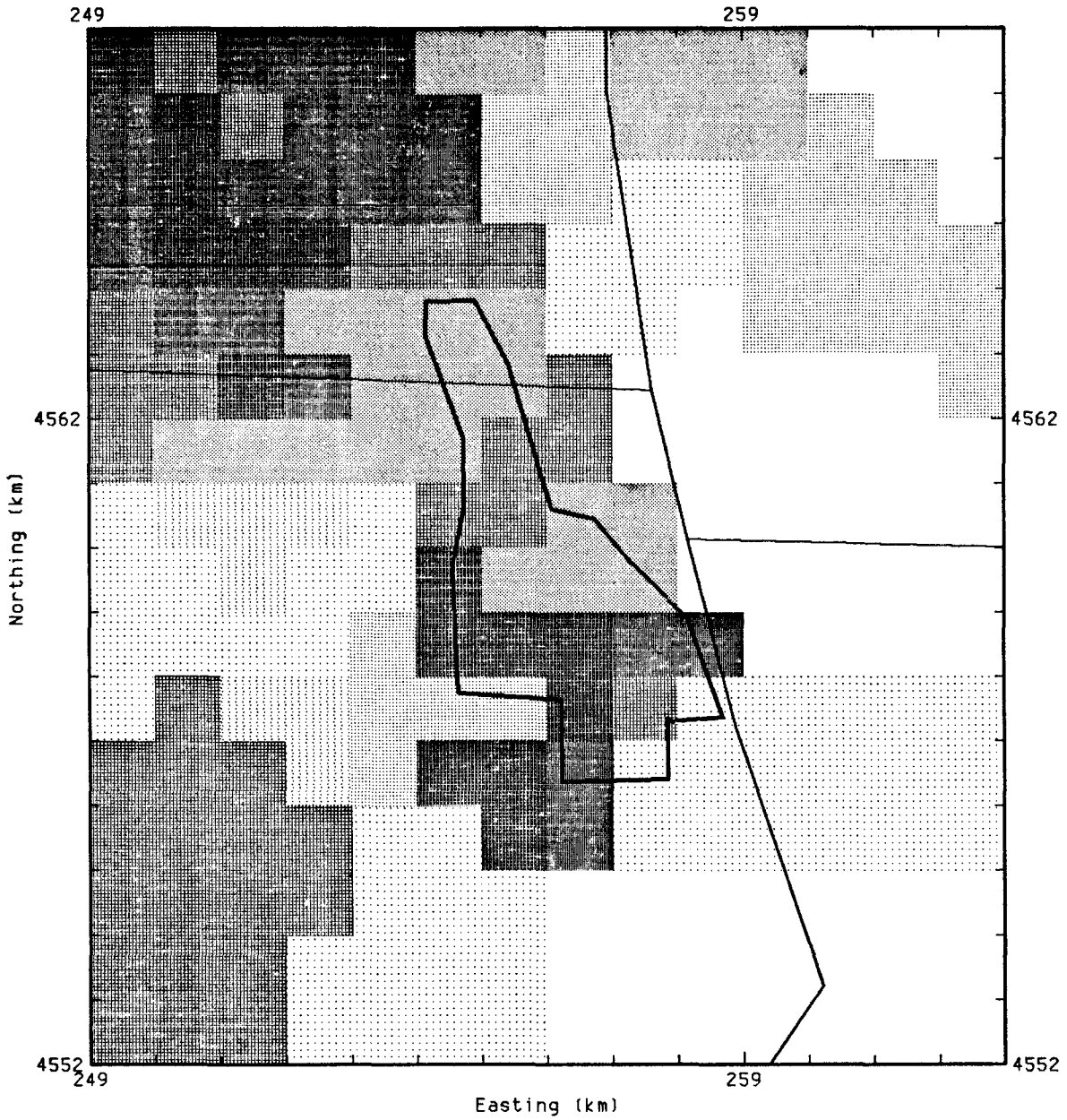


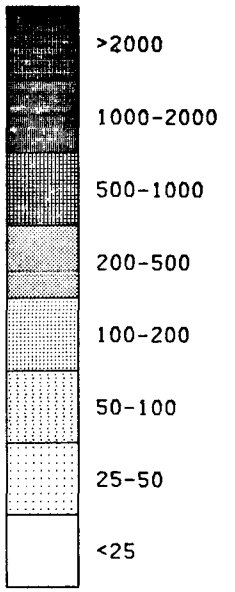


Density (people/km^2)

Enclosed Population is 6,500

Lincoln CO PNA
Population Density Map for Polygon 56

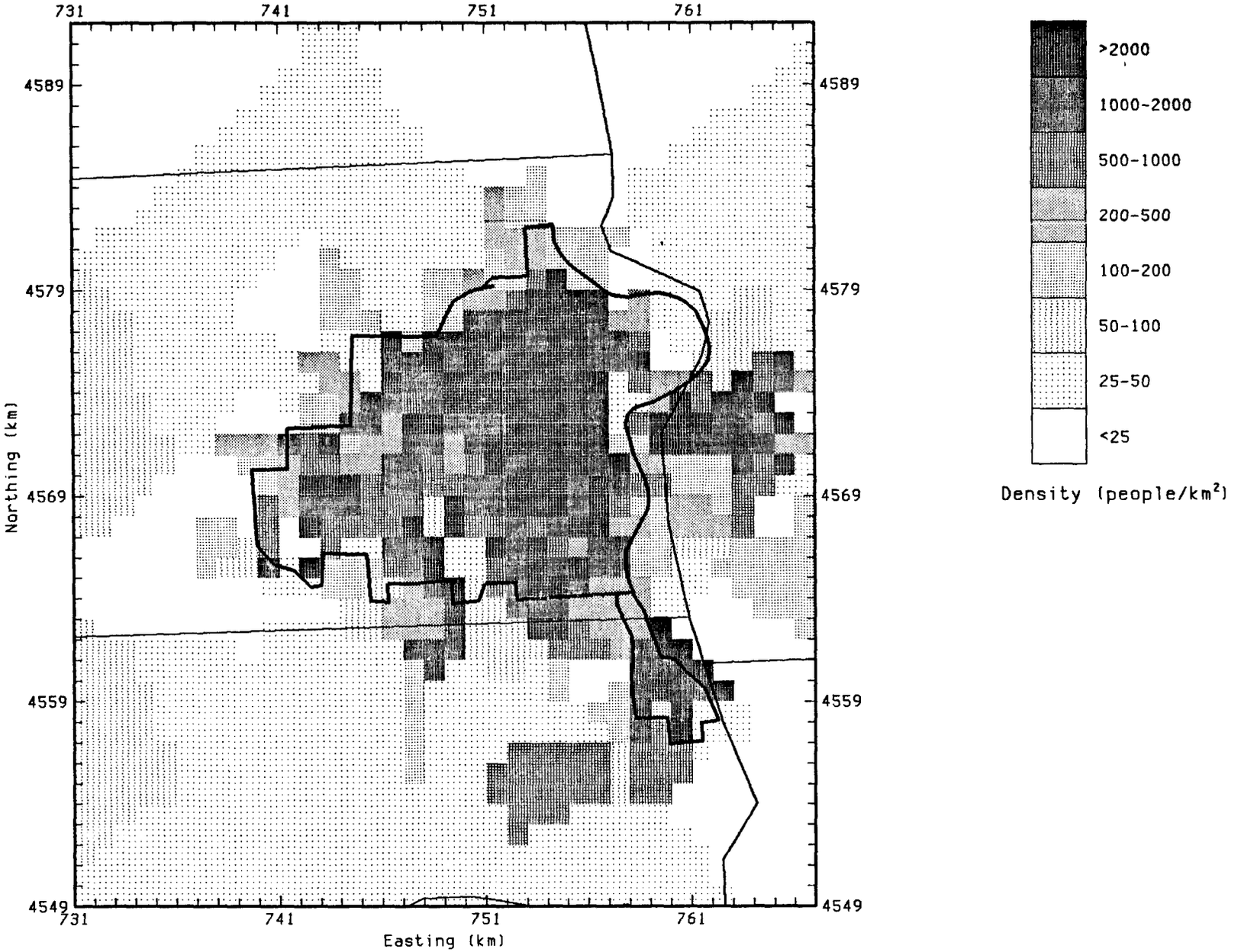




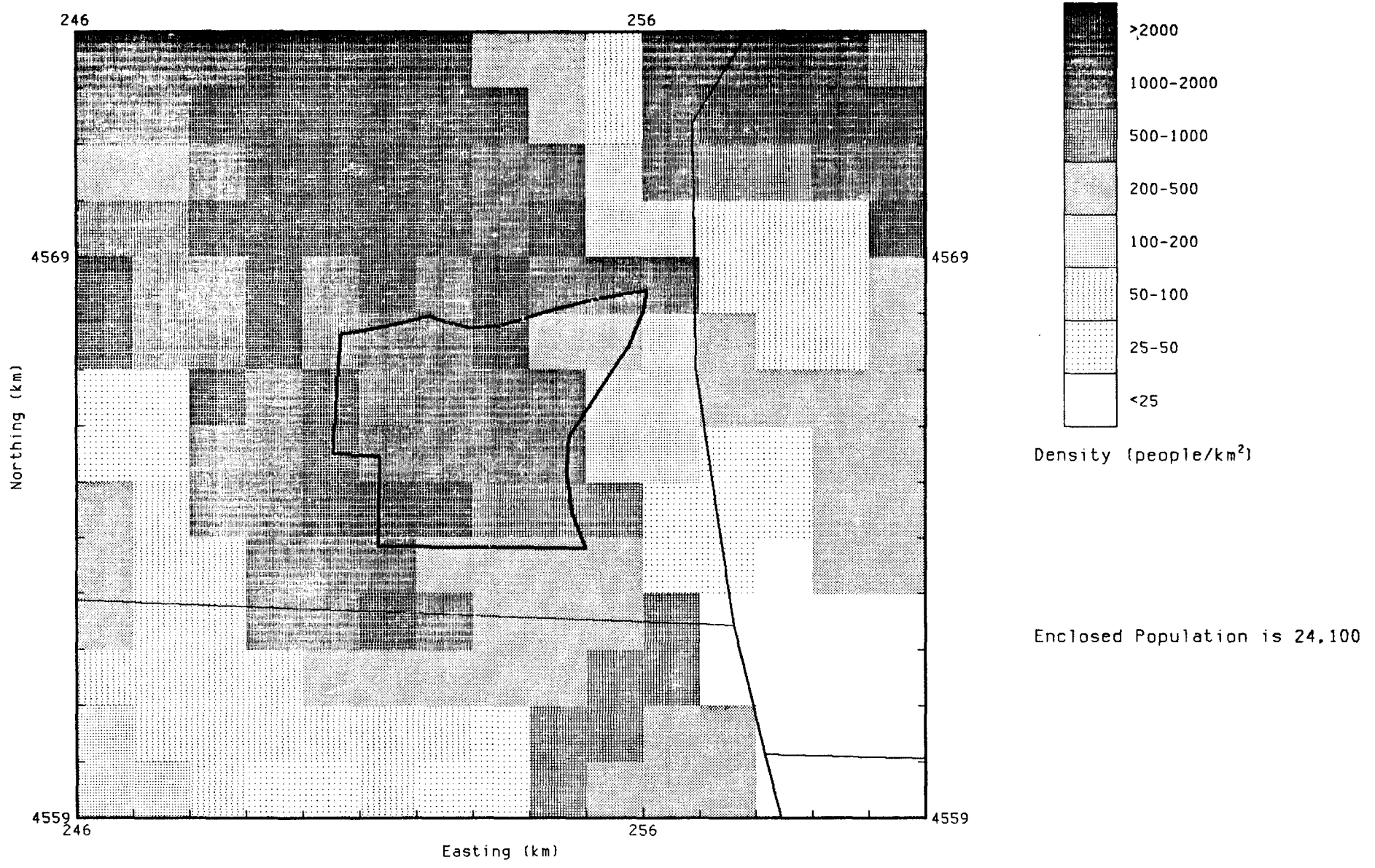
Density (people/km^2)

