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MERGING PLEISTOCENE LITHOSTRATIGRAPHY WITH GEOTECHNICAL AND HYDROGEOLOGIC DATA - EXAMPLES FROM EASTERN WISCONSIN

by

Sue Anita Rodenbeck

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PREFACE

This open-file report is a Master of Science thesis by Sue A. Rodenbeck, University of Wisconsin-Madison Department of Geology and Geophysics. This work was completed while Ms Rodenbeck was employed as a Research Assistant by the Wisconsin Geological and Natural History Survey, and reflects the Survey's continuing interest in the hydrogeologic properties of Pleistocene materials in Wisconsin. This study was funded through the Survey by a grant from the Wisconsin Department of Natural Resources.

This report contains the most complete synthesis to date of hydrogeologic and geotechnical data from solid waste disposal sites in eastern Wisconsin. These data, collected from 41 sites, are organized by lithostratigraphic unit, and are presented in spreadsheet format. The report discusses the values and ranges of variation of hydraulic conductivity, grain size, Atterberg Limits, and other parameters in relation to lithostratigraphic unit. The resulting analyses should be of interest to regulatory agencies and private firms involved in waste disposal and other shallow geotechnical projects in eastern Wisconsin.

Merging Pleistocene Lithostratigraphy with Geotechnical and Hydrogeologic Data--Examples from Eastern Wisconsin

by

Sue Anita Rodenbeck

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ABSTRACT

The objectives of this project are: 1) to identify the hydrogeologic and geotechnical properties of Pleistocene materials in eastern Wisconsin, 2) to associate the properties with mappable, extensive hydrostratigraphic units that can be identified in the field, and 3) to assess the variability and expected range of values within the individual units. This study is a synthesis of hydrogeologic and engineering data submitted by geotechnical consulting firms to the Wisconsin Department of Natural Resources. Values of hydraulic conductivity (380), particle size analyses (475 completed to .002 mm), Atterberg limits (525), approximations of strength (964 pocket penetrometer measurements), and dry unit weights (155) were compiled, geologically interpreted, and assigned to the till units in five mapped formations of late Wisconsin age. Published definitions of lithostratigraphic units are used.

The data are organized by till unit, then statistically analyzed to examine variation of properties within each till unit and to compare till units of superposed lithostratigraphic units. In cases for which at least five field measurements of hydraulic conductivity (K) are available at more than one site within a single till unit, ANOVA tests suggest that the till units have significant internal variation in K. Thus, the till units are heterogeneous. Application of ANOVA tests to field measurements of separate till units also indicates heterogeneity. Median field measurements of K vary considerably among till units of late Wisconsin age, from 10^{-6} to

10^{-4} cm/s. With respect to laboratory measurements of K at more than one site within a single till unit, only one till is homogeneous in a statistical sense while the others are statistically significantly different, thus heterogeneous. In contrast to field measurements, ANOVA tests of laboratory measurements of K for superposed, separate till units suggest that not all the till units are significantly different. Moreover, median laboratory and field measurements of K frequently differ by more than an order of magnitude for a single till unit.

Underlying relationships among the data recorded are statistically analyzed using correlation and regression. Median values of each parameter for each till unit were used in the analysis because geotechnical properties and hydraulic conductivity are typically not determined for the same sample. A weak relation between plastic limit and log field hydraulic conductivity (R^2 = 67%) and a relatively strong relationship between natural moisture content and dry unit weight (R^2 = 80%) could be used by hydrogeologists and engineers to constrain modeled values of hydraulic conductivity

Wisconsin Administrative Code should be modified to require a standard method for calculation of hydraulic conductivity from field measurements and should cite a specific reference for use of the Unified Soil Classification System. More than one classification and description system should be used, as no classification system seems best suited to hydrogeologic characterization. The lithostratigraphic framework has practical applications for landfill site assessment since it is useful for predicting the occurrence and characteristics of subsurface materials.

ACKNOWLEDGEMENTS

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I would not have been able to complete my studies at the UW - Madison if it were not for the financial assistance of the Jessie Smith Noyes Foundation, the Wisconsin Geological and Natural History Survey, and the Department of Geology and Geophysics. The Department of Natural Resources funded this project through the Wisconsin Geological and Natural History Survey. The staff at the Bureau of Solid Waste Management, Wisconsin Department of Natural Resources provided me with the background information necessary to collect data, and the Bureau provided office space.

My fellow graduate students provided a stimulating environment for the exchange of ideas and opinions. I would have given up without their support during especially difficult times. I owe special thanks to fellow users of the Quaternary lab.

My list of acknowledgments would be incomplete without mention of my parents. My father instilled me with a desire to understand nature and with the belief that people matter more than books. My mother encouraged me to choose my own path and cheerfully shared the cost

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I. Introduction

A. Reason for study

Pleistocene materials cover roughly three-quarters of Wisconsin's surface, including its most densely populated areas, yet the hydrogeologic properties of these materials have not been fully assessed. Nationally, concern over human degradation of drinking water supplies has grown tremendously since the 1960s. Recent estimates indicate that ". . . 95 percent of rural America and in total about half the U. S. population rely on ground water" (U. S. EPA, 1987, p. 3). At the federal level, the actions of citizens concerned about degradation of water resources resulted in statutory laws like the National Environmental Pollution Act (1970), the Federal Water Pollution Control Act (1972), the Clean Water Act (1977), the Safe Drinking Water Act (1974), the Toxic Substances Control Act (1976), the Resource Conservation and Recovery Act (1976), and the Comprehensive Environmental Response, Compensation, and Liability Act (1980). These federal statutory laws required that the states create legislation to protect water resources. In Wisconsin, the Department of Natural Resources wrote Administrative Code Chapter NR 180, "Solid Waste Management," in response to Wisconsin Statutes Chapters 144 and 227 (Laws of 1977). Chapter NR 180 requires geotechnical investigations to document hydrogeologic conditions at proposed solid waste land disposal sites (hereafter referred to as 'landfills').

The data submitted in accord with NR 180 and similar regulations is important for protection of drinking water supplies near proposed landfills, but much greater use could be made of the information if it could be easily retrieved and if it was organized so that a user could tell which information might be relevant to another location. Natural resource professionals working in the public and private sector are already accustomed to using written and computerized databases of well records and water quality analyses. A similar database of hydrogeologic and geotechnical data for Pleistocene materials in Wisconsin had not been attempted until this project. The Wisconsin Geological and Natural History Survey's Pleistocene mapping program and the development of a stratigraphic framework make this study possible.

B. Study definition

This study is part of a larger research project funded by the Wisconsin Department of Natural Resources and administered by the Wisconsin Geological and Natural History Survey. Long term objectives of the project are as follows:

1. To identify the hydrogeologic properties (permeability, porosity, etc.) and geotechnical properties (grain-size distribution, Atterberg limits, etc.) of Pleistocene materials in Wisconsin.

2. To associate these properties with mappable, areally extensive hydrostratigraphic units that can be identified in the field.

3. To assess the variability and expected range of values for these properties within any stratigraphic unit.

4. To develop field and laboratory methodologies for the evaluation of hydrogeologic and geotechnical properties in previously untested areas.

In keeping with these broad objectives, this study organizes and provides a geologic interpretation of the geotechnical and hydrogeologic information submitted in accord with NR 180 and other regulations for most of eastern Wisconsin. The lithostratigraphic framework defined in *Pleistocene Stratigraphic Units in Wisconsin* (Mickelson *et al.*, 1984) is the organizational framework used to categorize the submitted data. I compiled the properties of samples and then assigned the data to a lithostratigraphic unit. I studied type and reference sections of these mapped units in the field to improve my interpretation of the data in reports. I combined the properties of each lithostratigraphic unit and then analyzed them. The statistical techniques used to assess the variability and the expected range of values are discussed later in this report. Although this study does not directly address the development of new methodologies, suggestions are made for improvements based on a review of existing geotechnical test methods and the statistical analysis of data.

In addition to the larger research project objectives, the data compilation, interpretation, and analysis completed here provide information for the discussion of three additional questions:

1. Are the formally defined lithostratigraphic units also hydrostratigraphic units?

2. Would other sampling and testing procedures better define the site hydrogeology?

3. Can geotechnical index tests function as lithic criteria to identify and differentiate units?

These issues are discussed in Part V.

C. Location of study

I collected data from reports of geotechnical investigations on file at the Bureau of Solid Waste Management, Wisconsin Department of Natural Resources. I limited the study's extent to late Wisconsin-aged glacial sediments in twenty-four counties of eastern Wisconsin glaciated by the Green Bay and Lake Michigan Lobes of the Laurentide Ice Sheet (Figure 1). Plate 1 (in pocket) illustrates the location of more than forty proposed or existing landfills. My emphasis on the collection of grain size analyses, atterberg limits, and hydraulic conductivities restricted data collection to sites with relatively recent investigations, usually located in areas of dense population or economic development requiring land disposal facilities.

D. Why combine geotechnical data with lithostratigraphy?

There are many good reasons for both engineers and geologists to organize geotechnical data into a lithostratigraphic framework. Geologic studies provide relevant background information prior to detailed civil, structural, or foundation engineering investigations. Geotechnical consultants unfamiliar with the state's Pleistocene materials may find the compiled index test data and summary of geologic history useful for bid preparation. Regulatory agencies can refer to the data analysis to evaluate the reasonableness of submitted reports containing geotechnical data for which no standardized quality assurance and quality control methods exist.

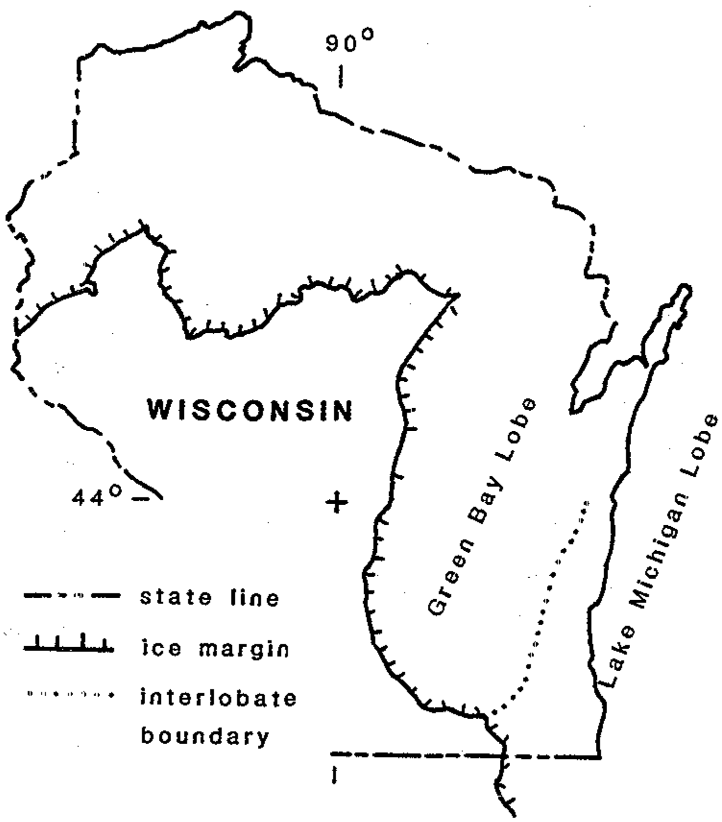


Figure 1. Maximum extent of ice during late Wisconsin time. Only the ice lobes pertinent to this study are labelled.

Hydrogeologists can use the hydraulic conductivity values reported here as input variables in groundwater flow models. Statistical summaries of hydraulic conductivity may be used to construct likely best and worst case scenarios for advective flow arrival times. Association of the hydraulic conductivity with mapped units makes it useful for site selection and screening on a statewide or regional scale.

Assessment of the local hydrogeologic setting prior to site-specific investigation usually consists of reviewing regional or county water resources investigations and geologic studies, soil surveys, and remote sensing techniques such as aerial photography. Unfortunately, water resources investigations in Wisconsin have tended to focus on bedrock aquifers, and have restricted discussion of Pleistocene and Holocene sediments to sand and gravel aquifers. Soil surveys are generally limited to materials within 6 feet of the land surface. This report uses the lithostratigraphic framework (Mickelson *et al.*, 1984) to present statistical summaries of geotechnical data for sediments from the land surface to bedrock, aquitards as well as aquifers. The same geologic conditions that make till units lithologically recognizable, areally continuous, and mappable may produce similar hydrogeologic and geotechnical properties within each unit. Once geotechnical data has been associated with lithostratigraphic units, the question, "Can geotechnical tests function as lithic criteria to differentiate units?" may be answered.

E. Problems of classification

The problem of how samples of earth materials should be described and classified has received considerable attention both in the past and in the present. The geologists who study the Quaternary materials in eastern Wisconsin define lithostratigraphic units using some or all of the criteria listed in Table 1 (Mickelson *et al.*, 1984). The American Society for Testing Materials (ASTM) "Standard Practice for Classification of Soils for Engineering Purposes" (D2488-84, ASTM, 1986) relies upon the Unified Soil Classification System (USCS). The USCS criteria are also listed in Table 1. Soil scientists use yet another descriptive scheme (see Table 1) and have devoted considerable attention to the revisions to Chapter 4 in the *Soil Survey Manual*, "Examination and Description of Soils in the Field," (Soil Survey Staff, 1981). All of these classifications include grain size analysis and a description of the soil color; other criteria and descriptive terms are related but not synonymous.

Even the common factors of the classifications are expressed in different terms and thus are not directly transferable. For example, soil scientists and geologists who study the Quaternary describe the grain size distribution of a sample using a textural triangle (figure 2) on which sand, silt, and clay percentages of the less than 2 mm size fraction are plotted. Geotechnical reports for landfill investigations describe the grain size distribution of a sample using a USCS group name and group symbol. The same reports generally include graphs of cumulative percent finer versus particle size in

Table 1 Description of 'soil' for classification

a. -by geologists who study the Quaternary in eastern Wisconsin
(Mickelson et al., 1984)

texture
munsell color
clay mineralogy
calcite to dolomite ratio
pebble lithology
stratigraphic position
magnetic susceptibility
depth of carbonate leaching

b. -by USCS
(ASTM, 1986)

percent finer than the #200 sieve (0.075 mm)
coefficient of uniformity
coefficient of curvature
liquid limit
plastic index
plotted location on the plasticity chart

c. -by soil scientists
(Soil Survey Staff, 1981)
depth
munsell color
texture
structure
cutans
consistance
special features
reaction or effervescense
boundary

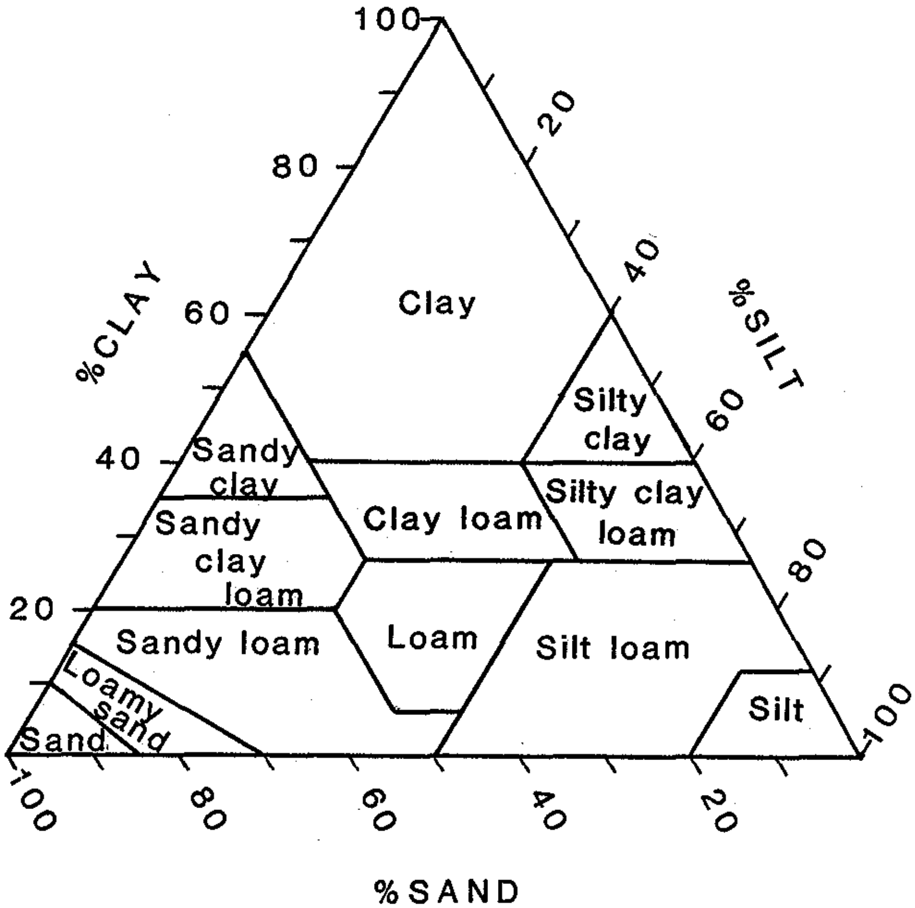


Figure 2. The U. S. Department of Agriculture (USDA) textural triangle. Both geologists and soil scientists use the textural triangle despite their differing definitions of silt and clay.

appendices. The exchange of information is hindered further by differing definitions of sand, silt, and clay. Figure 3 illustrates these definitions.

With respect to color, both Quaternary geologists and soil scientists use the Munsell color chart and notation (Munsell Color Co., Inc., Baltimore) in an attempt to standardize terminology. Geotechnical reports use descriptive phrases like "reddish-brown" that do not distinguish subtle variations in sediment color unless the phrases are standardized. Considering these inconsistent methods of sample description and classification, interdisciplinary transfer of information can be quite challenging.

F. Combination of geological and geotechnical approaches

The approach of assigning geotechnical data to stratigraphic units is not without precedent. Many authors have combined geotechnical data with glacial depositional or sedimentary models, but few, if any combine existing geotechnical data, including hydraulic conductivities, with a published formal lithostratigraphic framework. Kenney (1976) discusses glacial sedimentation in fresh and marine waters, the fabric of lacustrine sediments, and the relationship between the preceding factors and geotechnical behavior. May and Thompson (1978) discuss the Quaternary glacial deposits of the Edmonton area and describe circumstances in which lack of geologic interpretation can lead to engineering problems. Mickelson, Acomb, and Edil (1979) studied Wisconsin's Lake Michigan shoreline using

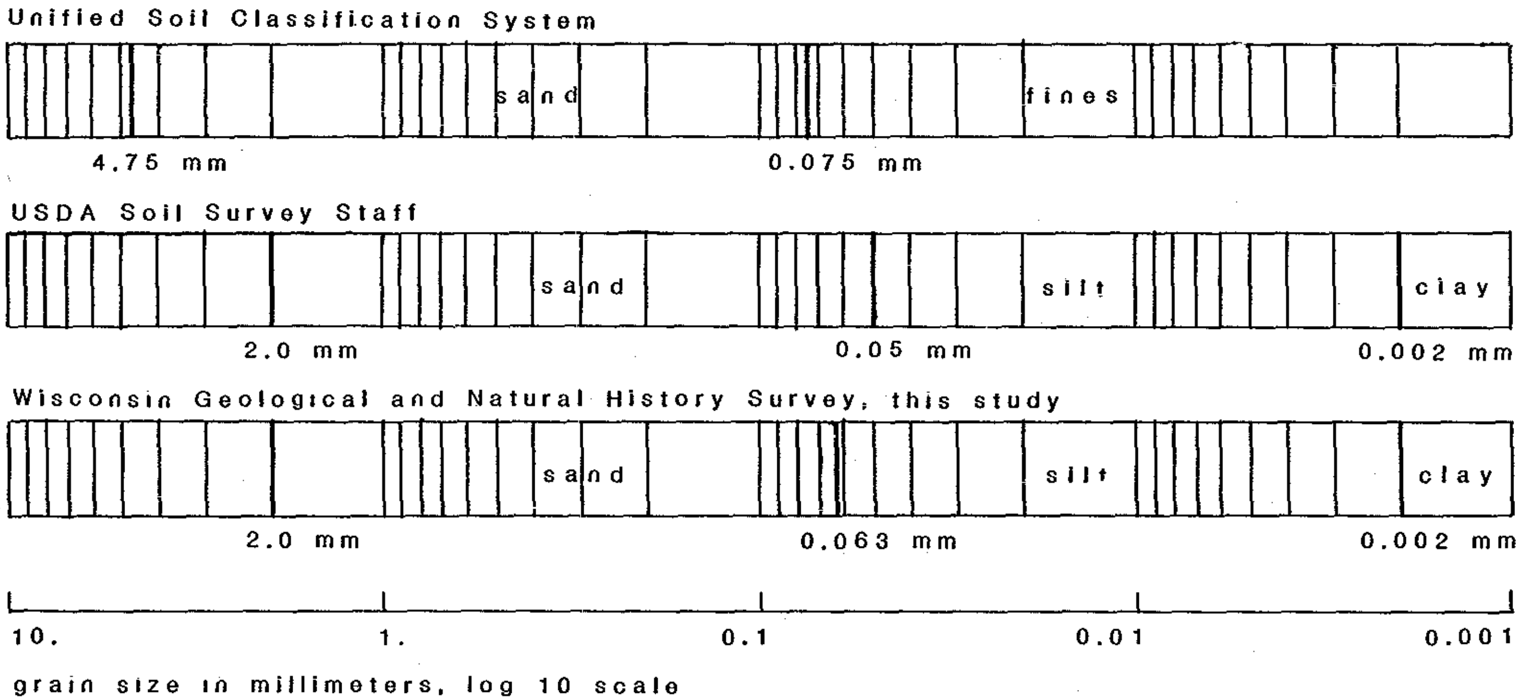


Figure 3. The USCS does not divide 'fines' into silt and clay fractions. The geologists studying the Quaternary materials in Wisconsin and soil scientists divide the silt and clay classes at different particle sizes.

engineering index properties and shear strength to interpret glacial processes. Singh, Tatioussian, and Flagg (1983) used a lithostratigraphic framework for their statistical summary of geotechnical data for the Milwaukee area and found the depositional environment valuable to their interpretation of the data. Baracos *et al.* (1983) prepared a series of engineering and geotechnical maps from geotechnical and geological data collected from several thousand boreholes in urban Winnipeg, Manitoba. Although Baracos *et al.* incorporated geological genetic terms, stratigraphy, sedimentary environment, and post-depositional changes in the environment, they did not use lithostratigraphic names for glacial sediments. Lo and McCabe (1984) used existing engineering and pedologic data, grouped by physiographic regions and soil classification, to create a geotechnical data base for Indiana. Similar studies too numerous to detail here include those by Chassefiere and Monaco (1983), Connell (1984), Eyles and Sladen (1981), Quigley (1980), and Richards (1976). This study is different from these for three reasons: 1) the geotechnical data base includes both hydraulic conductivity and engineering properties, 2) the properties have been organized with a published lithostratigraphic framework, and 3) data from diverse sources are organized within a single spatial coordinate system.

II. Pleistocene History and Stratigraphy

A. Stratigraphic terminology

1. Definition of rock stratigraphic terms

In addition to using the characteristics listed in Table 1, geologists subdivide, classify, and map sediments as stratigraphic units. The North American Stratigraphic Code (North American Commission on Stratigraphic Nomenclature (NACSN), 1983) requires that lithostratigraphic units be formally distinguished from each other and mapped on the basis of observable lithic characteristics and stratigraphic position. The formation is the fundamental unit in this system and must be mappable at land surface or traceable in the subsurface. Formations may be subdivided into members--these are the next lower hierarchy in the classification and need not be distinguishable in the field. Members are named when the formation is heterogeneous and when it is beneficial to do so. A member has lithic characteristics distinguishing it from adjacent parts of the formation.

2. Definition of geochronologic terms

Geologists' stratigraphic nomenclature also includes geochronologic units. These are divisions of time traditionally distinguished by bodies of rock with synchronous boundaries (NACSN, Articles 66 and 80). Geochronologic terms used include eon, era, period, epoch, and age. Geochronologic epochs may be modified with the adjectives Early, Middle, and Late (NACSN, Article 82). Capital letters indicate formal definition of time, whereas lower case, as in 'late Wisconsin', indicate informal use and lack of a formal definition. Figure 4a illustrates the temporal position of the late Wisconsin.

3. <u>Definition of diachronic terms</u>

Another category of stratigraphic terms, diachronic terms, is used when discussing the time during which the glacier produced specific stratigraphic units or an assemblage of units. Attig, Clayton, and Mickelson (1985) use event-stratigraphic units to associate landforms with ice advances that deposited specific lithostratigraphic units. These event-stratigraphic units are not recognized by the NACSN, but closely resemble the NACSN's diachronic units. Simultaneous use of lithostratigraphic, event-stratigraphic or diachronic, and geochronologic names confuses users and complicates the nomenclature. However, it also reduces confusion caused by revisions of the nomenclature when the same name (e.g., 'Cary' or 'Valders') is used for a lithostratigraphic unit, an interval of time, and the ice advance that deposited it (Attig, personal communication, 1987).

The nomenclature of diachronic units includes the terms episode and phase, with phase being subordinate in the hierarchy to episode (NACSN, Articles 91-95). Geographic names previously used for "geochronologic" units may be used for diachronic units only if the geochronologic use has been formally abandoned (NACSN, 1983, p. 871).

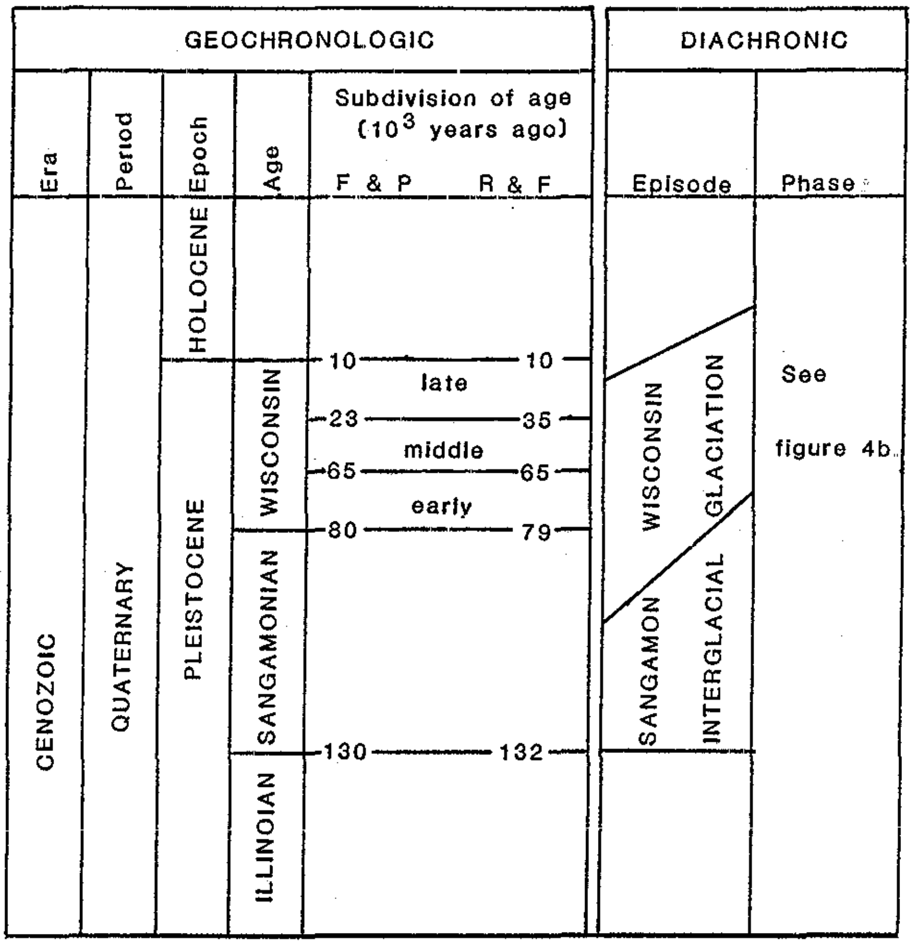


Figure 4a. Time-stratigraphic terminology. The late Wisconsin spanned the time from 10,000 b. p. to 23,000 b. p. (Fulton and Prest, 1987) or to 35,000 b. p. (Richmond and Fullerton, 1986). Informal stratigraphic units frequently have differing interpretations. Modified from Fulton and Prest, 1987 and Richmond and Fullerton, 1986.

Thus, the time when the Lake Michigan Lobe advanced to deposit the Cary Moraine in Illinois is now properly called the Cary phase (as used by Hansel *et al.*, 1985). Of all the tills described by Thwaites (1943) and Thwaites and Bertrand (1957) as being of Cary age, only the Oak Creek Formation is now (informally) associated with the Cary phase. Willman and Frye (1970) formally abandoned the geochronologic use of "Cary". Figure 4b provides the diachronic terms associated with late Wisconsin-aged glacial events in eastern Wisconsin.

B. History of stratigraphic nomenclature in eastern Wisconsin

Previous authors have classified the late Wisconsin-aged glacial sediments in eastern Wisconsin into five formations. Table 2 synthesizes some of the stratigraphic nomenclature found in the literature predating *Pleistocene Lithostratigraphic Units in Wisconsin* (Mickelson *et al.*, 1984). Observations made during earlier investigations should not be discounted because the terminology used is not up-to-date. Figure 5 is intended to improve the transition from past terminology to the present names.

C. The late Wisconsin lithostratigraphic framework in eastern Wisconsin

1. Introduction

The Zenda, Horicon, New Berlin, Oak Creek, and Kewaunee Formations include sediments of late Wisconsin age in eastern Wisconsin. They are heterogenous units containing a variety of ice-

GREEN BAY LOBE West Side	GREEN BAY LOBE East Side	LAKE MICHIGAN LOBE
Kewaunee Fm.	Kewaunee Fm.	Kewaunee Fm.
Middle Inlet M. (Late Athelstane phase)	Glenmore M. (Denmark phase)	Two Rivers M. (Two Rivers advance)
- - - - - - - - - - - -	- - - - - - - - - - - -	Two Creeks Forest Bed (Two Creeks retreat)
		Valders M. (Inner Port Huron advance)
Kirby Lake M. (Early Athelstane phase)	Chilton M.	Haven M. (Inner Port Huron advance)
Silver Cliff M. (Early Athelstane phase)	Branch River M.	Ozaukee M. (Outer Port Huron advance)
		Oak Creek Fm. (Cary advance)
Horicon Fm.	Horicon Fm.	New Berlin Fm.
Mapleview M. (Hancock phase)	Liberty Grove M.	
		Zenda Fm. Tiskilwa M.

Figure 4b. Lithostratigraphic framework of the study area with associated diachronic or event-stratigraphic phase names in parentheses. Phase names for the west side of the Green Bay Lobe are from Attig, Clayton, and Mickelson, 1985; these supercede phase names in McCartney, 1983. Phase names for the east side of the Green Bay Lobe have not been established except for McCartney's (1983) use of 'Denmark phase'. Phase names in the Lake Michigan Lobe are from Hansel et al., 1985 and are based on stratigraphic position and geomorphic evidence. At the time of writing, these have not been verified with field work in Wisconsin. McCartney and Mickelson (1982) correlated the Two Creeks Forest Bed across the Green Bay lobe.

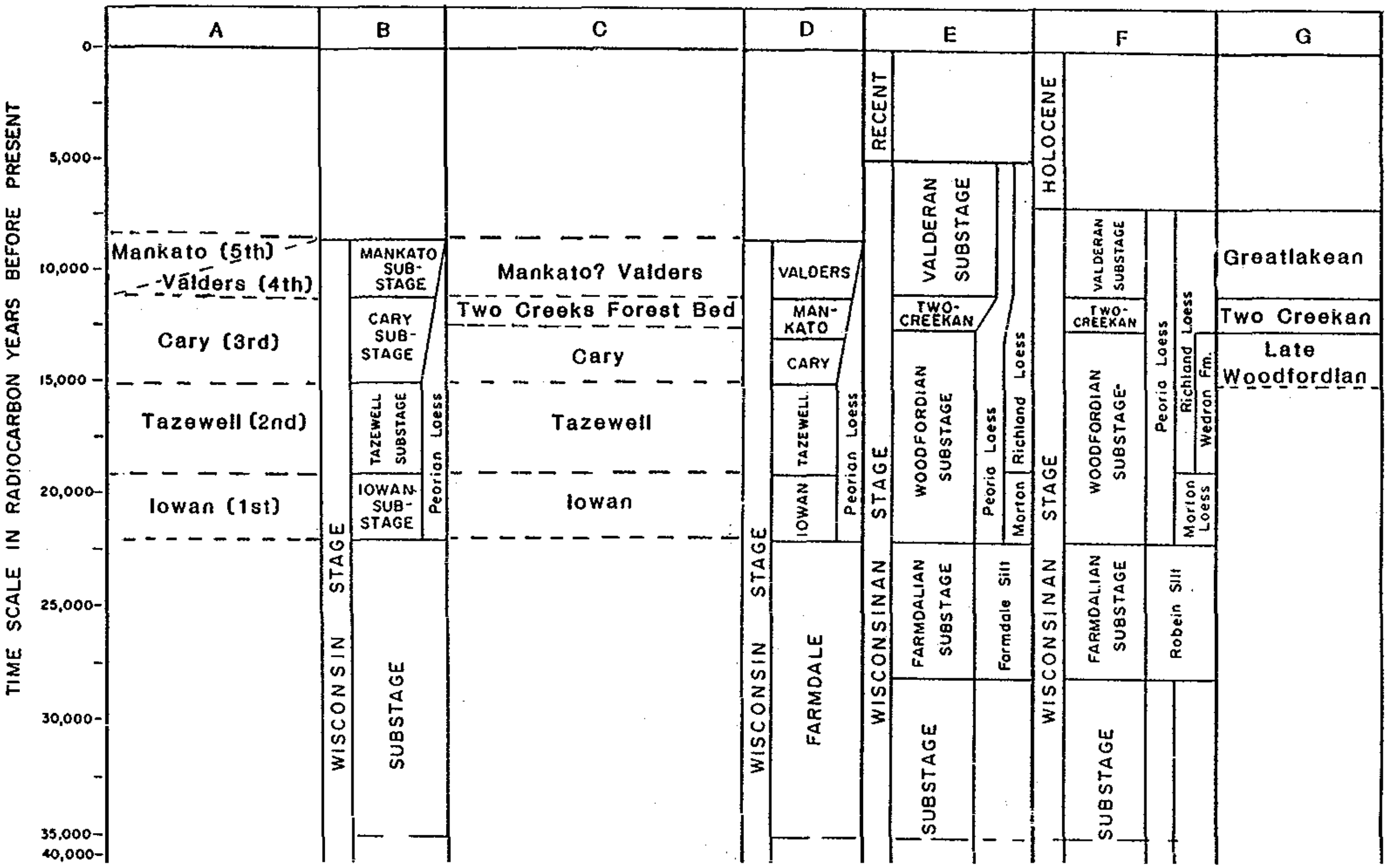


Figure 5. Equivalent time-related stratigraphic names. A: Thwaites, 1943. B: Leighton and Willman, 1950. C: Thwaites and Bertrand, 1957. D: Leighton, 1957. E: Frye and Willman, 1960. F: Willman and Frye, 1970. G: Acomb, Mickelson, and Evenson, 1982. After Frye and Willman, 1970, p. 123.

deposited (till), water-deposited (lacustrine or fluvial), or air-deposited (aeolian) sediments. The tills within the formations are more easily distinguished--using lithic criteria as stipulated by the NACSN's code--than the lacustrine and fluvial sediments that in many places separate them. Very similar lacustrine and fluvial sediments may occur repeatedly within a given stratigraphic sequence because the glacial lobes advanced into proglacial lakes, deposited till, and ablated into pro- and post glacial lakes. Eventually, as the study of these sediments continues and more subsurface stratigraphy is mapped, geologists may define lithostratigraphic members composed primarily of lacustrine and fluvial sediments.

This report summarizes late Wisconsin geologic history for the Green Bay and Lake Michigan Lobes. As Boulton and Paul (1976) write, "It seems axiomatic that the geotechnical properties of sediments should be related to their source, their mode of transport, and their mode of deposition" (p. 159). Papers by Hansel *et al.* (1985), McCartney and Mickelson (1982), Acomb, Mickelson, and Evenson (1982), Schneider and Need (1985), and Attig, Clayton, and Mickelson (1985) give a more detailed review of the relevant geology and complete references. The following narration collects the main features of the literature into an overview so that the sediments at a particular site can be more easily anticipated.

