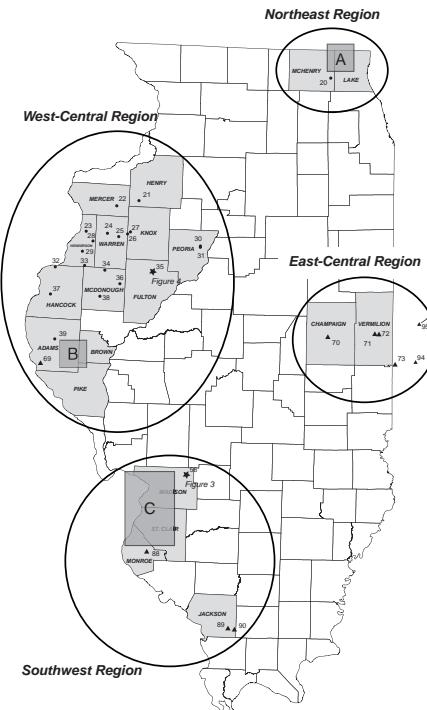
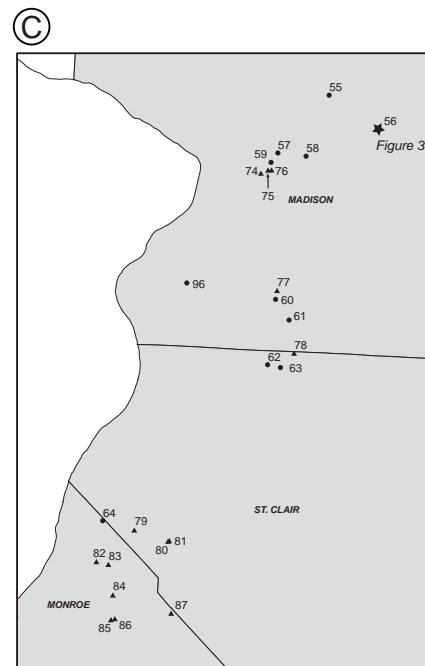
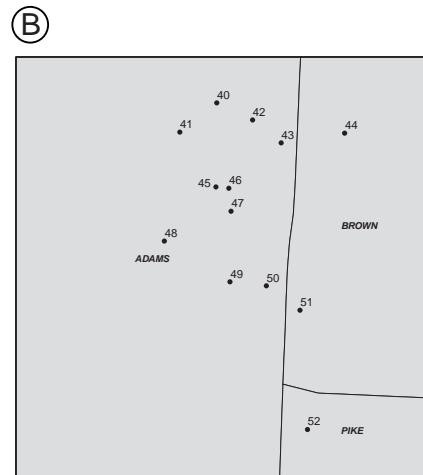
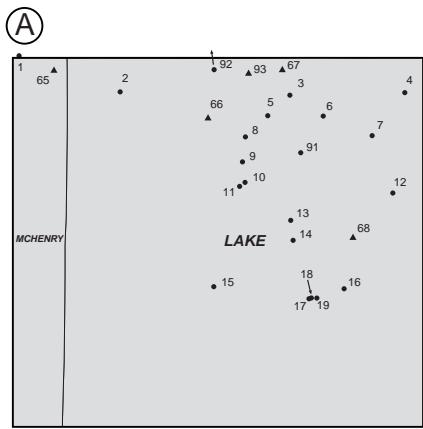
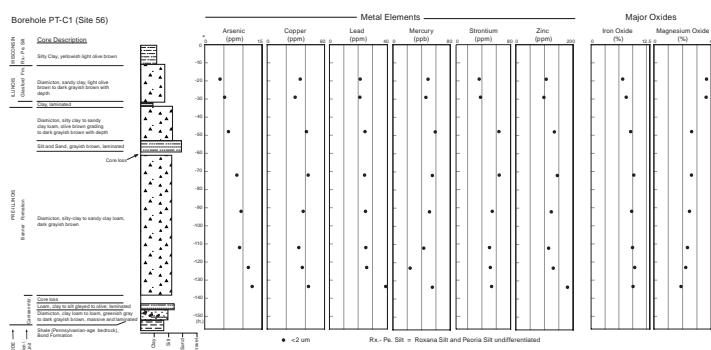


Geochemistry of Glacial Sediments in Illinois and Adjacent Areas

Antigone Dixon-Warren and Andrew J. Stumpf



Open File Series 2010-2



Institute of Natural Resource Sustainability
ILLINOIS STATE GEOLOGICAL SURVEY

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Institute of Natural Resource Sustainability
William W. Shilts, Executive Director
ILLINOIS STATE GEOLOGICAL SURVEY
E. Donald McKay III, Interim Director
615 East Peabody Drive
Champaign, Illinois 61820-6964
217-333-4747
www.isgs.illinois.edu

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Digital Data

Appendices A, B, C, and D presented in this report are included as digital data files Adobe Acrobat files, version 9.0. Appendices E, F, G, H, I and J are in Microsoft Excel 2003 format.

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Abstract

This report contains geochemical data collected from glacial sediments in Illinois and adjacent parts of Wisconsin and Indiana. Major, minor, and trace elemental concentrations were determined for 452 sediment samples collected from 67 boreholes and 29 field exposures. Glacial diamicton (till) was the preferred sampling material with the silt and clay (<0.063 mm) and clay (<0.002 mm) fractions analyzed. The detailed study of two boreholes illustrates how the chemical and mineralogical compositions of glacial sediments can be used for stratigraphic and provenance studies. This data also validates the conclusion of previous studies that the clay fraction in glacial sediments commonly has higher elemental concentrations than the coarser-grained silt and clay fraction.

Introduction

This report is a compilation of geochemical data collected from the silt and clay (<0.063 mm) and clay (<0.002 mm) matrix fraction of glacial sediments in Illinois and adjacent parts of Wisconsin and Indiana. Samples were collected in part for geologic mapping projects funded by the Great Lakes Geologic Mapping Coalition (GLGMC), State Geologic Survey Mapping (STATEMAP) component of the National Cooperative Geologic Mapping Program (NCGMP), and the Illinois Geologic Mapping Program (IGMaP).

This geochemical data, in combination with traditional mapping techniques, can be used to better evaluate the geographic and stratigraphic variations in glacial sediment composition. The data can also be used for characterizing the composition of materials for environmental investigations.

Field Sites and Sample Acquisition

A total of 471 samples of glacial sediment, including 56 duplicate samples for quality control, were taken from 67 boreholes and 29 field exposures (Figures 1 and 2), and analyzed for elemental compositions. The majority of samples were collected from archived material stored at the Illinois State Geological Survey (ISGS) samples library, but a few samples were collected at field exposures between 2000 and 2003. Samples selected for analyses came from sites where previous studies have mapped the glacial stratigraphy in detail. Sites were also selected to represent as wide a geographic area as possible to undertake regional trend analyses. Glacial diamicton (till) was preferentially sampled, although other sediments (e.g., lake sediment) were selectively submitted for analyses to limit gaps in data in vertical profiles, or where till was not present. When exposed to surficial processes sediments may undergo some degree of diagenetic alteration or weathering, which is, a major cause of significant variability in elemental concentrations (Shilts, 1975). Therefore, an emphasis was placed on collecting samples from C and D soil horizons.

Information pertaining to the site location and vertical profile, sedimentologic data, lithostratigraphic unit (formation and member), and associated laboratory sample number is provided in Appendices A through D. Data pertaining to each borehole or field exposure (outcrop) is organized by region (Northeast, West-Central, Southwest, and East-Central) alphabetically by county, and contain the following information: legal location based on the Illinois Public Land Survey System, site-specific location description, geographic coordinates (longitude and latitude) in decimal degrees referenced to the North American Datum (NAD) of 1983, and elevation in feet above mean sea level. Borehole and outcrop stations are identified with a field identification designation (Field_Id) and a unique American Petroleum Institute (API) number assigned by the ISGS Geological Records Unit for input of geologic descriptions into a relational database. Cores permanently archived at the ISGS are identified with a unique Core Number (C-number), whereas samples collected from outcrops or those subsampled from core are given a Pleistocene Series Number (P-number). In addition, for each sample, the size fraction(s) of sediment submitted, and the analytical method used at each lab are provided.

Sample Preparation and Analyses

Glacial diamicton from drill core and outcrop were collected for geochemical analysis and a brief summary of sample submission, preparation, and analyses is provided in Table 1 and in Appendix E. Of the 429 samples collected, 34 of the samples were prepared by the United States Geological Survey in Reston, Virginia, following standard US federal government laboratory protocols (Taggart, 2002). The silt and clay fraction of diamicton was submitted to SGS Mineral Services (formerly XRAL Laboratories) in Don Mills, Ontario, Canada, for 42 elemental determinations plus mercury by Inductively Coupled Plasma-Atomic Emission Spectrometry (ICP-AES) and Inductively Coupled Plasma-Mass Spectrometry (ICP-MS). As duplicate pairs and control standards were not submitted to SGS Mineral Services and no results of the Quality Assurance and Quality Control (QA/QC) analyses were received from the lab, further discussion of this data was not undertaken for the study. See Appendix F for the geochemical concentrations.

Three hundred and twenty-two silt and clay fraction samples were prepared at the ISGS by air-drying then dry sieving to <0.063 mm. Up to ten grams of each sample were sent to ACME Analytical Laboratories in Vancouver, British Columbia,

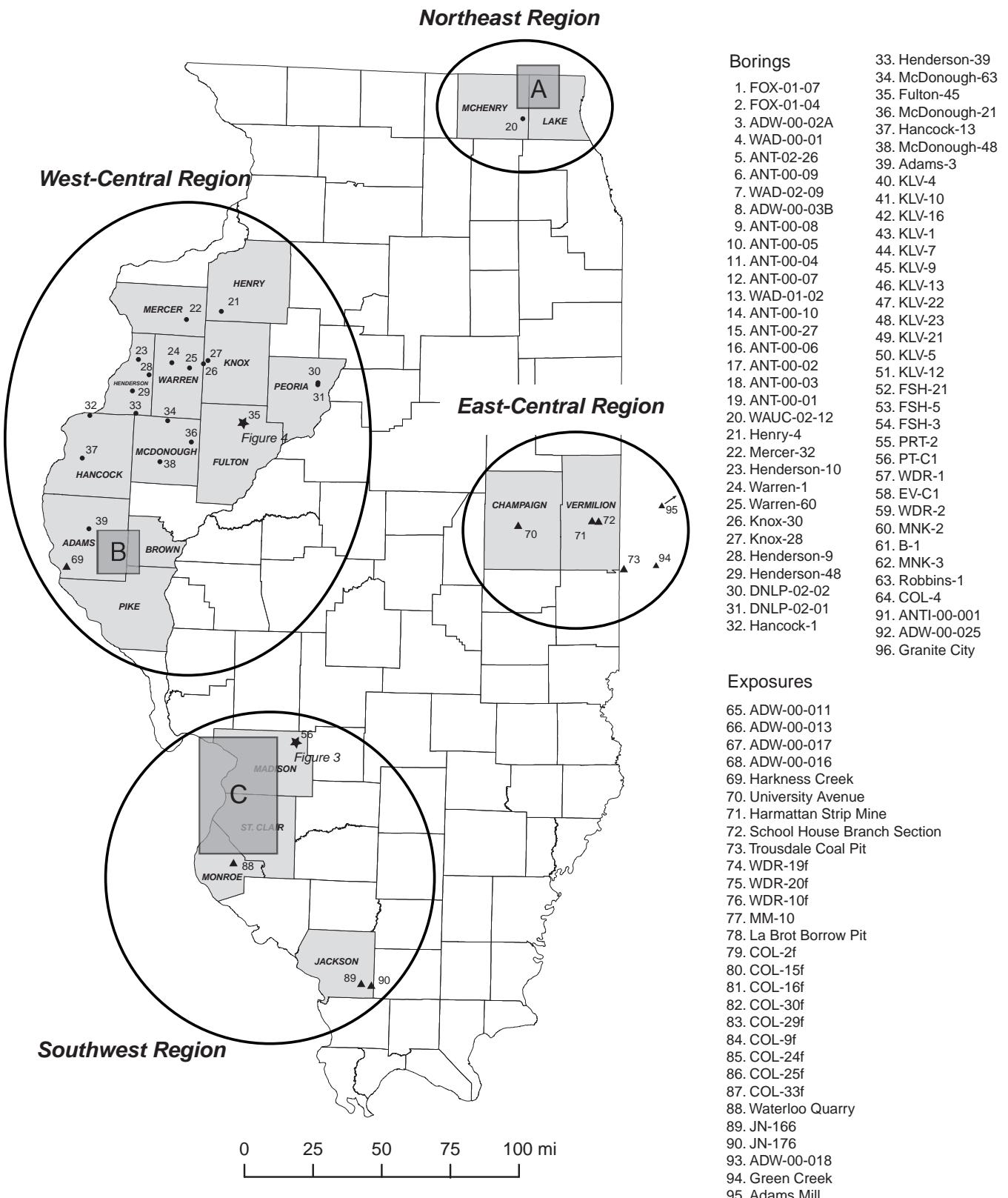


Figure 1 Location of geochemical sampling sites in Illinois and adjacent areas of Wisconsin and Indiana, including locations of inset maps (A, B, C) in areas of high density sampling shown in Figure 2. Outcrop sites are symbolized by triangles. Borehole sites are symbolized by circles or stars.

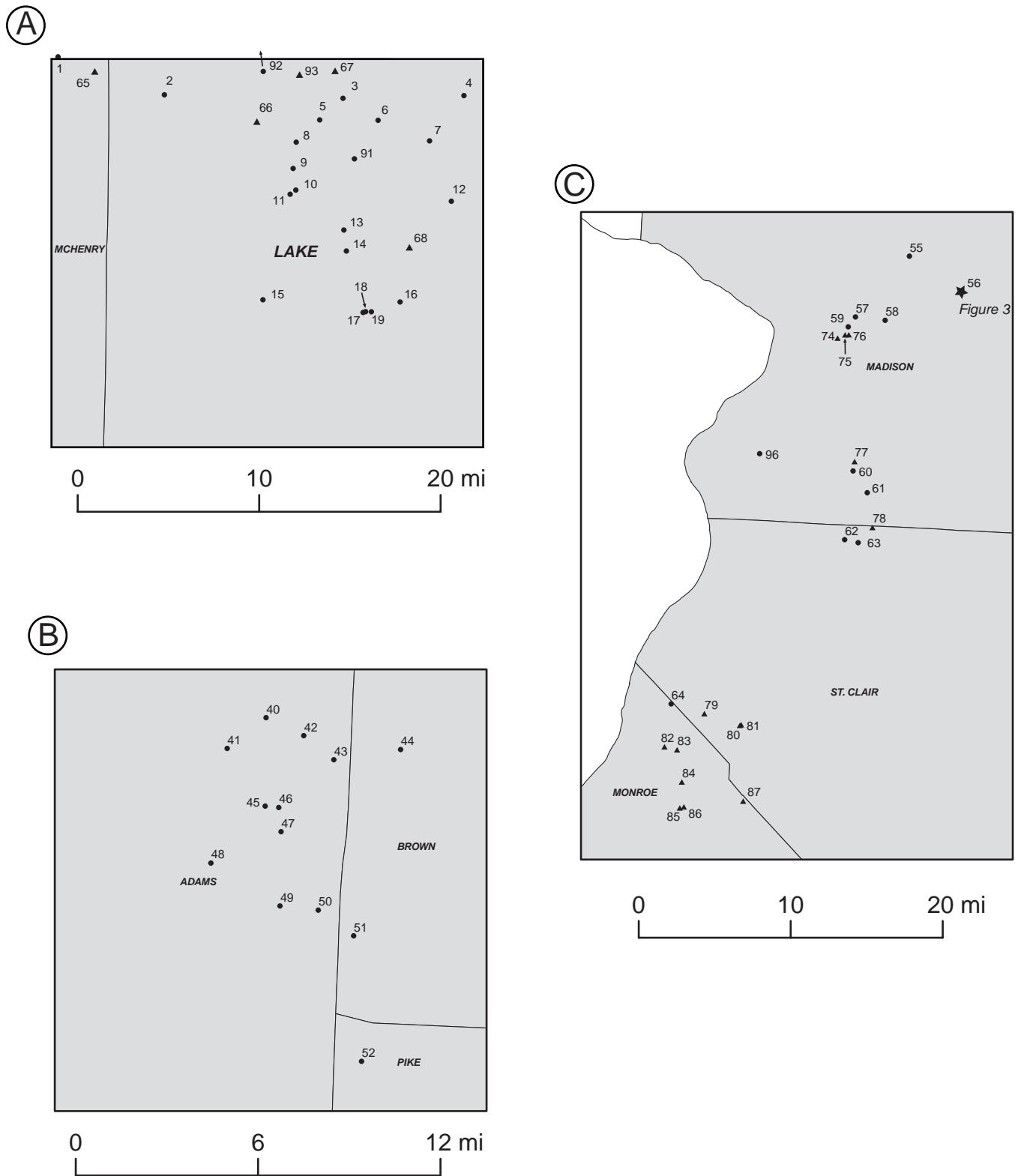


Figure 2 Inset maps showing locations of high-density sampling in the northeast (A), west-central (B) and southwest (C) regions outlined in Figure 1. The sample site numbers correspond to borings and exposures presented in Figure 1.

Table 1 Sample collection and analysis information for the project.

Prepared by	Number of Samples	Size Fraction	Number of Duplicate Pairs	Analyzed by	Analytical Method
USGS	34	<63 µm	0	SGS Mineral Services	ICP-AES, ICP-MS
ISGS	387	<63 µm	38	ACME Analytical Laboratories	ICP-MS, ICP-ES
GSC	118	<2 µm	8	ACME Analytical Laboratories	ICP-MS, ICP-ES

* A total of 505 samples were collected and submitted for trace and whole rock determinations

Canada, where they were subjected to aqua regia digestion and analysis for 30 elements by ICP-MS. Thirty-eight duplicate samples were included for quality control. If sufficient material and funds were available, the sample was also analyzed for major oxides by ICP-ES, using lithium borate fusion (11 oxides and 7 minor elements). The results of these analyses are listed in Appendices G and H.

One hundred and three samples were submitted to the Geological Survey of Canada (GSC) and prepared for clay separation using centrifugation and decantation, following standard Canadian government laboratory protocols outlined by Shilts and Lindsey (1995) and Girard et al (2004). Prepared samples were returned to the ISGS and up to ten-gram splits were sent to ACME Analytical Laboratories for elemental and major oxide analyses by ICP-MS and ICP-ES. Eight duplicate samples were included for quality control. Results of geochemical analyses on the clay-fraction are presented in Appendices I and J.