Enclosed Population is 18,600

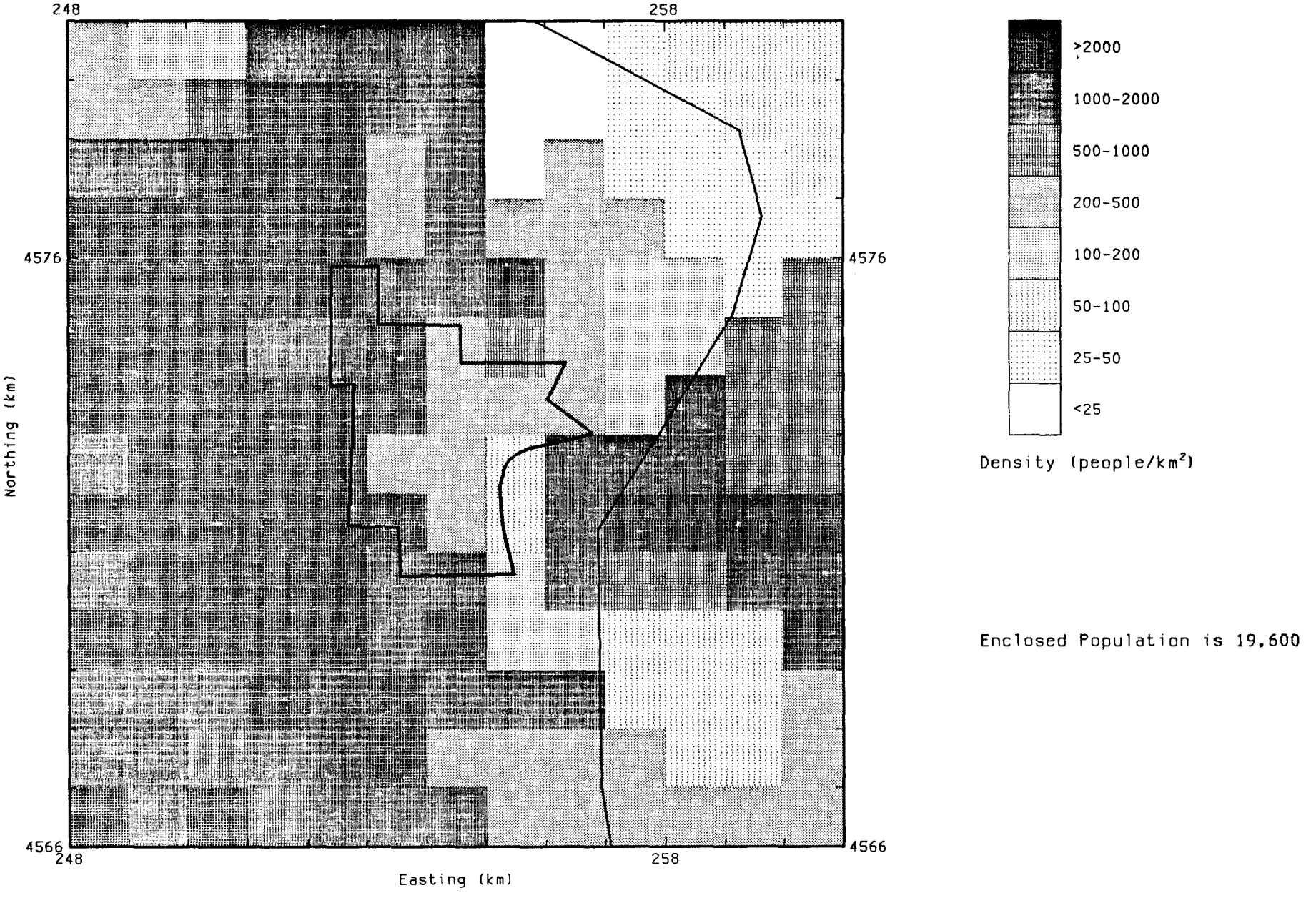
Omaha TSP SNA
Population Density Map for Polygon 60



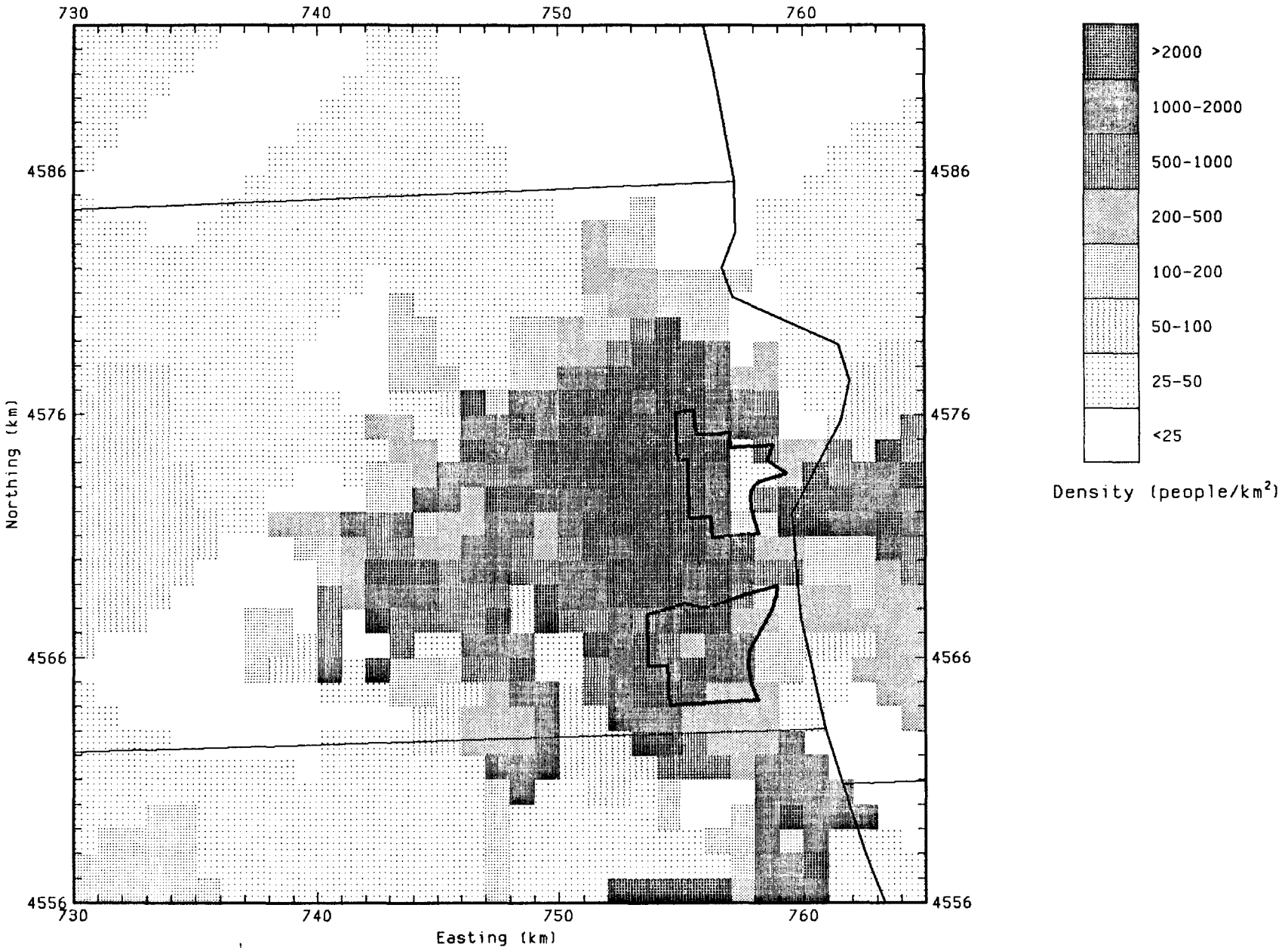
Population Density Map for Omaha, Nebraska -- TSP SNAs



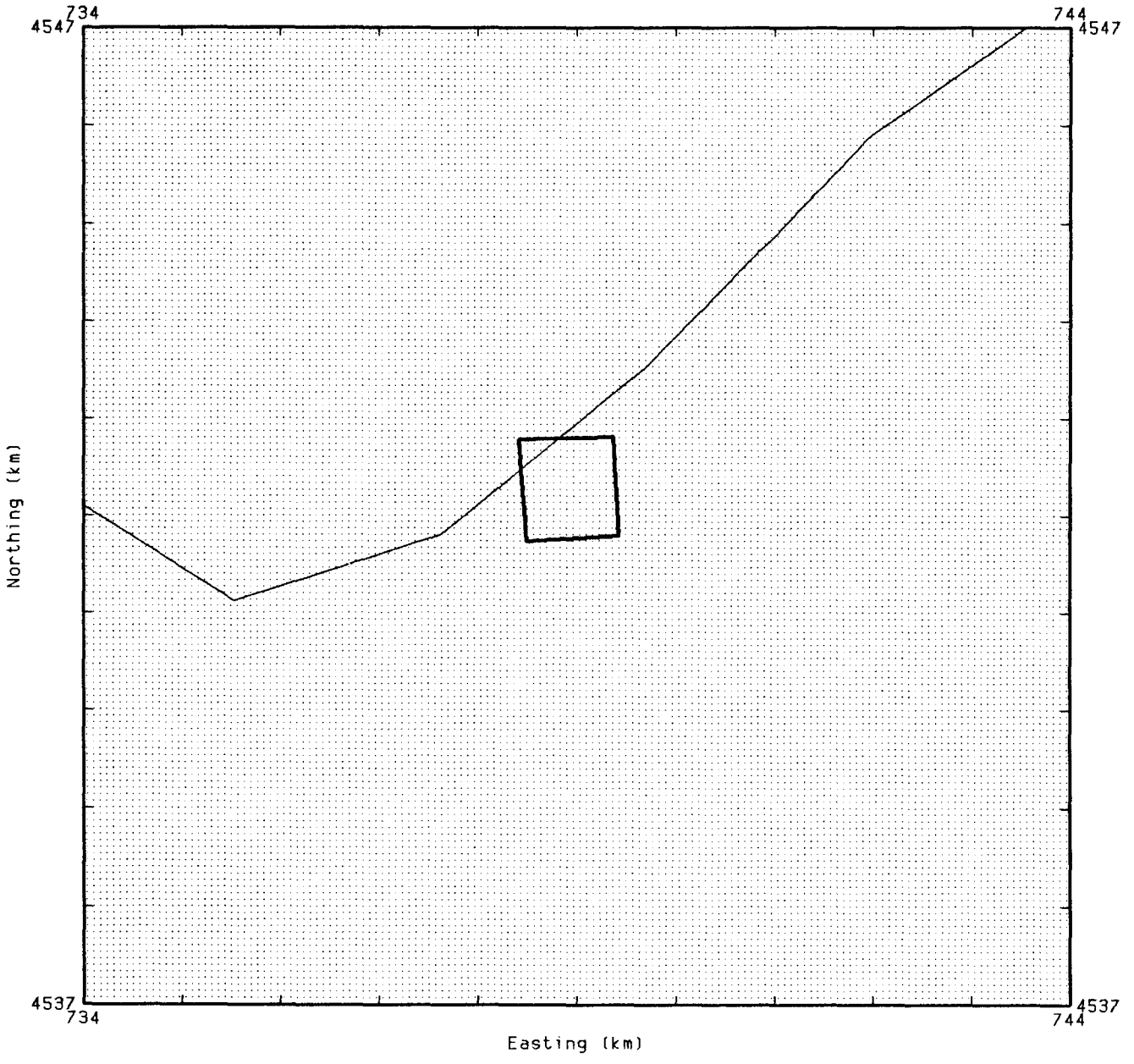
Omaha TSP PNA
Population Density Map for Polygon 61