2. Zenda Formation

Of the five late Wisconsin formations, the Zenda Formation is the oldest. The Harvard Sublobe of the Lake Michigan Lobe deposited the

Tiskilwa Member of the Zenda Formation between 18,000 to 20,000 years ago. This pinkish-tan sandy till is associated with the Wedron Formation and the Marengo moraine in Illinois (Mickelson *et al.*, 1984, p. A6-6), but it is mapped at the surface only in the extreme south-central portion of Walworth County in Wisconsin. It is present at least as far north as Milwaukee in the subsurface. No glacial sediments in the Green Bay Lobe have been formally correlated with the Zenda Formation; burial of the Zenda Formation by younger sediments complicates such correlation.

3. New Berlin Formation

The second-oldest late Wisconsin formations are the Horicon Formation, deposited by the Green Bay Lobe approximately 14,000 to 18,000 years ago, and the New Berlin Formation, deposited by the Delavan Sublobe of the Lake Michigan Lobe approximately 14,000 to 18,000 years ago. The Kettle Moraine was formed when the two ice lobes abutted against each other and discharged fluvial sand and gravel (outwash) over blocks of ice that later melted.

Two till units, one superposed on the other, can be recognized in the New Berlin Formation that outcrops in Lake Michigan shoreline bluffs, but these have not been mapped or traced in the subsurface individually. The New Berlin Formation has not been studied extensively or subdivided into formal lithostratigraphic members. Till in the formation has been described as gravelly sandy loam till of brown to yellowish brown color or gray color when unoxidized. Sand and gravel outwash underlies the till strata in the type and reference sections. The formation has been mapped at the land surface behind the Darien Moraine and between the Kettle Moraine and the Valparaiso Moraine (Mickelson *et al.*, 1984, p. A7-3).

4. Horicon Formation

The Horicon Formation includes three named lithostratigraphic members, the Mapleview, the Wayside, and the Liberty Grove Members. Till in the Horicon Formation have been described as brown to reddish-brown cobbly, pebbly, silty sand (Mapleview Member) and as light brown to yellowish brown pebbly sandy loam (Liberty Grove Member) (Mickelson *et al.*, 1984, p. A9-1). Each of these members was defined in the northernmost part of the Green Bay Lobe but the members have not been delimited. No lithostratigraphic members have been defined in the formation's southern extent. The moraines mapped by Alden (1918, Plates XXXVI and XXIII) indicate that separate till units may exist south of Lake Winnebago. The Hancock Moraine forms the Horicon Formation's western boundary (Attig, Clayton, and Mickelson, 1985). Prior to 1970, the Horicon Formation was known as drift of Cary age, or 'Cary drift'.

5. Oak Creek Formation

Deposition of the Horicon Formation coincides with deposition of the Oak Creek Formation in the Lake Michigan Lobe 14,000 to 12,500 years ago (Mickelson *et al.*, 1984, p. A8-3). Members of the Oak Creek Formation have been informally called the "Valparaiso," "Tinley," and "Lake Border" (Rodenbeck *et al.*, 1987) and "2A, 2B, and 2C" (Mickelson *et al.*, 1984). These preliminary designations are based on lithic characteristics and are associated with minor readvances of the retreating ("Cary advance" in Hansel *et al.*, 1985) ice that formed the Valparaiso, Tinley, and Lake Border Moraines. Tills in the Oak Creek Formation are silty because the ice overrode gray, silty lake sediments of Glacial Lake Milwaukee (Schneider and Need, 1985). In places, silty lake sediments separate the till units in the Oak Creek Formation.

Following deposition of the Oak Creek and Horicon Formations, both the Green Bay and Lake Michigan Lobes wasted back to the north beyond the Straits of Mackinac. Lake levels fell as the glacier retreated and Lake Superior, with its modern outlet blocked by ice, drained through a channel across the upper peninsula of Michigan and into the Lake Michigan Basin (Hansel *et al.*, 1985). This glacial retreat was temporary, and both lobes of the glacier again advanced down the Lake Michigan Basin and the Green Bay Lowland.

6. Kewaunee Formation

This Early Port Huron advance incorporated the finer grained, red sediment that had been carried into these basins from iron-rich glacial sediments in the Lake Superior Basin (Murray, 1953). The Kewaunee Formation, described in a very general way as having red, clayey tills, includes ten lithostratigraphic members consisting primarily of till (figure 4b). McCartney and Mickelson (1982) use the Fox River as an arbitrary dividing line between the lithostratigraphic members on the east and west sides of the Green Bay Lobe; Kewaunee Formation tills on the east and west sides have distinct lithic properties because the bedrock, which the glacier eroded as it advanced, outcrops in a pattern nearly parallel to the axis of the Green Bay Lobe. On the east side, ice of the Green Bay Lobe overrode the Maquoketa Formation of Ordovician age and dolomites of the Silurian System. On the west side, ice of the Green Bay Lobe eroded the Sinnippee, Ancell, and Prairie du Chien Groups of Ordovician age, Cambrian sandstones, and igneous rocks of the Middle Proterozoic Wolf River Batholith (Mudrey, Brown, and Greenberg, 1982).

The Ozaukee Member, stratigraphically the lowest Kewaunee Formation till in the Lake Michigan Basin, has been estimated as 12,900 years old (Mickelson *et al.*, 1984, p. A10-4). In the Green Bay Lobe, the lowermost Kewaunee Formation tills are included in the Silver Cliff Member on the west side and the Branch River Member on the east side. No radiocarbon dates are available and no member-to-member contacts have been observed, so the estimated age of greater than 12,200 years before present (b.p.) is by correlation of stratigraphic position and geomorphology (McCartney and Mickelson, 1982). The Silver Cliff Member is bounded by the Early Athelstane Moraine to the west (Attig, Clayton, and Mickelson, 1985). The Branch River Member has been assumed to extend as far south as Alden's (1918) "Outer Moraine of Red Drift."

After deposition of the first red tills, both lobes retreated at least as far north as Algoma (Acomb, Mickelson, and Evenson, 1982) before readvancing and depositing a second red till. In the Lake Michigan Lobe, the Haven Member overlies silty glacial Lake Chicago sediments and/or the Ozaukee Member. In the Green Bay Lobe, ice deposited the tills of the Chilton and Kirby Lake Members of the east and west sides of the Fox River, respectively. Sediment from a proglacial lake, Early Lake Oshkosh (Thwaites and Bertrand, 1957), in places separates the first and second tills of the Kewaunee Formation in the Green Bay Lowland. A third till was deposited by the Lake Michigan Lobe, and is included in the Valders Member. The Valders and Chilton Members form an interlobate boundary west of the late Woodfordian interlobate moraine, the Kettle Moraine (McCartney and Mickelson, 1982).

Roughly 12,000 years ago, ice again withdrew north of the Lake Michigan Basin and lake levels fell below the modern level. Water again entered the Lake Michigan Basin from the Lake Superior Basin across the upper peninsula of Michigan, bringing more red, fine-grained sediments. The boreal Two Creeks Forest grew during the time of this low lake level only to be drowned by the rise to Calumet level and buried in Lake Chicago sediments (Hansel *et al.*, 1985). The next ice advance (11,800 to 11,200 years b. p.) flattened the forest and deposited the uppermost Kewaunee Formation members in the Green Bay Lowland and Lake Michigan Basin: the Middle Inlet, Glenmore, and Two Rivers Members. The southern extents of the Two Rivers Member, the Glenmore Member, and the Middle Inlet Member are marked by the Two Rivers, the Denmark, and the Late Athelstane moraines, respectively (Evenson and Mickelson, 1974; Attig, Clayton, and Mickelson, 1985).

Later Lake Oshkosh, at the margin of the Greatlakean-age ice in the Green Bay Lowland, fell from an elevation of 829 feet. Apparently the ice margin was very jagged, and the lakes that formed at various elevations did not have sufficiently stable levels for mappable beaches to develop (Thwaites, 1943, p. 139). Lake levels fell from the time of Greatlakean ice retreat until the Nipissing I (4,500 b. p.) and later lake phases (Hansel *et al.*, 1985).

7. <u>Importance of the Pleistocene history and stratigraphy</u>

An understanding of the geologic setting and the variability possible is necessary to understand the potential variability in geotechnical properties (May and Thomson, 1978, p. 362). The proglacial and postglacial ice marginal lakes described by Quigley (1980) in Ontario may be very similar to Thwaites' Early Lake Oshkosh and Lake Oconto. Quigley (1980) describes glaciolacustrine facies including ice-contact deltas, fluvial or turbidite sands and gravels or clays in ice-proximal areas to thick, massive clays in distal regions (p. 266). Since Thwaites' mapping, additional buried beaches have been discovered in the area glaciated by the Green Bay Lobe (Gordon and Huebner, 1984).

III. Study methods

A. Application of lithostratigraphy

My interpretation and analysis of geotechnical data is based on the lithostratigraphic framework described in the preceding section. I associated the geotechnical and hydrogeologic properties compiled from geotechnical reports with the defined lithostratigraphic units. I interpreted the stratigraphy of the individual sites using stratigraphic investigations conducted at a reconnaissance level (McCartney, 1979; Need, 1985; Acomb, 1978) in conjunction with stratigraphic interpretation and geologic mapping of Wisconsin's Lake Michigan bluffs (Mickelson *et al.*, 1977). Detailed geologic mapping has not been attempted over most of the area glaciated by the Green Bay and Lake Michigan Lobes in late Wisconsin time; recent reports on Brown County (Need, 1985), Florence County (Clayton, 1986), and Portage County (Clayton, 1986) are notable exceptions.

One convention established by Mickelson *et al.* (1984) is to associate facies other than till with a named lithostratigraphic member. For example, "the Valders Member contains basal glacial till deposited by ice of the Lake Michigan Lobe and associated fluvial and lacustrine deposits" (p. A10-8). To be included in one lithostratigraphic member, all of the facies must be clearly lithologically associated with each of the others (Mickelson *et al.*, 1984, p. 3).

The boring logs that I used were not always written by geologists and frequently did not include the lithic criteria (e.g., mineralogy) necessary to distinguish one fluvial or lacustrine sediment from another. I made three assumptions: Mickelson *et al.*'s (1984) descriptions of tills in lithostratigraphic members are 1) accurate, 2) complete, and 3) the extent of the stratigraphic units is closely approximated by figure 6. Then I expected to find the mapped unit from the land surface to variable depths, underlain by a possibly discontinuous fluvial and/or a lacustrine layer of sediment, in turn underlain by the next lower lithostratigraphic member (including a till) in the stratigraphic section, and so forth. To some extent, my expectations were based on glacio-depositional models like those in Clayton and Moran (1974) and Boulton and Paul (1976), but consideration of local constraints (e.g., mapped distribution, topography) and my observations of modern glacial processes in Alaska influenced my interpretation more than the generic models. The buried glacial geomorphology produced by repeated ice advances (White, 1974) and other disruptions of bedding, such as involutions (Mickelson and Evenson, 1974) and glaciotectonic structures (Moran, 1971) frequently complicated stratigraphic interpretation.

B. USDA Soil Conservation Service county reports

I did not find published Soil Conservation Service reports consistently helpful for distinguishing lithostratigraphic members within a formation. The Soil Conservation Service map units are

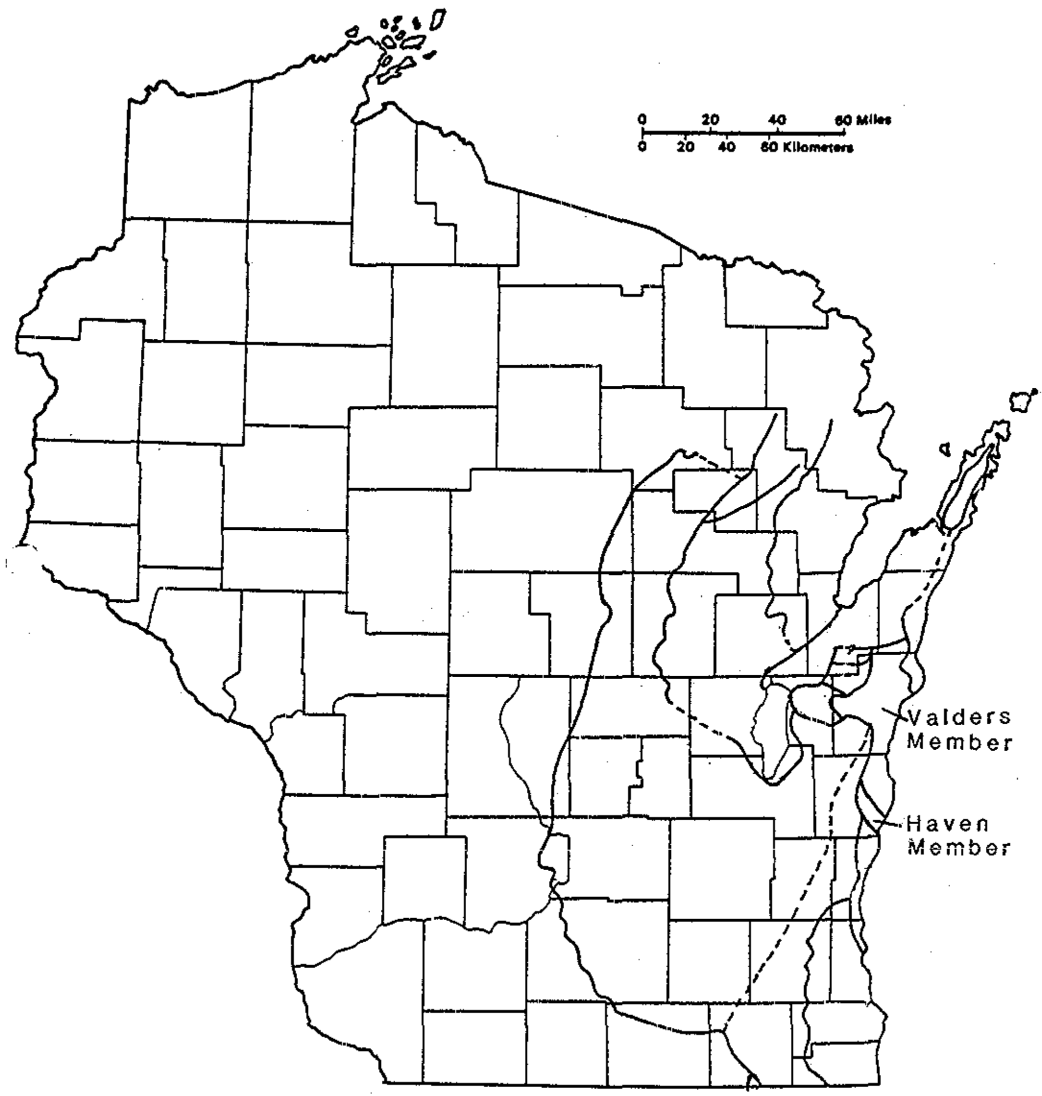


Figure 6. Surface distribution of named lithostratigraphic units of late Wisconsin age. (From Mickelson et al., 1984.) This map differs from Plate 1 by showing surface distribution of the Haven Member farther south than the Valders Member.

influenced by climate, living organisms, relief, parent material, and time. In other words, the factor pertinent to this study is combined with other factors in the determination of soils mapping units. As a result, the same soils mapping units may form on different lithostratigraphic members.

C. Geotechnical reports submitted in accord with Administrative Code

1. <u>The influence of Wisconsin Administrative Code</u>

The quality and quantity of data suitable for this study is strongly affected by the legal requirements for geotechnical information in the Wisconsin Administrative Code. Some reports of geotechnical investigations for proposed landfills prior to 1980 exceeded the minimum data requirements of Chapters NR 51 (1969) and NR 151 (1971). These early codes required investigations to a depth of only 10 feet below proposed base grade (revised to 15 feet) and did not stipulate a minimum number of borings or specific tests until a 1976 revision. NR 180 (1980) requires a minimum number of borings per area with descriptive boring logs, grain size analyses, permeability tests, and raw data in appendices. Data from geotechnical investigations prior to 1980 were included in the database of this report if the data resulted from standard engineering practices commensurable with those of post-1980 investigations. The availability and quantity of geotechnical information is expected to improve with the promulgation of NR 510 and NR 512; these will replace

NR 180.13 (5) and NR 180.13 (6), respectively. Excerpts from the Wisconsin Administrative Codes dealing with geotechnical investigations for landfills are included in an appendix to this report, "Data required by Wisconsin Administrative Code."

2. Compilation of information required by NR 180

i. Method of compiling data

Compilation of data submitted by consulting firms in individual reports and correspondence required considerable effort. A single site might have ten reports of geotechnical investigations by different consulting firms, each with a slightly different style of data presentation. The amount of suitable data varied with individual histories of site development and expansion. I compiled the data by hand and supervised its entry to a microcomputer spreadsheet.

ii. Quality and selection of data compiled

Early in the project, several individuals suggested that I eliminate reports by firms with reputations for poor quality work. I did not eliminate any firm's data because the apparent quality of all the reports varied with time, personnel, and circumstances. Moreover, I could not always distinguish between poor quality investigations and written reports of poor quality. Some "wild" data were "eliminated" by the resistant statistical techniques used; these techniques are described later in this report.

The emphasis in this report is on assessment of *in-situ* characteristics of stratigraphic units. For this reason, I did not compile lab hydraulic conductivities for samples identified as recompacted. I carefully reviewed field hydraulic conductivities and well construction diagrams, then recorded field hydraulic conductivities. If the well screen intersected two materials, I assigned codes indicating that two materials (facies) were present within the saturated interval tested. Hydraulic conductivities for multiple facies are not included in comparisons of tills in lithostratigraphic members.

D. Associating data with a lithostratigraphic unit.

Several difficulties complicated the process of associating geotechnical data with Pleistocene lithostratigraphy. These difficulties include: 1) the confusing and complex stratigraphic nomenclature, 2) the difference in approaches taken by geologists and engineers, 3) distinction of till from other sediment facies, 4) identification of till units, 5) "incompatible" scales and maps. Despite these problems, Pleistocene lithostratigraphy provides a reasonable framework for data organization. Resolution of these problems is described below.

1. Stratigraphic nomenclature

As demonstrated in part II, the late Wisconsin stratigraphic names are numerous and confusing. Using the most detailed information available requires knowledge of the variety of names and what the materials have most recently been called. Associating the engineering information with glacial lithostratigraphic units requires familiarity with the units both in the literature and in the field. I visited type or reference sections to obtain a better understanding of the literature.

2. <u>The different approaches taken by engineers and geologists</u>

It seemed as though the information in the boring logs was collected for a purpose other than definition of soil, bedrock, and groundwater conditions (hydrogeology) at the site. This is due to the difference in professional orientation between geotechnical engineers and geologists. Although Terzaghi, the father of soil mechanics, emphasized the effects of sedimentation, erosion, weathering, jointing, and groundwater flow (Dixon, 1974, p. 234), the boring logs produced by geotechnical consulting firms that are included in initial site reports and feasibility reports seem to emphasize the soil mechanics approximations of strength. To a large extent, this is a matter of presentation. Hydrogeologists prefer to see all test results and geologic interpretation on a boring log. A geotechnical consulting firm, on the other hand, may wish to present boring logs completed by a subcontractor separately (in an appendix) from the geologic interpretation (which is usually in the text).

3. <u>Distinction of till from other sedimentary facies</u>

Most geologists who study Quaternary materials rely on field and laboratory evidence to determine whether a sediment is till or sediment of a different facies. Dreimanis (1976) lists five criteria commonly emphasized in the identification of till:

". . . (1) glacial origin; (2) presence of a variety of rock and mineral fragments of various sizes, many of them having been transported considerable distances; (3) poor sorting, in the geologic meaning of this term, that is: presence of a wide range of particle sizes, usually with bi-modal or multi-modal distribution; (4) lack of stratification, although some tills are foliated, or even truly bedded; (5) compactness or close packing, also with certain exceptions" (p. 14).

Even with good field exposures, the interpretation is open to professional dispute, largely because of the varying definitions of till (see Dreimanis, 1976). The techniques used by geologists to distinguish individual till units have varied to accommodate the lithostratigraphy being studied, and the criteria pertinent to this study have been summarized in table 1. (Other techniques may be found in Raukas, Mickelson, and Dreimanis, 1978.) Within each of the Kewaunee Formation members, I relied on grain size analysis and sorting to determine whether a material was till (poorly sorted), or lacustrine or fluvial (well sorted). Distinguishing till from outwash in the very sandy Horicon Formation was nearly impossible if a complete grain size analysis was not available (i.e., if the grain size analysis was completed only to P200, 0.075 mm). If the genesis of a sediment could not be determined from the information available, it was coded as unknown.

4. Identification of lithostratigraphic units

Distinction of tills in members of the Kewaunee Formation presents another difficulty because the tills have similar provenance. Distinctions between lithostratigraphic members of the Kewaunee Formation were made on the basis of description (including qualitative color changes noted on the log and grain size analysis), mapped location, and stratigraphic sequence. If sediments clearly belonged within a formation, but could not be confidently identified at the member level, no member code was entered. If not even the formation could be identified, or if the sediment did not fit within a formation's defined range of lithic characteristics, a code of UN for unknown/unnamed was assigned. The sites with sediments that did not fit the expected lithostratigraphic framework are useful for identification of areas requiring further geologic study. Some excellent logs included observations on mineralogy, depth of leaching, or fabric and structure of the samples that were very helpful.

5. "Incompatible" maps and scales

The next difficulty in assigning data to a lithostratigraphic unit has to do with scale. Little detailed mapping of late Wisconsin glacial sediments has been completed in the Green Bay and Lake Michigan Lobes. Thesis (McCartney, 1979) and journal illustrations and two 1:1,000,000 maps of Quaternary sediments and glacial landforms (Lineback *et al.*, 1983; Farrand *et al.*, 1984) were used to determine a preliminary, theoretical stratigraphic section at a site. Incompatible map bases (lack of common political and hydrographic features or coordinate systems) complicated map-to-map comparisons. The geotechnical boring locations are plotted at a relatively large scale for submittal, on the order of 1 inch equals 200 feet. These boring locations were transferred to 7 1/2 minute topographic quadrangle maps so that the boring locations could be seen in a more regional geomorphic context.

E. The spreadsheet

Data from handwritten summary sheets were entered to a microcomputer spreadsheet for ease of manipulation. Table 2 gives the spreadsheet headings and subheadings used, and table 3 lists the codes. The spreadsheet allowed relatively easy sorting and combining of data into files of single parameters, such as lab or field hydraulic conductivity, or single lithostratigraphic units.

F. Spatial locations

The data collected for this study have been assigned spatial locations so that the data are suitable for entry to a geographic information system and may be combined with data from other sources. Reconciliation of the spatial location of all data points to a single system provided a difficult problem in the assembly of a large database from diverse sources. Engineering site plans usually record precise spatial locations, but these locations are frequently tied to arbitrary bench marks. In fact, the current administrative code, NR 180, requires site specific grid coordinates and the use of local benchmarks. Although this does not preclude use of a real space coordinate system such as universal transverse mercator, latitude and longitude, or public land survey system (township and range) coordinates for each borehole, none of the submitted reports included coordinates of these types for each boring.

Geological investigations typically use information plotted on 15- or 7 1/2-minute topographic quadrangles. For this study, latitude

Identity:	County Year sampled Lithostratigraphic unit Geologic genesis
Location:	Latitude (degrees, minutes, seconds) Longitude (degrees, minutes, seconds) Boring number Land surface elevation (feet above MSL) Top of interval sampled (depth in feet) Bottom of interval sampled (depth in feet)
Hydraulic conductivity:	Lab K (cm/s) Lab K method of test Field K (cm/s) Field K method of test
Grainsize percentages:	Percent of bulk > 2 mm Sand percentage of matrix (< 2 mm) Silt percentage of matrix (< 2 mm) Clay percentage of matrix (< 2 mm)
Engineering properties:	USCS group symbols P200 (%) Dry unit weight (pcf) SPT N (blows/foot) Natural moisture (% of dry weight) Liquid limit (%) Plastic index (%) Pocket penetrometer measurement (tsf)

Table 2. Categories of data recorded using the spreadsheet. 'K' symbolizes hydraulic conductivity. 'P200' means the percent passing the #200 sieve. 'SPT N' abbreviates standard penetration test blow counts.

Counties	
Brown	BN
Calumet	CA
Dane	DN
Dodge	DG
Door	DR
Fond du Lac	FL
Green Lake	GL
Kenosha	KE
Kewaunee	KW
Manitowoc	MN
Marinette	MT
Marquette	MQ
Milwaukee	ML
Oconto	OC
Outagamie	OU
Ozaukee	OZ
Racine	RA
Sauk	SK
Shawano	SH
Sheboygan	SB
Walworth	WW
Washington	WN
Waupaca	WP
Winnebago	WI

Test methods for hydraulic conductivity	
lab constant head (vert)	1
lab constant head (hor)	2
lab falling head (vert)	3
lab falling head (hor)	4
lab backpressure or consolidometer (vert)	5
lab backpressure or consolidometer (hor)	6
field rising head	7
field falling head	8
pumping test	9
other	10

Lithostratigraphic Units	
Middle Inlet M.	mi
Ozaukee M.	oz
Silver Cliff M.	si
Two Rivers M.	tr
Valders M.	va
Oak Creek Fm.	OC
Horicon Fm.	HO
Mapleview M.	ma
Liberty Grove M.	lg
New Berlin Fm.	NB
Zenda Fm.	ZE
Tiskilwa M.	ti
Unnamed units	UN

Materials and genesis	
Till (all varieties)	3
Outwash (sand & gravel)	4
Lacustrine (sand, silt and/or clay)	5
Loess	6
Modern alluvium	7
Rock	12
Organic	13
Undifferentiated	99

Table 3. Codes used to identify spreadsheet data. Although codes for lithostratigraphic members appear in only lower case here, they may appear in upper or lower case in the appendices.

and longitude coordinates were chosen because these coordinates lend themselves to easy conversion to map projections such as universal transverse mercator, and they follow simple rules like increasing to the north and west. The seconds of latitude and longitude usually provide an adequate resolution of borehole locations' relative positions at individual landfill sites. Use of latitude and longitude avoids problems associated with the use of township and range such as irregular section shapes that resulted from influences of the original system of surveying.

Elevations must be reported relative to USGS datum according to Wisconsin Administrative Code (NR 180.13(6)). The datum was often missing from the documents predating the existing code. Although reports have improved in this respect, lack of datum elevations continues to be a problem.

G. Choice of analytical tool

Associating groups of material properties with mapped lithostratigraphic units in Wisconsin is a principal goal of this study. All the material properties recorded vary in three dimensions. Measurement error is associated with each observation of each parameter. The lack of control over how samples were chosen for testing controls the choice of data analysis tools. Many of our sample sizes are small and lack Gaussian distributions; resistant and robust exploratory statistical methods are necessary for confidence in study results. In order to assess the validity of statistical assumptions that the sample is random, that it has a normal (Gaussian) distribution, and that all of the populations have equal variances, I used Minitab (Release 5.1.1, Minitab, Inc., 1986) statistical software.

Within each unit I constructed histograms of both field and lab $\log_{10}$ hydraulic conductivities, P200 values, plastic and liquid limits, plastic index, pocket penetrometer measurements, and dry unit weights for each site. According to Ryan, Joiner, and Ryan (1985), "Observations taken in close proximity, either in time or in space, often are correlated. Observations that are correlated do not form a simple random sample" (p. 175). In some cases there were clear patterns from site to site within a single till unit; thus, the sample is not random. However, in most cases, no clear pattern was apparent and a random sample was assumed.

I used several methods to determine whether the data are normally distributed. These methods include comparison of median and mean, normal probability plots (Ryan, Joiner, and Ryan, p. 177), and visual assessment of histograms. Liquid limit, plastic limit, and dry unit weights typically have Gaussian or approximately Gaussian distributions. Values of P200, $\log_{10}$ hydraulic conductivities, and pocket penetrometer measurements are not always Gaussian.

The assumption of equal variances between populations is important when choosing an analysis of variance (ANOVA) technique. Some of the samples are small ($15 > n > 5$), leading to relatively large standard deviations about the mean; when sample sizes are small and have unequal variances, use of an ANOVA technique incorporating pooled standard deviations leads to an undesirable Type I error.

Previous workers have described the statistical distribution of hydraulic conductivity data. Freeze and Cherry (1979, p. 31) and Neumann (1983, p. 83), among others, indicate that hydraulic conductivity follows a log-normal distribution. The hydraulic conductivities included here more closely resemble a Gaussian distribution after a base 10 power transformation. But the medians and the means of the hydraulic conductivity data still do not always equal each other; some histograms show a skewed distribution. In addition to the non-Gaussian distribution, the small sample sizes (fewer than 15 values) restrict the use of standard parametric statistical tests. Nonparametric techniques have the advantage of being resistant to the influence of a few outlying data points. In most cases, I used the Kruskal-Wallis test, ". . . a generalization of the Wilcoxon two-sample test to the case of $k > 2$ samples . . . the test is an alternative nonparametric procedure to the F test for testing the equality of means . . ." (p. 495, Walpole and Myers). The Kruskall-Wallis test assumes that the data form continuous distributions all having the same shape. The hypotheses are:

H_o: k independent samples are from identical populations;

H_1: there is at least one difference among the k independent samples.

If the test statistic h falls in the critical region $H > X^2$, H_o may be rejected at a level of significance determined from a statistical table. Otherwise, H_1 is rejected (Walpole and Myers, p. 496).

A nonparametric statistical technique--the boxplot--is well-suited for graphical analysis of data. A box and whisker plot gives more information than a histogram, but requires a minimum of 5 values. Figure 7 shows a median, the fourthspread (box), outerfourth ranges (whiskers), outliers, and the approximate 95% confidence interval (parentheses). The parentheses indicate the confidence interval of the median and are much more sensitive to changes in the data than the box. Batches (the exploratory data analysis equivalent of samples) of data may be compared using the values of the median, the fourth spread, the location of the median with respect to the fourths, whisker length, and outlying data points. Up to 25% of the data in each batch can be "wild" without greatly affecting the features of the box (Emerson and Strenio, 1983).

The methods just described are used to assess the variability and expected range of values for properties of tills within lithostratigraphic units. Other methods are appropriate for investigation of the underlying relationships among data compiled. If the compiled data are from a carefully designed experiment, inferences can be made from straight-line fits. The conditions for statistical inference follow.

> "1. In the underlying population, the relationship between *x* and *y* should be a straight line...."
> "2. For each *x*, the amount of variation in the population of *y*s in the population should be approximately the same...."

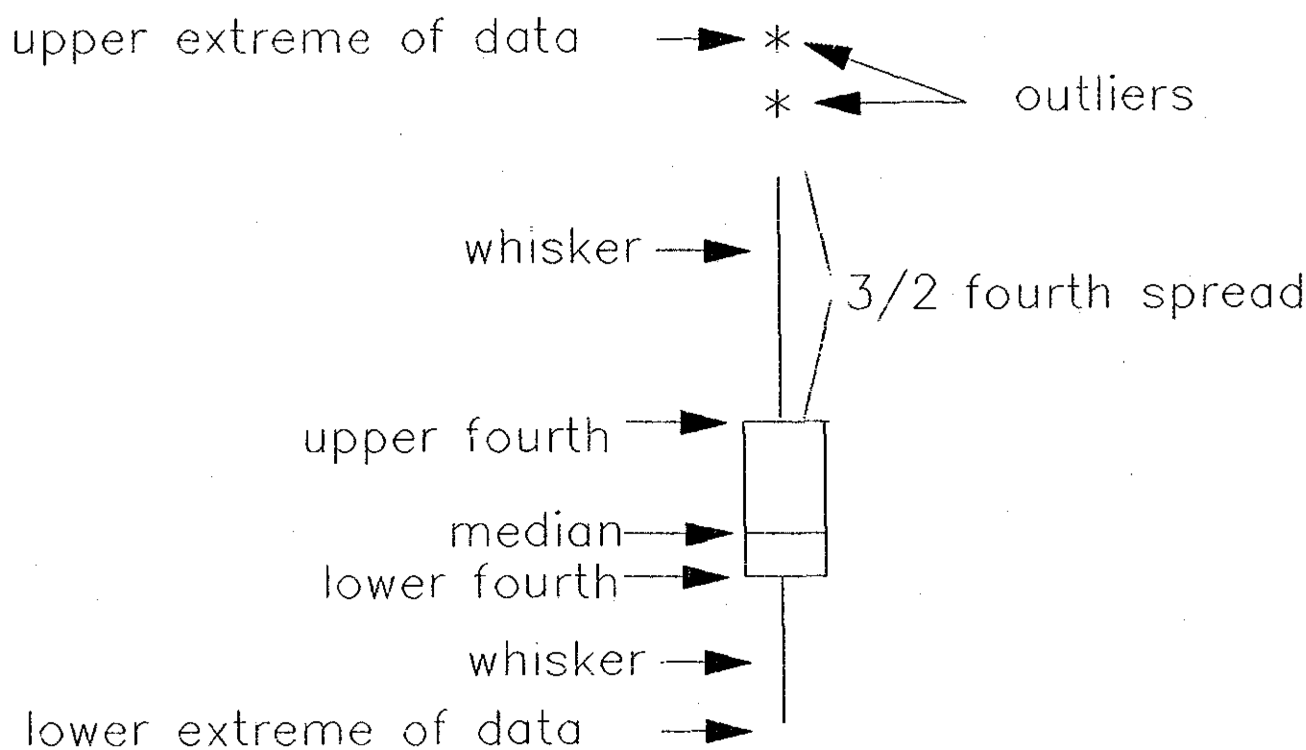


Figure 7. Features of the boxplot. This boxplot was drawn at an arbitrary scale. The fourth spread is the distance (or range of values) between the upper and lower fourths. Whiskers are drawn out to the data value most remote from the median within a distance evaluated as (3/2 * fourth spread). Confidence limits for the median may be added in the form of parentheses. See Hoaglin, Mosteller, and Tukey for a discussion of exploratory data analysis terminology (1983, pp. 1-6).

> "3. For each *x*, the distribution of *y*s in the population should be approximately normal...."
> "4. The *y*s that actually are obtained should be approximately independent..." (Ryan, Joiner, and Ryan, p. 230).

Frequently, only one type of data was available for a specific sample. The data compiled in this project were not always paired, and medians are used to represent individual till units. Thus, few inferences may be confidently made. Correlation and regression are used in this study to determine which tests are useful for hydrogeologic interpretation and to make recommendations for future investigations.

IV. Presentation of Data

A. Variation within tills of lithostratigraphic units

Data for materials other than till are not discussed here because the extent of these materials is not known. However, values of hydraulic conductivity for Pleistocene sand and gravel outwash in eastern Wisconsin are typically within an order of magnitude of 10^{-3} cm/s. Values of hydraulic conductivity measured in the field for silty lacustrine sediments are typically about 10^{-5} cm/s while rhythmites of silt and clay (commonly referred to as 'varved' lacustrine sediments) have lower values of hydraulic conductivity. Site-specific data for all materials at each site were included in appendices.

The following discussion of the variability of till units assumes that the stratigraphic and geologic interpretations are correct. Histograms of $\log_{10}$ values of hydraulic conductivity measured in the field and in the laboratory were plotted for the till(s) of each lithostratigraphic unit. Matrix percentages of sand, silt, and clay are plotted in textural triangles. Plasticity charts illustrate the range in liquid limit and plastic index. Pocket penetrometer and dry unit weight data are not discussed until section IV B unless sufficient data were available for an analysis of variance test (ANOVA). The standard penetration test, USCS group symbols, plastic limits, and other indices derived from Atterberg limits will be presented only for discussion in part V.

Within some tills, no quantitative comparison of data may be made for one of two reasons: 1) insufficient data are available at each site for statistical analysis, or 2) data were collected for only one site. Data points are coded by site within each of the four diagrams for each unit. Refer to Plate 1 for the location of sites. County names and section, township, and range numbers are provided for the sites in an appendix. The site numbers are consistent throughout text, illustrations, and appendices.