Quality Assurance and Quality Control

To discriminate geochemical trends related to geological factors from those that result from anthropogenic influences, spurious sampling, or analytical errors, a number of QA/QC measures were used. To estimate local variations in geochemical concentrations in these materials, 21 field duplicates were collected and incorporated into silt and clay and clay sample sets submitted to ACME Analytical Laboratories by the ISGS (Appendices G through J). For this study, field duplicates are defined as two distinct samples collected from adjacent locations in core samples or outcrops. These duplicate samples were randomly submitted to the laboratory without any indication of their proximity. An additional 25 split samples were submitted to ACME Analytical Laboratories for estimating the consistency of laboratory results

Split samples consisted of equivalent subsamples taken from single samples following the sample preparation process, but preceding geochemical analyses. The QA/QC scheme used for sample collection and analysis is outlined in Figure 3. Commonly, there is greater variability between the field duplicate pairs as compared to the split sample pairs as the former represents two different adjacent samples, whereas the latter represents two parts of the same sample.

The submission of material control standards was used to evaluate analytical accuracies. Geochemical reference materials TILL-2 and TILL-4 from CANMET Mining and Mineral Sciences Laboratories in Ottawa, Ontario, Canada, or San Joaquin Soil from the National Institute of Standards and Technology (NIST) were submitted to ACME Analytical Laboratories with each batch of samples. The control standards were submitted as blind samples. Specific information pertaining to these control reference materials are not provided in this report, but can be obtained from Natural Resources Canada and NIST. Also, ACME Analytical Laboratories inserted their own internal laboratory standards (DS2, DS3, DS4, DS5, SO-15/CSB, and SO-17/CSB) in the analysis to monitor matrix affects and internal drifts.

Scatter plots of analytical results from duplicate field and split sample pairs for the <0.063 mm and <0.002 mm fractions are presented for selected elements for ICP-MS (As, Cu, Pb, Hg, Sr, and Zn) and ICP-ES (iron oxide and magnesium oxide) in Figures 4 and 5. Correlation coefficients (*r*-values) for each pair were also calculated. The results show good reproducibility (*r* > 0.9) for most field duplicates, with correlation coefficients for arsenic, lead, mercury, zinc, iron oxide, and magnesium oxide ranging from 0.835 to 0.998 (Figure 4). Split sample pairs show an even higher degree of correlation with *r*-values between 0.991 and 1.000 for the same elements (Figure 5) as expected, due to the higher number of variables introduced in the field sampling process.

Geochemistry of Glacial Sediments

Differentiating between sediments from glacial stratigraphic units in Illinois based upon their physical character (e.g., grain size, color, moisture content, and compaction) has been a challenge with limited success because some adjacent sediments of different age have similar characteristics. Previous studies (e.g., Parkhurst, 1975; Glass and Killey, 1987; Hughes et al, 1994) have utilized clay mineral composition to distinguish stratigraphic units, but this method has had limited success because of

multiple analytical apparatus and operators, semi-quantitative results, complex sediment transport histories, and incomplete mapping/analysis of source bedrock units.

Geochemical analysis of the matrix (silt and clay) portion of glacial sediment is a common tool for provenance studies. Till is considered preferred medium for analysis since it is considered to be the first derivative of bedrock (Shilts, 1993). During transport by glaciers, fragments of bedrock are continually ground down (communition) resulting in constituent elements being redistributed into different grain-size fractions (Dreimanis and Vagners, 1971). In this communition process, many elements are concentrated in the finest (clay-sized) fraction.

In Table 2 and Figure 6 show, the elemental distribution is shown for the $<0.002\text{ mm}$ fraction of the diamicton collected from borehole PT-C1 (Site 56) in the southwest region (Figures 1 and 2c). Elemental and whole rock concentrations (e.g., arsenic, copper, zinc and iron oxide) collected from diamicton correlated to the Pre-Illinois Episode (Banner Formation) are generally higher than those from the overlying Illinois Episode (Glasford Formation) diamicton. Differences in geochemistry between the two units may be attributed to differing source areas – although glaciers during Illinois and Pre-Illinois Episodes advanced from the Labrador ice-center located to the northeast over the Province of Quebec, the Glasford diamicton was deposited by glaciers that followed a more northern trajectory through the Lake Michigan basin whereas the Banner Formation diamicton was deposited by glaciers flowing out of the Lake Michigan or Lake Erie basins (Geological Survey of Canada, 1970; Prest, 1984; Fulton, 1989).

Another example is the geochemical data for both the $<0.063\text{ mm}$ and $<0.002\text{ mm}$ fractions of diamictons collected from borehole Fulton-45 (Site 35 in Figures 1 and 2b) in the west-central region are presented in Figure 7 and Table 3. As with the previous example, geochemical differences exist between lithostratigraphic units. Diamictons from the Illinois Episode Glasford Formation have higher concentrations of arsenic, zinc, and magnesium oxide when compared to the Pre-Illinois Episode diamictons, with the Hulick Member of the Glasford Formation having the highest concentrations. Variations in chemical composition observed between the Illinois and pre-Illinois Episode deposits may also be attributed to the differing parent materials that the glaciers overrode. In this part of Illinois, the Pre-Illinois Episode diamictons were deposited by glaciers that advanced from the north and northwest, whereas the Glasford Formation diamictons were deposited by ice that advanced from the northeast out of the Lake Michigan Basin (Willman and Frye, 1970). The anomalously high elemental concentrations measured at 62 feet below ground surface within the Alburnett Formation diamicton may indicate post-depositional oxidation and weathering of the originally deposited material.

Comparison of elemental concentration in the $<0.063\text{ mm}$ and $<0.002\text{ mm}$ fractions of diamicton from the Fulton-45 borehole shows an overall increase of elemental concentrations in the finer fraction, especially for arsenic, copper, and zinc (Figure 7). This data suggests that geochemical partitioning of metal-rich phyllosilicate minerals has occurred in the clay-size ($<0.002\text{ mm}$) fraction (cf. Shilts, 1995). Therefore, it is important to know the type and proportion of minerals present, the size fraction being analyzed, and whether post-depositional reworking or weathering has occurred.

Summary

This report is a summary of the geochemical data collected from select glacial sediments within Illinois between 2000 and 2004. These data have been used to assist with mapping of the surface and subsurface glacial deposits and to estimate the source units of sediments. Combined with geological information from field outcrops and other sources, geochemical data can assist in identifying both gradual and abrupt changes in sediment elemental compositions (Shilts, 1993). The results from two boreholes illustrate the use of geochemical data to more accurately resolve the stratigraphic assignment of specific glacial deposits (cf. Kettles, 1980).

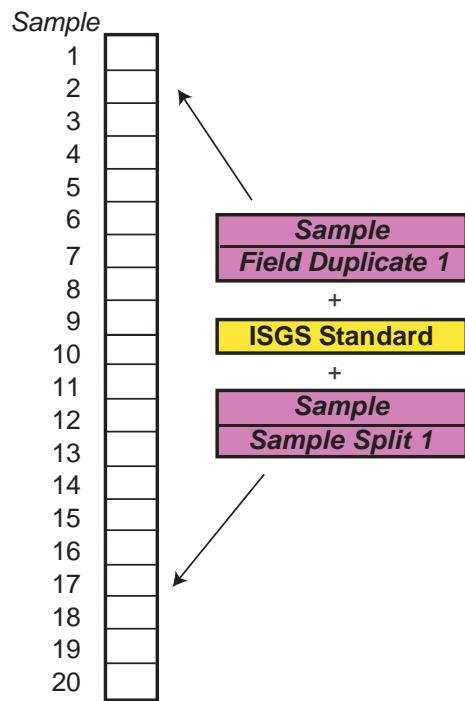


Figure 3 Typical 20-sample block QA/QC scheme used for sampling and analysis in this geochemical study. In every 20 samples submitted to ACME, one field duplicate and split sample pair, and ISGS standard was included. Duplicates and split samples were taken for the preceding sample submitted. The scheme is adapted from similar QA/QC schemes used by the British Columbia Geological Survey and the Geological Survey of Canada for regional geochemical surveys.

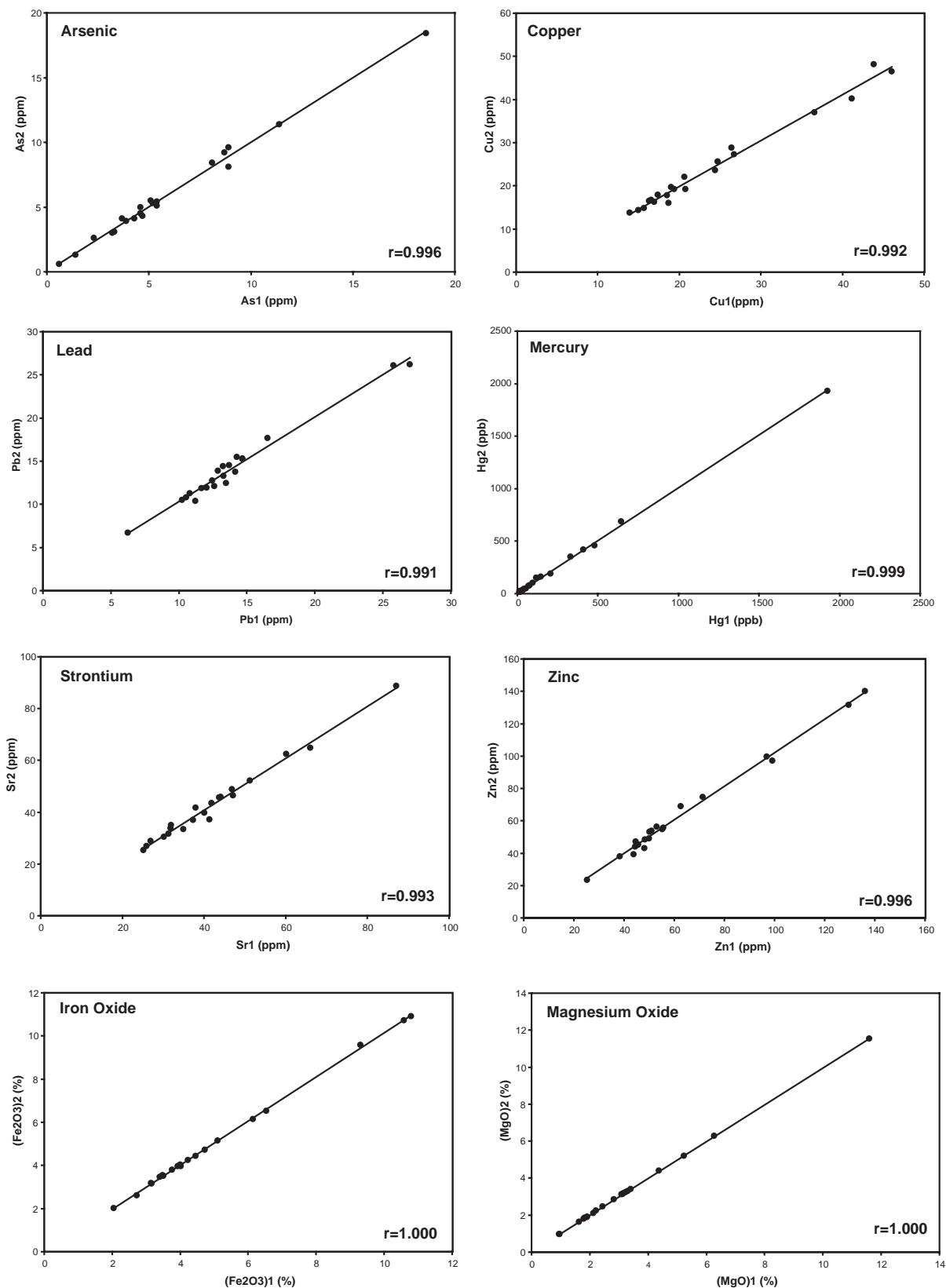


Figure 4 Scatter plots of split sample data for arsenic, copper, lead, mercury, strontium, zinc, iron oxide, and magnesium oxide from the <0.063 mm and <0.002 mm fractions using ICP-MS and ICP-ES methods.

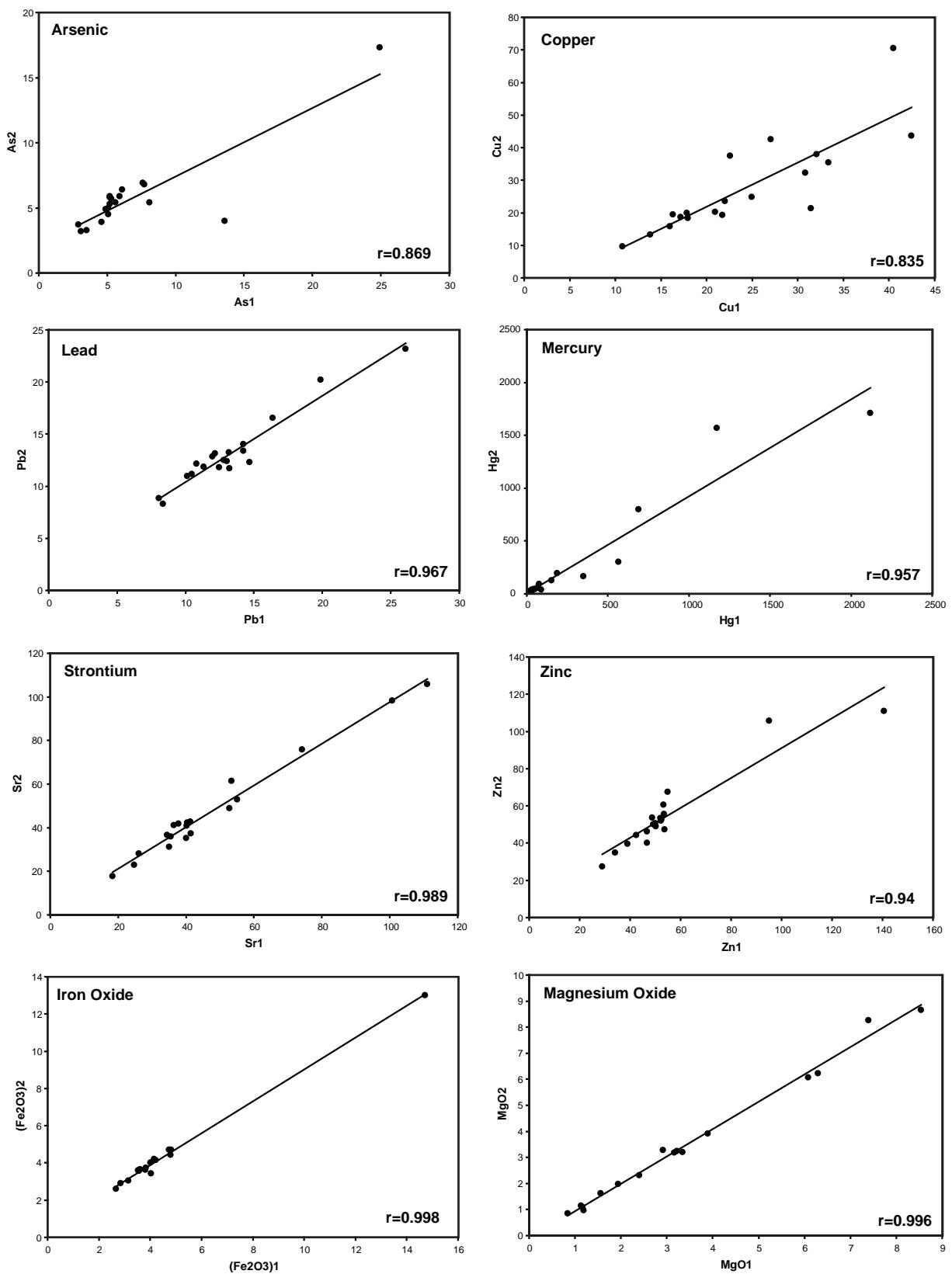


Figure 5 Scatter plots of field duplicate data for arsenic, copper, lead, mercury, strontium, zinc, iron oxide, and magnesium oxide from the <0.063 mm and <0.002 mm fractions using ICP-MS and ICP-ES methods.

Table 2 Summary of selected geochemical data for borehole PT-C1

Sample No.	Depth (feet)	Formation or Member	Arsenic	Copper	Lead	Mercury	Strontium	Zinc	Iron Oxide	Magnesium Oxide
			As (ppm)	Cu (ppm)	Pb (ppm)	Hg (ppb)	Sr (ppm)	Zn (ppm)	Fe ₂ O ₃ (wt. %)	MgO (wt. %)
		<2 µm	<2 µm	<2 µm	<2 µm	<2 µm	<2 µm	<2 µm	<2 µm	<2 µm
203089	19	Glasford	4.0	34.57	21.38	49	36.2	106.0	6.83	3.67
203090	29	Glasford	5.2	29.26	21.19	46	38.0	98.0	7.59	3.64
203091	48	Banner	6.2	41.06	24.75	59	63.7	134.5	8.56	2.63
203092	72	Banner	8.4	42.88	24.45	55	64.1	144.9	9.25	2.62
203093	92	Banner	9.5	37.65	25.11	51	54.4	123.7	8.77	2.48
203094	112	Banner	9.1	33.08	25.33	43	50.6	114.5	8.97	2.34
203095	123	Banner	11.4	36.76	25.94	24	51.7	130.6	9.31	2.21
203097	133.5	Banner	12.4	43.19	39.20	55	53.5	180.2	9.08	1.89

Sample No.	Depth (feet)	Formation or Member	Arsenic As (ppm)		Copper Cu (ppm)		Lead Pb (ppm)		Mercury Hg (ppb)		Strontium Sr (ppm)		Zinc Zn (ppm)		Iron Oxide Fe ₂ O ₃ (wt. %)		Magnesium Oxide MgO (wt. %)		
			<2 µm	<63 µm	<2 µm	<63 µm	<2 µm	<63 µm	<2 µm	<63 µm	<2 µm	<63 µm	<2 µm	<63 µm	<2 µm	<63 µm	<2 µm	<63 µm	
No.	63µm																		
203043	102062	20	Hulick	15.1	8.6	44.79	24.50	22.26	13.96	167	87	31.9	36.5	110.0	56.2	10.51	4.87	1.68	2.00
203044	102060	25	Hulick	24.9	8.7	42.45	23.50	26.03	12.56	2119	631	41.4	45.2	140.7	54.3	14.71	5.95	1.56	2.11
203046	102059	32	Hulick	18.6	11.4	41.15	24.98	27.00	14.63	480	278	47.1	48.0	136.2	68.5	10.58	5.07	1.83	1.73
203048	102058	37	Hulick	4.2	8.1	44.05	32.17	20.93	16.56	525	548	65.9	57.9	82.9	78.7	5.56	3.49	1.87	1.37
203049	102057	42	Kellerville	6.5	4.7	23.49	22.21	11.22	12.72	524	357	65.2	44.1	75.2	47.7	5.98	4.27	1.82	2.13
203050	102056	47	Kellerville	5.8	7.2	33.73	23.89	15.73	13.66	720	266	51.2	48.7	88.2	64.7	7.68	4.52	1.62	1.88
203051	102055	52	Wolf Creek	6.1	3.4	26.74	14.39	19.37	15.97	99	48	22.8	29.1	68.5	29.0	8.46	4.39	1.48	0.86
203052	102054	55	Wolf Creek	3.3	6.2	33.90	23.95	19.77	13.93	314	500	28	44.5	86.5	53.3	7.46	5.26	1.57	1.86
203053	102053	57	Wolf Creek	3.2	4.3	23.91	16.74	22.81	15.35	110	66	19.9	32.5	71.6	39.3	8.55	4.26	1.42	1.05
203054	102051	60	Wolf Creek	3.6	5.1	26.48	17.96	22.94	16.38	182	348	22.9	35.5	79.8	53.6	7.98	4.01	1.51	1.13
203055	102050	62	Alburnett	31.8	13.0	47.30	32.01	20.79	14.23	2845	1808	54.8	46.9	140.8	59.9	13.24	6.37	1.53	1.72
203056	102059	67	Alburnett	9.2	7.1	33.44	17.37	24.43	12.71	418	628	33.5	34.9	94.2	42.0	8.88	3.80	1.64	1.76