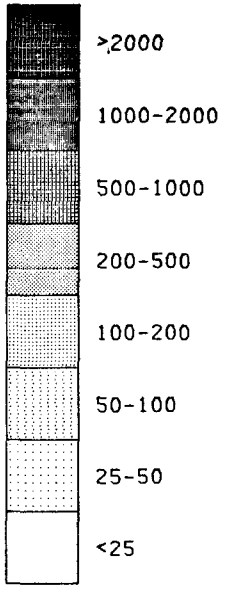


Omaha TSP PNA
Population Density Map for Polygon 62



Population Density Map for Omaha, Nebraska -- TSP PNAs

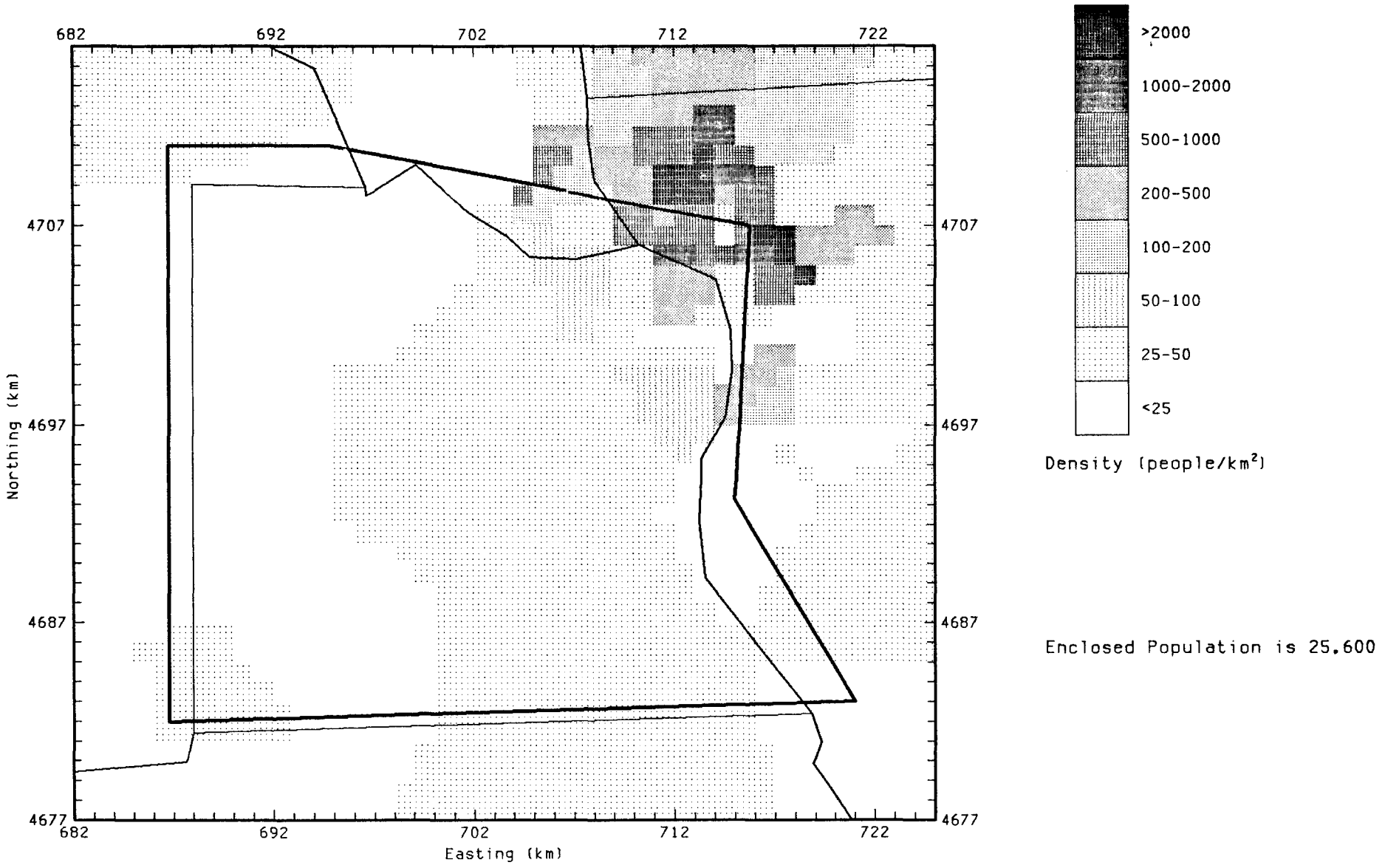




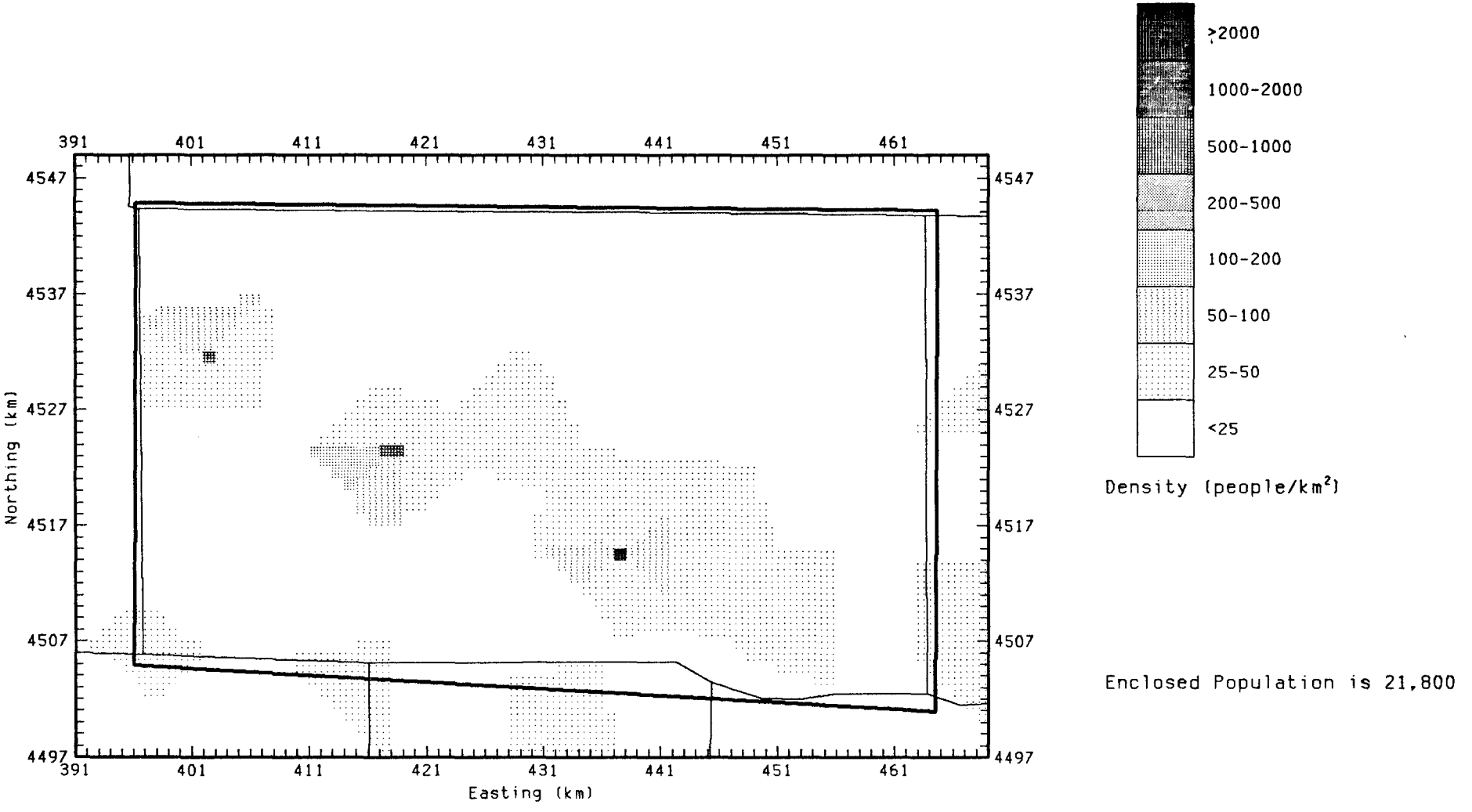
Density (people/km^2)

Enclosed Population is 17

Louisville TSP PNA
Population Density Map for Polygon 64



South Sioux City TSP Unclass
Population Density Map for Polygon 65



Dawson County TSP Unclass
Population Density Map for Polygon 66

REGION - 55
REGION ORIGIN (UTM COORDINATES/METERS)
EASTING - 239000.
NORTHING - 4558000.
ZONE - 15
REGION SIZE (METERS)
EAST-WEST - 26000.
NORTH-SOUTH - 29000.

Polygon # 55
etc.

POPULATION YEAR - 1978

51 STATES FOUND ON POPULATION-FILE INDEX.
3141 COUNTIES.
232567 BG/ED'S.
1000 BG/ED'S PER PAGE IN POPFILE.

1 BG/ED-S WITH A TOTAL POPULATION OF 20 EXTRACTED FROM COUNTY 19129
91 BG/ED-S WITH A TOTAL POPULATION OF 66635 EXTRACTED FROM COUNTY 19155
455 BG/ED-S WITH A TOTAL POPULATION OF 392548 EXTRACTED FROM COUNTY 31055
51 BG/ED-S WITH A TOTAL POPULATION OF 52726 EXTRACTED FROM COUNTY 31153

598 BG/ED-S WITH A TOTAL POPULATION OF 511929 EXTRACTED

REGION - 56
REGION ORIGIN (UTM COORDINATES/METERS)
EASTING - 690000.
NORTHING - 4513000.
ZONE - 14
REGION SIZE (METERS)
EAST-WEST - 12000.
NORTH-SOUTH - 14000.

POPULATION YEAR - 1978

51 STATES FOUND ON POPULATION-FILE INDEX,
3141 COUNTIES,
232567 BG/ED'S,
1000 BG/ED'S PER PAGE IN POPFILE.

177 BG/ED-S WITH A TOTAL POPULATION OF 167200 EXTRACTED FROM COUNTY 31109

177 BG/ED-S WITH A TOTAL POPULATION OF 167200 EXTRACTED
REGION - 57
REGION ORIGIN (UTM COORDINATES/METERS)
EASTING - 682000.
NORTHING - 4508000.
ZONE - 14
REGION SIZE (METERS)
EAST-WEST - 24000.
NORTH-SOUTH - 25000.

POPULATION YEAR - 1978

51 STATES FOUND ON POPULATION-FILE INDEX,
3141 COUNTIES,
232567 BG/ED'S,
1000 BG/ED'S PER PAGE IN POPFILE.

208 BG/ED-S WITH A TOTAL POPULATION OF 173778 EXTRACTED FROM COUNTY 31109

208 BG/ED-S WITH A TOTAL POPULATION OF 173778 EXTRACTED
REGION - 58
REGION ORIGIN (UTM COORDINATES/METERS)
EASTING - 710000.
NORTHING - 4513000.
ZONE - 14
REGION SIZE (METERS)
EAST-WEST - 64000.
NORTH-SOUTH - 42000.

POPULATION YEAR - 1978

51 STATES FOUND ON POPULATION-FILE INDEX,
3141 COUNTIES,
232567 BG/ED'S,
1000 BG/ED'S PER PAGE IN POPFILE.

2 BG/ED-S WITH A TOTAL POPULATION OF 706 EXTRACTED FROM COUNTY 19071
2 BG/ED-S WITH A TOTAL POPULATION OF 846 EXTRACTED FROM COUNTY 19129
49 BG/ED-S WITH A TOTAL POPULATION OF 20700 EXTRACTED FROM COUNTY 31025
3 BG/ED-S WITH A TOTAL POPULATION OF 952 EXTRACTED FROM COUNTY 31131
7 BG/ED-S WITH A TOTAL POPULATION OF 4206 EXTRACTED FROM COUNTY 31153
6 BG/ED-S WITH A TOTAL POPULATION OF 2997 EXTRACTED FROM COUNTY 31155

EAST-WEST - 15000.
NORTH-SOUTH - 14000.

POPULATION YEAR - 1978

51 STATES FOUND ON POPULATION-FILE INDEX.
3141 COUNTIES.
232567 BG/ED'S.
1000 BG/ED'S PER PAGE IN POPFILE.

1 BG/ED-S WITH A TOTAL POPULATION OF 20 EXTRACTED FROM COUNTY 19129
48 BG/ED-S WITH A TOTAL POPULATION OF 36221 EXTRACTED FROM COUNTY 19155
191 BG/ED-S WITH A TOTAL POPULATION OF 166082 EXTRACTED FROM COUNTY 31055
31 BG/ED-S WITH A TOTAL POPULATION OF 26284 EXTRACTED FROM COUNTY 31153

271 BG/ED-S WITH A TOTAL POPULATION OF 228607 EXTRACTED

REGION - 62
REGION ORIGIN (UTM COORDINATES/METERS)
EASTING - 248000.
NORTHING - 4566000.
ZONE - 15
REGION SIZE (METERS)
EAST-WEST - 13000.
NORTH-SOUTH - 14000.

POPULATION YEAR - 1978

51 STATES FOUND ON POPULATION-FILE INDEX.
3141 COUNTIES.
232567 BG/ED'S.
1000 BG/ED'S PER PAGE IN POPFILE.

53 BG/ED-S WITH A TOTAL POPULATION OF 40469 EXTRACTED FROM COUNTY 19155
285 BG/ED-S WITH A TOTAL POPULATION OF 235640 EXTRACTED FROM COUNTY 31055

338 BG/ED-S WITH A TOTAL POPULATION OF 276109 EXTRACTED

REGION - 64
REGION ORIGIN (UTM COORDINATES/METERS)
EASTING - 734000.
NORTHING - 4537000.
ZONE - 14
REGION SIZE (METERS)
EAST-WEST - 10000.
NORTH-SOUTH - 10000.