1. Kewaunee Formation

Figures 8a through 8h illustrate the hydraulic conductivities, grain size analyses, and plasticity charts for the tills in members of the Kewaunee Formation. Due to the geographic distribution of both the landfills and the Branch River Member, no data for the Branch River Member were recorded. Although some data for the Silver Cliff Member may have been recorded, I could not differentiate it from other Kewaunee Formation sediments.

a. Hydraulic conductivities measured in the field

In the Middle Inlet (figure 8a) and Kirby Lake (figure 8b) Members on the west side of the Green Bay Lobe, field hydraulic conductivities have the widest range, varying over four orders of magnitude. Tills in other members may have an equal range, but data are too sparse to show it. Sufficient samples for the Kruskal-Wallis test were available in both the Kirby Lake and Glenmore Members (figure 8c). In the Glenmore Member, I rejected the null hypothesis that two independent samples, sites 1 and 10 (figure 8c), are from

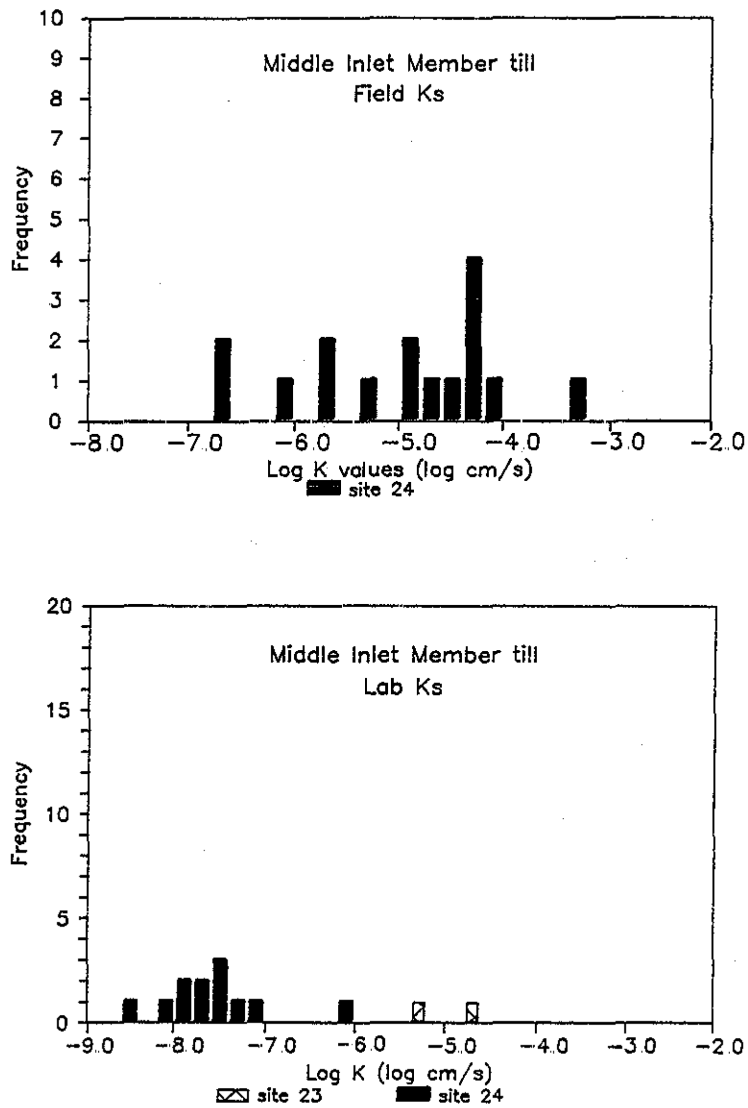
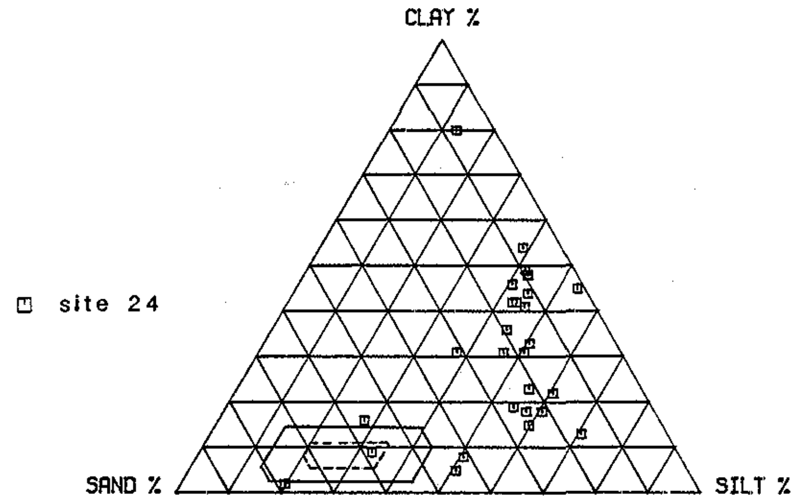


Figure 8a. Data for till in the Middle Inlet Member of the Kewaunee Formation. Field K means hydraulic conductivity measured in the field. Lab K means hydraulic conductivity measured in the laboratory. Data are plotted with a pattern indicating the source.



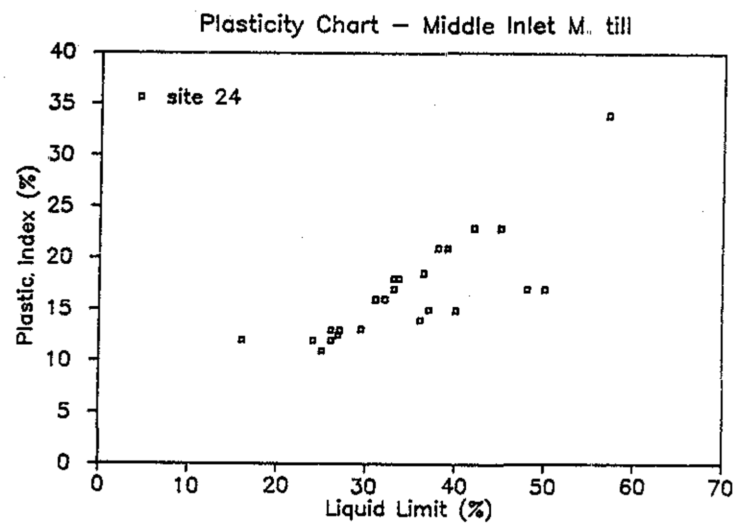
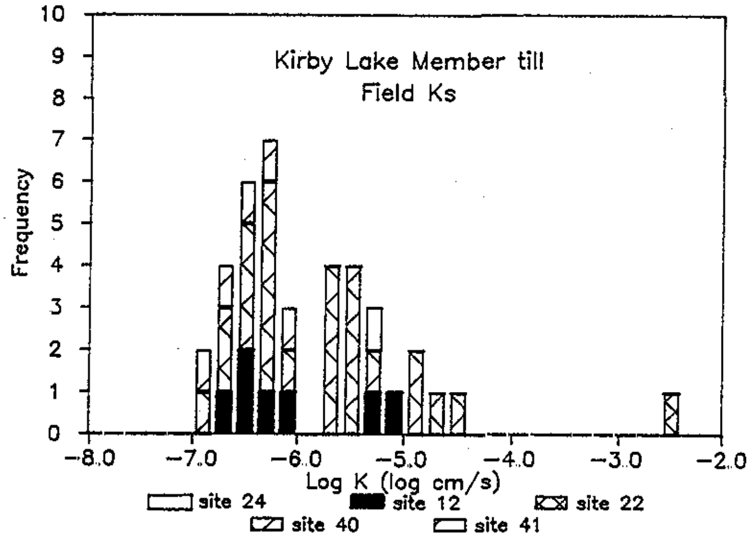


Figure 8a, cont. Data for till in the Middle Inlet Member of the Kewaunee Formation. Sand, silt, and clay percentages are for the less than 2 mm fraction. Data are plotted with a symbol indicating the source.



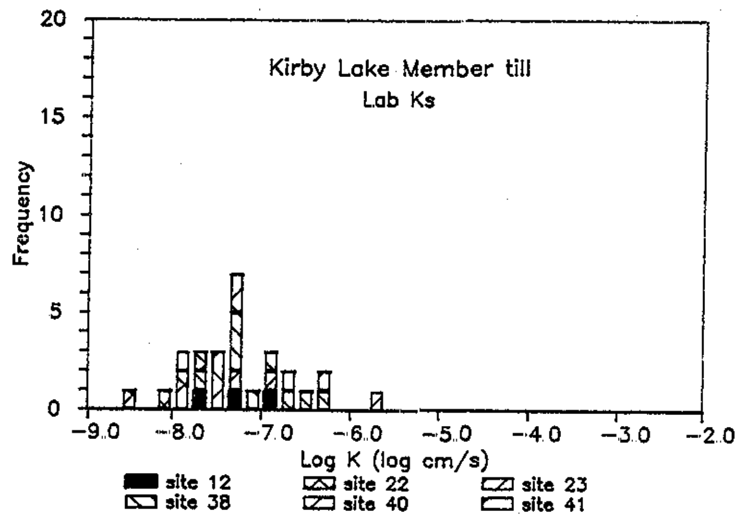
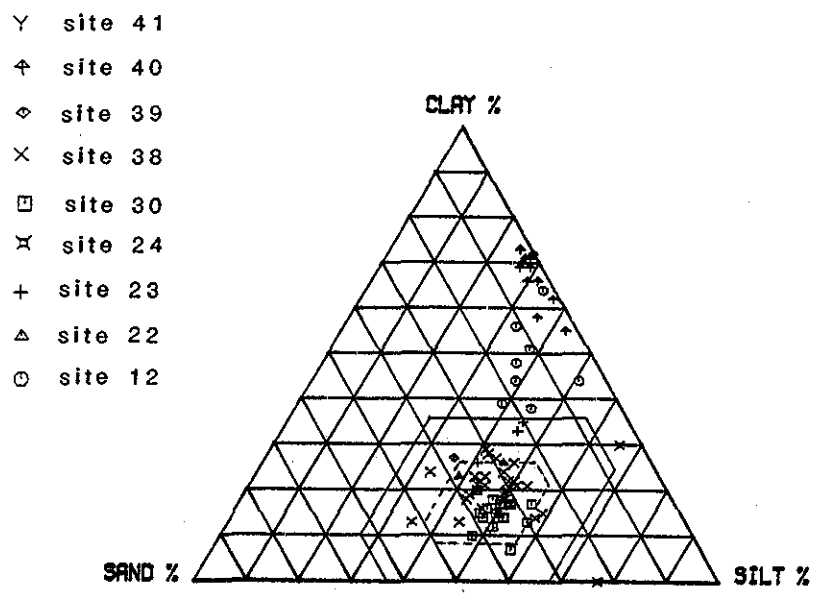


Figure 8b. Data for till in the Kirby Lake Member of the Kewaunee Formation. Field K means hydraulic conductivity measured in the field. Lab K means hydraulic conductivity measured in the laboratory. Data are plotted with a pattern indicating the source.



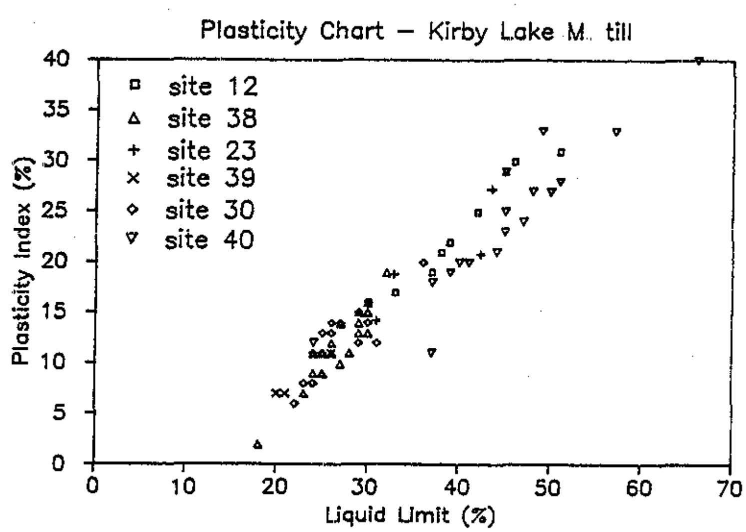
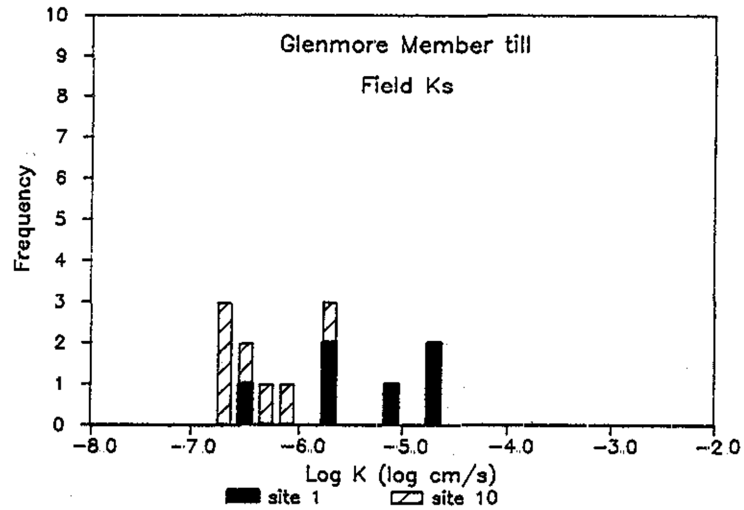


Figure 8b, cont. Data for till in the Kirby Lake Member of the Kewaunee Formation. Sand, silt, and clay percentages are for the less than 2 mm fraction. Data are plotted with a symbol indicating the source.



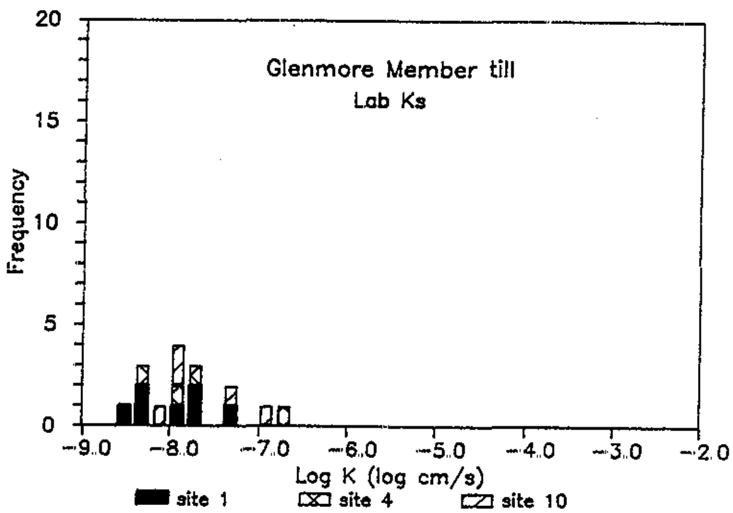
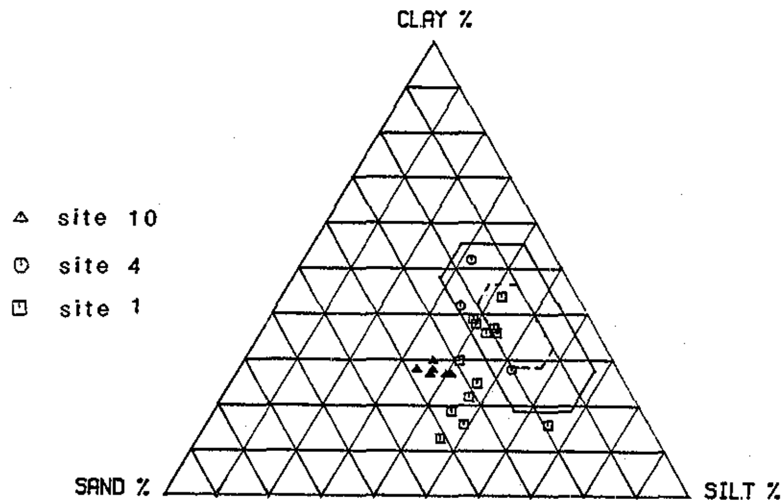


Figure 8c. Data for till in the Glenmore Member of the Kewaunee Formation. Field K means hydraulic conductivity measured in the field. Lab K means hydraulic conductivity measured in the laboratory. Data are plotted with a pattern indicating the source.



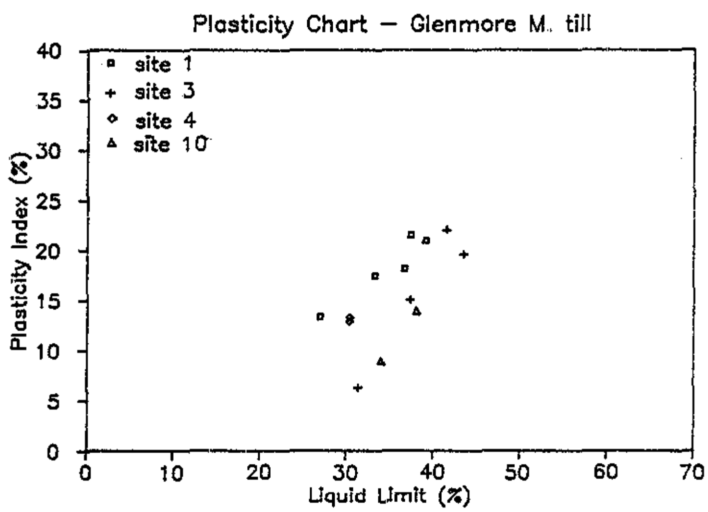
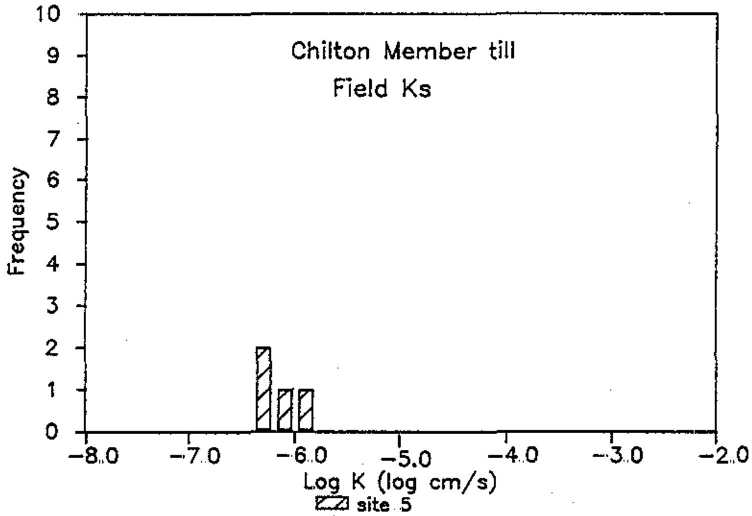


Figure 8c, cont. Data for till in the Glenmore Member of the Kewaunee Formation. Sand, silt, and clay percentages are for the less than 2 mm fraction. Data are plotted with a symbol indicating the source.



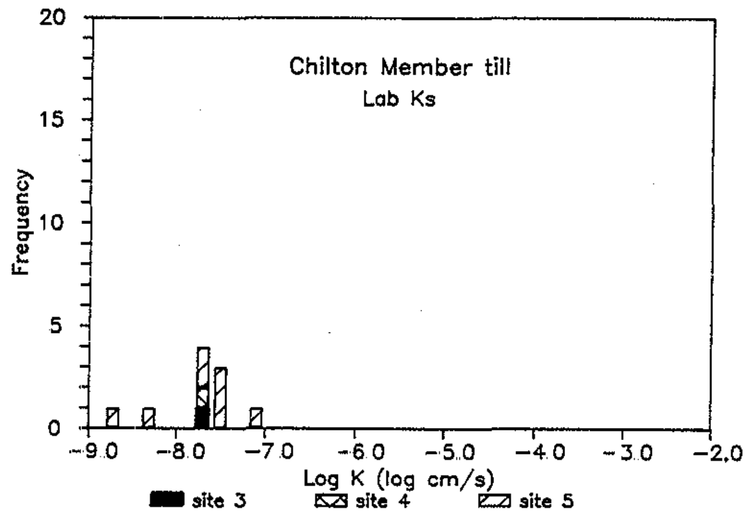
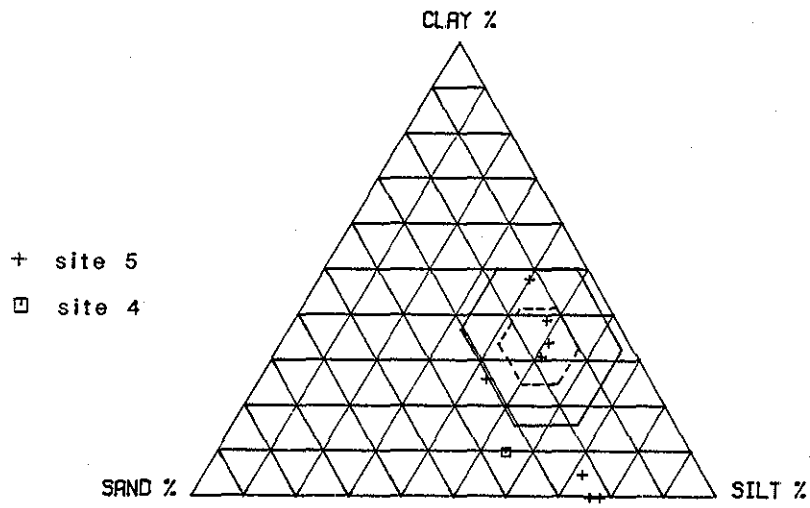


Figure 8d. Data for till in the Chilton Member of the Kewaunee Formation. Field K means hydraulic conductivity measured in the field. Lab K means hydraulic conductivity measured in the laboratory. Data are plotted with a pattern indicating the source.



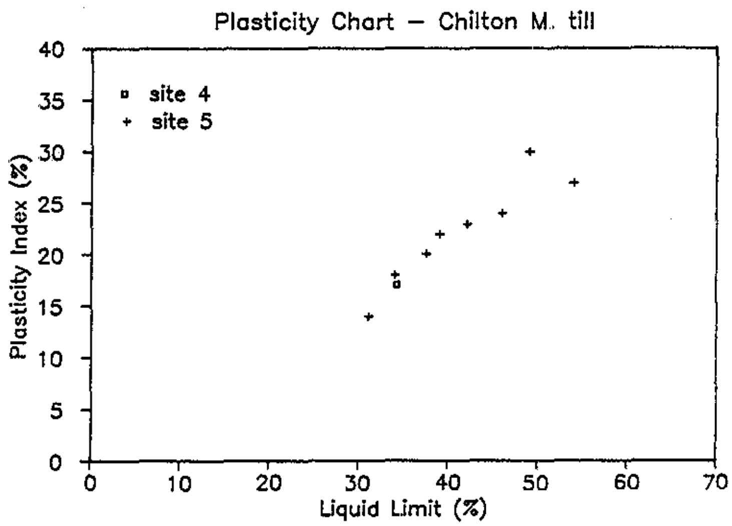


Figure 8d, cont. Data for till in the Chilton Member of the Kewaunee Formation. Sand, silt, and clay percentages are for the less than 2 mm fraction. Data are plotted with a symbol indicating the site.

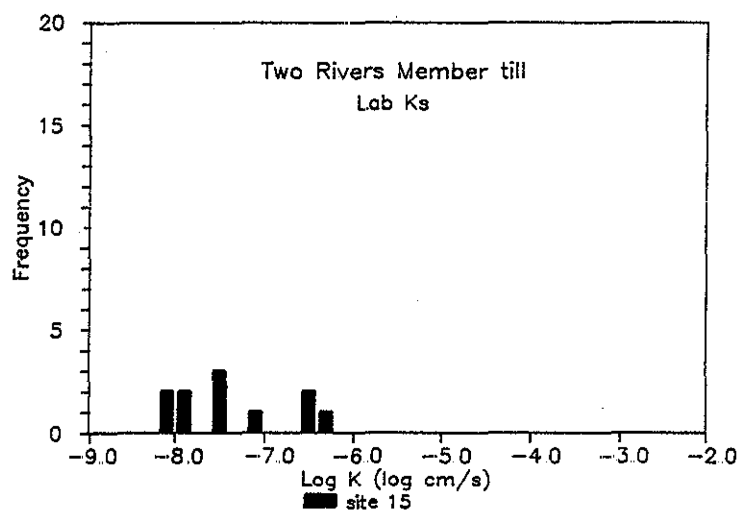


Figure 8e. Data for till in the Two Rivers Member of the Kewaunee Formation. No values of hydraulic conductivity measured in the field were compiled. Lab K means hydraulic conductivity measured in the laboratory. Data are plotted with a pattern indicating the source.

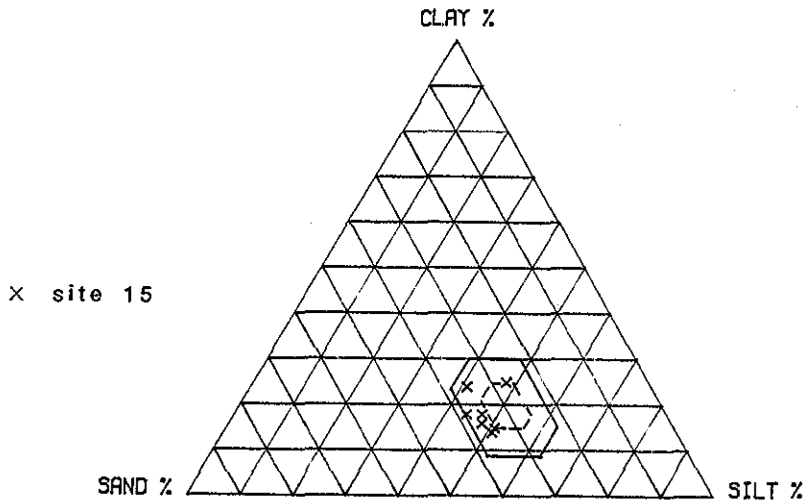


Figure 8e, cont. Data for till in the Two Rivers Member of the Kewaunee Formation. Sand, silt, and clay percentages are for the less than 2 mm fraction. No Atterberg limit data were compiled. Data are plotted with a symbol indicating the source.

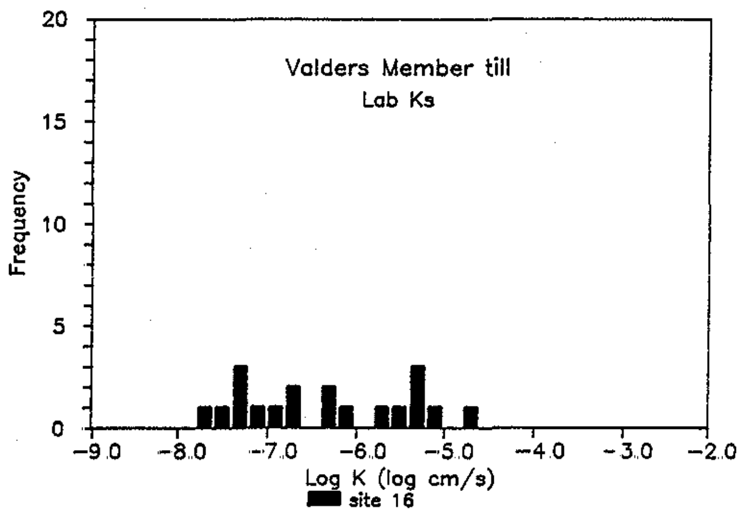
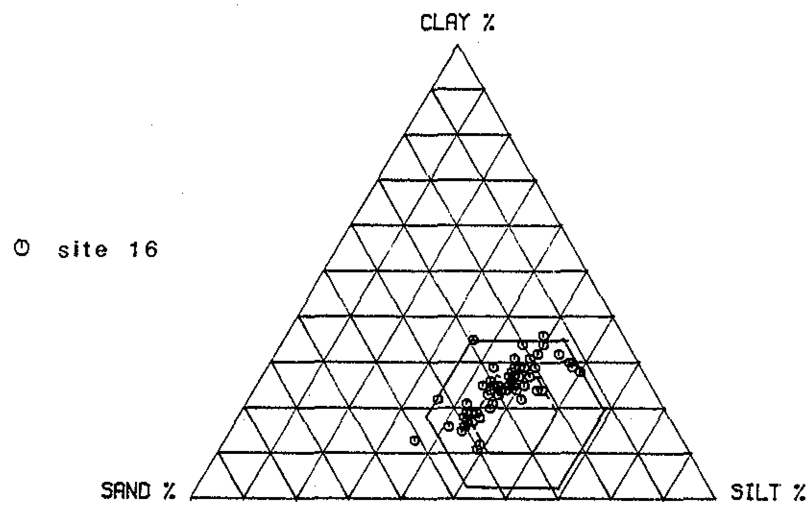


Figure 8f. Data for till in the Valders Member of the Kewaunee Formation. No values of hydraulic conductivity measured in the field were compiled. Lab K means hydraulic conductivity measured in the laboratory. Data are plotted with a pattern indicating the source.



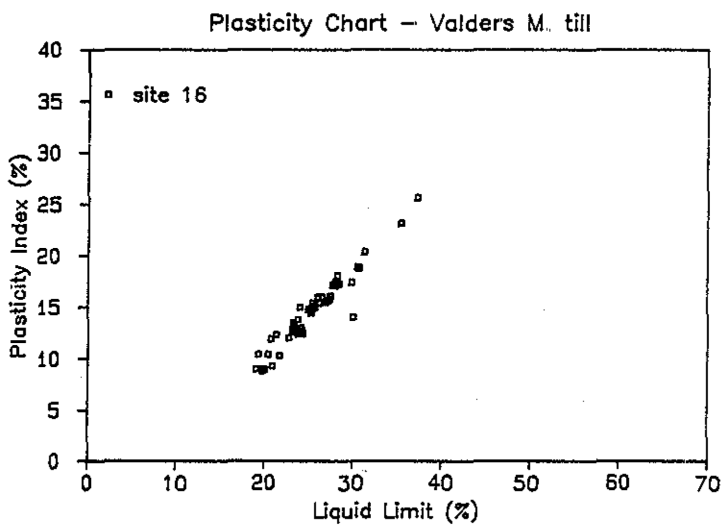
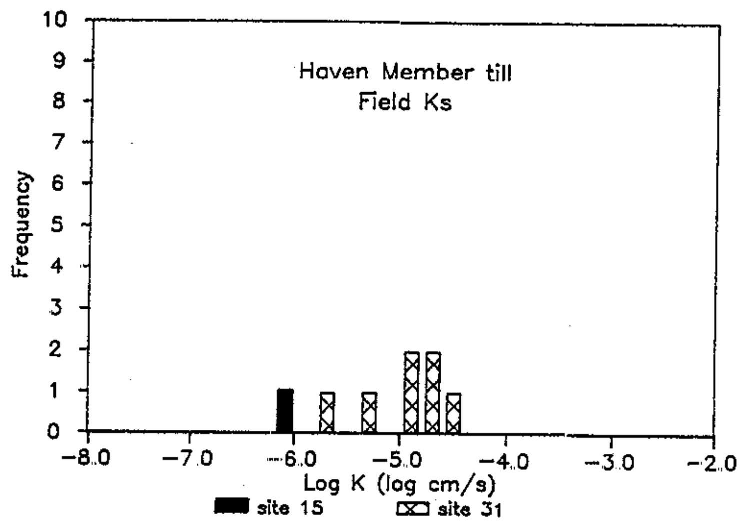


Figure 8f, cont. Data for till in the Valders Member of the Kewaunee Formation. Sand, silt, and clay percentages are for the less than 2 mm fraction. Data are plotted with a symbol indicating the source.



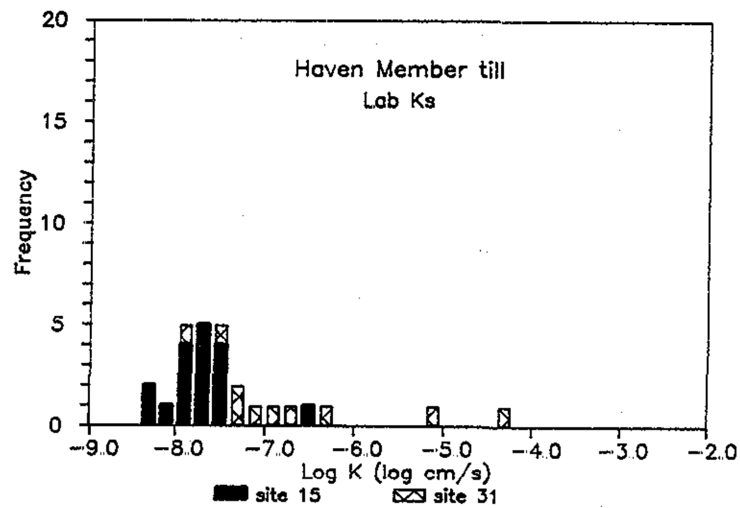
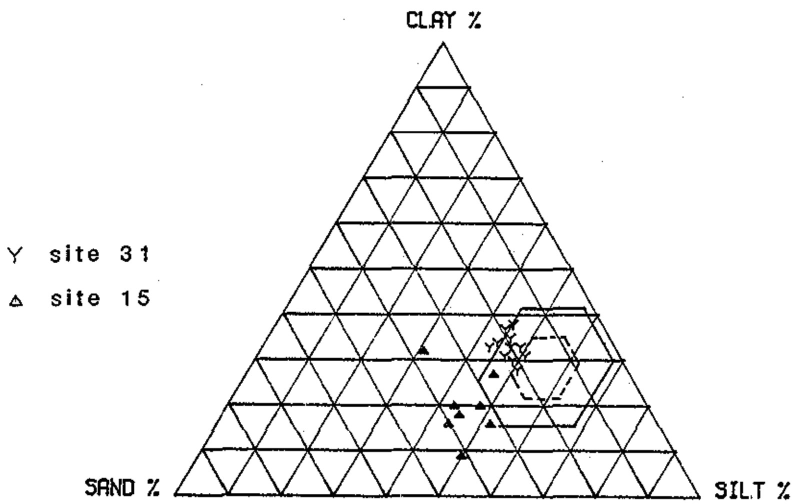


Figure 8g. Data for till in the Haven Member of the Kewaunee Formation. Field K means hydraulic conductivity measured in the field. Lab K means hydraulic conductivity measured in the laboratory. Data are plotted with a pattern indicating the source.



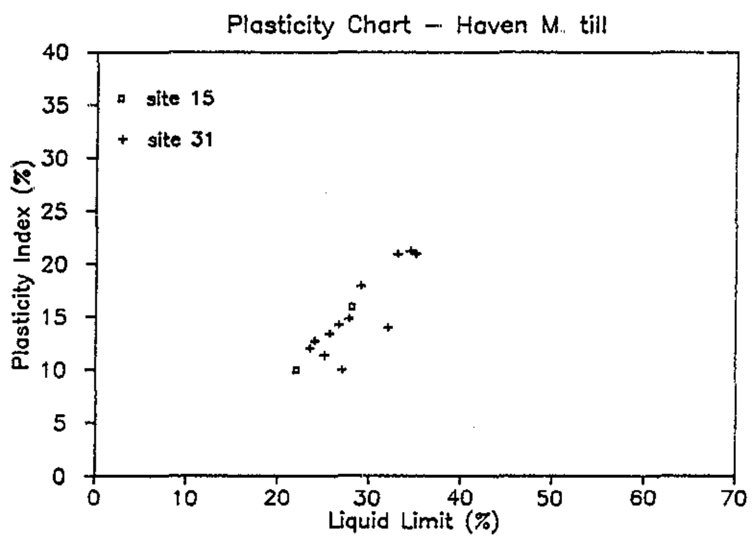


Figure 8g, cont. Data for till in the Haven Member of the Kewaunee Formation. Sand, silt, and clay percentages are for the less than 2 mm fraction. Data are plotted with a symbol indicating the source.