Table 3 Summary of selected geochemical data for borehole Fulton-45

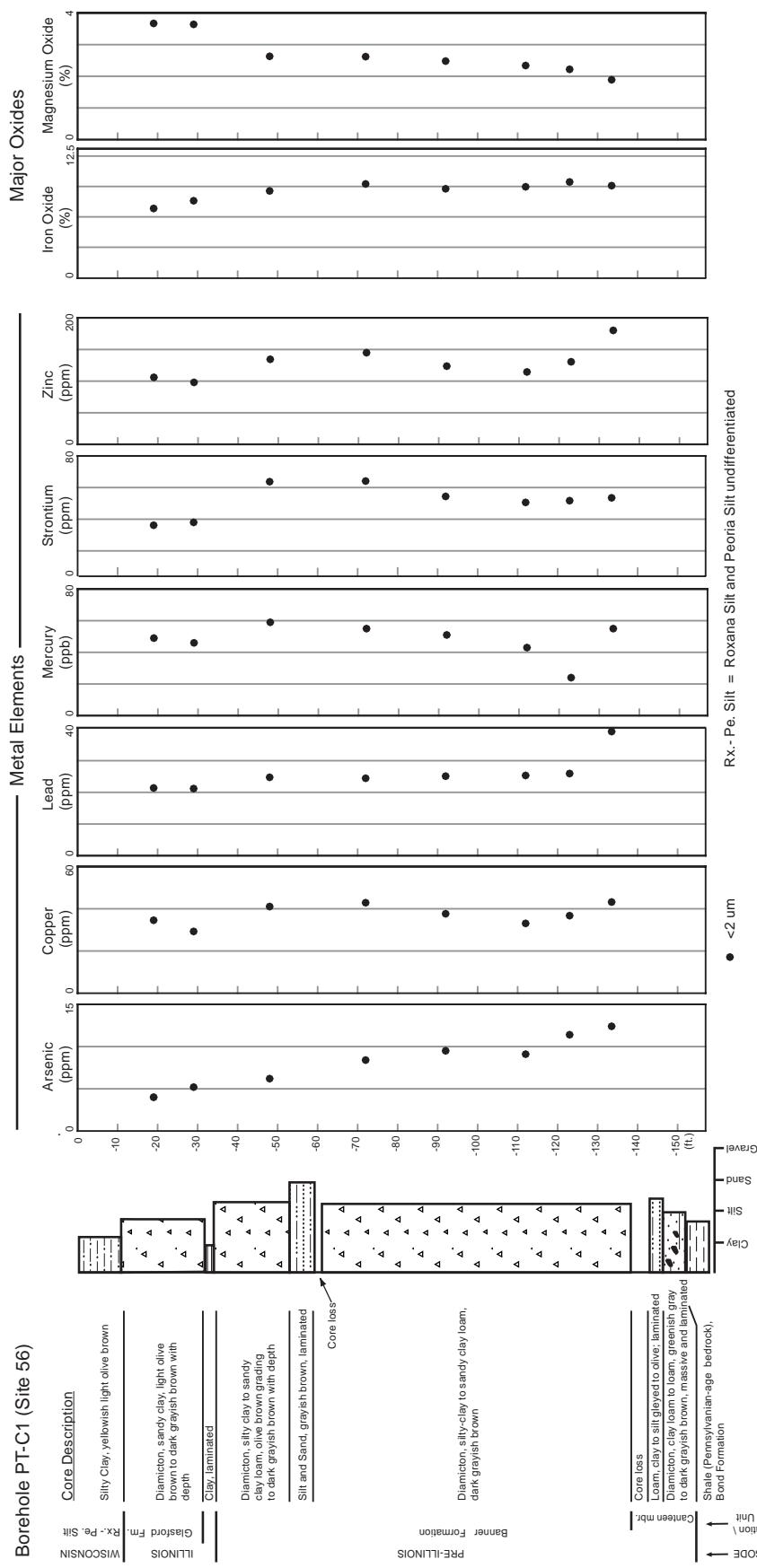


Figure 6 Geological log for borehole PT-C1 from the southwestern region with associated stratigraphic and lithologic data. The elemental concentrations of arsenic, lead, mercury, zinc, iron oxide, and magnesium oxide from the <0.002 mm fraction of diamictite are shown. See Figures 1 and 2 for the location of borehole PT-C1.

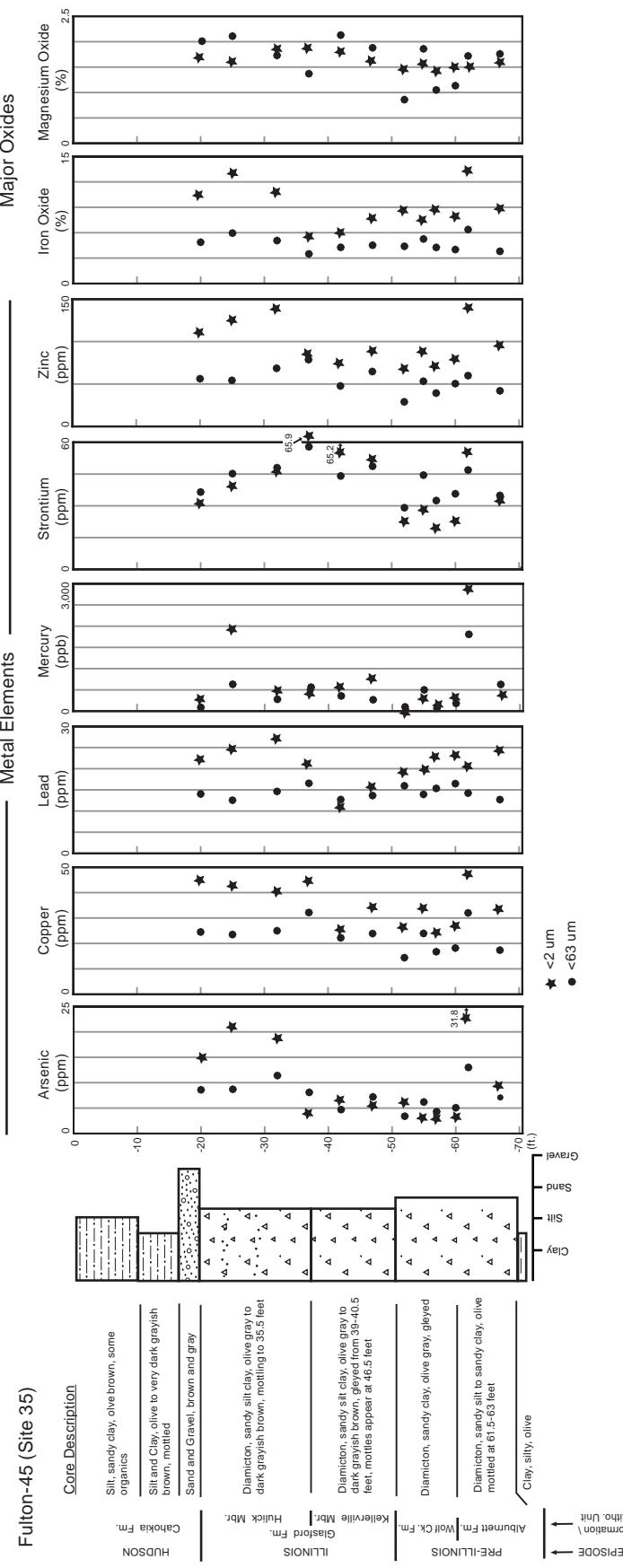


Figure 7 Geological log for borehole Fulton-45 from the west-central region with associated stratigraphic and lithologic data. The elemental concentrations of arsenic, lead, mercury, zinc, iron oxide, and magnesium oxide from the <0.063 mm and <0.002 mm fractions of diamictite are shown. See Figures 1 and 2 for the location of borehole Fulton-45.

Size-fraction based geochemical data also should be beneficial for hydrogeological and environmental studies, because the clay minerals can adsorb significant quantities of dissolved pollutants due to typically high exchange capacities, and non-colloidal minerals within the clay fraction are the first to weather and will release potentially toxic trace elements that can be a human or environmental health risk (Shilts, 1995).

Acknowledgements

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Appendix A

Location and geologic information for geochemical sampling sites in the
northeast region of the project area

(Lake and McHenry Counties in Illinois; Kenosha County in Wisconsin)

KENOSHA COUNTY, WISCONSIN

Boring Number: 92

Field Id: ADW-00-025

API Number: 480590000100

Core Number: NA

Location Description: Johnson property, 243rd Court, Paddock Lake, Wisconsin

Legal Description: NE-NW-NW, 2-1N-20E

Latitude, Longitude: N42.581339°, W88.105606°

Elevation: 831 feet

Depth (ft)	Description	Formation	Member	Sample No				
				<2 µm (ICP-MS)	<2 µm (ICP-ES)	<63 µm (ICP-MS)	<63 µm (ICP-ES)	<63 µm (ICP-AES)
10.0	Diamicton, silty clay loam, brown	Wadsworth	undivided	-	-	100079	100079	-
16.0	Diamicton, silty clay, dark gray	Wadsworth	undivided	-	-	100080	100080	-
30.0	Diamicton, silty clay, dark gray	Wadsworth	undivided	-	-	100082	100082	-
40.0	Diamicton, silty clay, dark gray	Wadsworth	undivided	-	-	100083	100083	-
50.0	Diamicton, silty clay, dark gray	Wadsworth	undivided	-	-	100084	100084	-
60.0	Diamicton, silty clay, dark gray	Wadsworth	undivided	-	-	100085	100085	-
70.0	Diamicton, silty clay, dark gray	Wadsworth	undivided	-	-	100086	100086	-
80.0	Diamicton, silty loam, dark gray	Wadsworth	undivided	-	-	100087	100087	-
90.0	Diamicton, silty loam, dark gray	Wadsworth	undivided	-	-	100088	100088	-
100.0	Diamicton, silty loam, dark gray	Wadsworth	undivided	-	-	100089	100089	-
105.0	Diamicton, sandy clay, dark gray	Wadsworth	undivided	-	-	100090F	100090F	-

Boring Number: 1

Field Id: FOX-01-07

API Number: 480590001200

Core Number: NA

Location Description: In field north of State Line Road; Rawlins Farm property

Legal Description: SW-SW-SE, 34-1N-19E

Latitude, Longitude: N42.495925°, W88.232164°

Elevation: 982 feet

Depth (ft)	Description	Formation	Member	Sample No				
				<2 µm (ICP-MS)	<2 µm (ICP-ES)	<63 µm (ICP-MS)	<63 µm (ICP-ES)	<63 µm (ICP-AES)
7.5	Diamicton, sandy loam, yellowish brown	Lemont	Haeger	-	-	-	-	C-225623
13.5	Diamicton, sandy loam	Lemont	Haeger	-	-	-	-	C-225624
22.5	Diamicton, sandy loam, yellowish brown	Lemont	Haeger	-	-	-	-	C-225625
32.0	Diamicton, sandy loam, dark yellowish brown	Lemont	Haeger	-	-	-	-	C-225626
39.5	Diamicton, sandy loam, dark yellowish brown	Lemont	Haeger	-	-	-	-	C-225627

LAKE COUNTY

Exposure Number: 66

Field Id: ADW-00-013

API Number: 120974282400

Location Description: Exposure on gravel road east of Illinois Route 59

Legal Description: NE-NE-SE, 18-46N-10E

Latitude, Longitude: N42.466391°, W88.103447°

Elevation: 802 feet

Depth (ft)	Description	Formation	Member	Sample No				
				<2 µm (ICP-MS)	<2 µm (ICP-ES)	<63 µm (ICP-MS)	<63 µm (ICP-ES)	<63 µm (ICP-AES)
3.0	Diamicton, silty clay, grayish brown	Wadsworth	Valparaiso	-	-	100022	100022	-

Exposure Number: 68

Field Id: ADW-00-016

API Number: 120974282500

Location Description: Samples collected from a pit on north-west corner of Illinois Route 45 and Sand Lake Road.

Legal Description: NE-NE-SE, 1-45N-10E

Latitude, Longitude: N42.407351°, W88.004233°

Elevation: 743 feet

Depth (ft)	Description	Formation	Member	Sample No				
				<2 µm (ICP-MS)	<2 µm (ICP-ES)	<63 µm (ICP-MS)	<63 µm (ICP-ES)	<63 µm (ICP-AES)
3.0	Diamicton, silty clay, dark grey	Wadsworth	Valparaiso	-	--	100029	100029	-

Exposure Number: 67

Field Id: ADW-00-017

API Number: 120974282600

Location Description: Exposure on north side of Illinois Route 173

Legal Description: SW-SE-NE, 3-46N-10E

Latitude, Longitude: N42.491068°, W88.053503°

Elevation: 810 feet

Depth (ft)	Description	Formation	Member	Sample No				
				<2 µm (ICP-MS)	<2 µm (ICP-ES)	<63 µm (ICP-MS)	<63 µm (ICP-ES)	<63 µm (ICP-AES)
3.0	Diamicton, clayey, dark gray	Wadsworth	Valparaiso	-	--	100034	-	-

Exposure Number: 93

Field Id: ADW-00-018

API Number: 120974282700

Location Description: Exposure at edge of hill northeast of intersection of North Avenue and Nelson Street

Legal Description: SE-SW-SW, 4-46N-10E

Latitude, Longitude: N42.489802°, W88.077095°

Elevation: 857 feet

Depth (ft)	Description	Formation	Member	Sample No				
				<2 µm (ICP-MS)	<2 µm (ICP-ES)	<63 µm (ICP-MS)	<63 µm (ICP-ES)	<63 µm (ICP-AES)
3.3	Diamicton, sandy	Wadsworth	Valparaiso	-	--	100012	100012	-
5.7	Diamicton, sandy	Wadsworth	Valparaiso			100013	100013	
8.2	Diamicton, sandy	Wadsworth	Valparaiso			100014	100014	
10.7	Diamicton, sandy	Wadsworth	Valparaiso			100015	100015	
13.1	Diamicton, sandy	Wadsworth	Valparaiso			100016A	100016A	
15.6	Diamicton, sandy	Wadsworth	Valparaiso			100018	100018	
18.0	Diamicton, sandy	Wadsworth	Valparaiso			100019	100019	
20.5	Diamicton, sandy	Wadsworth	Valparaiso			100020	100020	

Boring Number: 19

Field Id: ANT-00-01

API Number: 120974269700

Core Number: NA

Location Description: North-side of Rollins Savanna Forest Preserve access road near the bend in Drury Lane

Legal Description: SE-NW-SE, 14-45N-10E

Latitude, Longitude: N42.375967°, W88.033503°

Elevation: 781 feet

Depth (ft)	Description	Formation	Member	Sample No				
				<2 µm (ICP-MS)	<2 µm (ICP-ES)	<63 µm (ICP-MS)	<63 µm (ICP-ES)	<63 µm (ICP-AES)
11.0	Diamicton, silt loam, dark grayish brown to light olive brown, some oxidation along fractures	Wadsworth	Valparaiso	-	-	100002	-	-
16.0	Diamicton, silty clay, dark gray	Wadsworth	Valparaiso	-	-	100003	-	-
20.0	Sand and silt, gray, laminated	Wadsworth	Valparaiso	-	-	100004	-	-
25.0	Silt and clay, dark gray	Wadsworth	Valparaiso	-	-	100005	100005	-
31.0	Diamicton, silty clay loam, dark grayish brown	Wadsworth	Valparaiso	-	-	100006	-	-
36.0	Diamicton, silt clay loam, dark grayish brown	Wadsworth	Valparaiso	-	-	100007	-	-
41.0	Diamicton, clay loam, dark gray	Wadsworth	Valparaiso	-	-	100008F	-	-
46.0	Diamicton, clay loam, dark gray	Wadsworth	Valparaiso	-	-	100010	-	-
50.0	Diamicton, silty clay loam	Wadsworth	Valparaiso	-	-	100011	100011	-

Boring Number: 17

Field Id: ANT-00-02

API Number: 120974269800

Core Number: NA

Location Description: Rollins Savanna Forest Preserve, approximately 500 feet east of boring ANT-00-01

Legal Description: SE-NW-SE, 14-45N-10E

Latitude, Longitude: N42.376332°, W88.031893°

Elevation: 779 feet

Depth (ft)	Description	Formation	Member	Sample No				
				<2 µm (ICP-MS)	<2 µm (ICP-ES)	<63 µm (ICP-MS)	<63 µm (ICP-ES)	<63 µm (ICP-AES)
20.0	Diamicton, gray to grayish brown	Wadsworth	Valparaiso	-	-	100050	-	-
30.0	Diamicton, silt clay loam, dark gray	Wadsworth	Valparaiso	-	-	100051	100051	-
40.0	Diamicton, silty clay, laminated	Wadsworth	Valparaiso	-	-	100052	-	-
50.0	Diamicton, silty, dark gray	Wadsworth	Valparaiso	-	-	100053	100053	-

Boring Number: 18

Field Id: ANT-00-03

API Number: 120974269900

Core Number: NA

Location Description: Rollins Savanna Forest Preserve, 1000 feet east of boring ANT-00-02

Legal Description: SE-NW-SE, 14-45N-10E

Latitude, Longitude: N42.37632°, W88.028213°

Elevation: 782 feet

Depth (ft)	Description	Formation	Member	Sample No				
				<2 µm (ICP-MS)	<2 µm (ICP-ES)	<63 µm (ICP-MS)	<63 µm (ICP-ES)	<63 µm (ICP-AES)
10.0	Diamicton, loam to silt loam, dark gray	Wadsworth	Valparaiso	-	-	100054	100054	-
20.0	Diamicton, clay loam, dark gray	Wadsworth	Valparaiso	-	-	100055	-	-
30.0	Diamicton, silty clay loam, dark grayish brown	Wadsworth	Valparaiso	-	-	100056	100056	-
40.0	Diamicton, silt loam, dark grayish brown to light olive brown	Wadsworth	Valparaiso	-	-	100057	-	-
50.0	Silt and clay, dark gray, laminated	Wadsworth	Valparaiso	-	-	100058	100058	-

