Concentrations of Polynuclear Aromatic Hydrocarbons and Inorganic Constituents in Ambient Surface Soils, Chicago, Illinois: 2001-02

Water-Resources Investigations Report 03-4105

In cooperation with the Chicago Department of Environment

U.S. Department of the Interior
U.S. Geological Survey
Concentrations of Polynuclear Aromatic Hydrocarbons and Inorganic Constituents in Ambient Surface Soils, Chicago, Illinois: 2001-02

By Robert T. Kay¹, Terri L. Arnold¹, William F. Cannon¹, David Graham², Eric Morton³, and Raymond Bienert³

Water-Resources Investigations Report 03-4105

In cooperation with the Chicago Department of Environment

Urbana, Illinois
2003

¹ U.S. Geological Survey
² Chicago Department of Environment
³ TetraTech EM, Inc.
## CONTENTS

Abstract ........................................................................................................................................................................... 1  
Introduction .................................................................................................................................................................... 2  
Purpose and Scope .......................................................................................................................................................... 5  
Acknowledgments .......................................................................................................................................................... 5  
Methods .......................................................................................................................................................................... 5  
Site Selection ................................................................................................................................................................. 5  
Sample Collection and Analysis ................................................................................................................................... 8  
Statistical Analysis of Uncensored Polynuclear Aromatic Hydrocarbon Data ......................................................... 10  
  Populations Tests .......................................................................................................................................................... 10  
  Test for Lognormal Distribution .................................................................................................................................. 11  
  Graphical Analysis ...................................................................................................................................................... 11  
  Descriptive Statistics .................................................................................................................................................. 11  
  Outlier Test ............................................................................................................................................................... 11  
  95th Percentile, 95-Percent Confidence Interval for the Mean, and Geometric Mean ........................................ 11  
Relation Between Polynuclear Aromatic Hydrocarbon Concentrations and Land Use ........................................ 11  
  Simple Linear Regression .......................................................................................................................................... 12  
  Unbalanced One-Way Analysis of Variance ............................................................................................................... 12  
Geospatial Analyses of Benzo(a)pyrene Concentrations ............................................................................................ 13  
Statistical Analysis of Censored Polynuclear Aromatic Hydrocarbon Data .............................................................. 13  
  Graphical Analysis ...................................................................................................................................................... 13  
  Descriptive Statistics .................................................................................................................................................. 14  
  Outlier Test ............................................................................................................................................................... 14  
Relation Between Polynuclear Aromatic Hydrocarbon Concentrations and Land Use ........................................ 14  
  Correlation of Polynuclear Aromatic Hydrocarbon and Inorganic Concentrations ................................................ 14  
Analysis of Polynuclear Aromatic Hydrocarbon Data ................................................................................................. 15  
Analysis of Inorganic Data ......................................................................................................................................... 25  
Summary and Conclusions .......................................................................................................................................... 26  
References Cited .......................................................................................................................................................... 27  
Appendices: 
  1. Polynuclear Aromatic Hydrocarbons in Ambient Surface Soils, Chicago, Illinois ............................................. 61  
  2. Inorganic Constituents in Ambient Surface Soils, Chicago, Illinois ................................................................. 67  

### Figures

1-4. Maps showing: 
  1. Land use within the city of Chicago, Illinois ........................................................................................................ 3  
  2. Locations of (A) subareas, (B) vertical strips, and (C) equal-area cells used for selection of random sample locations, Chicago, Illinois ...................................................................................... 6  
  3. Locations of (A) properties owned by the city of Chicago and Commonwealth Edison, (B) final fixed population of potential sites used to randomly select sampling sites, and (C) randomly selected sampling sites, Chicago, Illinois ...................................................................................... 7  
  4. Locations of surface-soil sampling sites, Chicago, Illinois .............................................................................. 9  

5-8. Graphs showing: 
  5. Boxplots of (A) uncensored and (B) censored polynuclear aromatic hydrocarbon concentrations in ambient surface soils, Chicago, Illinois ........................................................................... 16  
  6. Boxplots of natural-log transformed (A) uncensored and (B) censored polynuclear aromatic hydrocarbon concentrations in ambient surface soils, Chicago, Illinois .................................................. 18
7. Normal probability plots of natural-log transformed (A) uncensored and (B) censored polynuclear aromatic hydrocarbon concentrations in ambient surface soils, Chicago, Illinois .................................................................20
8. Frequency of detections of polynuclear aromatic hydrocarbons in ambient surface soils, Chicago, Illinois, plotted against molecular weight of compound ..............................................................................................................22
9. Map showing (A) kriged concentrations of benzo(a)pyrene in ambient surface soils, Chicago, Illinois and (B) standard errors of predicted concentrations ........................................................................................................24

Table

1. Illinois Environmental Protection Agency Tier 1 remediation objectives for polynuclear aromatic hydrocarbons in soils ........................................................................................................................................33
2. Soil-sampling site data collected during the investigation, Chicago, Illinois ..........................................................................................................................34
3. Summary of polynuclear aromatic hydrocarbon data in ambient surface soils, Chicago, Illinois ........................................................................36
4. Mean distance from sample locations to nearby major land-use categories, Chicago, Illinois ..........................................................37
5. Percentages of major land-use categories around soil-sampling sites, Chicago, Illinois ........................................................39
6. Number of soil-sampling sites near each major land-use category, Chicago, Illinois ............................................................................45
7. Shapiro-Wilk test statistic for normal distribution of natural-log-transformed polynuclear aromatic hydrocarbon data in ambient surface soils, Chicago, Illinois ..................................................................................45
8. Statistical summary of natural-log transformed polynuclear aromatic hydrocarbon data for censored compounds in ambient surface soils, Chicago, Illinois ........................................................................46
10. Statistical summary of natural-log transformed polynuclear aromatic hydrocarbon concentrations in ambient surface soils, Chicago, Illinois .........................................................................................48
11. Results of Wilcoxon-Rank-Sum test comparing polynuclear aromatic hydrocarbon concentrations in surface soils collected at city properties and Commonwealth Edison properties, Chicago, Illinois ........................................................................49
13. Physical properties of select polynuclear aromatic hydrocarbons ..........................................................................................................................51
14. Summary of average polynuclear aromatic hydrocarbon concentrations in air samples, Chicago, Illinois ..........................................................................................................................52
15. Results of one-way analysis of variance of polynuclear aromatic hydrocarbon concentrations and distance from nearest roadway, Chicago, Illinois ...............................................................................52
16. Statistical description of polynuclear aromatic hydrocarbons in ambient soils for different land-use categories, Chicago, Illinois ........................................................................................................53
17. Results of analysis of variance of uncensored polynuclear aromatic hydrocarbon concentrations in ambient soils by land use, Chicago, Illinois ..................................................................................................................55
18. Regression of polynuclear aromatic hydrocarbon concentrations in surface soils and percent industrial land use within a 1-mile radius of the sample, Chicago, Illinois ........................................................................55
19. Summary of data on inorganic constituents in ambient surface soils, Chicago, Illinois ........................................................................56
20. Comparison of arithmetic mean concentrations of select inorganic constituents in ambient surface soils, Chicago, Illinois with mean concentrations from surrounding agricultural soils ........................................................................57
## Conversion Factors and Abbreviated Soil- and Air-Quality Units

<table>
<thead>
<tr>
<th>Multiply</th>
<th>By</th>
<th>To obtain</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Length</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>inch (in.)</td>
<td>2.54</td>
<td>centimeter</td>
</tr>
<tr>
<td>foot (ft)</td>
<td>0.3048</td>
<td>meter</td>
</tr>
<tr>
<td>mile (mi)</td>
<td>1.609</td>
<td>kilometer</td>
</tr>
<tr>
<td><strong>Area</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>acre</td>
<td>0.4047</td>
<td>hectare</td>
</tr>
<tr>
<td>square foot (ft²)</td>
<td>0.09290</td>
<td>square meter</td>
</tr>
<tr>
<td>square mile (mi²)</td>
<td>2.590</td>
<td>square kilometer</td>
</tr>
<tr>
<td><strong>Mass</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ounce, avoirdupois (oz)</td>
<td>28.35</td>
<td>gram</td>
</tr>
</tbody>
</table>

**Temperature** in degrees Celsius (°C) may be converted to degrees Fahrenheit (°F) as follows:

°F = (1.8 x °C) + 32

**Abbreviated soil- and air-quality units**: Chemical concentration is given in metric units. Chemical concentration is given in micrograms per kilogram (µg/Kg) and in micrograms per cubic meter (µg/m³). Micrograms per kilogram is a unit expressing the concentration of chemical constituents as weight (micrograms) of the constituent per unit mass (kilogram) of soil. One milligram equals 1,000 micrograms. Micrograms per cubic meter is a unit expressing the concentration of chemical constituents as weight (micrograms) of the constituent per unit volume (cubic meter) of air.

**Abbreviations**:
- µg/L micrograms per liter
- mg/Kg milligrams per kilogram
Concentrations of Polynuclear Aromatic Hydrocarbons and Inorganic Constituents in Ambient Surface Soils, Chicago, Illinois: 2001-02

By Robert T. Kay, Terri L. Arnold, William F. Cannon, David Graham, Eric Morton, and Raymond Bienert

Abstract

Polynuclear aromatic hydrocarbon (PAH) compounds are ubiquitous in ambient surface soils in the city of Chicago, Illinois. PAH concentrations in samples collected in June 2001 and January 2002 were typically in the following order from highest to lowest: fluoranthene, pyrene, benzo(b)fluoranthene, phenanthrene, benzo(a)pyrene, chrysene, benzo(a)anthracene, benzo(k)fluoranthene, indeno(1,2,3-cd)pyrene, benzo(g,h,i)perylene, dibenzo(a,h)anthracene, and anthracene. Naphthalene, acenaphthene, acenaphthylene, and fluorene were consistently at the lowest concentrations in each sample.

Concentrations of the PAH compounds showed variable correlation. Concentrations of PAH compounds with higher molecular weights typically show a higher degree of correlation with other PAH compounds of higher molecular weight, whereas PAH compounds with lower molecular weights tended to show a lower degree of correlation with all other PAH compounds. These differences indicate that high and low molecular-weight PAHs behave differently once released into the environment.

Concentrations of individual PAH compounds in soils typically varied by at least three orders of magnitude across the city and varied by more than an order of magnitude over a distance of about 1,000 feet. Concentrations of a given PAH in ambient surface soils are affected by a variety of site-specific factors, and may be affected by proximity to industrial areas. Concentrations of a given PAH in ambient surface soils did not appear to be affected by the organic carbon content of the soil, proximity to non-industrial land use, or proximity to a roadway.

The concentration of the different PAH compounds in ambient surface soils appears to be affected by the propensity for the PAH compound to be in the vapor or particulate phase in the atmosphere. Lower molecular-weight PAH compounds, which are primarily in the vapor phase in the atmosphere, were detected in lower concentrations in the surface soils. Higher molecular-weight PAH compounds, which are present primarily in the particulate phase in the atmosphere, tended to be in higher concentrations in the surface soils. The apparent effect of the PAH phase in the atmosphere on the concentration of a PAH in ambient surface soils indicates that atmospheric settling of particulate matter is an important source of the PAH compounds in ambient surface soils in Chicago.

The distribution of PAH compounds within the city was complex. Comparatively high concentrations were detected near Lake Michigan in the northern part of the city, in much of the western part of the city, and in isolated areas in the southern part of the city. Concentrations were lower in much of the northwestern, south-central, southwestern, and far southern parts of the city.

The arithmetic mean concentration of arsenic, mercury, calcium, magnesium, phosphorus, copper, molybdenum, zinc, and selenium was from 2 to 6 times higher in ambient surface soils in the city of Chicago than in soils from surrounding agricultural areas. The arithmetic mean concentration of lead in Chicago soils was about 20 times higher. Concentrations of calcium and magnesium above
those of surrounding agricultural areas appear to be related to the effects of dolomite bedrock on the chemical composition of the soil. Elevated concentrations of the remaining elements listed above indicate a potential anthropogenic source(s) of these elements in Chicago soils.

INTRODUCTION

Polynuclear aromatic hydrocarbon compounds (PAHs) are a family of fused ring hydrocarbon compounds derived primarily from the incomplete combustion of organic material including wood, coal, oil, gasoline, and garbage and from leaching from coal-tar products such as asphalt and roofing shingles. PAHs also are derived from natural sources such as forest fires and volcanic eruptions. However, the majority of PAHs released to the environment are derived from anthropogenic sources such as the operation of motor vehicles; burning coal, wood, or trash in a residential furnace; and industrial sources such as thermoelectric power generation and coking operations. There are more than 100 PAH compounds. However, the PAH compounds of interest for environmental investigations are acenaphthene, acenaphthylene, anthracene, benzo(a)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(g,h,i)perylene, benzo(a)pyrene, chrysene, dibenzo(a,h)anthracene, fluoranthene, fluorene, indeno(1,2,3-cd)pyrene, naphthalene, phenanthrene, and pyrene.

PAH compounds are released to the environment largely from emissions to the atmosphere. PAHs in the atmosphere typically are in the vapor phase or attached to particulate matter and are capable of being transported long distances from their sources before deposition on the land surface during precipitation and particle settling. Additionally, PAH compounds can be emplaced in surface soils by routine operations or leaks from storage tanks and during waste-disposal activities such as the historical use of coal ash and debris from the Great Chicago Fire as fill material. Surface-fill material is common in the Chicago area (Kay and others, 1997). PAH compounds enter surface water and sediment primarily in discharges from industrial and wastewater-treatment plants, and roadside runoff. Although PAHs do not easily dissolve in water, given the proper conditions PAHs in soils, sediments, and surface water are capable of degrading ground-water quality. Because of their physical properties and methods of production and dispersal, PAHs typically occur as a mixture of compounds in environmental media.

As in all urban areas, substantial quantities of PAH compounds have been generated within the city of Chicago (fig. 1) as a result of incineration of wood, coal, and trash; construction of roads and parking lots; operation of motor vehicles; coking operations associated with steel manufacturing; production of electricity at manufactured gas facilities; use of creosote for wood preservation; and a variety of other processes (Simcik and others, 1997). As a result of current (2003) and historical production and disposal practices, PAH compounds have been detected in a number of environmental media within the city of Chicago. PAH compounds have been detected in soils at a number of residential, commercial, industrial, and waste-disposal sites (Ecology and Environment, Inc., 1990; Harza Engineering, Inc., 1994; Ecology and Environment, Inc., 2001; U.S. Army Corp of Engineers, 2001). An investigation of ground-water quality in the southern part of the city detected PAH compounds (Duwelius and others, 1996) that may have been derived from fill materials and road runoff. PAH compounds also have been detected in surface water and streambed sediment in the Chicago area (HydroQual Inc., 1985; U.S. Army Corp of Engineers, 1986, 2001; Sullivan and others, 1998) and in lake-bottom sediments in Lake Michigan (Simcik and others, 1996). PAH compounds in streambed sediments are at least partially derived from erosion of surface soils.

Many PAH compounds are suspected carcinogens or mutagens, and are deemed hazardous substances by the U.S. Environmental Protection Agency (USEPA). Consequently, cleanup of residential, commercial, industrial, and waste-disposal sites, including Resource Conservation and Recovery Act (RCRA), Superfund, and Brownfield sites, in the city of Chicago requires remediation of soils containing concentrations of PAH compounds above what is prescribed in the Illinois Environmental Protection Agency’s (IEPA) Tiered Approach to Cleanup Objectives (TACO) guidance (table 1). The TACO cleanup objectives vary with the intended future land use (industrial/commercial or residential) of the site, the route of exposure (ingestion, inhalation, and potential for migration...
Figure 1. Land use within the city of Chicago, Illinois.
to ground water), and the type of activity leading to the exposure (resident or site-construction worker). Because the city of Chicago derives its water supply entirely from Lake Michigan and city ordinances prohibit the use of ground water wells for potable water use, TACO remedial objectives pertaining to potential for migration to ground water will not be discussed in this report.

The TACO cleanup objectives for a compound are based on assessment of the risk or hazard it poses to human health and the environment and do not automatically take its ambient concentration into account. The site-specific cleanup goals governed by the TACO guidance are intended to allow property remediation of hazardous compounds present as a result of historical operations, based on the site’s future use, not to remove compounds present as a result of ambient (background) deposition. Therefore, the TACO guidance does allow for an interested party to calculate the background concentration of a compound in soil, which can then be used as the remediation objective.

Without an accurate determination of the ambient concentrations of PAH compounds in urban soils, it can be difficult to determine if concentrations of PAH compounds encountered in soils during site remediation are the result of contamination or ambient effects. Soil remediation may include excavation and disposal of contaminated soil to an appropriate waste-disposal facility or installation of an engineered barrier (clean soils, pavement, buildings) to prevent human contact. Often, excess soil removed during construction projects containing PAH compounds at concentrations similar to ambient concentrations but above site-remediation objectives must be disposed of in local landfills at additional cost. Therefore, the absence of values for the ambient concentrations of PAH compounds in surface soils in the city of Chicago may result in increased site-remediation costs associated with unnecessary soil excavation and disposal and installation and maintenance of unnecessary engineered barriers. Site-specific removal of soils containing ambient concentrations of PAH compounds also is unlikely to result in an improvement to human health and the environment. Development of a scientifically valid assessment of ambient concentrations of PAH compounds in surface soils and identification of the factors that affect PAH concentrations in surface soils has the potential to substantially help project managers and site investigators increase the effectiveness of remediation at waste-disposal sites in Chicago.

Potential receptors (with the exception of construction workers under some circumstances) are most likely to be exposed to PAHs through ingestion and direct contact with compounds in surficial soil, rather than to PAHs in soil at greater depths. As a consequence, it particularly is important to characterize surficial soils. For the purposes of conducting Tier 3 risk assessments under TACO, the IEPA requires that exposure point concentrations for soil ingestion be calculated based on analytical data for surface soil (typically 0 to 6 in. below ground surface) in addition to the requirement of evaluating the upper 3 ft of the soil.

The U.S. Geological Survey (USGS), in cooperation with the city of Chicago, Department of Environment, assessed the concentration of each of the regulated PAH compounds in ambient surface soils within the city. For the purposes of this report, ambient soils are those soils whose chemical composition is affected by ubiquitous natural and anthropogenic processes rather than the site-specific disposal of waste materials. This investigation did not include O’Hare Airport on the far northwestern part of the city. Samples were collected in June 2001 and January 2002 from areas near residential, commercial, and industrial land use. Based on discussions with IEPA personnel, analytical results from surficial soil samples, for the purposes of comparison, were considered applicable for all depths. This approach is consistent with the TACO guidelines, which recommend use of a single set of inorganic chemical background concentrations in surface soil for comparison to analytical results from site-specific soil samples collected at various depths (Illinois Pollution Control Board, 2002; Illinois Environmental Protection Agency, 1994).

In addition to PAH compounds, samples of surface soils were analyzed to characterize concentrations of a number of inorganic constituents, including metals and major elements. Analysis of the concentration of inorganic constituents was performed by the USGS as part of a program to chemically characterize surface soils in the United States.
Purpose and Scope

This report describes the results of an investigation that used stratified random sampling techniques and geographic information system (GIS) analysis to characterize the concentration of PAH compounds in ambient surface soils in the city of Chicago. In addition, a preliminary assessment is provided of the concentrations of inorganic constituents in these soils. This report presents the results of soil-quality sampling for PAHs and inorganic constituents at 57 randomly selected sites. It also presents statistical and GIS analysis of the soil PAH data. This report provides summary statistics of the concentrations of the PAH compounds, including the mean concentration of the individual PAH compounds. A summary of the concentrations of inorganic constituents is given. Potential sources of PAH compounds and inorganic constituents are identified, along with some of the factors that may affect the concentrations of these constituents in ambient soils.

Acknowledgments

The authors thank Commonwealth Edison for allowing access to their property for sample collection.

METHODS

This investigation required the selection of appropriate sampling sites, collection of representative samples, accurate measurement of concentrations of PAHs and inorganic constituents in the samples, and statistical analysis of PAH concentrations. Because sampling for inorganic constituents was designed to provide only a general assessment of the distribution and concentration of these compounds in Chicago and was not designed to meet regulatory needs, the inorganic data were not statistically analyzed.

Site Selection

A random site-selection computer program (Scott, 1990) was used with a GIS spatial data base to select 173 potential sampling sites in Chicago. Of these potential sampling sites, 60 were selected as primary sites and 113 were selected as alternate sites in the event that a primary site could not be sampled. For the purpose of site selection, the city of Chicago boundary was used as the boundary of the study area (fig. 1). Using the program, the study area was divided into 4,601 small square polygons (subareas), each of which was approximately 0.05 mi² (fig. 2a). These subareas later were aggregated to create equal-area cells from which sites were selected randomly. To create the cells from which the sites were selected, the subareas were accumulated into eight vertical strips (fig. 2b). The number of vertical strips was determined by taking the square root of the number of primary sites and rounding the result to the nearest whole number. The area of each vertical strip was approximately 30 mi². The number of cells created was equal to the number of primary sites (60), resulting in 60 equal-area cells (fig. 2c). Cells were created by aggregating each horizontal row of subareas within consecutive vertical strips, beginning in the lower left corner of the study area, until the desired area was obtained. The resulting cells had irregular shapes and were approximately 3.8 mi² in area.

A total of 374 properties owned by the city of Chicago and Commonwealth Edison (a local utility) were used as the population of potential sampling sites for this study (fig. 3a). Properties owned by the city of Chicago including libraries, fire stations, and police stations and properties owned by Commonwealth Edison are located throughout the city. Point locations of these properties were combined into one layer using the GIS, with one point location representing each property. The density of the properties in the study area was about 0.5 of a point per square mile.

The modified GIS layer of properties owned by the city and Commonwealth Edison contained a total of 373 points (fig. 3b). These points were used as a fixed population of potential sites from which the site-selection program could choose randomly. From this fixed population of 373 points and the 60 equal-area cells, the site-selection program randomly selected 60 primary sites (one per cell), 58 secondary sites, and 55 tertiary sites (fig. 3c). The secondary and tertiary sites are alternate sites that could have been used if the primary site in a cell could not be
Figure 2. Locations of (A) subareas, (B) vertical strips, and (C) equal-area cells used for selection of random sample locations, Chicago, Illinois.
Figure 3. Locations of (A) properties owned by the city of Chicago and Commonwealth Edison, (B) final fixed population of potential sites used to randomly select sampling sites, and (C) randomly selected sampling sites, Chicago, Illinois.
sampled. Because of the distribution of potential sites, not every cell had enough points for the program to select two alternate sites from each cell.

Historical land use at each of the sample locations was evaluated by the Chicago Department of Environment (CDOE) to determine if PAH compounds derived from industrial activities or waste-disposal operations at the site might be present. Evaluation of historical land use consisted of reviewing available Sanborn Fire Insurance maps and aerial photographs. Within each cell, the primary location was the preferred sampling location unless it was deemed unsuitable based on the historical evaluation. For example, if the historical analysis indicated that land use at a particular location could have resulted in PAH contamination specific to the property, an alternative location within the cell was considered.

Following the historical review, the CDOE performed an inspection of the potential sampling sites. Sampling sites were rejected if there were indications of industrial sources of PAHs (electrical plants, steel mills, coke plants, gas stations, incinerators, and heating plants) at the site, if the property was paved entirely or contained structures so that soil samples could not be collected, or if stains or stressed vegetation were evident. If the site inspection indicated possible problems with the sampling site, the secondary or tertiary sampling locations were evaluated. Gravel areas that were not parking lots were considered for sampling if the gravel was less than 6 in. thick and could be scraped away to reveal soil.

Sample Collection and Analysis

Soil samples were collected at 57 sites (table 2). Samples collected from properties owned by the city of Chicago are denoted by a SS prefix. Samples collected from properties owned by Commonwealth Edison are denoted by a CE prefix. Samples were collected in accordance with the IEPA approved field sampling plan, which is included in the IEPA approved quality-assurance project plan (QAPP) (TetraTech EM, Inc., 2001) (table 2, fig. 4). Inorganic samples were collected and analyzed in accordance with standard USGS procedures (Arbogast, 1996).

Soil samples were collected from the upper 6 in. of the soil horizon (from 0 to 6 in. in an undisturbed soil horizon or from the upper 6 in. of a soil horizon where it may be covered by gravel) using a dedicated stainless-steel spoon or trowel. Samples were collected by personnel from Tetra Tech EM, Inc. and the CDOE. The soil type was characterized at the time of sample collection. Soil samples were placed in a disposable foil pan and homogenized by stirring the soil using the stainless-steel spoon or trowel. One 16-ounce and one 4-ounce sample jar were filled by spooning soil from the foil pan into the container. The latitude and longitude of the sample sites were determined with a global positioning system (GPS) unit.

Sampling activities were documented in the field. For each sample, all pertinent data including property address; cell number and whether primary, secondary, or tertiary property; sample number; date and time of sample collection; weather conditions; GPS coordinates; description of sample location; proximity to stained soil, stressed vegetation, asphalt, underground storage tanks, above-ground storage tanks, parking lots, or other distinguishing property characteristics, which could be a source of PAHs; soil characteristics; and sample depth were recorded. Samples were packaged, cooled to 4°C with ice, and shipped overnight to the laboratory for PAH analysis. Samples for inorganic analysis were stored at 4°C for as long as 7 days prior to shipment to the laboratory. Chain-of-custody procedures were followed for all samples collected for PAH analysis.

Soil samples were analyzed for PAHs in accordance with the approved QAPP (TetraTech EM, Inc., 2001). Soil samples used for PAH analysis were prepared according to SW-846 Method 3550 and analyzed by SW-846 Method 8270 SIM (U.S. Environmental Protection Agency, 1994a). All field and laboratory data were validated in accordance with accepted guidelines (U.S. Environmental Protection Agency, 1994b).

Analyses for inorganic constituents were performed using inductively coupled plasma-atomic emission spectrometry. Methods for handling and analysis of these samples are provided by Arbogast (1996). Samples were disaggregated and sieved to recover the minus 180 micrometer fraction for chemical analyses. Analyses were performed at Xral Laboratories in Toronto, Canada, using techniques developed by the USGS, and at USGS analytical laboratories in Lakewood, Colorado. Forty major, minor, and trace elements were determined by inductively coupled plasma-atomic emission
Figure 4. Locations of surface-soil sampling sites, Chicago, Illinois.
The technique yields quantitative data for 28 elements [appendix 2] the remaining 12 have all or most analyses below the detection limit. In addition, total carbon was determined by an automated carbon analyzer and carbonate carbon was determined as carbon dioxide by coulometric titration. Organic carbon was calculated as the difference between total and carbonate carbon. Total sulfur was determined using an automated sulfur analyzer and mercury was determined by cold-vapor atomic absorption spectrometry. Arsenic and selenium were analyzed by hydride generation atomic absorption spectrometry.

Calibration of the inorganic samples was performed by standardizing with digested rock reference materials and a series of multi-element solution standards. Data were deemed acceptable if recovery for all was ±15 percent at five times the Lower Limit of Determination (LOD) and the calculated Relative Standard Deviation (RSD) of duplicate samples was no greater than 15 percent for all elements except mercury, arsenic, and selenium. For these elements, ±20 percent recovery and an RSD no greater than 20 percent was considered acceptable.

Field and internal laboratory quality controls were performed to determine the precision, accuracy, completeness, representativeness, and comparability of the data. To assist in this effort, one field duplicate sample was collected for every 10 investigative samples. One matrix spike/matrix spike duplicate PAH sample was collected for every 20 investigative samples. The laboratory prepared one PAH method blank sample for every 20 investigative samples. All data for both PAH and inorganic constituents were reviewed following quality-assurance/quality-control (QA/QC) procedures.

### Statistical Analysis of Uncensored Polynuclear Aromatic Hydrocarbon Data

Benzo(a)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(g,h,i)perylene, benzo(a)pyrene, chrysene, dibenzo(a,h)anthracene, fluoranthene, indeno(1,2,3-cd)pyrene, phenanthrene, and pyrene were detected in each of the samples collected (table 3). As a consequence, the actual reported concentrations were used in the statistical analysis for these compounds (uncensored data). For sites where duplicate samples were collected, the average value was used for all analyses.

Concentrations of all of the PAH compounds in sample PAH-CE-19 except acenaphthylene were substantially higher than in the remaining samples (table 3). Because sampling location PAH-CE-19 was considered a potential outlier, most of the preliminary statistical analyses were performed both with and without this data point.

The sample location of PAH-CE-19 is adjacent to a Commonwealth Edison transfer station with no obvious source of atmospheric discharge. The property was grass covered and vacant with remnants of a former building foundation. Historical property use was residential, based on Sanborn Fire Insurance maps. Land use in the surrounding area was predominately residential according to the Northeastern Illinois Planning Commission (1994) maps. No obvious sources of PAHs were identified during site reconnaissance or sample collection.

The uncensored PAH data were analyzed statistically using standard parametric techniques as follows: test for two independent samples from the same population; graphical exploratory techniques; calculation of basic descriptive statistics; test for lognormal distribution; test for outliers; re-test for two independent samples from the same population without the outlier; re-test for lognormal distribution without the outlier; re-calculation of basic descriptive statistics without the outlier; calculation of the 95th percentile of the population, 95-percent confidence interval for the mean, and the mean; simple linear regressions of PAH concentration with percent land use and PAH concentration with mean distance to land use. Estimates of the actual values of the mean, standard deviation, and the 95th percentile of the lognormal distribution were estimated using techniques recommended by Gilbert (1987).

### Population Tests

City of Chicago properties were sampled in the summer of 2001 and Commonwealth Edison properties were sampled in the winter of 2002. Because all of the data were not collected at the same time or on the same set of properties, there potentially were two separate data populations (city of Chicago properties and Commonwealth Edison properties) for each of the PAHs. A two-sided Wilcoxon-Rank-Sum test in S-Plus (MathSoft, 2000)
was used to test if the one population contained larger or smaller values than the other. If the results of the test showed the populations likely were similar, then data from the city of Chicago and Commonwealth Edison properties could be combined into one dataset for further analysis. The null hypothesis was that the values in the two populations were similar and the alternate hypothesis was that the values from one population were larger or smaller than the other population. A 95-percent confidence interval (alpha of 0.05) was used for the Wilcoxon-Rank-Sum test. The Wilcoxon-Rank-Sum test was performed with and without sample PAH-CE-19.

Test for Lognormal Distribution

PAH concentrations were transformed in SAS (SAS Institute, Inc, 1999) by applying the natural logarithm (log transformation). The transformed data then were evaluated for lognormality using the Shapiro-Wilk test in SAS interactive data analysis with a significance level (alpha) of 0.1 as recommended by Helsel and Hirsch (1995) for normality tests. The Shapiro-Wilk test was performed with and without the data from sample PAH-CE-19.

Graphical Analysis

The raw uncensored data initially were investigated using graphical exploratory data techniques, including boxplots, histograms, and normal probability plots. Boxplots, histograms, and normal probability plots were graphed using Data Desk (Data Description, Inc., 1996). Natural-log transformed uncensored data also were explored using boxplots and normal probability plots graphed in Data Desk with and without the data from sample PAH-CE-19.

Descriptive Statistics

Standard descriptive statistics were calculated using interactive data analysis in SAS (SAS Institute, Inc, 1999). Descriptive statistics were calculated for raw and natural-log transformed data both with and without the data from sample PAH-CE-19. Calculated statistics (not all of which are presented in this report) include: mean, standard deviation, standard error, variance, number of observations, minimum, maximum, median, range of values, sum, corrected and uncorrected sum of squares, coefficient of variation, skewness, and kurtosis.

Outlier Test

A data point is classified as a mild outlier if the value is more than 1 step above the 75th percentile and classified as an extreme outlier if the value is more than 2 steps above the 75th percentile. A step is equal to 1.5 times the interquartile range (Helsel and Hirsch, 1995). To evaluate for an extreme outlier, the interquartile range and number of steps between the 75th percentile and the highest value were calculated. The interquartile range was calculated by subtracting the 25th percentile from the 75th percentile. The number of steps was calculated by subtracting the 75th percentile from the maximum value and dividing the result by 1.5 times the interquartile range. The outlier test was performed with the suspected outlier, PAH-CE-19, included.

To further determine if PAH-CE-19 is an outlier, the magnitude of the difference between the concentration of the PAH compound in this sample (the maximum value) and the next lowest value was examined using the number of standard deviations between them. The number of standard deviations between the maximum and next lowest value was calculated by subtracting the next lowest from the maximum value and dividing the result by the standard deviation.

95th Percentile, 95-Percent Confidence Interval For The Mean, and Geometric Mean

The 95th percentile and 95-percent confidence interval for the mean of the natural-log transformed data were calculated using interactive data analysis in SAS (SAS Institute, Inc, 1999). For natural-log transformed PAH concentrations, the geometric mean was calculated in Microsoft Excel (Microsoft Corporation, 2000) by taking the anti-log of the mean. The data from sample PAH-CE-19 were not included in these calculations.

Relation Between Polynuclear Aromatic Hydrocarbon Concentrations and Land Use

Various analyses were performed to determine if PAH concentrations in ambient surface soils were
affected by nearby land use. For the purposes of this discussion, land use also includes the distance between the sampling point and the middle of the nearest roadway.

The Northeastern Illinois Planning Commission’s 1990 land-use summary (Northeastern Illinois Planning Commission, 1994) was used to identify the current land use for each sample location. Chicago’s land-use code is broadly classified as urban, built-up land (85 percent), agricultural (less than 1 percent), open space (7 percent), vacant and wetland (6 percent), water (less than 2 percent), and unclassified (less than 1 percent). Urban, built-up land is further subdivided as residential (47 percent), commercial services (10 percent), institutional (6 percent), industrial (11 percent), transportation, communication, and utility (11 percent). Therefore, about 15 percent of the land composing the city of Chicago is considered undeveloped and the majority of the land use is for residential purposes.

Simple Linear Regression

The mean distance from each sampling point to each type of land use in the area of the sampling point was calculated [table 4]. Land use was classified as residential, commercial, institutional, industrial/warehousing/wholesale (hereafter referred to as industrial), transportation/communications/ utilities (hereafter referred to as transportation), agriculture, open space, vacant/wetland (hereafter referred to as vacant), and water according to 1990 land-use spatial data obtained from the Northeastern Illinois Planning Commission (1994) [fig. 1]. To calculate the mean distance to each land-use category from each sampling point, ArcInfo GIS (Environmental Systems Research Institute, 2001a) was used with four raster data layers representing soil-sampling point locations, sampling-point zones, distance, and land use in 1990 (Northeastern Illinois Planning Commission, 1994). Cell size of raster data layers was 30 ft². Each sampling-point location was enclosed by Thiessen (also called proximal) polygons using a Euclidean allocation function, which created sampling-point zones. The Thiessen polygons formed a zone around each sampling point such that any location inside the zone was closer to that zone’s sampling point than any other sampling point. Zones ranged in area from 1 mi² to 10 mi². The distance layer was created by calculating the Euclidean distance outward in every direction from each sampling point to the edge of the zone. The distance layer then was combined spatially with the land-use and sampling-point-zone layers to calculate the mean distance to each land use in the zone from the sampling point. Simple linear regressions of mean distance to each land use with natural-log transformed PAH concentrations were calculated using Data Desk (Data Description, Inc., 1996). The suspected outlier, PAH-CE-19, was not included in the regressions.

Land use surrounding the sampling site also was examined. Buffers of 0.25, 0.5, and 1 mi radius around the sampling site were created using ArcInfo GIS (Environmental Systems Research Institute, 2001a). The buffers were overlaid spatially with the land use layer (Northeastern Illinois Planning Commission, 1994) and the percent of land-use category within 0.25, 0.5, and 1 mi of the sampling point was calculated [table 5] Simple linear regressions of percent land use within a 0.25, 0.5, and 1 mi radius of the sample with natural-log transformed PAH concentrations were performed for all uncensored PAHs using Data Desk (Data Description, Inc., 1996). The data from sample PAH-CE-19 were not included in the regressions.

The distance between the sample location and the nearest roadway was estimated by use of an on-screen digitizer. The location of the sampling point was determined by GPS measurement, and the location of the nearest roadway was determined visually from a GIS coverage. The distance between the point and the road then was calculated by use of ArcInfo. Correlation between the natural-log transformed concentration of the PAH and the natural-log of the distance from the roadway then were estimated by simple linear regression in Microsoft Excel (Microsoft Corporation, 2000). The data from sample PAH-CE-19 were not included in the regressions.

Unbalanced One-Way Analysis of Variance

A spatial overlay of sampling locations and land use (Northeastern Illinois Planning Commission, 1994) was performed in ArcInfo GIS (Environmental Systems Research Institute, 2001a) to identify the land use at the sampling point. Sample locations were grouped into seven land-use categories: residential; commercial and service; institutional; industrial,
warehousing, and wholesale; transportation, communication, and utilities; open space; and vacant and wetland (table 6). The Shapiro-Wilk test in S-Plus (MathSoft, 2000) was used to verify that the natural-log transformed PAH concentrations for those land uses with five or more samples (vacant and wetland; transportation, communication and utilities; commercial and service; industrial, warehousing, and wholesale; and residential) were normally distributed. To test if mean log-transformed PAH concentrations varied for different land uses, a one-way unbalanced analysis-of-variance (ANOVA) was performed for each uncensored PAH using S-Plus. The null hypothesis was that the mean natural-log transformed values statistically were the same for each land use. The alternate hypothesis was that at least one of the means differed with land use. An alpha value of 0.05 was used for the test. The data from sample PAH-CE-19 were not included in the ANOVA.

The distance between the sampling locations and the roadway were grouped into five categories: 10 ft or less (20 data points), 11 to 30 ft (15 data points), 31 to 50 ft (9 data points), 51 to 100 ft (6 data points), and greater than 100 ft (6 data points). The Shapiro-Wilk test in S-Plus was used to verify that the natural-log transformed PAH concentrations for distances were normally distributed. To test if mean log-transformed PAH concentrations varied with distance from the roadway, a one-way unbalanced ANOVA was performed for each uncensored PAH using S-Plus. The null hypothesis was that the mean natural-log transformed values statistically were the same for each distance category. The alternate hypothesis was that at least one of the means differed with distance. An alpha value of 0.05 was used for the test. The data from sample PAH-CE-19 were not included in the ANOVA.

Geospatial Analyses of Benzo(a)pyrene Concentrations

ArcMap Geostatistical Analyst, (Environmental Systems Research Institute, 2001b) was used to spatially evaluate variations in benzo(a)pyrene concentrations with land use and location. Benzo(a)pyrene was used because it typically is the compound of greatest concern. To obtain the spatial distribution of benzo(a)pyrene concentrations, the natural-log transformed data was kriged using geospatial statistics in the GIS. Kriging is a geostatistical method used to statistically predict values at unsampled location based on the theory that points closer together are more similar than those farther apart. Kriging compares the values at pairs of sampling points (called bins) and considers the distance the points are from each other. The distribution of the bins were fit visually to a spherical spatial model using a semivariogram. A semivariogram graphs the variance in values with the distance that separates each pair of points.

Statistical Analysis of Censored Polynuclear Aromatic Hydrocarbon Data

Concentrations of naphthalene, acenaphthylene, acenaphthene, fluorene, and anthracene were below the detection limit in some of the samples (appendix 1) (table 3). Each of these compounds had multiple detection limits (the data are censored at multiple levels). Because concentrations for all of the samples are not known, assumptions about the presence of a normal or lognormal data distribution cannot be verified for the censored PAH compounds, which is a requirement for the use of parametric analytical techniques. As a consequence, the censored data were analyzed using nonparametric techniques described in Helsel and Hirsch (1995), Helsel and Cohn (1988), and Cohn (1988). Censored data were analyzed statistically as follows: test for two independent samples from the same population, graphical exploratory techniques, calculation of limited descriptive statistics, graphical analysis of lognormal distribution, test for outliers, and calculation of the 95th percentile and geometric mean. As was the case for the uncensored data, results of duplicate samples were averaged.

Graphical Analysis

Boxplots of raw and natural-log transformed censored data were made using Data Desk (Data Description, Inc., 1996). For construction of the boxplots, the censored values were used to create the portions of the box below the median. However, during visual analysis of the boxes, the highest censoring level of each PAH was considered and the parts of the box below that highest censored value were ignored. Boxplots were drawn with and without the data from sample PAH-CE-19.
Normal probability plots also were utilized during exploratory graphical analysis. Plotting positions for normal probability plots were calculated using a C program (Dave Lorenz, U.S. Geological Survey, written commun., 2002), which utilizes the methods outlined in Helsel and Cohn (1988). The program input is a specifically formatted ASCII file of the natural-log transformed data above and below the detection limit. The plotting positions output from the C program then were used in Data Desk (Data Description, Inc., 1996) to graph a scatterplot of the plotting positions with the natural-log transformed PAH concentrations. A regression line then was drawn for the scatterplot. Boxplots and normal probability plots were drawn with and without the data from sample PAH-CE-19.

Descriptive Statistics

Limited descriptive statistics for raw and natural-log transformed censored PAHs were calculated and estimated using robust methods described in Helsel and Hirsch (1995). Calculated statistics include: number of observations, number of censored values, range of censored values, maximum, median, 25th, 75th, and 95th percentile of the distribution, and geometric mean. The mean and standard deviations were estimated using robust log-probability regression based on plotting points for data censored at multiple levels using the methods outlined by Helsel and Cohn (1988) and Cohn (1988) and the C program (Dave Lorenz, U.S. Geological Survey, written commun., 2002). Another C program (Dave Lorenz, U.S. Geological Survey, written commun., 2002) that calculates an adjusted maximum-likelihood estimator following methods outlined by Helsel and Cohn (1988) was used to estimate the median and quartiles. Descriptive statistics were performed with and without the data from sample PAH-CE-19.

Outlier Test

Outlier testing for the uncensored data set was performed using most of the same procedures as for the censored data. However, the 25th, 50th, and 75th percentiles for the censored data were estimated using a C program, which calculates an adjusted maximum-likelihood estimator following methods outlined by Helsel and Cohn (1988) and Cohn (1988). Estimates of the standard deviation were calculated by log-probability regression using a C program, which follows the methods outlined in Helsel and Cohn (1988), Cohn (1988), and Helsel and Hirsch (1995).

Relation between Polynuclear Aromatic Hydrocarbon Concentrations and Land Use

Because of the high number of non-detects for some of the censored PAH compounds, simple linear regression of PAH concentrations with land use could not be performed for these constituents. The natural-log transformed concentrations of individual censored PAH compounds were compared for samples grouped by land-use category using multiple-population parametric and nonparametric statistical tests in a manner similar to the analysis of the uncensored data. Censored analytes were not analyzed with regard to distance from the roadway. Censored data in the distribution testing and multiple-population tests were treated by replacing each censored datum with its estimated value calculated using robust log-probability regression, following Helsel (1990), Helsel and Cohn (1988), and Akritas and others (1994).

Correlation of Polynuclear Aromatic Hydrocarbon and Inorganic Concentrations

Pearson product-moment correlations (r values) were obtained from the natural-log transformed concentration of each of the PAH pairs as well as each of the PAHs and total organic carbon using Microsoft Excel. PAH samples below the detection limit were assigned a concentration value of 1.39 µg/kg, the natural log of 4 µg/kg, which is 1 µg/kg lower than the lowest detection limit for any PAH. Correlations involving the PAHs were performed with and without the data from site PAH-CE-19. Pearson product-moment correlations also were obtained for every pair of inorganic constituents detected in more than 75 percent of the samples. Inorganic constituents below the detection limit were assigned a concentration value...
ANALYSIS OF POLYNUCLEAR AROMATIC HYDROCARBON DATA

The results of soil-quality sampling indicate that 11 or more of the 16 PAH compounds were detected in each of the 57 soil samples collected (samples and duplicates are counted as one sample).

Of the 57 samples collected, 35 contained detectable concentrations of every PAH compound analyzed. Of the 22 samples in which 1 or more PAH compounds were not detected, naphthalene was the most frequent non-detect, followed by acenaphthylene, fluorene and acenaphthene, and anthracene.

Fluoranthene was the PAH detected at the highest concentration of all the PAH compounds in every sample except samples PAH-SS-10 and PAH-SS-11. The concentration of benzo(g,h,i)perylene was highest in sample PAH-SS-10 and second highest in sample PAH-SS-11. The concentration of indeno(1,2,3-cd)pyrene was highest in sample PAH-SS-11 and second highest concentration in sample PAH-SS-10. Pyrene was present at the second highest concentration of any PAH compound in 37 of the samples. Samples PAH-SS-10 and PAH-SS-11 were the only samples where the ratio of fluoranthene to pyrene was less than one. Because the fluoranthene/pyrene ratio is an indicator of the temperature at which the PAHs were generated (McCarthy and others, 2000), the low value of this ratio in samples PAH-SS-10 and PAH-SS-11 may indicate that the PAHs at these locations were derived from a different source, or combination of sources, than most of the remainder of the city. However, there are no obvious anomalies in location, land use, or the soil descriptions at these sites to indicate differences in the source(s).

After fluoranthene and pyrene, PAH concentrations in a given sample, from highest to lowest, were roughly in the following order: benzo(b)fluoranthene, benzo(a)pyrene, phenanthrene, chrysene, benzo(a)anthracene, indeno(1,2,3-cd)pyrene, benzo(k)fluoranthene, benzo(g,h,i)perylene, anthracene, and dibenzo(a,h)anthracene. Naphthalene, acenaphthen, acenaphthylene, and fluorene consistently were present at the lowest concentrations in each sample.