POPULATION YEAR - 1978

51 STATES FOUND ON POPULATION-FILE INDEX.
3141 COUNTIES.
232567 BG/ED'S.
1000 BG/ED'S PER PAGE IN POPFILE.

3 BG/ED-S WITH A TOTAL POPULATION OF 1515 EXTRACTED FROM COUNTY 31025

3 BG/ED-S WITH A TOTAL POPULATION OF 1515 EXTRACTED
REGION - 65
REGION ORIGIN (UTM COORDINATES/METERS)
EASTING - 682000.
NORTHING - 4677000.
ZONE - 14
REGION SIZE (METERS)
EAST-WEST - 43000.
NORTH-SOUTH - 39000.

POPULATION YEAR - 1978

51 STATES FOUND ON POPULATION-FILE INDEX.
3141 COUNTIES.
232567 BG/ED'S.
1000 BG/ED'S PER PAGE IN POPFILE.

90 BG/ED-S WITH A TOTAL POPULATION OF 90463 EXTRACTED FROM COUNTY 19193
31 BG/ED-S WITH A TOTAL POPULATION OF 17419 EXTRACTED FROM COUNTY 31043
6 BG/ED-S WITH A TOTAL POPULATION OF 1970 EXTRACTED FROM COUNTY 31051
4 BG/ED-S WITH A TOTAL POPULATION OF 1654 EXTRACTED FROM COUNTY 31173
3 BG/ED-S WITH A TOTAL POPULATION OF 1866 EXTRACTED FROM COUNTY 46127

134 BG/ED-S WITH A TOTAL POPULATION OF 113372 EXTRACTED
REGION - 66
REGION ORIGIN (UTM COORDINATES/METERS)
EASTING - 391000.
NORTHING - 4497000.

ZONE - 14

REGION SIZE (METERS)
EAST-WEST - 78000.
NORTH-SOUTH - 52000.

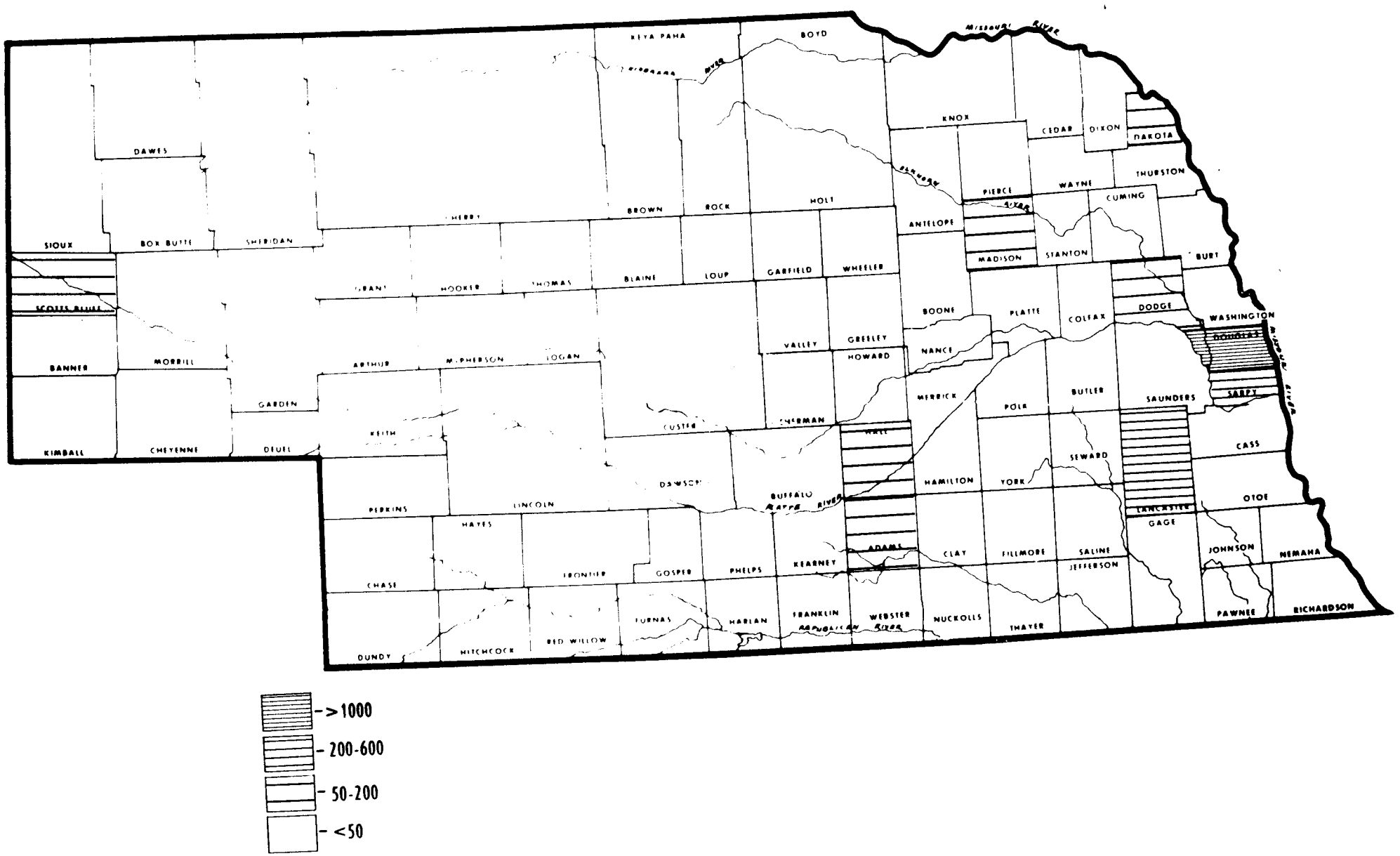
POPULATION YEAR - 1978

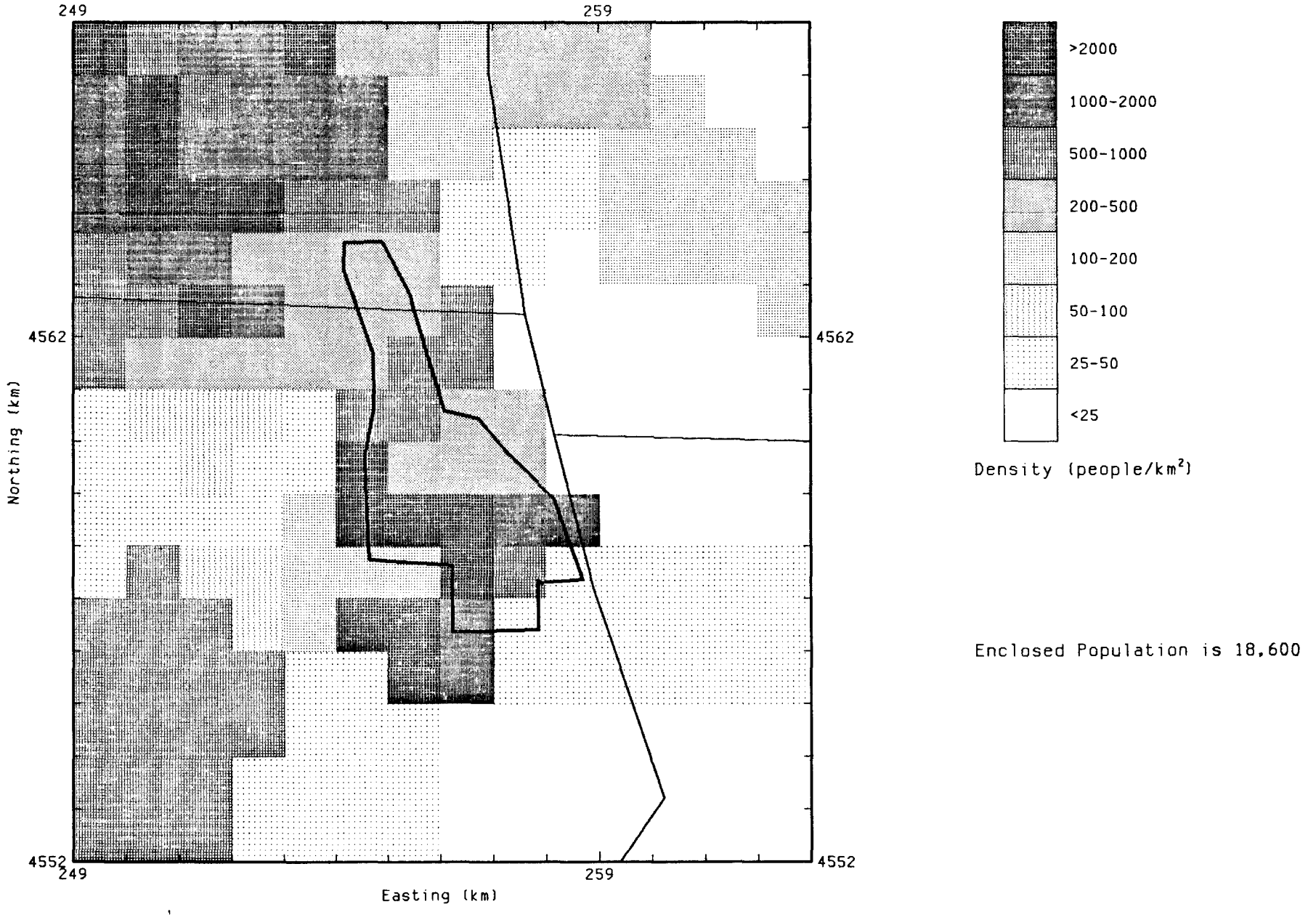
51 STATES FOUND ON POPULATION-FILE INDEX.
3141 COUNTIES.
232567 BG/ED'S.
1000 BG/ED'S PER PAGE IN POPFILE.

5 BG/ED-S WITH A TOTAL POPULATION OF 1511 EXTRACTED FROM COUNTY 31019
46 BG/ED-S WITH A TOTAL POPULATION OF 21431 EXTRACTED FROM COUNTY 31047
4 BG/ED-S WITH A TOTAL POPULATION OF 693 EXTRACTED FROM COUNTY 31063
3 BG/ED-S WITH A TOTAL POPULATION OF 660 EXTRACTED FROM COUNTY 31073
3 BG/ED-S WITH A TOTAL POPULATION OF 377 EXTRACTED FROM COUNTY 31111
2 BG/ED-S WITH A TOTAL POPULATION OF 409 EXTRACTED FROM COUNTY 31137