Boring Number: 11

Field Id: ANT-00-04

API Number: 120974270000

Core Number: NA

Location Description: Access road in Sun Lake Forest Preserve

Legal Description: NW-NE-SW, 28-46N-10E

Latitude, Longitude: N42.431919°, W88.081390°

Elevation: 786 feet

Depth (ft)	Description	Formation	Member	Sample No				
				<2 µm (ICP-MS)	<2 µm (ICP-ES)	<63 µm (ICP-MS)	<63 µm (ICP-ES)	<63 µm (ICP-AES)
10.0	Diamicton, silty clay loam to silt loam, dark grayish brown	Wadsworth	Valparaiso	-	-	100074	100074	-
19.0	Silt and clay, gray, laminated	Wadsworth	Valparaiso	-	-	100075	-	-
30.0	Diamicton, silt loam to silty clay loam, gray	Wadsworth	Valparaiso	-	-	100076	100076	-
40.5	Diamicton, silt clay loam, gray	Wadsworth	Valparaiso	-	-	100077	-	-
50.0	Sand, silt and clay, light gray to gray, laminated	Wadsworth	Valparaiso	-	-	100078	100078	-

Boring Number: 10

Field Id: ANT-00-05

API Number: 120974270100

Core Number: NA

Location Description: Along access road into Sun Lake Forest Preserve

Legal Description: NW-NE-SW, 28-46N-10E

Latitude, Longitude: N42.433927°, W88.077785°

Elevation: 781 feet

Depth (ft)	Description	Formation	Member	Sample No				
				<2 µm (ICP-MS)	<2 µm (ICP-ES)	<63 µm (ICP-MS)	<63 µm (ICP-ES)	<63 µm (ICP-AES)
10.0	Diamicton, silt clay, brown	Wadsworth	Valparaiso	-	-	100116	100116	-
13.0	Diamicton, sand clay, gray	Wadsworth	Valparaiso	-	-	100117	100117	-
20.0	Silt and clay, massive, gray	Wadsworth	Valparaiso	-	-	100118	100118	-
30.0	Silt and clay, massive, gray	Wadsworth	Valparaiso	-	-	100123	100123	-
47.0	Diamicton, clay loam, gray to dark gray	Wadsworth	Valparaiso	-	-	100122	100122	-

Boring Number: 16

Field Id: ANT-00-06

API Number: 120974270200

Core Number: NA

Location Description: Rollins Savanna Forest Preserve, south of Rollins Road

Legal Description: NW-NE-SW, 13-45N-10E

Latitude, Longitude: N42.381176°, W88.009780°

Elevation: 777 feet

Depth (ft)	Description	Formation	Member	Sample No				
				<2 µm (ICP-MS)	<2 µm (ICP-ES)	<63 µm (ICP-MS)	<63 µm (ICP-ES)	<63 µm (ICP-AES)
10.0	Diamicton, clay loam, light olive brown, interbedded with silt and fine sand	Wadsworth	Valparaiso	-	-	100137	100137	-
19.0	Diamicton, sand clay loam, gray	Wadsworth	Valparaiso	-	-	100138	100138	-
30.0	Diamicton, clay loam, dark gray to dark grayish brown	Wadsworth	Valparaiso	-	-	100139	100139	-
40.0	Silt, crudely laminated, gray to dark gray	Wadsworth	Valparaiso	-	-	100140	100140	-
50.0	Diamicton, sand clay, gray	Wadsworth	Valparaiso	-	-	100142	100142	-

Boring Number: 12

Field Id: ANT-00-07

API Number: 120974270300

Core Number: NA

Location Description: Duck Farm Forest Preserve, south of Illinois Route 132

Legal Description: NW-NE-NE, 3-45N-10E

Latitude, Longitude: N42.41516°, W88.046495°

Elevation: 795 feet

Depth (ft)	Description	Formation	Member	Sample No				
				<2 µm (ICP-MS)	<2 µm (ICP-ES)	<63 µm (ICP-MS)	<63 µm (ICP-ES)	<63 µm (ICP-AES)
10.0	Diamicton, sandy clay loam, dark gray to gray	Wadsworth	Valparaiso	-	-	100151	100151	-
20.0	Diamicton, sandy clay loam, dark gray	Wadsworth	Valparaiso	-	-	100152	100152	-
30.0	Diamicton, gravelly, gray	Wadsworth	Valparaiso	-	-	100153	100153	-
37.0	Diamicton, clay loam, gray to dark gray	Wadsworth	Valparaiso	-	-	100154	100154	-
50.0	Diamicton, silty clay, gray	Wadsworth	Valparaiso	-	-	100155	100155	-

Boring Number: 9

Field Id: ANT-00-08

API Number: 120974270400

Core Number: NA

Location Description: South of Grass Lake Road in Sun Lake Forest Preserve

Legal Description: NW-NW-NW, 28-46N-10E

Latitude, Longitude: N42.444202°, W88.079662°

Elevation: 792 feet

Depth (ft)	Description	Formation	Member	Sample No				
				<2 µm (ICP-MS)	<2 µm (ICP-ES)	<63 µm (ICP-MS)	<63 µm (ICP-ES)	<63 µm (ICP-AES)
10.0	Diamicton, clay loam, brown to yellowish brown, mottled	Wadsworth	Valparaiso	-	-	100124	100124	-
17.0	Diamicton, clay loam to sandy clay, gray to dark gray	Wadsworth	Valparaiso	-	-	100125	100125	-
29.0	Diamicton, clay loam, dark gray to gray, some silt beds	Wadsworth	Valparaiso	-	-	100126	100126	-
33.5	Diamicton, clay loam, gray, very few clasts	Wadsworth	Valparaiso	-	-	100127	100127	-
39.5	Silt, clay and fine sand, gray, laminated	Wadsworth	Valparaiso	-	-	100128A	100128A	-
48.5	Diamicton, silt clay loam, gray to grayish brown	Wadsworth	Valparaiso	-	-	100130	100130	-

Boring Number: 6

Field Id: ANT-00-09

API Number: 120974270500

Core Number: NA

Location Description: In field north of Illinois Route 173

Legal Description: NE-SE-NE, 14-46N-10E

Latitude, Longitude: N42.467695°, W88.025362°

Elevation: 811 feet

Depth (ft)	Description	Formation	Member	Sample No				
				<2 µm (ICP-MS)	<2 µm (ICP-ES)	<63 µm (ICP-MS)	<63 µm (ICP-ES)	<63 µm (ICP-AES)
9.5	Diamicton, clay loam, brown to yellowish brown, bleached	Wadsworth	Valparaiso	-	-	100156	100156	-
20.0	Diamicton, clay loam to sandy clay loam, dark gray to gray	Wadsworth	Valparaiso	-	-	100157	100157	-
30.0	Diamicton, clay loam to loam, dark gray to grayish brown, contained inclusions of oxidized materials	Wadsworth	Valparaiso	-	-	100158	100158	-
40.0	Diamicton, loam to clay loam, grayish brown	Wadsworth	Valparaiso	-	-	100160	100160	-
50.0	Diamicton, clay loam, gray	Wadsworth	Valparaiso	-	-	100159	100159	-

Boring Number: 14

Field Id: ANT-00-10

API Number: 120974270600

Core Number: NA

Location Description: South end of Douglas Lane in Duck Farm Forest Preserve

Legal Description: NE-SE-SE, 3-45N-10E

Latitude, Longitude: N42.405179°, W88.044749°

Elevation: 785 feet

Depth (ft)	Description	Formation	Member	Sample No				
				<2 µm (ICP-MS)	<2 µm (ICP-ES)	<63 µm (ICP-MS)	<63 µm (ICP-ES)	<63 µm (ICP-AES)
9.5	Diamicton, sandy loam, brown to yellowish brown	Wadsworth	Valparaiso	-	-	100131	100131	-
20.0	Diamicton, silt clay loam, gray	Wadsworth	Valparaiso	-	-	100132	100132	-
30.0	Diamicton, silt clay loam, gray	Wadsworth	Valparaiso	-	-	100119	100119	-
39.0	Diamicton, clay loam, grayish brown	Wadsworth	Valparaiso	-	-	100119, 100133	100119, 100133	-
40.0	Diamicton, clay loam, grayish brown	Wadsworth	Valparaiso	-	-	100120, 100134F	100120, 100134F	-
50.0	Diamicton, clay loam to silt clay loam, grayish brown to dark grayish brown	Wadsworth	Valparaiso	-	-	100136	100136	-

Boring Number: 5

Field Id: ANT-02-26

API Number: 120974475000

Core Number: NA

Location Description: In field on northwest corner of Illinois Route 173 and Deep Lake Road

Legal Description: SE-SE-NE, 16-46N-10E

Latitude, Longitude: N42.467521°, W88.062948°

Elevation: 792 feet

Depth (ft)	Description	Formation	Member	Sample No				
				<2 µm (ICP-MS)	<2 µm (ICP-ES)	<63 µm (ICP-MS)	<63 µm (ICP-ES)	<63 µm (ICP-AES)
233.0	Diamicton, gravelly sandy loam, brown	Tiskilwa	-	-	-	-	-	C-225612

Boring Number: 15

Field Id: ANT-02-27

API Number: 120974551500

Core Number: NA

Location Description: In undeveloped lot to east of the Round Lake Heights village hall building

Legal Description: NE-SW-NW, 17-45N-10E

Latitude, Longitude: N42.381401°, W88.097997°

Elevation: 770 feet

Depth (ft)	Description	Formation	Member	Sample No				
				<2 µm (ICP-MS)	<2 µm (ICP-ES)	<63 µm (ICP-MS)	<63 µm (ICP-ES)	<63 µm (ICP-AES)
36.0	Diamicton, silty clay, dark grayish brown	Wadsworth	Valparaiso	-	-	-	-	C-225613
61.0	Silt, silt loam, dark grayish brown, massive	Equality	undivided	-	-	-	-	C-225614
85.5	Diamicton, silty clay	Wadsworth	undivided	-	-	-	-	C-225615
136.0	Diamicton, loam to sandy loam, gray	Lemont	Haeger	-	-	-	-	C-225616
139.5	Diamicton, loam to sandy loam, light brownish gray	Lemont	Haeger	-	-	-	-	C-225617
195.5	Diamicton, loam to silty clay, brown	Older sediment	-	-	-	-	-	C-225618

Boring Number: 8

Field Id: ADW-00-03B

API Number: 120974281500

Core Number: ELL-2

Location Description: A lake core taken at west arm of East Loon Lake

Legal Description: NE-NW-NW, 21-46N-10E

Latitude, Longitude: N42.45675°, W88.077833°

Elevation: 770 feet

Depth (ft)	Description	Formation	Member	Sample No				
				<2 µm (ICP-MS)	<2 µm (ICP-ES)	<63 µm (ICP-MS)	<63 µm (ICP-ES)	<63 µm (ICP-AES)
18.5	Diamicton, silt-clay, dark gray	Wadsworth	Valparaiso	-	-	100035	-	-
22.0	Diamicton, silt-clay, dark gray	Wadsworth	Valparaiso	-	-	100036	100036	-
24.0	Diamicton, silt-clay, dark gray	Wadsworth	Valparaiso	-	-	100037	-	-
26.0	Diamicton, silt-clay, dark gray	Wadsworth	Valparaiso	-	-	100038	100038	-

Boring Number: 2

Field Id: FOX-01-04

API Number: 120974298800

Core Number: NA

Location Description: East side of Wells Lane north of Illinois Route 173

Legal Description: NW-SE-NE, 10-46N-9E

Latitude, Longitude: N42.478505°, W88.163222°

Elevation: 758 feet

Depth (ft)	Description	Formation	Member	Sample No				
				<2 µm (ICP-MS)	<2 µm (ICP-ES)	<63 µm (ICP-MS)	<63 µm (ICP-ES)	<63 µm (ICP-AES)
6.5	Diamicton, sandy loam, brown	Lemont	Haeger	-	-	-	-	C-225619
16.5	Diamicton, silty clay, dark reddish gray	Tiskilwa	undivided	-	-	-	-	C-225620
21.5	Diamicton, brown, sandy loam, calcareous	Tiskilwa	undivided	-	-	-	-	C-225621
24.5	Diamicton, clay loam, reddish brown, calcareous	Tiskilwa	undivided	-	-	-	-	C-225622

Boring Number: 3

Field Id: ADW-00-02B

API Number: 120974281400

Core Number: RWS-04

Location Description: A lake core taken from west side of Red Wing Slough

Legal Description: SE-SW-NE, 10-46N-10E

Latitude, Longitude: N42.477978°, W88.048133°

Elevation: 770 feet

Depth (ft)	Description	Formation	Member	Sample No				
				<2 µm (ICP-MS)	<2 µm (ICP-ES)	<63 µm (ICP-MS)	<63 µm (ICP-ES)	<63 µm (ICP-AES)
6.5	Diamicton, silt-sand, gray	Wadsworth	Valparaiso	-	-	100023	-	-
8.0	Diamicton, silt-sand, gray	Wadsworth	Valparaiso	-	-	100024	-	-
10.0	Diamicton, silt-sand, gray	Wadsworth	Valparaiso	-	-	100025	100025	-

Boring Number: 4

Field Id: WAD-00-01

API Number: 120974271100

Core Number: NA

Location Description: In field southeast of intersection of Hunt Club Road and West Edwards Road

Legal Description: NW-NW-SE, 8-46N-11E

Latitude, Longitude: N42.479934°, W87.970232°

Elevation: 754 feet

Depth (ft)	Description	Formation	Member	Sample No				
				<2 µm (ICP-MS)	<2 µm (ICP-ES)	<63 µm (ICP-MS)	<63 µm (ICP-ES)	<63 µm (ICP-AES)
10.0	Diamicton, clay loam, yellowish brown	Wadsworth	undivided	-	-	100166	100166	-
20.0	Diamicton, sandy clay loam to clay loam, dark gray to gray	Wadsworth	undivided	-	-	100167	100167	-
30.0	Diamicton, sandy clay loam, gray	Wadsworth	undivided	-	-	100168	100168	-
40.0	Diamicton, sandy clay, gray to dark grayish brown, slightly bleached	Wadsworth	undivided	-	-	100169	100169	-
41.5	Diamicton, silt clay loam, grayish-brown, calcareous	Wadsworth	undivided	-	-	-	-	C-225628
49.0	Diamicton, gravelly, gray to brownish gray	Wadsworth	undivided	-	-	-	-	C-225629
49.5	Diamicton, clay loam to sandy clay loam dark gray to grayish brown	Wadsworth	undivided	-	-	100170F	100170F	-

Boring Number: 13

Field Id: WAD-01-02

API Number: 120974298200

Core Number: NA

Location Description: In field to west of intersection of Hunt Club Road and Millburn-Wadsworth Road

Legal Description: SW-SW-SE, 29-46N-11E

Latitude, Longitude: N42.429494°, W87.977578°

Elevation: 726 feet

Depth (ft)	Description	Formation	Member	Sample No				
				<2 µm (ICP-MS)	<2 µm (ICP-ES)	<63 µm (ICP-MS)	<63 µm (ICP-ES)	<63 µm (ICP-AES)
29.0	Diamicton, clay loam to sand clay loam, gray	Wadsworth	undivided	-	-	-	-	C-225630
39.0	Diamicton, clay loam to silty-clay, gray to grayish-brown	Wadsworth	undivided	-	-	-	-	C-225631
49.0	Diamicton, sandy clay loam to clay loam, dark grayish-brown	Wadsworth	undivided	-	-	-	-	C-225632
59.0	Diamicton, silty-clay, grayish-brown	Wadsworth	undivided	-	-	-	-	C-225633

Boring Number: 7

Field Id: WAD-02-09

API Number: 120974473800

Core Number: NA

Location Description: Along the west side of Crawford Road at entrance to Ethel's Woods County Forest Preserve

Legal Description: NE-NE-NW, 19-46N-11E

Latitude, Longitude: N42.458151°, W87.992043°

Elevation: 795 feet

Depth (ft)	Description	Formation	Member	Sample No				
				<2 µm (ICP-MS)	<2 µm (ICP-ES)	<63 µm (ICP-MS)	<63 µm (ICP-ES)	<63 µm (ICP-AES)
166.0	Diamicton, silty clay to silt	Wadsworth	undivided, proglacial	-	-	-	-	C-225634
173.5	Diamicton, silty clay	Wadsworth	undivided, proglacial	-	-	-	-	C-225635
194.0	Diamicton, silty clay	Wadsworth	undivided, proglacial	-	-	-	-	C-225636
221.0	Silt, clayey, grayish brown, massive	older sediment	-	-	-	-	-	C-225637
224.0	Silt, clayey, grayish brown, massive	older sediment	-	-	-	-	-	C-225638
256.5	Diamicton, gravelly sandy loam, light brownish gray, calcareous	bedrock diamicton	-	-	-	-	-	C-225639

Boring Number: 91

Field Id: ANTI-00-001

API Number: 1209744282100

Core Number: NA

Location Description: On Martin property, west of intersection of Savage Road and Millar Road; 30 feet northwest of barn

Legal Description: NE-NE-NW, 19-46N-11E

Latitude, Longitude: N42.446163°, W88.039084°

Elevation: 788 feet

Depth (ft)	Description	Formation	Member	Sample No				
				<2 µm (ICP-MS)	<2 µm (ICP-ES)	<63 µm (ICP-MS)	<63 µm (ICP-ES)	<63 µm (ICP-AES)
6.5	Diamicton, silty clay, light olive brown	Wadsworth	undivided	-	-	100042	100042	-
11.5	Diamicton, silty clay, light brown	Wadsworth	undivided	-	-	100043	100043	-
16.5	Diamicton, silty clay, light brown	Wadsworth	undivided	-	-	100044A	100044A	-
26.5	Diamicton, silty clay, light brown	Wadsworth	undivided	-	-	100046	100046	-
31.5	Silt, silt, dark gray	Wadsworth	undivided			100039F	100039F	
36.5	Diamicton, silt loam; dark gray	Wadsworth	undivided	-	-	100047	100047	-
41.5	Silt, silty clay, brown	Wadsworth	undivided	-	-	100048	100048	-
46.5	Diamicton, dark gray	Wadsworth	undivided			100049	100049	
51.5	Diamicton, dark gray	Wadsworth	undivided			100062	100062	
56.5	Diamicton, dark gray	Wadsworth	undivided			100059F	100059F	
61.5	Diamicton, dark gray	Wadsworth	undivided			100063	100063	
65.5	Diamicton, silt loam, dark gray	Wadsworth	undivided			100064	100064	
71.5	Diamicton, silt loam, pebbly	Wadsworth	undivided			100065	100065	
76.5	Diamicton, silt loam, pebbly	Wadsworth	undivided			100066	100066	
81.5	Diamicton, loamy, dark gray	Wadsworth	undivided			100067	100067	
86.5	Diamicton, sandy loam, dark gray	Wadsworth	undivided			100068	100068	