Boxplots and histograms of the concentrations of the individual PAH compounds showed that the majority of the samples were in the lower end of the concentration range, with a smaller number of samples in the higher end of the range, including a number of potential outliers. This left-skewed distribution indicated that the PAH concentrations in these samples did not exhibit a normal distribution. Boxplots and histograms of the natural-log transformed concentration data typically displayed a more symmetrical distribution, indicating that the PAH compounds may exhibit a lognormal distribution. One remaining potential outlier (sample PAH-CE-19) was identified for each of the PAH compounds, except acenaphthylene, from the boxplots of the natural-log transformed data.

Analysis of the natural-log transformed concentration data for the uncensored PAH compounds indicated that the null hypothesis of a lognormal distribution could be accepted (p-value was greater than alpha level of 0.1) if the data from sample location PAH-CE-19 were excluded from the analysis. If the data from site PAH-CE-19 were included in the analysis, the hypothesis of a lognormal distribution was rejected (p-value was less than or equal to alpha level of 0.1) for pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, dibenzo(a,h)anthracene, benzo(g,h,i)perylene, and indeno(1,2,3-cd)pyrene. Normal probability plots of natural-log transformed censored PAH data without sample PAH-CE-19 were similar visually to those of the natural-log transformed uncensored PAH data without this sample. Based on the visual comparison, the censored natural-log transformed PAH data also had a normal, or nearly normal distribution.

Maximum-likelihood estimation and log-probability regression on the natural-log transformed concentration data for the censored PAH compounds were used to calculate the mean, standard deviation, 25th percentile, median, and 75th percentile of the distribution for these compounds. Estimates of the values of these parameters varied with the method, but agreed within a factor of four in all cases, and typically agreed within a factor of two.
Figure 5. Boxplots of (A) uncensored and (B) censored polynuclear aromatic hydrocarbon concentrations in ambient surface soils, Chicago, Illinois.
Figure 5. Boxplots of (A) uncensored and (B) censored polynuclear aromatic hydrocarbon concentrations in ambient surface soils, Chicago, Illinois—Continued.
Figure 6. Boxplots of natural-log transformed (A) uncensored and (B) censored polynuclear aromatic hydrocarbon concentrations in ambient surface soils, Chicago, Illinois.
Figure 6. Boxplots of natural-log transformed (A) uncensored and (B) censored polynuclear aromatic hydrocarbon concentrations in ambient surface soils, Chicago, Illinois—Continued.
Figure 7. Normal probability plots of natural-log transformed (A) uncensored and (B) censored polynuclear aromatic hydrocarbon concentrations in ambient surface soils, Chicago, Illinois.
Estimates of mean and standard deviation were obtained by use of the log-probability regression, and estimates of percentiles were obtained by use of the maximum-likelihood regression (Helsel and Hirsch, 1995).

Outlier testing indicates that with the exception of acenaphthylene, concentrations of all of the PAHs in the sample from site PAH-CE-19 were five or more standard deviations greater than the next highest concentration, indicating that the PAH data from sample PAH-CE-19 are a statistical outlier (Helsel and Hirsch, 1995) (table 9). Therefore, the results from site PAH-CE-19 were omitted from all statistical analyses of the PAH compounds, including kriging of the benzo(a)pyrene distribution. As a consequence, the distribution of the uncensored PAH compounds in the surface soils could be considered lognormal, and reliably described by parametric statistical analyses (table 10).

The two-sided Wilcoxon-Rank-Sum test resulted in a p-value greater than the alpha value of 0.05, indicating that the null hypothesis, that the data from the city of Chicago and Commonwealth Edison properties represented a similar population, was acceptable (table 11). As a consequence, combination of all of the data (excluding the outlier sample from site PAH-CE-19) into one dataset for analysis was acceptable.

The Pearson product moment correlation coefficients for the natural-log transformed concentrations of the PAH compounds were 0.70 or greater (table 12) indicating a high degree of correlation. Naphthalene and acenaphthylene, the PAH compounds with the lowest molecular weights (table 13) were the only PAHs that did not show a correlation coefficient of 0.90 or higher with at least one other PAH. Naphthalene, the PAH compound with the lowest molecular weight (table 13) was the only PAH that did not show a correlation coefficient of 0.80 or higher with at least one other PAH.

The Pearson product moment correlation coefficients showed a low degree of positive correlation between the natural-log transformed concentrations of PAHs and the natural-log

Figure 7. Normal probability plots of natural-log transformed (A) uncensored and (B) censored polynuclear aromatic hydrocarbon concentrations in ambient surface soils, Chicago, Illinois—Continued.
transformed concentration of total organic carbon, with the value of the correlation coefficient typically about 0.50 (Table 12). This positive correlation may indicate that the PAH compounds attach to organic matter in the soil. However, the low value of the correlation coefficient indicated that the organic carbon content of the soil does not have a substantial limiting effect on PAH concentrations.

As would be expected of PAH compounds that tend to show a high degree of correlation, the concentrations of the various PAH compounds in soils tended to show similar patterns (Appendix 1). Samples with high concentrations of one compound tended to have high concentrations of all compounds. Samples with low concentrations of one compound tended to have low concentrations of all compounds.

The distribution of PAH compounds at concentrations below the detection limit showed similar patterns. In all samples in which anthracene was not detected, acenaphthylene, fluorene, acenaphthene, and naphthalene also were not detected. In all samples in which fluorene and acenaphthene were not detected, acenaphthylene and naphthalene also were not detected. Sampling locations in which fluorene and acenaphthene were not detected are identical. In all samples in which acenaphthylene was not detected, naphthalene also was not detected.

Although this interpretation is complicated by differences in the detection limit among compounds, the frequency of detection tended to increase as the molecular weight of the compound increased (Fig. 8). Naphthalene, the compound with the lowest frequency of detection, also has the lowest molecular weight of any PAH (128 grams per mole). Acenaphthylene (molecular weight 154 grams per mole) had the second lowest frequency of detection. Acenaphthene, fluorene, and anthracene, all with molecular weights below 180 grams per mole, also did not have a 100-percent detection frequency. Every PAH with a molecular weight of 202 grams per mole or higher, and phenanthrene with a molecular weight of 178 grams per mole, were detected in every sample analyzed.

Comparison of the PAH concentration and frequency of detection in ambient soils with PAH concentrations in the atmosphere over Chicago obtained from June through December 2000 show large differences. Naphthalene, the PAH detected least frequently and at among the lowest concentrations in soil samples, was the PAH detected at the highest concentrations in ambient air, by at least a factor of four (Illinois Environmental Protection Agency, 2002) (Table 14). Fluoranthene and pyrene, the predominant PAH compounds in Chicago soils, were detected at the fourth and fifth highest concentrations, respectively, of the PAHs in the atmosphere. These results are consistent with air samples affected by various PAH sources within Chicago (Khalili and others, 1995), which typically show naphthalene present in the highest concentrations and substantially lower concentrations of fluoranthene and pyrene in air (Table 14). These sampling efforts did not distinguish between concentrations of PAHs in the vapor and in the particulate phase.

Figure 8. Frequency of detections of polynuclear aromatic hydrocarbons in ambient surface soils, Chicago, Illinois, plotted against molecular weight of compound.
The comparatively low correlation coefficient for the PAHs with low molecular weight, the frequency of detection of the PAH compounds in the soils, and the lack of correlation between the concentration of PAH compound in the atmosphere and in the ambient soils indicate that the concentration of PAH compounds in surface soils in the city of Chicago was affected by the physical properties of the compound. There are two aspects to this relation. First, the stability of a PAH compound in the soil environment increases with its molecular weight because of a decrease in its solubility in water and potential for volatilization and an increase in the potential to partition onto organic carbon and clay minerals [table 13]. As a consequence, the tendency of a PAH to attach to particulate matter, and to stay attached to particulate matter, increases with increasing molecular weight. Second, the molecular weight of the PAH compound affects its phase in the atmosphere, through which the PAHs must travel from their sources to the ambient soil.

Although affected by temperature and particle size (Baek and others, 1991), PAHs with molecular weights equal to or less than that of phenanthrene (178 grams per mole) with a higher Henry’s Law constant [table 13] partition primarily to the gas phase in the atmosphere. As the molecular weight of the PAH increases, partitioning to the gas phase decreases and partitioning to the particulate phase increases (Dickhut and Gustafson, 1995; Yaffe and others, 2001). PAHs with a molecular weight of more than about 247 grams per mole are primarily bound to particulate matter in the atmosphere. In comparison to the particulate-bound PAHs with higher molecular weights, the gas-phase PAHs with low molecular weights tend to remain in the atmosphere because they are less efficiently scavenged from the atmosphere by precipitation or particle settling. Higher molecular weight PAHs, therefore, are transported preferentially to the land surface where they can be incorporated into soils. The apparent effect of the phase of the PAH in the atmosphere on the presence of a PAH in ambient surface soils indicates that atmospheric settling of particulate matter is an important source of the PAH compounds in Chicago soils.

Concentrations of individual PAH compounds in ambient surface soils typically vary by at least three orders of magnitude across the city if the outlier sample is excluded [table 3]. Data from sites PAH-SS-12 and PAH-CE-15 and 15D [fig. 4] indicate that individual PAH concentrations can vary by more than an order of magnitude across a distance of about 1,000 ft [appendix 1]. Comparison of concentrations of the 16 PAH compounds at the 6 locations where duplicate samples were collected shows that PAH concentrations in the sample and its duplicate vary by less than a factor of 2 for 82 of the 96 analyses, vary by less than a factor of 3 for 90 of the 96 analyses, vary by less than a factor of 4 for 93 of the analysis, and vary by a factor of 7 or less in the remaining 3 analyses [appendix 1]. Eleven of the analyses that varied by more than a factor of two were from sample PAH-CE-15 and its duplicate. The generally good agreement between the PAH concentrations in the sample and its duplicate indicates that PAH concentrations in ambient surface soils typically do not vary substantially over distances of less than about 10 ft.

The variability of PAH concentrations in the soils across the entire city, over distances of about 1,000 ft, and between samples and their duplicates indicates that PAH concentrations in ambient soils in Chicago are affected by site-specific factors. The apparent decrease in the variability of PAH concentrations with a decreasing scale of observation indicates that PAH concentrations in ambient soils also are affected by larger-scale processes.

The variability of PAH concentrations within the city is approximated by the distribution of benzo(a)pyrene, which showed a complex distribution [fig. 9]. Higher concentrations were detected in the area near Lake Michigan in the northern part of the city, in much of the western part of the city, and in various pockets in the southern part of the city. Lower concentrations were detected in much of the northwestern, south-central, southwestern, and far southern parts of the city. Areas of lower benzo(a)pyrene concentration corresponded to areas where one or more PAH compound was not detected.

Previous investigators have identified an inverse correlation between concentrations of PAH compounds in surface soils and distance from a roadway (Bradley and others, 1994). Therefore, it was anticipated that proximity to a roadway may have been one of the site-specific factors affecting PAH concentrations in the city. However, linear regression of the concentrations of the uncensored PAHs and distance from the nearest roadway indicated no trend,
Figure 9. (A) Kriged concentrations of benzo(a)pyrene in ambient surface soils, Chicago, Illinois and (B) standard errors of predicted concentrations.
with all coefficients of determination (R²) less than 0.02. An analysis of variance did not indicate that mean concentrations of the uncensored PAHs differ in a statistically significant manner with distance from the roadway [table 15] These analyses indicate either that distance from roadways does not have a substantial affect on PAH concentrations in ambient soils in the city of Chicago or that other factors, such as the amount of traffic and the prevailing wind direction, need to be considered.

Analysis was performed to determine if PAH concentrations are related to land use. Results of the multiple-population tests for comparing the natural-log transformed concentrations of individual PAH compounds indicate that there are no statistically significant differences in the mean PAH concentration among land-use categories [tables 16 and 17]. It should be cautioned that the unequal sample sizes or “lack of balance” in the statistical tests can result in lower power, or diminished capability of the tests to correctly reject the null hypothesis that the means of the land-use categories are not statistically different when the null hypothesis is false.

Linear regression of natural-log transformed PAH concentrations with the percent industrial land use within a 1-mi radius of the sampling location yields a t-statistic for the slope coefficient greater than two for each PAH. Linear regression of natural-log transformed PAH concentrations with percent industrial land use within a 0.5-mi radius of the sampling location yields a t-statistic for the slope coefficient greater than 2 for each PAH except dibenzo(a,h)anthracene. Regressions using percentages of transportation, commercial, vacant, and residential land use showed no relation. A t-statistic for the slope coefficient greater than 2 indicates a statistically significant direct linear relation between the amount of industrial land use in the area and the PAH concentration in the sample (Helsel and Hirsch, 1995) [table 18]. The t-statistic for the slope coefficient was near two for each compound and the linear correlation coefficient between percent industrial land use and the PAH concentration is less than 0.10, indicating that this correlation (if present) is weak. Linear regression of natural-log transformed PAH concentrations with percent industrial land use within a 0.25-mi radius of the sampling location yielded a t-statistic for the slope coefficient less than 2 for each PAH. This result indicates no statistically significant direct linear relation between the amount of industrial land use within 0.25 mi of the sample and the PAH concentration in the sample. Simple linear regressions of mean distance to industrial land use and concentrations of uncensored PAH compounds did not show a relation. These data are insufficient to determine if the apparent relation between PAH concentrations and percent industrial land use is because of industrial emissions, increased traffic density in industrial areas, or some other source.

**ANALYSIS OF INORGANIC DATA**

Surface soils in the city of Chicago are composed of a mixture of compounds, and 34 of the 45 inorganic constituents were detected in more than 75 percent of the samples collected. This frequency of detection allowed the arithmetic mean, standard deviation, and ranges for these analytes to be calculated [table 19]. An additional 11 constituents were not quantifiable because all or many samples contained less than the lower limit of detection (LOD). Those elements, with their LOD, are silver (2 mg/Kg), gold (8 mg/Kg), beryllium (1 mg/Kg), bismuth (50 mg/Kg), cadmium (2 mg/Kg), europium (2 mg/Kg), holmium (4 mg/Kg), tin (50 mg/Kg), thallium (40 mg/Kg), uranium (100 mg/Kg), and ytterbium (1 mg/Kg).

The arithmetic mean of the concentration of the 34 inorganic analytes detected in more than 75 percent of the samples of Chicago soils was compared with the arithmetic mean concentration of these analytes in 106 samples of A-horizon soils collected primarily from agricultural areas within 500 kilometers of Chicago (Boerngen and Shacklette, 1981). The mean concentration of arsenic, mercury, calcium, magnesium, phosphorus, copper, molybdenum, zinc, and selenium was from two to six times higher in Chicago soils, and concentrations of lead were about 20 times higher than in soils from the surrounding area [table 20].

Inter-element correlation coefficients for the inorganic analytes were calculated to provide additional insight into the sources of the inorganic constituents [table 21]. The sets of elements showing strong mutual correlations can indicate causative factors for the observed concentrations and distribution of these elements.
Concentrations of all of the major element compositions, except for sodium, and many of the trace elements showed trends consistent with naturally developed soils. Bedrock beneath and near Chicago is composed of dolomite (a calcium, magnesium carbonate) and shale, a rock composed largely of clays, which are aluminosilicate minerals often rich in aluminum and potassium. The high ($r^2$ greater than 0.98) Pearson product moment correlation coefficients among calcium, magnesium, and carbonate carbon reflect the widespread distribution of dolomite in the soils. The lack of other highly correlated elements further suggests that the dolomite does not contain appreciable amounts of other trace elements. Likewise, high correlations ($r^2$ greater than 0.70) between aluminum and other clay-borne elements such as potassium and trace constituents expected in clays including barium, cerium, gallium, lanthanum, lithium, neodymium, scandium, titanium, vanadium, and yttrium demonstrate the extent the clays affect the soil composition.

Although the bulk of the compositional trends in Chicago soils are explainable by varying proportions of dolomite and shale, which likely are soil parent material, the elevated (in comparison to surrounding agricultural soils) concentrations of arsenic, copper, lead, mercury, molybdenum, nickel, phosphorus, selenium, and zinc indicate a potential anthropogenic source of these elements. Lead (concentration factor of 20.4), zinc (7.4), and mercury (4.5) especially are enriched relative to background soils and all seem likely to indicate substantial and widespread anthropogenic modifications to the trace-element character of the soils.

The high correlation between lead and zinc ($r^2 = 0.91$) suggests that the two elements have been added to soils largely from the same material or process rather than as independently distributed constituents. Mercury shows low correlation with all other constituents, including organic carbon ($r^2 = 0.135$). In many natural settings mercury and organic carbon are highly correlated so the lack of correlation in Chicago soils suggests an anthropogenic addition largely independent of natural processes.

Other correlations of possible significance are among chromium, manganese, iron, and molybdenum. All four of these elements are major or trace constituents in various ferroalloys, which indicates that man-made steel products, or breakdown products from them, might be widely dispersed. The strong correlation among sulfur, organic carbon, and molybdenum also is noteworthy. In Chicago soils, sulfur primarily occurs in organic compounds in contrast to more typical occurrences as naturally occurring iron-sulfide minerals. Conversely, the lack of strong correlation among sulfur and elements that typically concentrate in sulfide minerals, such as copper, lead, zinc, nickel, and cobalt, further indicates that sulfide minerals do not substantially affect the composition of Chicago soils.

**SUMMARY AND CONCLUSIONS**

The U.S. Geological Survey, in cooperation with the Chicago Department of Environment, assessed the concentration of polycyclic aromatic hydrocarbons (PAHs) and inorganic constituents in ambient surface soils within the city of Chicago. At least 11 of the 16 polycyclic aromatic hydrocarbon constituents were detected in each of the 57 soil samples collected. The distribution of the uncensored PAH compounds in the surface soils can be considered log normal once the data from the outlier location were excluded from the analysis.

PAH concentrations, from highest to lowest, were typically in the following order: fluoranthene, pyrene, benzo(b)fluoranthene, phenanthrene, benzo(a)pyrene, chrysene, benzo(a)anthracene, benzo(k)fluoranthene, indeno(1,2,3-cd)pyrene, benzo(g,h,i)perylene, dibenzo(a,h)anthracene, and anthracene. Naphthalene, acenaphthene, acenaphthylene, and fluorene consistently were at the lowest concentrations in each sample. Concentrations of the PAH compounds were highly correlated, but did show some variation with the molecular weight of the compound. PAH compounds appear to be derived from similar combinations of sources, and most of the PAHs tend to behave similarly once released into the air, water, and soil.

Concentrations of individual PAH compounds in soils typically varied by at least 3 orders of magnitude for each compound across the city and varied by more than an order of magnitude over a distance of about 1,000 ft. Data from duplicate
samples indicate that PAH concentrations typically varied by less than a factor of two over a distance of a few feet. Variations in the concentrations of a given PAH in ambient surface soils may be affected by proximity to industrial areas. Variations in the concentrations of a given PAH in ambient surface soils did not appear to be affected by proximity to roadways or non-industrial land uses and did not appear to be strongly affected by the organic carbon content of the soil.

The concentration of the different PAH compounds in ambient surface soils appears to have been affected by the physical properties of the compound, which are affected by its molecular weight. Lower molecular-weight PAH compounds, which were in lower concentrations in the soils, were primarily in the vapor phase in the atmosphere. Higher molecular-weight PAH compounds, which often were in higher concentrations in the soils, were primarily in the particulate phase in the atmosphere. The apparent effect of the phase of the PAH in the atmosphere on the concentration of a PAH in ambient surface soils indicated that atmospheric settling of particulate matter is an important source of the PAH compounds in ambient Chicago soils.

The distribution of benzo(a)pyrene, which approximated the distribution of the remaining PAH compounds within the city, was complex. Elevated concentrations (greater than 4,084 micrograms per kilogram) were detected near Lake Michigan in the northern part of the city, in much of the western part of the city, and in isolated areas in the southern part of the city. Comparatively low concentrations (less than 419 micrograms per kilogram) were detected in much of the northwestern, south-central, southwestern, and far southern parts of the city.

Concentrations of various inorganic constituents in surface soils in the city of Chicago appeared to be affected by the natural development of the soils. The arithmetic mean concentration of arsenic, mercury, calcium, magnesium, phosphorus, copper, molybdenum, zinc, selenium were from 2 to 8 times higher, and concentrations of lead were about 20 times higher, than in typical soils from the surrounding area and may indicate an anthropogenic source for these analytes. Elevated concentrations of calcium and magnesium appeared to be related to the effects of dolomite bedrock on the chemical composition of the soil.

REFERENCES CITED


Tables
Table 1. Illinois Environmental Protection Agency Tier 1 remediation objectives for polynuclear aromatic hydrocarbons in soils

<table>
<thead>
<tr>
<th>Constituent</th>
<th>Remedial objective for residential soil</th>
<th>Remedial objective for industrial or commercial soil</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Exposure route-specific values for soils</td>
<td>Soil component of the ground-water ingestion exposure route values</td>
</tr>
<tr>
<td></td>
<td>Ingestion (milligrams per kilogram)</td>
<td>Inhalation (milligrams per kilogram)</td>
</tr>
<tr>
<td></td>
<td>Exposure route-specific values for soils</td>
<td>Ingestion (milligrams per kilogram)</td>
</tr>
<tr>
<td></td>
<td>Soil component of the ground-water ingestion exposure route values</td>
<td></td>
</tr>
<tr>
<td>Acenaphthene</td>
<td>4,700.</td>
<td>na</td>
</tr>
<tr>
<td>Acenaphthylene</td>
<td>na</td>
<td>na</td>
</tr>
<tr>
<td>Anthracene</td>
<td>23,000.</td>
<td>na</td>
</tr>
<tr>
<td>Benzo(a)anthracene</td>
<td>.9</td>
<td>na</td>
</tr>
<tr>
<td>Benzo(b)fluoranthene</td>
<td>.9</td>
<td>na</td>
</tr>
<tr>
<td>Benzo(k)fluoranthene</td>
<td>9.</td>
<td>na</td>
</tr>
<tr>
<td>Benzo(g,h,i)perylene</td>
<td>na</td>
<td>na</td>
</tr>
<tr>
<td>Benzo(a)pyrene</td>
<td>.09</td>
<td>na</td>
</tr>
<tr>
<td>Chrysene</td>
<td>88.</td>
<td>na</td>
</tr>
<tr>
<td>Dibenzo(a,h)anthracene</td>
<td>.09</td>
<td>na</td>
</tr>
<tr>
<td>Fluoranthene</td>
<td>3,100.</td>
<td>na</td>
</tr>
<tr>
<td>Fluorene</td>
<td>3,100.</td>
<td>na</td>
</tr>
<tr>
<td>Indeno(1,2,3-cd)pyrene</td>
<td>.9</td>
<td>na</td>
</tr>
<tr>
<td>Naphthalene</td>
<td>3,100.</td>
<td>na</td>
</tr>
<tr>
<td>Phenanthrene</td>
<td>na</td>
<td>na</td>
</tr>
<tr>
<td>Pyrene</td>
<td>2,300.</td>
<td>na</td>
</tr>
</tbody>
</table>
Table 2. Soil-sampling site data collected during the investigation, Chicago, Illinois

[D, duplicate sample; USGS, U.S. Geological Survey]

<table>
<thead>
<tr>
<th>Sample number (location shown in figure 4)</th>
<th>Latitude</th>
<th>Longitude</th>
<th>USGS site identification number</th>
<th>Land use at site</th>
<th>Distance from nearest roadway (feet)</th>
<th>Date of sample collection</th>
</tr>
</thead>
<tbody>
<tr>
<td>PAH-CE-1</td>
<td>42°00'35&quot;</td>
<td>87°46'20&quot;</td>
<td>420003508746201</td>
<td>Commercial</td>
<td>25</td>
<td>1/24/2002</td>
</tr>
<tr>
<td>PAH-CE-2</td>
<td>41°58'46&quot;</td>
<td>87°48'25&quot;</td>
<td>415846087482501</td>
<td>Transportation</td>
<td>40</td>
<td>1/24/2002</td>
</tr>
<tr>
<td>PAH-CE-3</td>
<td>41°57'40&quot;</td>
<td>87°42'41&quot;</td>
<td>41574087424101</td>
<td>Commercial</td>
<td>61</td>
<td>1/24/2002</td>
</tr>
<tr>
<td>PAH-CE-4</td>
<td>41°54'04&quot;</td>
<td>87°38'18&quot;</td>
<td>415404087381801</td>
<td>Commercial</td>
<td>190</td>
<td>1/24/2002</td>
</tr>
<tr>
<td>PAH-CE-4D</td>
<td>41°54'04&quot;</td>
<td>87°38'18&quot;</td>
<td>415404087381802</td>
<td>Commercial</td>
<td>190</td>
<td>1/24/2002</td>
</tr>
<tr>
<td>PAH-CE-5</td>
<td>41°53'15&quot;</td>
<td>87°40'11&quot;</td>
<td>415316087401101</td>
<td>Industrial</td>
<td>118</td>
<td>1/24/2002</td>
</tr>
<tr>
<td>PAH-CE-6</td>
<td>41°51'07&quot;</td>
<td>87°42'14&quot;</td>
<td>415107087421401</td>
<td>Commercial</td>
<td>7</td>
<td>1/24/2002</td>
</tr>
<tr>
<td>PAH-CE-7</td>
<td>41°50'42&quot;</td>
<td>87°37'31&quot;</td>
<td>415042087373101</td>
<td>Industrial</td>
<td>74</td>
<td>1/24/2002</td>
</tr>
<tr>
<td>PAH-CE-8</td>
<td>41°49'17&quot;</td>
<td>87°36'38&quot;</td>
<td>414917087363801</td>
<td>Residential</td>
<td>78</td>
<td>1/24/2002</td>
</tr>
<tr>
<td>PAH-CE-9</td>
<td>41°47'43&quot;</td>
<td>87°37'41&quot;</td>
<td>414743087374101</td>
<td>Vacant or wetland</td>
<td>125</td>
<td>1/24/2002</td>
</tr>
<tr>
<td>PAH-CE-10</td>
<td>41°43'24&quot;</td>
<td>87°36'16&quot;</td>
<td>414324087361601</td>
<td>Transportation</td>
<td>16</td>
<td>1/24/2002</td>
</tr>
<tr>
<td>PAH-CE-11</td>
<td>41°44'57&quot;</td>
<td>87°40'37&quot;</td>
<td>414457087403701</td>
<td>Industrial</td>
<td>221</td>
<td>1/24/2002</td>
</tr>
<tr>
<td>PAH-CE-12</td>
<td>41°45'18&quot;</td>
<td>87°42'51&quot;</td>
<td>414518087425101</td>
<td>Residential</td>
<td>37</td>
<td>1/24/2002</td>
</tr>
<tr>
<td>PAH-CE-13</td>
<td>41°45'51&quot;</td>
<td>87°44'12&quot;</td>
<td>414551087441201</td>
<td>Industrial</td>
<td>626</td>
<td>1/24/2002</td>
</tr>
<tr>
<td>PAH-CE-14</td>
<td>41°46'42&quot;</td>
<td>87°44'26&quot;</td>
<td>414642087442601</td>
<td>Commercial</td>
<td>41</td>
<td>1/24/2002</td>
</tr>
<tr>
<td>PAH-CE-15</td>
<td>41°42'11&quot;</td>
<td>87°39'13&quot;</td>
<td>414211087391301</td>
<td>Industrial</td>
<td>140</td>
<td>1/25/2002</td>
</tr>
<tr>
<td>PAH-CE-15D</td>
<td>41°42'11&quot;</td>
<td>87°39'13&quot;</td>
<td>414211087391302</td>
<td>Industrial</td>
<td>140</td>
<td>1/25/2002</td>
</tr>
<tr>
<td>PAH-CE-16</td>
<td>41°42'49&quot;</td>
<td>87°32'45&quot;</td>
<td>414249087324501</td>
<td>Vacant or wetland</td>
<td>85</td>
<td>1/25/2002</td>
</tr>
<tr>
<td>PAH-CE-17</td>
<td>41°42'15&quot;</td>
<td>87°31'33&quot;</td>
<td>414215087313301</td>
<td>Transportation</td>
<td>69</td>
<td>1/25/2002</td>
</tr>
<tr>
<td>PAH-CE-18</td>
<td>41°44'42&quot;</td>
<td>87°38'37&quot;</td>
<td>414442087383701</td>
<td>Commercial</td>
<td>69</td>
<td>1/25/2002</td>
</tr>
<tr>
<td>PAH-CE-19</td>
<td>41°46'52&quot;</td>
<td>87°37'08&quot;</td>
<td>414652087370801</td>
<td>Vacant or wetland</td>
<td>120</td>
<td>1/25/2002</td>
</tr>
<tr>
<td>PAH-SS-01</td>
<td>41°55'57&quot;</td>
<td>87°43'37&quot;</td>
<td>415555087435701</td>
<td>Industrial</td>
<td>30</td>
<td>6/5/2001</td>
</tr>
<tr>
<td>PAH-SS-02</td>
<td>41°55'15&quot;</td>
<td>87°41'50&quot;</td>
<td>415515087415001</td>
<td>Commercial</td>
<td>10</td>
<td>6/5/2001</td>
</tr>
<tr>
<td>PAH-SS-03</td>
<td>41°54'33&quot;</td>
<td>87°46'08&quot;</td>
<td>415433087460801</td>
<td>Commercial</td>
<td>10</td>
<td>6/5/2001</td>
</tr>
<tr>
<td>PAH-SS-04</td>
<td>41°56'20&quot;</td>
<td>87°45'00&quot;</td>
<td>415620087450001</td>
<td>Commercial</td>
<td>45</td>
<td>6/5/2001</td>
</tr>
<tr>
<td>PAH-SS-05</td>
<td>41°55'25&quot;</td>
<td>87°48'02&quot;</td>
<td>415525087480201</td>
<td>Commercial</td>
<td>35</td>
<td>6/5/2001</td>
</tr>
<tr>
<td>PAH-SS-06</td>
<td>41°56'42&quot;</td>
<td>87°48'57&quot;</td>
<td>415642087485701</td>
<td>Residential</td>
<td>1</td>
<td>6/5/2001</td>
</tr>
<tr>
<td>PAH-SS-07</td>
<td>41°57'05&quot;</td>
<td>87°48'26&quot;</td>
<td>415705087482601</td>
<td>Commercial</td>
<td>45</td>
<td>6/5/2001</td>
</tr>
<tr>
<td>PAH-SS-08</td>
<td>41°58'37&quot;</td>
<td>87°50'12&quot;</td>
<td>415837087501201</td>
<td>Residential</td>
<td>16</td>
<td>6/5/2001</td>
</tr>
<tr>
<td>PAH-SS-09</td>
<td>41°59'31&quot;</td>
<td>87°47'54&quot;</td>
<td>415931087475401</td>
<td>Open space</td>
<td>22</td>
<td>6/5/2001</td>
</tr>
<tr>
<td>PAH-SS-10</td>
<td>41°58'27&quot;</td>
<td>87°45'59&quot;</td>
<td>415827087455901</td>
<td>Commercial</td>
<td>32</td>
<td>6/5/2001</td>
</tr>
<tr>
<td>PAH-SS-11</td>
<td>41°41'35&quot;</td>
<td>87°42'03&quot;</td>
<td>414135087420301</td>
<td>Commercial</td>
<td>30</td>
<td>6/5/2001</td>
</tr>
<tr>
<td>PAH-SS-12</td>
<td>41°42'18&quot;</td>
<td>87°39'24&quot;</td>
<td>414218087392401</td>
<td>Transportation</td>
<td>25</td>
<td>6/5/2001</td>
</tr>
<tr>
<td>PAH-SS-13</td>
<td>41°41'14&quot;</td>
<td>87°37'18&quot;</td>
<td>414114087371801</td>
<td>Commercial</td>
<td>20</td>
<td>6/5/2001</td>
</tr>
<tr>
<td>PAH-SS-14</td>
<td>41°40'36&quot;</td>
<td>87°31'21&quot;</td>
<td>414036087312101</td>
<td>Residential</td>
<td>10</td>
<td>6/5/2001</td>
</tr>
<tr>
<td>Sample number (location shown in figure 4)</td>
<td>Latitude</td>
<td>Longitude</td>
<td>USGS site identification number</td>
<td>Land use at site</td>
<td>Distance from nearest roadway (feet)</td>
<td>Date of sample collection</td>
</tr>
<tr>
<td>------------------------------------------</td>
<td>----------</td>
<td>-----------</td>
<td>---------------------------------</td>
<td>-----------------</td>
<td>--------------------------------------</td>
<td>--------------------------</td>
</tr>
<tr>
<td>PAH-SS-15</td>
<td>41°39'19&quot;</td>
<td>87°35'50&quot;</td>
<td>413919087355001</td>
<td>Commercial</td>
<td>50</td>
<td>6/5/2001</td>
</tr>
<tr>
<td>PAH-SS-16</td>
<td>41°39'34&quot;</td>
<td>87°32'55&quot;</td>
<td>413934087325501</td>
<td>Vacant or wetland</td>
<td>10</td>
<td>6/5/2001</td>
</tr>
<tr>
<td>PAH-SS-17</td>
<td>41°40'58&quot;</td>
<td>87°32'24&quot;</td>
<td>414058087322401</td>
<td>Vacant or wetland</td>
<td>23</td>
<td>6/5/2001</td>
</tr>
<tr>
<td>PAH-SS-17D</td>
<td>41°40'58&quot;</td>
<td>87°32'24&quot;</td>
<td>414058087322402</td>
<td>Vacant or wetland</td>
<td>23</td>
<td>6/5/2001</td>
</tr>
<tr>
<td>PAH-SS-18</td>
<td>41°43'35&quot;</td>
<td>87°33'00&quot;</td>
<td>414335087330001</td>
<td>Vacant or wetland</td>
<td>10</td>
<td>6/5/2001</td>
</tr>
<tr>
<td>PAH-SS-19</td>
<td>41°45'06&quot;</td>
<td>87°34'38&quot;</td>
<td>414506087343801</td>
<td>Commercial</td>
<td>20</td>
<td>6/5/2001</td>
</tr>
<tr>
<td>PAH-SS-20</td>
<td>41°45'44&quot;</td>
<td>87°33'50&quot;</td>
<td>414544087335001</td>
<td>Residential</td>
<td>20</td>
<td>6/5/2001</td>
</tr>
<tr>
<td>PAH-SS-21</td>
<td>41°46'00&quot;</td>
<td>87°36'20&quot;</td>
<td>414600087362001</td>
<td>Commercial</td>
<td>10</td>
<td>6/5/2001</td>
</tr>
<tr>
<td>PAH-SS-21D</td>
<td>41°46'00&quot;</td>
<td>87°36'20&quot;</td>
<td>414600087362002</td>
<td>Commercial</td>
<td>10</td>
<td>6/5/2001</td>
</tr>
<tr>
<td>PAH-SS-22</td>
<td>41°45'07&quot;</td>
<td>87°38'38&quot;</td>
<td>414507087383801</td>
<td>Commercial</td>
<td>5</td>
<td>6/5/2001</td>
</tr>
<tr>
<td>PAH-SS-23</td>
<td>41°46'43&quot;</td>
<td>87°43'25&quot;</td>
<td>414643087432501</td>
<td>Commercial</td>
<td>5</td>
<td>6/6/2001</td>
</tr>
<tr>
<td>PAH-SS-24</td>
<td>41°46'55&quot;</td>
<td>87°42'11&quot;</td>
<td>414655087421101</td>
<td>Commercial</td>
<td>5</td>
<td>6/6/2001</td>
</tr>
<tr>
<td>PAH-SS-25</td>
<td>41°47'06&quot;</td>
<td>87°39'51&quot;</td>
<td>414706087395101</td>
<td>Commercial</td>
<td>10</td>
<td>6/6/2001</td>
</tr>
<tr>
<td>PAH-SS-25D</td>
<td>41°47'06&quot;</td>
<td>87°39'51&quot;</td>
<td>414706087395102</td>
<td>Commercial</td>
<td>10</td>
<td>6/6/2001</td>
</tr>
<tr>
<td>PAH-SS-26</td>
<td>41°49'49&quot;</td>
<td>87°40'24&quot;</td>
<td>414949087402401</td>
<td>Commercial</td>
<td>5</td>
<td>6/6/2001</td>
</tr>
<tr>
<td>PAH-SS-27</td>
<td>41°48'54&quot;</td>
<td>87°42'09&quot;</td>
<td>414854087420901</td>
<td>Commercial</td>
<td>20</td>
<td>6/6/2001</td>
</tr>
<tr>
<td>PAH-SS-28</td>
<td>41°50'14&quot;</td>
<td>87°43'41&quot;</td>
<td>415014087434101</td>
<td>Residential</td>
<td>20</td>
<td>6/6/2001</td>
</tr>
<tr>
<td>PAH-SS-29</td>
<td>41°52'06&quot;</td>
<td>87°41'45&quot;</td>
<td>415206087414501</td>
<td>Residential</td>
<td>20</td>
<td>6/6/2001</td>
</tr>
<tr>
<td>PAH-SS-30</td>
<td>41°52'25&quot;</td>
<td>87°42'50&quot;</td>
<td>415225087425001</td>
<td>Institutional</td>
<td>10</td>
<td>6/6/2001</td>
</tr>
<tr>
<td>PAH-SS-31</td>
<td>41°53'18&quot;</td>
<td>87°42'23&quot;</td>
<td>415318087422301</td>
<td>Institutional</td>
<td>10</td>
<td>6/6/2001</td>
</tr>
<tr>
<td>PAH-SS-32</td>
<td>41°52'22&quot;</td>
<td>87°45'20&quot;</td>
<td>415222087452001</td>
<td>Transportation</td>
<td>10</td>
<td>6/6/2001</td>
</tr>
<tr>
<td>PAH-SS-33</td>
<td>41°53'42&quot;</td>
<td>87°44'54&quot;</td>
<td>415342087445401</td>
<td>Commercial</td>
<td>10</td>
<td>6/6/2001</td>
</tr>
<tr>
<td>PAH-SS-33D</td>
<td>41°53'42&quot;</td>
<td>87°44'54&quot;</td>
<td>415342087445402</td>
<td>Commercial</td>
<td>10</td>
<td>6/6/2001</td>
</tr>
<tr>
<td>PAH-SS-34</td>
<td>41°59'42&quot;</td>
<td>87°41'58&quot;</td>
<td>415942087415801</td>
<td>Commercial</td>
<td>10</td>
<td>6/6/2001</td>
</tr>
<tr>
<td>PAH-SS-35</td>
<td>41°59'47&quot;</td>
<td>87°40'10&quot;</td>
<td>415947087401001</td>
<td>Residential</td>
<td>50</td>
<td>6/6/2001</td>
</tr>
<tr>
<td>PAH-SS-36</td>
<td>41°56'50&quot;</td>
<td>87°38'58&quot;</td>
<td>415650087385801</td>
<td>Institutional</td>
<td>10</td>
<td>6/6/2001</td>
</tr>
<tr>
<td>PAH-SS-37</td>
<td>41°53'27&quot;</td>
<td>87°37'48&quot;</td>
<td>415327087374801</td>
<td>Transportation</td>
<td>20</td>
<td>1/25/2002</td>
</tr>
<tr>
<td>PAH-SS-38</td>
<td>41°57'52&quot;</td>
<td>87°45'28&quot;</td>
<td>415752087452801</td>
<td>Commercial</td>
<td>10</td>
<td>1/25/2002</td>
</tr>
</tbody>
</table>
Table 3. Summary of polynuclear aromatic hydrocarbon data in ambient surface soils, Chicago, Illinois

<table>
<thead>
<tr>
<th>Constituent</th>
<th>Number of samples collected</th>
<th>Number of detections</th>
<th>Percentage of samples with analyte detected</th>
<th>Number of samples exceeding Tier 1 remedial objectives for residential soil because of ingestion¹</th>
<th>Number of samples exceeding Tier 1 remedial objectives for industrial or commercial soil because of ingestion¹</th>
<th>Number of samples exceeding Tier 1 remedial objectives for construction workers because of ingestion¹</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acenaphthene</td>
<td>57</td>
<td>51</td>
<td>89</td>
<td>&lt;5-43,000</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Acenaphthylene</td>
<td>57</td>
<td>43</td>
<td>75</td>
<td>&lt;6-1,035</td>
<td>na</td>
<td>na</td>
</tr>
<tr>
<td>Anthracene</td>
<td>57</td>
<td>54</td>
<td>95</td>
<td>&lt;7-120,000</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Benzo(a)anthracene</td>
<td>57</td>
<td>57</td>
<td>100</td>
<td>26-370,000</td>
<td>27</td>
<td>5</td>
</tr>
<tr>
<td>Benzo(b)fluoranthene</td>
<td>57</td>
<td>57</td>
<td>100</td>
<td>40-550,000</td>
<td>32</td>
<td>6</td>
</tr>
<tr>
<td>Benzo(k)fluoranthene</td>
<td>57</td>
<td>57</td>
<td>100</td>
<td>36-280,000</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Benzo(g,h,i)perylene</td>
<td>57</td>
<td>57</td>
<td>100</td>
<td>24-290,000</td>
<td>na</td>
<td>na</td>
</tr>
<tr>
<td>Benzo(a)pyrene</td>
<td>57</td>
<td>57</td>
<td>100</td>
<td>39-460,000</td>
<td>51</td>
<td>31</td>
</tr>
<tr>
<td>Chrysene</td>
<td>57</td>
<td>57</td>
<td>100</td>
<td>31-350,000</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Dibenzo(a,h)anthracene</td>
<td>57</td>
<td>57</td>
<td>100</td>
<td>8-41,000</td>
<td>38</td>
<td>7</td>
</tr>
<tr>
<td>Fluoranthene</td>
<td>57</td>
<td>57</td>
<td>100</td>
<td>52-1,100,000</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Fluorene</td>
<td>57</td>
<td>51</td>
<td>89</td>
<td>&lt;6-36,000</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Indeno(1,2,3-cd)pyrene</td>
<td>57</td>
<td>57</td>
<td>100</td>
<td>31-370,000</td>
<td>22</td>
<td>3</td>
</tr>
<tr>
<td>Naphthalene</td>
<td>57</td>
<td>35</td>
<td>61</td>
<td>&lt;13-2,500</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Phenanthrene</td>
<td>57</td>
<td>57</td>
<td>100</td>
<td>22-520,000</td>
<td>na</td>
<td>na</td>
</tr>
<tr>
<td>Pyrene</td>
<td>57</td>
<td>57</td>
<td>100</td>
<td>51-720,000</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