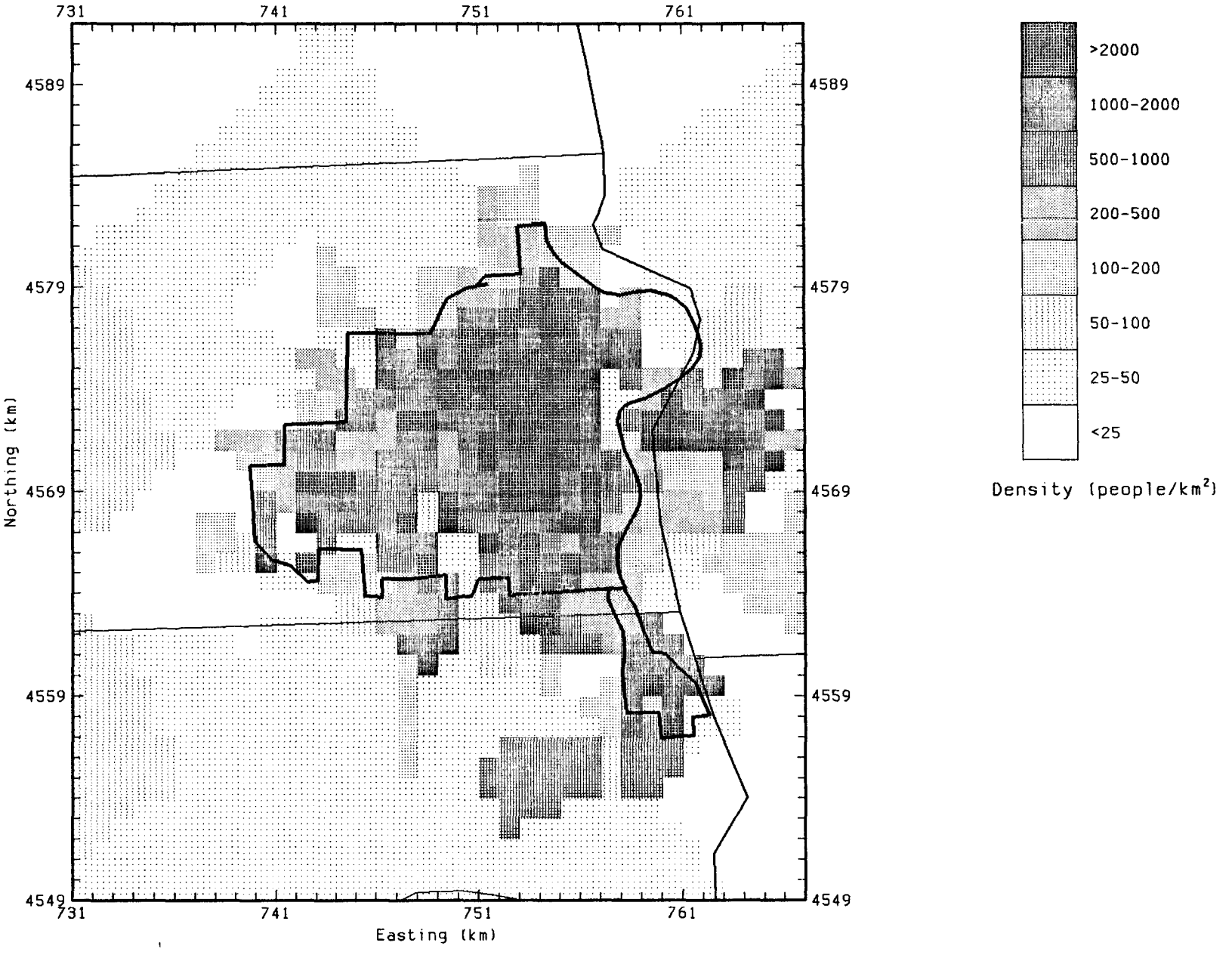
Figure 1

Population Density (People/mi^2)

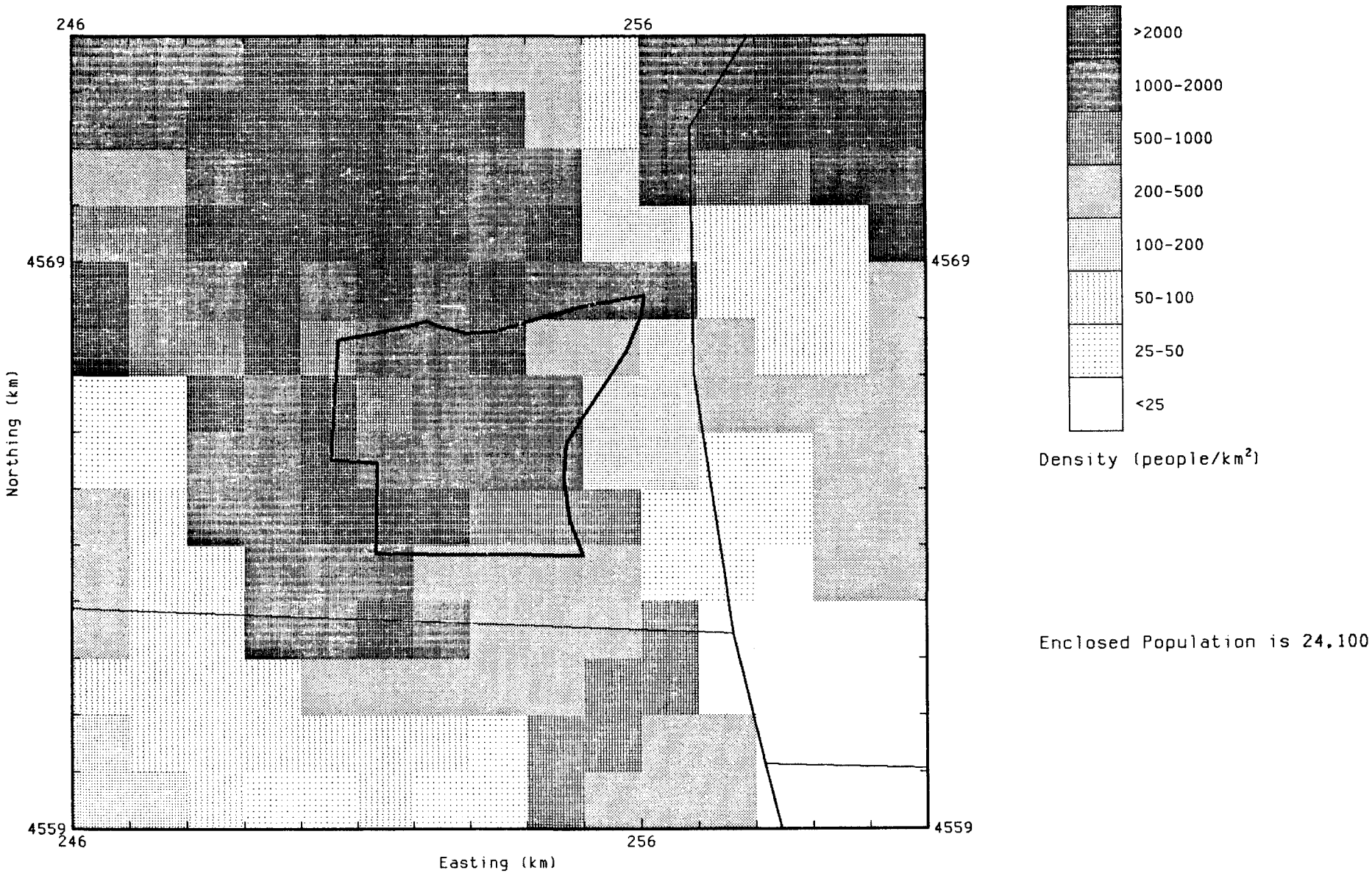




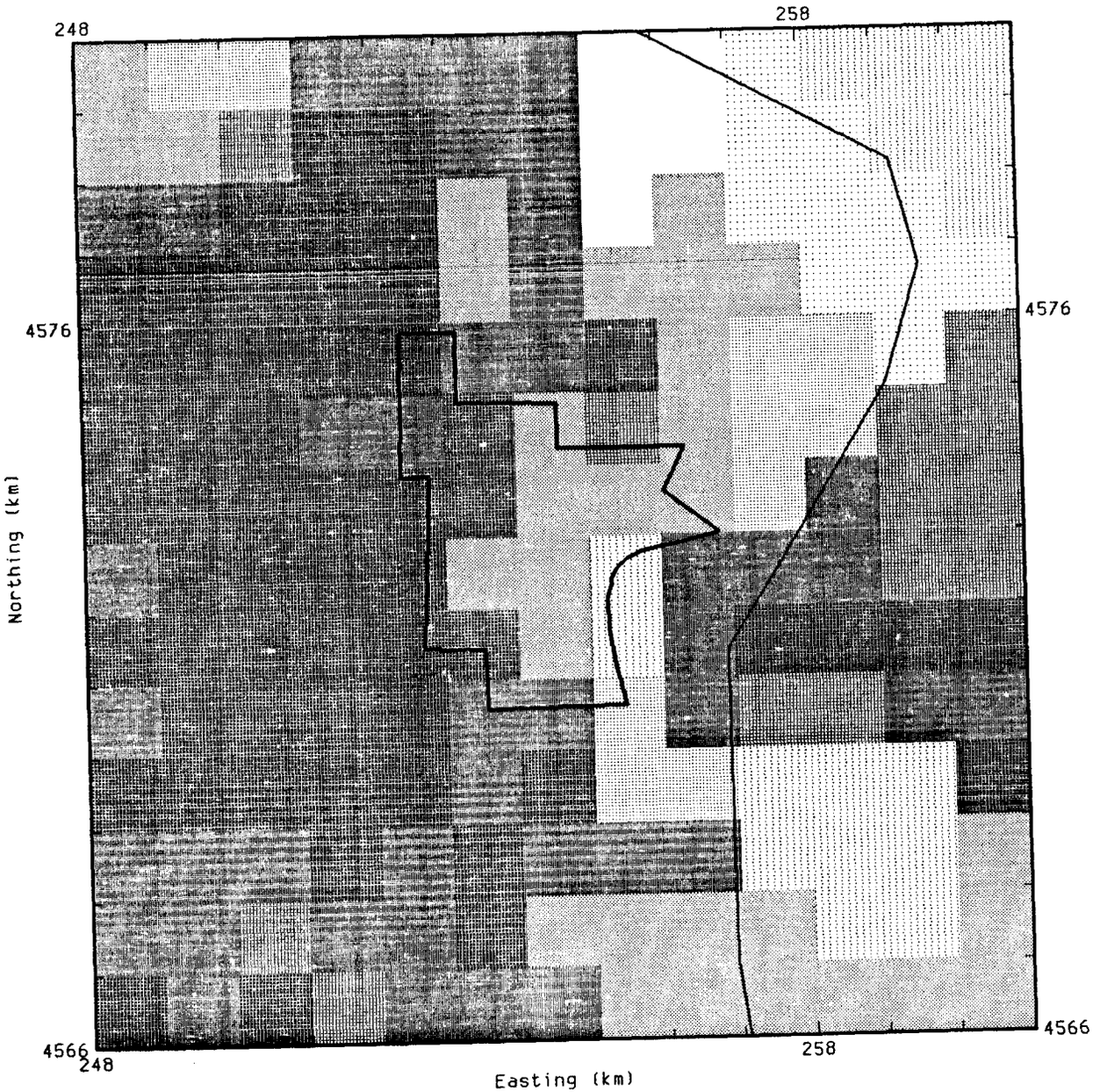
Omaha TSP SNA
Population Density Map for Polygon 60