MCHENRY COUNTY

Exposure Number: 65

Field Id: ADW-00-11

API Number: 121113797800

Location Description: Samples from north-facing exposure in the Payne and Dolan Inc. gravel pit west of Wilmot Road

Legal Description: SW-SW-SE, 5-46N-9E

Latitude, Longitude: N42.489253°, W88.208288°

Elevation: 895 feet

Depth (ft)	Description	Formation	Member	Sample No				
				<2 µm (ICP-MS)	<2 µm (ICP-ES)	<63 µm (ICP-MS)	<63 µm (ICP-ES)	<63 µm (ICP-AES)
1.0	Diamicton, sandy loam, brown	Lemont	Haeger	-	-	100026	100026	-
3.0	Diamicton, sandy loam, brown	Lemont	Haeger	-	-	100027	100027	-
5.0	Diamicton, sandy loam, brown	Lemont	Haeger	-	-	100028	100028	-

Boring Number: 20

Field Id: WAUC-02-12

API Number: 121114023800

Core Number: NA

Location Description: In open lot next to McHenry County's Prairieview Education Center

Legal Description: NE-NE-SE, 25-44N-8E

Latitude, Longitude: N42.263175°, W88.239753°

Elevation: 843 feet

Depth (ft)	Description	Formation	Member	Sample No				
				<2 µm (ICP-MS)	<2 µm (ICP-ES)	<63 µm (ICP-MS)	<63 µm (ICP-ES)	<63 µm (ICP-AES)
94.0	Diamicton, loam to clay loam, grayish brown	Tiskilwa	undivided	-	-	-	-	C-225640
116.5	Diamicton, silt loam to loam	Tiskilwa	undivided	-	-	-	-	C-225641
143.0	Diamicton, silt loam to loam, brown	Glasford	undivided	-	-	-	-	C-225642
155.0	Diamicton, silt loam	Glasford	undivided	-	-	-	-	C-225643
166.0	Diamicton, silt loam	Glasford	undivided	-	-	-	-	C-225644
206.0	Diamicton, loam to clay loam, light brownish-gray	bedrock diamicton	-	-	-	-	-	C-225645

F= Duplicate sample from field outcrop, drill core, or drill-cutting sample

A= Duplicate of sample obtained from silt and clay or clay separations

NA= No number assigned

Appendix B

Location and geologic information for geochemical sampling sites in the west-central region of the project area

(Adams, Brown, Fulton, Hancock, Henderson, Henry, Knox, McDonough, Mercer, Peoria, Pike, and Warren Counties in Illinois)

ADAMS COUNTY

Boring Number: 39
Field Id: Adams-3
API Number: 120012257800
Core Number: C-9156
Location Description: At railway bridge over Illinois Route 24
Legal Description: NE-NW-SW, 35-1N-7W
Latitude, Longitude: N40.026797°, W91.182903°
Elevation: 710 feet

Depth (ft)	Description	Formation	Member	Sample No				
				<2 µm (ICP-MS)	<2 µm (ICP-ES)	<63 µm (ICP-MS)	<63 µm (ICP-ES)	<63 µm (ICP-AES/MS)
38.0	Diamicton, pebbly sand silt, light olive brown, mottled (P-25245)	Wolf Creek	-	203034	203034	102133	102133	-
40.5	Diamicton, silty sandy, light olive brown, mottled (P-25246)	Wolf Creek	-	203035A	203035A	-	-	-
50.5	Diamicton, silty sandy, light yellowish brown, mottled (P-25247)	Wolf Creek	-	203037	203037	102134	102134	-
60.5	Diamicton, sandy silt, olive gray (P-25248)	Wolf Creek	-	203038	203038	102135	102135	-
65.5	Diamicton, sandy silt, olive (P-25249)	Wolf Creek	-	203039	203039	-	-	-
70.5	Diamicton, sandy silt, olive gray (P-25250)	Wolf Creek	-	203040	203040	102136	102136	-

Boring Number: 54
Field Id: FSH-3
API Number: 120012299800
Core Number: C-15142
Location Description: Along east side of County Road 2900E (Illinois Route 45), 4700 feet south of County Road 200N
Legal Description: SW-SW-SW, 26-3S-5W
Latitude, Longitude: N39.773290°, W90.953521°
Elevation: 840 feet

Depth (ft)	Description	Formation	Member	Sample No				
				<2 µm (ICP-MS)	<2 µm (ICP-ES)	<63 µm (ICP-MS)	<63 µm (ICP-ES)	<63 µm (ICP-AES)
20.6	Diamicton, sandy clay, yellowish brown, Mn concentrations	Alburnett	-	-	-	102118	102118	-
31.1	Diamicton, sandy clayey silt, yellowish brown	Alburnett	-	-	-	102117	102117	-
40.8	Diamicton, sandy silty clay, yellow to yellowish brown, Mn staining	Alburnett	-	-	-	102115	102115	-
48.0	Silt, clayey sand, very dark gray, gleyed (?)	Alburnett	-	-	-	102114	102114	-
56.5	Diamicton, clayey sandy silt, very dark gray	Alburnett	-	-	-	102113	102113	-
61.9	Clay, sandy silty, light yellowish brown, mottled	Baylis	-	-	-	102116	102116	-

Boring Number: 53

Field Id: FSH-5

API Number: 120012299900

Core Number: C-15144

Location Description: Northwest corner of County Road 100N and County Road 2700E

Legal Description: SE-SE-SE, 29-3S-5W

Latitude, Longitude: N39.771833°, W90.992595°

Elevation: 813 feet

Depth (ft)	Description	Formation	Member	Sample No				
				<2 µm (ICP-MS)	<2 µm (ICP-ES)	<63 µm (ICP-MS)	<63 µm (ICP-ES)	<63 µm (ICP-AES)
19.5	Diamicton, silt clay sand to silt sand clay, yellowish-brown, mottled, Mn spots	Wolf Creek	-	-	-	102009	102009	-
27.5	Diamicton, silty clayey sand, olive yellow, mottled, Mn spots	Wolf Creek	-	-	-	102110F	102110F	-
37.5	Diamicton, silty clayey sand, light olive brown, scattered Mn spots	Alburnett	-	-	-	102112	102112	-

Exposure Number: 69

Field Id: Harkness Creek

API Number: 120012315100

Location Description: In cutbank on south side of Harkness Creek

Legal Description: NW-NE-SE, 9-3S-8W

Latitude, Longitude: N39.823150°, W91.325707°

Elevation: 580 feet

Depth (ft)	Description	Formation	Member	Sample No				
				<2 µm (ICP-MS)	<2 µm (ICP-ES)	<63 µm (ICP-MS)	<63 µm (ICP-ES)	<63 µm (ICP-AES)
6.5	Diamicton, loam, dark grey	Alburnett	-	-	-	102127	102127	-
7.5	Diamicton, loam, dark grey	Alburnett	-	-	-	102128	102128	-

Boring Number: 43

Field Id: KLV-1

API Number: 120012295200

Core Number: C-14984

Location Description: Southwest corner of intersection of private drive and County Road 3050E

Legal Description: NE-NE-SW, 24-1S-5W

Latitude, Longitude: N39.966282°, W90.924332°

Elevation: 757 feet

Depth (ft)	Description	Formation	Member	Sample No				
				<2 µm (ICP-MS)	<2 µm (ICP-ES)	<63 µm (ICP-MS)	<63 µm (ICP-ES)	<63 µm (ICP-AES)
27.5	Diamicton, silt clay, olive gray, indistinct mottles	Glasford	Kellerville	-	-	101014	101014	-
33.0	Diamicton, silt clay, very dark gray, wood fragments	Glasford	Kellerville	-	-	101015	101015	-

Boring Number: 40

Field Id: KLV-4

API Number: 120012295100

Core Number: C-14987

Location Description: 1200 feet south of intersection of County Roads 1600N and 2800E; then east on private drive

Legal Description: NE-SW-NW, 15-1S-5W

Latitude, Longitude: N39.984307°, W90.968186°

Elevation: 750 feet

Depth (ft)	Description	Formation	Member	Sample No				
				<2 µm (ICP-MS)	<2 µm (ICP-ES)	<63 µm (ICP-MS)	<63 µm (ICP-ES)	<63 µm (ICP-AES)
27.0	Diamicton, clayey silt, dark gray, wood fragments	Glasford	Kellerville	-	-	101016	101016	-
34.0	Diamicton, clayey silt, dark gray, wood fragments	Glasford	Kellerville	-	-	101017	101017	-

Boring Number: 50

Field Id: KLV-5

API Number: 120012295300

Core Number: C-14988

Location Description: About 50 feet north of park headquarters/shop building parking lot in Siloam Spring State Park

Legal Description: NW-NE-SW, 13-2S-5W

Latitude, Longitude: N39.893647°, W90.930296°

Elevation: 758 feet

Depth (ft)	Description	Formation	Member	Sample No				
				<2 µm (ICP-MS)	<2 µm (ICP-ES)	<63 µm (ICP-MS)	<63 µm (ICP-ES)	<63 µm (ICP-AES)
23.0	Diamicton, clayey, yellowish brown, mottled, Mn spots	Glasford	Kellerville	-	-	101018	101018	-
33.0	Diamicton, clayey silt, light olive brown, Mn spots, coal fragments	Glasford	Kellerville	-	-	101019	101019	-
37.0	Diamicton, silt clay, light olive brown, mottled	Glasford	Kellerville	-	-	101020	101020	-
47.0	Diamicton, silt clay, grayish brown, mottled	Glasford	Kellerville	-	-	101022	101022	-

Boring Number: 45

Field Id: KLV-9

API Number: 120012295500

Core Number: C-15044

Location Description: About 720 feet south of County Road 1300N; 50 feet east of hog feeder barn on private drive

Legal Description: SW-NE-NW, 34-1S-5W

Latitude, Longitude: N39.941884°, W90.965643°

Elevation: 760 feet

Depth (ft)	Description	Formation	Member	Sample No				
				<2 µm (ICP-MS)	<2 µm (ICP-ES)	<63 µm (ICP-MS)	<63 µm (ICP-ES)	<63 µm (ICP-AES)
25.5	Diamicton, silty, dark grayish brown, coal pieces	Glasford	Kellerville	-	-	101004A	101004A	-
46.5	Diamicton, silty sand, olive brown, faint flow structures	Glasford	Kellerville	-	-	101006	101006	-
60.0	Diamicton, silt clay, dark grayish brown, flow structures	Glasford	Kellerville	-	-	101007	101007	-
72.5	Diamicton, clayey silt, dark grayish brown	Glasford	Kellerville	-	-	101008	101008	-

Boring Number: 41

Field Id: KLV-10

API Number: 120012295400

Core Number: C-15054

Location Description: East of bend in County Road 1503N, about 20 feet south of barn

Legal Description: SW-SW-NW, 21-1S-5W

Latitude, Longitude: N39.968955°, W90.990758°

Elevation: 770 feet

Depth (ft)	Description	Formation	Member	Sample No				
				<2 µm (ICP-MS)	<2 µm (ICP-ES)	<63 µm (ICP-MS)	<63 µm (ICP-ES)	<63 µm (ICP-AES)
20.0	Diamicton, silty clay, light olive brown, mottled, Mn spots, coal flakes	Glasford	Kellerville	-	-	101009	101009	-
28.0	Diamicton, sandy clayey silt, olive brown, organic flakes	Glasford	Kellerville	-	-	101010	101010	-
34.3	Diamicton, sandy clayey silt, grayish brown, oxidized spots, coaly matter	Glasford	Kellerville	-	-	101011F	101011F	-
44.0	Diamicton, clayey, gray, wood shreds	Glasford	Kellerville	-	-	101013	101013	-

Boring Number: 46

Field Id: KLV-13

API Number: 120012296000

Core Number: C-15051

Location Description: About 50 feet north of bend in County Road 2903E

Legal Description: Center of NE quarter, 34-1S-5W

Latitude, Longitude: N39.941698°, W90.957601°

Elevation: 746 feet

Depth (ft)	Description	Formation	Member	Sample No				
				<2 µm (ICP-MS)	<2 µm (ICP-ES)	<63 µm (ICP-MS)	<63 µm (ICP-ES)	<63 µm (ICP-AES)
37.5	Diamicton, clayey silt, dark gray	Glasford	Kellerville	-	-	101050	101050	-
47.2	Diamicton, sandy silty clay, dark gray	Glasford	Kellerville	-	-	101051	101051	-
59.5	Diamicton, sandy silty clay, dark gray	Glasford	Kellerville	-	-	101052	101052	-

Boring Number: 42

Field Id: KLV-16

API Number: 120012295700

Core Number: C-15054

Location Description: About 175 feet west of County Road 2950E and 920 feet north of County Road 1500N at field entrance

Legal Description: NE-SE-SW, 14-1S-5W

Latitude, Longitude: N39.976686°, W90.943869°

Elevation: 728 feet

Depth (ft)	Description	Formation	Member	Sample No				
				<2 µm (ICP-MS)	<2 µm (ICP-ES)	<63 µm (ICP-MS)	<63 µm (ICP-ES)	<63 µm (ICP-AES)
25.5	Diamicton, clayey silt, dark grayish brown, mottled	Glasford	Kellerville	-	-	101048	101048	-
34.0	Diamicton, sandy clay, light brownish gray, mottled	Wolf Creek	-	-	-	101049	101049	-

Boring Number: 49

Field Id: KLV-21

API Number: 120012296600

Core Number: C-15061

Location Description: Southeast of intersection of County Road 2873E and County Road 2753E; inside gate southwest of pond

Legal Description: NW-NW-SW, 14-2S-5W

Latitude, Longitude: N39.895035°, W90.95396°

Elevation: 690 feet

Depth (ft)	Description	Formation	Member	Sample No				
				<2 µm (ICP-MS)	<2 µm (ICP-ES)	<63 µm (ICP-MS)	<63 µm (ICP-ES)	<63 µm (ICP-AES)
36.5	Diamicton, sandy silty clay, olive to olive gray, oxidized joints (P-25231)	Wolf Creek	-	203019	203019	101038F	101038F	-
47.0	Diamicton, sandy clay, dark yellowish brown, Mn spots (P-25232)	Wolf Creek	-	203020	203020	101040	101040	-
51.5	Diamicton, sandy clay, yellowish brown, Mn spots (P-25233)	Wolf Creek	-	203022	203022	101042	101042	-
60.2	Diamicton, silty clay, light olive brown, gray subvertical channels (P-25234)	Wolf Creek	-	203023	203023	101043A	101043A	-
66.5	Diamicton, clayey, black, wood fragments (P-25235)	Wolf Creek	-	203024	203024	101045	101045	-
71.5	Diamicton, clayey, dark gray, organics (P-27236)	Wolf Creek	-	203025	203025	101046	101046	-
81.0	Diamicton, silty clay, dark olive gray, gleyed (P-25237)	Wolf Creek	-	203026	203026	101047	101047	-

Boring Number: 47

Field Id: KLV-22

API Number: 120012296400

Core Number: C-15062

Location Description: Southwest of intersection of County Road 1200N and County Road 2873E in right-of-way

Legal Description: NE-NE-NE, 3-2S-5W

Latitude, Longitude: N39.930469°, W90.955335°

Elevation: 740 feet

Depth (ft)	Description	Formation	Member	Sample No				
				<2 µm (ICP-MS)	<2 µm (ICP-ES)	<63 µm (ICP-MS)	<63 µm (ICP-ES)	<63 µm (ICP-AES)
13.5	Clay, silty, yellowish to yellowish brown, few granules and pebbles, Mn spots (<i>Sangamon Geosol</i>)	Glasford	Kellerville	-	-	101058	101058	-
17.0	Diamicton, clayey silt, light olive brown to brownish yellow, Mn spots	Glasford	Kellerville	-	-	101059	101059	-
28.5	Diamicton, sandy clayey silt, dark gray, wood fragments	Glasford	Kellerville	-	-	101060	101060	-
38.5	Diamicton, sandy clayey silt, gray, woody material	Glasford	Kellerville	-	-	101062	101062	-
48.5	Diamicton, sandy silt, very dark grayish brown and dark gray, coal granules	Glasford	Kellerville	-	-	101063	101063	-
60.5	Diamicton, sandy silt, grayish brown	Glasford	Kellerville	-	-	101064	101064	-
74.5	Diamicton, clayey, grayish brown	Glasford	Kellerville	-	-	101065	101065	-
88.5	Diamicton, clayey silt, dark grayish brown to dark gray	Glasford	Kellerville	-	-	101066	101066	-

Boring Number: 48

Field Id: KLV-23

API Number: 120012296800

Core Number: C-15070

Location Description: About 40 feet west of County Road 1100N, about 500 feet south of bend in road

Legal Description: NE-SW-NE, 8-2S-5W

Latitude, Longitude: N39.914029°, W90.997686°

Elevation: 678 feet

Depth (ft)	Description	Formation	Member	Sample No				
				<2 µm (ICP-MS)	<2 µm (ICP-ES)	<63 µm (ICP-MS)	<63 µm (ICP-ES)	<63 µm (ICP-AES)
12.0	Diamicton, silty clay and silty sand clay, yellowish brown (<i>Yarmouth Geoso</i>)	Wolf Creek	-	-	-	-	101032	101032
18.0	Diamicton, sandy clay, dark brown and gray, mottled	Wolf Creek	-	-	-	-	101033	101033
31.0	Diamicton, sandy pebbly clay, light olive brown, Mn patches	Wolf Creek	-	-	-	-	101034A	101034A
37.0	Diamicton, sandy pebbly clay, yellowish brown to brownish yellow, slightly mottled, Mn spots	Alburnett	-	-	-	-	101036	101036
38.0	Diamicton, sandy clay, dark gray	Alburnett	-	-	-	-	101037	101037

BROWN COUNTY

Boring Number: 44

Field Id: KLV-7

API Number: 120092233800

Core Number: C-14994

Location Description: Northeast end of Mayfield Landing Strip

Legal Description: NE-NE-NW, 20-1S-4W

Latitude, Longitude: N39.971789°, W90.883728°

Elevation: 733 feet

Depth (ft)	Description	Formation	Member	Sample No				
				<2 µm (ICP-MS)	<2 µm (ICP-ES)	<63 µm (ICP-MS)	<63 µm (ICP-ES)	<63 µm (ICP-AES)
24.5	Diamicton, silt clay, dark grayish brown, mottled, lineations	Glasford	Kellerville	-	-	101023	101023	-
31.5	Diamicton, sandy clay, light olive brown, gleyed	Wolf Creek	-	-	-	101024	101024	-
40.0	Diamicton, sand clay, yellowish brown, reduced streaks of gray	Wolf Creek	-	-	-	101025	101025	-
44.0	Sand and clay, gray and light yellowish brown, mottled	Baylis	-	-	-	101026	101026	-

Boring Number: 51

Field Id: KLV-12

API Number: 120092234100

Core Number: C-15047

Location Description: Siloam Spring Park, 1.2 miles from Adams-Brown county line along park road at bend where a dirt road intersects from the east