¹ Illinois Pollution Control Board, 2002
<table>
<thead>
<tr>
<th>Sample number (location shown in figure 4)</th>
<th>Mean distance to unclassified land use (feet)</th>
<th>Mean distance to residential land use (feet)</th>
<th>Mean distance to commercial land use (feet)</th>
<th>Mean distance to institutional land use (feet)</th>
<th>Mean distance to industrial, warehousing, and wholesale land use (feet)</th>
<th>Mean distance to transportation, communication, and utilities land use (feet)</th>
<th>Mean distance to agricultural land use (feet)</th>
<th>Mean distance to open space land use (feet)</th>
<th>Mean distance to vacant or wetland land use (feet)</th>
<th>Mean distance to water (feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PAH-CE-1</td>
<td>--</td>
<td>4,356</td>
<td>4,265</td>
<td>5,216</td>
<td>2,395</td>
<td>8,144</td>
<td>--</td>
<td>4,936</td>
<td>6,384</td>
<td>--</td>
</tr>
<tr>
<td>PAH-CE-2</td>
<td>5,253</td>
<td>3,403</td>
<td>2,645</td>
<td>3,441</td>
<td>--</td>
<td>1,970</td>
<td>--</td>
<td>2,294</td>
<td>1,361</td>
<td>--</td>
</tr>
<tr>
<td>PAH-CE-3</td>
<td>--</td>
<td>4,911</td>
<td>4,974</td>
<td>6,659</td>
<td>6,082</td>
<td>6,244</td>
<td>--</td>
<td>5,373</td>
<td>6,979</td>
<td>5,111</td>
</tr>
<tr>
<td>PAH-CE-4</td>
<td>--</td>
<td>4,967</td>
<td>5,055</td>
<td>4,288</td>
<td>4,737</td>
<td>4,944</td>
<td>--</td>
<td>5,459</td>
<td>3,786</td>
<td>5,235</td>
</tr>
<tr>
<td>PAH-CE-5</td>
<td>--</td>
<td>5,073</td>
<td>4,787</td>
<td>6,209</td>
<td>3,516</td>
<td>4,838</td>
<td>--</td>
<td>4,939</td>
<td>3,947</td>
<td>--</td>
</tr>
<tr>
<td>PAH-CE-6</td>
<td>--</td>
<td>3,767</td>
<td>3,531</td>
<td>3,957</td>
<td>4,944</td>
<td>4,428</td>
<td>--</td>
<td>2,922</td>
<td>4,585</td>
<td>6,241</td>
</tr>
<tr>
<td>PAH-CE-7</td>
<td>--</td>
<td>5,086</td>
<td>5,436</td>
<td>3,846</td>
<td>5,595</td>
<td>5,363</td>
<td>--</td>
<td>5,017</td>
<td>5,503</td>
<td>6,224</td>
</tr>
<tr>
<td>PAH-CE-8</td>
<td>--</td>
<td>4,727</td>
<td>4,621</td>
<td>4,601</td>
<td>6,503</td>
<td>5,926</td>
<td>--</td>
<td>5,385</td>
<td>3,801</td>
<td>--</td>
</tr>
<tr>
<td>PAH-CE-9</td>
<td>--</td>
<td>4,479</td>
<td>4,415</td>
<td>4,592</td>
<td>6,564</td>
<td>3,681</td>
<td>--</td>
<td>4,572</td>
<td>3,907</td>
<td>--</td>
</tr>
<tr>
<td>PAH-CE-10</td>
<td>--</td>
<td>4,973</td>
<td>5,277</td>
<td>4,041</td>
<td>5,024</td>
<td>5,901</td>
<td>--</td>
<td>7,191</td>
<td>6,299</td>
<td>--</td>
</tr>
<tr>
<td>PAH-CE-11</td>
<td>9,308</td>
<td>4,924</td>
<td>4,597</td>
<td>4,531</td>
<td>3,720</td>
<td>3,549</td>
<td>--</td>
<td>5,767</td>
<td>5,197</td>
<td>--</td>
</tr>
<tr>
<td>PAH-CE-12</td>
<td>10,330</td>
<td>5,321</td>
<td>5,448</td>
<td>7,313</td>
<td>2,457</td>
<td>3,294</td>
<td>--</td>
<td>4,829</td>
<td>3,933</td>
<td>4,874</td>
</tr>
<tr>
<td>PAH-CE-13</td>
<td>4,376</td>
<td>4,523</td>
<td>4,736</td>
<td>2,909</td>
<td>2,313</td>
<td>2,102</td>
<td>--</td>
<td>2,320</td>
<td>2,054</td>
<td>--</td>
</tr>
<tr>
<td>PAH-CE-14</td>
<td>11,084</td>
<td>9,809</td>
<td>9,386</td>
<td>10,373</td>
<td>10,686</td>
<td>5,856</td>
<td>--</td>
<td>8,757</td>
<td>5,353</td>
<td>--</td>
</tr>
<tr>
<td>PAH-CE-15</td>
<td>10,271</td>
<td>5,054</td>
<td>4,971</td>
<td>5,196</td>
<td>6,916</td>
<td>5,514</td>
<td>--</td>
<td>5,525</td>
<td>7,751</td>
<td>--</td>
</tr>
<tr>
<td>PAH-CE-16</td>
<td>--</td>
<td>4,386</td>
<td>3,752</td>
<td>5,079</td>
<td>3,195</td>
<td>5,434</td>
<td>--</td>
<td>5,964</td>
<td>6,269</td>
<td>2,825</td>
</tr>
<tr>
<td>PAH-CE-17</td>
<td>--</td>
<td>2,963</td>
<td>1,882</td>
<td>3,162</td>
<td>1,260</td>
<td>1,939</td>
<td>--</td>
<td>4,104</td>
<td>2,331</td>
<td>--</td>
</tr>
<tr>
<td>PAH-CE-18</td>
<td>--</td>
<td>4,829</td>
<td>4,670</td>
<td>4,213</td>
<td>3,401</td>
<td>4,642</td>
<td>--</td>
<td>4,908</td>
<td>4,800</td>
<td>--</td>
</tr>
<tr>
<td>PAH-CE-19</td>
<td>--</td>
<td>5,081</td>
<td>4,985</td>
<td>5,618</td>
<td>2,469</td>
<td>3,748</td>
<td>--</td>
<td>6,244</td>
<td>4,103</td>
<td>4,854</td>
</tr>
<tr>
<td>PAH-SS-01</td>
<td>--</td>
<td>4,130</td>
<td>3,963</td>
<td>3,865</td>
<td>4,061</td>
<td>5,186</td>
<td>--</td>
<td>3,497</td>
<td>5,280</td>
<td>--</td>
</tr>
<tr>
<td>PAH-SS-02</td>
<td>--</td>
<td>4,772</td>
<td>5,106</td>
<td>5,193</td>
<td>6,193</td>
<td>5,571</td>
<td>--</td>
<td>4,559</td>
<td>5,644</td>
<td>6,288</td>
</tr>
<tr>
<td>PAH-SS-03</td>
<td>4,951</td>
<td>3,904</td>
<td>4,059</td>
<td>4,690</td>
<td>3,946</td>
<td>3,012</td>
<td>--</td>
<td>4,016</td>
<td>3,757</td>
<td>--</td>
</tr>
<tr>
<td>PAH-SS-04</td>
<td>--</td>
<td>4,269</td>
<td>4,200</td>
<td>4,708</td>
<td>3,253</td>
<td>5,039</td>
<td>--</td>
<td>4,270</td>
<td>3,086</td>
<td>--</td>
</tr>
<tr>
<td>PAH-SS-05</td>
<td>5,112</td>
<td>4,083</td>
<td>4,035</td>
<td>3,988</td>
<td>3,297</td>
<td>5,758</td>
<td>--</td>
<td>4,542</td>
<td>3,632</td>
<td>--</td>
</tr>
<tr>
<td>PAH-SS-06</td>
<td>3,942</td>
<td>3,482</td>
<td>4,513</td>
<td>5,343</td>
<td>9,768</td>
<td>--</td>
<td>--</td>
<td>7,798</td>
<td>5,695</td>
<td>9,734</td>
</tr>
<tr>
<td>PAH-SS-07</td>
<td>4,008</td>
<td>4,556</td>
<td>3,244</td>
<td>3,868</td>
<td>4,659</td>
<td>--</td>
<td>--</td>
<td>4,504</td>
<td>5,144</td>
<td>--</td>
</tr>
<tr>
<td>PAH-SS-08</td>
<td>6,461</td>
<td>8,073</td>
<td>7,135</td>
<td>14,488</td>
<td>19,612</td>
<td>19,974</td>
<td>25,114</td>
<td>6,211</td>
<td>19,443</td>
<td>13,079</td>
</tr>
<tr>
<td>PAH-SS-09</td>
<td>12,046</td>
<td>6,017</td>
<td>5,384</td>
<td>4,158</td>
<td>3,059</td>
<td>4,909</td>
<td>--</td>
<td>4,396</td>
<td>6,918</td>
<td>--</td>
</tr>
<tr>
<td>PAH-SS-10</td>
<td>6,691</td>
<td>4,678</td>
<td>3,765</td>
<td>4,720</td>
<td>4,678</td>
<td>4,054</td>
<td>--</td>
<td>5,734</td>
<td>7,861</td>
<td>--</td>
</tr>
</tbody>
</table>
Table 4. Mean distance from sample locations to nearby major land-use categories, Chicago, Illinois—Continued
[---, no data]

<table>
<thead>
<tr>
<th>Sample number (location shown in figure 4)</th>
<th>Mean distance to unclassified land use (feet)</th>
<th>Mean distance to residential land use (feet)</th>
<th>Mean distance to commercial land use (feet)</th>
<th>Mean distance to institutional land use (feet)</th>
<th>Mean distance to industrial, warehousing, and wholesale land use (feet)</th>
<th>Mean distance to agricultural land use (feet)</th>
<th>Mean distance to open space land use (feet)</th>
<th>Mean distance to vacant or wetland land use (feet)</th>
<th>Mean distance to water (feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PAH-SS-11</td>
<td>7,930</td>
<td>5,957</td>
<td>6,824</td>
<td>5,864</td>
<td>9,956</td>
<td>7,545</td>
<td>5,100</td>
<td>4,773</td>
<td>9,022</td>
</tr>
<tr>
<td>PAH-SS-12</td>
<td>9,651</td>
<td>5,263</td>
<td>6,921</td>
<td>4,228</td>
<td>4,723</td>
<td>3,305</td>
<td>5,157</td>
<td>4,614</td>
<td>--</td>
</tr>
<tr>
<td>PAH-SS-13</td>
<td>--</td>
<td>4,071</td>
<td>3,364</td>
<td>3,495</td>
<td>5,610</td>
<td>5,632</td>
<td>--</td>
<td>7,401</td>
<td>7,434</td>
</tr>
<tr>
<td>PAH-SS-14</td>
<td>9,539</td>
<td>5,118</td>
<td>4,268</td>
<td>6,900</td>
<td>5,639</td>
<td>4,961</td>
<td>--</td>
<td>4,125</td>
<td>6,320</td>
</tr>
<tr>
<td>PAH-SS-15</td>
<td>6,413</td>
<td>3,198</td>
<td>2,922</td>
<td>2,360</td>
<td>6,322</td>
<td>4,260</td>
<td>--</td>
<td>3,128</td>
<td>5,162</td>
</tr>
<tr>
<td>PAH-SS-16</td>
<td>--</td>
<td>3,092</td>
<td>3,149</td>
<td>1,965</td>
<td>4,905</td>
<td>4,658</td>
<td>--</td>
<td>4,534</td>
<td>4,836</td>
</tr>
<tr>
<td>PAH-SS-17</td>
<td>--</td>
<td>3,126</td>
<td>1,875</td>
<td>2,911</td>
<td>5,158</td>
<td>4,474</td>
<td>--</td>
<td>3,609</td>
<td>5,864</td>
</tr>
<tr>
<td>PAH-SS-18</td>
<td>--</td>
<td>4,660</td>
<td>3,464</td>
<td>3,910</td>
<td>5,408</td>
<td>4,188</td>
<td>--</td>
<td>4,147</td>
<td>4,286</td>
</tr>
<tr>
<td>PAH-SS-19</td>
<td>--</td>
<td>3,958</td>
<td>3,961</td>
<td>3,745</td>
<td>3,807</td>
<td>3,729</td>
<td>--</td>
<td>4,842</td>
<td>4,620</td>
</tr>
<tr>
<td>PAH-SS-20</td>
<td>--</td>
<td>3,460</td>
<td>3,179</td>
<td>3,261</td>
<td>7,256</td>
<td>6,708</td>
<td>--</td>
<td>5,963</td>
<td>3,163</td>
</tr>
<tr>
<td>PAH-SS-21</td>
<td>--</td>
<td>4,331</td>
<td>4,516</td>
<td>3,113</td>
<td>3,236</td>
<td>3,680</td>
<td>--</td>
<td>7,257</td>
<td>4,838</td>
</tr>
<tr>
<td>PAH-SS-22</td>
<td>--</td>
<td>4,080</td>
<td>3,679</td>
<td>4,115</td>
<td>3,914</td>
<td>4,162</td>
<td>--</td>
<td>3,911</td>
<td>3,804</td>
</tr>
<tr>
<td>PAH-SS-23</td>
<td>--</td>
<td>3,492</td>
<td>3,705</td>
<td>3,033</td>
<td>6,983</td>
<td>7,376</td>
<td>--</td>
<td>3,410</td>
<td>1,243</td>
</tr>
<tr>
<td>PAH-SS-24</td>
<td>--</td>
<td>3,738</td>
<td>3,586</td>
<td>5,390</td>
<td>6,296</td>
<td>5,196</td>
<td>--</td>
<td>4,974</td>
<td>2,384</td>
</tr>
<tr>
<td>PAH-SS-25</td>
<td>--</td>
<td>4,606</td>
<td>4,585</td>
<td>4,682</td>
<td>5,326</td>
<td>5,788</td>
<td>--</td>
<td>4,556</td>
<td>4,311</td>
</tr>
<tr>
<td>PAH-SS-26</td>
<td>--</td>
<td>4,776</td>
<td>5,471</td>
<td>5,451</td>
<td>5,491</td>
<td>4,644</td>
<td>--</td>
<td>3,512</td>
<td>5,365</td>
</tr>
<tr>
<td>PAH-SS-27</td>
<td>--</td>
<td>4,472</td>
<td>4,286</td>
<td>5,376</td>
<td>5,175</td>
<td>4,607</td>
<td>--</td>
<td>6,033</td>
<td>6,008</td>
</tr>
<tr>
<td>PAH-SS-28</td>
<td>4,916</td>
<td>4,148</td>
<td>4,412</td>
<td>4,414</td>
<td>5,242</td>
<td>5,287</td>
<td>--</td>
<td>4,592</td>
<td>5,995</td>
</tr>
<tr>
<td>PAH-SS-29</td>
<td>--</td>
<td>4,666</td>
<td>4,839</td>
<td>4,706</td>
<td>3,737</td>
<td>5,070</td>
<td>--</td>
<td>3,823</td>
<td>4,047</td>
</tr>
<tr>
<td>PAH-SS-30</td>
<td>--</td>
<td>3,954</td>
<td>3,596</td>
<td>3,410</td>
<td>3,009</td>
<td>3,201</td>
<td>--</td>
<td>3,723</td>
<td>3,457</td>
</tr>
<tr>
<td>PAH-SS-33</td>
<td>--</td>
<td>4,077</td>
<td>4,636</td>
<td>3,977</td>
<td>4,068</td>
<td>4,148</td>
<td>--</td>
<td>4,630</td>
<td>4,471</td>
</tr>
<tr>
<td>PAH-SS-34</td>
<td>--</td>
<td>5,083</td>
<td>4,959</td>
<td>5,919</td>
<td>7,734</td>
<td>4,692</td>
<td>--</td>
<td>5,801</td>
<td>5,036</td>
</tr>
<tr>
<td>PAH-SS-35</td>
<td>--</td>
<td>5,303</td>
<td>5,328</td>
<td>4,591</td>
<td>5,361</td>
<td>7,664</td>
<td>--</td>
<td>6,556</td>
<td>4,915</td>
</tr>
<tr>
<td>PAH-SS-36</td>
<td>--</td>
<td>5,728</td>
<td>5,115</td>
<td>5,708</td>
<td>7,533</td>
<td>5,392</td>
<td>--</td>
<td>6,121</td>
<td>6,529</td>
</tr>
<tr>
<td>PAH-SS-37</td>
<td>--</td>
<td>4,946</td>
<td>3,944</td>
<td>4,716</td>
<td>5,538</td>
<td>5,058</td>
<td>--</td>
<td>5,559</td>
<td>4,974</td>
</tr>
<tr>
<td>PAH-SS-38</td>
<td>--</td>
<td>4,175</td>
<td>3,898</td>
<td>6,574</td>
<td>4,395</td>
<td>3,785</td>
<td>--</td>
<td>5,187</td>
<td>--</td>
</tr>
</tbody>
</table>
Table 5. Percentages of major land-use categories around soil-sampling sites, Chicago, Illinois

<table>
<thead>
<tr>
<th>Sample number</th>
<th>Residential</th>
<th>Commercial and services</th>
<th>Industrial, warehousing, and wholesale</th>
<th>Transportation, communication, and utilities</th>
<th>Open space</th>
<th>Vacant or wetland</th>
<th>Agriculture</th>
<th>Water</th>
<th>Unclassified (outside of city boundary)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PAH-CE-1</td>
<td>46.9</td>
<td>28.9</td>
<td>0</td>
<td>15.3</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>8.9</td>
</tr>
<tr>
<td>PAH-CE-2</td>
<td>66.3</td>
<td>13.6</td>
<td>0</td>
<td>0</td>
<td>19.3</td>
<td>0</td>
<td>0.8</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>PAH-CE-3</td>
<td>71.2</td>
<td>26.3</td>
<td>2.5</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>PAH-CE-4</td>
<td>37.1</td>
<td>8.9</td>
<td>10</td>
<td>11.5</td>
<td>3.3</td>
<td>13.1</td>
<td>16.2</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>PAH-CE-5</td>
<td>7.9</td>
<td>3.7</td>
<td>1.4</td>
<td>68.8</td>
<td>10.9</td>
<td>.2</td>
<td>7.0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>PAH-CE-6</td>
<td>59.4</td>
<td>30.7</td>
<td>5.6</td>
<td>1.0</td>
<td>0</td>
<td>0.9</td>
<td>2.4</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>PAH-CE-7</td>
<td>19.6</td>
<td>11.4</td>
<td>14.9</td>
<td>22.0</td>
<td>6.8</td>
<td>3.8</td>
<td>21.5</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>PAH-CE-8</td>
<td>60.5</td>
<td>10.3</td>
<td>7.2</td>
<td>3.1</td>
<td>0</td>
<td>1.3</td>
<td>17.6</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>PAH-CE-9</td>
<td>33.2</td>
<td>24.9</td>
<td>1.9</td>
<td>6.6</td>
<td>12.5</td>
<td>6.9</td>
<td>14.1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>PAH-CE-10</td>
<td>31.5</td>
<td>7.0</td>
<td>16.8</td>
<td>21.2</td>
<td>16.2</td>
<td>.7</td>
<td>6.6</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>PAH-CE-11</td>
<td>45.2</td>
<td>15.5</td>
<td>0</td>
<td>16.0</td>
<td>14.5</td>
<td>8.8</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>PAH-CE-12</td>
<td>59.9</td>
<td>0</td>
<td>0</td>
<td>21.6</td>
<td>16.9</td>
<td>0</td>
<td>1.6</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>PAH-CE-13</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>48.0</td>
<td>33.6</td>
<td>0</td>
<td>18.4</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>PAH-CE-14</td>
<td>48.4</td>
<td>26.2</td>
<td>.2</td>
<td>0</td>
<td>15.3</td>
<td>3.5</td>
<td>6.4</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>PAH-CE-15</td>
<td>39.5</td>
<td>2.8</td>
<td>11.1</td>
<td>21.4</td>
<td>19.2</td>
<td>0</td>
<td>6.0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>PAH-CE-16</td>
<td>0</td>
<td>0.7</td>
<td>0</td>
<td>31.0</td>
<td>32.3</td>
<td>4.3</td>
<td>20.0</td>
<td>0</td>
<td>11.7</td>
</tr>
<tr>
<td>PAH-CE-17</td>
<td>27.8</td>
<td>16.0</td>
<td>0</td>
<td>9.3</td>
<td>14.1</td>
<td>0</td>
<td>1.3</td>
<td>0</td>
<td>31.5</td>
</tr>
<tr>
<td>PAH-CE-18</td>
<td>58.6</td>
<td>12.5</td>
<td>.6</td>
<td>25.5</td>
<td>0</td>
<td>1.0</td>
<td>1.8</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>PAH-CE-19</td>
<td>44.0</td>
<td>8.7</td>
<td>4.8</td>
<td>10.5</td>
<td>25.3</td>
<td>0</td>
<td>6.7</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>PAH-SS-01</td>
<td>47.4</td>
<td>15.2</td>
<td>.7</td>
<td>28.3</td>
<td>0</td>
<td>7.7</td>
<td>.7</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>PAH-SS-02</td>
<td>61.4</td>
<td>28.6</td>
<td>6.3</td>
<td>2.1</td>
<td>0</td>
<td>1.5</td>
<td>0.1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>PAH-SS-03</td>
<td>77.1</td>
<td>14.7</td>
<td>3.6</td>
<td>1.6</td>
<td>0</td>
<td>3.0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>PAH-SS-04</td>
<td>63.9</td>
<td>21.6</td>
<td>10.6</td>
<td>2.6</td>
<td>.8</td>
<td>0</td>
<td>.5</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>PAH-SS-05</td>
<td>62.7</td>
<td>25.5</td>
<td>4.9</td>
<td>4.5</td>
<td>0</td>
<td>1.9</td>
<td>.5</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>PAH-SS-06</td>
<td>94.4</td>
<td>2.5</td>
<td>3.1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>PAH-SS-07</td>
<td>59.7</td>
<td>15.1</td>
<td>11.6</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0.5</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>PAH-SS-08</td>
<td>80.7</td>
<td>9.7</td>
<td>5.9</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>3.7</td>
</tr>
<tr>
<td>PAH-SS-09</td>
<td>68.9</td>
<td>15.5</td>
<td>10.8</td>
<td>2.5</td>
<td>0</td>
<td>2.3</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>PAH-SS-10</td>
<td>54.7</td>
<td>14.5</td>
<td>3.3</td>
<td>6.5</td>
<td>21.0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>PAH-SS-11</td>
<td>76.1</td>
<td>20.7</td>
<td>3.2</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>
Table 5. Percentages of major land-use categories around soil-sampling sites, Chicago, Illinois—Continued

<table>
<thead>
<tr>
<th>Sample number</th>
<th>Residential</th>
<th>Commercial and services</th>
<th>Institutional</th>
<th>Industrial, warehousing, and wholesale</th>
<th>Transportation, communication, and utilities</th>
<th>Open space</th>
<th>Vacant or wetland</th>
<th>Agriculture</th>
<th>Water</th>
<th>Unclassified (outside of city boundary)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PAH-SS-12</td>
<td>31.7</td>
<td>10.2</td>
<td>14.5</td>
<td>16.6</td>
<td>17.8</td>
<td>0.4</td>
<td>8.8</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>PAH-SS-13</td>
<td>52.5</td>
<td>41.2</td>
<td>5.1</td>
<td>0</td>
<td>0</td>
<td>.2</td>
<td>1.0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>PAH-SS-14</td>
<td>84.6</td>
<td>14.2</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0.2</td>
<td>1.2</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>PAH-SS-15</td>
<td>55.6</td>
<td>14.1</td>
<td>10.4</td>
<td>0</td>
<td>1.3</td>
<td>16.5</td>
<td>2.1</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>PAH-SS-16</td>
<td>58.4</td>
<td>2.9</td>
<td>2.8</td>
<td>0</td>
<td>10.0</td>
<td>13.6</td>
<td>12.3</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>PAH-SS-17</td>
<td>5.8</td>
<td>28.9</td>
<td>0</td>
<td>23.8</td>
<td>0</td>
<td>9.6</td>
<td>31.8</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>PAH-SS-18</td>
<td>15.9</td>
<td>31.7</td>
<td>0.8</td>
<td>11.1</td>
<td>20.0</td>
<td>0</td>
<td>20.5</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>PAH-SS-19</td>
<td>78.9</td>
<td>14.8</td>
<td>5.9</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>.4</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>PAH-SS-20</td>
<td>82.5</td>
<td>11.5</td>
<td>2.4</td>
<td>1.0</td>
<td>0</td>
<td>0</td>
<td>2.6</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>PAH-SS-21</td>
<td>28.2</td>
<td>11.4</td>
<td>28.8</td>
<td>8.3</td>
<td>17.1</td>
<td>0</td>
<td>2.8</td>
<td>0</td>
<td>3.4</td>
<td>0</td>
</tr>
<tr>
<td>PAH-SS-22</td>
<td>60.4</td>
<td>26.8</td>
<td>8.0</td>
<td>0</td>
<td>1.3</td>
<td>0</td>
<td>3.5</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>PAH-SS-23</td>
<td>66.6</td>
<td>31.1</td>
<td>1.8</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>.5</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>PAH-SS-24</td>
<td>78.2</td>
<td>17.7</td>
<td>3.5</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>.6</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>PAH-SS-25</td>
<td>60.7</td>
<td>24.0</td>
<td>4.5</td>
<td>1.4</td>
<td>0</td>
<td>2.4</td>
<td>7.0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>PAH-SS-26</td>
<td>60.8</td>
<td>26.1</td>
<td>1.8</td>
<td>3.3</td>
<td>0</td>
<td>.7</td>
<td>7.3</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>PAH-SS-27</td>
<td>54.8</td>
<td>28.6</td>
<td>4.3</td>
<td>12.3</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>PAH-SS-28</td>
<td>78.4</td>
<td>5.3</td>
<td>2.5</td>
<td>.9</td>
<td>0</td>
<td>12.2</td>
<td>.7</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>PAH-SS-29</td>
<td>36.6</td>
<td>7.1</td>
<td>5.7</td>
<td>15.5</td>
<td>4.7</td>
<td>9.7</td>
<td>20.7</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>PAH-SS-30</td>
<td>42.5</td>
<td>14.6</td>
<td>10.8</td>
<td>12.2</td>
<td>11.0</td>
<td>5.1</td>
<td>3.8</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>PAH-SS-31</td>
<td>43.1</td>
<td>4.2</td>
<td>16.8</td>
<td>15.1</td>
<td>1.7</td>
<td>8.1</td>
<td>11.0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>PAH-SS-32</td>
<td>43.2</td>
<td>12.8</td>
<td>7.9</td>
<td>11.9</td>
<td>21.9</td>
<td>0</td>
<td>2.3</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>PAH-SS-33</td>
<td>66.3</td>
<td>23.7</td>
<td>2.8</td>
<td>6.3</td>
<td>0</td>
<td>0</td>
<td>.9</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>PAH-SS-34</td>
<td>68.5</td>
<td>25.0</td>
<td>6.5</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>PAH-SS-35</td>
<td>66.6</td>
<td>25.0</td>
<td>6.0</td>
<td>0</td>
<td>0</td>
<td>1.1</td>
<td>1.3</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>PAH-SS-36</td>
<td>63.7</td>
<td>23.2</td>
<td>10.4</td>
<td>0</td>
<td>2.4</td>
<td>0</td>
<td>.3</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>PAH-SS-37</td>
<td>1.8</td>
<td>56.2</td>
<td>8.6</td>
<td>3.8</td>
<td>22.1</td>
<td>0.3</td>
<td>3.7</td>
<td>0</td>
<td>3.5</td>
<td>0</td>
</tr>
<tr>
<td>PAH-SS-38</td>
<td>66.4</td>
<td>18.9</td>
<td>4.1</td>
<td>0</td>
<td>3.6</td>
<td>7.0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>
Table 5. Percentages of major land-use categories around soil-sampling sites, Chicago, Illinois—Continued

<table>
<thead>
<tr>
<th>Sample number (location shown in figure 4)</th>
<th>Residential</th>
<th>Commercial and services</th>
<th>Institutional</th>
<th>Industrial, warehousing, and wholesale</th>
<th>Transportation, communication, and utilities</th>
<th>Open space</th>
<th>Vacant or wetland</th>
<th>Agriculture</th>
<th>Water</th>
<th>Unclassified (outside of city boundary)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PAH-CE-1</td>
<td>48.4</td>
<td>9.3</td>
<td>1.9</td>
<td>19.5</td>
<td>0</td>
<td>1.2</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>PAH-CE-2</td>
<td>71.5</td>
<td>10.0</td>
<td>4.5</td>
<td>0</td>
<td>9.6</td>
<td>3.9</td>
<td>.6</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>PAH-CE-3</td>
<td>79.5</td>
<td>15.9</td>
<td>4.3</td>
<td>0</td>
<td>.3</td>
<td>0</td>
<td>.1</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>PAH-CE-4</td>
<td>29.7</td>
<td>15.7</td>
<td>9.1</td>
<td>21.4</td>
<td>7.1</td>
<td>5.1</td>
<td>9.7</td>
<td>0</td>
<td>2.1</td>
<td>0</td>
</tr>
<tr>
<td>PAH-CE-5</td>
<td>25.6</td>
<td>10.7</td>
<td>5.3</td>
<td>39.2</td>
<td>5.0</td>
<td>3.6</td>
<td>10.7</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>PAH-CE-6</td>
<td>55.9</td>
<td>19.2</td>
<td>8.0</td>
<td>0.3</td>
<td>1.8</td>
<td>11.8</td>
<td>3.1</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>PAH-CE-7</td>
<td>23.7</td>
<td>10.5</td>
<td>14.5</td>
<td>16.7</td>
<td>16.2</td>
<td>8.3</td>
<td>10.1</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>PAH-CE-8</td>
<td>58.1</td>
<td>9.9</td>
<td>4.3</td>
<td>1.1</td>
<td>.9</td>
<td>8.4</td>
<td>17.5</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>PAH-CE-9</td>
<td>47.2</td>
<td>12.5</td>
<td>4.6</td>
<td>1.9</td>
<td>14.4</td>
<td>4.2</td>
<td>15.2</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>PAH-CE-10</td>
<td>45.2</td>
<td>6.3</td>
<td>20.9</td>
<td>12.8</td>
<td>7.9</td>
<td>2.3</td>
<td>4.6</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>PAH-CE-11</td>
<td>53.5</td>
<td>12.4</td>
<td>6.4</td>
<td>8.9</td>
<td>10.1</td>
<td>8.1</td>
<td>0.7</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>PAH-CE-12</td>
<td>57.9</td>
<td>3.8</td>
<td>4.1</td>
<td>18.7</td>
<td>13.2</td>
<td>1.0</td>
<td>1.2</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>PAH-CE-13</td>
<td>8.4</td>
<td>2.1</td>
<td>2.4</td>
<td>44.2</td>
<td>27.8</td>
<td>1.7</td>
<td>13.4</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>PAH-CE-14</td>
<td>48.9</td>
<td>14.0</td>
<td>1.6</td>
<td>9.0</td>
<td>20.1</td>
<td>2.1</td>
<td>4.4</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>PAH-CE-15</td>
<td>63.3</td>
<td>5.1</td>
<td>5.8</td>
<td>7.7</td>
<td>9.7</td>
<td>4.0</td>
<td>4.4</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>PAH-CE-16</td>
<td>20.7</td>
<td>2.8</td>
<td>0.7</td>
<td>26.5</td>
<td>17.7</td>
<td>2.7</td>
<td>17.3</td>
<td>0</td>
<td>11.6</td>
<td>0</td>
</tr>
<tr>
<td>PAH-CE-17</td>
<td>33.5</td>
<td>8.3</td>
<td>.7</td>
<td>2.9</td>
<td>9.2</td>
<td>1.1</td>
<td>1.6</td>
<td>0</td>
<td>0</td>
<td>42.7</td>
</tr>
<tr>
<td>PAH-CE-18</td>
<td>56.4</td>
<td>10.5</td>
<td>6.8</td>
<td>15.1</td>
<td>4.0</td>
<td>1.5</td>
<td>5.7</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>PAH-CE-19</td>
<td>44.0</td>
<td>8.5</td>
<td>2.6</td>
<td>13.9</td>
<td>19.2</td>
<td>2.6</td>
<td>9.2</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>PAH-SS-01</td>
<td>56.9</td>
<td>12.4</td>
<td>3.5</td>
<td>23.4</td>
<td>.9</td>
<td>2.7</td>
<td>.3</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>PAH-SS-02</td>
<td>65.2</td>
<td>20.7</td>
<td>5.2</td>
<td>2.8</td>
<td>0.2</td>
<td>4.8</td>
<td>1.1</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>PAH-SS-03</td>
<td>75.4</td>
<td>8.2</td>
<td>2.1</td>
<td>5.8</td>
<td>5.5</td>
<td>1.2</td>
<td>1.8</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>PAH-SS-04</td>
<td>72.9</td>
<td>13.6</td>
<td>3.5</td>
<td>9.5</td>
<td>.2</td>
<td>0</td>
<td>.4</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>PAH-SS-05</td>
<td>61.3</td>
<td>15.2</td>
<td>4.4</td>
<td>6.3</td>
<td>0</td>
<td>3.3</td>
<td>0.5</td>
<td>0</td>
<td>0</td>
<td>9.1</td>
</tr>
<tr>
<td>PAH-SS-06</td>
<td>83.7</td>
<td>4.5</td>
<td>10.7</td>
<td>0</td>
<td>0</td>
<td>1.1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>PAH-SS-07</td>
<td>53.6</td>
<td>8.2</td>
<td>12.2</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0.1</td>
<td>0</td>
<td>0</td>
<td>25.9</td>
</tr>
<tr>
<td>PAH-SS-08</td>
<td>77.7</td>
<td>12.3</td>
<td>4.8</td>
<td>0</td>
<td>4.3</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1.0</td>
</tr>
<tr>
<td>PAH-SS-09</td>
<td>79.5</td>
<td>6.6</td>
<td>7.0</td>
<td>1.9</td>
<td>0</td>
<td>5.1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>PAH-SS-10</td>
<td>71.0</td>
<td>12.2</td>
<td>2.2</td>
<td>2.5</td>
<td>9.0</td>
<td>3.1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>PAH-SS-11</td>
<td>69.0</td>
<td>7.1</td>
<td>23.2</td>
<td>0</td>
<td>0</td>
<td>.7</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>
### Table 5. Percentages of major land-use categories around soil-sampling sites, Chicago, Illinois—Continued

<table>
<thead>
<tr>
<th>Sample number (location shown in figure 4)</th>
<th>Residential</th>
<th>Commercial and services</th>
<th>Institutional</th>
<th>Industrial, warehousing, and wholesale</th>
<th>Transportation, communication, and utilities</th>
<th>Open space</th>
<th>Vacant or wetland</th>
<th>Agriculture</th>
<th>Water</th>
<th>Unclassified (outside of city boundary)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PAH-SS-12</td>
<td>65.9</td>
<td>4.7</td>
<td>5.6</td>
<td>7.7</td>
<td>10.0</td>
<td>1.3</td>
<td>4.9</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>PAH-SS-13</td>
<td>61.2</td>
<td>24.6</td>
<td>6.2</td>
<td>0</td>
<td>0</td>
<td>7.2</td>
<td>.9</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>PAH-SS-14</td>
<td>81.8</td>
<td>9.6</td>
<td>2.4</td>
<td>.4</td>
<td>1.7</td>
<td>1.1</td>
<td>2.6</td>
<td>0</td>
<td>.5</td>
<td>0</td>
</tr>
<tr>
<td>PAH-SS-15</td>
<td>30.6</td>
<td>3.5</td>
<td>10.1</td>
<td>0</td>
<td>17.2</td>
<td>26.8</td>
<td>6.3</td>
<td>0</td>
<td>5.6</td>
<td>0</td>
</tr>
<tr>
<td>PAH-SS-16</td>
<td>51.3</td>
<td>4.6</td>
<td>2.8</td>
<td>.5</td>
<td>23.2</td>
<td>6.2</td>
<td>11.4</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>PAH-SS-17</td>
<td>15.9</td>
<td>9.7</td>
<td>4.1</td>
<td>32.6</td>
<td>6.0</td>
<td>5.4</td>
<td>26.2</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>PAH-SS-18</td>
<td>34.9</td>
<td>14.3</td>
<td>3.4</td>
<td>14.5</td>
<td>14.3</td>
<td>1.3</td>
<td>12.3</td>
<td>0</td>
<td>5.0</td>
<td>0</td>
</tr>
<tr>
<td>PAH-SS-19</td>
<td>71.1</td>
<td>8.6</td>
<td>5.5</td>
<td>2.9</td>
<td>7.0</td>
<td>3.1</td>
<td>1.8</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>PAH-SS-20</td>
<td>65.1</td>
<td>11.1</td>
<td>2.0</td>
<td>.3</td>
<td>0</td>
<td>8.3</td>
<td>2.9</td>
<td>0</td>
<td>0</td>
<td>10.4</td>
</tr>
<tr>
<td>PAH-SS-21</td>
<td>45.3</td>
<td>8.2</td>
<td>28.1</td>
<td>4.9</td>
<td>9.1</td>
<td>.7</td>
<td>1.7</td>
<td>0</td>
<td>1.9</td>
<td>0</td>
</tr>
<tr>
<td>PAH-SS-22</td>
<td>66.0</td>
<td>13.1</td>
<td>3.5</td>
<td>4.2</td>
<td>4.2</td>
<td>1.5</td>
<td>7.6</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>PAH-SS-23</td>
<td>77.1</td>
<td>15.2</td>
<td>3.1</td>
<td>0</td>
<td>0</td>
<td>4.4</td>
<td>.2</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>PAH-SS-24</td>
<td>80.9</td>
<td>16.1</td>
<td>2.3</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>.7</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>PAH-SS-25</td>
<td>69.4</td>
<td>17.2</td>
<td>4.4</td>
<td>.8</td>
<td>.8</td>
<td>1.0</td>
<td>6.4</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>PAH-SS-26</td>
<td>55.4</td>
<td>12.8</td>
<td>2.2</td>
<td>15.5</td>
<td>2.4</td>
<td>7.3</td>
<td>4.4</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>PAH-SS-27</td>
<td>60.7</td>
<td>15.8</td>
<td>4.6</td>
<td>18.7</td>
<td>0</td>
<td>0.2</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>PAH-SS-28</td>
<td>60.4</td>
<td>5.7</td>
<td>2.1</td>
<td>19.5</td>
<td>5.8</td>
<td>4.8</td>
<td>1.8</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>PAH-SS-29</td>
<td>35.8</td>
<td>6.2</td>
<td>7.4</td>
<td>16.6</td>
<td>7.5</td>
<td>12.0</td>
<td>13.0</td>
<td>0</td>
<td>1.6</td>
<td>0</td>
</tr>
<tr>
<td>PAH-SS-30</td>
<td>45.6</td>
<td>11.2</td>
<td>7.7</td>
<td>11.3</td>
<td>7.6</td>
<td>2.5</td>
<td>14.1</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>PAH-SS-31</td>
<td>44.0</td>
<td>4.9</td>
<td>5.9</td>
<td>20.9</td>
<td>4.8</td>
<td>7.4</td>
<td>12.3</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>PAH-SS-32</td>
<td>44.2</td>
<td>5.8</td>
<td>6.2</td>
<td>24.4</td>
<td>16.6</td>
<td>1.5</td>
<td>1.4</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>PAH-SS-33</td>
<td>60.2</td>
<td>11.0</td>
<td>4.0</td>
<td>19.9</td>
<td>4.0</td>
<td>0</td>
<td>.8</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>PAH-SS-34</td>
<td>73.5</td>
<td>18.0</td>
<td>3.7</td>
<td>.3</td>
<td>0</td>
<td>4.3</td>
<td>.3</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>PAH-SS-35</td>
<td>68.6</td>
<td>15.5</td>
<td>8.5</td>
<td>3.3</td>
<td>.1</td>
<td>2.4</td>
<td>1.6</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>PAH-SS-36</td>
<td>58.7</td>
<td>22.7</td>
<td>4.4</td>
<td>.7</td>
<td>4.6</td>
<td>7.7</td>
<td>.7</td>
<td>0</td>
<td>0</td>
<td>.6</td>
</tr>
<tr>
<td>PAH-SS-37</td>
<td>1.9</td>
<td>56.3</td>
<td>6.9</td>
<td>5.9</td>
<td>17.9</td>
<td>2.9</td>
<td>2.4</td>
<td>0</td>
<td>5.9</td>
<td>0</td>
</tr>
<tr>
<td>PAH-SS-38</td>
<td>68.1</td>
<td>15.9</td>
<td>1.7</td>
<td>3.7</td>
<td>6.8</td>
<td>3.8</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Percent landuse within a 1-mile radius (2-mile diameter) around the sampling site

<p>| PAH-CE-1 | 32.0 | 3.8 | 1.8 | 8.5 | 0 | 17.1 | 0.1 | 0 | 0 | 36.9 |
| PAH-CE-2 | 74.2 | 3.9 | 9.7 | .5  | 4.2| 2.5  | .2  | 0 | 0 | 4.8  |</p>
<table>
<thead>
<tr>
<th>Sample number</th>
<th>Commercial and services</th>
<th>Institutional</th>
<th>Industrial, warehousing, and wholesale</th>
<th>Transportation, communication, and utilities</th>
<th>Open space</th>
<th>Vacant or wetland</th>
<th>Agriculture</th>
<th>Water</th>
<th>Unclassified (outside of city boundary)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PAH-CE-3</td>
<td>71.4</td>
<td>15.5</td>
<td>4.0</td>
<td>0.8</td>
<td>0.3</td>
<td>6.5</td>
<td>0.2</td>
<td>0</td>
<td>1.4</td>
</tr>
<tr>
<td>PAH-CE-4</td>
<td>25.1</td>
<td>19.1</td>
<td>6.5</td>
<td>19.6</td>
<td>10.1</td>
<td>5.3</td>
<td>7.7</td>
<td>0</td>
<td>3.0</td>
</tr>
<tr>
<td>PAH-CE-5</td>
<td>32.8</td>
<td>15.7</td>
<td>7.1</td>
<td>25.0</td>
<td>7.8</td>
<td>2.7</td>
<td>9.0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>PAH-CE-6</td>
<td>49.4</td>
<td>12.7</td>
<td>8.6</td>
<td>8.8</td>
<td>3.8</td>
<td>10.3</td>
<td>5.8</td>
<td>0</td>
<td>0.6</td>
</tr>
<tr>
<td>PAH-CE-7</td>
<td>23.6</td>
<td>13.5</td>
<td>10.1</td>
<td>11.3</td>
<td>20.2</td>
<td>7.5</td>
<td>9.5</td>
<td>0</td>
<td>9.5</td>
</tr>
<tr>
<td>PAH-CE-8</td>
<td>42.9</td>
<td>11.1</td>
<td>5.8</td>
<td>1.5</td>
<td>4.9</td>
<td>10.5</td>
<td>12.5</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>PAH-CE-9</td>
<td>39.6</td>
<td>9.5</td>
<td>4.9</td>
<td>4.2</td>
<td>15.6</td>
<td>13.8</td>
<td>12.0</td>
<td>0</td>
<td>0.5</td>
</tr>
<tr>
<td>PAH-CE-10</td>
<td>52.2</td>
<td>3.7</td>
<td>10.8</td>
<td>14.5</td>
<td>9.2</td>
<td>3.9</td>
<td>5.8</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>PAH-CE-11</td>
<td>53.9</td>
<td>8.5</td>
<td>4.1</td>
<td>8.3</td>
<td>9.6</td>
<td>12.8</td>
<td>2.8</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>PAH-CE-12</td>
<td>55.5</td>
<td>7.0</td>
<td>7.4</td>
<td>11.1</td>
<td>9.6</td>
<td>5.4</td>
<td>3.5</td>
<td>0</td>
<td>0.6</td>
</tr>
<tr>
<td>PAH-CE-13</td>
<td>28.8</td>
<td>10.4</td>
<td>6.0</td>
<td>24.8</td>
<td>11.5</td>
<td>1.9</td>
<td>5.7</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>PAH-CE-14</td>
<td>39.1</td>
<td>7.3</td>
<td>1.0</td>
<td>6.4</td>
<td>30.5</td>
<td>3.3</td>
<td>6.1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>PAH-CE-15</td>
<td>75.7</td>
<td>6.8</td>
<td>4.9</td>
<td>2.2</td>
<td>5.5</td>
<td>2.5</td>
<td>2.5</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>PAH-CE-16</td>
<td>33.7</td>
<td>6.0</td>
<td>1.3</td>
<td>17.9</td>
<td>13.4</td>
<td>6.3</td>
<td>15.0</td>
<td>0</td>
<td>5.8</td>
</tr>
<tr>
<td>PAH-CE-17</td>
<td>30.3</td>
<td>3.5</td>
<td>1.4</td>
<td>4.3</td>
<td>4.5</td>
<td>5.9</td>
<td>1.5</td>
<td>0</td>
<td>0.7</td>
</tr>
<tr>
<td>PAH-CE-18</td>
<td>58.4</td>
<td>10.0</td>
<td>3.8</td>
<td>12.4</td>
<td>6.2</td>
<td>3.2</td>
<td>6.0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>PAH-CE-19</td>
<td>45.1</td>
<td>9.3</td>
<td>7.7</td>
<td>6.2</td>
<td>12.1</td>
<td>10.3</td>
<td>8.5</td>
<td>0</td>
<td>0.9</td>
</tr>
<tr>
<td>PAH-SS-01</td>
<td>68.2</td>
<td>12.0</td>
<td>3.3</td>
<td>12.2</td>
<td>1.3</td>
<td>2.4</td>
<td>0.6</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>PAH-SS-02</td>
<td>59.9</td>
<td>17.1</td>
<td>3.5</td>
<td>6.2</td>
<td>3.4</td>
<td>6.6</td>
<td>3.0</td>
<td>0</td>
<td>0.4</td>
</tr>
<tr>
<td>PAH-SS-03</td>
<td>65.7</td>
<td>9.0</td>
<td>3.3</td>
<td>9.1</td>
<td>3.1</td>
<td>4.5</td>
<td>1.8</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>PAH-SS-04</td>
<td>72.7</td>
<td>13.0</td>
<td>3.7</td>
<td>7.4</td>
<td>0.5</td>
<td>2.6</td>
<td>0.3</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>PAH-SS-05</td>
<td>49.8</td>
<td>12.7</td>
<td>2.2</td>
<td>8.7</td>
<td>0</td>
<td>2.8</td>
<td>1.1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>PAH-SS-06</td>
<td>67.0</td>
<td>5.0</td>
<td>13.7</td>
<td>0</td>
<td>0</td>
<td>1.8</td>
<td>0.0</td>
<td>0</td>
<td>12.5</td>
</tr>
<tr>
<td>PAH-SS-07</td>
<td>46.5</td>
<td>5.1</td>
<td>20.3</td>
<td>3.0</td>
<td>0</td>
<td>1.0</td>
<td>2.8</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>PAH-SS-08</td>
<td>56.4</td>
<td>10.3</td>
<td>2.8</td>
<td>0</td>
<td>4.7</td>
<td>17.4</td>
<td>0.6</td>
<td>0</td>
<td>1.1</td>
</tr>
<tr>
<td>PAH-SS-09</td>
<td>62.8</td>
<td>6.3</td>
<td>16.8</td>
<td>1.5</td>
<td>3.5</td>
<td>8.2</td>
<td>0.2</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>PAH-SS-10</td>
<td>69.4</td>
<td>10.2</td>
<td>2.8</td>
<td>5.5</td>
<td>5.0</td>
<td>6.9</td>
<td>0.2</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>PAH-SS-11</td>
<td>65.0</td>
<td>5.0</td>
<td>14.1</td>
<td>1.1</td>
<td>0</td>
<td>7.6</td>
<td>1.2</td>
<td>2.6</td>
<td>1</td>
</tr>
<tr>
<td>PAH-SS-12</td>
<td>77.5</td>
<td>5.8</td>
<td>4.3</td>
<td>2.2</td>
<td>5.4</td>
<td>2.5</td>
<td>2.4</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>PAH-SS-13</td>
<td>64.7</td>
<td>11.3</td>
<td>5.3</td>
<td>10.3</td>
<td>2.6</td>
<td>2.5</td>
<td>3.2</td>
<td>0</td>
<td>0.2</td>
</tr>
</tbody>
</table>
Table 5. Percentages of major land-use categories around soil-sampling sites, Chicago, Illinois—Continued