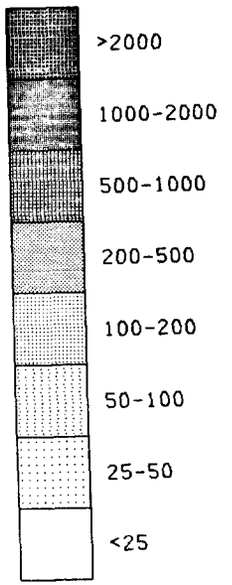


Population Density Map for Omaha, Nebraska -- TSP SNAs



Omaha TSP PNA
Population Density Map for Polygon 61

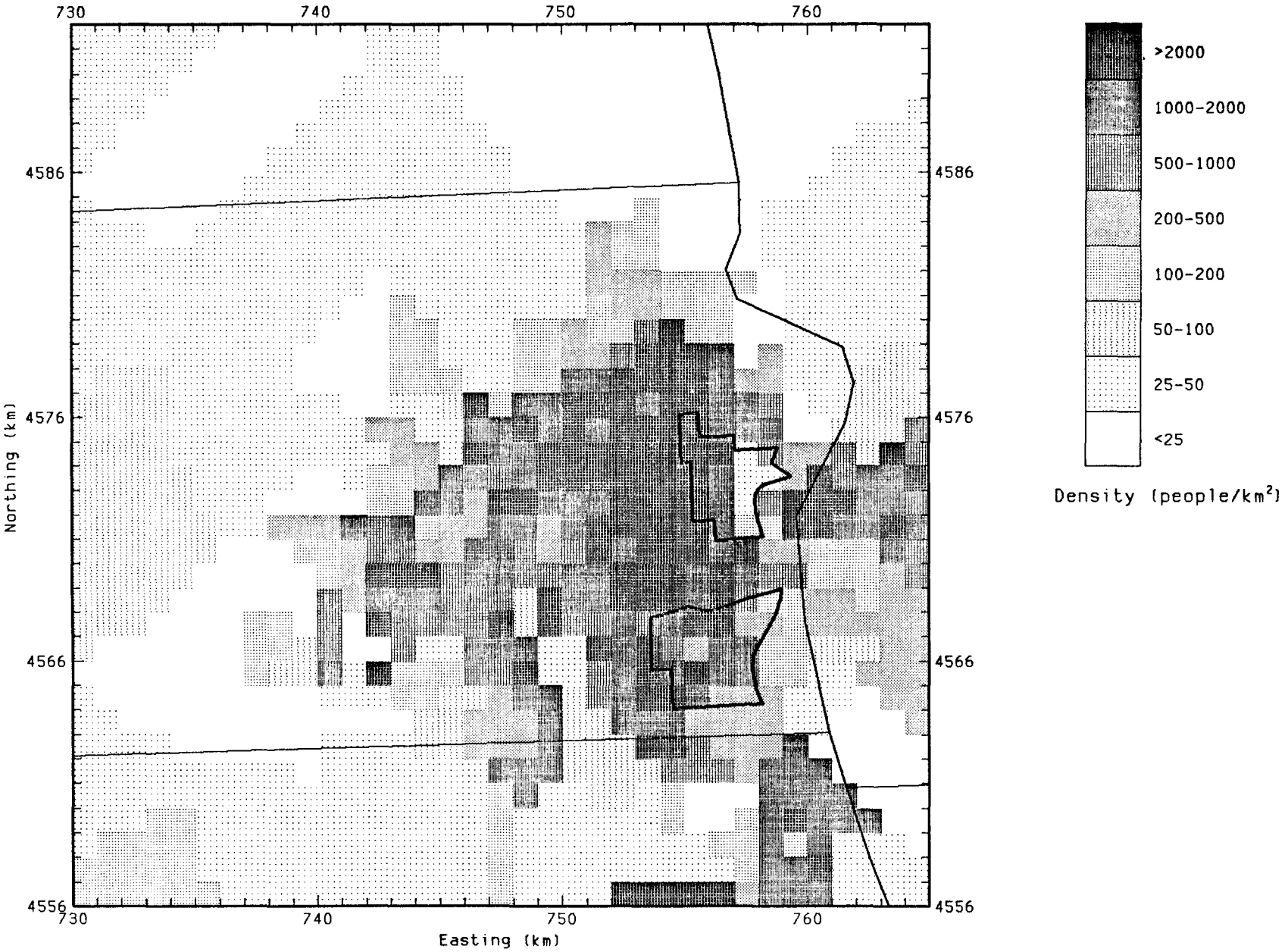




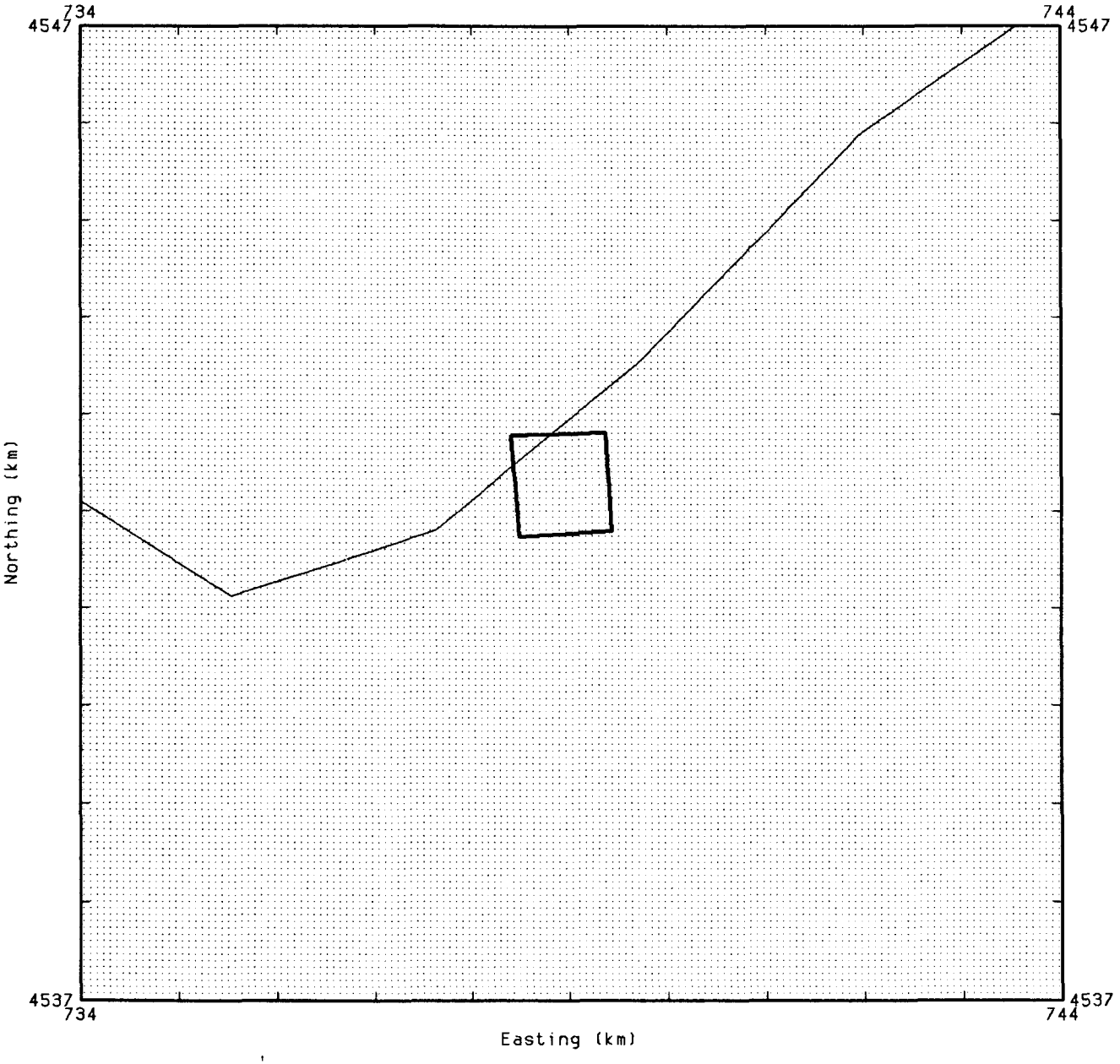
Density (people/km^2)

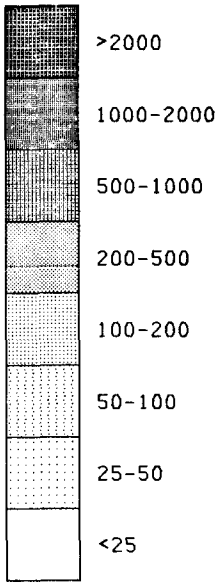
Enclosed Population is 19,600

Omaha TSP PNA
Population Density Map for Polygon 62



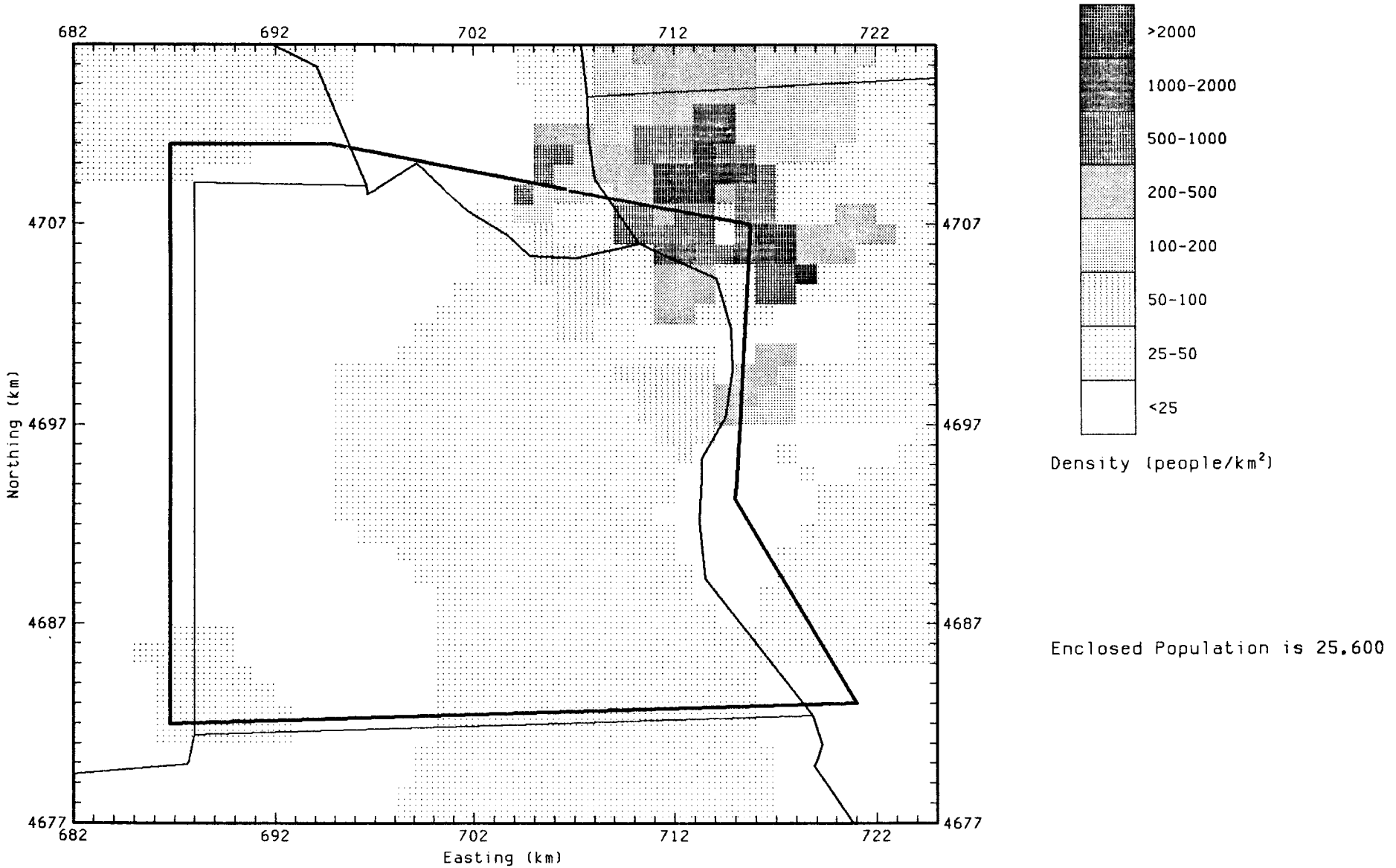
Population Density Map for Omaha, Nebraska -- TSP PNAs