Legal Description: SE-SE-NW 19-2S-4W

Latitude, Longitude: N39.882153°, W90.907720°

Elevation: 755 feet

Depth (ft)	Description	Formation	Member	Sample No				
				<2 µm (ICP-MS)	<2 µm (ICP-ES)	<63 µm (ICP-MS)	<63 µm (ICP-ES)	<63 µm (ICP-AES)
17.5	Diamicton, sandy clayey silt, yellowish brown, Mn and Fe spots (P-25238)	Glasford	Kellerville	203027	203027	-	-	-
25.8	Diamicton, sandy clayey silt, light olive brown (P-25239)	Glasford	Kellerville	203028	203028	-	-	-
35.8	Diamicton, sandy clayey silt, light olive brown (P-25240)	Glasford	Kellerville	203029	203029	-	-	-
43.0	Diamicton, sandy silty clay, light olive brown, faint smears of oxidation, wood shreds (P-25241)	Glasford	Kellerville	203030	203030	101053F	101053F	-
53.5	Diamicton, clayey sandy silt, zones of gray and olive brown (P-25242)	Glasford	Kellerville	203031	203031	101055	101055	-
59.5	Diamicton, clayey silt, dark gray, wood fragments (P-25243)	Glasford	Kellerville	203032	203032	101056	101056	-
75.0	Diamicton, clayey silt, dark gray, wood fragments (P-25244)	Glasford	Kellerville	203033	203033	101057	101057	-

FULTON COUNTY

Boring Number: 35

Field Id: Fulton-45

API Number: 120572417100

Core Number: C-13380

Location Description: At bridge along Illinois Route 97 over Turkey Creek

Legal Description: SE-SE-SE, 4-7N-3E

Latitude, Longitude: N40.611968°, W90.160016°

Elevation: 678 feet

Depth (ft)	Description	Formation	Member	Sample No				
				<2 µm (ICP-MS)	<2 µm (ICP-ES)	<63 µm (ICP-MS)	<63 µm (ICP-ES)	<63 µm (ICP-AES)
12.0	Silt, clayey, olive, mottled (P-25251)	Cahokia	-	203042	203042	102063	102063	-
20.0	Diamicton, sandy silt, olive yellow and light gray, gleyed (P-25252)	Glasford	Hulick	203043	203043	102062	102062	-
25.0	Diamicton, sandy silt, light olive brown (P-25253)	Glasford	Hulick	203044F	203044F	102060	102060	-
32.0	Diamicton, sandy silty clay, olive yellow, mottled (P-25254)	Glasford	Hulick	203046A	203046A	102059	102059	-
37.0	Diamicton, sandy silt clay, very dark grayish brown (P-25255)	Glasford	-	203048	203048	102058	102058	-
42.0	Diamicton, sandy clay, dark grayish brown (P-25256)	Glasford	Kellerville	203049	203049	102057	102057	-
47.0	Diamicton, sandy clay, dark olive brown, mottled (P-25257)	Glasford	Kellerville	203050	203050	102056	102056	-
52.0	Diamicton, sandy clay, light olive gray, mottled (P-25258)	Wolf Creek	-	203051	203051	102055	102055	-
55.0	Diamicton, clay loam, gray (P-25259)	Wolf Creek	-	203052	203052	102054	102054	-
57.0	Diamicton, sandy clay, olive gray (P-25260)	Wolf Creek	-	203053	203053	102053	102053	-
60.0	Diamicton, sandy clay, olive gray (P-25261)	Wolf Creek	-	203054	203054	102051F	102051F	-
62.0	Diamicton, sandy clay, olive, mottled (P-25262)	Alburnett	-	203055	203055	102050	102050	-
67.0	Diamicton, sandy silt, very dark grayish brown (P-25263)	Alburnett	-	203056	203056	102049	102049	-

HANCOCK COUNTY

Boring Number: 32

Field Id: Hancock-1

API Number: 120672126400

Core Number: C-4704

Location Description: Illinois Route 95 over Spillman Creek

Legal Description: SW-SW-SW, 4-7N-7W

Latitude, Longitude: N40.624199°, W91.214117°

Elevation: 535 feet

Depth (ft)	Description	Formation	Member	Sample No			
				<2 µm (ICP-MS)	<2 µm (ICP-ES)	<63 µm (ICP-MS)	<63 µm (ICP-ES)
37.0	Diamicton, sandy and silty, dark olive gray	Alburnett	-	-	-	102002	102002
42.0	Diamicton, sandy silty, black	Alburnett	-	-	-	102003	102003
50.0	Diamicton, sandy silty, black	Alburnett	-	-	-	102004	102004
55.0	Diamicton, sandy silty, black	Alburnett	-	-	-	102005	102005

Boring Number: 37

Field Id: Hancock-13

API Number: 120672128300

Core Number: C-11898

Location Description: Elvaston grain storage silo

Legal Description: NE-SW-NW 30-5N-7W

Latitude, Longitude: N40.397696°, W91.250418°

Elevation: 660 feet

Depth (ft)	Description	Formation	Member	Sample No			
				<2 µm (ICP-MS)	<2 µm (ICP-ES)	<63 µm (ICP-MS)	<63 µm (ICP-ES)
23.0	Diamicton, sandy silty, very dark grayish brown	Glasford	Kellerville	-	-	102142A	102142A
30.0	Diamicton, pebbly sandy silty, very dark grayish brown, mottled	Wolf Creek	-	-	-	102144	102144
40.0	Diamicton, pebbly sandy silty, very dark grayish brown, trace organics	Wolf Creek	-	-	-	102145	102145

HENDERSON COUNTY

Boring Number: 28

Field Id: Henderson-9

API Number: 120712094000

Core Number: C-11827

Location Description: Bridge over South Henderson Creek

Legal Description: SE-SE-SW, 14-10N-4W

Latitude, Longitude: N40.852041°, W90.816628°

Elevation: 660 feet

Depth (ft)	Description	Formation	Member	Sample No				
				<2 µm (ICP-MS)	<2 µm (ICP-ES)	<63 µm (ICP-MS)	<63 µm (ICP-ES)	<63 µm (ICP-AES)
47.5	Diamicton, sandy clay, dark olive gray	Alburnett	-	-	-	102006	102006	-
50.0	Diamicton, sandy silt, dark olive gray	Alburnett	-	-	-	102007	102007	-

Boring Number: 23

Field Id: Henderson-10

API Number: 120712095600

Core Number: C-11828

Location Description: Bridge over Smith Creek

Legal Description: SE-NW, 19-11N-4W

Latitude, Longitude: N40.931578°, W90.894817°

Elevation: 575 feet

Depth (ft)	Description	Formation	Member	Sample No				
				<2 µm (ICP-MS)	<2 µm (ICP-ES)	<63 µm (ICP-MS)	<63 µm (ICP-ES)	<63 µm (ICP-AES)
15.0	Diamicton, silty sandy clay, dark grayish brown, coal flakes	Glasford	Kellerville	-	-	102040	102040	-
17.5	Diamicton, sandy silt, very dark brown, organic matter	Glasford	Kellerville	-	-	102042A	102042A	-
20.0	Diamicton, sandy, olive	Wolf Creek	-	-	-	102044	102044	-
27.5	Diamicton, sandy silty clay, olive, mottled	Wolf Creek	-	-	-	102045	102045	-
40.0	Diamicton, sandy silt, dark grayish brown	Wolf Creek	-	-	-	102046	102046	-
50.0	Diamicton, sandy silt, very dark grayish brown, horizontal bedding	Wolf Creek	-	-	-	102047	102047	-
60.0	Diamicton, sandy silt, very dark grayish brown	Wolf Creek	-	-	-	102048	102048	-

Boring Number: 33

Field Id: Henderson-39

API Number: 120712063500

Core Number: C-13334

Location Description: Raritan Township Road 120 over Vole Creek

Legal Description: NW-SW-NE, 31-8N-4W

Latitude, Longitude: N40.646584°, W90.894377°

Elevation: 720 feet

Depth (ft)	Description	Formation	Member	Sample No				
				<2 µm (ICP-MS)	<2 µm (ICP-ES)	<63 µm (ICP-MS)	<63 µm (ICP-ES)	<63 µm (ICP-AES)
3.0	Silt, clayey, black to very dark brown (slight reddish tinge)	Peoria Silt	-	-	-	102018	102018	-
13.0	Diamicton, silty clayey sand, very dark grayish brown, organic flakes	Glasford	Kellerville	-	-	102019	102019	-
19.0	Diamicton, sandy silty clay, very dark grayish brown	Glasford	Kellerville	-	-	102020	102020	-
23.0	Clay, silty, slightly sandy, very dark grayish brown	Wolf Creek	Lierle Clay	-	-	102022	102022	-
28.0	Diamicton, silty sandy clay, olive	Wolf Creek	-	-	-	102023	102023	-
31.0	Diamicton, silty sandy clay, olive	Wolf Creek	-	-	-	102024	102024	-
33.0	Diamicton, silty sandy clay, olive gray, mottled	Alburnett	-	-	-	102025	102025	-
38.0	Diamicton, silty sandy clay, olive with yellowish brown and dark yellowish brown mottles	Alburnett	-	-	-	102026	102026	-
43.0	Diamicton, silty sand, olive to olive yellow	Alburnett	-	-	-	102027	102027	-
46.0	Till, shaley, (or weathered shale) light olive gray	-	-	-	-	102028	102028	-

Boring Number: 29

Field Id: Henderson-48

API Number: 120712078000

Core Number: C-13593

Location Description: Stronghurst Township Road 169 over South Branch of Dixon Creek

Legal Description: SW-SE-SE, 14-9N-5W

Latitude, Longitude: N40.763814°, W90.926602°

Elevation: 590 feet

Depth (ft)	Description	Formation	Member	Sample No				
				<2 µm (ICP-MS)	<2 µm (ICP-ES)	<63 µm (ICP-MS)	<63 µm (ICP-ES)	<63 µm (ICP-AES)
10.0	Silt, clayey, black (P-25264)	Glasford	Kellerville	203057	203057	-	-	-
17.0	Diamicton, clayey sandy silt, very dark grayish brown, mottled, wood fragments (P-25265)	Wolf Creek	Lierle Clay	203058	203058	102031A	102031A	-
25.0	Diamicton, clayey sandy silt, very dark grayish brown (P-25266)	Wolf Creek	-	203059	203059	102033	102033	-
32.0	Diamicton, clayey sandy silt, very dark grayish brown (P-25267)	Wolf Creek	-	203060	203060	102034F	102034F	-
40.0	Diamicton, clayey sandy silt, very dark grayish brown (P-25268)	Wolf Creek	-	203062	203062	102036	102036	-
50.0	Diamicton, sandy silty clayey, very dark gray to very dark grayish brown, organics (P-25269)	Wolf Creek	-	203063	203063	102037	102037	-
60.0	Diamicton, clayey sandy silt, very dark brown, organics (P-25270)	Wolf Creek	-	203064	203064	102038	102038	-
65.0	Diamicton, silty sandy clay, very dark grayish brown (P-25271)	Wolf Creek	-	203065	203065	102039	102039	-

HENRY COUNTY

Boring Number: 21

Field Id: Henry-4

API Number: 120732302600

Core Number: C-4870

Location Description: Interstate 74 bridge over Mud Creek; southbound lane

Legal Description: SW-SW-NE, 13-14N-1E

Latitude, Longitude: N41.202953°, W90.331668°

Elevation: 743 feet

Depth (ft)	Description	Formation	Member	Sample No				
				<2 µm (ICP-MS)	<2 µm (ICP-ES)	<63 µm (ICP-MS)	<63 µm (ICP-ES)	<63 µm (ICP-AES)
14.0	Diamicton, loam, dark grayish brown	Wolf Creek	-	-	-	102029	102029	-
33.0	Diamicton, clay loam, very dark grayish brown	Alburnett	-	-	-	102030	102030	-

KNOX COUNTY

Boring Number: 27

Field Id: Knox-28

API Number: 120952308700

Core Number: C-10770

Location Description: Bridge over Cedar Creek; northbound lanes

Legal Description: SW-SW-NE, 17-11N-1E

Latitude, Longitude: N40.942026°, W90.409754°

Elevation: 734 feet

Depth (ft)	Description	Formation	Member	Sample No			
				<2 µm (ICP-MS)	<2 µm (ICP-ES)	<63 µm (ICP-MS)	<63 µm (ICP-ES)
12.5	Diamicton, sandy clayey silt to silty clay, light olive brown and light brownish gray, Mn spots	Glasford	-	-	-	102008	102008
17.5	Diamicton, clayey sandy silt, olive brown with dark grayish brown	Alburnett	-	-	-	102009A	102009A
22.5	Diamicton, clayey silty sand, dark olive gray	Alburnett	-	-	-	102011	102011
27.5	Diamicton, silty sandy clay, very dark gray, faint flow lines	Alburnett	-	-	-	102012	102012
37.5	Diamicton, silty sandy clay, dark olive gray	Alburnett	-	-	-	102013F	102013F
45.0	Diamicton, silty sandy clay, very dark gray, faint flow lines, wood fragments	Alburnett	-	-	-	102015	102015
57.5	Diamicton, silty sandy clay, dark grayish brown, gleyed	Alburnett?	-	-	-	102016	102016
60.0	Diamicton, sandy silty clay, olive gray, gleyed	Alburnett?	-	-	-	102017	102017

Boring Number: 26

Field Id: Knox-30

API Number: 120952309500 (does not plot in Knox County)

Core Number: C-10784

Location Description: Galesburg Township Road 6 bridge over F.A. Route 404

Legal Description: NW-SW, 19-11N-1E

Latitude, Longitude: N40.922376°, W90.441247°

Elevation: 743 feet

Depth (ft)	Description	Formation	Member	Sample No			
				<2 µm (ICP-MS)	<2 µm (ICP-ES)	<63 µm (ICP-MS)	<63 µm (ICP-ES)
15.0	Diamicton, sandy silty clay, grayish brown, mottled	Glasford	Kellerville	-	-	102086	102086
20.0	Diamicton, sandy silty clay, grayish brown, mottled, faint flow lines	Wolf Creek	-	-	-	102085	102085
35.0	Diamicton, sandy silty clay, light olive brown, bedded (?)	Wolf Creek	-	-	-	102084	102084
42.5	Diamicton, silty sandy clay, dark olive gray with of silt and/or clay	Wolf Creek	-	-	-	102083	102083
50.0	Diamicton, silty sandy clay, very dark grayish brown	Wolf Creek	-	-	-	102082	102082
52.5	Diamicton, sandy silty, olive gray	Alburnett	-	-	-	102080	102080
57.5	Diamicton, silty sandy clay, very dark gray	Alburnett	-	-	-	102079	102079

MCDONOUGH COUNTY

Boring Number: 36

Field Id: McDonough-21

API Number: 121092243000

Core Number: C-12634

Location Description: Illinois Route 41 bridge over railway

Legal Description: SW-SW-NW, 15-6N-1W

Latitude, Longitude: N40.506188°, W90.503843°

Elevation: 650 feet

Depth (ft)	Description	Formation	Member	Sample No				
				<2 µm (ICP-MS)	<2 µm (ICP-ES)	<63 µm (ICP-MS)	<63 µm (ICP-ES)	<63 µm (ICP-AES)
55.0	Diamicton, silty sandy clay, olive	Glasford	Kellerville	-	-	102137	102137	-
65.0	Diamicton, clayey silty sandy, olive, one igneous pebble noted	Wolf Creek	-	-	-	102138	102138	-
75.0	Diamicton, silty sandy clay, very dark grayish brown with "smears" of dark brown	Wolf Creek	-	-	-	102139	102139	-
80.0	Diamicton, sandy silty clay, dark olive gray	Alburnett	-	-	-	102140	102140	-

Boring Number: 38

Field Id: McDonough-48

API Number: 121092156700

Core Number: C-13199

Location Description: Chalmers Township Road 248 over Troublesome Creek

Legal Description: NW-NW-NW, 26-5N-3W

Latitude, Longitude: N40.395822°, W90.715276°

Elevation: 570 feet

Depth (ft)	Description	Formation	Member	Sample No				
				<2 µm (ICP-MS)	<2 µm (ICP-ES)	<63 µm (ICP-MS)	<63 µm (ICP-ES)	<63 µm (ICP-AES)
14.0	Diamicton, sandy silt, light olive brown, coaly flakes	Glasford	Kellerville	-	-	102129	102129	-
22.0	Diamicton, sandy silt, olive gray, some coaly flakes	Glasford	Kellerville	-	-	102130F	102130F	-
32.0	Diamicton, sandy silt, olive gray, some coaly flakes	Alburnett	-	-	-	102132	102132	-

Boring Number: 34

Field Id: McDonough-63

API Number: 121092186700

Core Number: C-13571

Location Description: Illinois Route 67 over east fork of LaMoine River

Legal Description: SW-NW-NW, 7-7N-2W

Latitude, Longitude: N40.614988°, W90.673302°

Elevation: 730 feet

Depth (ft)	Description	Formation	Member	Sample No				
				<2 µm (ICP-MS)	<2 µm (ICP-ES)	<63 µm (ICP-MS)	<63 µm (ICP-ES)	<63 µm (ICP-AES)
32.0	Diamicton, clayey silty sand, olive, mottled	Alburnett	-	-	-	102087A	102087A	-
47.0	Diamicton, clayey silty sand, very dark grayish brown	Alburnett	-	-	-	102089	102089	-
55.0	Diamicton, clayey silty sand, very dark grayish brown	Alburnett	-	-	-	102090	102090	-

MERCER COUNTY

Boring Number: 22

Field Id: Mercer-32

API Number: 121312116000

Core Number: C-13349

Location Description: Rivoli Township Road 207 over Pope Creek

Legal Description: NW-NE-NE, 2-13N-2W

Latitude, Longitude: N41.152407°, W90.572235°

Elevation: 660 feet

Depth (ft)	Description	Formation	Member	Sample No			
				<2 µm (ICP-MS)	<2 µm (ICP-ES)	<63 µm (ICP-MS)	<63 µm (ICP-ES)
27.0	Diamicton, silty clayey sandy, olive brown to light olive brown, organics	Alburnett	-	-	-	102094F	102094F
37.0	Diamicton, silty clayey sand, olive brown, organics	Alburnett	-	-	-	102093	102093
47.0	Diamicton, silty sandy clayey, dark grayish brown, faint lineations	Alburnett	-	-	-	102092	102092
59.0	Diamicton, sandy silty clay, very dark grayish brown	Alburnett	-	-	-	102091	102091

PEORIA COUNTY

Boring Number: 31

Field Id: DNLP-02-01

API Number: 121433449200

Core Number: C-15186

Location Description: Edge of right-of-way along east side of Cline Road; Eldon Stahl property