<table>
<thead>
<tr>
<th>Sample number (location shown in figure 4)</th>
<th>Residential</th>
<th>Commercial and services</th>
<th>Institutional</th>
<th>Industrial, warehousing, and wholesale</th>
<th>Transportation, communication, and utilities</th>
<th>Open space</th>
<th>Vacant or wetland</th>
<th>Agriculture</th>
<th>Water</th>
<th>Unclassified (outside of city boundary)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PAH-SS-14</td>
<td>59.3</td>
<td>8.8</td>
<td>2.4</td>
<td>9.9</td>
<td>11.6</td>
<td>2.6</td>
<td>4.6</td>
<td>0</td>
<td>0.9</td>
<td>0</td>
</tr>
<tr>
<td>PAH-SS-15</td>
<td>14.7</td>
<td>1.5</td>
<td>3.5</td>
<td>13.5</td>
<td>39.5</td>
<td>13.2</td>
<td>6.6</td>
<td>0</td>
<td>7.5</td>
<td>0</td>
</tr>
<tr>
<td>PAH-SS-16</td>
<td>24.0</td>
<td>2.2</td>
<td>.8</td>
<td>18.8</td>
<td>19.5</td>
<td>5.3</td>
<td>17.6</td>
<td>0</td>
<td>11.9</td>
<td>0</td>
</tr>
<tr>
<td>PAH-SS-17</td>
<td>14.4</td>
<td>3.4</td>
<td>2.8</td>
<td>26.2</td>
<td>10.8</td>
<td>15.7</td>
<td>13.7</td>
<td>0</td>
<td>7.7</td>
<td>5.3</td>
</tr>
<tr>
<td>PAH-SS-18</td>
<td>40.3</td>
<td>7.1</td>
<td>2.7</td>
<td>14.9</td>
<td>13.9</td>
<td>3.2</td>
<td>13.8</td>
<td>0</td>
<td>4.0</td>
<td>0</td>
</tr>
<tr>
<td>PAH-SS-19</td>
<td>71.1</td>
<td>11.9</td>
<td>5.0</td>
<td>3.3</td>
<td>4.6</td>
<td>2.4</td>
<td>1.6</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>PAH-SS-20</td>
<td>53.4</td>
<td>7.2</td>
<td>2.4</td>
<td>.5</td>
<td>.6</td>
<td>9.1</td>
<td>1.5</td>
<td>0</td>
<td>25.3</td>
<td>0</td>
</tr>
<tr>
<td>PAH-SS-21</td>
<td>58.0</td>
<td>11.1</td>
<td>12.4</td>
<td>4.4</td>
<td>7.2</td>
<td>1.5</td>
<td>5.0</td>
<td>0</td>
<td>.5</td>
<td>0</td>
</tr>
<tr>
<td>PAH-SS-22</td>
<td>61.1</td>
<td>10.6</td>
<td>4.1</td>
<td>12.6</td>
<td>3.0</td>
<td>3.5</td>
<td>5.1</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>PAH-SS-23</td>
<td>77.1</td>
<td>9.7</td>
<td>2.4</td>
<td>1.1</td>
<td>2.5</td>
<td>4.7</td>
<td>2.4</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>PAH-SS-24</td>
<td>77.5</td>
<td>9.4</td>
<td>3.4</td>
<td>0</td>
<td>1.2</td>
<td>7.0</td>
<td>0.4</td>
<td>0</td>
<td>1.1</td>
<td>0</td>
</tr>
<tr>
<td>PAH-SS-25</td>
<td>61.6</td>
<td>10.6</td>
<td>4.6</td>
<td>4.6</td>
<td>1.4</td>
<td>8.3</td>
<td>8.9</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>PAH-SS-26</td>
<td>22.3</td>
<td>8.2</td>
<td>1.2</td>
<td>40.3</td>
<td>10.7</td>
<td>5.1</td>
<td>8.3</td>
<td>0</td>
<td>4.0</td>
<td>0</td>
</tr>
<tr>
<td>PAH-SS-27</td>
<td>40.1</td>
<td>9.4</td>
<td>1.7</td>
<td>34.1</td>
<td>12.4</td>
<td>1.0</td>
<td>1.4</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>PAH-SS-28</td>
<td>34.0</td>
<td>7.1</td>
<td>1.3</td>
<td>31.9</td>
<td>13.0</td>
<td>1.2</td>
<td>4.0</td>
<td>0</td>
<td>2.1</td>
<td>5.3</td>
</tr>
<tr>
<td>PAH-SS-29</td>
<td>35.6</td>
<td>11.8</td>
<td>6.9</td>
<td>14.2</td>
<td>10.1</td>
<td>9.2</td>
<td>11.5</td>
<td>0</td>
<td>0.6</td>
<td>0</td>
</tr>
<tr>
<td>PAH-SS-30</td>
<td>43.3</td>
<td>8.9</td>
<td>5.7</td>
<td>9.0</td>
<td>5.8</td>
<td>12.9</td>
<td>13.0</td>
<td>0</td>
<td>1.3</td>
<td>0</td>
</tr>
<tr>
<td>PAH-SS-31</td>
<td>43.2</td>
<td>8.0</td>
<td>4.6</td>
<td>15.1</td>
<td>7.4</td>
<td>11.7</td>
<td>9.3</td>
<td>0</td>
<td>.7</td>
<td>0</td>
</tr>
<tr>
<td>PAH-SS-32</td>
<td>35.8</td>
<td>10.6</td>
<td>3.0</td>
<td>22.6</td>
<td>7.4</td>
<td>7.2</td>
<td>3.0</td>
<td>0</td>
<td>.3</td>
<td>10.2</td>
</tr>
<tr>
<td>PAH-SS-33</td>
<td>55.0</td>
<td>8.8</td>
<td>3.6</td>
<td>20.0</td>
<td>6.2</td>
<td>1.8</td>
<td>4.5</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>PAH-SS-34</td>
<td>56.7</td>
<td>13.9</td>
<td>10.3</td>
<td>1.6</td>
<td>0.6</td>
<td>8.8</td>
<td>1.8</td>
<td>0</td>
<td>1.1</td>
<td>5.3</td>
</tr>
<tr>
<td>PAH-SS-35</td>
<td>56.3</td>
<td>10.2</td>
<td>16.4</td>
<td>2.9</td>
<td>.2</td>
<td>4.8</td>
<td>1.3</td>
<td>0</td>
<td>.2</td>
<td>7.7</td>
</tr>
<tr>
<td>PAH-SS-36</td>
<td>47.2</td>
<td>14.5</td>
<td>8.7</td>
<td>.7</td>
<td>2.8</td>
<td>8.8</td>
<td>.8</td>
<td>0</td>
<td>0</td>
<td>16.6</td>
</tr>
<tr>
<td>PAH-SS-37</td>
<td>11.0</td>
<td>36.0</td>
<td>5.6</td>
<td>7.5</td>
<td>15.8</td>
<td>8.5</td>
<td>7.5</td>
<td>0</td>
<td>4.0</td>
<td>4.1</td>
</tr>
<tr>
<td>PAH-SS-38</td>
<td>67.3</td>
<td>13.1</td>
<td>2.8</td>
<td>5.7</td>
<td>7.5</td>
<td>3.5</td>
<td>.1</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>
### Table 7. Shapiro-Wilk test statistic for normal distribution of natural-log-transformed polynuclear aromatic hydrocarbon data in ambient surface soils, Chicago, Illinois

[Alpha = 0.1. Null hypothesis (H₀) is that the distribution is lognormal.]

<table>
<thead>
<tr>
<th>Constituent (natural-log transformed)</th>
<th>Excluding sample PAH-CE-19</th>
<th>Including sample PAH-CE-19</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phenanthrene</td>
<td>0.968 0.14 Fail to reject H₀</td>
<td>0.971 0.19 Fail to reject H₀</td>
</tr>
<tr>
<td>Fluoranthene</td>
<td>0.969 0.16 Fail to reject H₀</td>
<td>0.967 0.13 Fail to reject H₀</td>
</tr>
<tr>
<td>Pyrene</td>
<td>0.969 0.16 Fail to reject H₀</td>
<td>0.962 0.07 Reject H₀</td>
</tr>
<tr>
<td>Benzo(a)anthracene</td>
<td>0.973 0.24 Fail to reject H₀</td>
<td>0.971 0.18 Fail to reject H₀</td>
</tr>
<tr>
<td>Chrysene</td>
<td>0.977 0.35 Fail to reject H₀</td>
<td>0.971 0.19 Fail to reject H₀</td>
</tr>
<tr>
<td>Benzo(b)fluoranthene</td>
<td>0.976 0.31 Fail to reject H₀</td>
<td>0.965 0.10 Reject H₀</td>
</tr>
<tr>
<td>Benzo(k)fluoranthene</td>
<td>0.970 0.17 Fail to reject H₀</td>
<td>0.961 0.08 Reject H₀</td>
</tr>
<tr>
<td>Benzo(a)pyrene</td>
<td>0.977 0.35 Fail to reject H₀</td>
<td>0.966 0.11 Fail to reject H₀</td>
</tr>
<tr>
<td>Dibenzo(a,h)anthracene</td>
<td>0.981 0.50 Fail to reject H₀</td>
<td>0.937 0.01 Reject H₀</td>
</tr>
<tr>
<td>Benzo(g,h,i)perylene</td>
<td>0.974 0.26 Fail to reject H₀</td>
<td>0.931 0.00 Reject H₀</td>
</tr>
<tr>
<td>Indeno(1,2,3-cd)pyrene</td>
<td>0.978 0.40 Fail to reject H₀</td>
<td>0.939 0.01 Reject H₀</td>
</tr>
</tbody>
</table>
Table 8. Statistical summary of log-transformed polynuclear aromatic hydrocarbon data for censored compounds in ambient surface soils, Chicago, Illinois

[Bold denotes retained estimates]

<table>
<thead>
<tr>
<th>Constituent</th>
<th>Number of samples</th>
<th>Number less than detection limit</th>
<th>Number of detection limits</th>
<th>Maximum detection limit (micro-grams per kilogram)</th>
<th>Mean (micro-grams per kilogram)</th>
<th>Standard deviation (micro-grams per kilogram)</th>
<th>Value of 25th percentile (micro-grams per kilogram)</th>
<th>Median (micro-grams per kilogram)</th>
<th>Value of 75th percentile (micro-grams per kilogram)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acenaphthene</td>
<td>57</td>
<td>7</td>
<td>5</td>
<td>3.05</td>
<td>4.24</td>
<td>1.86</td>
<td>2.41</td>
<td>4.44</td>
<td>5.63</td>
</tr>
<tr>
<td>Acenaphthylene</td>
<td>57</td>
<td>16</td>
<td>6</td>
<td>3.18</td>
<td>3.22</td>
<td>1.55</td>
<td>1.91</td>
<td>2.83</td>
<td>4.18</td>
</tr>
<tr>
<td>Anthracene</td>
<td>57</td>
<td>3</td>
<td>3</td>
<td>3.05</td>
<td>5.22</td>
<td>1.89</td>
<td>3.68</td>
<td>5.39</td>
<td>6.48</td>
</tr>
<tr>
<td>Fluorene</td>
<td>57</td>
<td>7</td>
<td>5</td>
<td>3.05</td>
<td>4.36</td>
<td>1.88</td>
<td>2.53</td>
<td>4.51</td>
<td>5.75</td>
</tr>
<tr>
<td>Naphthalene</td>
<td>57</td>
<td>22</td>
<td>7</td>
<td>3.18</td>
<td>3.56</td>
<td>1.44</td>
<td>2.42</td>
<td>3.00</td>
<td>4.54</td>
</tr>
</tbody>
</table>

Excluding Sample PAH-CE-19

<table>
<thead>
<tr>
<th>Constituent</th>
<th>Number of samples</th>
<th>Number less than detection limit</th>
<th>Number of detection limits</th>
<th>Maximum detection limit (micro-grams per kilogram)</th>
<th>Mean (micro-grams per kilogram)</th>
<th>Standard deviation (micro-grams per kilogram)</th>
<th>Value of 25th percentile (micro-grams per kilogram)</th>
<th>Median (micro-grams per kilogram)</th>
<th>Value of 75th percentile (micro-grams per kilogram)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acenaphthene</td>
<td>56</td>
<td>7</td>
<td>5</td>
<td>3.05</td>
<td>4.14</td>
<td>2.32</td>
<td>2.45</td>
<td>4.44</td>
<td>5.52</td>
</tr>
<tr>
<td>Acenaphthylene</td>
<td>56</td>
<td>16</td>
<td>6</td>
<td>3.18</td>
<td>3.16</td>
<td>1.76</td>
<td>1.90</td>
<td>2.80</td>
<td>4.10</td>
</tr>
<tr>
<td>Anthracene</td>
<td>56</td>
<td>3</td>
<td>3</td>
<td>3.05</td>
<td>5.10</td>
<td>2.15</td>
<td>3.66</td>
<td>5.32</td>
<td>6.44</td>
</tr>
<tr>
<td>Fluorene</td>
<td>56</td>
<td>7</td>
<td>5</td>
<td>3.05</td>
<td>4.25</td>
<td>2.27</td>
<td>2.53</td>
<td>4.43</td>
<td>5.72</td>
</tr>
<tr>
<td>Naphthalene</td>
<td>56</td>
<td>22</td>
<td>7</td>
<td>3.18</td>
<td>3.51</td>
<td>1.65</td>
<td>2.46</td>
<td>2.97</td>
<td>4.49</td>
</tr>
</tbody>
</table>

Estimates using adjusted lognormal maximum likelihood regression of samples with concentrations above the detection limit

<table>
<thead>
<tr>
<th>Constituent</th>
<th>Number of samples</th>
<th>Number less than detection limit</th>
<th>Number of detection limits</th>
<th>Maximum detection limit (micro-grams per kilogram)</th>
<th>Mean (micro-grams per kilogram)</th>
<th>Standard deviation (micro-grams per kilogram)</th>
<th>Value of 25th percentile (micro-grams per kilogram)</th>
<th>Median (micro-grams per kilogram)</th>
<th>Value of 75th percentile (micro-grams per kilogram)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acenaphthene</td>
<td>57</td>
<td>7</td>
<td>5</td>
<td>3.05</td>
<td>4.26</td>
<td>2.32</td>
<td>2.66</td>
<td>4.44</td>
<td>5.63</td>
</tr>
<tr>
<td>Acenaphthylene</td>
<td>57</td>
<td>16</td>
<td>6</td>
<td>3.18</td>
<td>3.22</td>
<td>1.76</td>
<td>2.00</td>
<td>2.83</td>
<td>4.18</td>
</tr>
<tr>
<td>Anthracene</td>
<td>57</td>
<td>3</td>
<td>3</td>
<td>3.05</td>
<td>5.24</td>
<td>2.15</td>
<td>3.68</td>
<td>5.39</td>
<td>6.48</td>
</tr>
<tr>
<td>Fluorene</td>
<td>57</td>
<td>7</td>
<td>5</td>
<td>3.05</td>
<td>4.38</td>
<td>2.27</td>
<td>2.79</td>
<td>4.51</td>
<td>5.75</td>
</tr>
<tr>
<td>Naphthalene</td>
<td>57</td>
<td>22</td>
<td>7</td>
<td>3.18</td>
<td>3.51</td>
<td>1.65</td>
<td>2.35</td>
<td>3.18</td>
<td>4.54</td>
</tr>
</tbody>
</table>

Excluding Sample PAH-CE-19

<table>
<thead>
<tr>
<th>Constituent</th>
<th>Number of samples</th>
<th>Number less than detection limit</th>
<th>Number of detection limits</th>
<th>Maximum detection limit (micro-grams per kilogram)</th>
<th>Mean (micro-grams per kilogram)</th>
<th>Standard deviation (micro-grams per kilogram)</th>
<th>Value of 25th percentile (micro-grams per kilogram)</th>
<th>Median (micro-grams per kilogram)</th>
<th>Value of 75th percentile (micro-grams per kilogram)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acenaphthene</td>
<td>56</td>
<td>7</td>
<td>5</td>
<td>3.05</td>
<td>4.15</td>
<td>2.17</td>
<td>2.64</td>
<td>4.44</td>
<td>5.52</td>
</tr>
<tr>
<td>Acenaphthylene</td>
<td>56</td>
<td>16</td>
<td>6</td>
<td>3.18</td>
<td>3.16</td>
<td>1.68</td>
<td>1.99</td>
<td>2.79</td>
<td>4.10</td>
</tr>
<tr>
<td>Anthracene</td>
<td>56</td>
<td>3</td>
<td>3</td>
<td>3.05</td>
<td>5.13</td>
<td>2.02</td>
<td>3.66</td>
<td>5.32</td>
<td>6.44</td>
</tr>
<tr>
<td>Fluorene</td>
<td>56</td>
<td>7</td>
<td>5</td>
<td>3.05</td>
<td>4.27</td>
<td>2.13</td>
<td>2.78</td>
<td>4.43</td>
<td>5.72</td>
</tr>
<tr>
<td>Naphthalene</td>
<td>56</td>
<td>22</td>
<td>7</td>
<td>3.18</td>
<td>3.44</td>
<td>1.54</td>
<td>2.36</td>
<td>3.14</td>
<td>4.49</td>
</tr>
</tbody>
</table>

Concentrations of Polynuclear Aromatic Hydrocarbons and Inorganic Constituents in Ambient Surface Soils, Chicago, Illinois: 2001-02
Table 9. Test for outliers in polynuclear aromatic hydrocarbon concentrations in sample PAH-CE-19, Chicago, Illinois
[%, percent; unk, unknown]

<table>
<thead>
<tr>
<th>Constituent</th>
<th>Lowest value (0%)</th>
<th>First quartile (Q1) (25%)</th>
<th>Median (50%)</th>
<th>Third quartile (Q3) (75%)</th>
<th>Interquartile range (IQR) (Q3-Q1)</th>
<th>Value in sample PAH-CE-19</th>
<th>Next highest value below PAH-CE-19</th>
<th>Standard deviation</th>
<th>1 Step (1.5 * IQR)</th>
<th>Number of steps between Q3 and the value in PAH-CE-19</th>
<th>Number of standard deviations between maximum value and the next highest value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phenanthrene</td>
<td>22</td>
<td>230</td>
<td>1,200</td>
<td>3,700</td>
<td>3,470</td>
<td>520,000</td>
<td>19,000</td>
<td>68,633</td>
<td>5,205</td>
<td>99</td>
<td>7</td>
</tr>
<tr>
<td>Fluoranthene</td>
<td>52</td>
<td>495</td>
<td>2,100</td>
<td>7,100</td>
<td>6,605</td>
<td>1,100,000</td>
<td>35,000</td>
<td>145,200</td>
<td>9,907</td>
<td>110</td>
<td>7</td>
</tr>
<tr>
<td>Pyrene</td>
<td>51</td>
<td>350</td>
<td>1,700</td>
<td>5,000</td>
<td>4,650</td>
<td>720,000</td>
<td>30,000</td>
<td>95,044</td>
<td>6,975</td>
<td>103</td>
<td>7</td>
</tr>
<tr>
<td>Benzo(a)anthracene</td>
<td>26</td>
<td>210</td>
<td>880</td>
<td>2,700</td>
<td>2,490</td>
<td>370,000</td>
<td>16,000</td>
<td>48,825</td>
<td>3,735</td>
<td>98</td>
<td>7</td>
</tr>
<tr>
<td>Chrysene</td>
<td>31</td>
<td>245</td>
<td>910</td>
<td>2,900</td>
<td>2,655</td>
<td>350,000</td>
<td>15,000</td>
<td>46,176</td>
<td>3,982</td>
<td>87</td>
<td>7</td>
</tr>
<tr>
<td>Benzo(b)fluoranthene</td>
<td>40</td>
<td>350</td>
<td>1,100</td>
<td>3,700</td>
<td>3,350</td>
<td>550,000</td>
<td>18,000</td>
<td>72,593</td>
<td>5,025</td>
<td>109</td>
<td>7</td>
</tr>
<tr>
<td>Benzo(k)fluoranthene</td>
<td>36</td>
<td>230</td>
<td>820</td>
<td>2,200</td>
<td>1,970</td>
<td>280,000</td>
<td>10,000</td>
<td>36,932</td>
<td>2,955</td>
<td>94</td>
<td>7</td>
</tr>
<tr>
<td>Benzo(a)pyrene</td>
<td>39</td>
<td>270</td>
<td>1,000</td>
<td>3,200</td>
<td>2,930</td>
<td>460,000</td>
<td>17,000</td>
<td>60,710</td>
<td>4,395</td>
<td>104</td>
<td>7</td>
</tr>
<tr>
<td>Dibenzo(a,h)anthracene</td>
<td>8</td>
<td>70</td>
<td>140</td>
<td>290</td>
<td>220</td>
<td>41,000</td>
<td>1,600</td>
<td>5,404</td>
<td>330</td>
<td>123</td>
<td>7</td>
</tr>
<tr>
<td>Benzo(g,h,i)perylene</td>
<td>24</td>
<td>190</td>
<td>490</td>
<td>1,200</td>
<td>1,010</td>
<td>290,000</td>
<td>8,100</td>
<td>38,298</td>
<td>1,515</td>
<td>191</td>
<td>7</td>
</tr>
<tr>
<td>Indeno(1,2,3-cd)pyrene</td>
<td>31</td>
<td>220</td>
<td>610</td>
<td>1,500</td>
<td>1,280</td>
<td>370,000</td>
<td>9,900</td>
<td>48,861</td>
<td>1,920</td>
<td>192</td>
<td>7</td>
</tr>
<tr>
<td>Naphthalene</td>
<td>unk</td>
<td>8</td>
<td>26</td>
<td>94</td>
<td>86</td>
<td>2,500</td>
<td>700</td>
<td>350</td>
<td>128</td>
<td>19</td>
<td>5</td>
</tr>
<tr>
<td>Acenaphthene</td>
<td>unk</td>
<td>16</td>
<td>85</td>
<td>279</td>
<td>263</td>
<td>43,000</td>
<td>1,500</td>
<td>5,678</td>
<td>393</td>
<td>109</td>
<td>7</td>
</tr>
<tr>
<td>Anthracene</td>
<td>unk</td>
<td>40</td>
<td>220</td>
<td>655</td>
<td>616</td>
<td>120,000</td>
<td>4,600</td>
<td>15,848</td>
<td>923</td>
<td>129</td>
<td>7</td>
</tr>
<tr>
<td>Fluorene</td>
<td>unk</td>
<td>18</td>
<td>91</td>
<td>315</td>
<td>297</td>
<td>36,000</td>
<td>2,000</td>
<td>4,753</td>
<td>445</td>
<td>80</td>
<td>7</td>
</tr>
<tr>
<td>Constituent (natural-log transformed)</td>
<td>Number of samples collected(^{1})</td>
<td>Censored data</td>
<td>Mean concentration (micrograms per kilogram)</td>
<td>Standard deviation (micrograms per kilogram)</td>
<td>Median (micrograms per kilogram)</td>
<td>95th percentile of the distribution (micrograms per kilogram)</td>
<td>Upper 95-percent confidence limit on the mean (micrograms per kilogram)</td>
<td>Lower 95-percent confidence limit on the mean (micrograms per kilogram)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>--------------------------------------</td>
<td>--------------------------------------</td>
<td>---------------</td>
<td>-----------------------------------------------</td>
<td>---------------------------------------------</td>
<td>-----------------</td>
<td>-------------------------------------------------</td>
<td>-------------------------------------------------</td>
<td>-------------------------------------------------</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acenaphthene</td>
<td>56</td>
<td>yes</td>
<td>4.14</td>
<td>1.65</td>
<td>4.44</td>
<td>7.00</td>
<td>na</td>
<td>na</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acenaphthylene</td>
<td>56</td>
<td>yes</td>
<td>3.16</td>
<td>1.47</td>
<td>2.79</td>
<td>6.09</td>
<td>na</td>
<td>na</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anthracene</td>
<td>56</td>
<td>yes</td>
<td>5.10</td>
<td>1.69</td>
<td>5.32</td>
<td>7.84</td>
<td>na</td>
<td>na</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Benzo(a)anthracene</td>
<td>56</td>
<td>no</td>
<td>6.58</td>
<td>1.65</td>
<td>6.75</td>
<td>9.12</td>
<td>7.03</td>
<td>6.14</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Benzo(b)fluoranthene</td>
<td>56</td>
<td>no</td>
<td>6.90</td>
<td>1.56</td>
<td>6.96</td>
<td>9.32</td>
<td>7.32</td>
<td>6.49</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Benzo(k)fluoranthene</td>
<td>56</td>
<td>no</td>
<td>6.52</td>
<td>1.51</td>
<td>6.64</td>
<td>8.97</td>
<td>6.92</td>
<td>6.11</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Benzo(g,h,i)perylene</td>
<td>56</td>
<td>no</td>
<td>6.19</td>
<td>1.34</td>
<td>6.13</td>
<td>8.75</td>
<td>6.55</td>
<td>5.83</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Benzo(a)pyrene</td>
<td>56</td>
<td>no</td>
<td>6.78</td>
<td>1.56</td>
<td>6.88</td>
<td>9.24</td>
<td>7.19</td>
<td>6.36</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chrysene</td>
<td>56</td>
<td>no</td>
<td>6.65</td>
<td>1.59</td>
<td>6.78</td>
<td>9.08</td>
<td>7.08</td>
<td>6.23</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dibenzo(a,h)anthracene</td>
<td>56</td>
<td>no</td>
<td>5.03</td>
<td>1.16</td>
<td>4.94</td>
<td>7.00</td>
<td>5.34</td>
<td>4.72</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fluoranthene</td>
<td>56</td>
<td>no</td>
<td>7.49</td>
<td>1.67</td>
<td>7.63</td>
<td>9.90</td>
<td>7.93</td>
<td>7.04</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fluorene</td>
<td>56</td>
<td>yes</td>
<td>4.25</td>
<td>1.69</td>
<td>4.43</td>
<td>7.24</td>
<td>na</td>
<td>na</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Indeno(1,2,3-cd)pyrene</td>
<td>56</td>
<td>no</td>
<td>6.41</td>
<td>1.37</td>
<td>6.39</td>
<td>8.87</td>
<td>6.77</td>
<td>6.04</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Naphthalene</td>
<td>56</td>
<td>yes</td>
<td>3.51</td>
<td>1.30</td>
<td>3.14</td>
<td>6.02</td>
<td>na</td>
<td>na</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Phenanthrene</td>
<td>56</td>
<td>no</td>
<td>6.75</td>
<td>1.76</td>
<td>7.00</td>
<td>9.39</td>
<td>7.22</td>
<td>6.28</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pyrene</td>
<td>56</td>
<td>no</td>
<td>7.14</td>
<td>1.61</td>
<td>7.41</td>
<td>9.39</td>
<td>7.57</td>
<td>6.71</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

\(^{1}\) Excludes data from sample PAH-CE-19
Table 11. Results of Wilcoxon-Rank-Sum test comparing polynuclear aromatic hydrocarbon concentrations in surface soils collected at city properties and Commonwealth Edison properties, Chicago, Illinois.

Value of detection limit used to compute rank for censored data. Data from site PAH-CE-19 excluded from analysis. Alpha = 0.05. Null hypothesis (H₀) is that city and Commonwealth Edison properties have the same mean value.

<table>
<thead>
<tr>
<th>Constituent</th>
<th>Rank sum normal statistic with correction</th>
<th>p-value</th>
<th>Conclusion</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Uncensored Data</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Phenanthrene</td>
<td>1.26</td>
<td>0.207</td>
<td>Fail to reject H₀</td>
</tr>
<tr>
<td>Fluoranthene</td>
<td>1.09</td>
<td>0.277</td>
<td>Fail to reject H₀</td>
</tr>
<tr>
<td>Pyrene</td>
<td>1.00</td>
<td>0.317</td>
<td>Fail to reject H₀</td>
</tr>
<tr>
<td>Benzo(a)anthracene</td>
<td>.98</td>
<td>0.326</td>
<td>Fail to reject H₀</td>
</tr>
<tr>
<td>Chrysene</td>
<td>1.16</td>
<td>0.247</td>
<td>Fail to reject H₀</td>
</tr>
<tr>
<td>Benzo(b)fluoranthene</td>
<td>.75</td>
<td>0.456</td>
<td>Fail to reject H₀</td>
</tr>
<tr>
<td>Benzo(k)fluoranthene</td>
<td>.54</td>
<td>0.593</td>
<td>Fail to reject H₀</td>
</tr>
<tr>
<td>Benzo(a)pyrene</td>
<td>.90</td>
<td>0.366</td>
<td>Fail to reject H₀</td>
</tr>
<tr>
<td>Dibenzo(a,h)anthracene</td>
<td>1.85</td>
<td>0.064</td>
<td>Fail to reject H₀</td>
</tr>
<tr>
<td>Benzo(g,h,i)perylene</td>
<td>1.40</td>
<td>0.160</td>
<td>Fail to reject H₀</td>
</tr>
<tr>
<td>Indeno(1,2,3-cd)pyrene</td>
<td>1.16</td>
<td>0.247</td>
<td>Fail to reject H₀</td>
</tr>
<tr>
<td><strong>Censored Data</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Naphthalene</td>
<td>1.82</td>
<td>0.069</td>
<td>Fail to reject H₀</td>
</tr>
<tr>
<td>Acenaphthylene</td>
<td>-.46</td>
<td>.648</td>
<td>Fail to reject H₀</td>
</tr>
<tr>
<td>Acenaphthene</td>
<td>-.48</td>
<td>.629</td>
<td>Fail to reject H₀</td>
</tr>
<tr>
<td>Fluorene</td>
<td>-.64</td>
<td>.522</td>
<td>Fail to reject H₀</td>
</tr>
<tr>
<td>Anthracene</td>
<td>-.97</td>
<td>.335</td>
<td>Fail to reject H₀</td>
</tr>
</tbody>
</table>

[Italic denotes constituents with censored data. --, not applicable]

<table>
<thead>
<tr>
<th>Constituent</th>
<th>Acenaphthene</th>
<th>Acenaphthylene</th>
<th>Anthracene</th>
<th>Benzo(a)anthracene</th>
<th>Benzo(b)fluoranthene</th>
<th>Benzo(k)fluoranthene</th>
<th>Benzo(a,h)perylene</th>
<th>Chrysene</th>
<th>Fluoranthene</th>
<th>Fluorene</th>
<th>Indeno(1,2,3-cd)pyrene</th>
<th>Naphthalene</th>
<th>Phenanthrene</th>
<th>Pyrene</th>
<th>Total organic carbon</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acenaphthene</td>
<td>--</td>
<td>0.79</td>
<td>0.97</td>
<td>0.93</td>
<td>0.92</td>
<td>0.92</td>
<td>0.86</td>
<td>0.92</td>
<td>0.81</td>
<td>0.94</td>
<td>0.98</td>
<td>0.88</td>
<td>0.73</td>
<td>0.95</td>
<td>0.94</td>
</tr>
<tr>
<td>Acenaphthylene</td>
<td>--</td>
<td>--</td>
<td>0.83</td>
<td>0.87</td>
<td>0.87</td>
<td>0.84</td>
<td>0.87</td>
<td>0.75</td>
<td>0.85</td>
<td>0.83</td>
<td>0.86</td>
<td>0.78</td>
<td>0.83</td>
<td>0.87</td>
<td>0.49</td>
</tr>
<tr>
<td>Anthracene</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>0.98</td>
<td>0.97</td>
<td>0.96</td>
<td>0.92</td>
<td>0.97</td>
<td>0.98</td>
<td>0.94</td>
<td>0.97</td>
<td>0.97</td>
<td>0.99</td>
<td>0.97</td>
<td>0.52</td>
</tr>
<tr>
<td>Benzo(a)anthracene</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>0.99</td>
<td>0.99</td>
<td>0.95</td>
<td>1.00</td>
<td>0.89</td>
<td>1.00</td>
<td>0.95</td>
<td>0.97</td>
<td>0.99</td>
<td>0.99</td>
<td>0.55</td>
</tr>
<tr>
<td>Benzo(b)fluoranthene</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>0.96</td>
<td>0.95</td>
<td>0.95</td>
<td>0.95</td>
<td>0.88</td>
<td>0.99</td>
<td>0.72</td>
<td>0.94</td>
<td>0.95</td>
<td>0.57</td>
</tr>
<tr>
<td>Benzo(k)fluoranthene</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>0.94</td>
<td>0.99</td>
<td>0.98</td>
<td>0.98</td>
<td>0.94</td>
<td>0.96</td>
<td>0.75</td>
<td>0.97</td>
<td>0.57</td>
</tr>
<tr>
<td>Benzo(g,h,i)perylene</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>0.73</td>
<td>0.96</td>
<td>0.96</td>
<td>0.95</td>
<td>0.99</td>
<td>0.99</td>
<td>0.99</td>
<td>0.56</td>
</tr>
<tr>
<td>Benzo(a)pyrene</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>0.75</td>
<td>0.75</td>
<td>0.40</td>
<td>0.90</td>
<td>0.77</td>
<td>0.96</td>
<td>0.55</td>
</tr>
<tr>
<td>Chrysene</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>0.90</td>
<td>0.99</td>
<td>0.98</td>
<td>0.73</td>
<td>0.98</td>
<td>0.99</td>
<td>0.56</td>
</tr>
<tr>
<td>Dibenzo(a,h)anthracene</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>0.88</td>
<td>0.82</td>
<td>0.95</td>
<td>0.70</td>
<td>0.89</td>
<td>0.88</td>
<td>0.57</td>
</tr>
<tr>
<td>Fluoranthene</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>0.95</td>
<td>0.96</td>
<td>0.72</td>
<td>0.99</td>
<td>0.99</td>
<td>0.99</td>
<td>0.55</td>
</tr>
<tr>
<td>Fluorene</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>0.90</td>
<td>0.77</td>
<td>0.96</td>
<td>0.95</td>
<td>0.96</td>
<td>0.96</td>
<td>0.48</td>
</tr>
<tr>
<td>Indeno(1,2,3-cd)pyrene</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>0.73</td>
<td>0.96</td>
<td>0.96</td>
<td>0.75</td>
<td>0.75</td>
<td>0.75</td>
<td>0.57</td>
</tr>
<tr>
<td>Naphthalene</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>0.75</td>
<td>0.75</td>
<td>--</td>
<td>--</td>
<td>0.99</td>
<td>0.99</td>
<td>0.40</td>
</tr>
<tr>
<td>Phenanthrene</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>0.99</td>
<td>0.99</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>0.53</td>
</tr>
<tr>
<td>Pyrene</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>0.54</td>
</tr>
</tbody>
</table>
**Table 13. Physical properties of select polynuclear aromatic hydrocarbons**

<table>
<thead>
<tr>
<th>Constituent</th>
<th>Molecular weight (grams per mole)</th>
<th>Solubility in water at 25 °C (micrograms per liter)</th>
<th>Octonal-water partition coefficient (dimensionless)</th>
<th>Organic carbon partition coefficient (milliliters water per gram carbon)</th>
<th>Henry's Law Constant (cubic meters atmosphere per mole)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acenaphthene</td>
<td>154</td>
<td>3,930.</td>
<td>9,600</td>
<td>4,600</td>
<td>1.40E-04</td>
</tr>
<tr>
<td>Acenaphthylene</td>
<td>154</td>
<td>3,420.</td>
<td>5,300</td>
<td>2,500</td>
<td>1.45E-03</td>
</tr>
<tr>
<td>Anthracene</td>
<td>178</td>
<td>59.</td>
<td>14,000</td>
<td>28,000</td>
<td>5.87E-05</td>
</tr>
<tr>
<td>Benzo(a)anthracene</td>
<td>228</td>
<td>11.</td>
<td>410,000</td>
<td>200,000</td>
<td>3.01E-06</td>
</tr>
<tr>
<td>Benzo(b)fluoranthene</td>
<td>252</td>
<td>2.4</td>
<td>1,100,000</td>
<td>550,000</td>
<td>1.22E-05</td>
</tr>
<tr>
<td>Benzo(k)fluoranthene</td>
<td>252</td>
<td>2.4</td>
<td>1,150,000</td>
<td>550,000</td>
<td>7.48E-07</td>
</tr>
<tr>
<td>Benzo(g,h,i)perylene</td>
<td>276</td>
<td>.3</td>
<td>3,200,000</td>
<td>1,600,000</td>
<td>1.44E-07</td>
</tr>
<tr>
<td>Benzo(a)pyrene</td>
<td>252</td>
<td>3.8</td>
<td>1,550,000</td>
<td>5,500,000</td>
<td>1.28E-09</td>
</tr>
<tr>
<td>Chrysene</td>
<td>228</td>
<td>1.9</td>
<td>410,000</td>
<td>200,000</td>
<td>8.45E-05</td>
</tr>
<tr>
<td>Dibenzo(a,h)anthracene</td>
<td>278</td>
<td>.4</td>
<td>6,900,000</td>
<td>3,300,000</td>
<td>1.33E-08</td>
</tr>
<tr>
<td>Fluoranthene</td>
<td>202</td>
<td>260.</td>
<td>79,000</td>
<td>38,000</td>
<td>1.45E-05</td>
</tr>
<tr>
<td>Fluorene</td>
<td>166</td>
<td>800.</td>
<td>15,000</td>
<td>7,300</td>
<td>5.74E-05</td>
</tr>
<tr>
<td>Indeno(1,2,3-cd)pyrene</td>
<td>276</td>
<td>.5</td>
<td>3,200,000</td>
<td>1,600,000</td>
<td>6.95E-08</td>
</tr>
<tr>
<td>Naphthalene</td>
<td>128</td>
<td>12,500.</td>
<td>2,344</td>
<td>1,290</td>
<td>1.08E-03</td>
</tr>
<tr>
<td>Phenanthrene</td>
<td>178</td>
<td>435.</td>
<td>28,000</td>
<td>14,000</td>
<td>1.45E-04</td>
</tr>
<tr>
<td>Pyrene</td>
<td>202</td>
<td>133.</td>
<td>80,000</td>
<td>38,000</td>
<td>9.92E-06</td>
</tr>
</tbody>
</table>
Table 14. Summary of average polynuclear aromatic hydrocarbon concentrations in air samples, Chicago, Illinois
[bdl, below detection limit]

<table>
<thead>
<tr>
<th>Constituent</th>
<th>Chicago-Washington School (micrograms per cubic meter)</th>
<th>Coke ovens (micrograms per cubic meter)</th>
<th>Warm diesel engines (micrograms per cubic meter)</th>
<th>Highway tunnel (micrograms per cubic meter)</th>
<th>Gasoline engines (micrograms per cubic meter)</th>
<th>Wood combustion (micrograms per cubic meter)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acenaphthene</td>
<td>12.8</td>
<td>0.023</td>
<td>0.566</td>
<td>0.168</td>
<td>0.0377</td>
<td>0.0515</td>
</tr>
<tr>
<td>Acenaphthylene</td>
<td>3.6</td>
<td>.747</td>
<td>.464</td>
<td>.445</td>
<td>.0708</td>
<td>1.83</td>
</tr>
<tr>
<td>Anthracene</td>
<td>1.5</td>
<td>.158</td>
<td>.251</td>
<td>.177</td>
<td>.0446</td>
<td>.0959</td>
</tr>
<tr>
<td>Benzo(a)anthracene</td>
<td>1.</td>
<td>.0076</td>
<td>.249</td>
<td>.09</td>
<td>.0059</td>
<td>.0187</td>
</tr>
<tr>
<td>Benzo(b)fluoranthene</td>
<td>.6</td>
<td>.0048</td>
<td>.137</td>
<td>.044</td>
<td>.033</td>
<td>.0234</td>
</tr>
<tr>
<td>Benzo(k)fluoranthene</td>
<td>bdl</td>
<td>.008</td>
<td>.098</td>
<td>.041</td>
<td>.0255</td>
<td>.0446</td>
</tr>
<tr>
<td>Benzo(g,h,i)perylene</td>
<td>bdl</td>
<td>.0007</td>
<td>.108</td>
<td>.017</td>
<td>.0092</td>
<td>bdl</td>
</tr>
<tr>
<td>Benzo(a)pyrene</td>
<td>.1</td>
<td>.0053</td>
<td>.302</td>
<td>.063</td>
<td>.027</td>
<td>.203</td>
</tr>
<tr>
<td>Chrysene</td>
<td>1.2</td>
<td>.0147</td>
<td>.143</td>
<td>.078</td>
<td>.0283</td>
<td>.0328</td>
</tr>
<tr>
<td>Dibenzo(a,h)anthracene</td>
<td>bdl</td>
<td>bdl</td>
<td>.170</td>
<td>.015</td>
<td>bdl</td>
<td>bdl</td>
</tr>
<tr>
<td>Fluoranthene</td>
<td>8.6</td>
<td>.0883</td>
<td>.081</td>
<td>.117</td>
<td>.0446</td>
<td>.0959</td>
</tr>
<tr>
<td>Fluorene</td>
<td>14.7</td>
<td>.502</td>
<td>.651</td>
<td>.406</td>
<td>.123</td>
<td>.128</td>
</tr>
<tr>
<td>Indeno(1,2,3-cd)pyrene</td>
<td>bdl</td>
<td>.0011</td>
<td>.250</td>
<td>.02</td>
<td>bdl</td>
<td>bdl</td>
</tr>
<tr>
<td>Naphthalene</td>
<td>202.9</td>
<td>22.4</td>
<td>.386</td>
<td>8.03</td>
<td>2.46</td>
<td>.402</td>
</tr>
<tr>
<td>Phenanthrene</td>
<td>46.8</td>
<td>.5</td>
<td>.472</td>
<td>.3</td>
<td>.0398</td>
<td>.219</td>
</tr>
<tr>
<td>Pyrene</td>
<td>4.9</td>
<td>.0563</td>
<td>.049</td>
<td>.193</td>
<td>.0719</td>
<td>.100</td>
</tr>
</tbody>
</table>

1 From Illinois Environmental Protection Agency, 2002
2 From Khalili and others, 1995

Table 15. Results of one-way analysis of variance of polynuclear aromatic hydrocarbon concentrations and distance from nearest roadway, Chicago, Illinois
[Alpha = 0.05. Null hypothesis (H₀) is that all means are equal.]