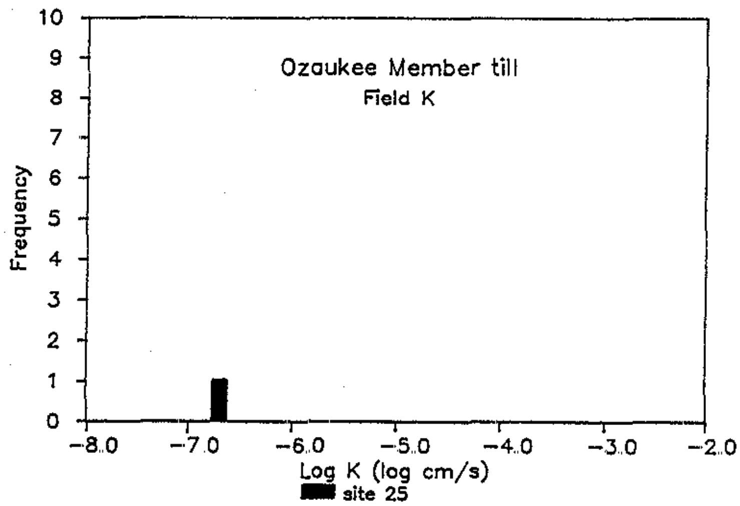
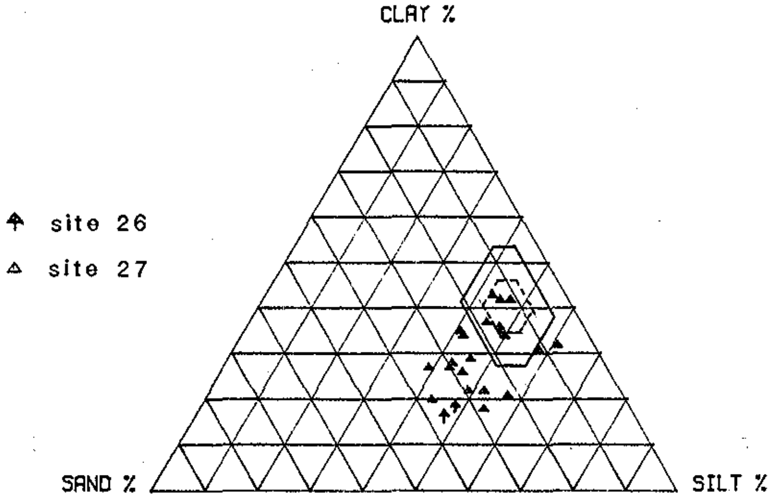


Figure 8h. Data for till in the Ozaukee Member of the Kewaunee Formation. Field K means hydraulic conductivity measured in the field. No values of hydraulic conductivity measured in the laboratory were compiled.



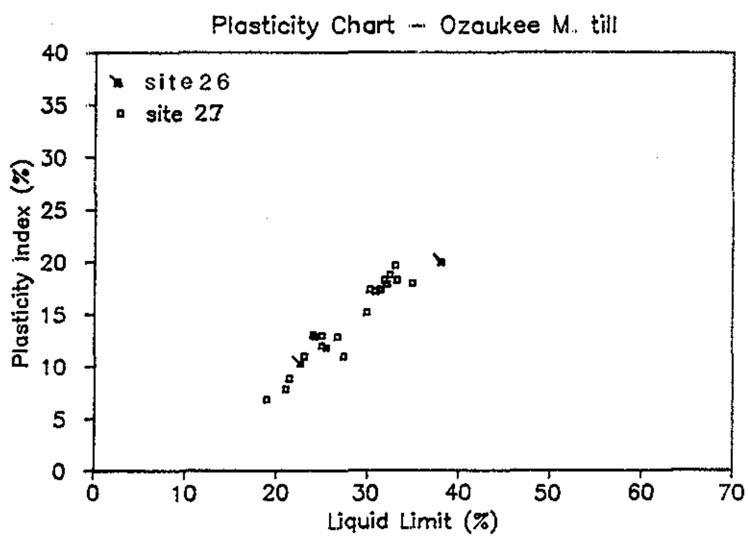


Figure 8h, cont. Data for till in the Ozaukee Member of the Kewaunee Formation. Sand, silt, and clay percentages are for the less than 2 mm fraction. Data are plotted with a symbol indicating the source.

identical populations (Walpole and Myers, 1978, p. 495). There was insufficient evidence to reject the same null hypothesis in the Kirby Lake Member for sites 12, 40, and 41 (figure 8b).

b. Hydraulic conductivities measured in the laboratory

Values of hydraulic conductivity measured in the laboratory range over at least two orders of magnitude in the Kewaunee Formation tills, and range over four orders of magnitude in both the Middle Inlet (figure 8b) and Haven Members (figure 8g). Sufficient data are available in the Haven, Glenmore, and Kirby Lake Members for the Kruskal-Wallis test. I rejected the null hypothesis that two independent samples are from identical populations in the Haven (sites 15 and 31, figure 8g) and Kirby Lake Members (sites 38 and 40, figure 8a), but there was not sufficient evidence to reject the null hypothesis for the Glenmore Member (sites 1 and 10, figure 8c).

c. Textural triangles

I used statistical summaries from McCartney and Mickelson (1982) and Acomb, Mickelson, and Evenson (1982) to construct the envelopes drawn on the textural triangles. The dashed lines represent one standard deviation and the solid lines represent two standard deviations from a mean. The compiled data clearly do not always plot within the confidence levels for each unit determined by previous authors. This is conspicuously true for tills in the Kirby Lake (figure 8a), Middle Inlet (figure 8b), Glenmore (figure 8c), and Ozaukee (figure 8h) Members.

d. Plasticity charts

The plasticity charts illustrate consistent trends at individual sites within each unit. Tills tend to plot in a long cluster with a positive slope. I regressed plasticity index on liquid limit for sites 12, 30, 38, and 40 in the Kirby Lake Member (figure 8b). At these sites, approximately 95, 74, 86, and 84% of the variation in plasticity index was accounted for by a straight line regression equation with liquid limit. The regressed lines for sites 12 and 30 are nearly identical. The 95% confidence levels for all the lines overlap.

2. <u>Oak Creek Formation</u>

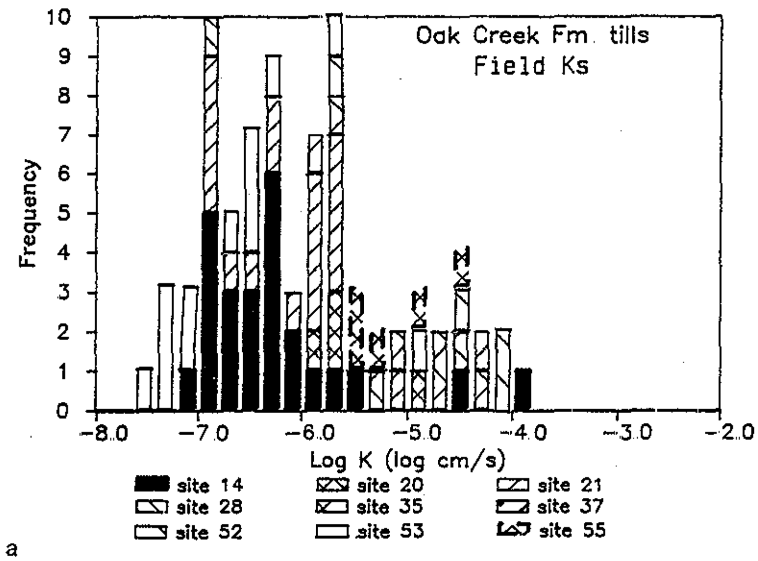
Data for tills of the Oak Creek Formation are summarized in figure 9.

a. Hydraulic conductivities measured in the field

Field hydraulic conductivities in the Oak Creek Formation range over four orders of magnitude, but at least two subgroups can be distinguished by looking carefully at the histogram (figure 9a). Sites 35, 37 and 55 have generally greater hydraulic conductivity than sites 14, 21 and 53, for example. An analysis of variance test at the 95% confidence level resulted in rejection of the null hypothesis that all site medians are equal.

b. Hydraulic conductivities measured in the laboratory

Hydraulic conductivities measured in the laboratory for samples of till from the Oak Creek Formation range over nearly three orders of magnitude, but subgroups are not as easily seen in the histogram (figure 9b) as for hydraulic conductivity measured in the field



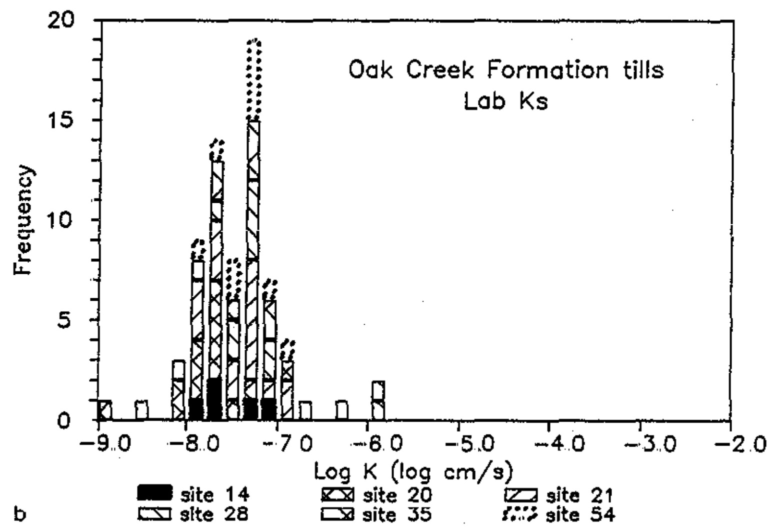
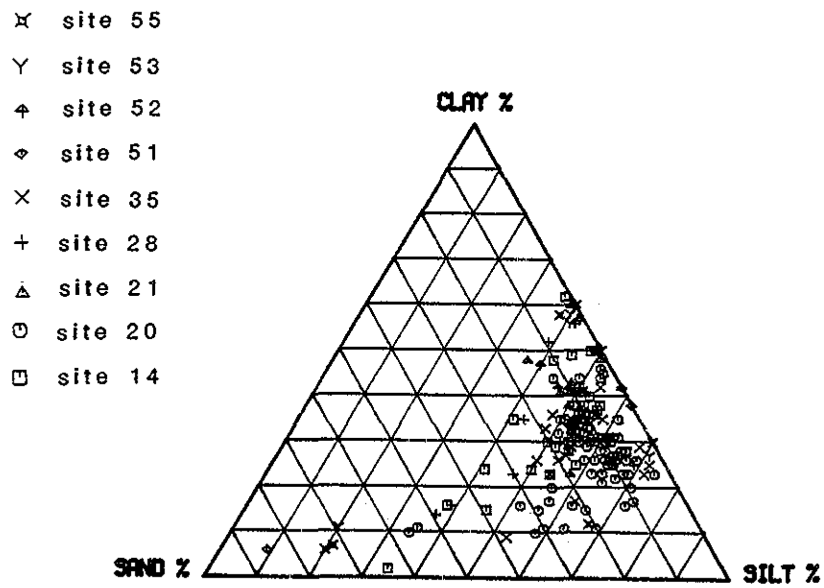


Figure 9. Data for till of the Oak Creek Formation. a) Field K means hydraulic conductivity measured in the field. b) Lab K means hydraulic conductivity measured in the laboratory. Data are plotted with a pattern indicating the source.



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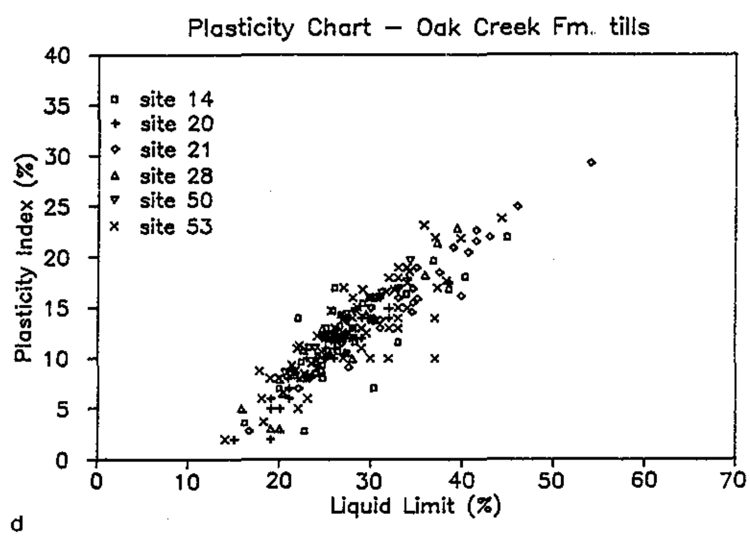

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Figure 9, cont. Data for till of the Oak Creek Formation. c) Sand, silt, and clay percentages are for the less than 2 mm fraction. Data are plotted with a symbol indicating the source.

(figure 9a). The results of an ANOVA test indicate that separate populations do exist, however. The null hypothesis that six independent samples (sites 14, 20, 21, 28, 35, and 54) are from the same population was rejected at a 99.5% confidence level.

c. Textural triangle

The particle size distribution of till in the Oak Creek Formation has not been statistically summarized, but ". . . the average composition is about 12 percent sand, 43 percent silt, and 45 percent clay . . . The texture of the till ranges from silty clay through clay loam and silty clay loam to silt loam" (Mickelson and others, 1984, p. A8-2). The data in figure 9c exhibit a quite similar distribution (refer to figure 2 for textural terms). The numerous analyses from site 20 cover nearly the entire range.

d. Plasticity chart

The plasticity chart (figure 9d) shows that data for till from different sites in the Oak Creek Formation plot within the same cluster. I regressed plasticity index on liquid limit and plotted the least squares regression lines for sites 14, 21, 28, 35, 37, 50, 52, 53, and 54. At these sites, 59, 93, 94, 89, 69, 79, 96, 90, 98, and 89% of the variation in plasticity index was accounted for by a regressed straight line equation with liquid limit. The lines for sites 14, 52, 21, and 35 have lower slopes than the others, but all the lines cross one another between liquid limits of 20 and 45. They are not significantly different.

e. Pocket penetrometer

Pocket penetrometer measurements on Oak Creek Formation tills range over the entire discrete scale, from 0.5 to 4.5 tsf. Pocket penetrometer data are not presented graphically except for comparison between lithostratigraphic units in a later section; the data are discussed here because there are sufficient values to statistically analyze variation within the till unit. Measurements at sites 21 and 28 yield relatively low values, with medians of 2.5 and 2.6 tsf. Medians at the other sites are between 3.0 and 3.3 tsf. Site 31 has the highest median, 4.0 tsf. The Kruskal-Wallis ANOVA test (95% confidence) indicated that the medians at independent sites are not from the same population.

f. Dry unit weight

Dry unit weights range from 89.0 to 140.0 pcf in tills of the Oak Creek Formation. Dry unit weight data are not presented graphically except for comparison between lithostratigraphic units in a later section; the data are discussed here because there are sufficient values to statistically analyze variation within the till of the Oak Creek Formation. Median values at individual sites range from 115.0 to 120.8 pcf at sites with greater than 5 samples. A Kruskal-Wallis test at the 95% confidence level did not indicate that separate populations exist at sites 21, 28, 35, and 54.

3. <u>Horicon Formation</u>

Figure 10 includes graphical summaries of values of hydraulic conductivity, grain size analyses, and a plasticity chart for till of the Horicon Formation.

a. Hydraulic conductivities measured in the field

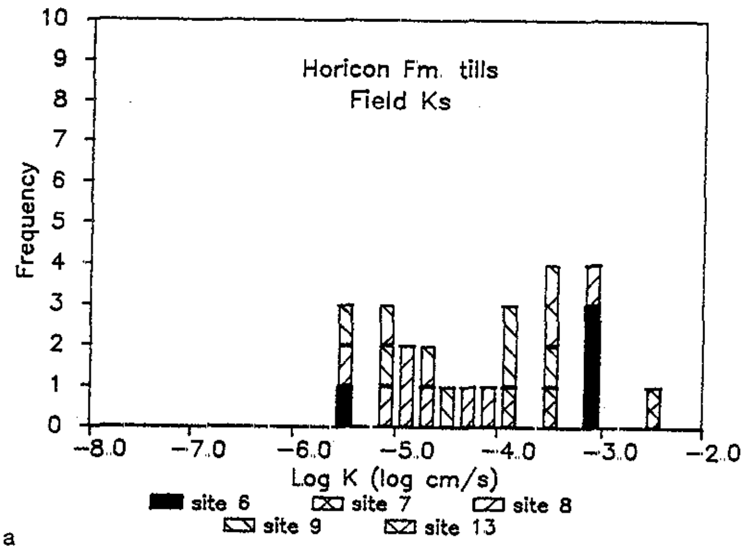
Field hydraulic conductivities range over three orders of magnitude (figure 10a). Nearly the entire range is present at sites 8 and 9. Sufficient data were available at these two sites for a Kruskal-Wallis ANOVA test. Insufficient data are available to reject the null hypothesis of equal medians at the two sites.

b. Hydraulic conductivities measured in the laboratory

Since the Horicon Formation till matrix is typically 60-80% sand (Mickelson *et al.*, 1984, p. A9-2), the collection of an undisturbed sample for a laboratory hydraulic conductivity test is difficult. I suspect that the values of hydraulic conductivity measured in the laboratory for site 8 may be recompacted, molded samples unrepresentative of *in-situ* conditions (figure 10b). These samples are included here because they were not recorded as recompacted. Sites 8, 13, and 29 have five samples each, enough for a Kruskal-Wallis ANOVA test. The test resulted in a rejection of the null hypothesis of equal median hydraulic conductivity values at all sites.

c. Textural triangle

Relatively few analyses of till were completed to the clay size fraction (figure 10c). This lack of data results from the mandated



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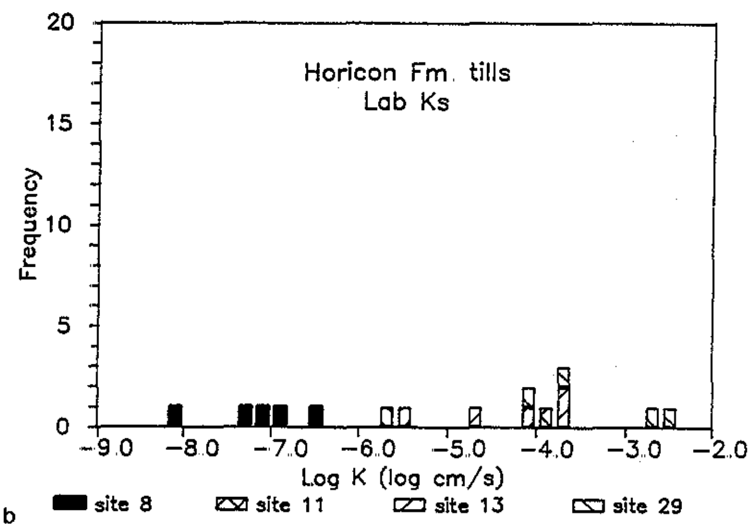
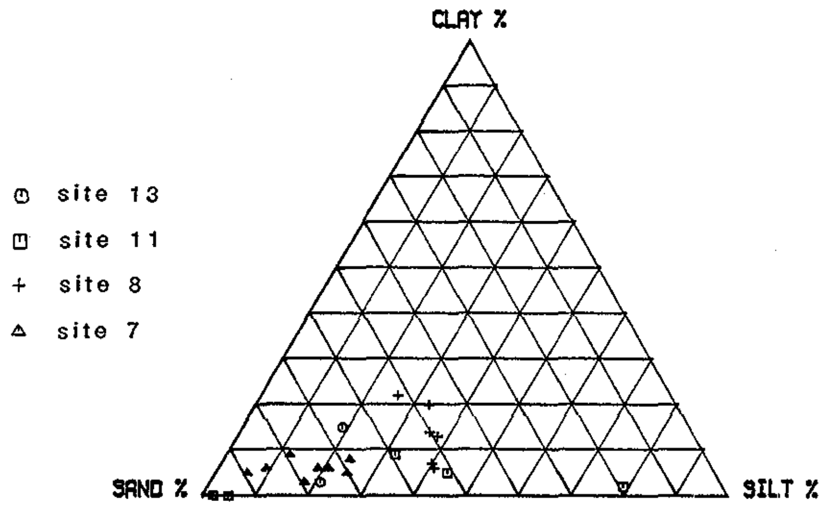


b

Figure 10. Data for till of the Horicon Formation. a) Field K means hydraulic conductivity measured in the field. b) Lab K means hydraulic conductivity measured in the laboratory. Data are plotted with a pattern indicating the source.



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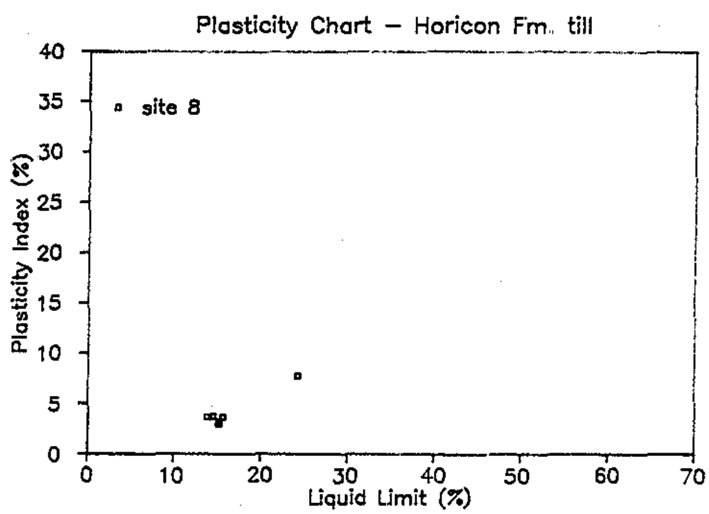

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Figure 10, cont. Data for till of the Horicon Formation. c) Sand, silt, and clay percentages are for the less than 2 mm fraction. Data are plotted with a symbol indicating the source.

use of the unified soil classification system (USCS). The dotted lines represent two standard deviations from sand, silt, and clay means determined by McCartney (1979, p. 11) for basal till in the Mapleview Member of the Horicon Formation. Statistical summaries are not available for the Liberty Grove Member, but the analyses at sites 7, 8, and 13 are similar texturally to the Mapleview Member.

d. Plasticity chart

Few samples of Horicon till (figure 10d) are so fine-grained that completion of liquid limit and plastic limit tests and plotting on a plasticity chart is necessary for classification in the USCS. The samples with Atterberg limits plot in a small cluster with a lone point indicating the same general trend seen in other tills.

4. Unnamed unit

A material similar to till of the Horicon Formation but much siltier than the Mapleview and Liberty Grove Members was identified at several sites near Lake Winnebago. Figure 11 contains graphs of the data. This material may represent a member of the Horicon Formation. A geologic investigation is required to determine the nature of its occurrence.

a. Hydraulic conductivity measured in the field

The range of field hydraulic conductivity values measured in the field covers four orders of magnitude (figure 11a). Application of an ANOVA test to data from sites 40 and 41 resulted in rejection of the null hypothesis of equal medians at a 95% confidence level.

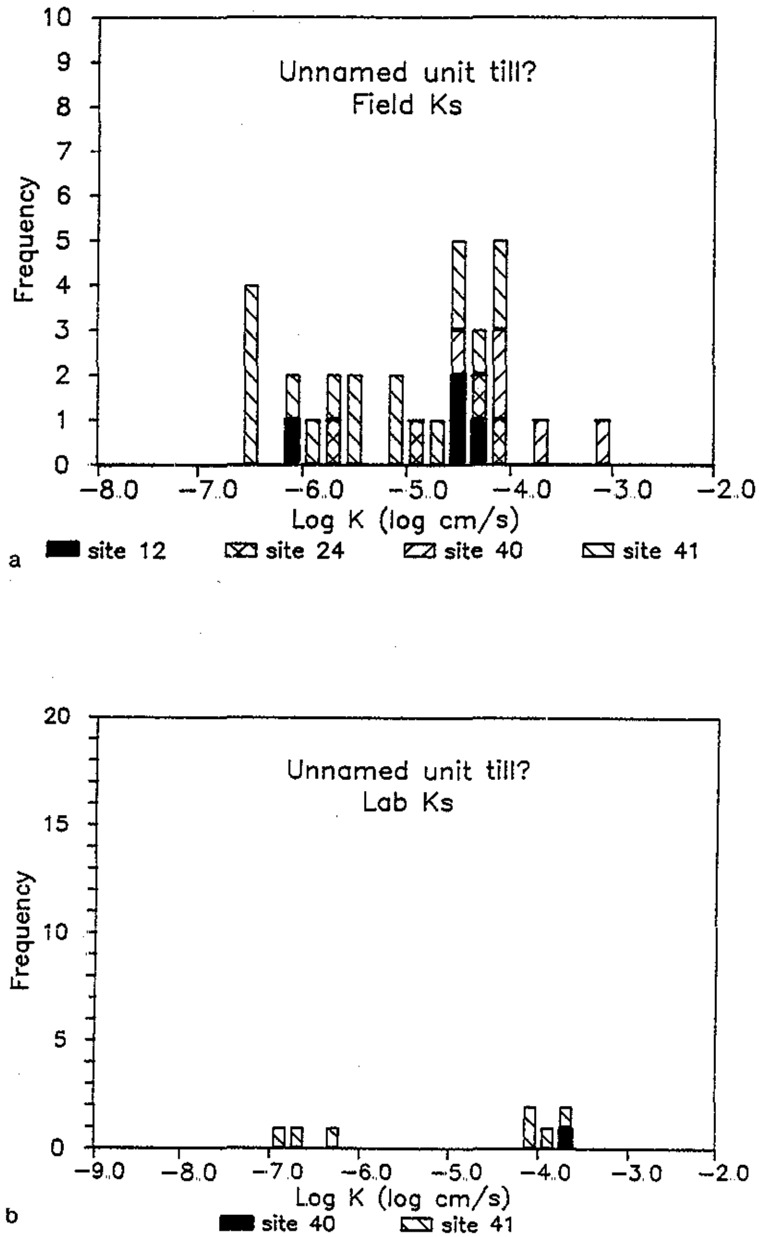
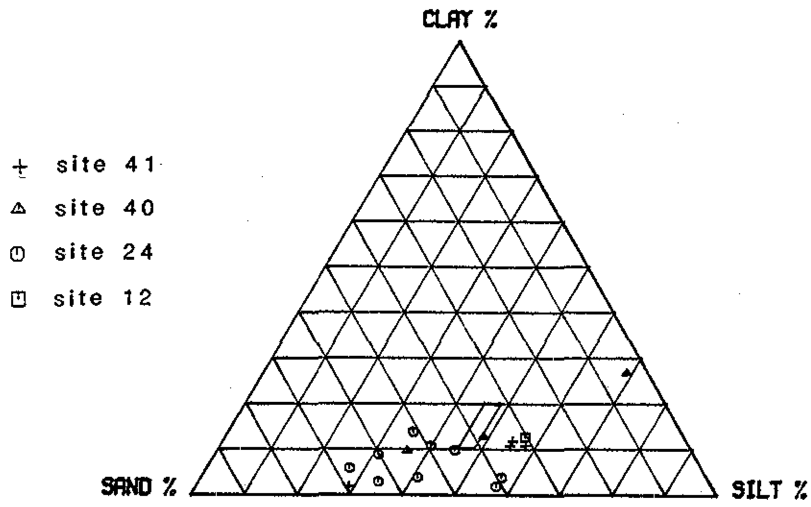


Figure 11. Data for an unnamed unit, possibly till of the Horicon Formation. a) Field K means hydraulic conductivity measured in the field. b) Lab K means hydraulic conductivity measured in the laboratory. Data are plotted with a pattern indicating the source.



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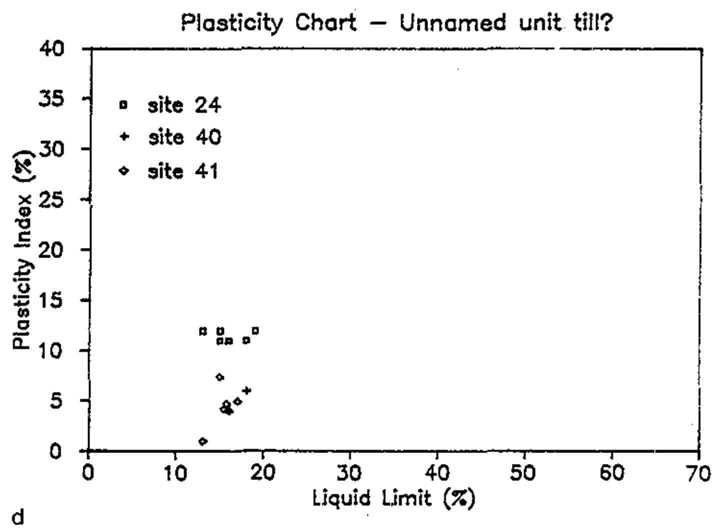


d

Figure 11, cont. Data for an unnamed unit, possibly till of the Horicon Formation. c) Sand, silt, and clay percentages are for the less than 2 mm fraction. Data are plotted with a symbol indicating the source.

b. Hydraulic conductivity measured in the laboratory

The data here appear bimodal (figure 11b), and I again suspect that some of the hydraulic conductivity values measured in the laboratory may be for recompacted samples although they were not recorded as such.

c. Textural triangle

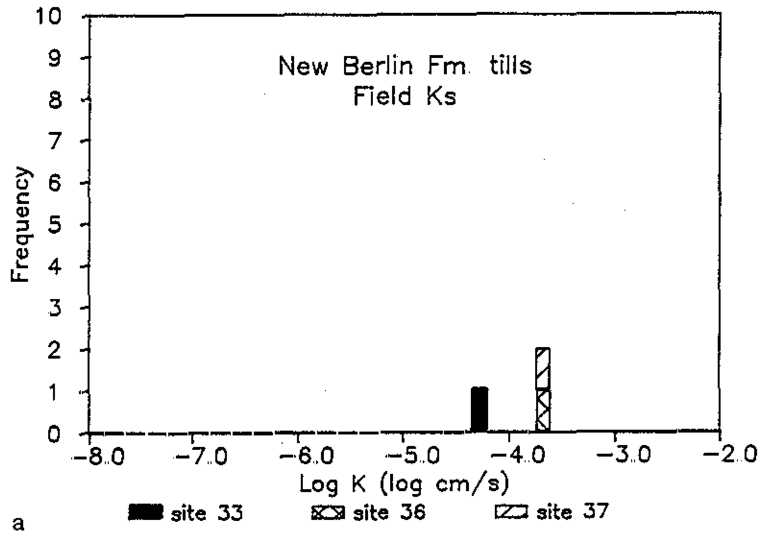
Textures for samples analyzed to 0.002 mm include sandy loam, loam, and silt loam (figure 11c). An envelope of texture for till of the Wayside Member of the Horicon Formation in Brown County described by Need (1985) is included for comparison.

d. Plasticity chart

The unnamed unit is roughly 30% stone (over 2 mm diameter) so that few samples have values of P200 greater than 50% by weight. Consequently, determination of Atterberg limits is not necessary for classification in the USCS. Data from sites 40 and 41 plot in the pattern expected for tills (figure 11d). Although the liquid limits at site 24 have the same range as sites 40 and 41, the data cluster separately.

5. <u>New Berlin Formation</u>

Few hydraulic conductivity data for till of the New Berlin Formation were compiled (figures 12a and 12b), and no statistical analysis of variation within the unit is possible. The particle size analyses compiled graph in a fairly tight cluster except for the Washington County sites (34 and 36, figure 12d).



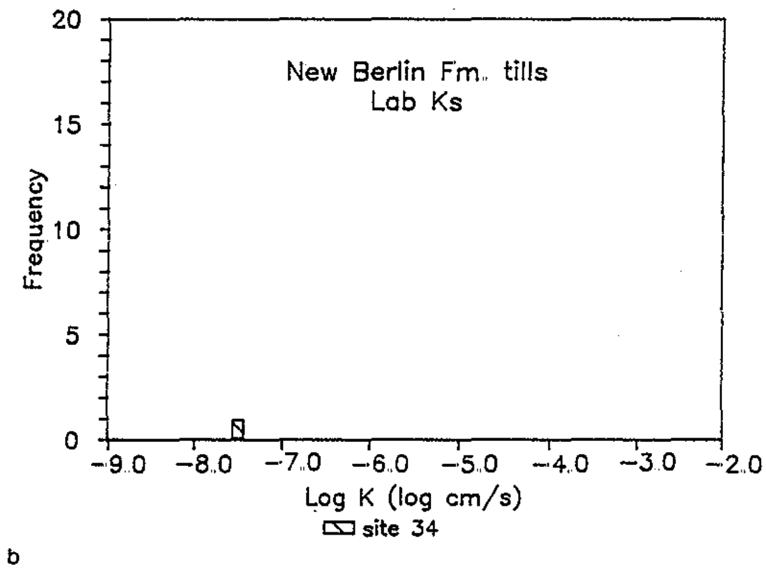
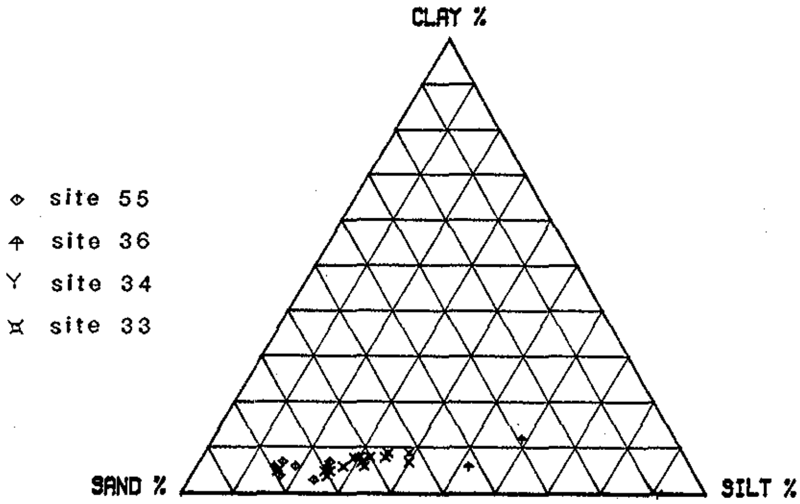


Figure 12. Data for till of the New Berlin Formation. a) Field K means hydraulic conductivity measured in the field. b) Lab K means hydraulic conductivity measured in the laboratory. Data are plotted with a pattern indicating the source.



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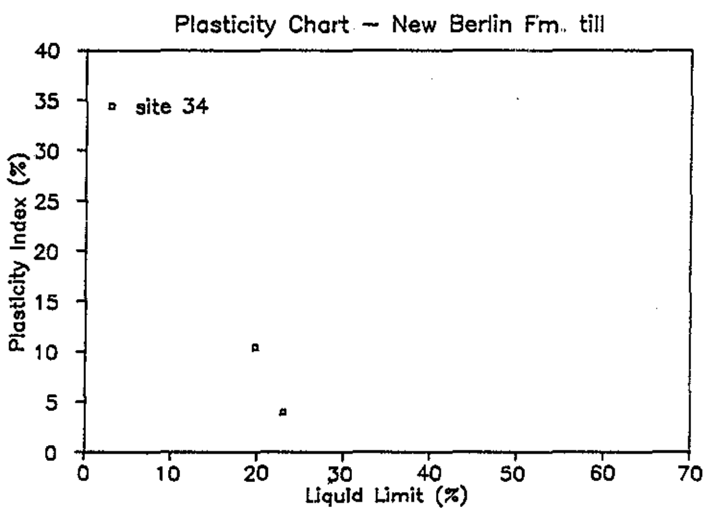

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Figure 12, cont. Data for till of the New Berlin Formation. c) Sand, silt, and clay percentages are for the less than 2 mm fraction. Data are plotted with a symbol indicating the site.

6. Tiskilwa Member of the Zenda Formation

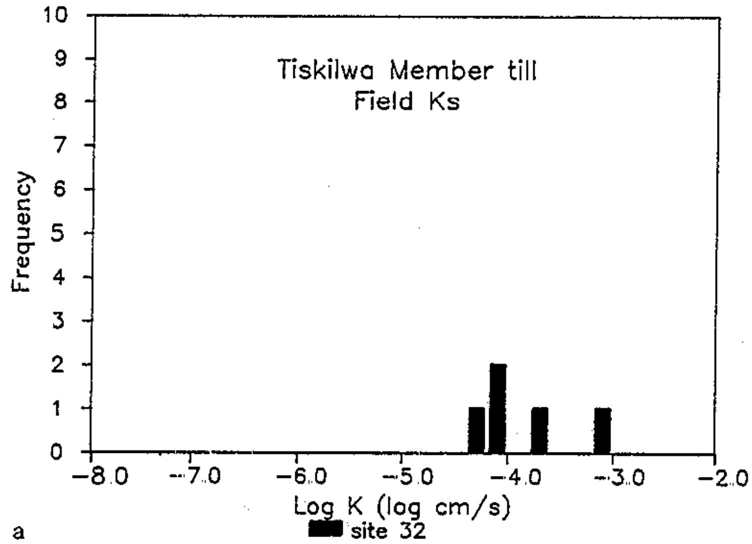
Data for the Tiskilwa Member were collected from only one site in the Lake Michigan Lobe, so no analysis of variance within the member from one site to another is possible. The available data are summarized graphically in figure 13. Hydraulic conductivities measured in the field range over 1 1/2 orders of magnitude at site 32 (figure 13a). Only one value of hydraulic conductivity was measured in the laboratory for till of the Tiskilwa Member (figure 13b). On the plasticity chart, till of the Tiskilwa Member plots in an elongate cluster with positive slope (figure 13d).