Legal Description: SW-NW-NW, 19-10N-8E

Latitude, Longitude: N40.832941°, W89.640115°

Elevation: 686 feet

Depth (ft)	Description	Formation	Member	Sample No			
				<2 µm (ICP-MS)	<2 µm (ICP-ES)	<63 µm (ICP-MS)	<63 µm (ICP-ES)
15.0	Silt, gray, organic material	-	-	-	-	102078	102078
28.0	Diamicton, brown	Tiskilwa	-	-	-	102077	102077
35.0	Diamicton, brown	Tiskilwa	-	-	-	102076	102076
56.0	Diamicton, silty loam, dark gray	Tiskilwa	-	-	-	102075	102075
71.0	Diamicton, dark gray	Tiskilwa	-	-	-	102074	102074
93.0	Diamicton, sandy loam	Tiskilwa	-	-	-	102073	102073
107.0	Diamicton, sandy loam, dark gray to grayish brown	Tiskilwa	-	-	-	102071F	102071F
115.0	Silt, gray, organic material, weak bedding and deformed	Glasford	Berry Clay	-	-	102070	102070
136.0	Diamicton, silt loam, light yellowish brown	Glasford	Hulick?	-	-	102069	102069
149.0	Diamicton, silt loam to sand loam, gray to grayish brown	Glasford	Kellerville	-	-	102068	102068
189.0	Diamicton, clay loam, dark grayish brown	Glasford	Kellerville	-	-	102067	102067
199.0	Diamicton, silt clay, pale olive to dark olive gray	-	-	-	-	102066	102066
209.0	Diamicton, silt loam to clay loam, gray to olive	-	-	-	-	102064A	102064A

Boring Number: 30

Field Id: DNLP-02-02

API Number: 121433458000

Core Number: C-15241

Location Description: In field northeast of intersection of Cline Road and West Cedars Hill Drive; Eldon Stahl property

Legal Description: SW-SW-SW, 18-10N-8E

Latitude, Longitude: N40.843848°, W89.639386°

Elevation: 714 feet

Depth (ft)	Description	Formation	Member	Sample No				
				<2 µm (ICP-MS)	<2 µm (ICP-ES)	<63 µm (ICP-MS)	<63 µm (ICP-ES)	<63 µm (ICP-AES)
10.0	Diamicton, loam, brown, some clay skins (P-25215)	Tiskilwa	-	203002	203002	-	-	-
16.0	Diamicton, silty clay loam, dark grayish brown (P-25216)	Tiskilwa	-	203003	203003	-	-	-
28.0	Diamicton, sandy clay loam, dark grayish brown (P-25217)	Tiskilwa	-	203004	203004	-	-	-
36.0	Diamicton, sandy clay loam, grayish brown (P-25218)	Tiskilwa	-	203005	203005	-	-	-
48.0	Diamicton, sandy clay loam, grayish brown (P-25219)	Tiskilwa	-	203006	203006	-	-	-
60.0	Diamicton, silty loam, dark gray to brown (P-25220)	Tiskilwa	-	203007	203007	-	-	-
70.0	Diamicton, loam, dark grayish brown (P-25221)	Tiskilwa	-	203008	203008	-	-	-
80.0	Diamicton, loam, dark grayish brown (P-25222)	Tiskilwa	-	203009	203009	-	-	-
90.0	Diamicton, silty clay loam, dark grayish brown (P-25223)	Tiskilwa	-	203010	203010	-	-	-
111.0	Diamicton, loam, dark grayish brown (P-25224)	Tiskilwa	-	203011	203011	-	-	-
117.0	Diamicton, silt loam, olive gray (P-25225)	Tiskilwa	-	203012	203012	-	-	-
150.0	Silt and clay with beds of silt and fine to very fine sand (P-25226)	-	-	203013	203013	-	-	-
196.0	Silt and clay, dark gray, laminated and bedded (P-25227)	-	-	203014	203014	-	-	-
221.0	Clay and silt, clay, dark gray, laminated, shell and wood fragments (P-25228)	-	-	203015A	203015A	-	-	-
225.0	Diamicton, sandy clay loam, dark grayish brown (P-25229)	-	-	203017	203017	-	-	-
228.0	Diamicton, sandy clay loam, dark grayish brown (P-25230)	-	-	203018	203018	-	-	-

PIKE COUNTY

Boring Number: 52

Field Id: FSH-21

API Number: 121492165900

Core Number: C-15231

Location Description: Along County Road 2850N about 1320 feet east of intersection with County Road 2454E

Legal Description: SE-SW-NE, 7-3S-4W

Latitude, Longitude: N39.822584°, W90.899491°

Elevation: 759 feet

Depth (ft)	Description	Formation	Member	Sample No			
				<2 µm (ICP-MS)	<2 µm (ICP-ES)	<63 µm (ICP-MS)	<63 µm (ICP-ES)
13.0	Diamicton, sandy silty clay, light olive brown, Mn spots	Wolf Creek	-	-	-	102124A	102124A
25.0	Diamicton, silt clay, yellowish brown, marbled, Mn spots	Wolf Creek	-	-	-	102123	102123
30.3	Diamicton, clayey silt, yellowish brown with pockets of gray and darker brown	Wolf Creek	-	-	-	102122	102122
34.2	Diamicton, clayey, gray with hint of dark olive brown	Wolf Creek	-	-	-	102120	102120
42.7	Diamicton, silty clay, dark gray	Wolf Creek	-	-	-	102119	102119

WARREN COUNTY

Boring Number: 24

Field Id: Warren-1

API Number: 121872168500

Core Number: C-4940

Location Description: Community hospital in Monmouth

Legal Description: SE-SE-SW, 19-11N-2W

Latitude, Longitude: 40.922180 N, -90.660802 W

Elevation: 750 feet

Depth (ft)	Description	Formation	Member	Sample No				
				<2 µm (ICP-MS)	<2 µm (ICP-ES)	<63 µm (ICP-MS)	<63 µm (ICP-ES)	<63 µm (ICP-AES)
65.0	Diamicton, silty, gravelly, brownish gray	Alburnett	-	-	-	102096	102096	-

Boring Number: 25

Field Id: Warren-60

API Number: 121872151100

Core Number: C-13557

Location Description: Coldbrook Township Road 174B and Tributary of Cedar Creek

Legal Description: NW-SW-NW, 32-11N-1W

Latitude, Longitude: N40.898726°, W90.537001°

Elevation: 730 feet

Depth (ft)	Description	Formation	Member	Sample No				
				<2 µm (ICP-MS)	<2 µm (ICP-ES)	<63 µm (ICP-MS)	<63 µm (ICP-ES)	<63 µm (ICP-AES)
17.0	Diamicton, sandy silt, dark grayish brown to olive brown	Wolf Creek	-	-	-	102102	102102	-
27.0	Diamicton, clayey sandy silt, dark grayish brown	Wolf Creek	-	-	-	102100	102100	-
37.0	Silt, clayey, some sand and few pebbles, very dark grayish brown	Wolf Creek	-	-	-	102099	102099	-
45.0	Diamicton, sandy clayey silt, dark olive gray to black, faint fine bedding, few organic flakes	Alburnett	-	-	-	102098	102098	-
55.0	Diamicton, clayey sandy silt, very dark grayish brown, few black coal fragments	Alburnett	-	-	-	102097	102097	-

F= Duplicate sample from field outcrop, drill core, or drill-cutting sample

A= Duplicate of sample obtained from silt and clay or clay separations

Appendix C

Location and geologic information for geochemical sampling sites in the southwest region of the project area

(Jackson, Madison, Monroe, and St. Clair Counties in Illinois)

JACKSON COUNTY

Exposure Number: 89

Field Id: JN166

API Number: 120772627200

Location Description: A highway excavation for a new bypass of US Route 51

Legal Description: 1465 feet from south line and 2100 feet from east line of section, 5-10S-1W

Latitude, Longitude: N37.67669°, W89.235167°

Elevation: 500 feet

Depth (ft)	Description	Formation	Member	Sample No				
				<2 µm (ICP-MS)	<2 µm (ICP-ES)	<63 µm (ICP-MS)	<63 µm (ICP-ES)	<63 µm (ICP-AES)
3.0	Diamicton	Glasford	-	-	-	100147A	100147A	

Exposure Number: 90

Field Id: JN176

API Number: 120772627300

Location Description: A cut bank on the west side of Sycamore Creek

Legal Description: 1400 feet from north line and 950 feet from west line of section, 12-10S-1W

Latitude, Longitude: N37.669149°, W89.168133°

Elevation: 450 feet

Depth (ft)	Description	Formation	Member	Sample No				
				<2 µm (ICP-MS)	<2 µm (ICP-ES)	<63 µm (ICP-MS)	<63 µm (ICP-ES)	<63 µm (ICP-AES)
11.0	Diamicton	Glasford	-	-	-	100149F	100149F	-

MADISON COUNTY

Boring Number: 61

Field Id: B-1

API Number: 121192766700

Core Number: NA

Location Description: Water storage tower south of Head Street

Legal Description: 1060 feet from north line and 1260 feet from west line of section, 21-3N-8W

Latitude, Longitude: N38.689806°, W89.989333°

Elevation: 546 feet

Depth (ft)	Description	Formation	Member	Sample No			
				<2 µm (ICP-MS)	<2 µm (ICP-ES)	<63 µm (ICP-MS)	<63 µm (ICP-ES)
69.0	Diamicton, silt to silty clay, dark gray	Glasford	-	-	-	100163	100163
79.0	Diamicton, silt to silty clay, dark gray	Banner?	-	-	-	100164	100164
119.0	Diamicton, silty clay, brown	Banner?	-	-	-	100165	100165

Boring Number: 58

Field Id: EV-C1

API Number: 121192805700

Core Number: C-15217

Location Description: Abandoned Smith Drive, between Springfield Drive and the railway

Legal Description: 25 feet south and 160 feet east of the SE corner of NW quarter of the section, 27-5N-8W

Latitude, Longitude: N38.854621°, W89.974392°

Elevation: 510 feet

Depth (ft)	Description	Formation	Member	Sample No			
				<2 µm (ICP-MS)	<2 µm (ICP-ES)	<63 µm (ICP-MS)	<63 µm (ICP-ES)
31.0	Diamicton, sandy clay loam, dark grayish brown, wood fragments, calcareous (P-25273)	Glasford	-	203072	203072	-	-
41.0	Diamicton, sandy clay loam, dark grayish brown, wood fragments, calcareous (P-25274)	Glasford	-	203703	203703	-	-
51.0	Silty clay loam to sandy clay loam, dark gray to dark gray brown, sparse ostracode and wood fragments (P-25275)	Glasford?/ Petersburg	-	203074	203074	-	-
63.3	Silty clay loam to sandy clay loam, dark gray to dark gray brown, sparse ostracode and wood fragments (P-25276)	Glasford?/ Petersburg	-	203075F	203075F	-	-
75.0	Silty clay loam to sandy clay loam, dark gray to dark gray brown, sparse ostracode and wood fragments (P-25277)	Glasford?/ Petersburg	-	203077	203077	-	-
102.5	Diamicton, silty clay to silty clay loam, grayish green, leached (P-25278)	Banner	-	203078	203078	-	-
107.5	Diamicton, silty clay to silty clay loam, olive gray, leached (P-25279)	Banner	-	203079	203079	-	-

Exposure Number: 77

Field Id: MM10

API Number: 121192914300

Location Description: On steep side-slope exposure along a ravine

Legal Description: 1300 feet from the south line and 900 feet from the east line of the section, 8-3N-8W

Latitude, Longitude: N38.719661°, W90.006800°

Elevation: 500 feet; reference point from top of ravine

Depth (ft)	Description	Formation	Member	Sample No				
				<2 µm (ICP-MS)	<2 µm (ICP-ES)	<63 µm (ICP-MS)	<63 µm (ICP-ES)	<63 µm (ICP-AES)
16.0	Diamicton, silt loam, gray	Glasford	-	-	-	100097	100097	-

Boring Number: 60

Field Id: MNK-2

API Number: 121192821800

Core Number: C-15224

Location Description: At west edge of farm field

Legal Description: 2300 feet from the north line and 1200 feet from the east line of the section, 17-3N-8W

Latitude, Longitude: N38.710249°, W90.007788°

Elevation: 590 feet

Depth (ft)	Description	Formation	Member	Sample No				
				<2 µm (ICP-MS)	<2 µm (ICP-ES)	<63 µm (ICP-MS)	<63 µm (ICP-ES)	<63 µm (ICP-AES)
112.0	Diamicton, loam to clay loam, dark gray	Glasford	-	-	-	102103A	102103A	-

Boring Number: 55

Field Id: PRT-2

API Number: 121192828400

Core Number: C-15323

Location Description: West of James Drive, northeast of house

Legal Description: 1300 feet from north line and 300 feet from the east line of the section, 2-5N-8W

Latitude, Longitude: N38.916517°, W89.947237°

Elevation: 522 feet

Depth (ft)	Description	Formation	Member	Sample No				
				<2 µm (ICP-MS)	<2 µm (ICP-ES)	<63 µm (ICP-MS)	<63 µm (ICP-ES)	<63 µm (ICP-AES)
25.0	Diamicton, pebbly loam, dark gray to dark grayish brown (P-25280)	Glasford	-	203082	203082	-	-	-
35.0	Diamicton, pebbly loam, dark gray to very dark gray, wood fragments (P-25281)	Glasford	-	203083	203083	-	-	-
45.0	Diamicton, pebbly loam, dark gray to very dark gray, wood fragments (P-25282)	Glasford	-	203084	203084	-	-	-
88.0	Diamicton, silty clay, dark gray, wood fragments (P-25283)	Banner	-	203085	203085	-	-	-
98.0	Diamicton, silty clay, dark gray, wood fragments (P-25284)	Banner	-	203086	203086	-	-	-
101.0	Diamicton, silty clay, dark gray, wood fragments (P-25285)	Banner	-	203087	203087	-	-	-
107.0	Diamicton, silty clay, dark gray, wood fragments (P-25286)	Banner	-	203088	203088	-	-	-

Boring Number: 56

Field Id: PT-C1

API Number: 121192803500

Core Number: N/A

Location Description: Along farm road east of Manix River; Brase property

Legal Description: 2640 feet from south line and 2610 feet from west line of section, 16-5N-7W

Latitude, Longitude: N38.882144°, W -89.881775°

Elevation: 540 feet

Depth (ft)	Description	Formation	Member	Sample No				
				<2 µm (ICP-MS)	<2 µm (ICP-ES)	<63 µm (ICP-MS)	<63 µm (ICP-ES)	<63 µm (ICP-AES)
19.0	Diamicton, sandy clay, gray (P-25287)	Glasford	-	203089	203089	-	-	-
29.0	Diamicton, sandy clay, dark grayish brown, wood fragments, coal (P-25288)	Glasford	-	203090	203090	-	-	-
48.0	Diamicton, silty clay to silty clay loam, dark grayish brown, wood fragments (P-25289)	Banner	-	203091	203091	-	-	-
72.0	Diamicton, silty clay loam to silty clay, dark gray (P-25290)	Banner	-	203092	203092	-	-	-
92.0	Diamicton, silty clay, dark grayish brown, few coal, little wood fragments (P-25291)	Banner	-	203093	203093	-	-	-
112.0	Diamicton, silty clay, dark grayish brown, few coal, little wood fragments (P-25292)	Banner	-	203094	203094	-	-	-
123.0	Diamicton, silty clay, dark grayish brown, few coal, little wood fragments (P-25293)	Banner	-	203095A	203095A	-	-	-
133.5	Diamicton, silty clay, dark grayish brown (P-25294)	Banner	-	203097	203097	-	-	-

Boring Number: 57

Field Id: WDR-1

API Number: 121192832600

Core Number: NA

Location Description: Along edge of farm field, south of Rockhill Road; Fred and Pam Heepke property

Legal Description: 1800 feet from north line and 2500 feet from east line of section, 29-5N-8W

Latitude, Longitude: N38.857294°, W90.010897°

Elevation: 490 feet

Depth (ft)	Description	Formation	Member	Sample No				
				<2 µm (ICP-MS)	<2 µm (ICP-ES)	<63 µm (ICP-MS)	<63 µm (ICP-ES)	<63 µm (ICP-AES)
44.0	Diamicton, pebbly loam, grayish brown, D horizon	Glasford	-	-	-	100146	100146	-

Boring Number: 59

Field Id: WDR-2

API Number: 121192788700

Core Number: C-15152

Location Description: 50 feet south of storage bins, near edge of field; Fred and Pam Heepke property

Legal Description: 100 feet from north line and 500 feet from west line of section, 32-5N-8W

Latitude, Longitude: N38.847286°, W90.019093°

Elevation: 471 feet

Depth (ft)	Description	Formation	Member	Sample No				
				<2 µm (ICP-MS)	<2 µm (ICP-ES)	<63 µm (ICP-MS)	<63 µm (ICP-ES)	<63 µm (ICP-AES)
50.0	Diamicton, loam, dark gray	Glasford	-	-	-	100143	100143	-
51.0	Diamicton, loam, dark gray	Glasford	-	-	-	100144	100144	-
52.0	Diamicton, loam, dark gray	Glasford	-	-	-	100145	100145	-

Exposure Number: 76

Field Id: WDR-10f

API Number: 121192932000

Location Description: In large cutbank on south side of Indian Creek

Legal Description: 2500 feet from south line and 750 feet from the west line of section, 32-5N-8W

Latitude, Longitude: N38.839694°, W90.018367°

Elevation: 460 feet; reference point at top of cutbank

Depth (ft)	Description	Formation	Member	Sample No				
				<2 µm (ICP-MS)	<2 µm (ICP-ES)	<63 µm (ICP-MS)	<63 µm (ICP-ES)	<63 µm (ICP-AES)
18.0	Diamicton, pebbly silt loam to loam, olive to gray	Glasford	-	-	-	100092F	100092F	-

Exposure Number: 74

Field Id: WDR-19f

API Number: 121192931800

Location Description: In large vertical cutbank on the east side of Indian Creek

Legal Description: 1200 feet from south line and 2000 feet from west line of section, 31-5N-8W

Latitude, Longitude: N38.836205°, W90.031716°

Elevation: 487 feet; reference point at the top of cutbank

Depth (ft)	Description	Formation	Member	Sample No				
				<2 µm (ICP-MS)	<2 µm (ICP-ES)	<63 µm (ICP-MS)	<63 µm (ICP-ES)	<63 µm (ICP-AES)
54.0	Diamicton, pebbly loam, dark grayish brown	Glasford	-	-	-	100094	100094	-

Exposure Number: 75

Field Id: WDR-20f

API Number: 121192931900

Location Description: In large vertical cutbank along south side of Indian Creek

Legal Description: 2350 feet from south line and 500 feet from east line of section, 31-5N-8W

Latitude, Longitude: N38.839589°, W90.022772°

Elevation: 466 feet; reference point at top of cutbank

Depth (ft)	Description	Formation	Member	Sample No				
				<2 µm (ICP-MS)	<2 µm (ICP-ES)	<63 µm (ICP-MS)	<63 µm (ICP-ES)	<63 µm (ICP-AES)
22.0	Diamicton, pebbly loam, olive brown to light olive brown, wood pieces	Glasford	-	-	-	100095	100095	-