<table>
<thead>
<tr>
<th>Constituent</th>
<th>F value</th>
<th>Probability of (F)</th>
<th>Conclusion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Benzo(a)anthracene</td>
<td>0.31</td>
<td>0.93</td>
<td>Fail to reject H₀</td>
</tr>
<tr>
<td>Benzo(a)pyrene</td>
<td>.29</td>
<td>.94</td>
<td>Fail to reject H₀</td>
</tr>
<tr>
<td>Benzo(b)fluoranthene</td>
<td>.36</td>
<td>.90</td>
<td>Fail to reject H₀</td>
</tr>
<tr>
<td>Benzo(g,h,i)perylene</td>
<td>.34</td>
<td>.91</td>
<td>Fail to reject H₀</td>
</tr>
<tr>
<td>Benzo(k)fluoranthene</td>
<td>.32</td>
<td>.93</td>
<td>Fail to reject H₀</td>
</tr>
<tr>
<td>Chrysene</td>
<td>.42</td>
<td>.86</td>
<td>Fail to reject H₀</td>
</tr>
<tr>
<td>Dibenzo(a,h)anthracene</td>
<td>.39</td>
<td>.88</td>
<td>Fail to reject H₀</td>
</tr>
<tr>
<td>Fluoranthene</td>
<td>.31</td>
<td>.93</td>
<td>Fail to reject H₀</td>
</tr>
<tr>
<td>Indeno(1,2,3-cd)pyrene</td>
<td>.56</td>
<td>.76</td>
<td>Fail to reject H₀</td>
</tr>
<tr>
<td>Phenanthrene</td>
<td>.26</td>
<td>.95</td>
<td>Fail to reject H₀</td>
</tr>
<tr>
<td>Pyrene</td>
<td>.43</td>
<td>.86</td>
<td>Fail to reject H₀</td>
</tr>
</tbody>
</table>

1 Probability of observing an F value this large by chance alone. Probabilities less than 0.05 are considered statistically significant.
Table 16. Statistical description of polynuclear aromatic hydrocarbons in ambient soils for different land-use categories, Chicago, Illinois

[Bold denotes rejection of the assumption of normal distribution for the constituent. %, percent]

<table>
<thead>
<tr>
<th>Constituent</th>
<th>Mean</th>
<th>Standard deviation</th>
<th>Lowest value (0%)</th>
<th>First quartile (25%)</th>
<th>Median (50%)</th>
<th>Third quartile (75%)</th>
<th>Highest value (100%)</th>
<th>Shapiro-Wilk test (p-value)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Vacant or Wetland (6 cases)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Phenanthrene</td>
<td>6.34</td>
<td>2.37</td>
<td>3.40</td>
<td>4.03</td>
<td>6.46</td>
<td>8.65</td>
<td>9.02</td>
<td>0.47</td>
</tr>
<tr>
<td>Fluoranthene</td>
<td>7.22</td>
<td>2.43</td>
<td>4.16</td>
<td>5.08</td>
<td>7.63</td>
<td>9.31</td>
<td>10.02</td>
<td>0.45</td>
</tr>
<tr>
<td>Pyrene</td>
<td>6.74</td>
<td>2.20</td>
<td>4.09</td>
<td>4.61</td>
<td>6.87</td>
<td>8.67</td>
<td>9.31</td>
<td>0.41</td>
</tr>
<tr>
<td>Benzo(a)anthracene</td>
<td>6.34</td>
<td>2.39</td>
<td>3.33</td>
<td>4.08</td>
<td>6.49</td>
<td>8.50</td>
<td>9.13</td>
<td>0.53</td>
</tr>
<tr>
<td>Chrysene</td>
<td>6.45</td>
<td>2.28</td>
<td>3.58</td>
<td>4.37</td>
<td>6.53</td>
<td>8.61</td>
<td>9.08</td>
<td>0.51</td>
</tr>
<tr>
<td>Benzo(b)fluoranthene</td>
<td>6.83</td>
<td>2.30</td>
<td>3.91</td>
<td>4.57</td>
<td>7.17</td>
<td>8.82</td>
<td>9.32</td>
<td>0.35</td>
</tr>
<tr>
<td>Benzo(k)fluoranthene</td>
<td>6.49</td>
<td>2.23</td>
<td>3.78</td>
<td>4.06</td>
<td>6.96</td>
<td>8.19</td>
<td>9.07</td>
<td>0.28</td>
</tr>
<tr>
<td>Benzo(a)pyrene</td>
<td>6.72</td>
<td>2.30</td>
<td>3.81</td>
<td>4.39</td>
<td>7.11</td>
<td>8.63</td>
<td>9.24</td>
<td>0.36</td>
</tr>
<tr>
<td>Dibenzo(a,h)anthracene</td>
<td>4.95</td>
<td>1.58</td>
<td>2.30</td>
<td>4.23</td>
<td>5.08</td>
<td>6.25</td>
<td>6.72</td>
<td>0.74</td>
</tr>
<tr>
<td>Benzo(g,h,i)perylenne</td>
<td>6.23</td>
<td>2.11</td>
<td>1.81</td>
<td>4.79</td>
<td>6.22</td>
<td>8.22</td>
<td>8.75</td>
<td>0.88</td>
</tr>
<tr>
<td>Indeno(1,2,3-cd)pyrene</td>
<td>6.38</td>
<td>2.09</td>
<td>3.43</td>
<td>4.87</td>
<td>6.40</td>
<td>8.32</td>
<td>8.87</td>
<td>0.83</td>
</tr>
<tr>
<td><strong>Transportation, Communication, and Utilities (5 cases)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Phenanthrene</td>
<td>5.69</td>
<td>2.33</td>
<td>3.09</td>
<td>4.87</td>
<td>5.08</td>
<td>6.02</td>
<td>9.39</td>
<td>0.54</td>
</tr>
<tr>
<td>Fluoranthene</td>
<td>6.42</td>
<td>2.04</td>
<td>4.30</td>
<td>5.44</td>
<td>6.02</td>
<td>6.59</td>
<td>9.74</td>
<td>0.46</td>
</tr>
<tr>
<td>Pyrene</td>
<td>6.09</td>
<td>2.05</td>
<td>3.93</td>
<td>5.01</td>
<td>5.86</td>
<td>6.25</td>
<td>9.39</td>
<td>0.52</td>
</tr>
<tr>
<td>Benzo(a)anthracene</td>
<td>5.62</td>
<td>1.99</td>
<td>3.40</td>
<td>4.70</td>
<td>5.35</td>
<td>5.89</td>
<td>8.76</td>
<td>0.66</td>
</tr>
<tr>
<td>Chrysene</td>
<td>5.66</td>
<td>1.95</td>
<td>3.56</td>
<td>4.79</td>
<td>5.30</td>
<td>5.89</td>
<td>8.79</td>
<td>0.56</td>
</tr>
<tr>
<td>Benzo(b)fluoranthene</td>
<td>5.94</td>
<td>1.79</td>
<td>3.91</td>
<td>5.01</td>
<td>5.77</td>
<td>6.29</td>
<td>8.70</td>
<td>0.78</td>
</tr>
<tr>
<td>Benzo(k)fluoranthene</td>
<td>5.71</td>
<td>1.98</td>
<td>3.58</td>
<td>4.55</td>
<td>5.30</td>
<td>6.36</td>
<td>8.75</td>
<td>0.77</td>
</tr>
<tr>
<td>Benzo(a)pyrene</td>
<td>5.84</td>
<td>1.91</td>
<td>3.71</td>
<td>4.87</td>
<td>5.52</td>
<td>6.31</td>
<td>8.79</td>
<td>0.75</td>
</tr>
<tr>
<td>Dibenzo(a,h)anthracene</td>
<td>4.30</td>
<td>1.80</td>
<td>2.08</td>
<td>3.30</td>
<td>4.22</td>
<td>5.08</td>
<td>6.85</td>
<td>0.99</td>
</tr>
<tr>
<td>Benzo(g,h,i)perylenne</td>
<td>5.38</td>
<td>1.88</td>
<td>3.18</td>
<td>4.60</td>
<td>4.87</td>
<td>6.06</td>
<td>8.19</td>
<td>0.84</td>
</tr>
<tr>
<td>Indeno(1,2,3-cd)pyrene</td>
<td>5.58</td>
<td>1.85</td>
<td>3.50</td>
<td>4.87</td>
<td>4.94</td>
<td>6.15</td>
<td>8.43</td>
<td>0.66</td>
</tr>
<tr>
<td><strong>Commercial (26 cases)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Phenanthrene</td>
<td>6.54</td>
<td>1.60</td>
<td>3.30</td>
<td>5.44</td>
<td>6.76</td>
<td>7.65</td>
<td>9.85</td>
<td>0.67</td>
</tr>
<tr>
<td>Fluoranthene</td>
<td>7.29</td>
<td>1.56</td>
<td>3.95</td>
<td>6.36</td>
<td>7.55</td>
<td>8.27</td>
<td>10.46</td>
<td>0.76</td>
</tr>
<tr>
<td>Pyrene</td>
<td>6.99</td>
<td>1.49</td>
<td>4.48</td>
<td>6.06</td>
<td>7.27</td>
<td>7.86</td>
<td>10.31</td>
<td>0.40</td>
</tr>
<tr>
<td>Benzo(a)anthracene</td>
<td>6.39</td>
<td>1.55</td>
<td>3.26</td>
<td>5.39</td>
<td>6.59</td>
<td>7.31</td>
<td>9.68</td>
<td>0.89</td>
</tr>
<tr>
<td>Chrysene</td>
<td>6.47</td>
<td>1.46</td>
<td>3.43</td>
<td>5.52</td>
<td>6.71</td>
<td>7.31</td>
<td>9.62</td>
<td>0.91</td>
</tr>
<tr>
<td>Benzo(b)fluoranthene</td>
<td>6.70</td>
<td>1.47</td>
<td>3.69</td>
<td>5.83</td>
<td>6.85</td>
<td>7.65</td>
<td>9.80</td>
<td>0.95</td>
</tr>
<tr>
<td>Benzo(k)fluoranthene</td>
<td>6.29</td>
<td>1.40</td>
<td>3.58</td>
<td>5.39</td>
<td>6.53</td>
<td>7.17</td>
<td>9.21</td>
<td>0.80</td>
</tr>
<tr>
<td>Benzo(a)pyrene</td>
<td>6.57</td>
<td>1.44</td>
<td>3.66</td>
<td>5.58</td>
<td>6.80</td>
<td>7.38</td>
<td>9.74</td>
<td>0.90</td>
</tr>
<tr>
<td>Dibenzo(a,h)anthracene</td>
<td>4.94</td>
<td>0.98</td>
<td>3.64</td>
<td>4.22</td>
<td>4.74</td>
<td>5.39</td>
<td>7.38</td>
<td>0.01</td>
</tr>
<tr>
<td>Benzo(g,h,i)perylenne</td>
<td>6.07</td>
<td>1.10</td>
<td>4.61</td>
<td>5.30</td>
<td>6.02</td>
<td>6.36</td>
<td>9.00</td>
<td>0.09</td>
</tr>
<tr>
<td>Indeno(1,2,3-cd)pyrene</td>
<td>6.26</td>
<td>1.16</td>
<td>4.59</td>
<td>5.42</td>
<td>6.29</td>
<td>6.77</td>
<td>9.20</td>
<td>0.36</td>
</tr>
</tbody>
</table>
Table 16. Statistical description of polynuclear aromatic hydrocarbons in ambient soils for different land-use categories, Chicago, Illinois—Continued

[Bold denotes rejection of the assumption of normal distribution for the constituent. %, percent]

<table>
<thead>
<tr>
<th>Constituent (natural-log transformed)</th>
<th>Mean</th>
<th>Standard deviation</th>
<th>Lowest value (0%)</th>
<th>First quartile (25%)</th>
<th>Median (50%)</th>
<th>Third quartile (75%)</th>
<th>Highest value (100%)</th>
<th>Shapiro-Wilk test (p-value)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Industrial, Warehousing, and Wholesale (5 cases)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Phenanthrene</td>
<td>7.15</td>
<td>1.28</td>
<td>5.19</td>
<td>6.55</td>
<td>7.65</td>
<td>8.10</td>
<td>8.27</td>
<td>0.34</td>
</tr>
<tr>
<td>Fluoranthene</td>
<td>7.91</td>
<td>1.14</td>
<td>6.13</td>
<td>7.44</td>
<td>8.40</td>
<td>8.70</td>
<td>8.87</td>
<td>0.28</td>
</tr>
<tr>
<td>Pyrene</td>
<td>7.55</td>
<td>1.14</td>
<td>6.06</td>
<td>6.72</td>
<td>7.74</td>
<td>8.56</td>
<td>8.68</td>
<td>0.48</td>
</tr>
<tr>
<td>Benzo(a)anthracene</td>
<td>7.00</td>
<td>1.17</td>
<td>5.35</td>
<td>6.40</td>
<td>7.09</td>
<td>8.07</td>
<td>8.10</td>
<td>0.49</td>
</tr>
<tr>
<td>Chrysene</td>
<td>7.04</td>
<td>1.10</td>
<td>5.39</td>
<td>6.58</td>
<td>7.17</td>
<td>7.97</td>
<td>8.07</td>
<td>0.52</td>
</tr>
<tr>
<td>Benzo(b)fluoranthene</td>
<td>7.37</td>
<td>1.01</td>
<td>5.86</td>
<td>6.91</td>
<td>7.63</td>
<td>8.13</td>
<td>8.34</td>
<td>0.57</td>
</tr>
<tr>
<td>Benzo(k)fluoranthene</td>
<td>6.95</td>
<td>1.13</td>
<td>5.44</td>
<td>6.11</td>
<td>7.33</td>
<td>7.90</td>
<td>7.97</td>
<td>0.31</td>
</tr>
<tr>
<td>Benzo(a)pyrene</td>
<td>7.18</td>
<td>1.08</td>
<td>5.60</td>
<td>6.63</td>
<td>7.41</td>
<td>8.07</td>
<td>8.19</td>
<td>0.51</td>
</tr>
<tr>
<td>Dibenzo(a,h)anthracene</td>
<td>5.07</td>
<td>1.01</td>
<td>3.30</td>
<td>5.25</td>
<td>5.39</td>
<td>5.56</td>
<td>5.83</td>
<td>0.03</td>
</tr>
<tr>
<td>Benzo(g,h,i)perylene</td>
<td>6.35</td>
<td>1.02</td>
<td>4.70</td>
<td>6.02</td>
<td>6.84</td>
<td>7.09</td>
<td>7.09</td>
<td>0.12</td>
</tr>
<tr>
<td>Indeno(1,2,3-cd)pyrene</td>
<td>6.59</td>
<td>0.98</td>
<td>5.08</td>
<td>6.15</td>
<td>7.04</td>
<td>7.31</td>
<td>7.38</td>
<td>0.21</td>
</tr>
<tr>
<td><strong>Residential (9 cases)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Phenanthrene</td>
<td>7.33</td>
<td>1.77</td>
<td>4.87</td>
<td>5.48</td>
<td>7.60</td>
<td>8.67</td>
<td>9.68</td>
<td>0.40</td>
</tr>
<tr>
<td>Fluoranthene</td>
<td>8.03</td>
<td>1.61</td>
<td>5.70</td>
<td>6.48</td>
<td>8.37</td>
<td>9.39</td>
<td>9.90</td>
<td>0.33</td>
</tr>
<tr>
<td>Pyrene</td>
<td>7.65</td>
<td>1.63</td>
<td>5.52</td>
<td>5.86</td>
<td>8.24</td>
<td>8.73</td>
<td>9.74</td>
<td>0.22</td>
</tr>
<tr>
<td>Benzo(a)anthracene</td>
<td>7.10</td>
<td>1.64</td>
<td>4.94</td>
<td>5.35</td>
<td>7.44</td>
<td>8.54</td>
<td>9.12</td>
<td>0.24</td>
</tr>
<tr>
<td>Chrysene</td>
<td>7.14</td>
<td>1.64</td>
<td>5.08</td>
<td>5.39</td>
<td>7.44</td>
<td>8.67</td>
<td>9.31</td>
<td>0.27</td>
</tr>
<tr>
<td>Benzo(b)fluoranthene</td>
<td>7.38</td>
<td>1.61</td>
<td>5.25</td>
<td>5.91</td>
<td>7.55</td>
<td>8.88</td>
<td>9.55</td>
<td>0.47</td>
</tr>
<tr>
<td>Benzo(k)fluoranthene</td>
<td>6.91</td>
<td>1.52</td>
<td>4.61</td>
<td>5.67</td>
<td>7.17</td>
<td>8.29</td>
<td>9.11</td>
<td>0.82</td>
</tr>
<tr>
<td>Benzo(a)pyrene</td>
<td>7.24</td>
<td>1.60</td>
<td>5.08</td>
<td>5.67</td>
<td>7.50</td>
<td>8.73</td>
<td>9.39</td>
<td>0.45</td>
</tr>
<tr>
<td>Dibenzo(a,h)anthracene</td>
<td>5.28</td>
<td>1.21</td>
<td>3.33</td>
<td>4.44</td>
<td>5.30</td>
<td>6.23</td>
<td>7.00</td>
<td>0.82</td>
</tr>
<tr>
<td>Benzo(g,h,i)perylene</td>
<td>6.52</td>
<td>1.51</td>
<td>4.79</td>
<td>5.14</td>
<td>6.59</td>
<td>7.60</td>
<td>8.84</td>
<td>0.41</td>
</tr>
<tr>
<td>Indeno(1,2,3-cd)pyrene</td>
<td>6.81</td>
<td>1.54</td>
<td>4.87</td>
<td>5.39</td>
<td>6.82</td>
<td>8.37</td>
<td>9.00</td>
<td>0.37</td>
</tr>
</tbody>
</table>
Table 17. Results of analysis of variance of uncensored polynuclear aromatic hydrocarbon concentrations in ambient soil by land use, Chicago, Illinois

[Alpha = 0.05. Null hypothesis (H<sub>0</sub>) is that mean concentrations are not significantly different among land-use categories.]

<table>
<thead>
<tr>
<th>Constituent (natural-log transformed)</th>
<th>F value</th>
<th>Probability&lt;sup&gt;1&lt;/sup&gt;</th>
<th>Conclusion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Benzo(a)anthracene</td>
<td>0.92</td>
<td>0.49</td>
<td>Fail to reject H&lt;sub&gt;0&lt;/sub&gt;</td>
</tr>
<tr>
<td>Benzo(a)pyrene</td>
<td>.94</td>
<td>.48</td>
<td>Fail to reject H&lt;sub&gt;0&lt;/sub&gt;</td>
</tr>
<tr>
<td>Benzo(b)fluoranthene</td>
<td>.93</td>
<td>.48</td>
<td>Fail to reject H&lt;sub&gt;0&lt;/sub&gt;</td>
</tr>
<tr>
<td>Benzo(g,h,i)perylene</td>
<td>.66</td>
<td>.68</td>
<td>Fail to reject H&lt;sub&gt;0&lt;/sub&gt;</td>
</tr>
<tr>
<td>Benzo(k)fluoranthene</td>
<td>.81</td>
<td>.57</td>
<td>Fail to reject H&lt;sub&gt;0&lt;/sub&gt;</td>
</tr>
<tr>
<td>Chrysene</td>
<td>.92</td>
<td>.49</td>
<td>Fail to reject H&lt;sub&gt;0&lt;/sub&gt;</td>
</tr>
<tr>
<td>Dibenzo(a,h)anthracene</td>
<td>.85</td>
<td>.54</td>
<td>Fail to reject H&lt;sub&gt;0&lt;/sub&gt;</td>
</tr>
<tr>
<td>Fluoranthene</td>
<td>1.01</td>
<td>.43</td>
<td>Fail to reject H&lt;sub&gt;0&lt;/sub&gt;</td>
</tr>
<tr>
<td>Indeno(1,2,3-cd)pyrene</td>
<td>.69</td>
<td>.66</td>
<td>Fail to reject H&lt;sub&gt;0&lt;/sub&gt;</td>
</tr>
<tr>
<td>Phenanthrene</td>
<td>1.01</td>
<td>.43</td>
<td>Fail to reject H&lt;sub&gt;0&lt;/sub&gt;</td>
</tr>
<tr>
<td>Pyrene</td>
<td>1.12</td>
<td>.37</td>
<td>Fail to reject H&lt;sub&gt;0&lt;/sub&gt;</td>
</tr>
</tbody>
</table>

<sup>1</sup> Probability of observing an F value this large by chance alone. Probabilities less than 0.05 are considered statistically significant.

Table 18. Regression of polynuclear aromatic hydrocarbon concentrations in surface soils and percent industrial land use within a 1-mile radius of the sample, Chicago, Illinois.

<table>
<thead>
<tr>
<th>Constituent (natural-log transformed)</th>
<th>T-ratio of slope coefficient</th>
<th>p-value</th>
<th>Correlation coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phenanthrene</td>
<td>2.01</td>
<td>0.049</td>
<td>0.070</td>
</tr>
<tr>
<td>Fluoranthene</td>
<td>2.27</td>
<td>0.27</td>
<td>0.087</td>
</tr>
<tr>
<td>Pyrene</td>
<td>2.33</td>
<td>0.023</td>
<td>0.092</td>
</tr>
<tr>
<td>Benzo(a)anthracene</td>
<td>2.41</td>
<td>0.19</td>
<td>0.097</td>
</tr>
<tr>
<td>Chrysene</td>
<td>2.32</td>
<td>0.024</td>
<td>0.091</td>
</tr>
<tr>
<td>Benzo(b)fluoranthene</td>
<td>2.34</td>
<td>0.023</td>
<td>0.092</td>
</tr>
<tr>
<td>Benzo(k)fluoranthene</td>
<td>2.38</td>
<td>0.021</td>
<td>0.095</td>
</tr>
<tr>
<td>Benzo(a)pyrene</td>
<td>2.43</td>
<td>0.019</td>
<td>0.098</td>
</tr>
<tr>
<td>Dibenzo(a,h)anthracene</td>
<td>2.11</td>
<td>0.40</td>
<td>0.076</td>
</tr>
<tr>
<td>Benzo(g,h,i)perylene</td>
<td>2.22</td>
<td>0.30</td>
<td>0.084</td>
</tr>
<tr>
<td>Indeno(1,2,3-cd)pyrene</td>
<td>2.24</td>
<td>0.030</td>
<td>0.085</td>
</tr>
</tbody>
</table>
### Table 19. Summary of data on inorganic constituents in ambient surface soils, Chicago, Illinois

[<, less than; nc, not calculated]

<table>
<thead>
<tr>
<th>Constituent</th>
<th>Number of samples collected</th>
<th>Number of detections</th>
<th>Percentage of samples with analyte detected</th>
<th>Arithmetic mean</th>
<th>Standard deviation</th>
<th>Range of detected concentrations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aluminum (weight percent)</td>
<td>57</td>
<td>57</td>
<td>100</td>
<td>4.8</td>
<td>1.7</td>
<td>0.775-7.45</td>
</tr>
<tr>
<td>Arsenic (milligrams per kilogram)</td>
<td>57</td>
<td>47</td>
<td>82</td>
<td>19.5</td>
<td>31.8</td>
<td>10-220</td>
</tr>
<tr>
<td>Barium (milligrams per kilogram)</td>
<td>57</td>
<td>57</td>
<td>100</td>
<td>427.2</td>
<td>126</td>
<td>100-697</td>
</tr>
<tr>
<td>Beryllium (milligrams per kilogram)</td>
<td>57</td>
<td>49</td>
<td>86</td>
<td>nc</td>
<td>nc</td>
<td>&lt;1-14</td>
</tr>
<tr>
<td>Bismuth (milligrams per kilogram)</td>
<td>57</td>
<td>1</td>
<td>2</td>
<td>nc</td>
<td>nc</td>
<td>&lt;50-57</td>
</tr>
<tr>
<td>Cadmium (milligrams per kilogram)</td>
<td>57</td>
<td>18</td>
<td>32</td>
<td>nc</td>
<td>nc</td>
<td>&lt;2-7</td>
</tr>
<tr>
<td>Calcium (weight percent)</td>
<td>57</td>
<td>57</td>
<td>100</td>
<td>4.1</td>
<td>3.4</td>
<td>0.61-16.4</td>
</tr>
<tr>
<td>Cerium (milligrams per kilogram)</td>
<td>57</td>
<td>55</td>
<td>96</td>
<td>47.4</td>
<td>21.8</td>
<td>100-697</td>
</tr>
<tr>
<td>Chromium (milligrams per kilogram)</td>
<td>57</td>
<td>57</td>
<td>100</td>
<td>71.2</td>
<td>49.6</td>
<td>8-363</td>
</tr>
<tr>
<td>Cobalt (milligrams per kilogram)</td>
<td>57</td>
<td>57</td>
<td>100</td>
<td>11.1</td>
<td>3.7</td>
<td>4-26</td>
</tr>
<tr>
<td>Copper (milligrams per kilogram)</td>
<td>57</td>
<td>57</td>
<td>100</td>
<td>150.5</td>
<td>373.7</td>
<td>9-2780</td>
</tr>
<tr>
<td>Europium (milligrams per kilogram)</td>
<td>57</td>
<td>1</td>
<td>2</td>
<td>nc</td>
<td>nc</td>
<td>&lt;2-3</td>
</tr>
<tr>
<td>Gallium (milligrams per kilogram)</td>
<td>57</td>
<td>54</td>
<td>95</td>
<td>13.9</td>
<td>4.3</td>
<td>5-23</td>
</tr>
<tr>
<td>Gold (milligrams per kilogram)</td>
<td>57</td>
<td>0</td>
<td>0</td>
<td>nc</td>
<td>nc</td>
<td>&lt;8</td>
</tr>
<tr>
<td>Holmium (milligrams per kilogram)</td>
<td>57</td>
<td>0</td>
<td>0</td>
<td>nc</td>
<td>nc</td>
<td>&lt;4</td>
</tr>
<tr>
<td>Iron (weight percent)</td>
<td>57</td>
<td>57</td>
<td>100</td>
<td>3.3</td>
<td>2.1</td>
<td>0.56-14.5</td>
</tr>
<tr>
<td>Lanthanum (milligrams per kilogram)</td>
<td>57</td>
<td>57</td>
<td>100</td>
<td>25.7</td>
<td>9.3</td>
<td>6-52</td>
</tr>
<tr>
<td>Lead (milligrams per kilogram)</td>
<td>57</td>
<td>57</td>
<td>100</td>
<td>395</td>
<td>494.2</td>
<td>13-1910</td>
</tr>
<tr>
<td>Lithium (milligrams per kilogram)</td>
<td>57</td>
<td>57</td>
<td>100</td>
<td>31.3</td>
<td>14.3</td>
<td>5-67</td>
</tr>
<tr>
<td>Magnesium (weight percent)</td>
<td>57</td>
<td>57</td>
<td>100</td>
<td>2.5</td>
<td>2.2</td>
<td>0.504-11.3</td>
</tr>
<tr>
<td>Manganese (milligrams per kilogram)</td>
<td>57</td>
<td>57</td>
<td>100</td>
<td>583.4</td>
<td>511</td>
<td>158-3670</td>
</tr>
<tr>
<td>Mercury (milligrams per kilogram)</td>
<td>57</td>
<td>56</td>
<td>98</td>
<td>.6</td>
<td>1.9</td>
<td>&lt;0.02-13.1</td>
</tr>
<tr>
<td>Molybdenum (milligrams per kilogram)</td>
<td>57</td>
<td>52</td>
<td>91</td>
<td>5.7</td>
<td>3.7</td>
<td>&lt;2-17</td>
</tr>
<tr>
<td>Neodymium (milligrams per kilogram)</td>
<td>57</td>
<td>57</td>
<td>89</td>
<td>24.8</td>
<td>7.7</td>
<td>&lt;9-49</td>
</tr>
<tr>
<td>Nickel (milligrams per kilogram)</td>
<td>57</td>
<td>57</td>
<td>100</td>
<td>36.4</td>
<td>23.5</td>
<td>5-154</td>
</tr>
<tr>
<td>Niobium (milligrams per kilogram)</td>
<td>57</td>
<td>57</td>
<td>98</td>
<td>9.7</td>
<td>3.3</td>
<td>&lt;4-23</td>
</tr>
<tr>
<td>Phosphorus (weight percent)</td>
<td>57</td>
<td>57</td>
<td>100</td>
<td>.1</td>
<td>.1</td>
<td>0.01-28</td>
</tr>
<tr>
<td>Potassium (weight percent)</td>
<td>57</td>
<td>57</td>
<td>100</td>
<td>1.8</td>
<td>.6</td>
<td>0.33-2.86</td>
</tr>
<tr>
<td>Scandium (milligrams per kilogram)</td>
<td>57</td>
<td>55</td>
<td>96</td>
<td>8.6</td>
<td>3.3</td>
<td>3-18</td>
</tr>
<tr>
<td>Selenium (milligrams per kilogram)</td>
<td>57</td>
<td>55</td>
<td>96</td>
<td>1</td>
<td>.6</td>
<td>&lt;0.2-3.1</td>
</tr>
<tr>
<td>Silver (milligrams per kilogram)</td>
<td>57</td>
<td>0</td>
<td>0</td>
<td>nc</td>
<td>nc</td>
<td>&lt;2</td>
</tr>
<tr>
<td>Sodium (weight percent)</td>
<td>57</td>
<td>57</td>
<td>100</td>
<td>0.5</td>
<td>0.2</td>
<td>0.0825-8.05</td>
</tr>
<tr>
<td>Strontium (milligrams per kilogram)</td>
<td>57</td>
<td>57</td>
<td>100</td>
<td>113.6</td>
<td>31.5</td>
<td>66-299</td>
</tr>
<tr>
<td>Sulfur (weight percent)</td>
<td>57</td>
<td>57</td>
<td>100</td>
<td>.1</td>
<td>.1</td>
<td>0.05-0.63</td>
</tr>
<tr>
<td>Tantalum (milligrams per kilogram)</td>
<td>57</td>
<td>0</td>
<td>0</td>
<td>nc</td>
<td>nc</td>
<td>&lt;40</td>
</tr>
<tr>
<td>Thorium (milligrams per kilogram)</td>
<td>57</td>
<td>44</td>
<td>77</td>
<td>9.</td>
<td>1.7</td>
<td>6-13</td>
</tr>
<tr>
<td>Tin (milligrams per kilogram)</td>
<td>57</td>
<td>4</td>
<td>7</td>
<td>nc</td>
<td>nc</td>
<td>&lt;50-248</td>
</tr>
<tr>
<td>Titanium (weight percent)</td>
<td>57</td>
<td>57</td>
<td>100</td>
<td>.2</td>
<td>.1</td>
<td>0.045-3.83</td>
</tr>
<tr>
<td>Uranium (milligrams per kilogram)</td>
<td>57</td>
<td>0</td>
<td>0</td>
<td>nc</td>
<td>nc</td>
<td>&lt;100</td>
</tr>
<tr>
<td>Vanadium (milligrams per kilogram)</td>
<td>57</td>
<td>57</td>
<td>100</td>
<td>76.5</td>
<td>26.9</td>
<td>24-145</td>
</tr>
<tr>
<td>Ytterbium (milligrams per kilogram)</td>
<td>57</td>
<td>48</td>
<td>84</td>
<td>nc</td>
<td>nc</td>
<td>&lt;1-3</td>
</tr>
<tr>
<td>Yttrium (milligrams per kilogram)</td>
<td>57</td>
<td>57</td>
<td>100</td>
<td>15.8</td>
<td>5.2</td>
<td>6-38</td>
</tr>
<tr>
<td>Zinc (milligrams per kilogram)</td>
<td>57</td>
<td>57</td>
<td>100</td>
<td>396.6</td>
<td>410.8</td>
<td>79-1690</td>
</tr>
<tr>
<td>Carbonate carbon (weight percent)</td>
<td>57</td>
<td>57</td>
<td>100</td>
<td>1.9</td>
<td>2.3</td>
<td>0.04-11.15</td>
</tr>
<tr>
<td>Organic carbon (weight percent)</td>
<td>57</td>
<td>57</td>
<td>100</td>
<td>5.7</td>
<td>3.9</td>
<td>0.22-22.31</td>
</tr>
</tbody>
</table>
Table 20. Comparison of arithmetic mean concentrations of select inorganic constituents in ambient surface soils, Chicago, Illinois with mean concentrations from surrounding agricultural soils

[Bold denotes analytes concentrated by a factor of two or more; mg/Kg, milligrams per kilogram]

<table>
<thead>
<tr>
<th>Constituent</th>
<th>Arithmetic mean concentration in 57 Chicago soil samples</th>
<th>Arithmetic mean concentration in 106 soil samples collected within 500 kilometers of Chicago</th>
<th>Concentration factor in Chicago soils relative to soils within 500 kilometers of Chicago</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aluminum (weight percent)</td>
<td>4.8</td>
<td>4.86</td>
<td>0.99</td>
</tr>
<tr>
<td>Arsenic (mg/Kg)</td>
<td>19.5</td>
<td>6.56</td>
<td>2.97</td>
</tr>
<tr>
<td>Barium (mg/Kg)</td>
<td>427.3</td>
<td>499.3</td>
<td>0.86</td>
</tr>
<tr>
<td>Beryllium (mg/Kg)</td>
<td>2.2</td>
<td>1.2</td>
<td>1.83</td>
</tr>
<tr>
<td>Calcium (weight percent)</td>
<td>4.06</td>
<td>.82</td>
<td>4.95</td>
</tr>
<tr>
<td>Total Carbon (weight percent)</td>
<td>7.61</td>
<td>2.55</td>
<td>2.98</td>
</tr>
<tr>
<td>Chromium (mg/Kg)</td>
<td>71.2</td>
<td>44.1</td>
<td>1.61</td>
</tr>
<tr>
<td>Cobalt (mg/Kg)</td>
<td>11.</td>
<td>8.51</td>
<td>1.29</td>
</tr>
<tr>
<td>Copper (mg/Kg)</td>
<td>150.5</td>
<td>18.4</td>
<td>8.18</td>
</tr>
<tr>
<td>Gallium (mg/Kg)</td>
<td>13.9</td>
<td>12.8</td>
<td>1.09</td>
</tr>
<tr>
<td>Iron (weight percent)</td>
<td>3.3</td>
<td>1.85</td>
<td>1.78</td>
</tr>
<tr>
<td>Lanthanum (mg/Kg)</td>
<td>25.7</td>
<td>36.2</td>
<td>.71</td>
</tr>
<tr>
<td>Lead (mg/Kg)</td>
<td>395.3</td>
<td>19.4</td>
<td>20.38</td>
</tr>
<tr>
<td>Lithium (mg/Kg)</td>
<td>31.3</td>
<td>19.74</td>
<td>1.59</td>
</tr>
<tr>
<td>Magnesium (weight percent)</td>
<td>2.47</td>
<td>.4</td>
<td>6.18</td>
</tr>
<tr>
<td>Manganese (mg/Kg)</td>
<td>583.4</td>
<td>460.4</td>
<td>1.27</td>
</tr>
<tr>
<td>Mercury (mg/Kg)</td>
<td>.64</td>
<td>.14</td>
<td>4.57</td>
</tr>
<tr>
<td>Molybdenum (mg/Kg)</td>
<td>5.74</td>
<td>2.46</td>
<td>2.33</td>
</tr>
<tr>
<td>Nickel (mg/Kg)</td>
<td>36.44</td>
<td>15.95</td>
<td>2.28</td>
</tr>
<tr>
<td>Phosphorus (weight percent)</td>
<td>.086</td>
<td>.043</td>
<td>2.00</td>
</tr>
<tr>
<td>Potassium (weight percent)</td>
<td>1.75</td>
<td>1.56</td>
<td>1.12</td>
</tr>
<tr>
<td>Scandium (mg/Kg)</td>
<td>8.6</td>
<td>8.2</td>
<td>1.05</td>
</tr>
<tr>
<td>Selenium (mg/Kg)</td>
<td>1.</td>
<td>.46</td>
<td>2.17</td>
</tr>
<tr>
<td>Sodium (weight percent)</td>
<td>.52</td>
<td>.73</td>
<td>.71</td>
</tr>
<tr>
<td>Strontium (mg/Kg)</td>
<td>113.6</td>
<td>122.1</td>
<td>.93</td>
</tr>
<tr>
<td>Thorium (mg/Kg)</td>
<td>9.</td>
<td>8.2</td>
<td>1.10</td>
</tr>
<tr>
<td>Titanium (weight percent)</td>
<td>.22</td>
<td>.27</td>
<td>.81</td>
</tr>
<tr>
<td>Vanadium (mg/Kg)</td>
<td>76.5</td>
<td>61.1</td>
<td>1.25</td>
</tr>
<tr>
<td>Yttrium (mg/Kg)</td>
<td>15.8</td>
<td>20.8</td>
<td>.76</td>
</tr>
<tr>
<td>Zinc (mg/Kg)</td>
<td>396.68</td>
<td>53.57</td>
<td>7.40</td>
</tr>
</tbody>
</table>
Table 21. Pearson product-moment correlation coefficients for selected inorganic constituents in ambient surface soils, Chicago, Illinois

[Positive coefficients greater than 0.70 in bold]

<table>
<thead>
<tr>
<th></th>
<th>ALUMINUM</th>
<th>ARSENIC</th>
<th>BARIUM</th>
<th>CALCIUM</th>
<th>CARBONATE CARBON</th>
<th>ORGANIC CARBON</th>
<th>CERIUM</th>
<th>CHROMIUM</th>
<th>COBALT</th>
<th>COPPER</th>
<th>GALLIUM</th>
<th>IRON</th>
<th>LANTHANUM</th>
<th>LEAD</th>
<th>LITHIUM</th>
<th>MAGNESIUM</th>
</tr>
</thead>
<tbody>
<tr>
<td>ALUMINUM</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ARSENIC</td>
<td>-.13</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BARIUM</td>
<td>.71</td>
<td>.13</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CALCIUM</td>
<td>-.73</td>
<td>.07</td>
<td>-.71</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ORGANIC CARBON</td>
<td>-.75</td>
<td>.07</td>
<td>-.73</td>
<td>.99</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CERIUM</td>
<td>.94</td>
<td>-.17</td>
<td>.69</td>
<td>-.62</td>
<td>-.62</td>
<td>-.14</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CHROMIUM</td>
<td>.25</td>
<td>.16</td>
<td>.33</td>
<td>-.15</td>
<td>-.24</td>
<td>.29</td>
<td>.27</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>COBALT</td>
<td>.75</td>
<td>.14</td>
<td>.66</td>
<td>-.44</td>
<td>-.50</td>
<td>.39</td>
<td>.72</td>
<td>.34</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>COPPER</td>
<td>-.07</td>
<td>.17</td>
<td>.12</td>
<td>.08</td>
<td>.05</td>
<td>.21</td>
<td>-.05</td>
<td>.13</td>
<td>.11</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GALLIUM</td>
<td>.92</td>
<td>-.07</td>
<td>.72</td>
<td>-.62</td>
<td>-.65</td>
<td>.08</td>
<td>.89</td>
<td>.30</td>
<td>.79</td>
<td>.02</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IRON</td>
<td>.29</td>
<td>.22</td>
<td>.39</td>
<td>-.35</td>
<td>.68</td>
<td>.20</td>
<td>.57</td>
<td>.62</td>
<td>.21</td>
<td>.37</td>
<td>.10</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LANTHANUM</td>
<td>.96</td>
<td>-.14</td>
<td>.71</td>
<td>-.64</td>
<td>-.65</td>
<td>-.05</td>
<td>.98</td>
<td>.30</td>
<td>.76</td>
<td>-.08</td>
<td>.90</td>
<td>.25</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LEAD</td>
<td>-.22</td>
<td>.46</td>
<td>.33</td>
<td>.07</td>
<td>.42</td>
<td>-.19</td>
<td>.29</td>
<td>.25</td>
<td>.51</td>
<td>-.01</td>
<td>.48</td>
<td>-.18</td>
<td>.10</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LITHIUM</td>
<td>.93</td>
<td>-.13</td>
<td>.62</td>
<td>-.52</td>
<td>-.55</td>
<td>.03</td>
<td>.91</td>
<td>.30</td>
<td>.80</td>
<td>-.03</td>
<td>.91</td>
<td>.30</td>
<td>.92</td>
<td>.13</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>MAGNESIUM</td>
<td>-.70</td>
<td>.05</td>
<td>-.71</td>
<td>.98</td>
<td>1.00</td>
<td>-.28</td>
<td>-.57</td>
<td>-.23</td>
<td>-.47</td>
<td>.07</td>
<td>-.59</td>
<td>-.35</td>
<td>-.60</td>
<td>-.06</td>
<td>-.49</td>
<td>1.00</td>
</tr>
<tr>
<td>MANGANESE</td>
<td>.17</td>
<td>-.04</td>
<td>.18</td>
<td>-.11</td>
<td>-.19</td>
<td>.21</td>
<td>.21</td>
<td>.93</td>
<td>.20</td>
<td>.05</td>
<td>.17</td>
<td>.53</td>
<td>.23</td>
<td>.11</td>
<td>.18</td>
<td>-.19</td>
</tr>
<tr>
<td>MERCURY</td>
<td>.00</td>
<td>.13</td>
<td>.14</td>
<td>.14</td>
<td>.03</td>
<td>.02</td>
<td>.10</td>
<td>.20</td>
<td>.10</td>
<td>.06</td>
<td>.05</td>
<td>.29</td>
<td>.10</td>
<td>.14</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MOLYBDENUM</td>
<td>.21</td>
<td>.31</td>
<td>.34</td>
<td>-.11</td>
<td>-.22</td>
<td>.66</td>
<td>.10</td>
<td>.75</td>
<td>.34</td>
<td>.26</td>
<td>.79</td>
<td>.19</td>
<td>.51</td>
<td>.27</td>
<td>-.22</td>
<td></td>
</tr>
<tr>
<td>NICKEL</td>
<td>.27</td>
<td>.18</td>
<td>.44</td>
<td>-.12</td>
<td>-.19</td>
<td>.39</td>
<td>.28</td>
<td>.47</td>
<td>.53</td>
<td>.78</td>
<td>.39</td>
<td>.55</td>
<td>.29</td>
<td>.61</td>
<td>.37</td>
<td>-.16</td>
</tr>
<tr>
<td>PHOSPHOROUS</td>
<td>.41</td>
<td>.08</td>
<td>.55</td>
<td>-.30</td>
<td>-.35</td>
<td>.30</td>
<td>.51</td>
<td>.47</td>
<td>.61</td>
<td>.26</td>
<td>.57</td>
<td>.53</td>
<td>.50</td>
<td>.44</td>
<td>.49</td>
<td>-.32</td>
</tr>
<tr>
<td>POTASSIUM</td>
<td>.88</td>
<td>-.22</td>
<td>.55</td>
<td>-.68</td>
<td>-.67</td>
<td>-.27</td>
<td>.83</td>
<td>.11</td>
<td>.47</td>
<td>-.13</td>
<td>.80</td>
<td>.01</td>
<td>.80</td>
<td>-.39</td>
<td>.81</td>
<td>-.61</td>
</tr>
<tr>
<td>SCANDIUM</td>
<td>.96</td>
<td>-.06</td>
<td>.67</td>
<td>-.61</td>
<td>-.64</td>
<td>.15</td>
<td>.91</td>
<td>.29</td>
<td>.86</td>
<td>-.01</td>
<td>.91</td>
<td>.39</td>
<td>.94</td>
<td>-.10</td>
<td>.95</td>
<td>-.59</td>
</tr>
<tr>
<td>SELENIUM</td>
<td>.29</td>
<td>.24</td>
<td>.48</td>
<td>-.26</td>
<td>-.31</td>
<td>.57</td>
<td>.32</td>
<td>.41</td>
<td>.66</td>
<td>.24</td>
<td>.48</td>
<td>.65</td>
<td>.32</td>
<td>.60</td>
<td>.36</td>
<td>-.30</td>
</tr>
<tr>
<td>SODIUM</td>
<td>.49</td>
<td>.09</td>
<td>.58</td>
<td>-.74</td>
<td>-.74</td>
<td>-.04</td>
<td>.45</td>
<td>.04</td>
<td>.21</td>
<td>-.06</td>
<td>.44</td>
<td>.44</td>
<td>.09</td>
<td>-.09</td>
<td>.25</td>
<td>-.73</td>
</tr>
<tr>
<td>SULFUR</td>
<td>-.06</td>
<td>.22</td>
<td>.11</td>
<td>-.04</td>
<td>-.13</td>
<td>.90</td>
<td>-.25</td>
<td>.26</td>
<td>.36</td>
<td>-.17</td>
<td>-.03</td>
<td>.68</td>
<td>-.15</td>
<td>.46</td>
<td>.06</td>
<td>-.16</td>
</tr>
<tr>
<td>STRONTIUM</td>
<td>.29</td>
<td>.17</td>
<td>.46</td>
<td>-.21</td>
<td>-.29</td>
<td>.39</td>
<td>.32</td>
<td>.33</td>
<td>.58</td>
<td>.11</td>
<td>.36</td>
<td>.42</td>
<td>.36</td>
<td>.40</td>
<td>.35</td>
<td>.31</td>
</tr>
<tr>
<td>THORIUM</td>
<td>.22</td>
<td>.12</td>
<td>.28</td>
<td>-.39</td>
<td>-.35</td>
<td>-.12</td>
<td>.17</td>
<td>-.17</td>
<td>.13</td>
<td>-.23</td>
<td>.06</td>
<td>-.15</td>
<td>.22</td>
<td>-.17</td>
<td>.14</td>
<td>-.38</td>
</tr>
<tr>
<td>TITANIUM</td>
<td>.95</td>
<td>-.10</td>
<td>.71</td>
<td>-.68</td>
<td>-.70</td>
<td>.14</td>
<td>.89</td>
<td>.30</td>
<td>.78</td>
<td>.00</td>
<td>.87</td>
<td>.40</td>
<td>.94</td>
<td>-.12</td>
<td>.87</td>
<td>-.66</td>
</tr>
<tr>
<td>VANADIUM</td>
<td>.89</td>
<td>-.02</td>
<td>.66</td>
<td>-.56</td>
<td>-.61</td>
<td>.27</td>
<td>.83</td>
<td>.55</td>
<td>.86</td>
<td>.01</td>
<td>.85</td>
<td>.60</td>
<td>.88</td>
<td>.01</td>
<td>.88</td>
<td>-.57</td>
</tr>
<tr>
<td>YTTRIUM</td>
<td>.83</td>
<td>.01</td>
<td>.66</td>
<td>-.48</td>
<td>-.54</td>
<td>.30</td>
<td>.81</td>
<td>.35</td>
<td>.91</td>
<td>.05</td>
<td>.81</td>
<td>.53</td>
<td>.87</td>
<td>.07</td>
<td>.84</td>
<td>-.50</td>
</tr>
<tr>
<td>ZINC</td>
<td>-.19</td>
<td>.46</td>
<td>.32</td>
<td>.16</td>
<td>.09</td>
<td>.52</td>
<td>-.18</td>
<td>.30</td>
<td>.32</td>
<td>.54</td>
<td>.00</td>
<td>.49</td>
<td>-.14</td>
<td>.91</td>
<td>-.08</td>
<td>.08</td>
</tr>
</tbody>
</table>
Table 21. Pearson product-moment correlation coefficients for selected inorganic constituents in ambient surface soils, Chicago, Illinois—Continued

[Positive coefficients greater than 0.70 in bold]