B. Variation between tills of lithostratigraphic units

1. Interunit comparisons of hydraulic conductivity measured in the field

a. The Green Bay Lobe

There is a statistically significant difference in hydraulic conductivity between till of the Middle Inlet and Kirby Lake Members of the Green Bay Lobe. I rejected the null hypothesis that the median log values of hydraulic conductivity measured in the field for till in the Middle Inlet Member and for till in the Kirby Lake Member are equal at the 99.5% confidence level. It is apparent from the boxplots in figure 14 that portions of the fourth spread overlap for these till units. The median hydraulic conductivity measured in the field for till of the Middle Inlet Member is about an order of magnitude greater than the median value for till of the Kirby Lake Member.



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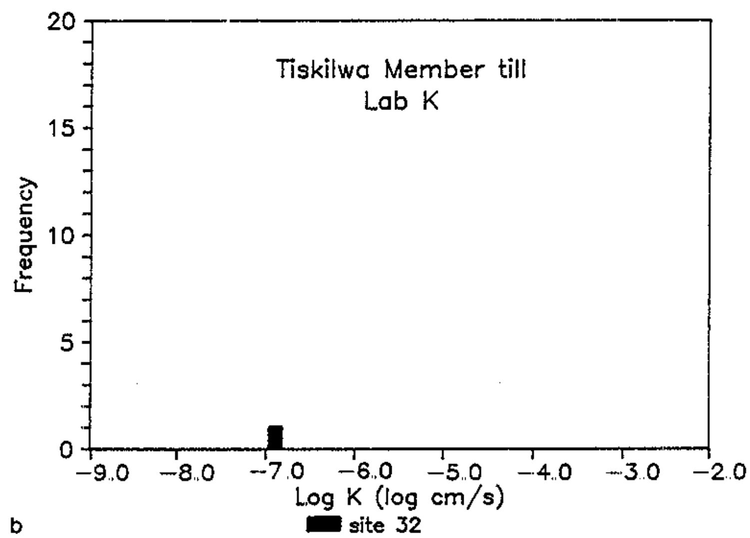
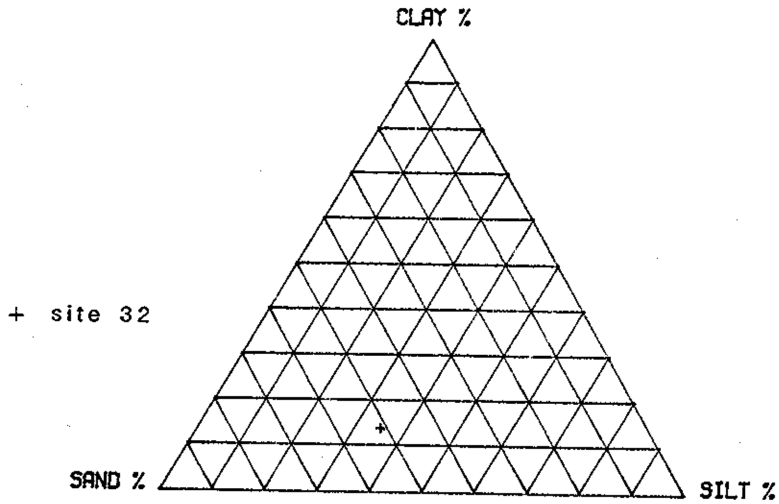


b

Figure 13. Data for till of the Tiskilwa Member of the Zenda Formation. a) Field K means hydraulic conductivity measured in the field. b) Lab K means hydraulic conductivity measured in the laboratory. Data are plotted with a pattern indicating the source.



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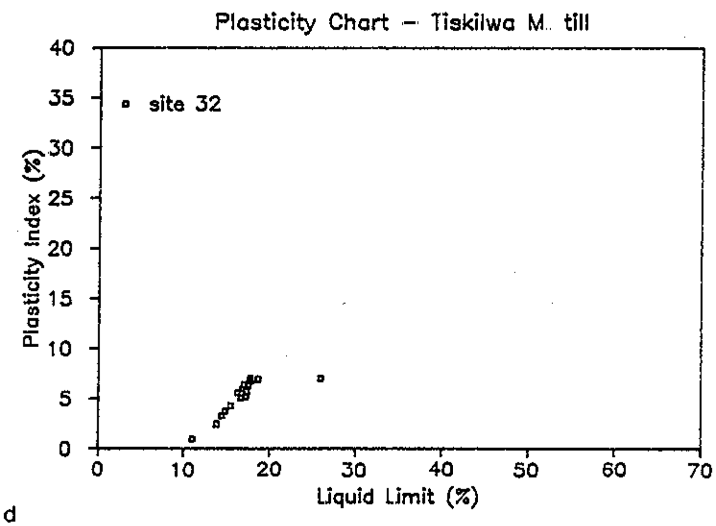

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Figure 13, cont. Data for till of the Tiskilwa Member of the Zenda Formation. c) Sand, silt, and clay percentages are for the less than 2 mm fraction. Data are plotted with a symbol indicating the source.

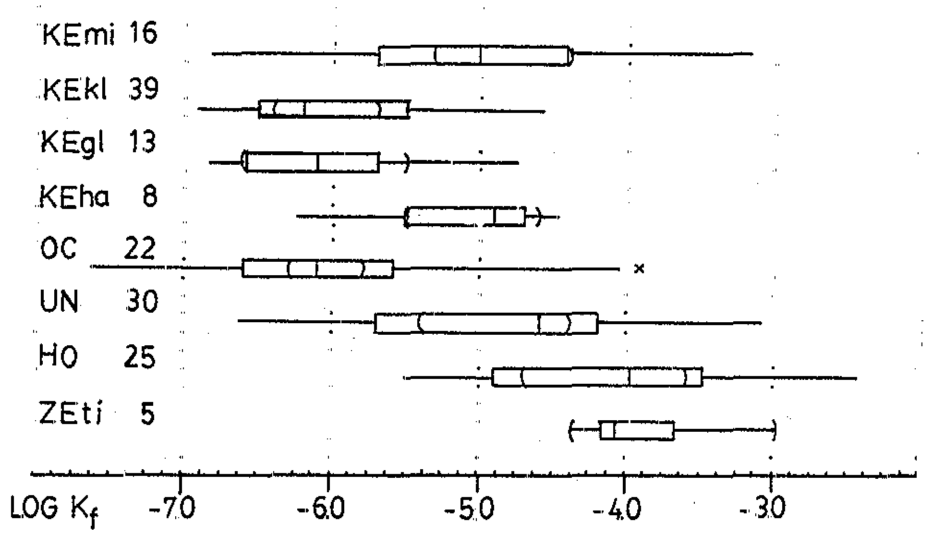


Figure 14. Boxplots for interunit comparison of hydraulic conductivity measured in the field (K_f). Boxplots are constructed for till units with at least 5 values. The number of values is given with the abbreviated unit name.

As mentioned in the section on variation within units, the unnamed unit stratigraphically below the Kewaunee Formation could be a member of the Horicon Formation. I rejected the null hypothesis that the medians of log hydraulic conductivity measured in the field in till of the unnamed unit and in till of the Horicon Formation are equal with a confidence level of 99%. Median log hydraulic conductivity measured in the field for these two tills differ by 0.6 order of magnitude.

To the east, the location of the batch median for the Glenmore Member may be compared to the data available for till of the Chilton Member (figure 14 and figure 8d). Each of the four measurements in till of the Chilton Member are within the 95% confidence limits for till of the Glenmore Member. The unnamed unit discussed in the preceding paragraph may also underlie the Kewaunee Formation on the eastern side of the Green Bay Lobe. The Horicon Formation does extend eastward to the Lake Michigan Lobe (see Plate 1).

b. Lake Michigan Lobe

Hydraulic conductivity data from field measurements are not available for till in each member of the Kewaunee Formation. Insufficient data (fewer than 5 samples) are available for tills in the Haven and Ozaukee Members to test a null hypothesis, but the boxplot for till of the Haven Member in figure 14 may be compared to data for the Ozaukee Member in figure 8h. The single value for till of the Ozaukee Member lies outside the range of 95% confidence for the median value of field hydraulic conductivity in the Haven Member.

Hydraulic conductivity data from field measurements of till in the Oak Creek Formation are relatively plentiful. In spite of the range over four orders of magnitude (figure 9), the range of the 95% confidence level for the median is only half an order of magnitude wide (figure 14).

Data compiled for the New Berlin Formation contain only four values of hydraulic conductivity measured with field tests (figure 12). Hydraulic conductivity values in till of the New Berlin Formation are 3 to 4 orders of magnitude greater than the median value for tills of the Oak Creek Formation in figure 14. Values of hydraulic conductivity measured in the field in tills of the New Berlin Formation have a range similar to till in the Tiskilwa Member of the Zenda Formation. A boxplot of hydraulic conductivity values measured in the field for till in the Tiskilwa Member is included in figure 14.

2. Interunit comparison of hydraulic conductivity measured in the laboratory

The median values hydraulic conductivity measured in the laboratory for each till have narrower approximate 95% confidence intervals than do the median values of hydraulic conductivity measured in the laboratory (note the scale differences before comparing figures 14 and 15). As for values of hydraulic conductivity measured in the field, boxplots have been constructed for tills with five or more

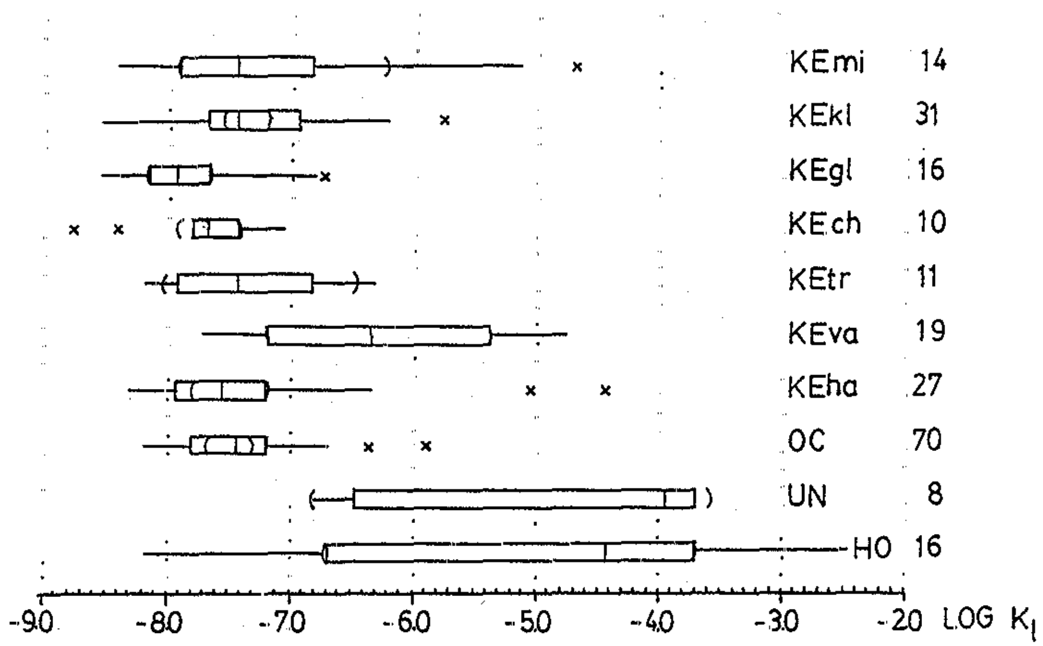


Figure 15. Boxplots for interunit comparison of hydraulic conductivity measured in the laboratory (K_l). Boxplots are constructed for till units with at least 5 values. The number of values is given with the abbreviated unit name.

values available. ANOVA tests were applied to tills of overlying members. Refer back to figures 12 and 13 for the New Berlin and Zenda Formations.

In the Green Bay Lobe, insufficient data were available to reject the null hypothesis of equal median values of hydraulic conductivity measured in the laboratory for tills of these stratigraphically superposed lithostratigraphic units: Middle Inlet and Kirby Lake Members, Glenmore and Chilton Members, and the unnamed unit and the Horicon Formation. In the Lake Michigan Lobe, I rejected the same null hypothesis at a 99.5% confidence level for tills in both the Two Rivers and Valders Members and the Valders and Haven Members.

3. Vertical differences in texture

a. Green Bay Lobe

The tills of superposed members have similar textural ranges on both the east and west sides of the Green Bay Lobe. On the west side, the Middle Inlet Member analyses show greater scatter than those of the Kirby Lake Member below and include some samples that are much sandier than till of the Kirby Lake Member. On the east side of Green Bay, the till unit in the Glenmore Member is also slightly sandier than till of the underlying Chilton Member. Tills of the Horicon Formation are distinguished from tills in the Kewaunee Formation by their abundant sand content.

b. Lake Michigan Lobe

As in the Green Bay Lobe, till of the Two Rivers Member (figure 8e) is texturally very similar to till of the underlying Valders

Member (figure 8f). The cluster of points for till of the Two Rivers Member illustrates a sandier 'average' texture than the cluster of till analyses for the Valders Member. Thus, texture in the upper two tills in the Green Bay and Lake Michigan Lobes changes in the same way, with increasing sand content upwards. The textures determined for till of the Haven Member (figure 8g) are less silty but otherwise very similar to till of the Valders Member (figure 8f). Till of the Ozaukee Member (figure 8h) contains more silt and clay than till of the Haven Member.

Below the Kewaunee Formation, till of the Oak Creek Formation is very similar to till in the Ozaukee Member. Many more particle size analyses are available for the Oak Creek Formation tills, and a wide range in texture is apparent. The tills of the New Berlin Formation, like till in the Horicon Formation, is distinctively sandy with a very low clay content. Only one complete analysis for till in the Tiskilwa Member was recorded. This single sample contains more clay than the 'average' till samples from the New Berlin Formation.

4. Interunit comparison of plasticity charts

Scatterplots of plastic index and liquid limit for the till units overlap. If the mean liquid limit and plastic index are used to represent each till as in figure 16, the same general trend emerges as from the individual plots with finer grained units farther from the origin.

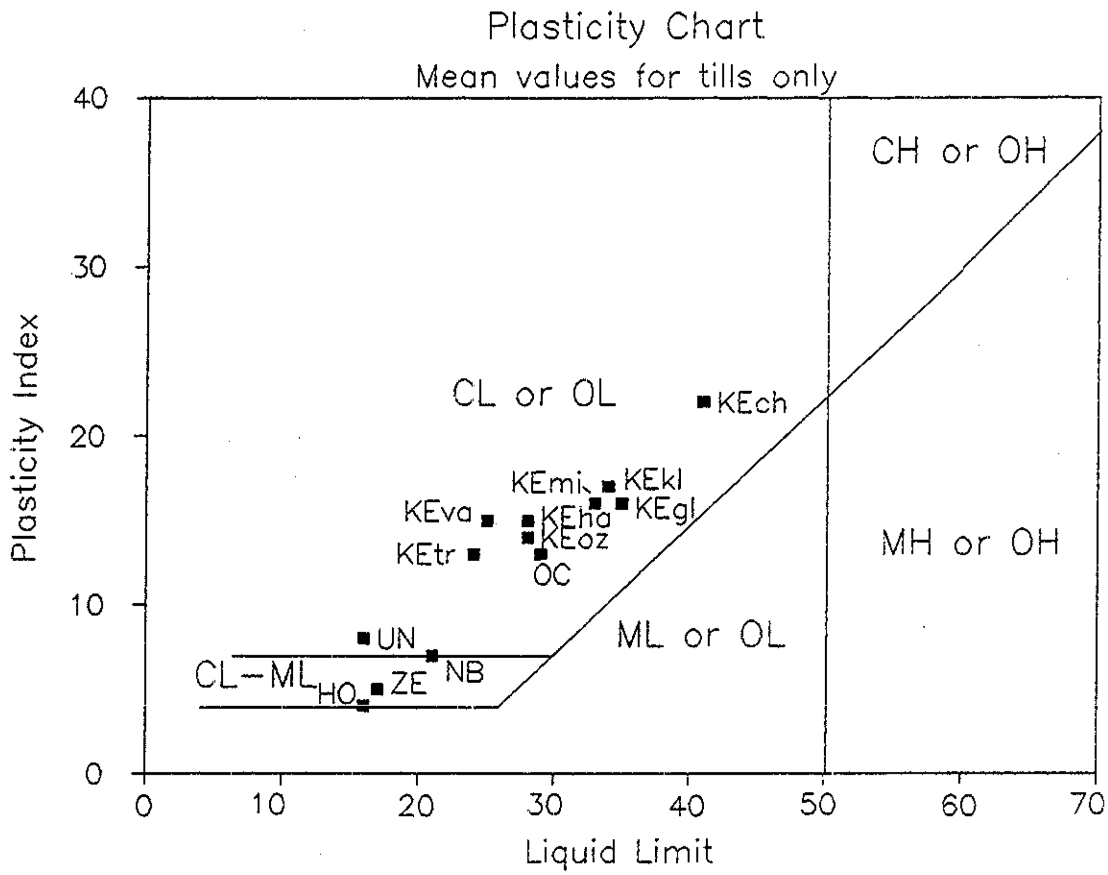


Figure 16. Plasticity chart with mean values of plasticity index and liquid limit for tills of lithostratigraphic units.

5. Interunit comparison of dry unit weight

Figure 17 consists of boxplots of dry unit weight for those units with five or more measurements. Dry unit weight data are summarized in table 4. The median dry unit weight of tills are very similar in superposed members of the Kewaunee Formation on the west side of the Green Bay Lobe (Middle Inlet and Kirby Lake Members) and in the Lake Michigan Lobe (Two Rivers, Valders, and Haven Members). Till of the Ozaukee Member is more similar to till of the Oak Creek Formation than to other Kewaunee Formation tills with respect to dry unit weight. A null hypothesis of equal median dry unit weights for the Haven and Ozaukee Member tills was rejected at a level of 99% confidence. The same null hypothesis could not be rejected for tills of the Ozaukee Member and the Oak Creek Formation or for other members in the Kewaunee Formation.

The median dry unit weight for the Horicon Formation exceeds all other medians by 15 pounds per cubic foot. This is most likely due to the unit lithology since the specific gravity of dolomite is greater than the specific gravity typically assumed for soils. Alternatively, the difference may be caused by the coarse particle size. No dry unit weight data were compiled for the New Berlin Formation, but it probably also has a relatively high dry unit weight because its lithology and particle size distribution resembles that of the Horicon Formation.

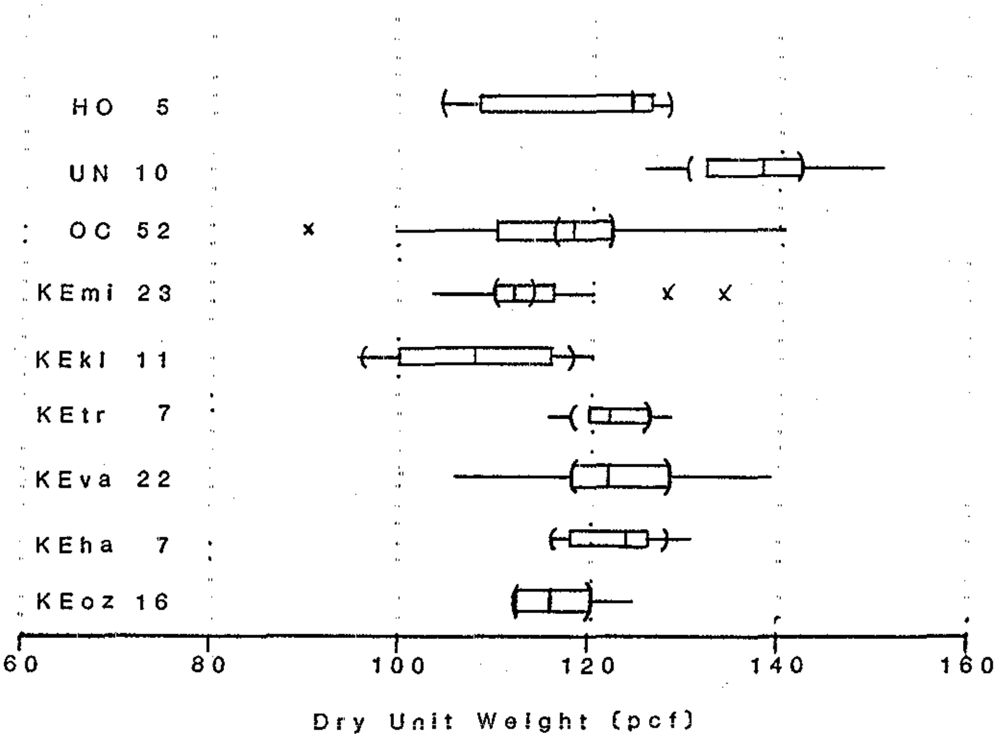


Figure 17. Boxplots for interunit comparison of dry unit weight. Boxplots are constructed for till units with at least 5 values. The number of values used to construct the boxplot is given with the abbreviated unit name.

Dry unit weight (pounds per cubic foot)

till	N	Median	Minimum	Maximum
KEmi	23	112.0	103.2	133.1
KEkl	11	107.0	61.1	119.8
KEgl	2	114.5	114.0	115.0
KEch	0	-	-	-
KEtr	7	122.0	115.5	127.9
KEva	22	122.4	99.7	138.5
KEha	7	123.0	115.4	129.7
KEoz	16	116.1	111.1	123.0
OC	52	117.8	89.0	140.0
NB	0	-	-	-
ZEti	0	-	-	-
HO	10	138.7	125.8	150.6
UN	5	123.9	104.7	128.1

Table 4. Statistical summary of dry unit weights in pounds per cubic foot for tills in lithostratigraphic units (except for 'UN') with number of samples (N), median values, minimum value, and maximum value.

6. Pocket Penetrometer

Surprisingly, the median pocket penetrometer measurement is significantly different for Lake Michigan Lobe tills in superposed lithostratigraphic units. Pocket penetrometer data is presented graphically in figure 18. The ranges are almost identical for all units. I tested and rejected the null hypothesis of equal medians for one way ANOVA of tills in the Two Rivers and Valders Members (97.5% confidence level), the Valders and Haven Members (99.5% confidence level), the Haven and Ozaukee Members (99.5% confidence level), and the Ozaukee Member and the Oak Creek Formation (99.5% confidence level). The same null hypothesis could not be rejected for tills of superposed members in the Green Bay Lobe.

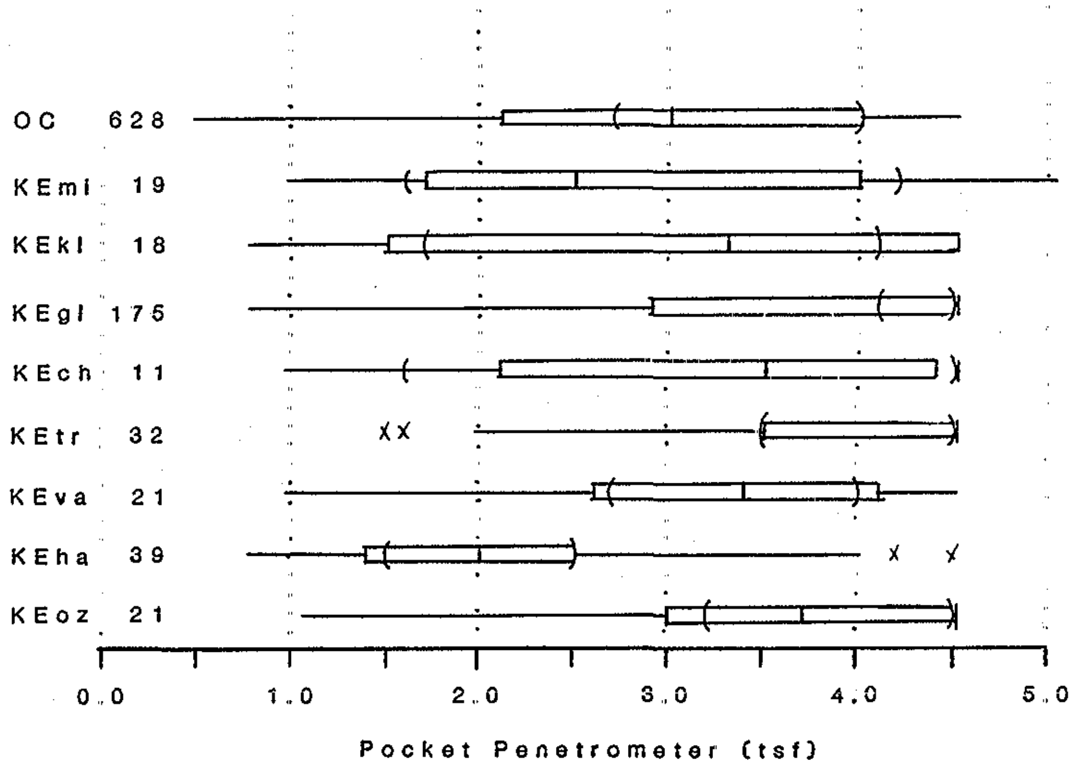


Figure 18. Boxplots for interunit comparison of pocket penetrometer measurements. Boxplots are constructed for till units with at least 5 values. The number of values is given with the abbreviated unit name.

V. Discussion of data

This section contains a discussion of the data presented in part IV, emphasizing the test methods and relations to other tests in till units. I use correlation and regression analysis to determine which tests are meaningful to hydrologic or geologic interpretation. These correlations and regressions do not imply cause and effect relationships.

A. Approximations of strength

1. Standard penetration test

There is a great deal of disagreement over how useful the standard penetration test is to hydrogeologists. Blow counts (N) from the Standard Penetration Test (SPT) (D1586-84, ASTM, pp. 298-303) have been used with limited success as an index test of strength and a predictor of deformation. Blow counts have been correlated with the Dutch Cone Test, the friction angle of sand, density of sands, shear strength in clay, modulus of compressibility of sands, and liquefaction potential with some success (Douglas, 1983; Dept. of the Navy, 1982; Dunn, Anderson, and Kiefer, 1980). However, ASTM D1586-84 states,

"Variations in N-values of 100% or more have been observed when using different standard penetration test apparatus and drillers for adjacent borings in the same formation. Current opinion, based on field experience, indicates that when using the same apparatus and driller, N-values in the same soil can be reproduced with a coefficient of variation of about 10%" (ASTM, 1986, p. 299).

Similarly, Baecher attributed 50% of observed scatter in SPT data to measurement noise (1984, p.11). Little emphasis was placed on collection of SPT data for this study because different test apparatus and drillers generated the data and because glacial tills are known to contain boulders that inflate SPT estimates of strength.

2. Pocket penetrometer

Pocket penetrometer readings are commonly reported (in tons per square foot, tsf) for fine-grained sediments but rarely correlated with any other parameters. They are a relative measure of the unconfined compressive strength of a material. The ASTM has not published a standard method for use of the pocket penetrometer; use of a vane shear device is preferred and has been quantitatively correlated with other tests. The Dept. of the Navy Soil Mechanics Design Manual includes the following brief statement about pocket penetrometers: "The tool is an aid to obtaining uniform classification of soils. It does not replace other field tests or laboratory tests" (1982, p. 7.1-97). Pocket penetrometer measurements were typically recorded only for samples having hydraulic conductivity or grain size analyses.

3. Applications of approximations of strength

Strength data is relevant to geologic interpretation, but most authors who refer to it combine it with data not included in this study's database. For example, Scott and St-Onge (1969) recommend use of the pocket penetrometer to estimate the compactness of till. They write, "Compactness . . . . embodies concepts of cohesion, consolidation, shear strength, and, because of the range in grain size of till, also relative density and consistency" (1969, p. 4). They define a compactness ratio, C_r, equal to bulk density divided by void ratio and apparently then use the compactness ratio to characterize till units (1969, p. 6). Other authors have related shear strength to geologic stress history (Mickelson, Acomb, and Edil, 1979), deposition of cementing agents from the ground water (Baracos *et al.*, 1983), clay mineralogy (Grim, 1962), density (Lutenegger, Kemmis, and Hallberg, 1981), and weathering profiles in till (Eyles and Sladen, 1981). It is important to note that these authors used laboratory determinations of shear strength, not a field approximation like the pocket penetrometer or a method characterized by high variation, like the standard penetration test. Although median pocket penetrometer measurements differ for individual till units, the data give little information about specific characteristics of the tills.

I investigated the relationship between density from SPT blow counts and hydraulic conductivity. One engineering firm implied that increasing blow counts correlate with decreasing field measurements of hydraulic conductivity. The data for till units are not suitable for correlation because they are not paired--blow counts vary over the screened interval used to determine field hydraulic conductivity.

SPT data show no correlation between blow counts and depth. From soil mechanics theory, I expect blow counts to increase with depth as the thickness of material over the interval measured increases. Figure 19, a scatterplot of SPT blow counts versus depth in the Oak Creek Formation, illustrates no correlation for these till,

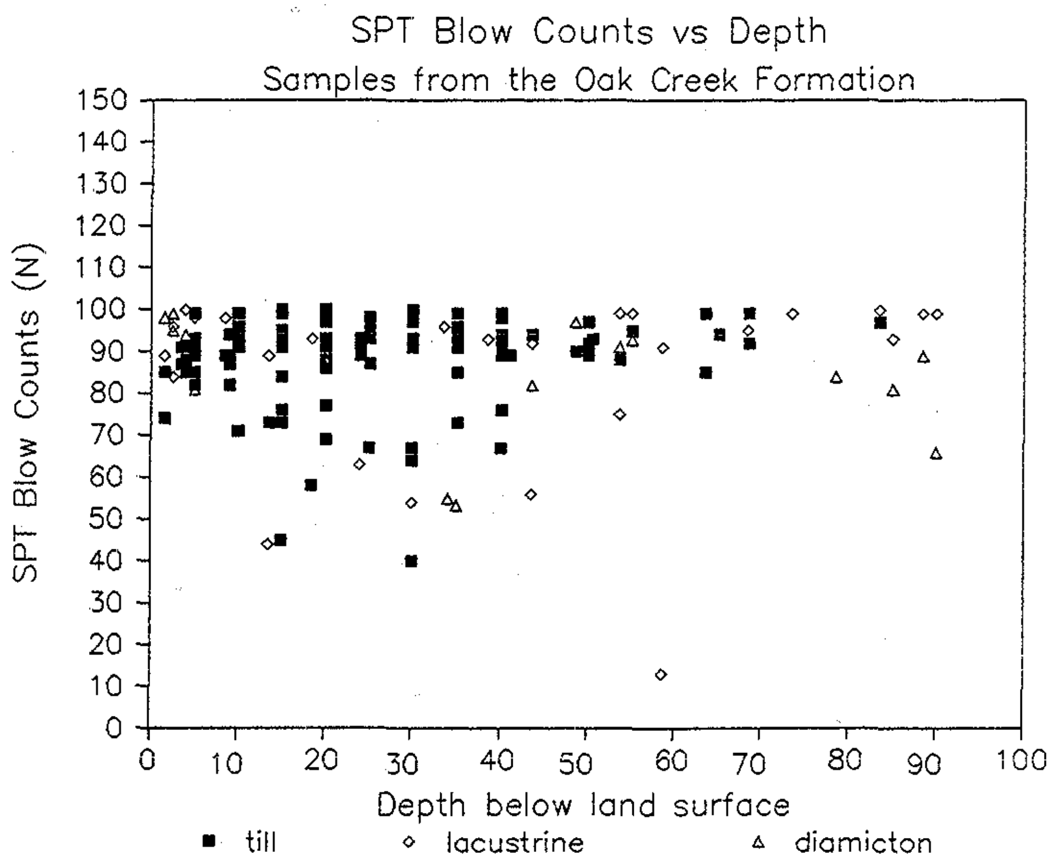


Figure 19. Plot of SPT blow counts as a function of depth below the land surface for sediments in the Oak Creek Formation.

lacustrine, or diamicton sediments, possibly because ". . . the testis conducted in a dynamic form and while the limited volume of material is in a state of failure and high disturbance" (Johnston, 1983, p. 12).

SPT blow counts have been correlated with shear strength in clay (e.g., Stroud and Butler, 1975) and pocket penetrometer measurements approximate unconfined compressive strength. However, a plot of SPT blow counts versus pocket penetrometer measurements for 453 samples of till from the Oak Creek Formation (figure 20) shows that a wide range of SPT blow counts may be anticipated for any pocket penetrometer measurement. Clearly, SPT blow counts and pocket penetrometer measurements are not directly related. A straight line, least squares regression indicates that 19% of the variation in blow counts may be explained by variation in pocket penetrometer measurements. Similar but not identical variables probably affect the two tests.

In individual boreholes considered in this study, pocket penetrometer readings tend to reach a maximum within several feet of the land surface. This maximum may reflect overconsolidation due to repeated wetting and drying within the capillary fringe, but appropriate consolidation data are not available to confirm this relationship. Moreover, pocket penetrometer readings should not be used to determine the elevation of the modern water table since the climate has changed following deposition of the sediment, and the zone of higher readings may represent past conditions.

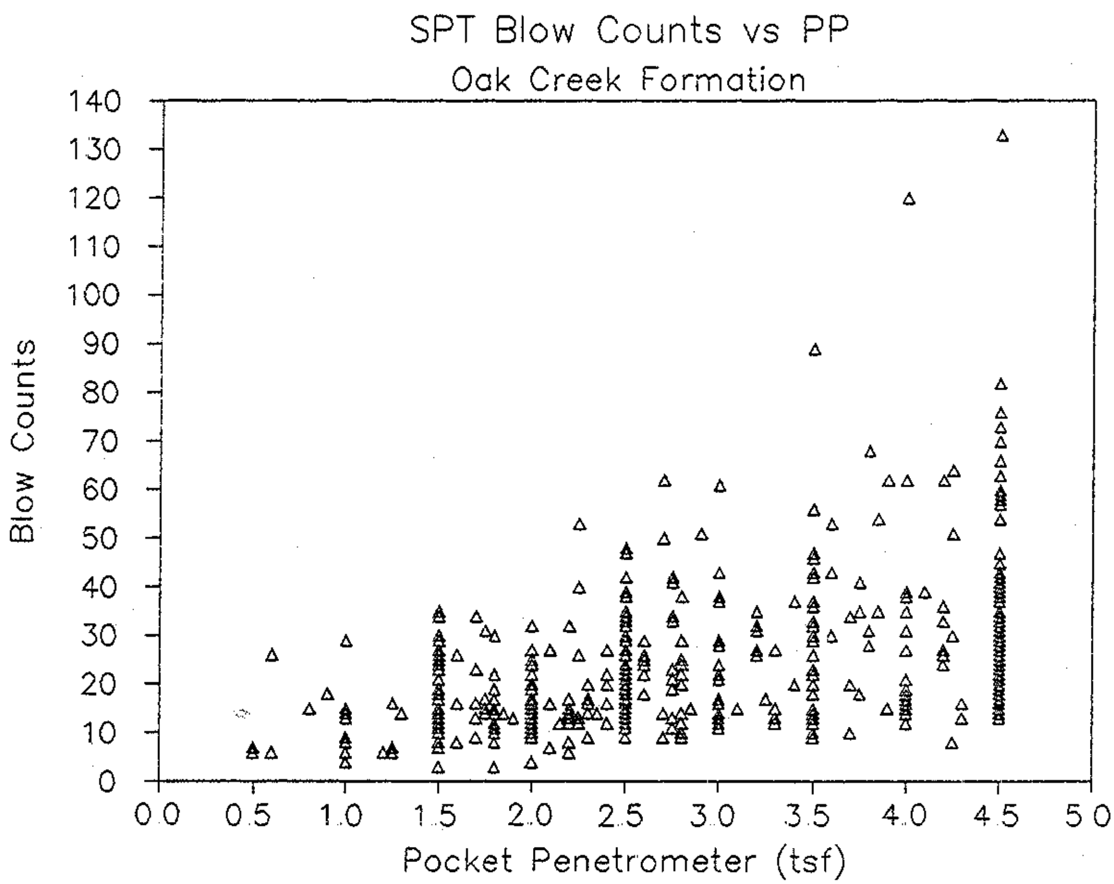


Figure 20. Plot of SPT blow counts as a function of pocket penetrometer measurements for samples of till in the Oak Creek Formation.