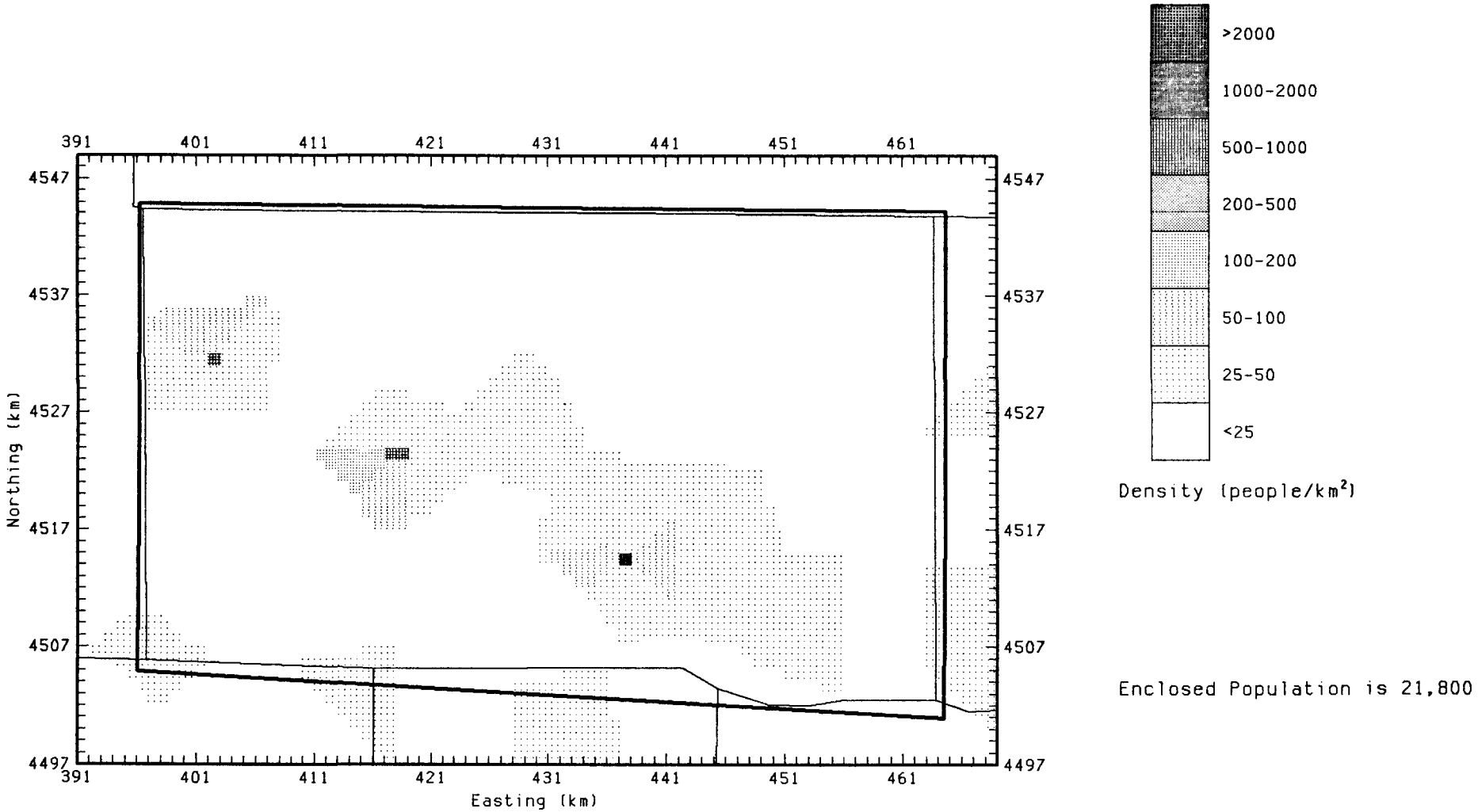


Enclosed Population is 17

Louisville TSP PNA
Population Density Map for Polygon 64



South Sioux City TSP Unclass
Population Density Map for Polygon 65



Dawson County TSP Unclass
Population Density Map for Polygon 66

```
REGION - 55
REGION ORIGIN (UTM COORDINATES/METERS)
        EASTING -                239000.
        NORTHING -              4558000.
        ZONE -                       15
REGION SIZE (METERS)
        EAST-WEST -              26000.
        NORTH-SOUTH -            29000.

POPULATION YEAR - 1978


     51 STATES FOUND ON POPULATION-FILE INDEX.
   3141 COUNTIES.
 232567 BG/ED'S.
   1000 BG/ED'S PER PAGE IN POPFILE.

      1 BG/ED-S WITH A TOTAL POPULATION OF       20 EXTRACTED FROM COUNTY 19129
     91 BG/ED-S WITH A TOTAL POPULATION OF    66635 EXTRACTED FROM COUNTY 19155
    455 BG/ED-S WITH A TOTAL POPULATION OF   392548 EXTRACTED FROM COUNTY 31055
     51 BG/ED-S WITH A TOTAL POPULATION OF    52726 EXTRACTED FROM COUNTY 31153


    598 BG/ED-S WITH A TOTAL POPULATION OF   511929 EXTRACTED
REGION - 56
REGION ORIGIN (UTM COORDINATES/METERS)
        EASTING -                690000.
        NORTHING -              4513000.
        ZONE -                       14
REGION SIZE (METERS)
        EAST-WEST -              12000.
        NORTH-SOUTH -            14000.

POPULATION YEAR - 1978
```

Polygon # 55
etc.

51 STATES FOUND ON POPULATION-FILE INDEX.
3141 COUNTIES.
232567 BG/ED'S.
1000 BG/ED'S PER PAGE IN POPFILE.

177 BG/ED-S WITH A TOTAL POPULATION OF 167200 EXTRACTED FROM COUNTY 31109

177 BG/ED-S WITH A TOTAL POPULATION OF 167200 EXTRACTED
REGION - 57
REGION ORIGIN (UTM COORDINATES/METERS)
EASTING - 682000.
NORTHING - 4508000.
ZONE - 14
REGION SIZE (METERS)
EAST-WEST - 24000.
NORTH-SOUTH - 25000.

POPULATION YEAR - 1978

51 STATES FOUND ON POPULATION-FILE INDEX.
3141 COUNTIES.
232567 BG/ED'S.
1000 BG/ED'S PER PAGE IN POPFILE.

208 BG/ED-S WITH A TOTAL POPULATION OF 173778 EXTRACTED FROM COUNTY 31109

208 BG/ED-S WITH A TOTAL POPULATION OF 173778 EXTRACTED
REGION - 58
REGION ORIGIN (UTM COORDINATES/METERS)
EASTING - 710000.
NORTHING - 4513000.
ZONE - 14
REGION SIZE (METERS)
EAST-WEST - 64000.
NORTH-SOUTH - 42000.

POPULATION YEAR - 1978

51 STATES FOUND ON POPULATION-FILE INDEX.
3141 COUNTIES.
232567 BG/ED'S.
1000 BG/ED'S PER PAGE IN POPFILE.

2 BG/ED-S WITH A TOTAL POPULATION OF 706 EXTRACTED FROM COUNTY 19071
2 BG/ED-S WITH A TOTAL POPULATION OF 846 EXTRACTED FROM COUNTY 19129
49 BG/ED-S WITH A TOTAL POPULATION OF 20700 EXTRACTED FROM COUNTY 31025
3 BG/ED-S WITH A TOTAL POPULATION OF 952 EXTRACTED FROM COUNTY 31131
7 BG/ED-S WITH A TOTAL POPULATION OF 4206 EXTRACTED FROM COUNTY 31153
6 BG/ED-S WITH A TOTAL POPULATION OF 2997 EXTRACTED FROM COUNTY 31155

EAST-WEST - 15000.
NORTH-SOUTH - 14000.

POPULATION YEAR - 1978

51 STATES FOUND ON POPULATION-FILE INDEX.
3141 COUNTIES.
232567 BG/ED'S.
1000 BG/ED'S PER PAGE IN POPFILE.

1 BG/ED-S WITH A TOTAL POPULATION OF 20 EXTRACTED FROM COUNTY 19129
48 BG/ED-S WITH A TOTAL POPULATION OF 36221 EXTRACTED FROM COUNTY 19155
191 BG/ED-S WITH A TOTAL POPULATION OF 166082 EXTRACTED FROM COUNTY 31055
31 BG/ED-S WITH A TOTAL POPULATION OF 26284 EXTRACTED FROM COUNTY 31153

271 BG/ED-S WITH A TOTAL POPULATION OF 228607 EXTRACTED

REGION - 62
REGION ORIGIN (UTM COORDINATES/METERS)
EASTING - 248000.
NORTHING - 4566000.
ZONE - 15
REGION SIZE (METERS)
EAST-WEST - 13000.
NORTH-SOUTH - 14000.

POPULATION YEAR - 1978

51 STATES FOUND ON POPULATION-FILE INDEX.
3141 COUNTIES.
232567 BG/ED'S.
1000 BG/ED'S PER PAGE IN POPFILE.

53 BG/ED-S WITH A TOTAL POPULATION OF 40469 EXTRACTED FROM COUNTY 19155
285 BG/ED-S WITH A TOTAL POPULATION OF 235640 EXTRACTED FROM COUNTY 31055

338 BG/ED-S WITH A TOTAL POPULATION OF 276109 EXTRACTED

REGION - 64
REGION ORIGIN (UTM COORDINATES/METERS)
EASTING - 734000.
NORTHING - 4537000.
ZONE - 14
REGION SIZE (METERS)
EAST-WEST - 10000.
NORTH-SOUTH - 10000.

POPULATION YEAR - 1978

51 STATES FOUND ON POPULATION-FILE INDEX.
3141 COUNTIES.
232567 BG/ED'S.
1000 BG/ED'S PER PAGE IN POPFILE.

3 BG/ED-S WITH A TOTAL POPULATION OF 1515 EXTRACTED FROM COUNTY 31025

3 BG/ED-S WITH A TOTAL POPULATION OF 1515 EXTRACTED
REGION - 65
REGION ORIGIN (UTM COORDINATES/METERS)
EASTING - 682000.
NORTHING - 4677000.
ZONE - 14
REGION SIZE (METERS)
EAST-WEST - 43000.
NORTH-SOUTH - 39000.

POPULATION YEAR - 1978

51 STATES FOUND ON POPULATION-FILE INDEX.
3141 COUNTIES.
232567 BG/ED'S.
1000 BG/ED'S PER PAGE IN POPFILE.

90 BG/ED-S WITH A TOTAL POPULATION OF 90463 EXTRACTED FROM COUNTY 19193
31 BG/ED-S WITH A TOTAL POPULATION OF 17419 EXTRACTED FROM COUNTY 31043
6 BG/ED-S WITH A TOTAL POPULATION OF 1970 EXTRACTED FROM COUNTY 31051
4 BG/ED-S WITH A TOTAL POPULATION OF 1654 EXTRACTED FROM COUNTY 31173
3 BG/ED-S WITH A TOTAL POPULATION OF 1866 EXTRACTED FROM COUNTY 46127

134 BG/ED-S WITH A TOTAL POPULATION OF 113372 EXTRACTED
REGION - 66
REGION ORIGIN (UTM COORDINATES/METERS)
EASTING - 391000.
NORTHING - 4497000.

ZONE - 14
REGION SIZE (METERS)
EAST-WEST - 78000.
NORTH-SOUTH - 52000.