<table>
<thead>
<tr>
<th></th>
<th>MANGANESE</th>
<th>MERCURY</th>
<th>MOLYBDENUM</th>
<th>NICKEL</th>
<th>PHOSPHOROUS</th>
<th>POTASSIUM</th>
<th>SCANDIUM</th>
<th>SELENIUM</th>
<th>SODIUM</th>
<th>SULFUR</th>
<th>STRONTIUM</th>
<th>THORIUM</th>
<th>TITANIUM</th>
<th>VANADIUM</th>
<th>YTTRIUM</th>
<th>ZINC</th>
</tr>
</thead>
<tbody>
<tr>
<td>ALUMINUM</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ARSENIC</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BARIUM</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CALCIUM</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CARBONATE</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CARBON</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CERIUM</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CHROMIUM</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>COBALT</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>COPPER</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GALLIUM</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IRON</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LANTHANUM</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LEAD</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LITHIUM</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MAGNESIUM</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MANGANESE</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MERCURY</td>
<td>-.03</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MOLYBDENUM</td>
<td>.62</td>
<td>.12</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NICKEL</td>
<td>.31</td>
<td>.16</td>
<td>.65</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PHOSPHOROUS</td>
<td>.37</td>
<td>.28</td>
<td>.42</td>
<td>.60</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>POTASSIUM</td>
<td>.07</td>
<td>-.06</td>
<td>-.06</td>
<td>.07</td>
<td>.20</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SCANDIUM</td>
<td>.17</td>
<td>.08</td>
<td>.34</td>
<td>.39</td>
<td>.49</td>
<td>.78</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SELENIUM</td>
<td>.28</td>
<td>.20</td>
<td>.57</td>
<td>.56</td>
<td>.70</td>
<td>.02</td>
<td>.40</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SODIUM</td>
<td>.08</td>
<td>-.15</td>
<td>-.09</td>
<td>-.03</td>
<td>.22</td>
<td>.49</td>
<td>.32</td>
<td>.12</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SULFUR</td>
<td>.17</td>
<td>.04</td>
<td>.74</td>
<td>.33</td>
<td>.13</td>
<td>-.34</td>
<td>.08</td>
<td>.46</td>
<td>-.14</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>STRONTIUM</td>
<td>.22</td>
<td>.23</td>
<td>.48</td>
<td>.43</td>
<td>.59</td>
<td>-.02</td>
<td>.41</td>
<td>.56</td>
<td>.22</td>
<td>.35</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>THORIUM</td>
<td>-.20</td>
<td>.05</td>
<td>-.10</td>
<td>-.14</td>
<td>-.10</td>
<td>.19</td>
<td>-.09</td>
<td>.24</td>
<td>-.12</td>
<td>.19</td>
<td>.10</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TITANIUM</td>
<td>.20</td>
<td>.01</td>
<td>.30</td>
<td>.36</td>
<td>.43</td>
<td>.74</td>
<td>.94</td>
<td>.33</td>
<td>.42</td>
<td>.06</td>
<td>.33</td>
<td>.15</td>
<td>.10</td>
<td>1.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>VANADIUM</td>
<td>.45</td>
<td>.08</td>
<td>.55</td>
<td>.47</td>
<td>.56</td>
<td>.64</td>
<td>.93</td>
<td>.49</td>
<td>.26</td>
<td>.22</td>
<td>.43</td>
<td>.10</td>
<td>.90</td>
<td>1.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>YTTRIUM</td>
<td>.24</td>
<td>.16</td>
<td>.47</td>
<td>.47</td>
<td>.60</td>
<td>.51</td>
<td>.92</td>
<td>.52</td>
<td>.27</td>
<td>.24</td>
<td>.61</td>
<td>.14</td>
<td>.89</td>
<td>.92</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>ZINC</td>
<td>.11</td>
<td>.37</td>
<td>.59</td>
<td>.68</td>
<td>.43</td>
<td>-.41</td>
<td>-.04</td>
<td>.57</td>
<td>-.15</td>
<td>.56</td>
<td>.50</td>
<td>-.11</td>
<td>-.06</td>
<td>.07</td>
<td>.16</td>
<td>1.00</td>
</tr>
</tbody>
</table>
### Appendix 1. Polynuclear aromatic hydrocarbons in ambient surface soils, Chicago, Illinois

[µg/Kg, micrograms per kilogram; 15 U, constituent not detected and detection limit; J, estimated; D, duplicate sample]

<table>
<thead>
<tr>
<th>Sample Number</th>
<th>Naphthalene (µg/Kg)</th>
<th>Acenaphthyene (µg/Kg)</th>
<th>Acenaphthene (µg/Kg)</th>
<th>Fluorene (µg/Kg)</th>
<th>Phenanthrene (µg/Kg)</th>
<th>Anthracene (µg/Kg)</th>
<th>Fluoranthene (µg/Kg)</th>
<th>Pyrene (µg/Kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PAH-SS-01</td>
<td>15</td>
<td>9</td>
<td></td>
<td>44</td>
<td>49</td>
<td>700</td>
<td>150</td>
<td>1,700</td>
</tr>
<tr>
<td>PAH-SS-02</td>
<td>14</td>
<td>6</td>
<td></td>
<td>9</td>
<td>11</td>
<td>200</td>
<td>38</td>
<td>580</td>
</tr>
<tr>
<td>PAH-SS-03</td>
<td>15</td>
<td>7</td>
<td></td>
<td>93</td>
<td>77</td>
<td>1,000</td>
<td>220</td>
<td>2,100</td>
</tr>
<tr>
<td>PAH-SS-04</td>
<td>14</td>
<td>14</td>
<td></td>
<td>57</td>
<td>53</td>
<td>900</td>
<td>140</td>
<td>2,000</td>
</tr>
<tr>
<td>PAH-SS-05</td>
<td>13</td>
<td>6</td>
<td></td>
<td>37</td>
<td>36</td>
<td>690</td>
<td>97</td>
<td>1,600</td>
</tr>
<tr>
<td>PAH-SS-06</td>
<td>160</td>
<td>340</td>
<td>370</td>
<td>400</td>
<td>8,100</td>
<td>1,000</td>
<td>20,000</td>
<td>12,000</td>
</tr>
<tr>
<td>PAH-SS-07</td>
<td>14</td>
<td>7</td>
<td>7</td>
<td>8 UJ</td>
<td>83</td>
<td>14 J</td>
<td>130</td>
<td>100</td>
</tr>
<tr>
<td>PAH-SS-08</td>
<td>15</td>
<td>7</td>
<td>14</td>
<td>10 J</td>
<td>190</td>
<td>37</td>
<td>480</td>
<td>290</td>
</tr>
<tr>
<td>PAH-SS-09</td>
<td>15</td>
<td>23</td>
<td></td>
<td>450</td>
<td>680</td>
<td>5,900</td>
<td>1,300</td>
<td>7,800</td>
</tr>
<tr>
<td>PAH-SS-10</td>
<td>14</td>
<td>7</td>
<td>6</td>
<td>7 U</td>
<td>27</td>
<td>7 U</td>
<td>52</td>
<td>88</td>
</tr>
<tr>
<td>PAH-SS-11</td>
<td>14</td>
<td>6</td>
<td>5</td>
<td>7 U</td>
<td>33</td>
<td>8 J</td>
<td>81</td>
<td>98</td>
</tr>
<tr>
<td>PAH-SS-12</td>
<td>14</td>
<td>6</td>
<td>8</td>
<td>11 J</td>
<td>130</td>
<td>28</td>
<td>230</td>
<td>150</td>
</tr>
<tr>
<td>PAH-SS-13</td>
<td>30</td>
<td>62</td>
<td>320</td>
<td>260</td>
<td>4,600</td>
<td>890</td>
<td>8,400</td>
<td>4,100</td>
</tr>
<tr>
<td>PAH-SS-14</td>
<td>41</td>
<td>440</td>
<td>110</td>
<td>330</td>
<td>5,800</td>
<td>680</td>
<td>12,000</td>
<td>6,200</td>
</tr>
<tr>
<td>PAH-SS-15</td>
<td>16</td>
<td>7</td>
<td>8</td>
<td>8 J</td>
<td>130</td>
<td>25</td>
<td>340</td>
<td>220</td>
</tr>
<tr>
<td>PAH-SS-16</td>
<td>14</td>
<td>6</td>
<td>5</td>
<td>7 U</td>
<td>56</td>
<td>11 J</td>
<td>160</td>
<td>100</td>
</tr>
<tr>
<td>PAH-SS-17</td>
<td>290</td>
<td>970</td>
<td>520</td>
<td>990</td>
<td>11,000</td>
<td>3,200</td>
<td>26,000</td>
<td>13,000</td>
</tr>
<tr>
<td>PAH-SS-17D</td>
<td>240</td>
<td>1,100</td>
<td>74</td>
<td>460</td>
<td>5,600</td>
<td>1,900</td>
<td>19,000</td>
<td>9,200</td>
</tr>
<tr>
<td>PAH-SS-18</td>
<td>15</td>
<td>77</td>
<td>640</td>
<td>420</td>
<td>5,700</td>
<td>980</td>
<td>11,000</td>
<td>5,800</td>
</tr>
<tr>
<td>PAH-SS-19</td>
<td>13</td>
<td>6</td>
<td>5</td>
<td>6 U</td>
<td>84</td>
<td>14 J</td>
<td>220</td>
<td>110</td>
</tr>
<tr>
<td>PAH-SS-20</td>
<td>13</td>
<td>7</td>
<td>7</td>
<td>7 J</td>
<td>130</td>
<td>22</td>
<td>300</td>
<td>250</td>
</tr>
<tr>
<td>PAH-SS-21</td>
<td>19</td>
<td>21</td>
<td>8</td>
<td>12 J</td>
<td>210</td>
<td>39</td>
<td>460</td>
<td>430</td>
</tr>
<tr>
<td>PAH-SS-21D</td>
<td>19</td>
<td>26</td>
<td>10</td>
<td>16 J</td>
<td>250</td>
<td>53</td>
<td>530</td>
<td>430</td>
</tr>
<tr>
<td>PAH-SS-22</td>
<td>350</td>
<td>480</td>
<td>1,500</td>
<td>2,000</td>
<td>19,000</td>
<td>4,600</td>
<td>35,000</td>
<td>30,000</td>
</tr>
<tr>
<td>PAH-SS-23</td>
<td>15</td>
<td>28</td>
<td>39</td>
<td>46</td>
<td>820</td>
<td>150</td>
<td>2,000</td>
<td>1,600</td>
</tr>
<tr>
<td>PAH-SS-24</td>
<td>58</td>
<td>390</td>
<td>98</td>
<td>310</td>
<td>3,700</td>
<td>540</td>
<td>7,200</td>
<td>5,500</td>
</tr>
<tr>
<td>PAH-SS-25</td>
<td>14</td>
<td>10</td>
<td>12</td>
<td>12 J</td>
<td>220</td>
<td>39</td>
<td>570</td>
<td>490</td>
</tr>
<tr>
<td>PAH-SS-25D</td>
<td>14</td>
<td>11</td>
<td>17</td>
<td>18 J</td>
<td>280</td>
<td>48</td>
<td>650</td>
<td>560</td>
</tr>
<tr>
<td>PAH-SS-26</td>
<td>17</td>
<td>16</td>
<td>41</td>
<td>43</td>
<td>670</td>
<td>120</td>
<td>1,300</td>
<td>1,000</td>
</tr>
<tr>
<td>PAH-SS-27</td>
<td>90</td>
<td>130</td>
<td>220</td>
<td>210</td>
<td>3,500</td>
<td>620</td>
<td>8,400</td>
<td>7,000</td>
</tr>
<tr>
<td>PAH-SS-28</td>
<td>40</td>
<td>51</td>
<td>140</td>
<td>130</td>
<td>2,000</td>
<td>380</td>
<td>4,300</td>
<td>3,800</td>
</tr>
<tr>
<td>PAH-SS-29</td>
<td>78</td>
<td>35</td>
<td>380</td>
<td>390</td>
<td>4,000</td>
<td>620</td>
<td>5,300</td>
<td>4,500</td>
</tr>
<tr>
<td>PAH-SS-30</td>
<td>65</td>
<td>37</td>
<td>190</td>
<td>170</td>
<td>1,800</td>
<td>400</td>
<td>3,600</td>
<td>2,900</td>
</tr>
<tr>
<td>PAH-SS-31</td>
<td>290</td>
<td>74</td>
<td>330</td>
<td>340</td>
<td>4,500</td>
<td>1,000</td>
<td>6,000</td>
<td>5,000</td>
</tr>
<tr>
<td>PAH-SS-32</td>
<td>610</td>
<td>100</td>
<td>1,100</td>
<td>1,400</td>
<td>12,000</td>
<td>2,500</td>
<td>17,000</td>
<td>12,000</td>
</tr>
<tr>
<td>PAH-SS-33</td>
<td>36</td>
<td>39</td>
<td>150</td>
<td>170</td>
<td>1,900</td>
<td>390</td>
<td>3,200</td>
<td>2,700</td>
</tr>
</tbody>
</table>
Appendix 1. Polynuclear aromatic hydrocarbons in ambient surface soils, Chicago, Illinois—Continued

[µg/Kg, micrograms per kilogram; 15 U, constituent not detected and detection limit; J, estimated; D, duplicate sample]

<table>
<thead>
<tr>
<th>Sample Number</th>
<th>Benzo(a)-anthracene (µg/Kg)</th>
<th>Chrysene (µg/Kg)</th>
<th>Benzo(b)-fluoranthene (µg/Kg)</th>
<th>Benzo(k)-fluoranthene (µg/Kg)</th>
<th>Benzo(a)-pyrene (µg/Kg)</th>
<th>Dibenzo-(a,h)-anthracene (µg/Kg)</th>
<th>Benzo-(g,h,i)-perylene (µg/Kg)</th>
<th>Indeno-(1,2,3-cd)-pyrene (µg/Kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PAH-SS-01</td>
<td>600</td>
<td>720</td>
<td>1,000</td>
<td>450</td>
<td>760</td>
<td>190</td>
<td>410</td>
<td>470</td>
</tr>
<tr>
<td>PAH-SS-02</td>
<td>200</td>
<td>250</td>
<td>340</td>
<td>220</td>
<td>260</td>
<td>93</td>
<td>200</td>
<td>210</td>
</tr>
<tr>
<td>PAH-SS-03</td>
<td>720</td>
<td>800</td>
<td>920</td>
<td>650</td>
<td>850</td>
<td>140</td>
<td>430</td>
<td>500</td>
</tr>
<tr>
<td>PAH-SS-04</td>
<td>740</td>
<td>910</td>
<td>1,100</td>
<td>900</td>
<td>1,000</td>
<td>150</td>
<td>490</td>
<td>610</td>
</tr>
<tr>
<td>PAH-SS-05</td>
<td>510</td>
<td>650</td>
<td>760</td>
<td>530</td>
<td>680</td>
<td>110</td>
<td>360</td>
<td>430</td>
</tr>
<tr>
<td>PAH-SS-06</td>
<td>9,100</td>
<td>11,000</td>
<td>14,000</td>
<td>9,000</td>
<td>12,000</td>
<td>770</td>
<td>6,900</td>
<td>8,100</td>
</tr>
<tr>
<td>PAH-SS-07</td>
<td>47</td>
<td>54</td>
<td>100</td>
<td>53</td>
<td>81</td>
<td>68</td>
<td>120</td>
<td>110</td>
</tr>
<tr>
<td>PAH-SS-08</td>
<td>180</td>
<td>220</td>
<td>260</td>
<td>220</td>
<td>250</td>
<td>96</td>
<td>170</td>
<td>200</td>
</tr>
<tr>
<td>PAH-SS-09</td>
<td>2,700</td>
<td>2,900</td>
<td>3,000</td>
<td>2,200</td>
<td>3,000</td>
<td>290</td>
<td>1,000</td>
<td>1,300</td>
</tr>
<tr>
<td>PAH-SS-10</td>
<td>26</td>
<td>31</td>
<td>40</td>
<td>36</td>
<td>39</td>
<td>62</td>
<td>110</td>
<td>98</td>
</tr>
<tr>
<td>PAH-SS-11</td>
<td>43</td>
<td>61</td>
<td>63</td>
<td>59</td>
<td>66</td>
<td>62</td>
<td>100</td>
<td>110</td>
</tr>
<tr>
<td>PAH-SS-12</td>
<td>110</td>
<td>120</td>
<td>150</td>
<td>95</td>
<td>130</td>
<td>68</td>
<td>130</td>
<td>140</td>
</tr>
<tr>
<td>PAH-SS-13</td>
<td>3,400</td>
<td>3,500</td>
<td>4,000</td>
<td>1,900</td>
<td>3,700</td>
<td>640</td>
<td>1,300</td>
<td>1,500</td>
</tr>
<tr>
<td>PAH-SS-14</td>
<td>5,100</td>
<td>5,800</td>
<td>7,200</td>
<td>4,400</td>
<td>6,200</td>
<td>510</td>
<td>2,000</td>
<td>4,300</td>
</tr>
<tr>
<td>PAH-SS-15</td>
<td>160</td>
<td>180</td>
<td>240</td>
<td>140</td>
<td>200</td>
<td>82</td>
<td>160</td>
<td>170</td>
</tr>
<tr>
<td>PAH-SS-16</td>
<td>59</td>
<td>79</td>
<td>97</td>
<td>58</td>
<td>81</td>
<td>69</td>
<td>120</td>
<td>130</td>
</tr>
<tr>
<td>PAH-SS-17</td>
<td>10,000</td>
<td>9,300</td>
<td>13,000</td>
<td>7,100</td>
<td>11,000</td>
<td>870</td>
<td>7,100</td>
<td>8,100</td>
</tr>
<tr>
<td>PAH-SS-17D</td>
<td>8,400</td>
<td>8,200</td>
<td>9,400</td>
<td>8,600</td>
<td>9,700</td>
<td>780</td>
<td>5,500</td>
<td>6,100</td>
</tr>
<tr>
<td>PAH-SS-18</td>
<td>4,900</td>
<td>5,500</td>
<td>6,800</td>
<td>3,600</td>
<td>5,600</td>
<td>520</td>
<td>3,700</td>
<td>4,100</td>
</tr>
<tr>
<td>PAH-SS-19</td>
<td>77</td>
<td>99</td>
<td>99</td>
<td>70</td>
<td>95</td>
<td>70</td>
<td>130</td>
<td>140</td>
</tr>
<tr>
<td>PAH-SS-20</td>
<td>140</td>
<td>160</td>
<td>190</td>
<td>100</td>
<td>160</td>
<td>28</td>
<td>120</td>
<td>130</td>
</tr>
<tr>
<td>PAH-SS-21</td>
<td>210</td>
<td>230</td>
<td>300</td>
<td>170</td>
<td>250</td>
<td>44</td>
<td>180</td>
<td>210</td>
</tr>
<tr>
<td>PAH-SS-21D</td>
<td>230</td>
<td>260</td>
<td>330</td>
<td>190</td>
<td>280</td>
<td>52</td>
<td>200</td>
<td>240</td>
</tr>
<tr>
<td>PAH-SS-22</td>
<td>16,000</td>
<td>15,000</td>
<td>18,000</td>
<td>10,000</td>
<td>17,000</td>
<td>1,600</td>
<td>8,100</td>
<td>9,900</td>
</tr>
<tr>
<td>PAH-SS-23</td>
<td>880</td>
<td>980</td>
<td>970</td>
<td>1,000</td>
<td>1,000</td>
<td>110</td>
<td>490</td>
<td>620</td>
</tr>
<tr>
<td>PAH-SS-24</td>
<td>2,500</td>
<td>2,600</td>
<td>3,700</td>
<td>2,000</td>
<td>3,000</td>
<td>290</td>
<td>1,500</td>
<td>1,800</td>
</tr>
<tr>
<td>PAH-SS-25</td>
<td>240</td>
<td>280</td>
<td>340</td>
<td>210</td>
<td>280</td>
<td>59</td>
<td>210</td>
<td>250</td>
</tr>
<tr>
<td>PAH-SS-25D</td>
<td>280</td>
<td>330</td>
<td>380</td>
<td>270</td>
<td>340</td>
<td>70</td>
<td>230</td>
<td>280</td>
</tr>
<tr>
<td>PAH-SS-26</td>
<td>550</td>
<td>540</td>
<td>530</td>
<td>340</td>
<td>570</td>
<td>71</td>
<td>280</td>
<td>370</td>
</tr>
<tr>
<td>PAH-SS-27</td>
<td>3,800</td>
<td>4,200</td>
<td>5,700</td>
<td>2,900</td>
<td>4,200</td>
<td>760</td>
<td>3,200</td>
<td>3,800</td>
</tr>
<tr>
<td>PAH-SS-28</td>
<td>2,000</td>
<td>1,900</td>
<td>2,600</td>
<td>1,300</td>
<td>2,100</td>
<td>280</td>
<td>920</td>
<td>1,100</td>
</tr>
<tr>
<td>PAH-SS-29</td>
<td>1,700</td>
<td>1,700</td>
<td>1,900</td>
<td>1,300</td>
<td>1,800</td>
<td>200</td>
<td>730</td>
<td>920</td>
</tr>
<tr>
<td>PAH-SS-30</td>
<td>1,700</td>
<td>1,600</td>
<td>1,600</td>
<td>1,500</td>
<td>1,600</td>
<td>280</td>
<td>640</td>
<td>830</td>
</tr>
<tr>
<td>PAH-SS-31</td>
<td>2,400</td>
<td>2,500</td>
<td>3,000</td>
<td>1,700</td>
<td>2,400</td>
<td>370</td>
<td>930</td>
<td>1,200</td>
</tr>
<tr>
<td>PAH-SS-32</td>
<td>6,400</td>
<td>6,600</td>
<td>6,000</td>
<td>6,300</td>
<td>6,600</td>
<td>940</td>
<td>3,600</td>
<td>4,600</td>
</tr>
<tr>
<td>PAH-SS-33</td>
<td>1,300</td>
<td>1,300</td>
<td>1,300</td>
<td>1,400</td>
<td>1,400</td>
<td>220</td>
<td>570</td>
<td>700</td>
</tr>
</tbody>
</table>
### Appendix 1. Polynuclear aromatic hydrocarbons in ambient surface soils, Chicago, Illinois—Continued

[μg/Kg, micrograms per kilogram; 15 U, constituent not detected and detection limit; J, estimated; D, duplicate sample]

<table>
<thead>
<tr>
<th>Sample Number</th>
<th>Naphthalene (µg/Kg)</th>
<th>Acenaphthylene (µg/Kg)</th>
<th>Acenaphthene (µg/Kg)</th>
<th>Fluorene (µg/Kg)</th>
<th>Phenanthrene (µg/Kg)</th>
<th>Anthracene (µg/Kg)</th>
<th>Fluoranthene (µg/Kg)</th>
<th>Pyrene (µg/Kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PAH-SS-33D</td>
<td>50 J</td>
<td>48</td>
<td>130</td>
<td>150</td>
<td>1,700</td>
<td>340</td>
<td>3,000</td>
<td>2,500</td>
</tr>
<tr>
<td>PAH-SS-34</td>
<td>50 J</td>
<td>17 J</td>
<td>190</td>
<td>180</td>
<td>2,100</td>
<td>380</td>
<td>3,900</td>
<td>3,100</td>
</tr>
<tr>
<td>PAH-SS-35</td>
<td>700 J</td>
<td>300</td>
<td>1,200</td>
<td>1,500</td>
<td>16,000</td>
<td>3,000</td>
<td>20,000</td>
<td>17,000</td>
</tr>
<tr>
<td>PAH-SS-36</td>
<td>190 J</td>
<td>250</td>
<td>510</td>
<td>630</td>
<td>8,200</td>
<td>1,400</td>
<td>16,000</td>
<td>12,000</td>
</tr>
<tr>
<td>PAH-SS-37</td>
<td>68</td>
<td>54</td>
<td>210</td>
<td>210</td>
<td>2,200</td>
<td>470</td>
<td>4,700</td>
<td>2,000</td>
</tr>
<tr>
<td>PAH-SS-38</td>
<td>24 UJ</td>
<td>24 UJ</td>
<td>33</td>
<td>40</td>
<td>430</td>
<td>84</td>
<td>990</td>
<td>500</td>
</tr>
<tr>
<td>PAH-CE-1</td>
<td>21 UJ</td>
<td>21 UJ</td>
<td>17 J</td>
<td>18 J</td>
<td>330</td>
<td>330</td>
<td>880</td>
<td>610</td>
</tr>
<tr>
<td>PAH-CE-2</td>
<td>18 U</td>
<td>18 U</td>
<td>18 U</td>
<td>18 U</td>
<td>22</td>
<td>18 UJ</td>
<td>74</td>
<td>51</td>
</tr>
<tr>
<td>PAH-CE-3</td>
<td>110</td>
<td>8 J</td>
<td>46</td>
<td>52</td>
<td>620</td>
<td>120</td>
<td>1,100</td>
<td>840</td>
</tr>
<tr>
<td>PAH-CE-4</td>
<td>20</td>
<td>13 J</td>
<td>170</td>
<td>170</td>
<td>2,100</td>
<td>300</td>
<td>3,500</td>
<td>2,600</td>
</tr>
<tr>
<td>PAH-CE-4D</td>
<td>14 J</td>
<td>9 J</td>
<td>100</td>
<td>110</td>
<td>1,400</td>
<td>200</td>
<td>3,100</td>
<td>1,800</td>
</tr>
<tr>
<td>PAH-CE-5</td>
<td>97</td>
<td>72</td>
<td>140</td>
<td>180</td>
<td>2,100</td>
<td>510</td>
<td>6,000</td>
<td>5,200</td>
</tr>
<tr>
<td>PAH-CE-6</td>
<td>50</td>
<td>17 J</td>
<td>84</td>
<td>91</td>
<td>1,200</td>
<td>190</td>
<td>1,800</td>
<td>1,800</td>
</tr>
<tr>
<td>PAH-CE-7</td>
<td>410</td>
<td>50</td>
<td>260</td>
<td>320</td>
<td>3,900</td>
<td>680</td>
<td>7,100</td>
<td>5,900</td>
</tr>
<tr>
<td>PAH-CE-8</td>
<td>20</td>
<td>7 J</td>
<td>110</td>
<td>120</td>
<td>1,200</td>
<td>290</td>
<td>2,300</td>
<td>1,500</td>
</tr>
<tr>
<td>PAH-CE-9</td>
<td>21 U</td>
<td>21 U</td>
<td>21 U</td>
<td>21 U</td>
<td>30</td>
<td>21 U</td>
<td>64</td>
<td>60</td>
</tr>
<tr>
<td>PAH-CE-10</td>
<td>21 UJ</td>
<td>7 J</td>
<td>9 J</td>
<td>9 J</td>
<td>160</td>
<td>29</td>
<td>410</td>
<td>350</td>
</tr>
<tr>
<td>PAH-CE-11</td>
<td>18 UJ</td>
<td>18 U</td>
<td>9 J</td>
<td>9 J</td>
<td>180</td>
<td>28</td>
<td>460</td>
<td>430</td>
</tr>
<tr>
<td>PAH-CE-12</td>
<td>14 J</td>
<td>13 J</td>
<td>36</td>
<td>31</td>
<td>240</td>
<td>49</td>
<td>650</td>
<td>350</td>
</tr>
<tr>
<td>PAH-CE-13</td>
<td>51</td>
<td>69</td>
<td>85</td>
<td>110</td>
<td>1,500</td>
<td>260</td>
<td>5,700</td>
<td>2,800</td>
</tr>
<tr>
<td>PAH-CE-14</td>
<td>110</td>
<td>55</td>
<td>110</td>
<td>130</td>
<td>1,700</td>
<td>260</td>
<td>3,400</td>
<td>2,100</td>
</tr>
<tr>
<td>PAH-CE-15</td>
<td>180 J</td>
<td>17 J</td>
<td>920 J</td>
<td>950 J</td>
<td>5,100</td>
<td>980 J</td>
<td>6,200</td>
<td>3,400</td>
</tr>
<tr>
<td>PAH-CE-15D</td>
<td>38</td>
<td>11 J</td>
<td>250</td>
<td>220</td>
<td>1,500</td>
<td>280</td>
<td>2,700</td>
<td>1,200</td>
</tr>
<tr>
<td>PAH-CE-16</td>
<td>84</td>
<td>14 J</td>
<td>9 J</td>
<td>13 J</td>
<td>270</td>
<td>41</td>
<td>450</td>
<td>330</td>
</tr>
<tr>
<td>PAH-CE-17</td>
<td>98</td>
<td>20</td>
<td>17 J</td>
<td>17 J</td>
<td>410</td>
<td>53</td>
<td>730</td>
<td>520</td>
</tr>
<tr>
<td>PAH-CE-18</td>
<td>86</td>
<td>40</td>
<td>310</td>
<td>290</td>
<td>3,600</td>
<td>770</td>
<td>8,600</td>
<td>6,000</td>
</tr>
<tr>
<td>PAH-CE-19</td>
<td>2,500</td>
<td>1,000</td>
<td>43,000</td>
<td>36,000</td>
<td>520,000</td>
<td>120,000</td>
<td>1,100,000</td>
<td>720,000 J</td>
</tr>
<tr>
<td>Sample Number</td>
<td>Benzo(a)-anthracene (µg/Kg)</td>
<td>Chrysene (µg/Kg)</td>
<td>Benzo(b)-fluoranthene (µg/Kg)</td>
<td>Benzo(k)-fluoranthene (µg/Kg)</td>
<td>Benzo(a)-pyrene (µg/Kg)</td>
<td>Dibenzo-(a,h)anthracene (µg/Kg)</td>
<td>Benzo-(g,h,i)-perylene (µg/Kg)</td>
<td>Indeno-(1,2,3-cd)-pyrene (µg/Kg)</td>
</tr>
<tr>
<td>---------------</td>
<td>-----------------------------</td>
<td>------------------</td>
<td>--------------------------------</td>
<td>-------------------------------</td>
<td>--------------------------</td>
<td>-------------------------------</td>
<td>-------------------------------</td>
<td>-------------------------------</td>
</tr>
<tr>
<td>PAH-SS-33D</td>
<td>1,300</td>
<td>1,300</td>
<td>1,700</td>
<td>950</td>
<td>1,400</td>
<td>220</td>
<td>540</td>
<td>700</td>
</tr>
<tr>
<td>PAH-SS-34</td>
<td>1,500</td>
<td>1,600</td>
<td>2,100</td>
<td>720</td>
<td>1,600</td>
<td>220</td>
<td>920</td>
<td>1,200</td>
</tr>
<tr>
<td>PAH-SS-35</td>
<td>8,100</td>
<td>7,800</td>
<td>9,000</td>
<td>4,000</td>
<td>7,500</td>
<td>1,100</td>
<td>4,100</td>
<td>5,000</td>
</tr>
<tr>
<td>PAH-SS-36</td>
<td>6,100</td>
<td>6,400</td>
<td>8,500</td>
<td>3,900</td>
<td>6,600</td>
<td>1,100</td>
<td>4,000</td>
<td>5,200</td>
</tr>
<tr>
<td>PAH-SS-37</td>
<td>1,800 J</td>
<td>1,500</td>
<td>2,600</td>
<td>1,300</td>
<td>1,700</td>
<td>130</td>
<td>570</td>
<td>870 J</td>
</tr>
<tr>
<td>PAH-SS-38</td>
<td>300 J</td>
<td>310</td>
<td>440 J</td>
<td>490</td>
<td>490</td>
<td>140</td>
<td>220</td>
<td>360 J</td>
</tr>
<tr>
<td>PAH-CE-1</td>
<td>320</td>
<td>380</td>
<td>480</td>
<td>330</td>
<td>410</td>
<td>38</td>
<td>200</td>
<td>270</td>
</tr>
<tr>
<td>PAH-CE-2</td>
<td>30</td>
<td>35</td>
<td>50</td>
<td>36</td>
<td>41</td>
<td>8 J</td>
<td>24</td>
<td>33</td>
</tr>
<tr>
<td>PAH-CE-3</td>
<td>430</td>
<td>430</td>
<td>550</td>
<td>410</td>
<td>480</td>
<td>48</td>
<td>200</td>
<td>260</td>
</tr>
<tr>
<td>PAH-CE-4</td>
<td>1,400</td>
<td>1,400</td>
<td>1,800</td>
<td>1,400</td>
<td>1,600</td>
<td>120</td>
<td>560</td>
<td>790</td>
</tr>
<tr>
<td>PAH-CE-4D</td>
<td>1,000</td>
<td>1,000</td>
<td>1,300</td>
<td>950 J</td>
<td>1,200</td>
<td>130 J</td>
<td>560</td>
<td>770</td>
</tr>
<tr>
<td>PAH-CE-5</td>
<td>3,200</td>
<td>2,900</td>
<td>3,400</td>
<td>2,900</td>
<td>3,600</td>
<td>260 J</td>
<td>1,200</td>
<td>1,500</td>
</tr>
<tr>
<td>PAH-CE-6</td>
<td>880</td>
<td>850</td>
<td>1,200</td>
<td>820</td>
<td>950</td>
<td>120</td>
<td>580</td>
<td>700</td>
</tr>
<tr>
<td>PAH-CE-7</td>
<td>3,300</td>
<td>3,200</td>
<td>4,200</td>
<td>2,700</td>
<td>3,200</td>
<td>340 J</td>
<td>1,200</td>
<td>1,600</td>
</tr>
<tr>
<td>PAH-CE-8</td>
<td>830</td>
<td>730</td>
<td>830</td>
<td>620</td>
<td>780</td>
<td>78</td>
<td>290</td>
<td>410</td>
</tr>
<tr>
<td>PAH-CE-9</td>
<td>28</td>
<td>36</td>
<td>50</td>
<td>44</td>
<td>45</td>
<td>10 J</td>
<td>24</td>
<td>31</td>
</tr>
<tr>
<td>PAH-CE-10</td>
<td>210</td>
<td>200</td>
<td>320</td>
<td>200</td>
<td>250</td>
<td>27</td>
<td>99</td>
<td>130</td>
</tr>
<tr>
<td>PAH-CE-11</td>
<td>210</td>
<td>220</td>
<td>350</td>
<td>230</td>
<td>270</td>
<td>27</td>
<td>110</td>
<td>160</td>
</tr>
<tr>
<td>PAH-CE-12</td>
<td>210 J</td>
<td>200</td>
<td>370 J</td>
<td>290</td>
<td>290</td>
<td>85</td>
<td>130</td>
<td>220 J</td>
</tr>
<tr>
<td>PAH-CE-13</td>
<td>1,800 J</td>
<td>1,800</td>
<td>3,900</td>
<td>2,900</td>
<td>3,500</td>
<td>200</td>
<td>820 J</td>
<td>1,200</td>
</tr>
<tr>
<td>PAH-CE-14</td>
<td>1,300 J</td>
<td>1,300</td>
<td>2,100</td>
<td>1,800</td>
<td>1,600</td>
<td>200</td>
<td>390</td>
<td>580 J</td>
</tr>
<tr>
<td>PAH-CE-15</td>
<td>1,600 J</td>
<td>1,800 J</td>
<td>2,600</td>
<td>2,100</td>
<td>2,100</td>
<td>220 J</td>
<td>1,300 J</td>
<td>1,500 J</td>
</tr>
<tr>
<td>PAH-CE-15D</td>
<td>810 J</td>
<td>790</td>
<td>1,500 J</td>
<td>960</td>
<td>1,200</td>
<td>220</td>
<td>560</td>
<td>780 J</td>
</tr>
<tr>
<td>PAH-CE-16</td>
<td>240 J</td>
<td>260</td>
<td>430 J</td>
<td>380</td>
<td>430</td>
<td>130</td>
<td>310</td>
<td>300 J</td>
</tr>
<tr>
<td>PAH-CE-17</td>
<td>360 J</td>
<td>360</td>
<td>540 J</td>
<td>580</td>
<td>550</td>
<td>160</td>
<td>430</td>
<td>470</td>
</tr>
<tr>
<td>PAH-CE-18</td>
<td>4,100</td>
<td>3,700</td>
<td>4,000</td>
<td>3,200</td>
<td>4,100</td>
<td>980</td>
<td>2,100</td>
<td>3,100</td>
</tr>
<tr>
<td>PAH-CE-19</td>
<td>370,000</td>
<td>350,000 J</td>
<td>550,000</td>
<td>280,000</td>
<td>460,000</td>
<td>41,000</td>
<td>290,000</td>
<td>370,000</td>
</tr>
</tbody>
</table>
Appendix 2. Inorganic constituents in ambient surface soils, Chicago, Illinois.
### Appendix 2. Inorganic constituents in ambient surface soils, Chicago, Illinois

[percent, percent-weight; D, duplicate sample; <50, constituent not detected and detection limit]

<table>
<thead>
<tr>
<th>Sample Number</th>
<th>Constituent</th>
<th>Carbon Dioxide (percent)</th>
<th>Carbonate Carbon (percent)</th>
<th>Total Carbon (percent)</th>
<th>Total Organic Carbon (percent)</th>
<th>Aluminum (percent)</th>
<th>Calcium (percent)</th>
<th>Iron (percent)</th>
<th>Magnesium (percent)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PAH-SS-01</td>
<td></td>
<td>0.91</td>
<td>0.25</td>
<td>6.01</td>
<td>5.76</td>
<td>5.66</td>
<td>1.27</td>
<td>2.78</td>
<td>0.92</td>
</tr>
<tr>
<td>PAH-SS-02</td>
<td></td>
<td>2.02</td>
<td>.55</td>
<td>4.50</td>
<td>3.95</td>
<td>5.83</td>
<td>1.77</td>
<td>2.29</td>
<td>1.16</td>
</tr>
<tr>
<td>PAH-SS-03</td>
<td></td>
<td>2.38</td>
<td>.65</td>
<td>5.64</td>
<td>4.99</td>
<td>6.90</td>
<td>1.94</td>
<td>3.50</td>
<td>1.47</td>
</tr>
<tr>
<td>PAH-SS-04</td>
<td></td>
<td>3.77</td>
<td>1.03</td>
<td>6.79</td>
<td>5.76</td>
<td>5.68</td>
<td>2.65</td>
<td>2.63</td>
<td>1.77</td>
</tr>
<tr>
<td>PAH-SS-05</td>
<td></td>
<td>16.30</td>
<td>4.45</td>
<td>7.77</td>
<td>3.32</td>
<td>4.33</td>
<td>7.95</td>
<td>2.57</td>
<td>5.25</td>
</tr>
<tr>
<td>PAH-SS-06</td>
<td></td>
<td>16.40</td>
<td>4.48</td>
<td>11.50</td>
<td>7.02</td>
<td>4.58</td>
<td>8.95</td>
<td>3.19</td>
<td>5.65</td>
</tr>
<tr>
<td>PAH-SS-07</td>
<td></td>
<td>1.97</td>
<td>.54</td>
<td>2.49</td>
<td>1.95</td>
<td>7.13</td>
<td>1.68</td>
<td>3.23</td>
<td>1.43</td>
</tr>
<tr>
<td>PAH-SS-08</td>
<td></td>
<td>1.54</td>
<td>.42</td>
<td>4.85</td>
<td>4.43</td>
<td>6.26</td>
<td>1.48</td>
<td>2.90</td>
<td>1.18</td>
</tr>
<tr>
<td>PAH-SS-09</td>
<td></td>
<td>1.88</td>
<td>.51</td>
<td>5.99</td>
<td>5.48</td>
<td>5.89</td>
<td>1.70</td>
<td>2.97</td>
<td>1.23</td>
</tr>
<tr>
<td>PAH-SS-11</td>
<td></td>
<td>2.76</td>
<td>0.75</td>
<td>4.88</td>
<td>4.13</td>
<td>5.54</td>
<td>2.34</td>
<td>2.83</td>
<td>1.39</td>
</tr>
<tr>
<td>PAH-SS-12</td>
<td></td>
<td>.35</td>
<td>.10</td>
<td>2.39</td>
<td>2.29</td>
<td>6.12</td>
<td>.86</td>
<td>2.88</td>
<td>.74</td>
</tr>
<tr>
<td>PAH-SS-13</td>
<td></td>
<td>3.15</td>
<td>.86</td>
<td>5.13</td>
<td>4.27</td>
<td>6.74</td>
<td>2.64</td>
<td>3.63</td>
<td>1.71</td>
</tr>
<tr>
<td>PAH-SS-14</td>
<td></td>
<td>3.38</td>
<td>.92</td>
<td>6.95</td>
<td>6.03</td>
<td>6.52</td>
<td>2.77</td>
<td>3.94</td>
<td>1.68</td>
</tr>
<tr>
<td>PAH-SS-15</td>
<td></td>
<td>3.49</td>
<td>.95</td>
<td>3.50</td>
<td>2.55</td>
<td>6.39</td>
<td>2.66</td>
<td>3.30</td>
<td>1.67</td>
</tr>
<tr>
<td>PAH-SS-16</td>
<td></td>
<td>1.46</td>
<td>0.40</td>
<td>3.32</td>
<td>2.92</td>
<td>6.48</td>
<td>1.67</td>
<td>3.21</td>
<td>1.04</td>
</tr>
<tr>
<td>PAH-SS-17</td>
<td></td>
<td>4.40</td>
<td>1.20</td>
<td>8.26</td>
<td>7.06</td>
<td>5.42</td>
<td>4.15</td>
<td>5.27</td>
<td>1.82</td>
</tr>
<tr>
<td>PAH-SS-17D</td>
<td></td>
<td>4.54</td>
<td>1.24</td>
<td>7.94</td>
<td>6.70</td>
<td>5.32</td>
<td>4.58</td>
<td>5.61</td>
<td>1.82</td>
</tr>
<tr>
<td>PAH-SS-18</td>
<td></td>
<td>3.85</td>
<td>1.05</td>
<td>16.00</td>
<td>14.95</td>
<td>3.78</td>
<td>3.43</td>
<td>14.50</td>
<td>1.52</td>
</tr>
<tr>
<td>PAH-SS-19</td>
<td></td>
<td>1.33</td>
<td>.36</td>
<td>2.62</td>
<td>2.26</td>
<td>6.49</td>
<td>1.32</td>
<td>3.05</td>
<td>1.16</td>
</tr>
<tr>
<td>PAH-SS-20</td>
<td></td>
<td>4.23</td>
<td>1.15</td>
<td>9.30</td>
<td>8.15</td>
<td>4.58</td>
<td>3.30</td>
<td>3.83</td>
<td>1.76</td>
</tr>
<tr>
<td>PAH-SS-21</td>
<td></td>
<td>.76</td>
<td>.21</td>
<td>3.21</td>
<td>3.00</td>
<td>6.71</td>
<td>1.15</td>
<td>3.00</td>
<td>.94</td>
</tr>
<tr>
<td>PAH-SS-21D</td>
<td></td>
<td>.80</td>
<td>.22</td>
<td>3.16</td>
<td>2.94</td>
<td>6.78</td>
<td>1.18</td>
<td>3.02</td>
<td>.98</td>
</tr>
<tr>
<td>PAH-SS-22</td>
<td></td>
<td>15.10</td>
<td>4.12</td>
<td>7.93</td>
<td>3.81</td>
<td>4.82</td>
<td>8.55</td>
<td>2.76</td>
<td>4.58</td>
</tr>
<tr>
<td>PAH-SS-23</td>
<td></td>
<td>1.83</td>
<td>.50</td>
<td>5.91</td>
<td>5.41</td>
<td>5.86</td>
<td>1.80</td>
<td>3.07</td>
<td>1.09</td>
</tr>
<tr>
<td>PAH-SS-24</td>
<td></td>
<td>0.61</td>
<td>0.17</td>
<td>5.69</td>
<td>5.52</td>
<td>6.26</td>
<td>1.15</td>
<td>3.19</td>
<td>0.94</td>
</tr>
<tr>
<td>PAH-SS-25</td>
<td></td>
<td>.90</td>
<td>.25</td>
<td>3.55</td>
<td>3.30</td>
<td>5.78</td>
<td>1.15</td>
<td>2.63</td>
<td>.86</td>
</tr>
<tr>
<td>PAH-SS-25D</td>
<td></td>
<td>.94</td>
<td>.26</td>
<td>3.56</td>
<td>3.30</td>
<td>5.83</td>
<td>1.23</td>
<td>2.70</td>
<td>.95</td>
</tr>
<tr>
<td>PAH-SS-26</td>
<td></td>
<td>6.97</td>
<td>1.90</td>
<td>7.98</td>
<td>6.08</td>
<td>4.92</td>
<td>4.42</td>
<td>2.75</td>
<td>2.53</td>
</tr>
<tr>
<td>PAH-SS-27</td>
<td></td>
<td>9.55</td>
<td>2.61</td>
<td>10.50</td>
<td>7.89</td>
<td>4.73</td>
<td>5.45</td>
<td>4.18</td>
<td>3.46</td>
</tr>
<tr>
<td>PAH-SS-28</td>
<td></td>
<td>2.18</td>
<td>0.59</td>
<td>6.07</td>
<td>5.48</td>
<td>7.00</td>
<td>1.89</td>
<td>3.98</td>
<td>1.67</td>
</tr>
<tr>
<td>PAH-SS-29</td>
<td></td>
<td>26.90</td>
<td>7.34</td>
<td>9.77</td>
<td>2.43</td>
<td>3.09</td>
<td>12.90</td>
<td>2.24</td>
<td>8.06</td>
</tr>
<tr>
<td>PAH-SS-30</td>
<td></td>
<td>1.97</td>
<td>.54</td>
<td>4.73</td>
<td>4.19</td>
<td>6.44</td>
<td>1.79</td>
<td>4.28</td>
<td>1.22</td>
</tr>
<tr>
<td>PAH-SS-31</td>
<td></td>
<td>3.07</td>
<td>.84</td>
<td>10.90</td>
<td>10.06</td>
<td>4.56</td>
<td>2.41</td>
<td>5.75</td>
<td>1.39</td>
</tr>
<tr>
<td>PAH-SS-32</td>
<td></td>
<td>5.49</td>
<td>1.50</td>
<td>8.99</td>
<td>7.49</td>
<td>5.89</td>
<td>3.96</td>
<td>3.67</td>
<td>2.09</td>
</tr>
</tbody>
</table>
Appendix 2. Inorganic constituents in ambient surface soils, Chicago, Illinois—Continued