May and Thomson found higher strengths to be associated with lower moisture contents for selected till units of the Edmonton area (1978,p. 368). Figure 21 illustrates the relationship between natural moisture and log pocket penetrometer measurements for fine-grained till units included in this study. The individual units scatter throughout the large cluster without any indication of a trend characteristic of a single till or site. Similarly, Muldoon (1987), working with pre-late Wisconsin fine-grained till units in central Wisconsin, found no significant relationships between log pocket penetrometer and moisture content. Muldoon reported that other authors described a strong relationship between natural moisture and log pocket penetrometer for different Wisconsin till units.

B. Particle size analysis

The particle size divisions entered to the database include the percent of the sample greater than 2 mm, the percent sand, silt, and clay of the less than 2 mm fraction, and the P200 (percent passing the #200 sieve, 0.075 mm diameter). These categories were chosen to accommodate the different classification systems used by engineers and geologists. I recorded P200 values because this percentage is necessary for classification in the USCS and because analyses frequently are not completed beyond this particle size. Values of P200 are not presented except in the appendices because this percentage varies considerably with measurement technique. Values of P200 determined by dry sieving tend to be lower than those determined

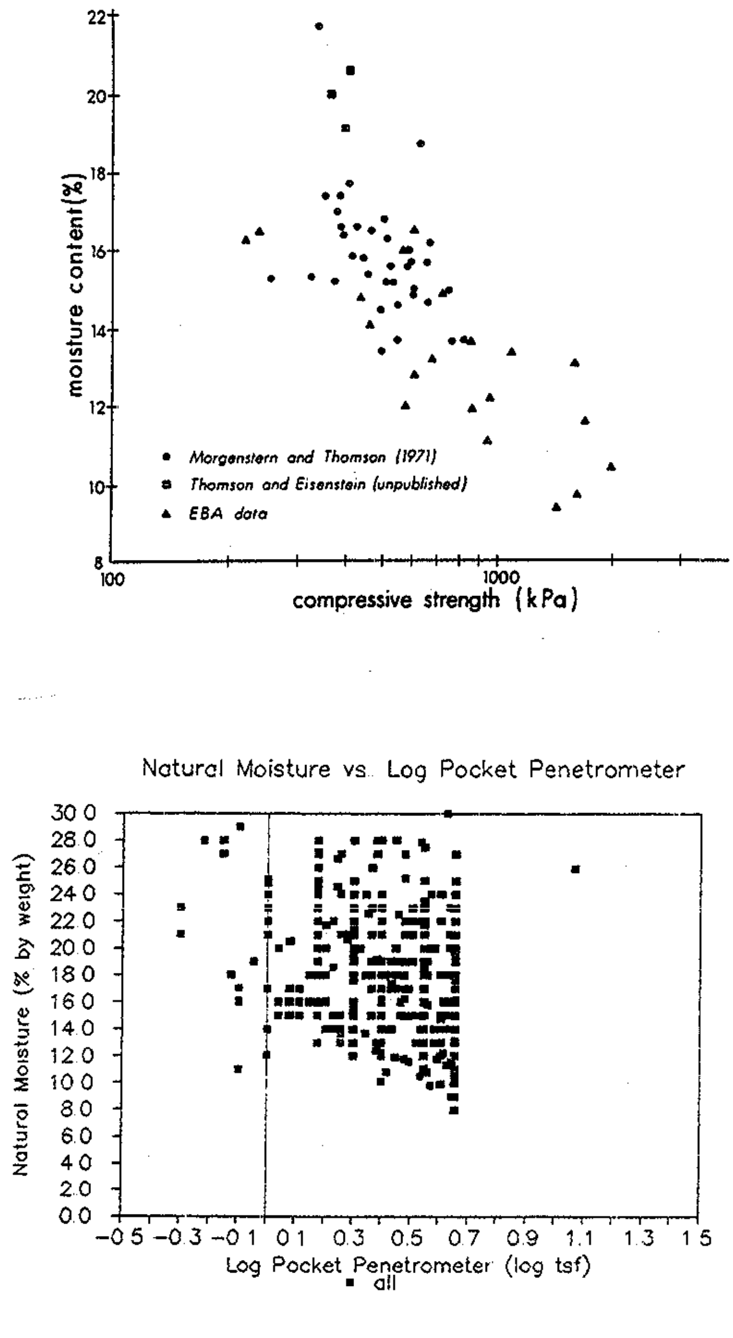


Figure 21. Relationship between natural moisture content and log pocket penetrometer. a) From May and Thomson (1978, p. 368). b) For fine-grained till units in eastern Wisconsin.

by wet sieving, and hydrometer analysis measurements of P200 tend to be greater than those determined by sieving. P200s may be used to check the USCS group symbol.

Wisconsin Geological and Natural History Survey (WGNHS) reports use the sand, silt, and clay divisions indicated in figure 3. Percentages of these particle sizes are reported as matrix percent (that is, percent of the less than 2mm fraction of the sample) to normalize samples collected by different methods because the distribution of particles larger than 2 mm has a much greater spatial variability than the matrix percent in basal till. Furthermore, most sedimentological work uses these sand, silt, and clay classes and they are compatible with terms used in the geologic literature (see Folk, 1958, p. 5). Both sedimentologists and engineers, however, present grain size analysis in graphs of cumulative percent versus grain size diameter. Geologists who study Quaternary materials in Wisconsin adopted use of the textural triangle because early soil surveys placed a greater emphasis on soil parent material.

Considerable geologic interpretation was necessary to assign data to lithostratigraphic units. Frequently, the only type of information common to the definition of the lithostratigraphic units and the geotechnical data was particle size analyses. Discussion of particle size analyses will be limited to till units with observable trends or in which the texture of the matrix can be related to geologic processes or local sources. Sites are consistently identified by number throughout the figures in part IV, on plate 1, in the appendices, and in the following text.

1. Till of the Middle Inlet Member of the Kewaunee Formation

As noted in the data presentation section, the textural analyses compiled for this study do not always plot within the confidence levels determined by the geologist who originally defined the lithostratigraphic unit associated with the till. For example, in the Middle Inlet Member, only two of the data points fall within the 95 percent confidence interval determined by McCartney (1979). I attribute this difference to the limited area from which data was collected in this study. McCartney based her definition of the Middle Inlet Member on particle size analyses of basal till samples from Marinette and Oconto Counties. Later analyses completed in the Quaternary Laboratory at the University of Wisconsin-Madison for till of the Middle Inlet Member farther southeast more closely resemble the data plotted in figure 8a. Need (1985) reported textural analyses for till of the Middle Inlet Member in Brown County. The mean sand, silt, and clay percentages in Brown County are 40, 40, and 20 for till of the Middle Inlet Member, compared to 22, 47, and 30 at site 24 (32 samples) in this study.

Within till of the Middle Inlet Member in Marinette and Oconto Counties, to the northwest of site 24 (plate 1), McCartney noted an increase in silt content which she attributed to the "incorporation of loess and weathered dolomite over Paleozoic rock in the southeast" (1979, p. 62). McCartney also noted that a similar trend of increasing carbonate to the south may have the same cause as the increasing silt content to the southeast:

". . . the carbonate increases to the south with increasing incorporation of the fine-grained, carbonate-rich material as the ice moved south into the lake-filled basin. This may also be the cause of the increase in silt content to the south" (1979, p. 86).

Initially, interpretation of the stratigraphy at site 24 was blocked by the marked difference between the textures at the site and the published definition. The location of site 24 is between McCartney and Mickelson's (1982) solid line border of the Middle Inlet Member and the Fox River. Site stratigraphy affirms the identification as till of the Middle Inlet Member: the Two Creeks Forest Bed underlies this till at site 24. Site 24 is a good example of how tills of lithostratigraphic units may be identified using the criteria listed in table 1a (stratigraphic position and particle size analysis/texture) and familiarity with the literature.

2. Till of the Kirby Lake Member of the Kewaunee Formation

The same deviation from McCartney's statistical summary is seen in till of the Kirby Lake Member, especially at sites 40 and 12 (plate 1 and figure 8b), which are farther south and closer to the Fox River than the type and reference sections. The mean sand, silt, and clay percentages for each site with till of the Kirby Lake Member are presented in table 5 with the number of analyses, N.

McCartney noted that till in the Kirby Lake Member appears texturally to be a reworked lake sediment that experienced little reduction in particle size due to glacial crushing before deposition (1979, p. 55, 73). Another investigator of till in the Kirby Lake

Till of the Kirby Lake Member

	West							East
Site	38	39	22	23	30	40	41	12
N	24	4	2	4	1	13	1	8
% > 2 mm	7	4	11	40	1	1	7	9
% sand	33	34	33	27	35	3	38	13
% silt	46	45	42	46	51	31	52	40
% clay	21	22	25	27	17	67	11	48

Till of the Oak Creek Formation

	West								East
Site	55	35	53	21	14	51	52	20	28
N	7	23	8	16	29	4	2	81	7
% > 2 mm	16	4	1	2	6	13	0	2	10
% sand	28	14	11	7	16	21	13	13	23
% silt	47	56	43	49	50	48	43	59	45
% clay	25	29	45	44	34	31	45	27	32

Till of the Horicon Formation

	North			South
Site	11	8	13	7
N	5	7	2	8
% > 2 mm	32	17	6	11
% sand	64	51	71	77
% silt	33	36	20	17
% clay	3	14	9	6

Till of the New Berlin Formation

	West		East
Site	33	36	55
N	15	3	8
% > 2 mm	30	18	52
% sand	64	27	75
% silt	29	67	20
% clay	6	6	6

Table 5. Mean values of % greater than 2 mm, matrix percent sand, matrix percent silt, and matrix percent clay for till units by site. The maximum, minimum, and median are just as important as the mean, and reference to the plot in figure 8b (Kirby Lake Member), figure 9 (Oak Creek Formation), figure 10 (Horicon Formation), and figure 12 (New Berlin Formation) should be made. Site locations are plotted on plate 1.

Member (Piette, 1963) experienced difficulty distinguishing the till from lacustrine sediment even with good field exposures in Brown County. Need characterized till of the Kirby Lake Member as composed of 16% sand, 46% silt, and 38% clay in Brown County (1985, p. 10). This statistical summary is considerably different from the summary determined by McCartney for Marinette and Oconto Counties (and plotted in figure 8b). Like Piette, I found it very difficult to distinguish between massive, clay-rich lacustrine sediment and till in the Kirby Lake Member, and I relied on the sorting evident in complete particle size analyses to distinguish the two.

Assuming that the till in the Kirby Lake Member is indeed reworked glaciolacustrine sediment, it is reasonable to assume that it would become finer in the Green Bay lowland with increasing distance from the ice front. The particle size data summarized above indicates that till of the Kirby Lake Member is much finer in the Green Bay lowland than in Waupaca (sites 38 and 39), Oconto (sites 22 and 23), and Shawano (site 30) Counties to the north and west. Finer-textured till in the Kirby Lake Member should be expected near Lake Winnebago than to the north and west.

3. <u>Till of the Glenmore Member of the Kewaunee Formation</u>

Need (1985) and McCartney and Mickelson (1982) present statistical summaries of till in the Glenmore Member that differ by only one percent in the sand and clay fractions. Till of the Glenmore Member is siltier at site 1 and sandier at site 10 with less clay than the mean (plate 1 and figure 8c). Site 1 is in western Brown County near the Niagaran escarpment and overlies a gray, stony, silty till (possibly the Wayside Member of Need (1985)). Thus, at site 1, the siltier till in the Glenmore Member may be attributed to local incorporation of the underlying silty till. At site 10, in Door County, till of the Glenmore Member is lodged against the Niagaran escarpment of the Door Peninsula. Higher sand content at site 10 may be due to glacial erosion and mechanical weathering of bedrock or to incorporation of sand beaches.

4. Till units of the Chilton, Two Rivers, Valders, Haven, and Ozaukee Members of the Kewaunee Formation

Data for till units of the Chilton, Two Rivers, Valders, Haven, and Ozaukee Members are plotted in figures 8c through 8h. Although some of these particle size analyses plot outside the confidence intervals determined by the geologist who defined the lithostratigraphic units, I could not attribute the differences to geologic process or to provenance. In fact, particle size analyses of till from the Chilton Member are from the northern and southern extremes of the Chilton Member's mapped extent, but the few data do not illustrate trends like those in till units of the west side of the Green Bay Lobe. As previously mentioned, discrepancies between published particle sizes and data compiled here may be due to use of only basal till in the definition of the lithostratigraphic unit.

5. Till of the Oak Creek Formation

Schneider and Need (1985) discuss the texture of glacial sediments in the Oak Creek Formation, but use 0.004 mm as the division between silt and clay size fractions. Thus, the textural envelope provided by Schneider and Need has not been reproduced in figure 9. Schneider and Need report average grain-size composition of till units equivalent to Oak Creek Formation till units from Wisconsin and Illinois. In Wisconsin, the mean of 68 samples was 12% sand, 44% silt, and 44% clay (<0.004 mm) (Schneider and Need, 1985, p. 58). The very sandy outliers apparent in figure 9 probably represent blocks of sandy sediment locally incorporated into till. Means of sand, silt, and clay for the data plotted in figure 9 are summarized in table 5 by site with left-to-right representing west-to-east. Unlike the particle size analyses for till of the Kirby Lake Member, no clear trend is apparent in till units of the Oak Creek Formation at this scale, and variability at one site, 20, covers nearly the entire range (figure 9). Interbedded silty or sandy sediments and till were recorded as '99' during data collection and were not genetically interpreted.

6. Till of the Horicon Formation

The southern extent of the Horicon Formation has not been geologically studied and divided into members, so few references on particle size analyses are available. The analyses plotted in figure 10 may not be representative of the till because only relatively fine-grained samples would have particle size analyses completed to 0.002 mm for classification purposes at landfill sites. Sand, silt, and clay means are presented in table 5 by site with north to south approximately represented by left to right. Site 11 in Brown County and probably contains till of the Wayside Member (Need, 1985). Sites 8, 13, and 7 are in Dodge, Green Lake, and Dane Counties, respectively; these sites show a progressive fining to the south. This could result from deposition by a glacier that readvanced over proglacial or post glacial lake sediments in the Green Bay lowland, or it could indicate that debris entrained in the glacier was more thoroughly reduced in size before it was deposited during ice wasting and glacial retreat to the north.

7. Till of the unnamed unit

Particle size analyses of till from sites 12, 24, 40, and 41 in Fond du Lac, Outagamie, and Winnebago Counties (figure 11) demonstrate the existence of a till unit much siltier than expected in the Horicon Formation and stratigraphically below the Kewaunee Formation. McCartney and Mickelson assert that there are no till units correlative to the Oak Creek Formation till units in the Green Bay lowland (1985, p. 301). Their research did not provide sufficient data to support this contention because it did not extend farther south than the north end of Lake Winnebago. The data compiled for this study are not adequate to test the hypothesis that the sediments at these sites (and possibly at site 1 in Brown County) represent a unit correlative with the Oak Creek Formation in the Lake Michigan basin. In support of this hypothesis, ice in the two lobes seems to have behaved similarly during deposition of the Horicon and New Berlin Formations and during deposition of the Kewaunee Formation as indicated by interlobate moraines and outwash surfaces. I know of no evidence indicating that ice in the two lobes did not behave similarly during retreat from a middle Woodfordian maximum.

8. Till of the New Berlin Formation

Schneider and Need report the following average texture for till of the New Berlin Formation: 58% sand, 29% silt, 13% clay (<0.004 mm) for 15 samples (1985, p. 58). The envelope they plot for till has not been reproduced in figure 12 because of the difference in size classes. The textures of samples from all the sites contain less clay than those reported by Schneider and Need. Presumably, this is due to the differing definitions of clay since no obvious trend is apparent when data from the three sites are separated. Mean size classes are presented in table 5 with left to right representing west to east. Sites 33, 36, and 55 are in Walworth, Washington, and Waukesha Counties, respectively. The large variation in mean particle size class from site to site may be due to local influences or may result from an unrepresentative, small number of analyses.

9. Till of the Tiskilwa Member of the Zenda Formation

The single textural analysis of till at site 32 (figure 13) indicated a composition between the "typical" (42% sand, 35% silt, and 23% clay) and "sandy phase" (65% sand, 24% silt, 11% clay) (Mickelson *et al.*, 1984, p. A6-6).

C. Atterberg Limits

1. Background

Atterberg limits have been used primarily as an aid to classification in the Unified Soil Classification System (USCS), but this classification is of little use to glacial geologists or to hydrogeologists except in a very general way. Complete particle size analyses give much more information about depositional process than Atterberg Limits as they are determined for use in the USCS. I studied the references available on Atterberg Limits to determine whether the limits and indices derived from them could be of use to hydrogeologists or geologists.

A. Atterberg, a swedish scientist, established his "limits of consistency" in 1911 in an attempt to classify soils in their plastic state by their water content. Of Atterberg's original six consistency limits, only the liquid limit (LL), plastic limit (PL), and shrinkage limit (SL) have been incorporated into geotechnical practice. The liquid limit is the lower limit of viscous flow, and the plastic limit is the lower limit of the plastic state. (See Casagrande, 1932 for a more detailed summary of Atterberg limits.) Figure 22 illustrates the physical meaning of these three limits. Atterberg also defined the plasticity index as the difference between the liquid limit and plastic limit (PI = LL - PL). The ASTM standard method for determining Atterberg limits specifies use of the less than 0.425 mm fraction of the sample (D4318-84, ASTM, 1986).

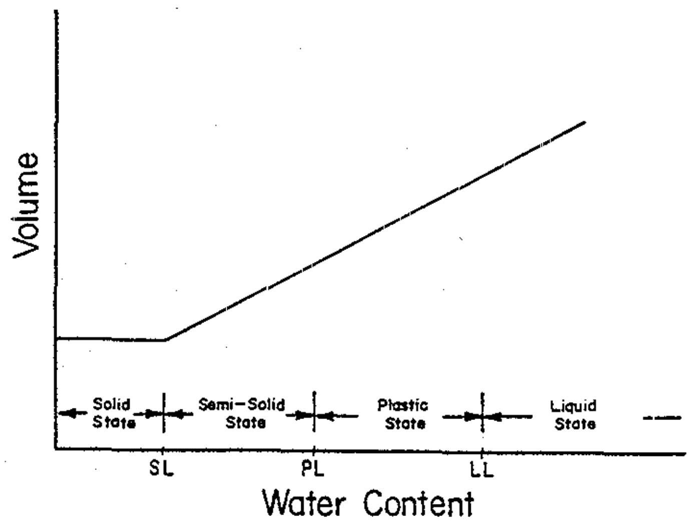


Figure 22. Atterberg limits related to volume and water content. The increase in volume from the shrinkage limit to the plastic limit is part air- and part water-filled void space. The soil is saturated at the plastic limit and increases in volume from the plastic limit consist of water. (From Dunn, Anderson, and Kiefer, 1980, p. 28.)

Atterberg limits have received considerable attention in the geotechnical and soils literature, but are sometimes used inappropriately in contexts for which they were not developed. For example, they have been interpreted to indicate pollutant attenuation potential or cation exchange capacity when too little information is available for such inferences. Atterberg limits have been correlated with compressibility, compactability, shrink-swell, shear strength (ASTM, 1986), specific surface area, geometric properties of clay, physical-chemical factors (Nagaraj and Jayadeva, 1981), organic matter content, percent clay, and clay mineralogy (Odell, Thornburn, and McKenzie, 1960). Farrar and Coleman (1967) found a high correlation between liquid limit and cation exchange capacity and specific surface area. Atterberg limits are influenced by mixing and drying of the sample, particle size distribution, presence of organic matter (Casagrande, 1932), mineralogy, and pore fluid chemistry (Yong and Warkentin, 1975), and a concise interpretation depends on an accurate definition of the variables in the soil-water system. Moreover, the determination of Atterberg limits destroys the soil's structure so that Atterberg limits yield information about material properties which are not necessarily the same as *in-situ* properties.

2. Plasticity charts

Casagrande, or plasticity, charts consist of liquid limit on the x-axis and plasticity index on the y-axis. Casagrande plotted an "A-line" on the chart to classify soils. Glacial sediments, like any other sediments, should plot in an elongate cluster parallel to the A-line. Decreasing particle size within the fraction tested increases both the liquid limit and plastic limit, but increases the liquid limit more (White, 1949). An elongate cluster of data with positive slope results from the variation in particle size distribution within the fractions tested. Muldoon found that increasing matrix percent sand correlated negatively with Atterberg limits (1987, p. 86); the presence of fine sand in the less than .425 mm fraction for the Atterberg limits test suppressed limit values. Chassefiere and Monaco (1983) found the location of sediments along the A-line to be a function of the degree of evolution of the sedimentary facies (sorting) and the smectite content. Figure 23 shows the general relationship between liquid limit and plastic index for several sediment and soil types.

Boulton and Paul (1976) tried to relate Atterberg limits to glacial sediments and introduced a "T-line" for tills which they plot on plasticity charts. Boulton and Paul found that melt out tills occupy a field on the plasticity chart similar to that for englacial debris and lodgement till from the same glacier. Given an understanding of why sediments and soils plot in elongate clusters on a plasticity chart, the T-line is superfluous--especially since it does not differentiate between glacial facies and is not part of a classification system.

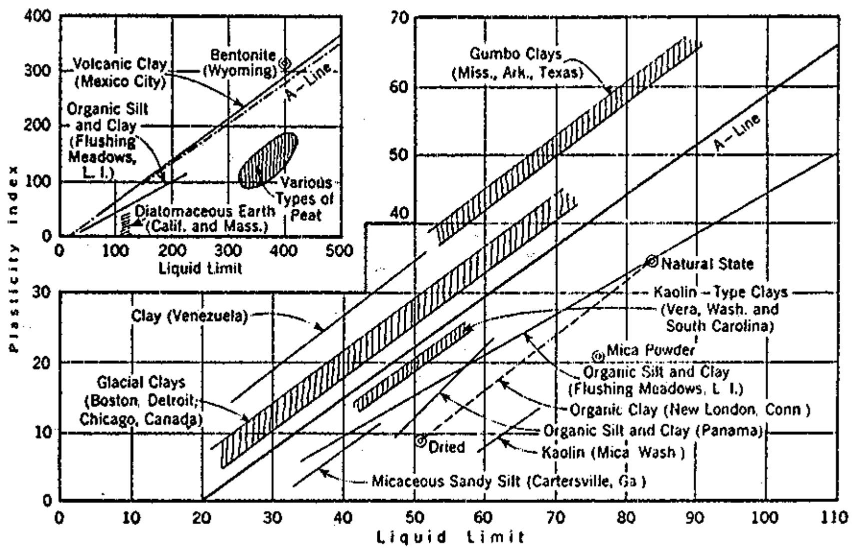


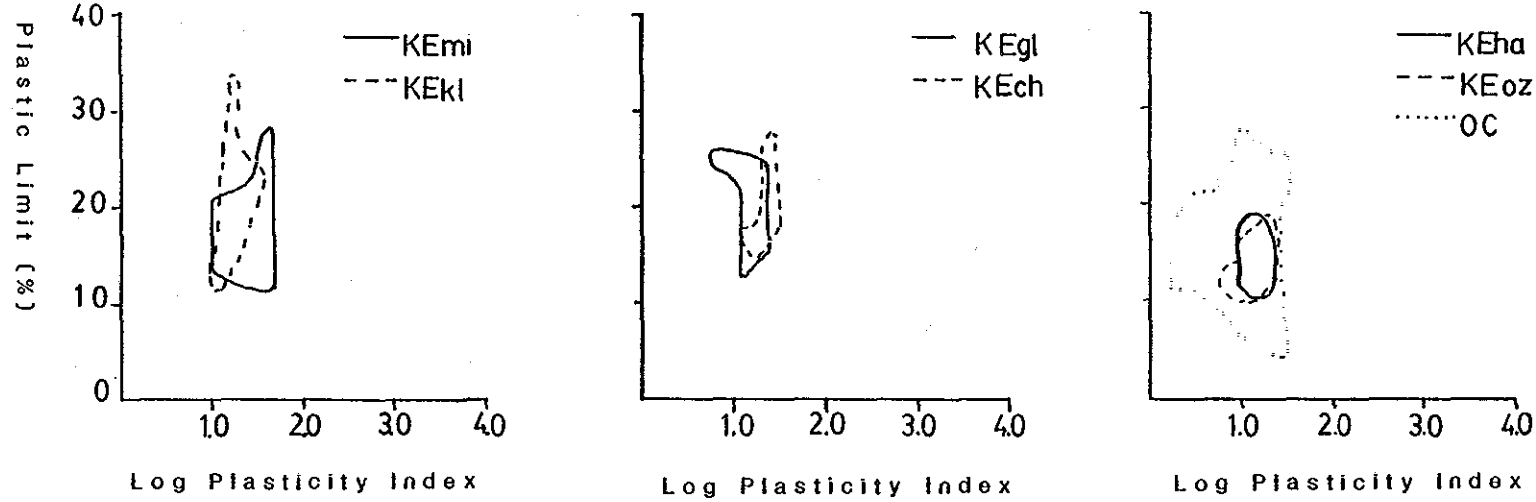
Figure 23. Plasticity chart for a variety of soils. (From Casagrande, 1947, p. 803.)

3. <u>Clay mineralogy</u>

Atterberg limits may be related to geology in a way not illustrated by the plasticity chart and have been used to identify clay minerals. For example, Bain (1971) plots plastic limit on the y-axis against plasticity index on a log x-axis to separate clay mineral clusters. Figure 24 shows plots of this type for till units from eastern Wisconsin. Mickelson *et al.* (1984) report semi-quantitative x-ray diffraction analyses for clay minerals in some of eastern Wisconsin's till units; these are included in the same figure. These plots indicate agreement with published clay mineral analyses. Till in the Oak Creek Formation has the highest illite content and since illite has low plasticity, plots closer to the y-axis. Although clay mineral analyses are not available for the Kirby Lake, Glenmore, and Chilton Members, I infer from the plots that the mineralogy of these till units resembles the other members in the Kewaunee Formation. The influence of fine sand and silt in the less than 0.425 mm fraction complicates interpretation of these plots.

4. <u>Activity</u>

Atterberg limits have been used to derive indices in addition to the plasticity index. For example, *activity* is defined as the plasticity index divided by the percent less than 0.002 mm (A = PI / % clay). Sediments with activities less than 0.75, between 0.75 and 1.25, and greater than 1.25 are classified as inactive, normal, and active (Grim, 1962). Professionals concerned with the suitability of material for liners and caps would prefer to use materials that are



Till unit	Illite	Exp.	Kaol. + Chlor.	Reference
Middle Inlet Member	49%	33%	19%	Mickelson et al., 1984
Haven Member	56%	25%	19%	Acomb, Mickelson, & Evenson, 1982
Ozaukee Member	60%	20%	20%	Acomb, Mickelson, & Evenson, 1982
Oak Creek Formation	72%	15%	13%	Schneider & Need, 1985

Figure 24. Plots of plastic limit versus log plasticity index for till units in superposed lithostratigraphic units. These plots (after Bain, 1971) indicate agreement with the published clay mineral analysis for till units--only the till in the Oak Creek Formation is considerably different. I infer from the plots that the clay mineralogy of the Green Bay lobe till units in the Kewaunee Formation is similar to those analyzed.

inactive and unlikely to heave or shrink and swell. According to Terzaghi (1955), activity varies with particle size, adsorption complex, and mineralogy. Activities for samples of till with both plasticity indices and percent clay are summarized in table 6. Only till units in the Kirby Lake and Middle Inlet Members of the Kewaunee Formation included samples that were classified as active. These two till units also included proportionally more samples classified as normal. Most of the late Wisconsin till units in eastern Wisconsin are inactive.

Grim (1962) associates the following qualities with active clays: relatively high water holding capacity, high compaction under load, high cation exchange capacity, variation in properties with variation in exchangeable cations, high thixotropy, low permeability, low resistance to shear, and strength dependent on cohesion (p. 219). Uehara and Gilman find that tropical soils with low activity

> ". . . do not shrink or swell greatly, are generally well aggregated, and therefore have higher water intake rates, which in turn reduces hazards from erosion. They can accommodate traffic more readily after heavy rains and offer less resistance to tillage implements than do soils with high-activity clays of comparable textures" (1981, pp. 99-100).

Presumably Uehara and Gilman's observations about activity are not limited to the tropics, and most late Wisconsin till units in the eastern third of Wisconsin are not expected to cause problems for the geotechnical engineer. If Atterberg limits are determined for the entire sample rather than for the fraction less than 0.425 mm, the sample may be classified by its potential for volume change (Dept. of the Navy, 1982, p. 7.1-38).

	Activity classification				Liquidity index classification				Consistency index		
Till unit	N	Inactive	Normal	Active	N	Solid	Plastic	Thixotropic	N	mean	std. dev.
KEmi	23	18	2	3	23	17	6	0	23	1.8	0.8
KEkl	67	51	14	2	67	47	20	0	67	1.6	0.7
KEgl	4	4	–	–	4	4	0	0	4	1.9	0.
KEch	8	6	2	–	8	8	0	0	8	1.9	0.2
KEtr	0	–	–	–	0	0	0	0	0	–	–
KEva	53	48	5	–	53	29	24	0	53	1.3	0.5
KEha	13	12	1	–	13	13	0	0	13	1.9	0.3
KEoz	22	21	1	–	22	5	17	0	22	1.0	0.6
HO	6	6	–	–	6	6	0	0	6	4.1	0.7
OC	106	105	1	–	102	81	21	0	104	2.2	1.4
NB	1	1	–	–	1	1	0	0	1	5.8	–
ZEti	1	1	–	–	1	1	0	0	1	2.9	–

Table 6. Summary of classication using activity and liquidity index with N, total number of samples representing the till of a lithostratigraphic unit, and the number of samples in each category. Summary of consistency index with number of samples per till (N) in a lithostratigraphic unit, mean, and standard deviation.

5. Liquidity index

The liquidity index is also derived from Atterberg limits. Liquidity index is defined as the quantity natural moisture content minus plastic limit divided by plasticity index (LI = (nm% - PL) / PI). If the liquidity index is less than 0, between 0 and 1, or greater than 1, then the material is solid, plastic, or thixotropic (regains strength over time), respectively (Chassefiere and Monaco, 1982, p. 174). A high liquidity index is probable in highly porous, fine-grained sediments with high natural moisture. Such conditions might be met by a clay-sized material that flocculated to silt-size sediment--for example, by a water-laid till or lacustrine sediment--but are more likely in an aqueous than a sub-ice environment.

Boswell (1961) associated decreasing liquidity indices with increasing geologic age. He suggested that the liquidity index would be negative in Paleozoic clays and shales and occasionally negative in Cenozoic and Mesozoic clays. Boswell expected glacial and recent clays to have liquidity indices equal to 2.0 or 3.0 (p. 68). In contrast to Boswell, Skempton and Northey (1952) explain that glacially overconsolidated clays don't regain strength because their liquidity index roughly equals zero. Thus, there is no possibility for age-hardening.

Liquidity indices for the till units included in this study are summarized in table 6. As might be expected, most till units were classified as solid, but a significant proportion of the till samples in the Middle Inlet, Kirby Lake, Valders and Ozaukee Members and in the Oak Creek Formation are plastic. Since consolidation is really a dewatering process that doesn't affect Atterberg limits (water is added to the sample to determine Atterberg limits), higher liquidity indices should be associated with less well consolidated sediments regardless of their age.

6. Consistency index

Boswell (1961) defines another index derived from Atterberg limits, the consistency index, CI = (LL - % nm) / PI. Boswell writes, "In high moisture sediments it becomes zero or negative and tends to increase as deposits become older and to possess lower Atterberg limits" (1961, p. 68). It is clear from the equation that the consistency index approaches zero and negative values when the natural moisture content is high. Values of the consistency index are given in table 6. The consistency index increases with geologic age of the sediments only if the natural moisture content decreases and all the variables affecting Atterberg limits remain constant. The consistency index appears to have no applications for geotechnical engineers or geologists.

D. Classification in the Unified Soil Classification System

The only benefit of using the USCS appears to be establishment of a common language among professionals, but lack of a common reference restricts this benefit. I recorded USCS group symbols from grain size curves or descriptions of samples given on lab sheets and from boring log descriptions when a more specific source was not available. Even though these symbols are "standardized", not all the engineering consulting firms use the USCS in a consistent way. Group symbols are reported combined by hyphens, slashes, commas, and 'and'. The Casagrande chart typically used in textbook descriptions of the USCS shows only one combined symbol, CL-ML, although the ASTM references (D2487-85 and D2488-84) include discussions of when hyphenated symbols and symbols with a slash may be used. The USCS, a revised version of the Airfield Classification (AC) System developed in 1947 by Casagrande, was not specifically intended for hydrogeologic assessment.

A sixty-page discussion of the AC system in Casagrande's 1948 publication documents a variety of misgivings about application of the system for all purposes. In fact, Casagrande emphasized that group symbols are no substitute for detailed descriptions (1948, p. 917). The system was intended for field classification under circumstances such that only manual techniques are practical. Criticisms of the AC system include: that the system ignores fundamental soil properties (Hough, p. 987), that the system is actually a plasticity classification for fine-grained soils and a textural classification for coarse-grained soils (Lane, p. 952), that further confusion of plasticity and consistency would result from its use (Sowers, p. 959), and that it is frequently appropriate to use at least several classifications for describing soils (Spangler, p. 978; all in Casagrande, 1948).

Figure 16 clearly shows that the USCS can not distinguish between till units in the Kewaunee Formation or Oak Creek Formation. The USCS usually does differentiate between outwash and fine-grained till in the Kewaunee and Oak Creek Formations, but does not differentiate between till and outwash in the sandier Horicon Formation. Batches of hydraulic conductivity data for till of lithostratigraphic members have been compared, and ANOVA tests indicate that the hydraulic conductivity values are from populations with statistically significant differences. The USCS does not distinguish between genetic units; thus it gives no clues about geometry of the soil material (on the scale of this study). Neither the USCS nor the lithostratigraphic classification distinguish materials with statistically significant different hydraulic conductivities.

E. Hydraulic conductivity

Hydraulic conductivity is the most important material parameter determined during assessment of site conditions for waste disposal systems. Accordingly, assembling available hydraulic conductivity data for the various geologic units has been a major focus of this project. Recompacted samples were not included in the hydraulic conductivity data collection because the project focuses on characterization of *in-situ* materials. Other investigators (Muldoon, 1987; Herzog and Morse, 1984; Olson and Daniel, 1981) have reported that various methods of hydraulic conductivity measurement can yield widely varying results, and that laboratory and field measurements of hydraulic conductivity may vary from each other due to problems of scale and disturbance.

In a thorough review article, Olson and Daniel (1981) list six major causes for higher field than lab hydraulic conductivity:

"(1) a tendency to run laboratory tests on more clayey samples; (2) the presence of sand seams, fissures, and other macrostructures in the field which are not represented properly in laboratory tests; (3) the use of lab k values back-calculated from consolidation theory rather than directly measured values; (4) measurement of vertical flow k in the laboratory and horizontal flow k in the field; (5) the use of distilled water in the laboratory; (6) air entrapment in laboratory samples" (p. 54).

When laboratory and field hydraulic conductivity data compiled for this study are sorted by till units, the laboratory and field data differ by at least an order of magnitude for a combination of all these reasons. Many of the landfill studies are for proposed zone of saturation sites. Thus, consultants may have been concerned with finding a material suitable for use as clay liner material and may have selected finer-grained samples for laboratory testing. Connell (1984) and Fleming (1986) document the existence of fractures and/or joints in the clayey till units included in this study. Written descriptions of samples used for laboratory measurement of hydraulic conductivity almost never include these structures. Relatively few of the lab hydraulic conductivity data were determined using a method derived from Terzaghi's consolidation theory. Olson and Daniel (1982) ascribe the discrepancies between conventional permeability tests and consolidation theory to ". . . the fact that the classical theory of consolidation makes no adjustment for the structural viscosity of the soil" (p. 25). In contrast, Houston and Kasim (1982) write that the consolidation test is usually the most satisfactory method for clays with low hydraulic conductivity and high compressibility of the material skeleton (p. 152).