Boring Number: 96

Field Id: Granite City

API Number: 121192741400

Location Description: Metro East Sanitary District Site

Legal Description: 670 feet from south line and 660 feet from east line of section, 8-3N-9W

Latitude, Longitude: N38.718827°, W90.115427°

Elevation: 417 feet

Depth (ft)	Description	Formation	Member	Sample No				
				<2 µm (ICP-MS)	<2 µm (ICP-ES)	<63 µm (ICP-MS)	<63 µm (ICP-ES)	<63 µm (ICP-AES)
40.0	Sand, coarse	Cahokia	-	-	-	101027	101027	-
50.0	Sand, coarse	Cahokia	-	-	-	101028	101028	-
65.0	Sand	Cahokia	-	-	-	101029	101029	-
75.0	Sand	Cahokia	-	-	-	101030	101030	-
85.0	Silt, black	Cahokia	-	-	-	101031	101031	-

MONROE COUNTY

Boring Number: 64

Field Id: COL-4

API Number: 121332276800

Core Number: C-15048

Location Description: South edge of field above old house; several hundred feet north of Columbia Golf club house

Legal Description: 1200 feet from north line and 100 feet from west line of section, 4-1S-10W

Latitude, Longitude: N38.482379°, W90.219272°

Elevation: 455 feet

Depth (ft)	Description	Formation	Member	Sample No				
				<2 µm (ICP-MS)	<2 µm (ICP-ES)	<63 µm (ICP-MS)	<63 µm (ICP-ES)	<63 µm (ICP-AES)
34.0	Diamicton, silt, light olive brown, slightly mottled	Glasford	-	-	-	100099	100099	-
36.0	Diamicton, silty clay, dark gray to olive gray, few shells	Glasford	-	-	-	100100	100100	-
38.0	Diamicton, silty clay, dark gray to olive gray, few shells	Glasford	-	-	-	100113	100113	-
40.0	Diamicton, silty clay, dark gray to olive gray, few shells	Glasford	-	-	-	100114	100114	-
42.0	Diamicton, silty clay, dark gray to olive gray, few shells	Glasford	-	-	-	100115	100115	-

Exposure Number: 84

Field Id: COL-9f

API Number: 121332318400

Location Description: Road cut on east side of Gall Road

Legal Description: NW-NE-SE-NE, 33-1S-10W

Latitude, Longitude: N38.40884°, W90.202683°

Elevation: 510 feet; reference point at top of road cut

Depth (ft)	Description	Formation	Member	Sample No				
				<2 µm (ICP-MS)	<2 µm (ICP-ES)	<63 µm (ICP-MS)	<63 µm (ICP-ES)	<63 µm (ICP-AES)
6.0	Diamicton, silt loam, brown to yellowish brown, C horizon	Glasford	-	-	-	100103	100103	-

Exposure Number: 85

Field Id: COL-24f

API Number: 121332319400

Location Description: In gully on west bank of creek

Legal Description: NW-NE-NE, 9-2S-10W

Latitude, Longitude: N38.382565°, W90.204389°

Elevation: 545 feet

Depth (ft)	Description	Formation	Member	Sample No				
				<2 µm (ICP-MS)	<2 µm (ICP-ES)	<63 µm (ICP-MS)	<63 µm (ICP-ES)	<63 µm (ICP-AES)
21.0	Diamicton, silty clay, olive brown to orange brown, Manganese stains, C horizon	Glasford	-	-	-	100109	100109	-

Exposure Number: 86**Field Id:** COL-25f**API Number:** 121332319500**Location Description:** Along cutbank on south side of creek**Legal Description:** SW-SW-SW, 3-2S-10W**Latitude, Longitude:** N38.384373°, W90.199648°**Elevation:** 555 feet; reference point at top of cutbank

Depth (ft)	Description	Formation	Member	Sample No				
				<2 µm (ICP-MS)	<2 µm (ICP-ES)	<63 µm (ICP-MS)	<63 µm (ICP-ES)	<63 µm (ICP-AES)
14.0	Diamicton, silty clay, orange-brown, Manganese stains	Glasford	-	-	-	100110	100110	-

Exposure Number: 83**Field Id:** COL-29f**API Number:** 121332319900**Location Description:** Excavation into bank near car dealership**Legal Description:** SW-NW-NE, 21-1S-10W**Latitude, Longitude:** N38.438921°, W90.20899°**Elevation:** 470 feet; reference point at top of exposure

Depth (ft)	Description	Formation	Member	Sample No				
				<2 µm (ICP-MS)	<2 µm (ICP-ES)	<63 µm (ICP-MS)	<63 µm (ICP-ES)	<63 µm (ICP-AES)
28.0	Diamicton, silty clay to silt, brown to gray brown to orange brown	Glasford	-	-	-	100111	100111	-

Exposure Number: 82**Field Id:** COL-30f**API Number:** 121332320000**Location Description:** Borrow pit into loess and till**Legal Description:** NE-NW-NE, 20-1S-10W**Latitude, Longitude:** N38.440833°, W90.225505°**Elevation:** 472 feet; reference point at top of borrow pit

Depth (ft)	Description	Formation	Member	Sample No				
				<2 µm (ICP-MS)	<2 µm (ICP-ES)	<63 µm (ICP-MS)	<63 µm (ICP-ES)	<63 µm (ICP-AES)
23.0	Diamicton, silty loam, brown with some orange brown stains, coal	Glasford	-	-	-	102126	102126	-

Exposure Number: 87**Field Id:** COL-33f**API Number:** 121332320100**Location Description:** In cutbank exposure on south side of a tributary to Prairie Du Long Creek**Legal Description:** 2100 feet from north line and 400 feet from east line of section, 6-2S-9W**Latitude, Longitude:** N38.39151°, W90.128985°**Elevation:** 601 feet; reference point at top of exposure

Depth (ft)	Description	Formation	Member	Sample No				
				<2 µm (ICP-MS)	<2 µm (ICP-ES)	<63 µm (ICP-MS)	<63 µm (ICP-ES)	<63 µm (ICP-AES)
30.0	Diamicton, silt loam, mainly brown with some orange-brown stains and gray fractures	Glasford	-	-	-	100112	100112	-

Exposure Number: 88

Field Id: Waterloo Quarry

API Number: 121332323200

Location Description: South-facing highwall at the north end of quarry

Legal Description: 300 feet from south line and 1300 feet from east line of section, 5-3S-9W

Latitude, Longitude: N38.296669°, W90.114211°

Elevation: 580 feet; reference point at top of highwall

Depth (ft)	Description	Formation	Member	Sample No				
				<2 µm (ICP-MS)	<2 µm (ICP-ES)	<63 µm (ICP-MS)	<63 µm (ICP-ES)	<63 µm (ICP-AES)
20.0	Diamicton, clay loam, weathered	Banner	-	-	-	100098	100098	-

ST. CLAIR COUNTY

Exposure Number: 79

Field Id: COL-2f

API Number: 121633066000

Location Description: Columbia Quarry No. 1 highwall, northeast portion of quarry

Legal Description: NE-NE-SW-SW, 2-1S-10W

Latitude, Longitude: N38.473762°, W90.177892°

Elevation: 670 feet; reference point at top of highwall

Depth (ft)	Description	Formation	Member	Sample No				
				<2 µm (ICP-MS)	<2 µm (ICP-ES)	<63 µm (ICP-MS)	<63 µm (ICP-ES)	<63 µm (ICP-AES)
20.0	Diamicton, silt loam, yellow brown; calcareous	Glasford	-	-	-	100102, 100107F	100102, 100107F	-

Exposure Number: 80

Field Id: COL-15f

API Number: 121633066200

Location Description: In small cut bank along east side of Hickman Creek

Legal Description: SW-NW-SE-NE, 7-1S-9W

Latitude, Longitude: N38.464757°, W90.132434°

Elevation: 586 feet

Depth (ft)	Description	Formation	Member	Sample No				
				<2 µm (ICP-MS)	<2 µm (ICP-ES)	<63 µm (ICP-MS)	<63 µm (ICP-ES)	<63 µm (ICP-AES)
3.0	Diamicton, silty clay loam, orange brown; calcareous with gray joints	Glasford?	-	-	-	100104A	100104A	-

Exposure Number: 81

Field Id: COL-16f

API Number: 121633066300

Location Description: In small exposure along west side of Hickman Creek

Legal Description: NW-SE-SW-NE, 7-1S-9W

Latitude, Longitude: N38.463873°, W90.134745°

Elevation: 605 feet; reference point at top of exposure

Depth (ft)	Description	Formation	Member	Sample No				
				<2 µm (ICP-MS)	<2 µm (ICP-ES)	<63 µm (ICP-MS)	<63 µm (ICP-ES)	<63 µm (ICP-AES)
3.0	Diamicton; calcareous	Glasford?	-	-	-	100106	100106	-

Exposure Number: 78

Field Id: La Brot Borrow Pit (CV67)

API Number: 121633079400

Location Description: Exposure in lower pit

Legal Description: NE-NW-NW 3-2N-8W

Latitude, Longitude: N38.656751°, W89.981552°

Elevation: 530 feet

Depth (ft)	Description	Formation	Member	Sample No				
				<2 µm (ICP-MS)	<2 µm (ICP-ES)	<63 µm (ICP-MS)	<63 µm (ICP-ES)	<63 µm (ICP-AES)
19.0	Diamicton, silt loam, light brown to olive brown, C horizon	Glasford	-	-	-	100096	100096	-

Boring Number: 62

Field Id: MNK-3

API Number: 121632993800

Core Number: NA

Location Description: In field, 102 feet north of northeast corner of barn at Silver Creek Farm; Margie Hines property

Legal Description: 390 feet north from south line and 2960 feet west from east line of section; SE-SE-SW, 5-2N-8W

Latitude, Longitude: N38.644486°, W90.01504°

Elevation: 475 feet

Depth (ft)	Description	Formation	Member	Sample No				
				<2 µm (ICP-MS)	<2 µm (ICP-ES)	<63 µm (ICP-MS)	<63 µm (ICP-ES)	<63 µm (ICP-AES)
82.5	Silt clay to silty clay loam	Equality	-	203067A	203067A	-	-	-
87.4	Silt clay to silty clay loam	Equality	-	203069	203069	-	-	-
100.3	Silt clay to silty clay loam (P-25272)	Equality	-	203070	203070	-	-	-
100.6	Silt clay to silty clay loam	Equality	-	203071	203071	-	-	-

Boring Number: 63

Field Id: Robbins-1

API Number: 121632988900

Core Number: C-15410

Location Description: In vacant field on private property; Richard Robbins property

Legal Description: 525 feet from north line and 3700 feet from east line of section, 9-2N-8W

Latitude, Longitude: N38.642078°, W89.99858°

Elevation: 562 feet

Depth (ft)	Description	Formation	Member	Sample No				
				<2 µm (ICP-MS)	<2 µm (ICP-ES)	<63 µm (ICP-MS)	<63 µm (ICP-ES)	<63 µm (ICP-AES)
65.0	Diamicton, silt, dark gray	Glasford	-	-	-	102108	102108	-
70.0	Diamicton, silt, olive gray, shell fragments	Glasford	-	-	-	102107	102107	-
120.0	Diamicton, silty clay, dark gray, coal and wood fragments	Banner	-	-	-	102106	102106	-
126.0	Diamicton, silty clay, dark gray, coal and wood fragments	Banner	-	-	-	102105	102105	-

F= Duplicate sample from field outcrop, drill core, or drill-cutting sample

A= Duplicate of sample obtained from silt and clay or clay separations

NA= No number assigned

Appendix D

Location and geologic information for geochemical sampling sites in the
east-central region of the project area

(Champaign and Vermillion Counties in Illinois; Carroll, Parke, and
Vermillion Counties in Indiana)

CHAMPAIGN COUNTY

Exposure Number: 70

Field Id: University Avenue

API Number: 120192650700

Location Description: Excavation pit located 100 feet south of University Avenue (Champaign) and 125 feet west of Fifth Street

Legal Description: NW-SE-SW, 7-19N-9E

Latitude, Longitude: N40.115954°, W88.232595°

Elevation: 736 feet

Depth (ft)	Description	Formation	Member	Sample No				
				<2 µm (ICP-MS)	<2 µm (ICP-ES)	<63 µm (ICP-MS)	<63 µm (ICP-ES)	<63 µm (ICP-AES)
5.0	Diamicton, silt loam, light olive brown	Lemont	Batetown	-	-	100069	100069	-
5.5	Diamicton, silt loam, olive	Lemont	Batetown	-	-	100030A, 100070	10030A, 100070	-
6.0	Diamicton, silt loam, brown	Lemont	Batetown	-	-	100071	100071	-
7.5	Diamicton, silt clay loam, dark gray	Lemont	Batetown	-	-	100032, 100072A	100032, 100072A	-
9.0	Diamicton, silt loam to silty clay loam, grey	Lemont	Batetown	-	-	100033	100033	-

VERMILLION COUNTY, ILLINOIS

Exposure Number: 71

Field Id: Hartmattan Strip Mine (section L)

API Number: 121832641200

Location Description: In composite section 250-yard from east-west on the north highwall of the Harmattan Strip Mine

Legal Description: NE-NE-NW, 4-19N-12W

Latitude, Longitude: N40.144487°, W87.726713°

Elevation: 640 feet; reference point at top of highwall

Depth (ft)	Description	Formation	Member	Sample No				
				<2 µm (ICP-MS)	<2 µm (ICP-ES)	<63 µm (ICP-MS)	<63 µm (ICP-ES)	<63 µm (ICP-AES)
37.0	Diamicton, silt loam, brown to dark brown, calcareous (P-11895)	Banner	Hillery	203117	-	-	-	-
47.0	Diamicton, loam, dark grayish brown, calcareous (P-11896)	Banner	Tilton	203110	203110	-	-	-
49.0	Diamicton, silt loam, brown to dark brown, calcareous (P-11897)	Banner	Hillary	203111	203111	-	-	-
57.0	Diamicton, loam, dark gray, calcareous (P-11913)	Banner	Harmattan	203113	203113	-	-	-
64.0	Silt, dark grayish brown, calcareous, massive, mollusk shells (P-11916)	Banner	Belgium	203114	203114	-	-	-
67.0	Silt, olive brown to grayish brown, leached, appears colluvial in origin (P-11917)	Banner	-	203115	203115	-	-	-

Exposure Number: 72

Field Id: School House Branch Section of Hungry Hollow

API Number: 121832641300

Location Description: In section along the east cutbank in meander of a branch of Hungry Hollow; tributary of the North Fork Vermillion River

Legal Description: SE-NE-NE, 2-19N-12W

Latitude, Longitude: N40.140987°, W87.677931°

Elevation: 635 feet; reference point at top of cutbank

Depth (ft)	Description	Formation	Member	Sample No				
				<2 µm (ICP-MS)	<2 µm (ICP-ES)	<63 µm (ICP-MS)	<63 µm (ICP-ES)	<63 µm (ICP-AES)
37.0	Diamicton, loam, very dark grayish brown ped interiors with lighter colored exteriors; few yellowish red and black stains; leached (P-11781)	Banner	Tilton	203116	203116	-	-	-
38.0	Diamicton, loam, dark grayish brown with dark gray stains, mottles (P-11785)	Banner	Tilton	203112	203112	-	-	-

CARROLL COUNTY, INDIANA

Exposure Number: 95

Field Id: Adams Mill (Downstream Section); samples collected by W.H. Johnson in 1982

API Number: 130150000100

Location Description: Wildcat Creek; 2 miles north of Cutler, IN; 1 ¼ miles east of Indiana State Road 75

Legal Description: 2660 feet from north line and 165 feet from west line of section, SW-SW-NW, 35-24N-1W

Latitude, Longitude: N40.481909°, W86.505526°

Elevation: 688 feet; reference point at top of cutbank

Depth (ft)	Description	Formation	Member	Sample No				
				<2 µm (ICP-MS)	<2 µm (ICP-ES)	<63 µm (ICP-MS)	<63 µm (ICP-ES)	<63 µm (ICP-AES)
32.0	Diamicton, loam, gray, D horizon (P-24997)	Glasford	Vandalia	203104	203104	-	-	-
35.0	Diamicton, loam, oxidized, truncated soil, eastern-source till, C horizon (P-24998)	Banner	Hillery? or Tilton?	203105	203105	-	-	-
36.0	Diamicton, loam, oxidized, truncated soil, C horizon (P-24999)	Banner	Hillery?	203106	203106	-	-	-
39.0	Diamicton, loam, oxidized, truncated soil, C horizon (P-25000)	Banner	Hillery?	203107	203107	-	-	-
41.0	Diamicton, loam, reddish brown, oxidized, C horizon (P-25001)	Banner	Hillery	203098F	203098F	101002	101002	
43.0	Diamicton, loam, reddish brown, oxidized, C horizon (P-25002)	Banner	Hillery	203108	203108			

PARKE COUNTY, INDIANA

Exposure Number: 94

Field Id: Green Creek (Section A); samples collected by W.H. Johnson in 1982

API Number: 131210000100

Location Description: Downstream of Green Creek, 500 feet southwest of section B; Stop #5, 1983 Midwest FOP field trip

Legal Description: NE-NW-SE, 8-16N-5W

Latitude, Longitude: N39.898779°, W87.234226°

Elevation: 569 feet; from top of the section

Depth (ft)	Description	Formation	Member	Sample No			
				<2 µm (ICP-MS)	<2 µm (ICP-ES)	<63 µm (ICP-MS)	<63 µm (ICP-ES)
48.5	Diamicton, loam to clay loam (P-25047)	Banner	Trafalgar? or Hillery?	203109	203109	101003	101003

VERMILLION COUNTY, INDIANA

Exposure Number: 73

Field Id: Trousdale Coal Pit

API Number: 131650000100

Location Description: At south end of highwall

Legal Description: NE-SE-NE, 32-17N-10W

Latitude, Longitude: N39.891077°, W87.502687°

Elevation: 600 feet; from 30-m gridded digital elevation model

Depth (ft)*	Description	Formation	Member	Sample No				
				<2 µm (ICP-MS)	<2 µm (ICP-ES)	<63 µm (ICP-MS)	<63 µm (ICP-ES)	<63 µm (ICP-AES)
0.7	Diamicton, loam, gray with slight violet cast, D horizon (P-24898)	Banner	Hillery	203080	203080	-	-	-
6.6	Diamicton, loam, gray with slight violet cast, D horizon (P-24899)	Banner	Hillery	203100	203100	-	-	-
10.5	Diamicton, loam, gray with slight violet cast, D horizon (P-24900)	Banner	Hillery	203102	203102	-	-	-
15.0	Diamicton, loam, gray with slight violet cast, D horizon (P-24901)	Banner	Hillery	203103	203103	-	-	-

* Depths measured from bottom of highwall

F= Duplicate sample from field outcrop, drill core, or drill-cutting sample

A= Duplicate of sample obtained from silt and clay or clay separations