[percent, percent-weight; D, duplicate sample; <50, constituent not detected and detection limit]

<table>
<thead>
<tr>
<th>Sample Number</th>
<th>Carbon Dioxide (percent)</th>
<th>Carbonate Carbon (percent)</th>
<th>Total Carbon (percent)</th>
<th>Total Organic Carbon (percent)</th>
<th>Aluminum (percent)</th>
<th>Calcium (percent)</th>
<th>Iron (percent)</th>
<th>Magnesium (percent)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PAH-SS-33</td>
<td>4.25</td>
<td>1.16</td>
<td>8.38</td>
<td>7.22</td>
<td>5.97</td>
<td>3.10</td>
<td>3.36</td>
<td>1.95</td>
</tr>
<tr>
<td>PAH-SS-33D</td>
<td>4.30</td>
<td>1.17</td>
<td>8.34</td>
<td>7.17</td>
<td>5.86</td>
<td>3.18</td>
<td>3.31</td>
<td>1.94</td>
</tr>
<tr>
<td>PAH-SS-34</td>
<td>6.89</td>
<td>1.88</td>
<td>5.53</td>
<td>3.65</td>
<td>5.44</td>
<td>3.85</td>
<td>2.79</td>
<td>2.82</td>
</tr>
<tr>
<td>PAH-SS-35</td>
<td>5.68</td>
<td>1.55</td>
<td>11.50</td>
<td>9.95</td>
<td>7.46</td>
<td>4.55</td>
<td>5.51</td>
<td>1.94</td>
</tr>
<tr>
<td>PAH-SS-36</td>
<td>6.97</td>
<td>1.90</td>
<td>11.80</td>
<td>9.90</td>
<td>4.30</td>
<td>4.53</td>
<td>4.32</td>
<td>2.59</td>
</tr>
<tr>
<td>PAH-SS-37</td>
<td>7.35</td>
<td>2.01</td>
<td>6.94</td>
<td>4.93</td>
<td>2.60</td>
<td>3.89</td>
<td>2.15</td>
<td>2.16</td>
</tr>
<tr>
<td>PAH-SS-38</td>
<td>.65</td>
<td>.18</td>
<td>7.35</td>
<td>7.17</td>
<td>5.26</td>
<td>1.23</td>
<td>2.44</td>
<td>.81</td>
</tr>
<tr>
<td>PAH-CE-01</td>
<td>16.00</td>
<td>4.37</td>
<td>13.40</td>
<td>9.03</td>
<td>2.33</td>
<td>7.38</td>
<td>1.23</td>
<td>4.60</td>
</tr>
<tr>
<td>PAH-CE-02</td>
<td>29.20</td>
<td>7.97</td>
<td>8.19</td>
<td>.22</td>
<td>1.21</td>
<td>12.30</td>
<td>.56</td>
<td>7.84</td>
</tr>
<tr>
<td>PAH-CE-03</td>
<td>18.40</td>
<td>5.02</td>
<td>9.11</td>
<td>4.09</td>
<td>3.44</td>
<td>8.10</td>
<td>2.38</td>
<td>5.44</td>
</tr>
<tr>
<td>PAH-CE-04</td>
<td>40.00</td>
<td>10.92</td>
<td>12.10</td>
<td>1.18</td>
<td>0.83</td>
<td>15.90</td>
<td>0.80</td>
<td>10.80</td>
</tr>
<tr>
<td>PAH-CE-04D</td>
<td>41.70</td>
<td>11.38</td>
<td>12.20</td>
<td>.82</td>
<td>.73</td>
<td>16.90</td>
<td>.73</td>
<td>11.80</td>
</tr>
<tr>
<td>PAH-CE-05</td>
<td>7.13</td>
<td>1.95</td>
<td>11.60</td>
<td>9.65</td>
<td>3.81</td>
<td>4.09</td>
<td>5.59</td>
<td>2.20</td>
</tr>
<tr>
<td>PAH-CE-06</td>
<td>9.89</td>
<td>2.70</td>
<td>6.60</td>
<td>3.90</td>
<td>1.92</td>
<td>5.29</td>
<td>2.52</td>
<td>3.03</td>
</tr>
<tr>
<td>PAH-CE-07</td>
<td>5.22</td>
<td>1.42</td>
<td>16.20</td>
<td>14.78</td>
<td>3.45</td>
<td>3.38</td>
<td>6.36</td>
<td>1.76</td>
</tr>
<tr>
<td>PAH-CE-08</td>
<td>8.46</td>
<td>2.31</td>
<td>3.46</td>
<td>1.15</td>
<td>2.91</td>
<td>4.68</td>
<td>0.91</td>
<td>2.44</td>
</tr>
<tr>
<td>PAH-CE-09</td>
<td>.28</td>
<td>.08</td>
<td>2.71</td>
<td>2.63</td>
<td>5.94</td>
<td>.75</td>
<td>2.75</td>
<td>.77</td>
</tr>
<tr>
<td>PAH-CE-10</td>
<td>1.79</td>
<td>.49</td>
<td>3.78</td>
<td>3.29</td>
<td>3.07</td>
<td>1.37</td>
<td>1.24</td>
<td>.68</td>
</tr>
<tr>
<td>PAH-CE-11</td>
<td>33.20</td>
<td>9.06</td>
<td>10.20</td>
<td>1.14</td>
<td>1.47</td>
<td>14.20</td>
<td>.78</td>
<td>9.42</td>
</tr>
<tr>
<td>PAH-CE-12</td>
<td>5.35</td>
<td>1.46</td>
<td>6.37</td>
<td>4.91</td>
<td>5.34</td>
<td>3.00</td>
<td>2.96</td>
<td>2.02</td>
</tr>
<tr>
<td>PAH-CE-13</td>
<td>1.44</td>
<td>0.39</td>
<td>22.70</td>
<td>22.31</td>
<td>5.74</td>
<td>3.48</td>
<td>9.31</td>
<td>0.50</td>
</tr>
<tr>
<td>PAH-CE-14</td>
<td>9.11</td>
<td>2.49</td>
<td>8.44</td>
<td>5.95</td>
<td>3.45</td>
<td>5.23</td>
<td>2.90</td>
<td>2.76</td>
</tr>
<tr>
<td>PAH-CE-15</td>
<td>1.50</td>
<td>.41</td>
<td>8.48</td>
<td>8.07</td>
<td>4.48</td>
<td>1.74</td>
<td>2.10</td>
<td>.89</td>
</tr>
<tr>
<td>PAH-CE-15D</td>
<td>1.38</td>
<td>.38</td>
<td>8.33</td>
<td>7.95</td>
<td>4.47</td>
<td>1.69</td>
<td>2.09</td>
<td>.87</td>
</tr>
<tr>
<td>PAH-CE-16</td>
<td>9.29</td>
<td>2.54</td>
<td>5.50</td>
<td>2.96</td>
<td>2.64</td>
<td>4.85</td>
<td>1.47</td>
<td>2.88</td>
</tr>
<tr>
<td>PAH-CE-17</td>
<td>5.25</td>
<td>1.43</td>
<td>5.99</td>
<td>4.56</td>
<td>3.04</td>
<td>3.85</td>
<td>2.69</td>
<td>1.68</td>
</tr>
<tr>
<td>PAH-CE-18</td>
<td>4.02</td>
<td>1.10</td>
<td>5.59</td>
<td>4.49</td>
<td>3.70</td>
<td>2.74</td>
<td>2.52</td>
<td>1.40</td>
</tr>
<tr>
<td>PAH-CE-19</td>
<td>11.20</td>
<td>3.06</td>
<td>18.70</td>
<td>15.64</td>
<td>1.75</td>
<td>6.04</td>
<td>1.45</td>
<td>3.31</td>
</tr>
</tbody>
</table>
### Appendix 2. Inorganic constituents in ambient surface soils, Chicago, Illinois—Continued

<table>
<thead>
<tr>
<th>Sample Number</th>
<th>Constituent</th>
<th>Phosphorus (percent)</th>
<th>Potassium (percent)</th>
<th>Sodium (percent)</th>
<th>Sulfur (percent)</th>
<th>Titanium (percent)</th>
<th>Arsenic (milligrams per kilogram)</th>
<th>Barium (milligrams per kilogram)</th>
<th>Beryllium (milligrams per kilogram)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PAH-SS-01</td>
<td></td>
<td>0.080</td>
<td>2.04</td>
<td>0.56</td>
<td>0.08</td>
<td>0.273</td>
<td>15</td>
<td>445</td>
<td>2</td>
</tr>
<tr>
<td>PAH-SS-02</td>
<td></td>
<td>0.90</td>
<td>1.84</td>
<td>0.74</td>
<td>0.05</td>
<td>0.273</td>
<td>&lt;10</td>
<td>449</td>
<td>1</td>
</tr>
<tr>
<td>PAH-SS-03</td>
<td></td>
<td>0.070</td>
<td>2.45</td>
<td>0.47</td>
<td>0.09</td>
<td>0.278</td>
<td>16</td>
<td>453</td>
<td>2</td>
</tr>
<tr>
<td>PAH-SS-04</td>
<td></td>
<td>0.175</td>
<td>2.19</td>
<td>0.49</td>
<td>0.10</td>
<td>0.247</td>
<td>10</td>
<td>403</td>
<td>2</td>
</tr>
<tr>
<td>PAH-SS-05</td>
<td></td>
<td>0.070</td>
<td>1.71</td>
<td>0.56</td>
<td>0.06</td>
<td>0.210</td>
<td>12</td>
<td>278</td>
<td>1</td>
</tr>
<tr>
<td>PAH-SS-06</td>
<td></td>
<td>0.090</td>
<td>1.62</td>
<td>0.67</td>
<td>0.12</td>
<td>0.221</td>
<td>12</td>
<td>403</td>
<td>2</td>
</tr>
<tr>
<td>PAH-SS-07</td>
<td></td>
<td>0.055</td>
<td>2.63</td>
<td>0.59</td>
<td>0.05</td>
<td>0.305</td>
<td>11</td>
<td>475</td>
<td>2</td>
</tr>
<tr>
<td>PAH-SS-08</td>
<td></td>
<td>0.085</td>
<td>2.31</td>
<td>0.76</td>
<td>0.06</td>
<td>0.284</td>
<td>&lt;10</td>
<td>481</td>
<td>2</td>
</tr>
<tr>
<td>PAH-SS-09</td>
<td></td>
<td>0.110</td>
<td>2.24</td>
<td>0.70</td>
<td>0.08</td>
<td>0.252</td>
<td>11</td>
<td>463</td>
<td>2</td>
</tr>
<tr>
<td>PAH-SS-10</td>
<td></td>
<td>0.065</td>
<td>1.98</td>
<td>0.81</td>
<td>&lt;0.05</td>
<td>0.305</td>
<td>13</td>
<td>540</td>
<td>1</td>
</tr>
<tr>
<td>PAH-SS-11</td>
<td></td>
<td>0.095</td>
<td>1.84</td>
<td>0.61</td>
<td>0.05</td>
<td>0.268</td>
<td>11</td>
<td>499</td>
<td>1</td>
</tr>
<tr>
<td>PAH-SS-12</td>
<td></td>
<td>0.065</td>
<td>1.88</td>
<td>0.69</td>
<td>&lt;0.05</td>
<td>0.310</td>
<td>10</td>
<td>543</td>
<td>1</td>
</tr>
<tr>
<td>PAH-SS-13</td>
<td></td>
<td>0.210</td>
<td>2.60</td>
<td>0.51</td>
<td>0.09</td>
<td>0.257</td>
<td>20</td>
<td>572</td>
<td>2</td>
</tr>
<tr>
<td>PAH-SS-14</td>
<td></td>
<td>0.100</td>
<td>2.28</td>
<td>0.54</td>
<td>0.13</td>
<td>0.268</td>
<td>12</td>
<td>666</td>
<td>3</td>
</tr>
<tr>
<td>PAH-SS-15</td>
<td></td>
<td>0.055</td>
<td>2.34</td>
<td>0.52</td>
<td>0.05</td>
<td>0.289</td>
<td>17</td>
<td>442</td>
<td>2</td>
</tr>
<tr>
<td>PAH-SS-16</td>
<td></td>
<td>0.070</td>
<td>2.43</td>
<td>0.53</td>
<td>0.05</td>
<td>0.326</td>
<td>15</td>
<td>485</td>
<td>2</td>
</tr>
<tr>
<td>PAH-SS-17</td>
<td></td>
<td>0.120</td>
<td>1.91</td>
<td>0.45</td>
<td>0.16</td>
<td>0.252</td>
<td>&lt;10</td>
<td>426</td>
<td>2</td>
</tr>
<tr>
<td>PAH-SS-17D</td>
<td></td>
<td>0.130</td>
<td>1.87</td>
<td>0.44</td>
<td>0.14</td>
<td>0.247</td>
<td>&lt;10</td>
<td>436</td>
<td>2</td>
</tr>
<tr>
<td>PAH-SS-18</td>
<td></td>
<td>0.240</td>
<td>0.94</td>
<td>0.64</td>
<td>0.30</td>
<td>0.200</td>
<td>25</td>
<td>477</td>
<td>3</td>
</tr>
<tr>
<td>PAH-SS-19</td>
<td></td>
<td>0.060</td>
<td>2.45</td>
<td>0.58</td>
<td>&lt;0.05</td>
<td>0.305</td>
<td>13</td>
<td>505</td>
<td>2</td>
</tr>
<tr>
<td>PAH-SS-20</td>
<td></td>
<td>0.140</td>
<td>1.55</td>
<td>0.70</td>
<td>0.14</td>
<td>0.210</td>
<td>19</td>
<td>397</td>
<td>2</td>
</tr>
<tr>
<td>PAH-SS-21</td>
<td></td>
<td>0.065</td>
<td>2.51</td>
<td>0.60</td>
<td>&lt;0.05</td>
<td>0.305</td>
<td>&lt;10</td>
<td>473</td>
<td>2</td>
</tr>
<tr>
<td>PAH-SS-21D</td>
<td></td>
<td>0.065</td>
<td>2.53</td>
<td>0.60</td>
<td>0.05</td>
<td>0.294</td>
<td>14</td>
<td>483</td>
<td>2</td>
</tr>
<tr>
<td>PAH-SS-22</td>
<td></td>
<td>0.055</td>
<td>1.93</td>
<td>0.42</td>
<td>0.11</td>
<td>0.221</td>
<td>11</td>
<td>450</td>
<td>2</td>
</tr>
<tr>
<td>PAH-SS-23</td>
<td></td>
<td>0.125</td>
<td>1.94</td>
<td>0.58</td>
<td>0.09</td>
<td>0.289</td>
<td>17</td>
<td>588</td>
<td>2</td>
</tr>
<tr>
<td>PAH-SS-24</td>
<td></td>
<td>0.090</td>
<td>2.25</td>
<td>0.66</td>
<td>0.08</td>
<td>0.294</td>
<td>15</td>
<td>498</td>
<td>2</td>
</tr>
<tr>
<td>PAH-SS-25</td>
<td></td>
<td>0.080</td>
<td>2.16</td>
<td>0.62</td>
<td>0.05</td>
<td>0.305</td>
<td>10</td>
<td>494</td>
<td>1</td>
</tr>
<tr>
<td>PAH-SS-25D</td>
<td></td>
<td>0.085</td>
<td>2.20</td>
<td>0.63</td>
<td>0.05</td>
<td>0.294</td>
<td>15</td>
<td>536</td>
<td>2</td>
</tr>
<tr>
<td>PAH-SS-26</td>
<td></td>
<td>0.075</td>
<td>1.91</td>
<td>0.53</td>
<td>0.17</td>
<td>0.226</td>
<td>13</td>
<td>394</td>
<td>1</td>
</tr>
<tr>
<td>PAH-SS-27</td>
<td></td>
<td>0.150</td>
<td>1.72</td>
<td>0.46</td>
<td>0.13</td>
<td>0.242</td>
<td>13</td>
<td>451</td>
<td>2</td>
</tr>
<tr>
<td>PAH-SS-28</td>
<td></td>
<td>0.095</td>
<td>2.86</td>
<td>0.46</td>
<td>0.10</td>
<td>0.268</td>
<td>21</td>
<td>460</td>
<td>3</td>
</tr>
<tr>
<td>PAH-SS-29</td>
<td></td>
<td>0.050</td>
<td>1.24</td>
<td>0.29</td>
<td>0.11</td>
<td>0.158</td>
<td>11</td>
<td>284</td>
<td>1</td>
</tr>
<tr>
<td>PAH-SS-30</td>
<td></td>
<td>0.100</td>
<td>2.34</td>
<td>0.63</td>
<td>0.07</td>
<td>0.284</td>
<td>16</td>
<td>494</td>
<td>2</td>
</tr>
<tr>
<td>PAH-SS-31</td>
<td></td>
<td>0.120</td>
<td>1.53</td>
<td>0.54</td>
<td>0.25</td>
<td>0.221</td>
<td>27</td>
<td>414</td>
<td>2</td>
</tr>
<tr>
<td>PAH-SS-32</td>
<td></td>
<td>0.125</td>
<td>2.16</td>
<td>0.41</td>
<td>0.14</td>
<td>0.257</td>
<td>18</td>
<td>519</td>
<td>3</td>
</tr>
</tbody>
</table>
Appendix 2. Inorganic constituents in ambient surface soils, Chicago, Illinois—Continued
[percent, percent-weight; D, duplicate sample; <50, constituent not detected and detection limit]

<table>
<thead>
<tr>
<th>Sample Number</th>
<th>Phosphorus (percent)</th>
<th>Potassium (percent)</th>
<th>Sodium (percent)</th>
<th>Sulfur (percent)</th>
<th>Titanium (percent)</th>
<th>Arsenic (milligrams per kilogram)</th>
<th>Barium (milligrams per kilogram)</th>
<th>Beryllium (milligrams per kilogram)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PAH-SS-33</td>
<td>0.095</td>
<td>2.09</td>
<td>0.50</td>
<td>0.14</td>
<td>0.268</td>
<td>13</td>
<td>431</td>
<td>2</td>
</tr>
<tr>
<td>PAH-SS-33D</td>
<td>0.090</td>
<td>2.06</td>
<td>.51</td>
<td>.13</td>
<td>.273</td>
<td>12</td>
<td>428</td>
<td>2</td>
</tr>
<tr>
<td>PAH-SS-34</td>
<td>0.075</td>
<td>2.25</td>
<td>.53</td>
<td>.07</td>
<td>.226</td>
<td>&lt;10</td>
<td>394</td>
<td>2</td>
</tr>
<tr>
<td>PAH-SS-35</td>
<td>.280</td>
<td>1.32</td>
<td>.49</td>
<td>.20</td>
<td>.383</td>
<td>32</td>
<td>697</td>
<td>9</td>
</tr>
<tr>
<td>PAH-SS-36</td>
<td>.140</td>
<td>1.30</td>
<td>.49</td>
<td>.17</td>
<td>.236</td>
<td>28</td>
<td>541</td>
<td>2</td>
</tr>
<tr>
<td>PAH-SS-37</td>
<td>0.095</td>
<td>1.10</td>
<td>0.48</td>
<td>0.11</td>
<td>0.145</td>
<td>&lt;10</td>
<td>390</td>
<td>&lt;1</td>
</tr>
<tr>
<td>PAH-SS-38</td>
<td>.100</td>
<td>1.84</td>
<td>.49</td>
<td>.07</td>
<td>.245</td>
<td>14</td>
<td>437</td>
<td>1</td>
</tr>
<tr>
<td>PAH-CE-01</td>
<td>0.080</td>
<td>1.12</td>
<td>.38</td>
<td>.12</td>
<td>.090</td>
<td>31</td>
<td>227</td>
<td>&lt;1</td>
</tr>
<tr>
<td>PAH-CE-02</td>
<td>0.010</td>
<td>.82</td>
<td>.20</td>
<td>&lt;0.05</td>
<td>.045</td>
<td>&lt;10</td>
<td>106</td>
<td>&lt;1</td>
</tr>
<tr>
<td>PAH-CE-03</td>
<td>0.090</td>
<td>1.51</td>
<td>.35</td>
<td>.10</td>
<td>.155</td>
<td>51</td>
<td>412</td>
<td>1</td>
</tr>
<tr>
<td>PAH-CE-04</td>
<td>0.020</td>
<td>0.35</td>
<td>0.10</td>
<td>&lt;0.05</td>
<td>0.050</td>
<td>35</td>
<td>110</td>
<td>&lt;1</td>
</tr>
<tr>
<td>PAH-CE-04D</td>
<td>0.015</td>
<td>.31</td>
<td>.07</td>
<td>.05</td>
<td>.040</td>
<td>31</td>
<td>91</td>
<td>&lt;1</td>
</tr>
<tr>
<td>PAH-CE-05</td>
<td>.080</td>
<td>1.18</td>
<td>.60</td>
<td>.24</td>
<td>.180</td>
<td>220</td>
<td>521</td>
<td>4</td>
</tr>
<tr>
<td>PAH-CE-06</td>
<td>.075</td>
<td>.85</td>
<td>.35</td>
<td>.09</td>
<td>.125</td>
<td>35</td>
<td>506</td>
<td>1</td>
</tr>
<tr>
<td>PAH-CE-07</td>
<td>.050</td>
<td>.98</td>
<td>.56</td>
<td>.52</td>
<td>.180</td>
<td>20</td>
<td>693</td>
<td>3</td>
</tr>
<tr>
<td>PAH-CE-08</td>
<td>0.025</td>
<td>1.62</td>
<td>0.78</td>
<td>&lt;0.05</td>
<td>0.075</td>
<td>11</td>
<td>349</td>
<td>&lt;1</td>
</tr>
<tr>
<td>PAH-CE-09</td>
<td>.045</td>
<td>2.34</td>
<td>.50</td>
<td>&lt;0.05</td>
<td>.275</td>
<td>13</td>
<td>468</td>
<td>1</td>
</tr>
<tr>
<td>PAH-CE-10</td>
<td>.070</td>
<td>1.45</td>
<td>.65</td>
<td>.05</td>
<td>.105</td>
<td>13</td>
<td>378</td>
<td>&lt;1</td>
</tr>
<tr>
<td>PAH-CE-11</td>
<td>.020</td>
<td>.88</td>
<td>.13</td>
<td>&lt;0.05</td>
<td>.075</td>
<td>&lt;10</td>
<td>113</td>
<td>&lt;1</td>
</tr>
<tr>
<td>PAH-CE-12</td>
<td>.070</td>
<td>2.35</td>
<td>.46</td>
<td>.09</td>
<td>.230</td>
<td>14</td>
<td>366</td>
<td>2</td>
</tr>
<tr>
<td>PAH-CE-13</td>
<td>0.020</td>
<td>1.08</td>
<td>.25</td>
<td>0.63</td>
<td>0.345</td>
<td>&lt;10</td>
<td>257</td>
<td>14</td>
</tr>
<tr>
<td>PAH-CE-14</td>
<td>.045</td>
<td>1.45</td>
<td>.44</td>
<td>.19</td>
<td>.140</td>
<td>16</td>
<td>362</td>
<td>2</td>
</tr>
<tr>
<td>PAH-CE-15</td>
<td>.065</td>
<td>1.62</td>
<td>.52</td>
<td>.16</td>
<td>.175</td>
<td>11</td>
<td>413</td>
<td>1</td>
</tr>
<tr>
<td>PAH-CE-15D</td>
<td>.060</td>
<td>1.63</td>
<td>.53</td>
<td>.14</td>
<td>.180</td>
<td>13</td>
<td>408</td>
<td>1</td>
</tr>
<tr>
<td>PAH-CE-16</td>
<td>.020</td>
<td>1.32</td>
<td>.67</td>
<td>.10</td>
<td>.085</td>
<td>11</td>
<td>295</td>
<td>1</td>
</tr>
<tr>
<td>PAH-CE-17</td>
<td>0.040</td>
<td>1.22</td>
<td>.71</td>
<td>0.11</td>
<td>0.120</td>
<td>&lt;10</td>
<td>371</td>
<td>2</td>
</tr>
<tr>
<td>PAH-CE-18</td>
<td>.075</td>
<td>1.51</td>
<td>.57</td>
<td>.08</td>
<td>.150</td>
<td>15</td>
<td>407</td>
<td>2</td>
</tr>
<tr>
<td>PAH-CE-19</td>
<td>.030</td>
<td>.75</td>
<td>.42</td>
<td>.20</td>
<td>.090</td>
<td>&lt;10</td>
<td>169</td>
<td>&lt;1</td>
</tr>
</tbody>
</table>
## Appendix 2. Inorganic constituents in ambient surface soils, Chicago, Illinois—Continued
[percent, percent-weight; D, duplicate sample; <50, constituent not detected and detection limit]

<table>
<thead>
<tr>
<th>Sample Number</th>
<th>Constituent</th>
<th>Bismuth (milligrams per kilogram)</th>
<th>Cadmium (milligrams per kilogram)</th>
<th>Cesium (milligrams per kilogram)</th>
<th>Chromium (milligrams per kilogram)</th>
<th>Cobalt (milligrams per kilogram)</th>
<th>Copper (milligrams per kilogram)</th>
<th>Europium (milligrams per kilogram)</th>
<th>Gallium (milligrams per kilogram)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PAH-SS-01</td>
<td></td>
<td>&lt;50</td>
<td>&lt;2</td>
<td>63</td>
<td>65</td>
<td>11</td>
<td>43</td>
<td>&lt;2</td>
<td></td>
</tr>
<tr>
<td>PAH-SS-02</td>
<td></td>
<td>&lt;50</td>
<td>&lt;2</td>
<td>61</td>
<td>53</td>
<td>10</td>
<td>37</td>
<td>&lt;2</td>
<td></td>
</tr>
<tr>
<td>PAH-SS-03</td>
<td></td>
<td>&lt;50</td>
<td>&lt;2</td>
<td>63</td>
<td>75</td>
<td>13</td>
<td>57</td>
<td>&lt;2</td>
<td></td>
</tr>
<tr>
<td>PAH-SS-04</td>
<td></td>
<td>&lt;50</td>
<td>3</td>
<td>54</td>
<td>66</td>
<td>11</td>
<td>69</td>
<td>&lt;2</td>
<td></td>
</tr>
<tr>
<td>PAH-SS-05</td>
<td></td>
<td>&lt;50</td>
<td>&lt;2</td>
<td>41</td>
<td>44</td>
<td>9</td>
<td>51</td>
<td>&lt;2</td>
<td></td>
</tr>
<tr>
<td>PAH-SS-06</td>
<td></td>
<td>&lt;50</td>
<td>6</td>
<td>44</td>
<td>78</td>
<td>12</td>
<td>343</td>
<td>&lt;2</td>
<td></td>
</tr>
<tr>
<td>PAH-SS-07</td>
<td></td>
<td>&lt;50</td>
<td>&lt;2</td>
<td>72</td>
<td>70</td>
<td>14</td>
<td>39</td>
<td>&lt;2</td>
<td></td>
</tr>
<tr>
<td>PAH-SS-08</td>
<td></td>
<td>&lt;50</td>
<td>&lt;2</td>
<td>62</td>
<td>64</td>
<td>12</td>
<td>35</td>
<td>&lt;2</td>
<td></td>
</tr>
<tr>
<td>PAH-SS-09</td>
<td></td>
<td>&lt;50</td>
<td>&lt;2</td>
<td>61</td>
<td>64</td>
<td>11</td>
<td>43</td>
<td>&lt;2</td>
<td></td>
</tr>
<tr>
<td>PAH-SS-10</td>
<td></td>
<td>&lt;50</td>
<td>&lt;2</td>
<td>64</td>
<td>54</td>
<td>11</td>
<td>28</td>
<td>&lt;2</td>
<td></td>
</tr>
<tr>
<td>PAH-SS-11</td>
<td></td>
<td>&lt;50</td>
<td>&lt;2</td>
<td>61</td>
<td>56</td>
<td>9</td>
<td>36</td>
<td>&lt;2</td>
<td></td>
</tr>
<tr>
<td>PAH-SS-12</td>
<td></td>
<td>&lt;50</td>
<td>&lt;2</td>
<td>71</td>
<td>68</td>
<td>11</td>
<td>38</td>
<td>&lt;2</td>
<td></td>
</tr>
<tr>
<td>PAH-SS-13</td>
<td></td>
<td>&lt;50</td>
<td>&lt;2</td>
<td>69</td>
<td>78</td>
<td>14</td>
<td>66</td>
<td>&lt;2</td>
<td></td>
</tr>
<tr>
<td>PAH-SS-14</td>
<td></td>
<td>&lt;50</td>
<td>&lt;2</td>
<td>67</td>
<td>102</td>
<td>13</td>
<td>73</td>
<td>&lt;2</td>
<td></td>
</tr>
<tr>
<td>PAH-SS-15</td>
<td></td>
<td>&lt;50</td>
<td>&lt;2</td>
<td>68</td>
<td>63</td>
<td>14</td>
<td>42</td>
<td>&lt;2</td>
<td></td>
</tr>
<tr>
<td>PAH-SS-16</td>
<td></td>
<td>&lt;50</td>
<td>&lt;2</td>
<td>75</td>
<td>66</td>
<td>15</td>
<td>36</td>
<td>&lt;2</td>
<td></td>
</tr>
<tr>
<td>PAH-SS-17</td>
<td></td>
<td>&lt;50</td>
<td>&lt;2</td>
<td>55</td>
<td>340</td>
<td>11</td>
<td>75</td>
<td>&lt;2</td>
<td></td>
</tr>
<tr>
<td>PAH-SS-17D</td>
<td></td>
<td>&lt;50</td>
<td>&lt;2</td>
<td>60</td>
<td>387</td>
<td>11</td>
<td>76</td>
<td>&lt;2</td>
<td></td>
</tr>
<tr>
<td>PAH-SS-18</td>
<td></td>
<td>&lt;50</td>
<td>7</td>
<td>38</td>
<td>192</td>
<td>16</td>
<td>395</td>
<td>&lt;2</td>
<td></td>
</tr>
<tr>
<td>PAH-SS-19</td>
<td></td>
<td>&lt;50</td>
<td>&lt;2</td>
<td>69</td>
<td>61</td>
<td>12</td>
<td>42</td>
<td>&lt;2</td>
<td></td>
</tr>
<tr>
<td>PAH-SS-20</td>
<td></td>
<td>&lt;50</td>
<td>&lt;2</td>
<td>43</td>
<td>66</td>
<td>11</td>
<td>67</td>
<td>&lt;2</td>
<td></td>
</tr>
<tr>
<td>PAH-SS-21</td>
<td></td>
<td>&lt;50</td>
<td>&lt;2</td>
<td>70</td>
<td>76</td>
<td>11</td>
<td>44</td>
<td>&lt;2</td>
<td></td>
</tr>
<tr>
<td>PAH-SS-21D</td>
<td></td>
<td>&lt;50</td>
<td>&lt;2</td>
<td>73</td>
<td>72</td>
<td>12</td>
<td>47</td>
<td>&lt;2</td>
<td></td>
</tr>
<tr>
<td>PAH-SS-22</td>
<td></td>
<td>&lt;50</td>
<td>&lt;2</td>
<td>46</td>
<td>57</td>
<td>13</td>
<td>89</td>
<td>&lt;2</td>
<td></td>
</tr>
<tr>
<td>PAH-SS-23</td>
<td></td>
<td>&lt;50</td>
<td>&lt;2</td>
<td>63</td>
<td>69</td>
<td>12</td>
<td>74</td>
<td>&lt;2</td>
<td></td>
</tr>
<tr>
<td>PAH-SS-24</td>
<td></td>
<td>&lt;50</td>
<td>&lt;2</td>
<td>64</td>
<td>73</td>
<td>13</td>
<td>57</td>
<td>&lt;2</td>
<td></td>
</tr>
<tr>
<td>PAH-SS-25</td>
<td></td>
<td>&lt;50</td>
<td>&lt;2</td>
<td>58</td>
<td>59</td>
<td>10</td>
<td>35</td>
<td>&lt;2</td>
<td></td>
</tr>
<tr>
<td>PAH-SS-25D</td>
<td></td>
<td>&lt;50</td>
<td>&lt;2</td>
<td>63</td>
<td>61</td>
<td>10</td>
<td>37</td>
<td>&lt;2</td>
<td></td>
</tr>
<tr>
<td>PAH-SS-26</td>
<td></td>
<td>&lt;50</td>
<td>&lt;2</td>
<td>51</td>
<td>64</td>
<td>11</td>
<td>48</td>
<td>&lt;2</td>
<td></td>
</tr>
<tr>
<td>PAH-SS-27</td>
<td></td>
<td>&lt;50</td>
<td>5</td>
<td>48</td>
<td>94</td>
<td>12</td>
<td>2,780</td>
<td>&lt;2</td>
<td></td>
</tr>
<tr>
<td>PAH-SS-28</td>
<td></td>
<td>&lt;50</td>
<td>2</td>
<td>70</td>
<td>78</td>
<td>16</td>
<td>117</td>
<td>&lt;2</td>
<td></td>
</tr>
<tr>
<td>PAH-SS-29</td>
<td></td>
<td>&lt;50</td>
<td>3</td>
<td>33</td>
<td>50</td>
<td>9</td>
<td>208</td>
<td>&lt;2</td>
<td></td>
</tr>
<tr>
<td>PAH-SS-30</td>
<td></td>
<td>&lt;50</td>
<td>&lt;2</td>
<td>66</td>
<td>76</td>
<td>14</td>
<td>99</td>
<td>&lt;2</td>
<td></td>
</tr>
<tr>
<td>PAH-SS-31</td>
<td></td>
<td>&lt;50</td>
<td>&lt;2</td>
<td>44</td>
<td>82</td>
<td>13</td>
<td>214</td>
<td>&lt;2</td>
<td></td>
</tr>
<tr>
<td>PAH-SS-32</td>
<td></td>
<td>&lt;50</td>
<td>&lt;2</td>
<td>60</td>
<td>79</td>
<td>14</td>
<td>134</td>
<td>&lt;2</td>
<td></td>
</tr>
</tbody>
</table>
Appendix 2. Inorganic constituents in ambient surface soils, Chicago, Illinois—Continued

[percent, percent-weight; D, duplicate sample; <50, constituent not detected and detection limit]

<table>
<thead>
<tr>
<th>Sample Number</th>
<th>Bismuth (milligrams per kilogram)</th>
<th>Cadmium (milligrams per kilogram)</th>
<th>Cesium (milligrams per kilogram)</th>
<th>Chromium (milligrams per kilogram)</th>
<th>Cobalt (milligrams per kilogram)</th>
<th>Copper (milligrams per kilogram)</th>
<th>Europium (milligrams per kilogram)</th>
<th>Gallium (milligrams per kilogram)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PAH-SS-33</td>
<td>&lt;50</td>
<td>&lt;2</td>
<td>60</td>
<td>77</td>
<td>12</td>
<td>84</td>
<td>&lt;2</td>
<td>17</td>
</tr>
<tr>
<td>PAH-SS-33D</td>
<td>&lt;50</td>
<td>&lt;2</td>
<td>59</td>
<td>81</td>
<td>14</td>
<td>83</td>
<td>&lt;2</td>
<td>18</td>
</tr>
<tr>
<td>PAH-SS-34</td>
<td>&lt;50</td>
<td>&lt;2</td>
<td>54</td>
<td>61</td>
<td>12</td>
<td>46</td>
<td>&lt;2</td>
<td>16</td>
</tr>
<tr>
<td>PAH-SS-35</td>
<td>&lt;50</td>
<td>3</td>
<td>104</td>
<td>129</td>
<td>26</td>
<td>234</td>
<td>3</td>
<td>23</td>
</tr>
<tr>
<td>PAH-SS-36</td>
<td>&lt;50</td>
<td>7</td>
<td>45</td>
<td>118</td>
<td>12</td>
<td>355</td>
<td>&lt;2</td>
<td>17</td>
</tr>
<tr>
<td>PAH-SS-37</td>
<td>&lt;50</td>
<td>3</td>
<td>15</td>
<td>67</td>
<td>7</td>
<td>73</td>
<td>&lt;2</td>
<td>7</td>
</tr>
<tr>
<td>PAH-SS-38</td>
<td>57</td>
<td>&lt;2</td>
<td>52</td>
<td>45</td>
<td>12</td>
<td>35</td>
<td>&lt;2</td>
<td>13</td>
</tr>
<tr>
<td>PAH-CE-01</td>
<td>&lt;50</td>
<td>3</td>
<td>19</td>
<td>29</td>
<td>8</td>
<td>47</td>
<td>&lt;2</td>
<td>6</td>
</tr>
<tr>
<td>PAH-CE-02</td>
<td>&lt;50</td>
<td>&lt;5</td>
<td>8</td>
<td>5</td>
<td>9</td>
<td>&lt;2</td>
<td>&lt;4</td>
<td></td>
</tr>
<tr>
<td>PAH-CE-03</td>
<td>&lt;50</td>
<td>4</td>
<td>23</td>
<td>90</td>
<td>10</td>
<td>66</td>
<td>&lt;2</td>
<td>10</td>
</tr>
<tr>
<td>PAH-CE-04</td>
<td>&lt;50</td>
<td>3</td>
<td>&lt;5</td>
<td>20</td>
<td>5</td>
<td>98</td>
<td>&lt;2</td>
<td>&lt;4</td>
</tr>
<tr>
<td>PAH-CE-04D</td>
<td>&lt;50</td>
<td>2</td>
<td>&lt;5</td>
<td>17</td>
<td>4</td>
<td>77</td>
<td>&lt;2</td>
<td>&lt;4</td>
</tr>
<tr>
<td>PAH-CE-05</td>
<td>&lt;50</td>
<td>7</td>
<td>23</td>
<td>131</td>
<td>14</td>
<td>475</td>
<td>&lt;2</td>
<td>11</td>
</tr>
<tr>
<td>PAH-CE-06</td>
<td>&lt;50</td>
<td>6</td>
<td>8</td>
<td>87</td>
<td>5</td>
<td>419</td>
<td>&lt;2</td>
<td>6</td>
</tr>
<tr>
<td>PAH-CE-07</td>
<td>&lt;50</td>
<td>7</td>
<td>16</td>
<td>88</td>
<td>14</td>
<td>484</td>
<td>&lt;2</td>
<td>11</td>
</tr>
<tr>
<td>PAH-CE-08</td>
<td>&lt;50</td>
<td>&lt;2</td>
<td>11</td>
<td>19</td>
<td>5</td>
<td>12</td>
<td>&lt;2</td>
<td>7</td>
</tr>
<tr>
<td>PAH-CE-09</td>
<td>&lt;50</td>
<td>&lt;2</td>
<td>60</td>
<td>55</td>
<td>13</td>
<td>25</td>
<td>&lt;2</td>
<td>17</td>
</tr>
<tr>
<td>PAH-CE-10</td>
<td>&lt;50</td>
<td>&lt;2</td>
<td>18</td>
<td>31</td>
<td>4</td>
<td>24</td>
<td>&lt;2</td>
<td>8</td>
</tr>
<tr>
<td>PAH-CE-11</td>
<td>&lt;50</td>
<td>&lt;2</td>
<td>13</td>
<td>23</td>
<td>5</td>
<td>24</td>
<td>&lt;2</td>
<td>&lt;4</td>
</tr>
<tr>
<td>PAH-CE-12</td>
<td>&lt;50</td>
<td>&lt;2</td>
<td>47</td>
<td>54</td>
<td>13</td>
<td>78</td>
<td>&lt;2</td>
<td>15</td>
</tr>
<tr>
<td>PAH-CE-13</td>
<td>&lt;50</td>
<td>5</td>
<td>13</td>
<td>82</td>
<td>16</td>
<td>45</td>
<td>&lt;2</td>
<td>11</td>
</tr>
<tr>
<td>PAH-CE-14</td>
<td>&lt;50</td>
<td>&lt;2</td>
<td>29</td>
<td>45</td>
<td>10</td>
<td>63</td>
<td>&lt;2</td>
<td>9</td>
</tr>
<tr>
<td>PAH-CE-15</td>
<td>&lt;50</td>
<td>&lt;2</td>
<td>41</td>
<td>43</td>
<td>11</td>
<td>46</td>
<td>&lt;2</td>
<td>12</td>
</tr>
<tr>
<td>PAH-CE-15D</td>
<td>&lt;50</td>
<td>&lt;2</td>
<td>38</td>
<td>42</td>
<td>9</td>
<td>42</td>
<td>&lt;2</td>
<td>11</td>
</tr>
<tr>
<td>PAH-CE-16</td>
<td>&lt;50</td>
<td>&lt;2</td>
<td>16</td>
<td>26</td>
<td>6</td>
<td>13</td>
<td>&lt;2</td>
<td>6</td>
</tr>
<tr>
<td>PAH-CE-17</td>
<td>&lt;50</td>
<td>&lt;2</td>
<td>25</td>
<td>56</td>
<td>6</td>
<td>59</td>
<td>&lt;2</td>
<td>8</td>
</tr>
<tr>
<td>PAH-CE-18</td>
<td>&lt;50</td>
<td>3</td>
<td>30</td>
<td>45</td>
<td>9</td>
<td>200</td>
<td>&lt;2</td>
<td>11</td>
</tr>
<tr>
<td>PAH-CE-19</td>
<td>&lt;50</td>
<td>3</td>
<td>6</td>
<td>26</td>
<td>5</td>
<td>59</td>
<td>&lt;2</td>
<td>5</td>
</tr>
</tbody>
</table>
## Appendix 2. Inorganic constituents in ambient surface soils, Chicago, Illinois—Continued

[percent, percent-weight; D, duplicate sample; <50, constituent not detected and detection limit]