Scale is perhaps the most important factor influencing the differences between lab and field hydraulic conductivity in this study. There is little or no evidence that vertically oriented samples of less than 5 inches diameter taken from a borehole and tested for hydraulic conductivity in a laboratory yield values of vertical hydraulic conductivity appropriate for use in the field at a site of many acres. The fractures and/or joints evident in the field (sometimes identified by gleyed colors, oxidized rims, manganese precipitate, calcite crystals, or silt coats) most likely have a profound, positive influence on vertical hydraulic conductivity and rate of groundwater recharge. These fractures may account for much of the discrepancy between lab and field values.

Unfortunately, neither field nor lab hydraulic conductivity data are suitable for a quantitative comparison of the accuracy of measurement methods. I attempted a two-way analysis of variance test for hydraulic conductivities measured in the laboratory for samples of till from the Oak Creek Formation. Till properties vary from site to site, and I had hoped to determine whether one test method consistently gave higher or lower values at individual sites. However, consistent test methods are usually used at single sites, and two-way analysis of variance requires the same variety of methods at all sites.

Direct comparison of lab and field hydraulic conductivity and comparison of measured hydraulic conductivity with grain size methods of estimating hydraulic conductivity require that the tests and measurements be made on paired samples. Very few lab hydraulic conductivity tests were performed on samples opposite piezometer screened intervals with field test data. Complete grain size data were not available for many samples with hydraulic conductivity data. Muldoon (1987) controlled the selection of samples for testing and was able to regress many variables, including grain size data, against hydraulic conductivity.

1. <u>Field hydraulic conductivity</u>

Using dissimilar sources of hydraulic conductivity data presents several inherent problems. First, the choice between rising and falling head tests could induce variation by a factor of 500 according to Milligan (Houston and Kasim, 1982). Second, several reports included more than one value of hydraulic conductivity for the same well or piezometer, and some values of hydraulic conductivity were determined by Bureau of Solid Waste Management tests and calculations. In these cases, both values are reported in the appendices, but Bureau of Solid Waste Management values were used for the statistical analysis of hydraulic conductivity. Third, a lack of consistently organized raw data in the database prevented consistent recalculation of all hydraulic conductivity values.

The nature of the geotechnical investigations limits the choice of a field method. Many of the piezometers with hydraulic conductivity determinations are also used to detect changes in static water level or for water quality monitoring. Consultants are reluctant to introduce water to such wells, and prefer to bail down the water level for rising head tests. Thus the removal of the 'slug' of water is not instantaneous. Piezometers with ten-foot-long screened intervals were common. Shorter screened lengths, such as three feet, are preferred for better resolution of head (a 'point' measurement) and to prevent down- and up- hole dilution and/or contamination in the event of leachate movement.

The implementation of field methods has changed rapidly since 1980. In particular, the use of field measurements of hydraulic conductivity has become a legal necessity and improved implementation of the technique may have been concurrent. Most of the data included here are from baildown tests. Whether the same values would result from use of a pressure transducer and continuous recorder is not known. Firms referred to journal articles (Bouwer, 1961; Bouwer and Rice, 1976; Cooper, Bredehoeft, and Papadopulos, 1967; Papadopulos, Bredehoeft, and Cooper, 1973) and standard references (Department of the Navy, 1971; Chow, 1964; Freeze and Cherry, 1979; Hvorslev, 1951) to document their methods. These references focus primarily on choice of an appropriate equation for data analysis, and little attention is devoted to the technique of performing the field test, well construction techniques, or analysis of experimental error.

Scarrow (1985) discussed the effect of screen length on field determinations of hydraulic conductivity and concluded that longer screen lengths give lower values of hydraulic conductivity (pp. 65, 66). The data compiled for this study do not support Scarrow's assertion. Figure 25 indicates that the length of the saturated interval tested does not have a dominant influence on the value of hydraulic conductivity. Scarrow also concluded that "the method chosen to analyze slug test data does not have any measurable impact on the accuracy of the subsequent conductivity estimate" (1985, p. 72). The several orders of magnitude variation seen within till units, then, must reflect variation within the till units according to Scarrow's analysis.

2. Laboratory measurements

Laboratory measurements of hydraulic ocnductivity are used in several phases of the landfill siting and approval process, and it was necessary to read the consultants' reports to determine whether reported laboratory measurements of hydraulic conductivity represented 'undisturbed' conditions. Nearly all the reports lack a description of the laboratory equipment used. The frequent absence of references for the laboratory hydraulic conductivity method used indicates that standard methods for laboratory measurement of natural materials in their native state do not exist. Herzog and Morse (1984) and Muldoon (1987) emphasize description of the laboratory apparatus for this reason. Most laboratory data were labelled as rising or falling head but recompacted samples from clay liners were not always clearly identified. I avoided errors in interpretation of the data by reading the accompanying text. Reading errors could be eliminated by

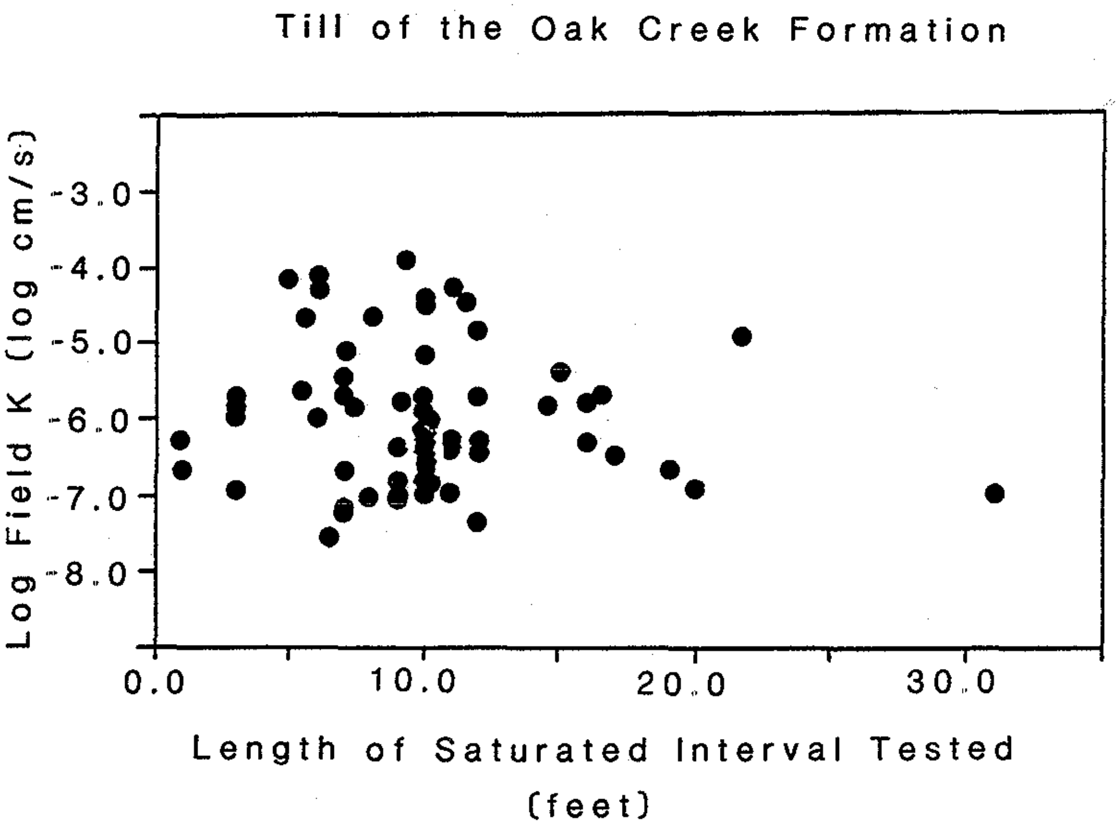


Figure 25. Log hydraulic conductivity from field measurements versus length of the saturated interval tested.

reporting field compacted (liner), lab recompacted, and *in-situ* values in separate columns or tables.

F. Dry unit weight

Hydrogeologic assessments do not require determination of dry or moist unit weight but hydrologic use may be made of the data. Materials frequently tested for dry unit weight include potential lining materials for which standard or modified proctor compaction tests are run. The relationship between dry unit weight and porosity should follow weight-volume equations established by soil mechanics theory. The equations of interest are in figure 26. Assuming a specific gravity for the glacial sediment, the void ratio and porosity may be calculated from the dry unit weight. Porosities are needed to calculate average linear velocity and travel times (Feinstein and Anderson, 1987, p. 95).

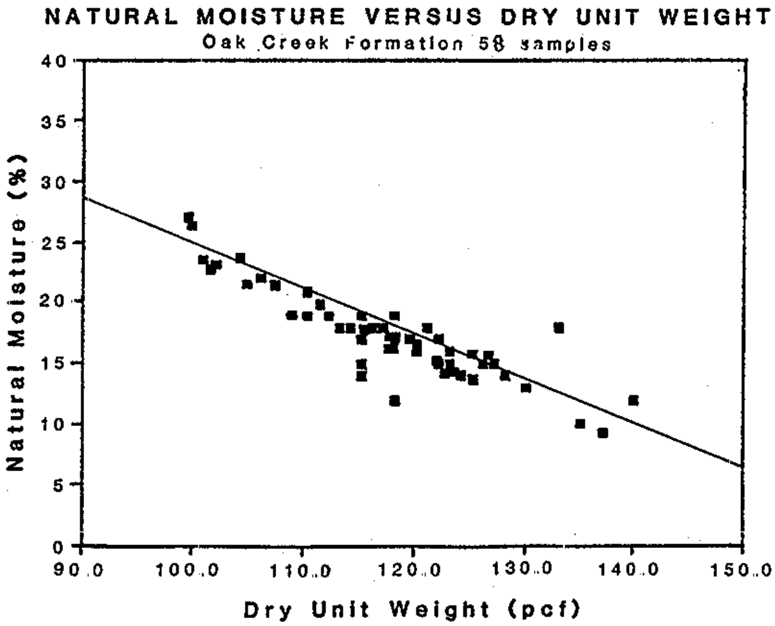
Samples are typically removed from below the water table. Then, assuming saturation, natural moisture content should equal porosity and be related to void ratio. At low porosity, dry unit weights should be higher. Plotted data illustrate this relationship (figure 26). The straight-line fitted equation explains 80% of the variation in natural moisture content for samples from the Oak Creek Formation. For example, the 95% confidence interval for an individual natural moisture content ranges from 14.9 to 21.7% when the dry unit weight equals 115 pcf. The 95% confidence interval for the *mean* of all natural moisture contents ranges from 17.9 to 18.8% when the dry unit

$$\text{gamma}_d = \frac{G}{1 + e} \qquad e = \frac{G * \text{gamma}_w}{\text{gamma}_d} - 1$$

$$e = \frac{n}{1 - n} \qquad n = \frac{e}{1 + e}$$

Where: G = specific gravity, unitless
gamma_d = dry unit weight, from data
gamma_w = unit weight of water, 62.5 pcf
e = void ratio
n = porosity

a



b

The regression equation is
nm % = 60.0 - (0.36 * dry pcf)

	Coef.	Std. dev. of the Coef.	t-ratio
A (y)	60.01	2.82	21.28
b (x)	- 0.36	0.02	-15.15

s = 1.726 R^2 = 80.4% R^2 (adj.) = 80.0%
The t-value corresponding to 56 degrees of freedom and 95% confidence is 1.96.

Figure 26. a) Equations for the calculation of porosity from dry unit weight. Specific gravity is usually estimated as 2.65 (Dunn, Anderson, and Kiefer, 1980, p. 19). b) Natural moisture versus dry unit weight.

weight equals 115 pcf. A regression of dry unit weight on natural moisture content also indicates a statistically significant relationship. The regression results are included in figure 26.

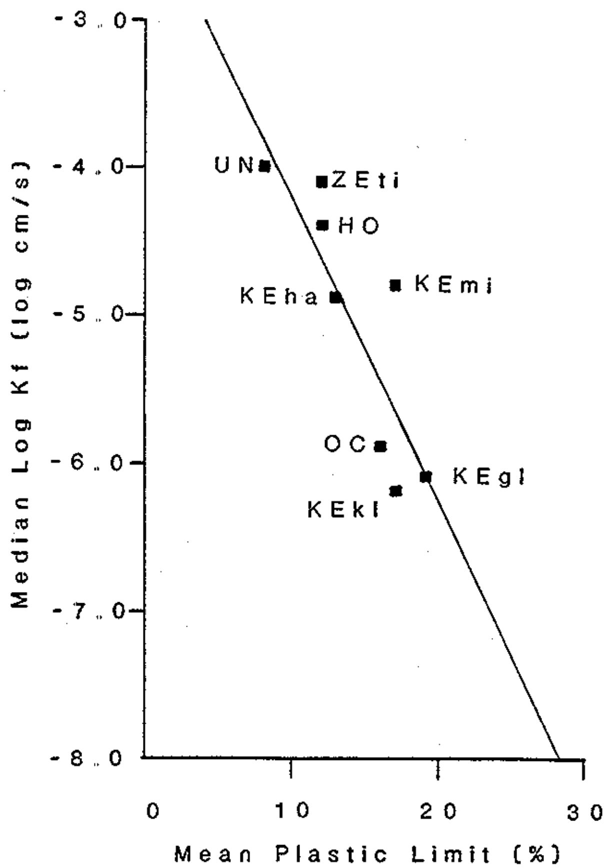
G. Relationships between hydraulic conductivity and other tests.

As previously stated, investigation of the relationship between textures and hydraulic conductivity using correlation and regression is not possible because the data are not paired. For the same reasons, exploratory data analysis of relationships between hydraulic conductivity and other data parameters is limited to plots of median values for lithostratigraphic units.

1. <u>Hydraulic conductivity and plastic limit</u>

Previous work suggests that a relationship may exist between plastic limit and hydraulic conductivities measured in the field. Connell (1984) observed a weak negative correlation between plastic limit and the frequency of vertical joints. A good correlation between the log of hydraulic conductivities measured in the field and plastic limit would be expected if a relationship exists between plastic limit, fracture frequency, and field hydraulic conductivity in these data. I plotted the median value of hydraulic conductivities measured in the field versus the mean plastic limit for till units with more than 5 values of each.

Although the data in figure 27 appear to illustrate a trend and the straight line regression equation explains 67% of the variation in log median hydraulic conductivity measured in the field, the



The regression equation is
$\text{Log } K_f = -2.14 - (0.206 * PL)$

	Coef.	Std. dev. of the Coef.	t-ratio
A (y)	-2.14	0.779	-2.75
B (x)	-0.21	0.053	-3.88

s = 0.509 R^2 = 71.4% R^2 (adj.) = 66.7%

The t value corresponding to 6 degrees of freedom and 95% confidence is 2.45.

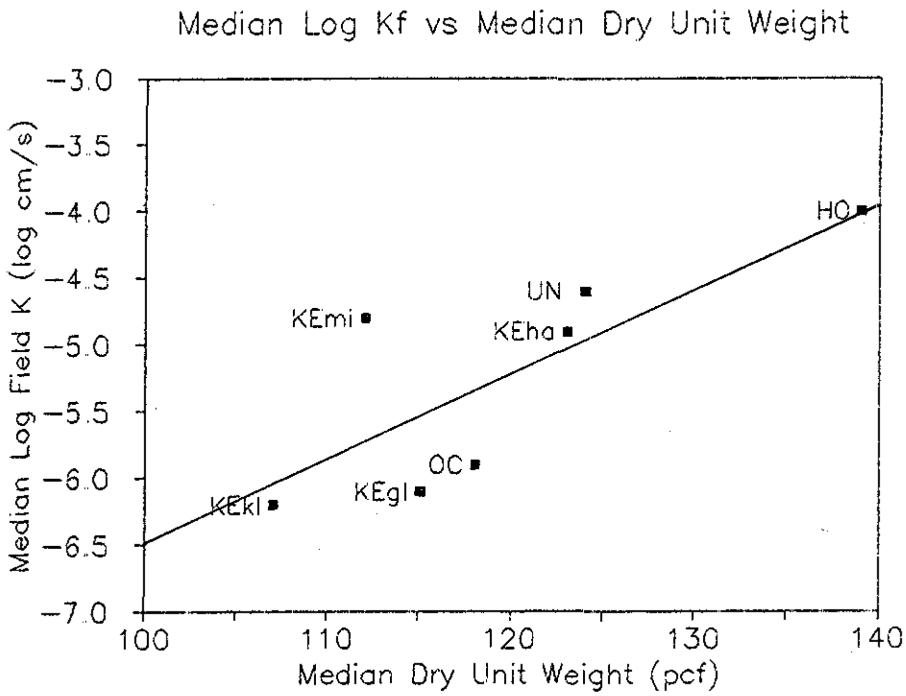
Figure 27. Regression of median log hydraulic conductivity measured in the field on mean plastic limit.

relationship has limited practical applications because medians and means are used. Despite this, the results of the statistical analysis can be used to predict field hydraulic conductivity from plastic limit. For example, the 95% confidence interval for a single hydraulic conductivity (median) value when (mean) plastic limit equals 17% ranges from 5.0×10^{-5} to 1.0×10^{-7} cm/s.

2. Hydraulic conductivity and dry unit weight

Hydraulic conductivity is intuitively related to dry unit weight (bulk density) because fluid flow requires permeability and porosity, and more porous soils are expected to be have lower bulk density. Porosity and hydraulic conductivity are commonly thought to be related, especially in granular porous media: porosity is included in the parameter 'C' in Darcy's equation and as 'n' in the Kozeny-Carmen and Fair-Hatch equations (Freeze and Cherry, 1979, pp. 27, 351).

I plotted median field hydraulic conductivity against median dry unit weight for each till unit with greater than five data values to determine whether such a relationship deserves further attention (figure 28). (Like many other parameters in the database, measurements of hydraulic conductivity and density are not paired.) The median dry unit weights are lower for finer grained till units with higher natural moisture contents, as suggested by figure 26b for sediments in the Oak Creek Formation. High porosity is associated with fine-grained materials but high porosity does not always result in greater values of hydraulic conductivity. High permeability is



The regression equation is
Log K_f = -13.0 + (0.065 * dry pcf)

	Coef.	Std. dev. of the Coef.	t-ratio
A (y)	-12.96	2.67	-4.85
B (x)	0.06	0.02	2.91

s = 0.569 R^2 = 62.8% R^2 (adj.) = 55.4%

The t value corresponding to 5 degrees of freedom and 95% confidence is 2.56.

Figure 28. Regression of median log hydraulic conductivity measured in the field on median dry unit weight for till units.

required in addition to high porosity for high hydraulic conductivity. Figure 28 indicates that coarser-grained units have greater permeability. The poor fit of the regressed equation confirms that multiple variables influence the value of hydraulic conductivity.

According to straight-line linear regression results, 55% of the variation in median log hydraulic conductivity from field measurements can be explained by the fitted equation. As was the case for plastic limit, the regression of median log hydraulic conductivity on median dry unit weight has limited practical applications. For example, the 95% confidence interval for a single median hydraulic conductivity field measured value corresponding to a dry unit weight of 112 pcf ranges from 1.1×10^{-4} to 3.5×10^{-8} cm/s. A more narrow range of values can be predicted for the mean median log hydraulic conductivity at a given dry unit weight (Ryan, Joiner, and Ryan, 1985, p. 233).

3. <u>Hydraulic conductivity and pocket penetrometer measurements</u>

I also investigated the relationship between hydraulic conductivities measured in the field and pocket penetrometer measurements because pocket penetrometer data has been thought to indicate density. A similar correlation coefficient (r^2=0.64) resulted from a straight line linear regression of the median log field hydraulic conductivity on the median pocket penetrometer measurement for till units. Despite the value of r^2, statistical analysis (a t-test of the null hypothesis that B=0 (Ryan, Joiner, and Ryan, 1985, p. 292)) implies that the pocket penetrometer is not a useful predictor of log hydraulic conductivities measured in the field.

H. Relationships between lithostratigraphic units and hydrostratigraphic units

Laney and Davidson (1986) discuss the definition of the hydrogeologic framework in much the same way as Mickelson *et al.* (1984) discuss the lithostratigraphic framework. Laney and Davidson write:

"In hydrogeologic studies, as in purely geologic investigations, the orderly, consistent designations of pertinent parts of the geologic framework is essential to a clear reporting and understanding of the study results. In ground-water studies, this involves definition and correlation of water-yielding rock materials, and relating those rock materials to established rock-stratigraphic units" (p. 9).

In this study, the hydrologic and geotechnical properties of till units were emphasized although data for both local and extensive sand and gravel bodies and till units were compiled.

Till units function as aquifers or aquitards depending on local conditions that frequently are a function of the unconformities and depositional environments noted in sections II-D and III-A. The till units are heterogeneous since hydraulic conductivity values at separate sites differ significantly within a single till and since a wide range of values is present at single sites.

Similarly, Feinstein and Anderson (1987) did not use formal lithostratigraphic units but did use genetic terms to define hydrostratigraphic units in Brown County, within the area glaciated by the Green Bay Lobe in late Wisconsin time. Feinstein and Anderson divided till of single lithostratigraphic units into separate hydrostratigraphic units (clayey, loamy, or stony till; clayey or silty lacustrine; silty sand; sand, gravel, some silt) on the basis of piezometer tests of hydraulic conductivity. That approach was not possible for this study because the entire study area has not been mapped in the same detail as Brown County was by Need (1985). The lack of control over placement of piezometers also restricted application of this approach. Feinstein and Anderson combined Need's map units into hydrostratigraphic units.

I. Recommendations for sampling and testing procedures

Following Laney and Davidson's lead, I recommend that both geologic interpretation (genesis) and USCS classification be required on boring logs. The USCS can provide a common language for communication of observations if a standard reference is used, such as ASTM D2488-84 (ASTM, 1986, pp.411-424), and it provides information of interest to geotechnical engineers. The geologic interpretation is critical to inferences regarding the geometry of the materials. Use of the USCS alone to identify major soil layers and to determine the number of samples required means that two till units or a till unit and a clayey lacustrine unit could be present at one site, but only one would be sampled. Complete particle size analyses are necessary for geologic interpretation. Thorough description of samples, including notes on lithologies, structures, mottling, evidence of leaching, reaction, staining, and Munsell color would aid identification of lithostratigraphic units considerably. Continuous sampling methods and continuous cores are preferable to split spoon samples at five foot intervals because continuous samples are more likely to indicate the presence of small sand layers affecting the flow of groundwater.

The variability of field measurements of hydraulic conductivity within one till requires further investigation. Error analysis of hydraulic conductivities requires documentation of sampling, measurement, and calculation methodology. Placement of the screened interval of a piezometer should be within only one genetic unit. Piezometers screened in silty or sandy sediments and finer-grained till units probably result in values of hydraulic conductivity representative of the non-till sediments. Until thorough error analysis of hydraulic conductivity tests has been completed, short piezometer screens located in one genetic unit are preferred. A carefully designed experiment should be completed to assess the effects of different field measurement techniques.

Several methods for the calculation of hydraulic conductivity from field tests require selection of data points and regression of a best-fit least-squares line. The selection of data points introduces individual bias to test results. Muldoon (1987) and Feinstein and Anderson (1987) calculate hydraulic conductivity between each recorded measurement during a field test, then report a geometric mean for the entire test. This reduces the subjectivity of data interpretation, but the method would be more resistant to the influence of very high initial changes in head (possibly caused by the well screen's sand pack) if the median value rather than the mean is reported.

Throughout the data collection phase of this study, I was impressed with the number of borings completed at individual sites. I was also surprised by how few tests of hydraulic conductivity and complete grain size analyses are completed. Presumably, a large number of borings will provide data necessary to assess on-site stratigraphy, but the boring descriptions yield little information about hydraulic conductivity. The purpose of the geotechnical investigation is to determine the hydrogeologic setting and availability of suitable materials for landfill construction, but remarkably few hydrogeologic data results. This study indicates that there is a great deal of on-site variability, and the three values of hydraulic conductivity required by Wisconsin Administrative Code NR 180.13 for each major soil layer do not necessarily represent the range in hydraulic conductivity of a single stratum. Many of the data used in this study resulted from remedial action investigations at sites established prior to 1980. In modern waste disposal, the engineering design of sites is emphasized and relied upon to protect groundwater and surface water from contamination. These engineered sites have been in operation for a relatively short time and have provided geotechnical surprises in terms of gas build-up, leachate generation, and settlement. Incorporation of site-specific data into a more regional context can help resource managers anticipate problems at sites that otherwise seem to have nothing in common.

VI. Summary and Conclusions

A. Summary

This study was carried out in response to the long term objectives listed in the introduction. Compilation of the database used in this study addressed the first objective, to identify the hydrogeologic and geotechnical properties of Pleistocene materials in eastern Wisconsin. Hydraulic conductivity values, particle size analyses, Atterberg limits, approximations of strength, and dry unit weights have been compiled from reports on file at the Wisconsin Department of Natural Resources and assigned to one of five formations (one formation includes ten lithostratigraphic members) in eastern Wisconsin.

Association of the data with extensive lithostratigraphic units that have been associated with mapped ice margin positions partially meets the second objective--to associate the properties with mappable, extensive hydrostratigraphic units that can be identified in the field. The lithostratigraphic units are characterized with values of hydraulic conductivity, but are not divided into hydrostratigraphic units. No hydrostratigraphic units are designated because sources of data are not evenly distributed throughout the units and because an appropriate scale for the definition of hydrostratigraphic units has not been defined.

The data have been statistically analyzed to assess the variability and expected range of values within the individual till units, accomplishing the third objective. Several till units are demonstrably heterogeneous, both with respect to grain size and to hydraulic conductivity, and statistically significant differences within a single till are documented.

The fourth objective is to develop field and laboratory methodologies for the evaluation of hydrogeologic and geotechnical properties in previously untested areas. Several recommendations follow the conclusions.

B. Conclusions

This study leads to the following general conclusions.

1. The quality of geotechnical investigations has improved in response to recent modifications of Wisconsin Administrative Code. However, the three values of hydraulic conductivity required by Wisconsin Administrative Code Chapter NR 180 for each major soil layer do not necessarily represent the range in hydraulic conductivity and grain size of a single stratum at a single site. This study indicates that more testing of samples is necessary for characterization of variability.

2. Field measurements of hydraulic conductivity in one of the most variable tills, the till in the Middle Inlet Member, range from 10^{-7} to 10^{-3} cm/s while less variable tills such as the till in the Haven Member range over only two orders of magnitude.

3. Median field measurements of hydraulic conductivity are at least an order of magnitude greater than laboratory measurements in fine-

grained till units. In coarse-grained till units, median field measurements of hydraulic conductivity are half an order of magnitude greater than the median laboratory measurements.

4. Compilation of geotechnical data makes it more accessible and provides a reference database. Incorporation of site-specific data into a more regional context can help resource managers anticipate problems at sites that otherwise seem to have nothing in common.

5. Particle size analysis to .002 mm is necessary for confident determination of sediment genesis. Geologists should provide complete grain size curves in addition to textural classification so that individuals familiar with other classifications can use geologic data. Textures of till samples from specific sites deviate from the published lithostratigraphic definition, but in some cases consideration of local sediment sources and glacial processes may explain the deviation.

6. Geotechnical index tests, such as Atterberg limits, can be used as lithic criteria to characterize lithostratigraphic units, but like other criteria used by geologists, can not distinguish lithostratigraphic units in all cases.

7. Atterberg limits plotted on plasticity charts do not distinguish till units from each other. Glacial sediments plot in elongate clusters on a plasticity chart. Most till units in the study are "inactive" and "solid," but some are "normal" and "plastic."

8. No meaningful relationships were found between standard penetration test data and depth or pocket penetrometer measurements.

The pocket penetrometer correlations found by previous investigators were not corroborated in this study.

9. Dry unit weight data may be used in calculations of void ratio, porosity, and average linear velocity of advective flow. A weak linear relationship exists between median log hydraulic conductivity measured in the field and median dry unit weight for till units.

10. Values of plastic limit may be used to constrain the predicted range in values of hydraulic conductivity measured in the field for till units.

11. Incorporation of more refined genetic terms into a geotechnical and hydrogeologic data base like the one used in this project could provide data for facies models and perhaps improve prediction of hydrogeologic conditions at sites prior to investigation.

C. Recommendations

1. All new data submitted to DNR for report approval should be compiled in a summary form similar to the database used for this study.

2. Data in geotechnical reports would be more easily accessed if boring locations were reported using a global coordinate system that follows simple, consistent rules of orientation. If only 3 points at each site had global coordinates, the remainder could be easily digitized.

3. More than one classification system (USCS, geologic, and possibly

others) should be used to describe samples with standard terminology from a reference cited in Wisconsin Administrative Code.

4. Shorter piezometer screens should be installed to improve point measurements of hydraulic head and to avoid potential movement of contaminants between units. Piezometers should be screened in only one genetic unit.

5. Standard references for determining the hydraulic conductivity of undisturbed fine-grained samples in the laboratory should be developed if such tests continue to be used. Laboratory values of hydraulic conductivity are of questionable value to hydrogeologic assessments of *in-situ* conditions.

6. No improvement in the precision of hydraulic conductivity testing should be expected until the experimental error and variation in field tests has been analyzed. Without such an analysis, the variation in hydraulic conductivity values is usually attributed to variation in the materials tested. To test this assumption, a carefully designed experiment should be completed in which data are recorded from field tests that use different methods of lowering and raising the water level in correctly placed and constructed piezometers and different methods of recording the data (continuous strip recorders vs. taped measurements). If one aspect of the experiment is changed while holding all others constant, values of hydraulic conductivity could be statistically analyzed using two-way analysis of variance. The method of calculating hydraulic conductivity from field test data should be

standardized, and a variation of the method reported by Muldoon (1987) could be used.

7. A more refined definition of hydrogeologic units requires complete definition of the lithostratigraphy, particularly in the central portion of the Green Bay lowland (from Green Bay to south of Lake Winnebago). Units of extensive lake sediments and outwash should be mapped in the areas glaciated by the Green Bay and Lake Michigan lobes.

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Appendix 1 Data required by Wisconsin Administrative Code

NR 51.10 (1)(c) states that

"A report shall accompany the plans indicating: . . . (3) Geological formations and ground water elevations to a depth of at least 10 feet below proposed excavation and lowest elevation of the site. Such data shall be obtained by soil borings or other appropriate means."

The same phrasing was used in NR 151.10(1)(c); apparently, only the numbering was changed.

NR 151.12(5) (1976) indicates growing concern in the Department of Natural Resources and reflects the influence of federal and state statutory laws. The requirements for geotechnical information are more specific:

NR 151.12(5)(c): "An acceptable report on geological formations based on soil borings. The minimum number of borings to be taken is based on site size according to the following schedule:

1. 3 borings for a site of up to 5 acres in size.
2. 1 boring for each additional 5 acres or portion thereof up to 50 acres.
3. 1 boring for each additional 10 acres or portion thereof over 50 acres.

Borings shall be arranged as nearly as possible to form a grid pattern over the site, to provide a subsurface investigation representing the entire site, and to facilitate analysis. When information is insufficient to adequately evaluate the site, additional deeper borings may be required. All borings shall extend to a depth of at least 15 feet below the lowest proposed elevation of waste disposal in the areas of the borings. Boring holes shall be refilled with a bentonite-earth slurry prior to disposal of solid waste." (Register, June 1976, No. 246, Environmental Protection, p. 118-2)

Both NR 51 and NR 151 required only one phase of investigation prior to site development. As the expense of more detailed investigations became a factor, the code changed to require two phases of investigation--initial site reports (ISRs) and feasibility reports, completed at different levels of detail--prior to approval and prior to further investment in the proposed site.

NR 180 (1980) requires that submitted ISRs and feasibility reports be prepared in the following manner: under the direction of a registered professional engineer, using standard procedures approved by the department, in a standard format, using a site-specific grid and containing appendices listing all references, all necessary data, procedures, and calculations (Register, February, 1980, No. 290, Environmental Protection, pp.686-9 to 10). Both initial site and feasibility reports must contain regional geotechnical information including topography, hydrology, geology, hydrogeology, and water quality (Register, March, 1984, No. 339, Environmental Protection, p. 686-34). The code clearly states the minimum field and lab investigations required for a feasibility report:

NR 180.13(6)3a.: "Sufficient soil borings to adequately define the soil, bedrock, and groundwater conditions at the site. Under most site conditions, 5 soil borings for the first 5 acres and 3 borings for each additional 5 acres or portion thereof should be performed. A lesser number of borings may be made based on specific site conditions and site design. The borings shall be located in a grid pattern such that there is a minimum of one boring in each major geomorphic feature (e.g. ridges, lowlands and drainage swales). All borings shall extend a minimum of 25 feet below the anticipated site base grade or to bedrock, whichever is less."

NR 180.13(6)3b.: "Where soil conditions permit, soil samples shall be collected utilizing standard undisturbed soil sampling techniques. Samples shall not be composited for testing purposes. Soil samples shall be collected from each major soil layer encountered and at maximum 5-foot intervals. All soil samples shall be described."

NR180.13(6)3c.: "Boring logs shall be recorded for all borings. Each log shall include soil and rock descriptions and method of sampling, sample depth, date of boring, water level measurements and dates, and soil test data. All elevations shall be corrected to USGS datum."

NR180.13(6)3d.: "For each major soil layer encountered, at least 3 soil samples shall be analyzed for grain size distribution (mechanical and/or hydrometer as appropriate to the soil type) and classified according to the unified soil classification system."

NR180.13(6)3e.: "A minimum of 3 permeability tests shall be conducted for each major soil layer. At least one of the 3 tests shall be performed utilizing in-field testing procedures."

NR180.13(6)4a.: "All raw data such as boring logs, well logs, soil tests and water level measurements shall be included in the report appendix."
(Register, February, 1980, No. 290, Environmental Protection, pp. 686-36 to 686-37)

In addition to the data collection outlined above, the BSWM requires an investigation to document the availability of a suitable fine-grained material for use as a recompacted liner if no fine-grained sediment is available on-site. These "clay liner investigations" typically include boring logs of the same quality as required for feasibility reports and complete grain size analyses.

Appendix 2 Location summary by site: latitude and longitude

Site #	minimum latitude	maximum latitude	minimum longitude	maximum longitude	default latitude	default longitude
1	443021	443029	875010	875045	443099	875099
2	443041	443103	880913	880940	443099	880999
3	442409	442439	880019	880059	442499	880099
4	443142	443153	875949	880016		
5	440609	460619	881128	881137		
6	430434	430445	891142	891156		
7	430105	430131	892007	892055		
8	431854	432333	885133	890145	432399	885299
9	432729	432808	883304	883335		
10	445145	445150	872638	872709		
11	452305	452310	835608	865304	452399	865399
12	434917	434932	883138	883201		
13	435728	435744	885426	885452	435799	885499
14	423506	423550	880213	880247		
15	442822	442835	873440	873515		
16	441004	441046	874937	875012	441099	874999
17	451411	451429	880532	880542	451499	880599
18	not assigned					
19	434703	434716	892841	892858		
20	425007	425031	875017	875052	425099	875099
21	425037	425112	880329	880410	425199	880499
22	445142	445154	880923	880940		
23	443921	445026	880602	881027		
24	441717	441755	882003	882107	441799	882199
25	432141	432151	875427	875429		
26	432539	432600	875104	875121		
27	432647	432702	875138	875156		
28	424218	424240	875120	875154		
29	432041	432247	894250	894557	432199	894499
30	444608	444821	883330	883345	444699	883399
30	(Clay source)				444899	883699
31	434136	434157	874703	874725		
32	424529	424610	882440	882511	424699	882599
33	413918	423910	884305	884329	423999	884399
34	431744	431756	881128	881158		
35	431115	431157	880315	880453	431199	880499
36	431747	431755	881037	881041		
37	430245	450258	880847	880911		
38	442621	442630	885822	885837		
39	442017	442034	885655	885706		
40	440500	440523	883215	883327	440599	883399
41	470330	470354	883327	883407	470399	883499

41-49 not assigned. Bill Simpkins provided data for sites 50-55.