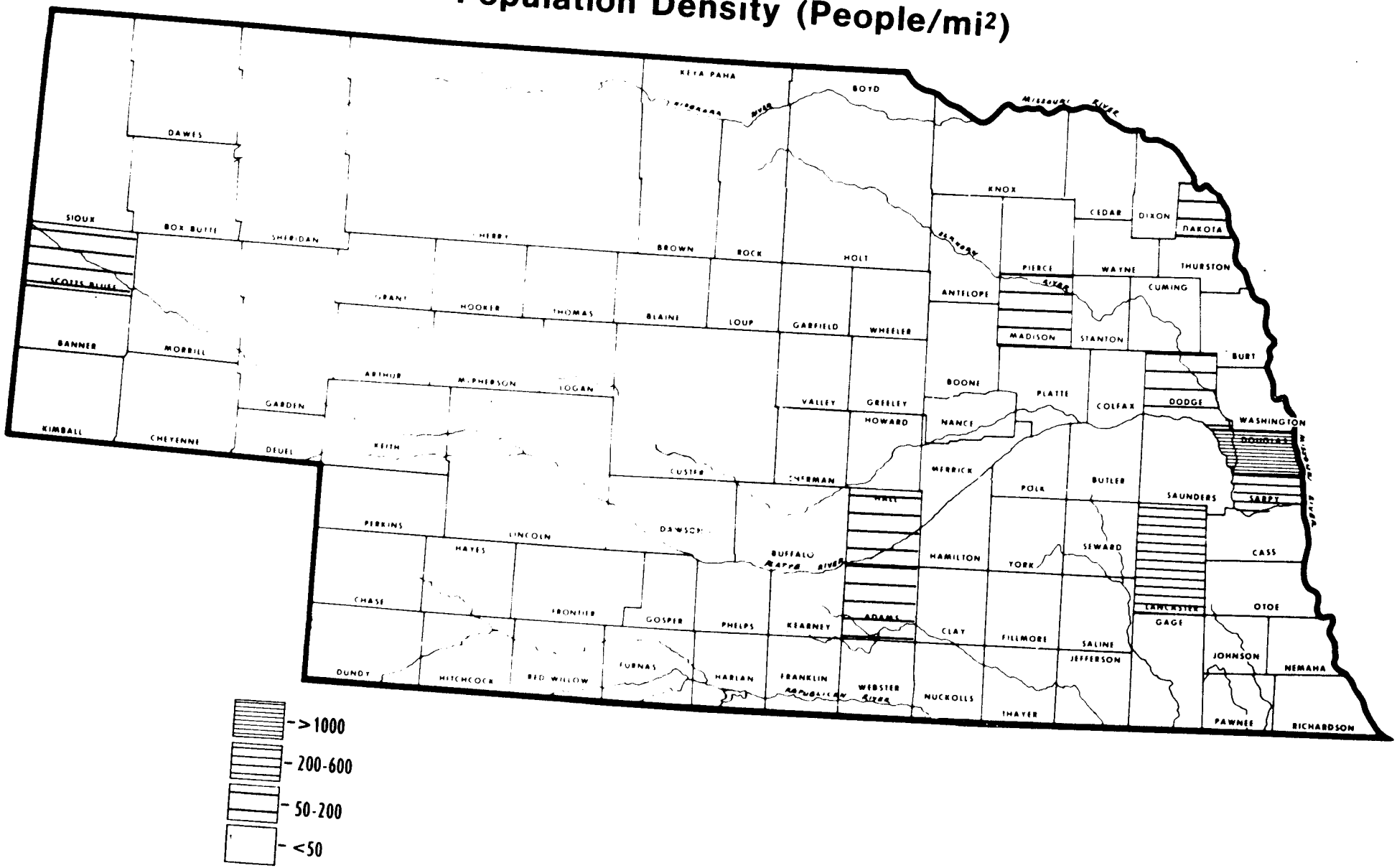
POPULATION YEAR - 1978

51 STATES FOUND ON POPULATION-FILE INDEX.
3141 COUNTIES.
232567 BG/ED'S.
1000 BG/ED'S PER PAGE IN POPFILE.

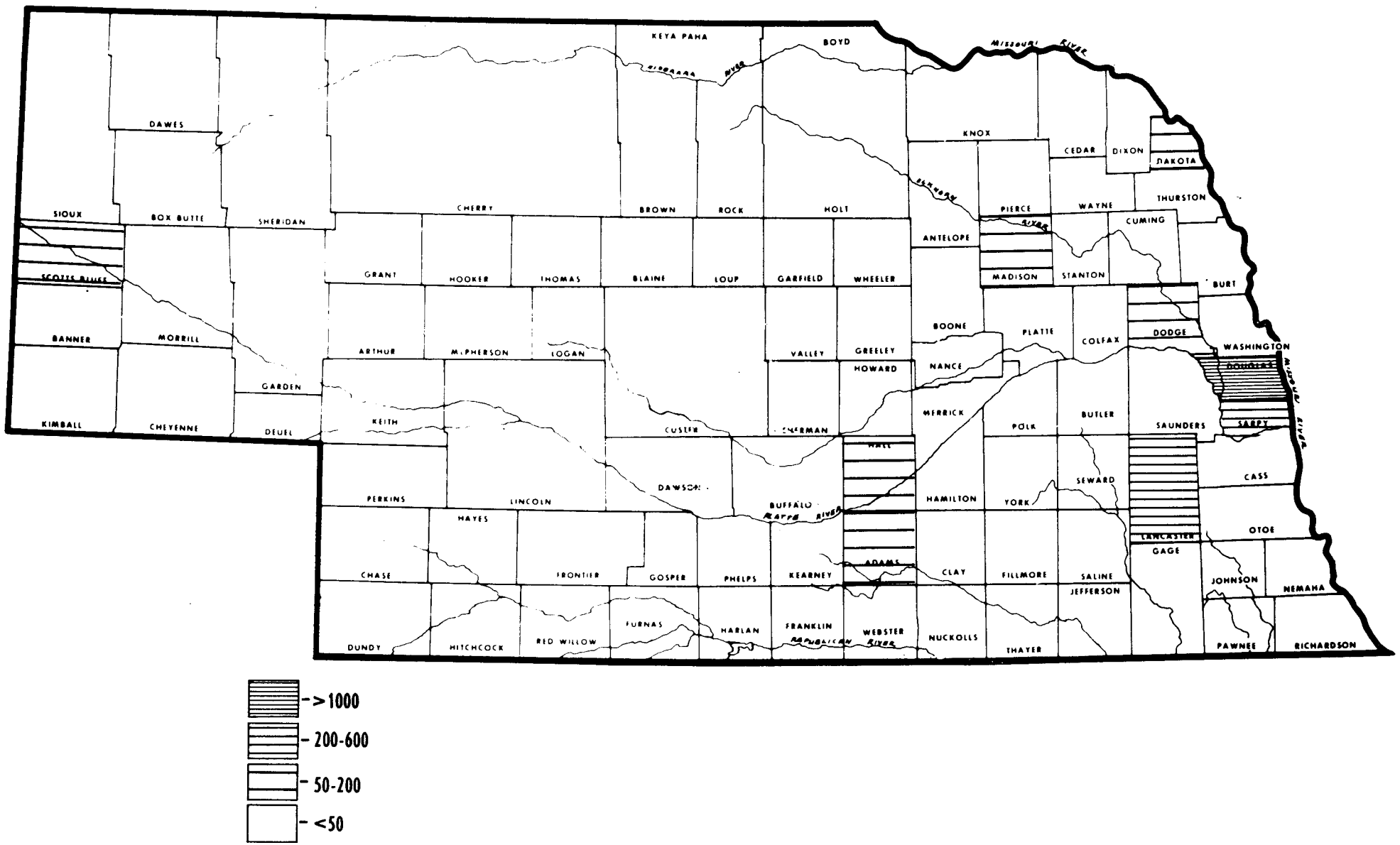
5	BG/ED-S WITH A TOTAL POPULATION OF	1511	EXTRACTED FROM COUNTY 31019
46	BG/ED-S WITH A TOTAL POPULATION OF	21431	EXTRACTED FROM COUNTY 31047
4	BG/ED-S WITH A TOTAL POPULATION OF	693	EXTRACTED FROM COUNTY 31063
3	BG/ED-S WITH A TOTAL POPULATION OF	660	EXTRACTED FROM COUNTY 31073
3	BG/ED-S WITH A TOTAL POPULATION OF	377	EXTRACTED FROM COUNTY 31111
2	BG/ED-S WITH A TOTAL POPULATION OF	409	EXTRACTED FROM COUNTY 31137

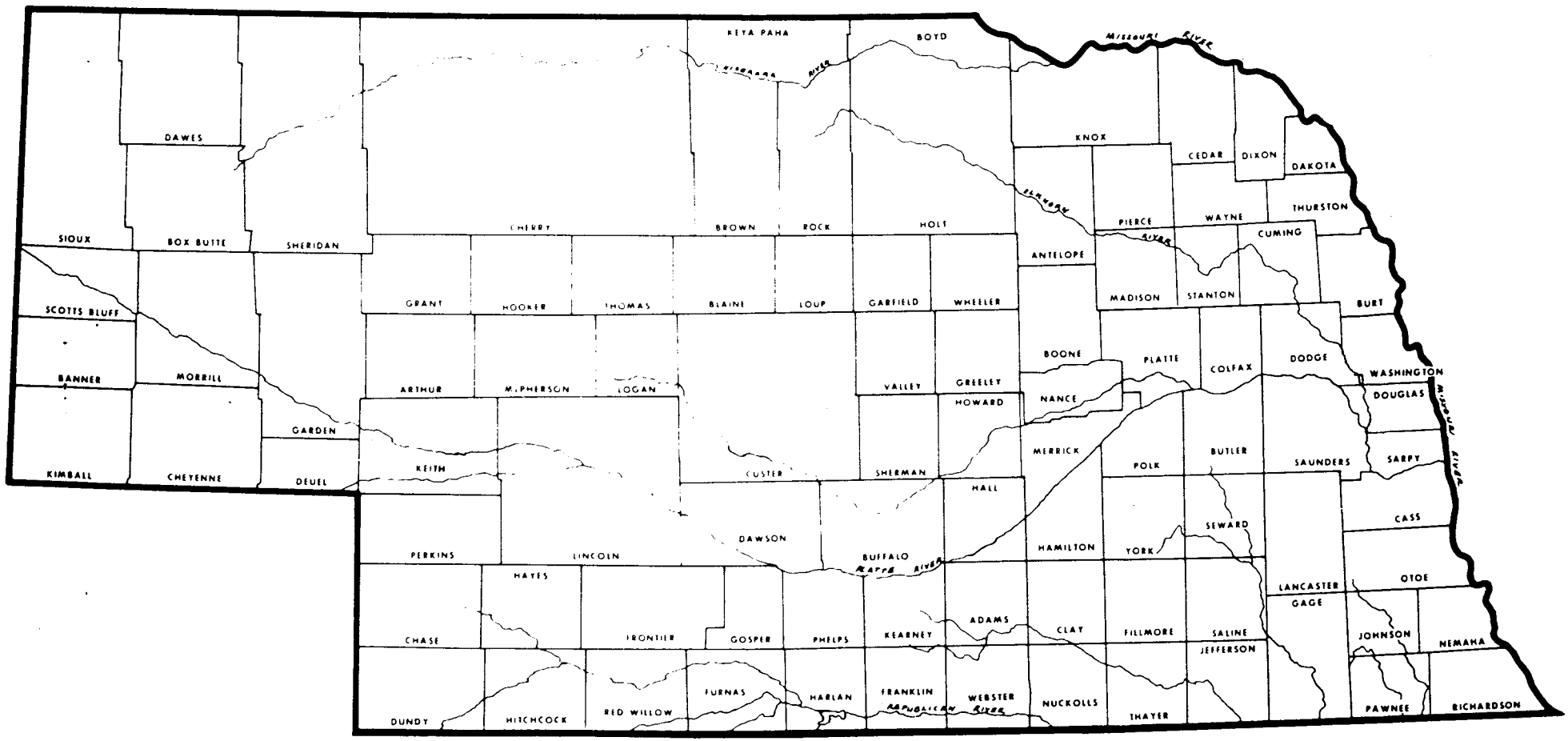
Figure 1

Population Density (People/mi²)



Population Density (People/mi²)

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BOYD
Missouri River
DAWES
KNOX
CEDAR
DIXON
DAKOTA
Niobrara River
THURSTON
PIERCE
WAYNE
Elkhorn River
CUMING
SIOUX
BOX BUTTE
SHERIDAN
CHERRY
BROWN
ROCK
HOLT
ANTELOPE
MADISON
STANTON
BURT
SCOTTS BLUFF
GRANT
HOOKER
THOMAS
BLAINE
LOUP
GARFIELD
WHEELER
BOONE
PLATTE
COLFAX
DODGE
WASHINGTON
BANNER
MORRILL
ARTHUR
McPHERSON
LOGAN
VALLEY
GREELEY
HOWARD
NANCE
DOUGLAS
Missouri River
GARDEN
MERRICK
POLK
BUTLER
SAUNDERS
SARPY
KIMBALL
CHEYENNE
DEUEL
KEITH
CUSTER
SHERMAN
HALL
CASS
SEWARD
PERKINS
LINCOLN
DAWSON
BUFFALO
HAMILTON
YORK
Platte River
HAYES
LANCASTER
OTOE
GAGE
CHASE
FRONTIER
GOSPER
PHELPS
KEARNEY
ADAMS
CLAY
FILLMORE
SALINE
JOHNSON
NEMAHA
JEFFERSON
FURNAS
HARLAN
FRANKLIN
WEBSTER
NUCKOLLS
THAYER
DUNDY
HITCHCOCK
RED WILLOW
Republican River
PAWNEE
RICHARDSON

TABLE 2

LEGEND FOR AMBIENT MONITORING DATA MAPS

Boundaries

- Primary Nonattainment Area
- Secondary Nonattainment Area
- Unclassified Area

Monitor Symbol Colors and Flag

- No Violation of Standard
- Violation of Secondary Standard
- Violation of Primary Standard
- Exceedance of Alert Level

Annotation for Standards Violated

- A — Annual Primary Standard
- Q — Quarterly Primary Standard
- 24 — 24-hour Primary Standard
- 24 — 24-hour Secondary Standard
- 8 — 8-hour Primary Standard
- 3 — 3-hour Secondary Standard
- 1 — 1-hour Primary Standard

Annotation for Trends

- ↑ Increasing Trend
- ∧ Probable Increasing Trend
- — No Trend
- ∨ Probable Decreasing Trend
- ↓ Decreasing Trend

(Where two trend symbols are shown, the first is for long-term averages, the second for 24-hour observations.)

Monitor Symbol Sizes

- Microscale
- Middle Scale
- Neighborhood Scale
- Urban Scale
- Regional Scale

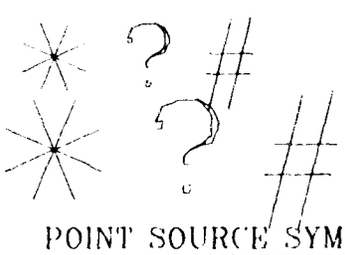
Data Completeness

- Data met completeness criteria each year.
- Data did not meet completeness criteria one or more years.

TABLE 3

LEGEND FOR EMISSIONS DATA MAPS

POINT SOURCE SYMBOL SIZE -- EMISSIONS (TONS/YEAR)



	NON-LEAD	LEAD
? #	100 - 1000	5 - 25
	1001 - 5000	26 - 100
	OVER 5000	OVER 100

POINT SOURCE SYMBOL COLOR -- STACK HEIGHT (METERS)

?	UNKNOWN
	1 - 45
	46 - 120
	OVER 120

AMBIENT MONITOR SYMBOLS

■	NAMS
●	SLAMS
▲	SPMS