<table>
<thead>
<tr>
<th>Sample Number</th>
<th>Gold (milligrams per kilogram)</th>
<th>Holmium (milligrams per kilogram)</th>
<th>Lanthanum (milligrams per kilogram)</th>
<th>Lead (milligrams per kilogram)</th>
<th>Lithium (milligrams per kilogram)</th>
<th>Manganese (milligrams per kilogram)</th>
<th>Mercury (milligrams per kilogram)</th>
<th>Molybdenum (milligrams per kilogram)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PAH-SS-01</td>
<td>&lt;8</td>
<td>&lt;4</td>
<td>32</td>
<td>93</td>
<td>36</td>
<td>561</td>
<td>0.11</td>
<td>4</td>
</tr>
<tr>
<td>PAH-SS-02</td>
<td>&lt;8</td>
<td>&lt;4</td>
<td>33</td>
<td>40</td>
<td>32</td>
<td>327</td>
<td>.09</td>
<td>2</td>
</tr>
<tr>
<td>PAH-SS-03</td>
<td>&lt;8</td>
<td>&lt;4</td>
<td>34</td>
<td>198</td>
<td>52</td>
<td>461</td>
<td>.86</td>
<td>5</td>
</tr>
<tr>
<td>PAH-SS-04</td>
<td>&lt;8</td>
<td>&lt;4</td>
<td>30</td>
<td>283</td>
<td>43</td>
<td>365</td>
<td>.31</td>
<td>4</td>
</tr>
<tr>
<td>PAH-SS-05</td>
<td>&lt;8</td>
<td>&lt;4</td>
<td>23</td>
<td>150</td>
<td>29</td>
<td>433</td>
<td>.17</td>
<td>4</td>
</tr>
<tr>
<td>PAH-SS-06</td>
<td>&lt;8</td>
<td>&lt;4</td>
<td>25</td>
<td>654</td>
<td>37</td>
<td>628</td>
<td>0.32</td>
<td>6</td>
</tr>
<tr>
<td>PAH-SS-07</td>
<td>&lt;8</td>
<td>&lt;4</td>
<td>35</td>
<td>42</td>
<td>52</td>
<td>390</td>
<td>.07</td>
<td>5</td>
</tr>
<tr>
<td>PAH-SS-08</td>
<td>&lt;8</td>
<td>&lt;4</td>
<td>33</td>
<td>87</td>
<td>40</td>
<td>507</td>
<td>.09</td>
<td>3</td>
</tr>
<tr>
<td>PAH-SS-09</td>
<td>&lt;8</td>
<td>&lt;4</td>
<td>31</td>
<td>224</td>
<td>38</td>
<td>582</td>
<td>.38</td>
<td>3</td>
</tr>
<tr>
<td>PAH-SS-10</td>
<td>&lt;8</td>
<td>&lt;4</td>
<td>34</td>
<td>27</td>
<td>28</td>
<td>751</td>
<td>.08</td>
<td>3</td>
</tr>
<tr>
<td>PAH-SS-11</td>
<td>&lt;8</td>
<td>&lt;4</td>
<td>33</td>
<td>35</td>
<td>30</td>
<td>699</td>
<td>0.08</td>
<td>3</td>
</tr>
<tr>
<td>PAH-SS-12</td>
<td>&lt;8</td>
<td>&lt;4</td>
<td>36</td>
<td>39</td>
<td>29</td>
<td>651</td>
<td>.19</td>
<td>2</td>
</tr>
<tr>
<td>PAH-SS-13</td>
<td>&lt;8</td>
<td>&lt;4</td>
<td>34</td>
<td>323</td>
<td>51</td>
<td>524</td>
<td>1.89</td>
<td>6</td>
</tr>
<tr>
<td>PAH-SS-14</td>
<td>&lt;8</td>
<td>&lt;4</td>
<td>33</td>
<td>504</td>
<td>55</td>
<td>821</td>
<td>.33</td>
<td>6</td>
</tr>
<tr>
<td>PAH-SS-15</td>
<td>&lt;8</td>
<td>&lt;4</td>
<td>34</td>
<td>47</td>
<td>42</td>
<td>694</td>
<td>.07</td>
<td>5</td>
</tr>
<tr>
<td>PAH-SS-16</td>
<td>&lt;8</td>
<td>&lt;4</td>
<td>36</td>
<td>65</td>
<td>44</td>
<td>795</td>
<td>0.08</td>
<td>5</td>
</tr>
<tr>
<td>PAH-SS-17</td>
<td>&lt;8</td>
<td>&lt;4</td>
<td>30</td>
<td>240</td>
<td>39</td>
<td>3,250</td>
<td>.18</td>
<td>15</td>
</tr>
<tr>
<td>PAH-SS-17D</td>
<td>&lt;8</td>
<td>&lt;4</td>
<td>33</td>
<td>246</td>
<td>38</td>
<td>4,090</td>
<td>.16</td>
<td>17</td>
</tr>
<tr>
<td>PAH-SS-18</td>
<td>&lt;8</td>
<td>&lt;4</td>
<td>21</td>
<td>1,690</td>
<td>28</td>
<td>2,330</td>
<td>.93</td>
<td>14</td>
</tr>
<tr>
<td>PAH-SS-19</td>
<td>&lt;8</td>
<td>&lt;4</td>
<td>35</td>
<td>44</td>
<td>43</td>
<td>634</td>
<td>.07</td>
<td>3</td>
</tr>
<tr>
<td>PAH-SS-20</td>
<td>&lt;8</td>
<td>&lt;4</td>
<td>24</td>
<td>239</td>
<td>25</td>
<td>802</td>
<td>0.25</td>
<td>4</td>
</tr>
<tr>
<td>PAH-SS-21</td>
<td>&lt;8</td>
<td>&lt;4</td>
<td>34</td>
<td>72</td>
<td>51</td>
<td>427</td>
<td>.27</td>
<td>3</td>
</tr>
<tr>
<td>PAH-SS-21D</td>
<td>&lt;8</td>
<td>&lt;4</td>
<td>35</td>
<td>70</td>
<td>51</td>
<td>420</td>
<td>.59</td>
<td>3</td>
</tr>
<tr>
<td>PAH-SS-22</td>
<td>&lt;8</td>
<td>&lt;4</td>
<td>25</td>
<td>303</td>
<td>36</td>
<td>541</td>
<td>1.91</td>
<td>6</td>
</tr>
<tr>
<td>PAH-SS-23</td>
<td>&lt;8</td>
<td>&lt;4</td>
<td>33</td>
<td>198</td>
<td>39</td>
<td>442</td>
<td>.28</td>
<td>5</td>
</tr>
<tr>
<td>PAH-SS-24</td>
<td>&lt;8</td>
<td>&lt;4</td>
<td>34</td>
<td>109</td>
<td>38</td>
<td>683</td>
<td>0.17</td>
<td>5</td>
</tr>
<tr>
<td>PAH-SS-25</td>
<td>&lt;8</td>
<td>&lt;4</td>
<td>31</td>
<td>82</td>
<td>33</td>
<td>471</td>
<td>.06</td>
<td>2</td>
</tr>
<tr>
<td>PAH-SS-25D</td>
<td>&lt;8</td>
<td>&lt;4</td>
<td>33</td>
<td>90</td>
<td>35</td>
<td>549</td>
<td>.06</td>
<td>3</td>
</tr>
<tr>
<td>PAH-SS-26</td>
<td>&lt;8</td>
<td>&lt;4</td>
<td>27</td>
<td>105</td>
<td>31</td>
<td>459</td>
<td>.14</td>
<td>6</td>
</tr>
<tr>
<td>PAH-SS-27</td>
<td>&lt;8</td>
<td>&lt;4</td>
<td>24</td>
<td>1,310</td>
<td>33</td>
<td>697</td>
<td>1.65</td>
<td>11</td>
</tr>
<tr>
<td>PAH-SS-28</td>
<td>&lt;8</td>
<td>&lt;4</td>
<td>35</td>
<td>275</td>
<td>49</td>
<td>415</td>
<td>0.39</td>
<td>7</td>
</tr>
<tr>
<td>PAH-SS-29</td>
<td>&lt;8</td>
<td>&lt;4</td>
<td>18</td>
<td>473</td>
<td>25</td>
<td>512</td>
<td>.70</td>
<td>5</td>
</tr>
<tr>
<td>PAH-SS-30</td>
<td>&lt;8</td>
<td>&lt;4</td>
<td>34</td>
<td>355</td>
<td>42</td>
<td>544</td>
<td>.25</td>
<td>6</td>
</tr>
<tr>
<td>PAH-SS-31</td>
<td>&lt;8</td>
<td>&lt;4</td>
<td>24</td>
<td>469</td>
<td>26</td>
<td>631</td>
<td>.31</td>
<td>7</td>
</tr>
<tr>
<td>PAH-SS-32</td>
<td>&lt;8</td>
<td>&lt;4</td>
<td>29</td>
<td>528</td>
<td>42</td>
<td>495</td>
<td>.21</td>
<td>7</td>
</tr>
<tr>
<td>Sample Number</td>
<td>Gold (milligrams per kilogram)</td>
<td>Holmium (milligrams per kilogram)</td>
<td>Lanthanum (milligrams per kilogram)</td>
<td>Lead (milligrams per kilogram)</td>
<td>Lithium (milligrams per kilogram)</td>
<td>Manganese (milligrams per kilogram)</td>
<td>Mercury (milligrams per kilogram)</td>
<td>Molybdenum (milligrams per kilogram)</td>
</tr>
<tr>
<td>---------------</td>
<td>-------------------------------</td>
<td>----------------------------------</td>
<td>------------------------------------</td>
<td>-------------------------------</td>
<td>----------------------------------</td>
<td>-----------------------------------</td>
<td>----------------------------------</td>
<td>-----------------------------------</td>
</tr>
<tr>
<td>PAH-SS-33</td>
<td>&lt;8</td>
<td>&lt;4</td>
<td>31</td>
<td>281</td>
<td>46</td>
<td>411</td>
<td>0.44</td>
<td>6</td>
</tr>
<tr>
<td>PAH-SS-33D</td>
<td>&lt;8</td>
<td>&lt;4</td>
<td>31</td>
<td>283</td>
<td>45</td>
<td>405</td>
<td>.43</td>
<td>6</td>
</tr>
<tr>
<td>PAH-SS-34</td>
<td>&lt;8</td>
<td>&lt;4</td>
<td>28</td>
<td>175</td>
<td>36</td>
<td>533</td>
<td>.12</td>
<td>4</td>
</tr>
<tr>
<td>PAH-SS-35</td>
<td>&lt;8</td>
<td>&lt;4</td>
<td>52</td>
<td>1,270</td>
<td>67</td>
<td>710</td>
<td>5.13</td>
<td>12</td>
</tr>
<tr>
<td>PAH-SS-36</td>
<td>&lt;8</td>
<td>&lt;4</td>
<td>24</td>
<td>1,910</td>
<td>28</td>
<td>642</td>
<td>.75</td>
<td>6</td>
</tr>
<tr>
<td>PAH-SS-37</td>
<td>&lt;8</td>
<td>&lt;4</td>
<td>13</td>
<td>1,000</td>
<td>12</td>
<td>390</td>
<td>0.25</td>
<td>4</td>
</tr>
<tr>
<td>PAH-SS-38</td>
<td>&lt;8</td>
<td>&lt;4</td>
<td>28</td>
<td>85</td>
<td>32</td>
<td>484</td>
<td>.08</td>
<td>3</td>
</tr>
<tr>
<td>PAH-CE-01</td>
<td>&lt;8</td>
<td>&lt;4</td>
<td>13</td>
<td>260</td>
<td>13</td>
<td>240</td>
<td>.12</td>
<td>2</td>
</tr>
<tr>
<td>PAH-CE-02</td>
<td>&lt;8</td>
<td>&lt;4</td>
<td>10</td>
<td>13</td>
<td>7</td>
<td>196</td>
<td>&lt;0.02</td>
<td>&lt;2</td>
</tr>
<tr>
<td>PAH-CE-03</td>
<td>&lt;8</td>
<td>&lt;4</td>
<td>18</td>
<td>886</td>
<td>24</td>
<td>335</td>
<td>13.10</td>
<td>5</td>
</tr>
<tr>
<td>PAH-CE-04</td>
<td>&lt;8</td>
<td>&lt;4</td>
<td>7</td>
<td>270</td>
<td>5</td>
<td>166</td>
<td>0.08</td>
<td>&lt;2</td>
</tr>
<tr>
<td>PAH-CE-04D</td>
<td>&lt;8</td>
<td>&lt;4</td>
<td>6</td>
<td>200</td>
<td>5</td>
<td>150</td>
<td>.12</td>
<td>&lt;2</td>
</tr>
<tr>
<td>PAH-CE-05</td>
<td>&lt;8</td>
<td>&lt;4</td>
<td>19</td>
<td>1,450</td>
<td>20</td>
<td>415</td>
<td>.38</td>
<td>13</td>
</tr>
<tr>
<td>PAH-CE-06</td>
<td>&lt;8</td>
<td>&lt;4</td>
<td>11</td>
<td>1,500</td>
<td>8</td>
<td>327</td>
<td>.21</td>
<td>6</td>
</tr>
<tr>
<td>PAH-CE-07</td>
<td>&lt;8</td>
<td>&lt;4</td>
<td>17</td>
<td>1,680</td>
<td>17</td>
<td>517</td>
<td>.41</td>
<td>15</td>
</tr>
<tr>
<td>PAH-CE-08</td>
<td>&lt;8</td>
<td>&lt;4</td>
<td>12</td>
<td>70</td>
<td>7</td>
<td>276</td>
<td>0.03</td>
<td>&lt;2</td>
</tr>
<tr>
<td>PAH-CE-09</td>
<td>&lt;8</td>
<td>&lt;4</td>
<td>32</td>
<td>30</td>
<td>42</td>
<td>479</td>
<td>.03</td>
<td>3</td>
</tr>
<tr>
<td>PAH-CE-10</td>
<td>&lt;8</td>
<td>&lt;4</td>
<td>12</td>
<td>98</td>
<td>8</td>
<td>241</td>
<td>.28</td>
<td>&lt;2</td>
</tr>
<tr>
<td>PAH-CE-11</td>
<td>&lt;8</td>
<td>&lt;4</td>
<td>13</td>
<td>66</td>
<td>15</td>
<td>236</td>
<td>.02</td>
<td>2</td>
</tr>
<tr>
<td>PAH-CE-12</td>
<td>&lt;8</td>
<td>&lt;4</td>
<td>28</td>
<td>167</td>
<td>40</td>
<td>368</td>
<td>.06</td>
<td>6</td>
</tr>
<tr>
<td>PAH-CE-13</td>
<td>&lt;8</td>
<td>&lt;4</td>
<td>21</td>
<td>49</td>
<td>32</td>
<td>579</td>
<td>0.03</td>
<td>17</td>
</tr>
<tr>
<td>PAH-CE-14</td>
<td>&lt;8</td>
<td>&lt;4</td>
<td>18</td>
<td>977</td>
<td>22</td>
<td>405</td>
<td>.11</td>
<td>6</td>
</tr>
<tr>
<td>PAH-CE-15</td>
<td>&lt;8</td>
<td>&lt;4</td>
<td>23</td>
<td>135</td>
<td>32</td>
<td>346</td>
<td>.10</td>
<td>6</td>
</tr>
<tr>
<td>PAH-CE-15D</td>
<td>&lt;8</td>
<td>&lt;4</td>
<td>22</td>
<td>114</td>
<td>32</td>
<td>333</td>
<td>.07</td>
<td>6</td>
</tr>
<tr>
<td>PAH-CE-16</td>
<td>&lt;8</td>
<td>&lt;4</td>
<td>11</td>
<td>30</td>
<td>8</td>
<td>311</td>
<td>.03</td>
<td>2</td>
</tr>
<tr>
<td>PAH-CE-17</td>
<td>&lt;8</td>
<td>&lt;4</td>
<td>17</td>
<td>332</td>
<td>14</td>
<td>954</td>
<td>0.48</td>
<td>4</td>
</tr>
<tr>
<td>PAH-CE-18</td>
<td>&lt;8</td>
<td>&lt;4</td>
<td>20</td>
<td>428</td>
<td>22</td>
<td>414</td>
<td>.44</td>
<td>3</td>
</tr>
<tr>
<td>PAH-CE-19</td>
<td>&lt;8</td>
<td>&lt;4</td>
<td>10</td>
<td>90</td>
<td>7</td>
<td>320</td>
<td>.09</td>
<td>&lt;2</td>
</tr>
</tbody>
</table>
Appendix 2. Inorganic constituents in ambient surface soils, Chicago, Illinois—Continued
[percent, percent-weight; D, duplicate sample; <50, constituent not detected and detection limit]

<table>
<thead>
<tr>
<th>Sample Number</th>
<th>Niobium (milligrams per kilogram)</th>
<th>Neodymium (milligrams per kilogram)</th>
<th>Nickel (milligrams per kilogram)</th>
<th>Scandium (milligrams per kilogram)</th>
<th>Selenium (milligrams per kilogram)</th>
<th>Silver (milligrams per kilogram)</th>
<th>Strontium (milligrams per kilogram)</th>
<th>Tantalum (milligrams per kilogram)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PAH-SS-01</td>
<td>9</td>
<td>27</td>
<td>29</td>
<td>10</td>
<td>0.7</td>
<td>&lt;2</td>
<td>98</td>
<td>&lt;40</td>
</tr>
<tr>
<td>PAH-SS-02</td>
<td>7</td>
<td>31</td>
<td>27</td>
<td>9</td>
<td>0.7</td>
<td>&lt;2</td>
<td>102</td>
<td>&lt;40</td>
</tr>
<tr>
<td>PAH-SS-03</td>
<td>7</td>
<td>30</td>
<td>41</td>
<td>12</td>
<td>1.0</td>
<td>&lt;2</td>
<td>100</td>
<td>&lt;40</td>
</tr>
<tr>
<td>PAH-SS-04</td>
<td>8</td>
<td>27</td>
<td>37</td>
<td>10</td>
<td>0.8</td>
<td>&lt;2</td>
<td>125</td>
<td>&lt;40</td>
</tr>
<tr>
<td>PAH-SS-05</td>
<td>10</td>
<td>24</td>
<td>26</td>
<td>7</td>
<td>0.6</td>
<td>&lt;2</td>
<td>100</td>
<td>&lt;40</td>
</tr>
<tr>
<td>PAH-SS-06</td>
<td>11</td>
<td>24</td>
<td>52</td>
<td>8</td>
<td>0.9</td>
<td>&lt;2</td>
<td>123</td>
<td>&lt;40</td>
</tr>
<tr>
<td>PAH-SS-07</td>
<td>6</td>
<td>29</td>
<td>38</td>
<td>13</td>
<td>0.5</td>
<td>&lt;2</td>
<td>98</td>
<td>&lt;40</td>
</tr>
<tr>
<td>PAH-SS-08</td>
<td>8</td>
<td>30</td>
<td>30</td>
<td>11</td>
<td>0.7</td>
<td>&lt;2</td>
<td>99</td>
<td>&lt;40</td>
</tr>
<tr>
<td>PAH-SS-09</td>
<td>6</td>
<td>32</td>
<td>29</td>
<td>10</td>
<td>0.8</td>
<td>&lt;2</td>
<td>107</td>
<td>&lt;40</td>
</tr>
<tr>
<td>PAH-SS-10</td>
<td>10</td>
<td>32</td>
<td>25</td>
<td>9</td>
<td>0.7</td>
<td>&lt;2</td>
<td>98</td>
<td>&lt;40</td>
</tr>
<tr>
<td>PAH-SS-11</td>
<td>7</td>
<td>28</td>
<td>24</td>
<td>9</td>
<td>0.7</td>
<td>&lt;2</td>
<td>122</td>
<td>&lt;40</td>
</tr>
<tr>
<td>PAH-SS-12</td>
<td>10</td>
<td>31</td>
<td>27</td>
<td>10</td>
<td>0.6</td>
<td>&lt;2</td>
<td>99</td>
<td>&lt;40</td>
</tr>
<tr>
<td>PAH-SS-13</td>
<td>12</td>
<td>33</td>
<td>41</td>
<td>13</td>
<td>1.2</td>
<td>&lt;2</td>
<td>106</td>
<td>&lt;40</td>
</tr>
<tr>
<td>PAH-SS-14</td>
<td>13</td>
<td>31</td>
<td>45</td>
<td>12</td>
<td>1.3</td>
<td>&lt;2</td>
<td>106</td>
<td>&lt;40</td>
</tr>
<tr>
<td>PAH-SS-15</td>
<td>9</td>
<td>30</td>
<td>32</td>
<td>11</td>
<td>0.8</td>
<td>&lt;2</td>
<td>104</td>
<td>&lt;40</td>
</tr>
<tr>
<td>PAH-SS-16</td>
<td>10</td>
<td>32</td>
<td>31</td>
<td>12</td>
<td>0.9</td>
<td>&lt;2</td>
<td>94</td>
<td>&lt;40</td>
</tr>
<tr>
<td>PAH-SS-17</td>
<td>10</td>
<td>25</td>
<td>54</td>
<td>10</td>
<td>1.2</td>
<td>&lt;2</td>
<td>132</td>
<td>&lt;40</td>
</tr>
<tr>
<td>PAH-SS-17D</td>
<td>13</td>
<td>32</td>
<td>57</td>
<td>9</td>
<td>1.2</td>
<td>&lt;2</td>
<td>127</td>
<td>&lt;40</td>
</tr>
<tr>
<td>PAH-SS-18</td>
<td>16</td>
<td>21</td>
<td>77</td>
<td>7</td>
<td>2.7</td>
<td>&lt;2</td>
<td>143</td>
<td>&lt;40</td>
</tr>
<tr>
<td>PAH-SS-19</td>
<td>7</td>
<td>29</td>
<td>30</td>
<td>11</td>
<td>0.6</td>
<td>&lt;2</td>
<td>91</td>
<td>&lt;40</td>
</tr>
<tr>
<td>PAH-SS-20</td>
<td>9</td>
<td>23</td>
<td>28</td>
<td>8</td>
<td>1.5</td>
<td>&lt;2</td>
<td>122</td>
<td>&lt;40</td>
</tr>
<tr>
<td>PAH-SS-21</td>
<td>10</td>
<td>30</td>
<td>34</td>
<td>12</td>
<td>0.8</td>
<td>&lt;2</td>
<td>141</td>
<td>&lt;40</td>
</tr>
<tr>
<td>PAH-SS-21D</td>
<td>7</td>
<td>32</td>
<td>33</td>
<td>12</td>
<td>0.7</td>
<td>&lt;2</td>
<td>141</td>
<td>&lt;40</td>
</tr>
<tr>
<td>PAH-SS-22</td>
<td>11</td>
<td>23</td>
<td>34</td>
<td>9</td>
<td>0.7</td>
<td>&lt;2</td>
<td>133</td>
<td>&lt;40</td>
</tr>
<tr>
<td>PAH-SS-23</td>
<td>7</td>
<td>30</td>
<td>34</td>
<td>10</td>
<td>0.7</td>
<td>&lt;2</td>
<td>131</td>
<td>&lt;40</td>
</tr>
<tr>
<td>PAH-SS-24</td>
<td>11</td>
<td>28</td>
<td>34</td>
<td>11</td>
<td>1.0</td>
<td>&lt;2</td>
<td>101</td>
<td>&lt;40</td>
</tr>
<tr>
<td>PAH-SS-25</td>
<td>11</td>
<td>29</td>
<td>25</td>
<td>9</td>
<td>0.7</td>
<td>&lt;2</td>
<td>98</td>
<td>&lt;40</td>
</tr>
<tr>
<td>PAH-SS-25D</td>
<td>10</td>
<td>30</td>
<td>25</td>
<td>10</td>
<td>0.7</td>
<td>&lt;2</td>
<td>99</td>
<td>&lt;40</td>
</tr>
<tr>
<td>PAH-SS-26</td>
<td>10</td>
<td>24</td>
<td>32</td>
<td>9</td>
<td>1.0</td>
<td>&lt;2</td>
<td>112</td>
<td>&lt;40</td>
</tr>
<tr>
<td>PAH-SS-27</td>
<td>14</td>
<td>22</td>
<td>154</td>
<td>9</td>
<td>1.3</td>
<td>&lt;2</td>
<td>115</td>
<td>&lt;40</td>
</tr>
<tr>
<td>PAH-SS-28</td>
<td>11</td>
<td>34</td>
<td>51</td>
<td>14</td>
<td>1.9</td>
<td>&lt;2</td>
<td>94</td>
<td>&lt;40</td>
</tr>
<tr>
<td>PAH-SS-29</td>
<td>11</td>
<td>19</td>
<td>35</td>
<td>6</td>
<td>0.7</td>
<td>&lt;2</td>
<td>97</td>
<td>&lt;40</td>
</tr>
<tr>
<td>PAH-SS-30</td>
<td>9</td>
<td>28</td>
<td>43</td>
<td>11</td>
<td>1.3</td>
<td>&lt;2</td>
<td>114</td>
<td>&lt;40</td>
</tr>
<tr>
<td>PAH-SS-31</td>
<td>10</td>
<td>26</td>
<td>43</td>
<td>8</td>
<td>2.7</td>
<td>&lt;2</td>
<td>102</td>
<td>&lt;40</td>
</tr>
<tr>
<td>PAH-SS-32</td>
<td>11</td>
<td>27</td>
<td>53</td>
<td>11</td>
<td>1.2</td>
<td>&lt;2</td>
<td>146</td>
<td>&lt;40</td>
</tr>
<tr>
<td>Sample Number</td>
<td>Niobium (milligrams per kilogram)</td>
<td>Neodymium (milligrams per kilogram)</td>
<td>Nickel (milligrams per kilogram)</td>
<td>Scandium (milligrams per kilogram)</td>
<td>Selenium (milligrams per kilogram)</td>
<td>Silver (milligrams per kilogram)</td>
<td>Strontium (milligrams per kilogram)</td>
<td>Tantalum (milligrams per kilogram)</td>
</tr>
<tr>
<td>---------------</td>
<td>----------------------------------</td>
<td>------------------------------------</td>
<td>----------------------------------</td>
<td>----------------------------------</td>
<td>----------------------------------</td>
<td>---------------------------------</td>
<td>-----------------------------------</td>
<td>----------------------------------</td>
</tr>
<tr>
<td>PAH-SS-33</td>
<td>10</td>
<td>31</td>
<td>41</td>
<td>11</td>
<td>1.2</td>
<td>&lt;2</td>
<td>116</td>
<td>&lt;40</td>
</tr>
<tr>
<td>PAH-SS-33D</td>
<td>10</td>
<td>27</td>
<td>40</td>
<td>11</td>
<td>1.2</td>
<td>&lt;2</td>
<td>114</td>
<td>&lt;40</td>
</tr>
<tr>
<td>PAH-SS-34</td>
<td>8</td>
<td>29</td>
<td>31</td>
<td>10</td>
<td>.9</td>
<td>&lt;2</td>
<td>94</td>
<td>&lt;40</td>
</tr>
<tr>
<td>PAH-SS-35</td>
<td>18</td>
<td>49</td>
<td>93</td>
<td>18</td>
<td>3.1</td>
<td>&lt;2</td>
<td>299</td>
<td>&lt;40</td>
</tr>
<tr>
<td>PAH-SS-36</td>
<td>10</td>
<td>23</td>
<td>55</td>
<td>8</td>
<td>3.1</td>
<td>&lt;2</td>
<td>144</td>
<td>&lt;40</td>
</tr>
<tr>
<td>PAH-SS-37</td>
<td>7</td>
<td>&lt;9</td>
<td>22</td>
<td>3</td>
<td>0.5</td>
<td>&lt;2</td>
<td>104</td>
<td>&lt;40</td>
</tr>
<tr>
<td>PAH-SS-38</td>
<td>10</td>
<td>25</td>
<td>24</td>
<td>9</td>
<td>1.0</td>
<td>&lt;2</td>
<td>108</td>
<td>&lt;40</td>
</tr>
<tr>
<td>PAH-CE-01</td>
<td>6</td>
<td>&lt;9</td>
<td>26</td>
<td>3</td>
<td>.8</td>
<td>&lt;2</td>
<td>103</td>
<td>&lt;40</td>
</tr>
<tr>
<td>PAH-CE-02</td>
<td>6</td>
<td>&lt;9</td>
<td>5</td>
<td>&lt;2</td>
<td>&lt;0.2</td>
<td>&lt;2</td>
<td>78</td>
<td>&lt;40</td>
</tr>
<tr>
<td>PAH-CE-03</td>
<td>13</td>
<td>13</td>
<td>25</td>
<td>6</td>
<td>.9</td>
<td>&lt;2</td>
<td>93</td>
<td>&lt;40</td>
</tr>
<tr>
<td>PAH-CE-04</td>
<td>12</td>
<td>9</td>
<td>15</td>
<td>&lt;2</td>
<td>0.3</td>
<td>&lt;2</td>
<td>65</td>
<td>&lt;40</td>
</tr>
<tr>
<td>PAH-CE-04D</td>
<td>6</td>
<td>&lt;9</td>
<td>12</td>
<td>&lt;2</td>
<td>.3</td>
<td>&lt;2</td>
<td>67</td>
<td>&lt;40</td>
</tr>
<tr>
<td>PAH-CE-05</td>
<td>10</td>
<td>18</td>
<td>48</td>
<td>7</td>
<td>1.5</td>
<td>&lt;2</td>
<td>153</td>
<td>&lt;40</td>
</tr>
<tr>
<td>PAH-CE-06</td>
<td>8</td>
<td>12</td>
<td>88</td>
<td>3</td>
<td>.7</td>
<td>&lt;2</td>
<td>94</td>
<td>&lt;40</td>
</tr>
<tr>
<td>PAH-CE-07</td>
<td>16</td>
<td>10</td>
<td>48</td>
<td>6</td>
<td>1.6</td>
<td>&lt;2</td>
<td>125</td>
<td>&lt;40</td>
</tr>
<tr>
<td>PAH-CE-08</td>
<td>5</td>
<td>&lt;9</td>
<td>8</td>
<td>3</td>
<td>0.2</td>
<td>&lt;2</td>
<td>128</td>
<td>&lt;40</td>
</tr>
<tr>
<td>PAH-CE-09</td>
<td>13</td>
<td>23</td>
<td>28</td>
<td>10</td>
<td>.8</td>
<td>&lt;2</td>
<td>87</td>
<td>&lt;40</td>
</tr>
<tr>
<td>PAH-CE-10</td>
<td>9</td>
<td>&lt;9</td>
<td>10</td>
<td>3</td>
<td>.5</td>
<td>&lt;2</td>
<td>117</td>
<td>&lt;40</td>
</tr>
<tr>
<td>PAH-CE-11</td>
<td>8</td>
<td>13</td>
<td>11</td>
<td>3</td>
<td>&lt;0.2</td>
<td>&lt;2</td>
<td>83</td>
<td>&lt;40</td>
</tr>
<tr>
<td>PAH-CE-12</td>
<td>12</td>
<td>20</td>
<td>39</td>
<td>9</td>
<td>.8</td>
<td>&lt;2</td>
<td>91</td>
<td>&lt;40</td>
</tr>
<tr>
<td>PAH-CE-13</td>
<td>23</td>
<td>11</td>
<td>50</td>
<td>13</td>
<td>0.9</td>
<td>&lt;2</td>
<td>142</td>
<td>&lt;40</td>
</tr>
<tr>
<td>PAH-CE-14</td>
<td>8</td>
<td>16</td>
<td>24</td>
<td>6</td>
<td>.8</td>
<td>&lt;2</td>
<td>114</td>
<td>&lt;40</td>
</tr>
<tr>
<td>PAH-CE-15</td>
<td>13</td>
<td>14</td>
<td>27</td>
<td>7</td>
<td>1.4</td>
<td>&lt;2</td>
<td>114</td>
<td>&lt;40</td>
</tr>
<tr>
<td>PAH-CE-15D</td>
<td>7</td>
<td>17</td>
<td>26</td>
<td>7</td>
<td>1.7</td>
<td>&lt;2</td>
<td>113</td>
<td>&lt;40</td>
</tr>
<tr>
<td>PAH-CE-16</td>
<td>&lt;4</td>
<td>11</td>
<td>11</td>
<td>3</td>
<td>.3</td>
<td>&lt;2</td>
<td>115</td>
<td>&lt;40</td>
</tr>
<tr>
<td>PAH-CE-17</td>
<td>4</td>
<td>10</td>
<td>19</td>
<td>4</td>
<td>0.6</td>
<td>&lt;2</td>
<td>153</td>
<td>&lt;40</td>
</tr>
<tr>
<td>PAH-CE-18</td>
<td>6</td>
<td>18</td>
<td>23</td>
<td>6</td>
<td>.8</td>
<td>&lt;2</td>
<td>121</td>
<td>&lt;40</td>
</tr>
<tr>
<td>PAH-CE-19</td>
<td>6</td>
<td>&lt;9</td>
<td>12</td>
<td>3</td>
<td>.7</td>
<td>&lt;2</td>
<td>83</td>
<td>&lt;40</td>
</tr>
</tbody>
</table>
### Appendix 2. Inorganic constituents in ambient surface soils, Chicago, Illinois

[percent, percent-weight; D, duplicate sample; <50, constituent not detected and detection limit]

<table>
<thead>
<tr>
<th>Sample Number</th>
<th>Thorium (milligrams per kilogram)</th>
<th>Tin (milligrams per kilogram)</th>
<th>Uranium (milligrams per kilogram)</th>
<th>Vanadium (milligrams per kilogram)</th>
<th>Ytterbium (milligrams per kilogram)</th>
<th>Yttrium (milligrams per kilogram)</th>
<th>Zinc (milligrams per kilogram)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PAH-SS-01</td>
<td>9</td>
<td>&lt;50</td>
<td>&lt;100</td>
<td>84</td>
<td>2</td>
<td>17</td>
<td>137</td>
</tr>
<tr>
<td>PAH-SS-02</td>
<td>8</td>
<td>&lt;50</td>
<td>&lt;100</td>
<td>82</td>
<td>2</td>
<td>19</td>
<td>83</td>
</tr>
<tr>
<td>PAH-SS-03</td>
<td>10</td>
<td>&lt;50</td>
<td>&lt;100</td>
<td>104</td>
<td>2</td>
<td>19</td>
<td>213</td>
</tr>
<tr>
<td>PAH-SS-04</td>
<td>&lt;6</td>
<td>&lt;50</td>
<td>&lt;100</td>
<td>83</td>
<td>2</td>
<td>17</td>
<td>380</td>
</tr>
<tr>
<td>PAH-SS-05</td>
<td>&lt;6</td>
<td>&lt;50</td>
<td>&lt;100</td>
<td>63</td>
<td>2</td>
<td>14</td>
<td>109</td>
</tr>
<tr>
<td>PAH-SS-06</td>
<td>&lt;6</td>
<td>&lt;50</td>
<td>&lt;100</td>
<td>70</td>
<td>2</td>
<td>16</td>
<td>804</td>
</tr>
<tr>
<td>PAH-SS-07</td>
<td>8</td>
<td>&lt;50</td>
<td>&lt;100</td>
<td>106</td>
<td>3</td>
<td>19</td>
<td>97</td>
</tr>
<tr>
<td>PAH-SS-08</td>
<td>9</td>
<td>&lt;50</td>
<td>&lt;100</td>
<td>91</td>
<td>2</td>
<td>17</td>
<td>112</td>
</tr>
<tr>
<td>PAH-SS-09</td>
<td>9</td>
<td>&lt;50</td>
<td>&lt;100</td>
<td>85</td>
<td>2</td>
<td>17</td>
<td>170</td>
</tr>
<tr>
<td>PAH-SS-10</td>
<td>9</td>
<td>&lt;50</td>
<td>&lt;100</td>
<td>89</td>
<td>2</td>
<td>18</td>
<td>79</td>
</tr>
<tr>
<td>PAH-SS-11</td>
<td>9</td>
<td>&lt;50</td>
<td>&lt;100</td>
<td>83</td>
<td>2</td>
<td>18</td>
<td>90</td>
</tr>
<tr>
<td>PAH-SS-12</td>
<td>9</td>
<td>&lt;50</td>
<td>&lt;100</td>
<td>93</td>
<td>2</td>
<td>20</td>
<td>105</td>
</tr>
<tr>
<td>PAH-SS-13</td>
<td>10</td>
<td>&lt;50</td>
<td>&lt;100</td>
<td>105</td>
<td>2</td>
<td>19</td>
<td>235</td>
</tr>
<tr>
<td>PAH-SS-14</td>
<td>8</td>
<td>&lt;50</td>
<td>&lt;100</td>
<td>106</td>
<td>2</td>
<td>20</td>
<td>388</td>
</tr>
<tr>
<td>PAH-SS-15</td>
<td>9</td>
<td>&lt;50</td>
<td>&lt;100</td>
<td>99</td>
<td>3</td>
<td>19</td>
<td>112</td>
</tr>
<tr>
<td>PAH-SS-16</td>
<td>9</td>
<td>&lt;50</td>
<td>&lt;100</td>
<td>95</td>
<td>3</td>
<td>18</td>
<td>108</td>
</tr>
<tr>
<td>PAH-SS-17</td>
<td>&lt;6</td>
<td>&lt;50</td>
<td>&lt;100</td>
<td>116</td>
<td>2</td>
<td>18</td>
<td>325</td>
</tr>
<tr>
<td>PAH-SS-17D</td>
<td>7</td>
<td>&lt;50</td>
<td>&lt;100</td>
<td>122</td>
<td>2</td>
<td>17</td>
<td>320</td>
</tr>
<tr>
<td>PAH-SS-18</td>
<td>&lt;6</td>
<td>105</td>
<td>&lt;100</td>
<td>105</td>
<td>1</td>
<td>19</td>
<td>1,180</td>
</tr>
<tr>
<td>PAH-SS-19</td>
<td>8</td>
<td>&lt;50</td>
<td>&lt;100</td>
<td>94</td>
<td>3</td>
<td>18</td>
<td>99</td>
</tr>
<tr>
<td>PAH-SS-20</td>
<td>&lt;6</td>
<td>&lt;50</td>
<td>&lt;100</td>
<td>70</td>
<td>2</td>
<td>18</td>
<td>239</td>
</tr>
<tr>
<td>PAH-SS-21</td>
<td>9</td>
<td>&lt;50</td>
<td>&lt;100</td>
<td>95</td>
<td>2</td>
<td>18</td>
<td>173</td>
</tr>
<tr>
<td>PAH-SS-21D</td>
<td>8</td>
<td>&lt;50</td>
<td>&lt;100</td>
<td>95</td>
<td>3</td>
<td>18</td>
<td>165</td>
</tr>
<tr>
<td>PAH-SS-22</td>
<td>&lt;6</td>
<td>&lt;50</td>
<td>&lt;100</td>
<td>72</td>
<td>2</td>
<td>16</td>
<td>359</td>
</tr>
<tr>
<td>PAH-SS-23</td>
<td>9</td>
<td>&lt;50</td>
<td>&lt;100</td>
<td>90</td>
<td>2</td>
<td>20</td>
<td>243</td>
</tr>
<tr>
<td>PAH-SS-24</td>
<td>9</td>
<td>&lt;50</td>
<td>&lt;100</td>
<td>92</td>
<td>3</td>
<td>18</td>
<td>172</td>
</tr>
<tr>
<td>PAH-SS-25</td>
<td>9</td>
<td>&lt;50</td>
<td>&lt;100</td>
<td>81</td>
<td>2</td>
<td>16</td>
<td>115</td>
</tr>
<tr>
<td>PAH-SS-25D</td>
<td>9</td>
<td>&lt;50</td>
<td>&lt;100</td>
<td>86</td>
<td>2</td>
<td>17</td>
<td>124</td>
</tr>
<tr>
<td>PAH-SS-26</td>
<td>&lt;6</td>
<td>&lt;50</td>
<td>&lt;100</td>
<td>73</td>
<td>2</td>
<td>16</td>
<td>172</td>
</tr>
<tr>
<td>PAH-SS-27</td>
<td>&lt;6</td>
<td>248</td>
<td>&lt;100</td>
<td>78</td>
<td>1</td>
<td>17</td>
<td>1,240</td>
</tr>
<tr>
<td>PAH-SS-28</td>
<td>7</td>
<td>&lt;50</td>
<td>&lt;100</td>
<td>115</td>
<td>2</td>
<td>20</td>
<td>260</td>
</tr>
<tr>
<td>PAH-SS-29</td>
<td>&lt;6</td>
<td>&lt;50</td>
<td>&lt;100</td>
<td>47</td>
<td>1</td>
<td>12</td>
<td>623</td>
</tr>
<tr>
<td>PAH-SS-30</td>
<td>8</td>
<td>&lt;50</td>
<td>&lt;100</td>
<td>93</td>
<td>2</td>
<td>19</td>
<td>243</td>
</tr>
<tr>
<td>PAH-SS-31</td>
<td>&lt;6</td>
<td>&lt;50</td>
<td>&lt;100</td>
<td>79</td>
<td>1</td>
<td>14</td>
<td>507</td>
</tr>
<tr>
<td>PAH-SS-32</td>
<td>7</td>
<td>&lt;50</td>
<td>&lt;100</td>
<td>96</td>
<td>2</td>
<td>18</td>
<td>760</td>
</tr>
</tbody>
</table>
## Appendix 2. Inorganic constituents in ambient surface soils, Chicago, Illinois

[percent, percent-weight; D, duplicate sample; <50, constituent not detected and detection limit]

<table>
<thead>
<tr>
<th>Sample Number</th>
<th>Thorium (milligrams per kilogram)</th>
<th>Tin (milligrams per kilogram)</th>
<th>Uranium (milligrams per kilogram)</th>
<th>Vanadium (milligrams per kilogram)</th>
<th>Ytterbium (milligrams per kilogram)</th>
<th>Yttrium (milligrams per kilogram)</th>
<th>Zinc (milligrams per kilogram)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PAH-SS-33</td>
<td>8</td>
<td>&lt;50</td>
<td>&lt;100</td>
<td>91</td>
<td>2</td>
<td>18</td>
<td>348</td>
</tr>
<tr>
<td>PAH-SS-33D</td>
<td>8</td>
<td>&lt;50</td>
<td>&lt;100</td>
<td>88</td>
<td>2</td>
<td>18</td>
<td>339</td>
</tr>
<tr>
<td>PAH-SS-34</td>
<td>&lt;6</td>
<td>&lt;50</td>
<td>&lt;100</td>
<td>81</td>
<td>2</td>
<td>17</td>
<td>191</td>
</tr>
<tr>
<td>PAH-SS-35</td>
<td>13</td>
<td>&lt;50</td>
<td>&lt;100</td>
<td>145</td>
<td>3</td>
<td>38</td>
<td>1,500</td>
</tr>
<tr>
<td>PAH-SS-36</td>
<td>&lt;6</td>
<td>&lt;50</td>
<td>&lt;100</td>
<td>79</td>
<td>1</td>
<td>16</td>
<td>1,140</td>
</tr>
<tr>
<td>PAH-SS-37</td>
<td>6</td>
<td>&lt;50</td>
<td>&lt;100</td>
<td>42</td>
<td>1</td>
<td>9</td>
<td>431</td>
</tr>
<tr>
<td>PAH-SS-38</td>
<td>11</td>
<td>&lt;50</td>
<td>&lt;100</td>
<td>71</td>
<td>2</td>
<td>16</td>
<td>133</td>
</tr>
<tr>
<td>PAH-CE-01</td>
<td>7</td>
<td>&lt;50</td>
<td>&lt;100</td>
<td>35</td>
<td>&lt;1</td>
<td>9</td>
<td>606</td>
</tr>
<tr>
<td>PAH-CE-02</td>
<td>10</td>
<td>&lt;50</td>
<td>&lt;100</td>
<td>24</td>
<td>&lt;1</td>
<td>6</td>
<td>100</td>
</tr>
<tr>
<td>PAH-CE-03</td>
<td>8</td>
<td>101</td>
<td>&lt;100</td>
<td>62</td>
<td>1</td>
<td>13</td>
<td>930</td>
</tr>
<tr>
<td>PAH-CE-04</td>
<td>8</td>
<td>&lt;50</td>
<td>&lt;100</td>
<td>34</td>
<td>&lt;1</td>
<td>7</td>
<td>242</td>
</tr>
<tr>
<td>PAH-CE-04D</td>
<td>&lt;6</td>
<td>&lt;50</td>
<td>&lt;100</td>
<td>32</td>
<td>&lt;1</td>
<td>8</td>
<td>187</td>
</tr>
<tr>
<td>PAH-CE-05</td>
<td>11</td>
<td>&lt;50</td>
<td>&lt;100</td>
<td>73</td>
<td>2</td>
<td>16</td>
<td>1,260</td>
</tr>
<tr>
<td>PAH-CE-06</td>
<td>10</td>
<td>&lt;50</td>
<td>&lt;100</td>
<td>38</td>
<td>&lt;1</td>
<td>8</td>
<td>1,400</td>
</tr>
<tr>
<td>PAH-CE-07</td>
<td>8</td>
<td>51</td>
<td>&lt;100</td>
<td>70</td>
<td>1</td>
<td>14</td>
<td>1,690</td>
</tr>
<tr>
<td>PAH-CE-08</td>
<td>11</td>
<td>&lt;50</td>
<td>&lt;100</td>
<td>27</td>
<td>&lt;1</td>
<td>7</td>
<td>83</td>
</tr>
<tr>
<td>PAH-CE-09</td>
<td>10</td>
<td>&lt;50</td>
<td>&lt;100</td>
<td>88</td>
<td>3</td>
<td>17</td>
<td>80</td>
</tr>
<tr>
<td>PAH-CE-10</td>
<td>8</td>
<td>&lt;50</td>
<td>&lt;100</td>
<td>30</td>
<td>&lt;1</td>
<td>7</td>
<td>106</td>
</tr>
<tr>
<td>PAH-CE-11</td>
<td>&lt;6</td>
<td>&lt;50</td>
<td>&lt;100</td>
<td>34</td>
<td>&lt;1</td>
<td>9</td>
<td>142</td>
</tr>
<tr>
<td>PAH-CE-12</td>
<td>13</td>
<td>&lt;50</td>
<td>&lt;100</td>
<td>82</td>
<td>2</td>
<td>15</td>
<td>174</td>
</tr>
<tr>
<td>PAH-CE-13</td>
<td>8</td>
<td>&lt;50</td>
<td>&lt;100</td>
<td>124</td>
<td>3</td>
<td>26</td>
<td>490</td>
</tr>
<tr>
<td>PAH-CE-14</td>
<td>7</td>
<td>&lt;50</td>
<td>&lt;100</td>
<td>58</td>
<td>2</td>
<td>13</td>
<td>251</td>
</tr>
<tr>
<td>PAH-CE-15</td>
<td>11</td>
<td>&lt;50</td>
<td>&lt;100</td>
<td>65</td>
<td>2</td>
<td>14</td>
<td>163</td>
</tr>
<tr>
<td>PAH-CE-15D</td>
<td>12</td>
<td>&lt;50</td>
<td>&lt;100</td>
<td>63</td>
<td>2</td>
<td>14</td>
<td>158</td>
</tr>
<tr>
<td>PAH-CE-16</td>
<td>10</td>
<td>&lt;50</td>
<td>&lt;100</td>
<td>34</td>
<td>&lt;1</td>
<td>8</td>
<td>89</td>
</tr>
<tr>
<td>PAH-CE-17</td>
<td>12</td>
<td>&lt;50</td>
<td>&lt;100</td>
<td>50</td>
<td>2</td>
<td>11</td>
<td>528</td>
</tr>
<tr>
<td>PAH-CE-18</td>
<td>7</td>
<td>&lt;50</td>
<td>&lt;100</td>
<td>53</td>
<td>2</td>
<td>13</td>
<td>371</td>
</tr>
<tr>
<td>PAH-CE-19</td>
<td>6</td>
<td>&lt;50</td>
<td>&lt;100</td>
<td>34</td>
<td>&lt;1</td>
<td>7</td>
<td>264</td>
</tr>
</tbody>
</table>