50	425145	425216	875041	875106
51	425206	425215	875245	875258
52	425503	425524	875152	875201
53	425115	425131	880246	880452
54	425005	425029	875019	875050
55	425324	425356	881029	881109

Appendix 2 Location summary by site: topographic quadrangle, section, township, & range

County	Site	Site name	7.5' map name	Sec., Township, & Range
Brown	1	Baeton	New Franken	Sec. 33, T24N, R22E
Brown	2	Decaster	Oneida North	Sec. 25 & 26, T24N, R19E
Brown	3	Decleene	DePere	Sec. 1 & 6, T23N, R20&21E
Brown	4	Northland Sludge	Green Bay E. and W.	T24N, R21E
Calumet	5	Calumet Co. LF	Chilton	Sec. 23, T19N, R19E
Dane	6	Hydrite Chemical Corp.	Cottage Grove	Sec. 16, T7N, R10E
Dane	7	Libby Road	Madison East	Sec. 32, T7N, R10E
Dodge	8	Carl Schmitt	Lost Lake	Sec. 30, T11N, R14E
Dodge	9	Hechimovich & clay source	Mayville South	Sec. 35, T12N, R16E
Door	10	Door Co. Balefill	Sturgeon Bay West	Sec. 34, T28N, R25E
Door	11	Town of Washington	Washington Island NW	Sec. 32, T34N, R30E
Fond du Lac	12	Eldorado	Eldorado	Sec. 25, T16N, R16E
Green Lake	13	Green Lake Co. LF	Berlin	Sec. 11, T17N, R13E
Kenosha	14	Pheasant Run	Paddock Lake	Sec. 32, T2N, R21E
Kewaunee	15	Kewaunee Co. LF	Kewaunee	Sec. 9, T23N, R24E
Manitowoc	16	Lemberger	Whitelaw	Sec. 26, T20N, R22E
Manitowoc	16	Proposed Co. LF	Whitelaw	Sec. 26, T20N, R22E
Manitowoc	16	Ridgeview	Whitelaw	Sec. 26, T20N, R22E
Marinette	17	Proposed Co. LF	Crivitz	Sec. 23, T32N, R19E
	18	not assigned		
Marquette	19	Marquette Co. LF	Packwaukee	Sec. 8, T15N, R9E
Racine	20	Caledonia (WEPCO)	Racine North	Sec. 1, T4N, R22E
Milwaukee	21	Metro	North Cape	Sec. 31, T5N, R21E
Oconto	22	City of Oconto Falls	Oconto Falls South	Sec. 35, T28N, R19E
Brown	23a	Oconto Co. LF	Pulaski	Sec. 11, T25N, R19E
Oconto	23b	Oconto Co. LF	Abrams	Sec. 5, T27N, R20E
Oconto	23c	Oconto Co. LF	Pulaski	Sec. 35, T26N, R19E
Outagamie	24	Outagamie Co. LF	Kaukauna	Sec. 7, T21N, R18E
Ozaukee	25	Anderson ISR	Cedarburg	Sec. 5, T10N, R22E
Ozaukee	26	Didier ISR	Port Washington East	Sec. 10, T11N, R22E
Ozaukee	27	WEPCO ISR	Port Washington East	Sec. 4, T11N, R22E
Racine	28	Land Reclamation	Racine South	Sec. 23, T3N, R22E
Sauk	29	Badger Army Amm. Plant	Baraboo	Sec. 6, T10N, R7E
Sauk	29	Badger Army Amm. Plant	Sauk Prairie	Sec. 14, T10N, R6E
Sauk	29	Badger Army Amm. Plant	Sauk City	Sec. 1 & 14, T10N, R6E
Shawano	30	Shawano Co. LF	Shawano	Sec. 19 & 33, T27N, R16E
Sheboygan	31	Sheboygan Co. LF	Sheboygan Falls	Sec. 7, T14N, R23E
Walworth	32	East Troy	East Troy	Sec. 31, T4N, R18E
Walworth	33	Greidanus	Delavan	Sec. 4 & 9, T2N, R15E
Washington	34	Mertens ISR	Jackson	Sec. 25, T10N, R19E
Washington	35	Omega Hills	Menominee Falls	Sec. 36, T9N, R20E
Waukesha	35	Omega Hills	Menominee Falls	Sec. 1, T8N, R20E
Washington	36	Schowalter ISR	Jackson	Sec. 30, T10N, R20E
Waukesha	37	Brookfield	Waukesha	Sec. 20, T7N, R20E
Waupaca	38	Kempf	Manawa	Sec. 30, T23N, R13E
Waupaca	39	Town of Royalton	Weyawauga	Sec. 32, T22N, R13E

Winnebago	40 Bartlett	Oshkosh	Sec. 26, T19N, R16E
Winnebago	41 Winnebago Co. LF	Oshkosh	Sec 2 & 3, T18N, R16E
Milwaukee	50 Bender Park	Racine North	Sec. 25, T5N, R22E
Milwaukee	51 Derosso ISR	Franksville	Sec. 27, T5N, R22E
Milwaukee	52 Falk LF	S. Milwaukee	Sec. 2, T5N, R22E
Waukesha	53 Future Parkland	North Cape	Sec. 36, T5N, R20E
Milwaukee	54 WEPCO2	Racine North	Sec. 1, T4N, R22E
Milwaukee	55 Muskego	Muskego	Sec. 18, T5N, R20E

Bill Simpkins collected data for sites 50-55.
ISR stands for initial site report.
LF stands for landfill.

APPENDIX 3 DATA REFERENCES AND DATA

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Foth and Van Dyke and Associates, Inc. (1983). Feasibility study, Job FU 8301. Twin City Testing logs.

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Soil Testing Services of Wisconsin, Inc. Data from Jobs 7801A (1977) through 7801K (1982).

Appendix 3 - HYDROGEOLOGIC AND ENGINEERING DATA FOR BROWN COUNTY - BAETON SITE

IDENTITY County (code)	Year	Litho-strat. unit (code)	Mat. (code)	Site No.	Lat.	Long.	Brng. no.	Surf. Elev. (ft)	Sample top (ft)	Sample bottom (ft)	HYDRAULIC CONDUCTIVITY Lab K (cm/s)	Meth code	Fld K (cm/s)	Meth code	GRAINSIZE PERCENTAGES Bulk % >2.0mm	Matrix % sand (2.0 to 0.0625mm)	Matrix % silt (0.0625 to 0.002mm)	Matrix % clay (<0.002mm)	ENGINEERING PROPERTIES Unified Soil Class.	Bulk Percent P200	Dry Unit Wt. (pcf)	SPT (N)	Moist. cont. (%)	Liquid limit	Plastic. index	UC (tsf)
BN	1980	KEGI	3	1	443048	875045	B1	791.4	5.0	6.5									CL			35				2.5
BN	1980	KEGI	3	1	443048	875045	B1	791.4	10.0	11.0									CL			400				4.5
BN	1980	KEGI	3	1	443048	875045	B1	791.4	15.0	15.5									CL							4.5
BN	1980	KEGI	3	1	443048	875045	B1	791.4	20.0	21.5					0	19	45	36	CL	83		36				1.0
BN	1980	KEGI	3	1	443048	875045	B1	791.4	25.0	26.5									CL			30				2.0
BN	1980	KEGI	3	1	443048	875045	B1	791.4	30.0	31.5									CL			18				1.0
BN	1980	UN	4	1	443048	875045	B1	791.4	35.0	36.5									SM-GM			75				
BN	1980	UN	4	1	443048	875045	B1	791.4	40.0	40.5									SM-GM			400				
BN	1980	KEGI	3	1	443048	875010	B2	798.3	5.0	6.5									CL			35				3.0
BN	1980	KEGI	3	1	443048	875010	B2	798.3	10.0	10.5									CL			600				4.5
BN	1980	KEGI	3	1	443048	875010	B2	798.3	15.0	16.0					0	14	42	44	CL	88		200				4.5
BN	1980	KEGI	3	1	443048	875010	B2	798.3	20.0	21.5									CL			35				1.5
BN	1980	KEGI	3	1	443048	875010	B2	798.3	25.0	26.5									CL			25				1.0
BN	1980	KEGI	3	1	443048	875010	B2	798.3	30.0	31.5									CL			30				1.5
BN	1980	KEGI	3	1	443048	875010	B2	798.3	35.0	36.5									CL			25				1.4
BN	1980	UN	4	1	443048	875010	B2	798.3	40.0	40.5									SM-GM			200				
BN	1980	KEGI	3	1	443034	875028	B3	794.4	5.0	6.5									CL-GC			22				3.5
BN	1980	KEGI	3	1	443034	875028	B3	794.4	10.0	12.0									CL							4.5
BN	1980	UN	3	1	443034	875028	B3	794.4	15.0	15.5									ML-SM-GM							
BN	1980	UN	3	1	443034	875028	B3	794.4	20.0	21.5					39				ML-SM-GM	41		100				
BN	1980	UN	3	1	443034	875028	B3	794.4	25.0	25.5									ML-SM-GM			300				
BN	1980	UN	3	1	443034	875028	B3	794.4	30.0	35.5									SC-GC			63				
BN	1980	UN	3	1	443034	875028	B3	794.4	35.0	35.5									SC-GC			200				
BN	1980	UN	3	1	443034	875028	B3	794.4	40.0	40.5									ML-SM-GM			200				
BN	1980	KEGI	3	1	443022	875045	B4	788.8	5.0	6.5									CL			60				4.0
BN	1980	KEGI	3	1	443022	875045	B4	788.8	10.0	11.5									CL			38				3.5
BN	1980	KEGI	3	1	443022	875045	B4	788.8	15.0	16.5									CL			25				3.0
BN	1980	UN	3	1	443022	875045	B4	788.8	20.0	21.5									ML,SM,GM			192				
BN	1980	UN	3	1	443022	875045	B4	788.8	25.0	25.5									ML,SM,GM			200				
BN	1980	UN	3	1	443022	875045	B4	788.8	30.0	30.5					27				ML,SM,GM	42		280				
BN	1980	UN	3	1	443022	875045	B4	788.8	35.0	35.5									ML,SM,GM			250				
BN	1980	KEGI	3	1	443022	875015	B5	800.9	2.0	4.0									CL							4.5
BN	1980	KEGI	3	1	443022	875015	B5	800.9	4.0	6.0									CL							4.5
BN	1980	KEGI	3	1	443022	875015	B5	800.9	6.0	8.0									CL							4.5
BN	1980	KEGI	3	1	443022	875015	B5	800.9	8.0	8.5									CL							4.5
BN	1980	KEGI	3	1	443022	875015	B5	800.9	8.5	10.0	2.28E-08	1			0	28	47	25	CL	74						
BN	1980	KEGI	3	1	443022	875015	B5	800.9	10.0	11.5									CL							4.3
BN	1980	KEGI	3	1	443022	875015	B5	800.9	15.0	16.5									CL			32				
BN	1980	KEGI	3	1	443022	875015	B5	800.9	20.0	21.5									CL			28				1.7
BN	1980	KEGI	3	1	443022	875015	B5	800.9	25.0	27.0	1.39E-08	1			0	14	42	44	CL	88						1.7
BN	1980	KEGI	3	1	443022	875015	B5	800.9	30.0	32.0									CL-GC							0.8
BN	1980	UN	3	1	443022	875015	B5	800.9	35.0	37.0									SM,GM							
BN	1980	UN	3	1	443022	875015	B5	800.9	40.0	41.5									SM,GM			100				
BN	1982	KEGI	3	1	443047	875042	B1A	792.3	0.5	5.0									CL							
BN	1982	KEGI	3	1	443047	875042	B1A	792.3	5.0	7.0									CL				15.0			
BN	1982	KEGI	3	1	443047	875042	B1A	792.3	10.0	12.0									CL							

Appendix 3 - HYDROSEOLOGIC AND ENGINEERING DATA FOR BROWN COUNTY - BAETON SITE

IDENTITY County (code)	Year	Litho-strat. unit (code)	Mat. (code)	Site No.	Lat.	Long.	Brno. no.	Surf. Elev. (ft)	Sample top (ft)	Sample bottom (ft)	HYDRAULIC CONDUCTIVITY Lab K (cm/s)	Meth code	Fld K (cm/s)	Meth code	GRAINSIZE PERCENTAGES Bulk % >2.0mm	Matrix % sand (2.0 to 0.0625mm)	Matrix % silt (0.0625 to 0.002mm)	Matrix % clay (<0.002mm)	ENGINEERING PROPERTIES Unified Soil Class.	Bulk Percent P200	Dry Unit Wt. (pcf)	SPT (N)	Moist. cont. (%)	Liquid limit	Plastic index	UC (tsf)
BN	1982	KEG1	3	1	443047	875042	B1A	792.3	12.0	14.0									CL				23.0			
BN	1982	KEG1	3	1	443047	875042	B1A	792.3	15.0	17.0									CL				24.0			1.5
BN	1982	KEG1	3	1	443047	875042	B1A	792.3	20.0	22.0									CL				25.0			1.5
BN	1982	KEG1	3	1	443047	875042	B1A	792.3	25.0	26.0									CL				22.0			
BN	1982	UN	4	1	443047	875042	B1A	792.3	26.0	27.0									SP-SM				17.0			
BN	1982	UN	5	1	443047	875042	B1A	792.3	30.0	31.5									ML			16				
BN	1982	UN	3	1	443047	875042	B1A	792.3	35.0	36.5									SM			53				
BN	1982	UN	3	1	443047	875042	B1A	792.3	40.0	41.0									SM							
BN	1982	KEUN	399	1	443039	875042	B2A	789.7	5.0	20.0			1.06E-05	8					CL,SM							
BN	1982	KEG1	3	1	443039	875042	B2A	789.7	1.2	5.0									CL							
BN	1982	KEG1	3	1	443039	875042	B2A	789.7	5.0	7.0									CL				16.0			
BN	1982	KEG1	3	1	443039	875042	B2A	789.7	10.0	12.0									CL				15.0			
BN	1982	KEG1	3	1	443039	875042	B2A	789.7	15.0	17.0									CL				26.0			
BN	1982	UN	3	1	443039	875042	B2A	789.7	20.0	21.5									SM							
BN	1982	UN	3	1	443039	875042	B2A	789.7	25.0	26.5									SM			51				
BN	1982	UN	3	1	443039	875042	B2A	789.7	30.0	31.5									SM			58				
BN	1982	UN	3	1	443039	875042	B2A	789.7	35.0	35.6									SM			42				
BN	1982	UN	3	1	443039	875042	B2A	789.7	40.0	40.3									SM			100				
BN	1982	UN	3	1	443039	875042	B2A	789.7	35.0	40.0			1.35E-06	8					SM							
BN	1982	KEG1	3	1	443032	875042	B3A	790.3	0.0	1.0									CL							
BN	1982	KEG1	3	1	443032	875042	B3A	790.3	5.0	7.0									CL				13.0			4.5
BN	1982	KEG1	3	1	443032	875042	B3A	790.3	10.0	12.0									CL				13.0			4.5
BN	1982	KEG1	3	1	443032	875042	B3A	790.3	15.0	17.0									CL				22.0			3.2
BN	1982	KEG1	3	1	443032	875042	B3A	790.3	20.0	22.0									CL							2.5
BN	1982	UN	99	1	443032	875042	B3A	790.3	25.0	26.5									SM,ML			43				
BN	1982	UN	99	1	443032	875042	B3A	790.3	30.0	31.5									SM,ML			42				
BN	1982	UN	3	1	443032	875042	B3A	790.3	35.0	36.5									SM			61				
BN	1982	UN	12	1	443032	875042	B3A	790.3	40.0										rock			100				
BN	1982	KEG1	3	1	443028	875042	B4	781.0	1.0	5.0									CL							
BN	1982	KEG1	3	1	443028	875042	B4	781.0	5.0	7.0									CL				16.0			
BN	1982	KEG1	3	1	443028	875042	B4	781.0	10.0	12.0									CL				16.0			
BN	1982	KEG1	3	1	443028	875042	B4	781.0	15.0	17.0									CL							
BN	1982	KEG1	3	1	443028	875042	B4	781.0	20.0	22.0									CL				26.0			
BN	1982	KEG1	3	1	443028	875042	B4	781.0	25.0	27.0									CL,ML				24.0			
BN	1982	UN	5	1	443028	875042	B4	781.0	30.0	32.0									CL				24.0			
BN	1982	UN	5	1	443028	875042	B4	781.0	35.0	37.0									CL,CH,ML			100				
BN	1982	KEUN	3	1	443023	875042	B5	788.5	14.9	19.9			1.52E-06	8					CL,SM							
BN	1982	KEG1	3	1	443023	875042	B5A	789.5	1.0	5.0									CL							
BN	1982	KEG1	3	1	443023	875042	B5A	788.5	5.0	7.0									CL				15.0			
BN	1982	KEG1	3	1	443023	875042	B5A	788.5	10.0	12.0									CL				17.0			
BN	1982	KEG1	3	1	443023	875042	B5A	788.5	15.0	17.0									CL				23.0			
BN	1982	UN	3	1	443023	875042	B5A	788.5	20.0	21.0									SM			100				
BN	1982	UN	3	1	443023	875042	B5A	788.5	25.0	25.8									SM			165				
BN	1982	UN	3	1	443023	875042	B5A	788.5	30.0	30.8									SM			225				
BN	1982	UN	3	1	443023	875042	B5A	788.5	35.0	35.8									SM			280				
BN	1982	UN	12	1	443023	875042	B5A	788.5	38.5	40.0									ROCK							

Appendix 3 - HYDROGEOLOGIC AND ENGINEERING DATA FOR BROWN COUNTY - BAETGN SITE

IDENTITY County (code)	Year	Litho-strat. unit (code)	Nat. (code)	Site No.	Lat.	Long.	Brng. no.	Surf. Elev. (ft)	Sample top (ft)	Sample bottom (ft)	HYDRAULIC CONDUCTIVITY Lab K (cm/s)	Meth code	Fld K (cm/s)	Meth code	GRAINSIZE PERCENTAGES Bulk % >2.0mm	Matrix % sand (2.0 to 0.0625mm)	Matrix % silt (0.0625 to 0.002mm)	Matrix % clay (<0.002mm)	ENGINEERING PROPERTIES Unified Soil Class.	Bulk Percent P200	Dry Unit Wt. (pcf)	SPT (N)	Moist. cont.(%)	Liquid limit	Plastic. index	UC (tsf)
BN	1982	KEGI	3	i	443045	875035	B6	793.0	0.5	5.0									CL							
BN	1982	KEGI	3	i	443045	875035	B6	793.0	5.0	6.0									CL				11.0			
BN	1982	KEGI	3	i	443045	875035	B6	793.0	10.0	11.5									CL			48				
BN	1982	UN	3	i	443045	875035	B6	793.0	15.0	16.0	1.80E-08	1			24	54	46	0	SM	35						
BN	1982	UN	3	i	443045	875035	B6	793.0	20.0	21.0									SM			65				
BN	1982	UN	3	i	443045	875035	B6	793.0	25.0	26.0									SM			59				
BN	1982	UN	3	i	443045	875035	B6	793.0	30.0	30.5									SM							
BN	1982	UN	3	i	443045	875035	B6	793.0	35.0	36.0									SM							
BN	1982	UN	3	i	443045	875035	B6	793.0	40.0	40.5									SM							
BN	1982	KEGI	3	i	443039	875035	B7	790.0	1.0	5.0									CL							
BN	1982	KEGI	3	i	443039	875035	B7	790.0	5.0	6.5									CL				13.0			
BN	1982	KEGI	3	i	443039	875035	B7	790.0	10.0	11.5					2	19	44	37	CL	79			16.0			
BN	1982	KEGI	3	i	443039	875035	B7	790.0	15.0	16.0					9	35	48	16	CL	60			17.0			
BN	1982	UN	3	i	443039	875035	B7	790.0	20.0	21.5									SM			61				
BN	1982	UN	3	i	443039	875035	B7	790.0	25.0	25.5					11	49	43	8	SM	45						
BN	1982	UN	3	i	443039	875035	B7	790.0	30.0	31.5									SM			140				
BN	1982	UN	3	i	443039	875035	B7	790.0	35.0	35.5									SM							
BN	1982	UN	3	i	443039	875035	B7	790.0	40.0	40.5									SM			216				
BN	1982	KEGI	3	i	443030	875035	B8	794.8	1.0	5.0									CL							
BN	1982	KEGI	3	i	443030	875035	B8	794.8	5.0	6.5									CL				15.0			
BN	1982	KEGI	3	i	443030	875035	B8	794.8	10.0	11.5									CL				16.0			
BN	1982	KEGI	3	i	443030	875035	B8	794.8	15.0	15.5									CL							
BN	1982	KEGI	3	i	443030	875035	B8	794.8	20.0	21.5									CL				21.0			
BN	1982	KEGI	3	i	443030	875035	B8	794.8	25.0	26.5									CL				26.0			
BN	1982	UN	3	i	443030	875035	B8	794.8	30.0	31.5									SM			43				
BN	1982	UN	3	i	443030	875035	B8	794.8	35.0	36.5									SM			64				
BN	1982	UN	3	i	443030	875035	B8	794.8	40.0	41.5									SM			90				
BN	1982	KEGI	3	i	443025	875035	B9	788.5	5.0	7.0									CL				15.0			
BN	1982	KEGI	3	i	443025	875035	B9	788.5	10.0	12.0									CL							
BN	1982	KEGI	3	i	443025	875035	B9	788.5	15.0	17.0									CL				17.0			
BN	1982	KEGI	3	i	443025	875035	B9	788.5	20.0	22.0									CL				26.0			
BN	1982	UN	513	i	443025	875035	B9	788.5	25.0	26.0									ML				20.0			
BN	1982	UN	5	i	443025	875035	B9	788.5	26.0	27.0									SM				15.0			
BN	1982	UN	3	i	443025	875035	B9	788.5	30.0	31.5									SM			51				
BN	1982	UN	3	i	443025	875035	B9	788.5	35.0	35.5									SM							
BN	1982	KEGI	3	i	443099	875099	B10		1.0	5.5									CL							
BN	1982	UN	99	i	443099	875099	B10		5.5	7.5									SM,ML				16.0			
BN	1982	UN	3	i	443099	875099	B10		10.0	11.5									SM			55				
BN	1982	UN	3	i	443099	875099	B10		15.0	16.5									SM			60				
BN	1982	UN	3	i	443099	875099	B10		20.0	20.7									SM			600				
BN	1982	UN	3	i	443099	875099	B10		25.0	26.0									SM			150				
BN	1982	UN	3	i	443099	875099	B10		30.0	30.6									SM			396				
BN	1982	KEUN	35	i	443047	875028	B11	798.5	5.3	20.3			4.01E-06	8					CL,SM							
BN	1982	KEGI	3	i	443047	875028	B11A	798.5	1.0	5.0									CL							
BN	1982	KEGI	3	i	443047	875028	B11A	798.5	5.0	5.5									CL				15.0			
BN	1982	KEGI	3	i	443047	875028	B11A	798.5	10.0	11.5									CL							

Appendix 3 - HYDROGEOLOGIC AND ENGINEERING DATA FOR BROWN COUNTY - BAETON SITE

IDENTITY County (code)	Year	Litho-strat. unit (code)	Mat. (code)	Site No.	Lat.	Long.	Brng. no.	Surf. Elev. (ft)	Sample top (ft)	Sample bottom (ft)	HYDRAULIC CONDUCTIVITY Lab K (cm/s)	Meth code	Fld K (cm/s)	Meth code	GRAINSIZE PERCENTAGES Bulk % >2.0mm	Matrix % sand (2.0 to 0.0625mm)	Matrix % silt (0.0625 to 0.002mm)	Matrix % clay (<0.002mm)	ENGINEERING PROPERTIES Unified Soil Class.	Bulk Percent P200	Dry Unit Wt. (pcf)	SPT (N)	Moist. cont.(%)	Liquid limit	Plastic. index	UC (tsf)
BN	1982	KEG1	3	1	443047	875028	B11A	798.5	15.0	17.0									CL				21.0			
BN	1982	UN	3	1	443047	875028	B11A	798.5	19.5	21.5									SM			31				
BN	1982	UN	3	1	443047	875028	B11A	798.5	25.0	26.2									SM							
BN	1982	UN	3	1	443047	875028	B11A	798.5	30.0	31.0									SM							
BN	1982	UN	3	1	443047	875028	B11A	798.5	35.0	35.2									SM							
BN	1982	UN	3	1	443047	875028	B11A	798.5	34.7	39.7			5.12E-06	8					SM							
BN	1982	KEG1	3	1	443041	875028	B12	794.0	1.0	5.0									CL							
BN	1982	KEG1	3	1	443041	875028	B12	794.0	5.0	6.5									CL			31				
BN	1982	KEG1	3	1	443041	875028	B12	794.0	10.0	11.5									CL			52				
BN	1982	KEG1	3	1	443041	875028	B12	794.0	15.0	17.0									CL				26.0			
BN	1982	UN	3	1	443041	875028	B12	794.0	20.0	21.5	1.50E-05	1			23	56	44		SM	34						
BN	1982	UN	3	1	443041	875028	B12	794.0	25.0	26.5									SM			34				
BN	1982	UN	3	1	443041	875028	B12	794.0	30.0	31.5									SM			77				
BN	1982	UN	3	1	443041	875028	B12	794.0	35.0	36.5									SM			82				
BN	1982	KEG1	3	1	443036	875028	B13	792.0	1.0	5.0									CL							
BN	1982	KEG1	3	1	443036	875028	B13	792.0	5.0	7.0									CL				25.0			
BN	1982	KEG1	3	1	443036	875028	B13	792.0	10.0	12.0									CL				17.0			
BN	1982	KEG1	3	1	443036	875028	B13	792.0	15.0	17.0									CL				24.0			
BN	1982	KEG1	3	1	443036	875028	B13	792.0	20.0	22.0									CL				25.0			
BN	1982	UN	3	1	443036	875028	B13	792.0	25.0	26.5									SM			55				
BN	1982	UN	3	1	443036	875028	B13	792.0	30.0	31.0									SM							
BN	1982	UN	3	1	443036	875028	B13	792.0	35.0	35.6									SM							
BN	1982	UN	3	1	443031	875028	B14	794.0	1.0	2.5									ML			35				
BN	1982	KEG1	3	1	443031	875028	B14	794.0	5.0	6.5									CL,SM			53				
BN	1982	KEG1	3	1	443031	875028	B14	794.0	10.0	11.5					11	36	45	19	CL	57		64				
BN	1982	UN	3	1	443031	875028	B14	794.0	15.0	16.0									SM			139				
BN	1982	UN	3	1	443031	875028	B14	794.0	20.0	21.0									SM			180				
BN	1982	UN	3	1	443031	875028	B14	794.0	25.0	26.0					14	52	40	8	SM	41						
BN	1982	UN	3	1	443031	875028	B14	794.0	30.0	30.6									SM							
BN	1982	UN	3	1	443031	875028	B14	794.0	35.0	36.0									SM							
BN	1982	UN	99	1	443026	875028	B15	792.0	1.2	5.0									ML							
BN	1982	KEG1	3	1	443026	875028	B15	792.0	5.0	7.0									CL				13.0			4.5
BN	1982	KEG1	3	1	443026	875028	B15	792.0	10.0	11.5									CL				17.0			4.5
BN	1982	UN	3	1	443026	875028	B15	792.0	15.0	16.0									SM			90				
BN	1982	UN	3	1	443026	875028	B15	792.0	20.0	21.5									SM			87				
BN	1982	UN	3	1	443026	875028	B15	792.0	25.0	26.0									SM			144				
BN	1982	UN	3	1	443026	875028	B15	792.0	30.0	30.2									SM			260				
BN	1982	UN	3	1	443026	875028	B15	792.0	35.0	35.5									SM			300				
BN	1982	KEG1	3	1	443021	875028	B16A	792.8	1.0	5.0									CL							
BN	1982	KEG1	3	1	443021	875028	B16A	792.8	5.0	7.0									CL				13.0			4.5
BN	1982	KEG1	3	1	443021	875028	B16A	792.8	10.0	12.0									CL				14.0			4.5
BN	1982	KEG1	3	1	443021	875028	B16A	792.8	15.0	17.0									CL				24.0			2.0
BN	1982	KEG1	3	1	443021	875028	B16A	792.8	20.0	22.0									CL							
BN	1982	KEG1	3	1	443021	875028	B16A	792.8	25.0	27.0									CL				26.0			1.5
BN	1982	KEG1	3	1	443021	875028	B16A	792.8	30.0	32.0									CL							
BN	1982	UN	3	1	443021	875028	B16A	792.8	35.0	36.0									SM			100				

Appendix 3 - HYDROGEOLOGIC AND ENGINEERING DATA FOR BROWN COUNTY - BAETON SITE

+ IDENTITY County (code)	Year	Litho-strat. unit (code)	Mat. (code)	Site No.	Lat.	Long.	Brng. no.	Surf. Elev. (ft)	Sample top (ft)	Sample bottom (ft)	+ HYDRAULIC CONDUCTIVITY Lab K (cm/s)	Meth code	Fld K (cm/s)	Meth code	+ GRAINSIZE PERCENTAGES Bulk % >2.0mm	Matrix % sand (2.0 to 0.0625mm)	Matrix % silt (0.0625 to 0.002mm)	Matrix % clay (<0.002mm)	+ ENGINEERING PROPERTIES Unified Soil Class.	Bulk Percent P200	Dry Unit Wt. (pcf)	SPT (N)	Moist. cont.(%)	Liquid limit	Plastic. index	UC (tsf)
BN	1982	KEGI	3	i	443045	875021	B17	798.0	1.0	5.0									CL							
BN	1982	KEGI	3	i	443045	875021	B17	798.0	5.0	7.0									CL				15.0			
BN	1982	KEGI	3	i	443045	875021	B17	798.0	10.0	12.0									CL							
BN	1982	KEGI	3	i	443045	875021	B17	798.0	12.0	14.0									CL				16.0			
BN	1982	KEGI	3	i	443045	875021	B17	798.0	15.0	17.0	5.10E-09	i			5	22	40	38	CL	74				37	22	
BN	1982	KEGI	3	i	443045	875021	B17	798.0	20.0	22.0	2.30E-08	i			2	21	43	36	CL	77				37	18	
BN	1982	KEGI	3	i	443045	875021	B17	798.0	25.0	26.0									CL				15.0			
BN	1982	UN	13	i	443045	875021	B17	798.0	26.0	27.0									SM							
BN	1982	UN	3	i	443045	875021	B17	798.0	30.0	31.0									SM							
BN	1982	UN	3	i	443045	875021	B17	798.0	35.0	36.0									SM							
BN	1982	UN	3	i	443045	875021	B17	798.0	40.0	40.7									SM							
BN	1982	KEGI	3	i	443039	875021	B18	799.0	1.0	5.0									CL							
BN	1982	KEGI	3	i	443039	875021	B18	799.0	5.0	7.0									CL							
BN	1982	KEGI	3	i	443039	875021	B18	799.0	10.0	11.5									CL			50				
BN	1982	KEGI	3	i	443039	875021	B18	799.0	15.0	17.0									CL				19.0			
BN	1982	KEGI	3	i	443039	875021	B18	799.0	20.0	22.0					5	22	39	39	CL	74						
BN	1982	UN	99	i	443039	875021	B18	799.0	25.0	27.0	1.30E-07	i			i	24	58	18	ML-CL	75				18	2	
BN	1982	UN	99	i	443039	875021	B18	799.0	30.0	31.0									ML,SM							
BN	1982	UN	3	i	443039	875021	B18	799.0	32.0	33.5									SM-SM							
BN	1982	UN	3	i	443039	875021	B18	799.0	35.0	36.5									SM-GM							
BN	1982	UN	3	i	443039	875021	B18	799.0	40.0	40.9					40	65	35		SM-GM	21						
BN	1982	KEGI	3	i	443039	875021	B18	799.0	5.0	20.0			1.58E-05	8												
BN	1982	KEGI	3	i	443034	875021	B19	797.0	0.7	3.0									CL							
BN	1982	KEGI	3	i	443034	875021	B19	797.0	5.0	6.5									CL				15.0			3.0
BN	1982	UN	99	i	443034	875021	B19	797.0	10.0	11.5									ML,SM				33.0			4.5
BN	1982	UN	3	i	443034	875021	B19	797.0	15.0	15.5									ML,SM				13.0			
BN	1982	UN	3	i	443034	875021	B19	797.0	20.0	21.5									SM							
BN	1982	UN	3	i	443034	875021	B19	797.0	25.0	25.5									SM							
BN	1982	UN	3	i	443034	875021	B19	797.0	30.0	31.0									SM							
BN	1982	UN	3	i	443034	875021	B19	797.0	35.0	36.0									SM							
BN	1982	UN	3	i	443034	875021	B19	797.0	40.0	40.5									SM							
BN	1982	KEGI	3	i	443030	875021	B20	800.4	0.5	3.0									CL							
BN	1982	KEGI	3	i	443030	875021	B20	800.4	5.0	6.5									CL			30				
BN	1982	KEGI	3	i	443030	875021	B20	800.4	10.0	11.5									CL			24				
BN	1982	KEGI	3	i	443030	875021	B20	800.4	15.0	17.0	2.90E-09	i							CL					39	21	
BN	1982	KEGI	3	i	443030	875021	B20	800.4	20.0	20.5									CL				16.0			1.4
BN	1982	KEGI	3	i	443030	875021	B20	800.4	25.0	26.5									SM							
BN	1982	UN	3	i	443030	875021	B20	800.4	30.0	31.5									SM							
BN	1982	UN	3	i	443030	875021	B20	800.4	35.0	36.5									SM							
BN	1982	UN	3	i	443030	875021	B20	800.4	40.0	40.5									SM							
BN	1982	KEGI	3	i	443030	875021	B20	800.4	4.4	19.4			1.56E-05	8												
BN	1982	KEGI	3	i	443023	875021	B21	795.0	1.0	5.0									CL,ML							
BN	1982	KEGI	3	i	443023	875021	B21	795.0	5.0	7.0									CL,ML				11.0			
BN	1982	KEGI	3	i	443023	875021	B21	795.0	10.0	12.0									CL				16.0			
BN	1982	KEGI	3	i	443023	875021	B21	795.0	15.0	17.0									CL				19.0			
BN	1982	KEGI	3	i	443023	875021	B21	795.0	20.0	22.0									CL				26.0			

Appendix 3 - HYDROGEOLOGIC AND ENGINEERING DATA FOR BROWN COUNTY - BAETON SITE

County (code)	Year	Litho-strat. unit (code)	Nat. (code)	Site No.	Lat.	Long.	Brng. no.	Surf. Elev. (ft)	Sample top (ft)	Sample bottom (ft)	Lab K (cm/s)	Meth code	Fld K (cm/s)	Meth code	Bulk % >2.0mm	Matrix % sand (2.0 to 0.0625mm)	Matrix % silt (0.0625 to 0.002mm)	Matrix % clay (<0.002mm)	Unified Soil Class.	Bulk Percent P200	Dry Unit Wt. (pcf)	SPT (N)	Moist. cont.(%)	Liquid limit	Plastic. index	UC (tsf)
BN	1982	KEG1	3	1	443023	875021	B21	795.0	25.0	27.0									CL				26.0			
BN	1982	UN	3	1	443023	875021	B21	795.0	30.0	32.0									SM				12.0			
BN	1982	UN	3	1	443023	875021	B21	795.0	35.0	36.5									SM			64				
BN	1982	UN	3	1	443023	875021	B21	795.0	40.0	41.5									SM			83				
BN	1982	KEG1	3	1	443047	875015	B22	798.0	1.0	5.0									CL							
BN	1982	KEG1	3	1	443047	875015	B22	798.0	5.0	7.0									CL				10.0			
BN	1982	KEG1	3	1	443047	875015	B22	798.0	10.0	12.0									CL				13.0			
BN	1982	KEG1	3	1	443047	875015	B22	798.0	15.0	17.0									CL				15.0			
BN	1982	KEG1	3	1	443047	875015	B22	798.0	20.0	22.0									CL				23.0			
BN	1982	KEG1	3	1	443047	875015	B22	798.0	25.0	27.0									CL							
BN	1982	KEG1	3	1	443047	875015	B22	798.0	30.0	32.0									CL				25.0			
BN	1982	UN	3	1	443047	875015	B22	798.0	35.0	36.5									SM							
BN	1982	UN	3	1	443047	875015	B22	798.0	40.0	41.5									SM							
BN	1982	KEG1	99	1	443041	875015	B23	796.0	2.5	5.0									CL,ML,SM							
BN	1982	KEG1	99	1	443041	875015	B23	796.0	5.0	7.0									CL,ML,SM				20.0			
BN	1982	KEG1	3	1	443041	875015	B23	796.0	10.0	12.0									CL				7.0			
BN	1982	KEG1	3	1	443041	875015	B23	796.0	15.0	17.0									CL							
BN	1982	KEG1	3	1	443041	875015	B23	796.0	20.0	22.0									CL				26.0			
BN	1982	KEG1	3	1	443041	875015	B23	796.0	25.0	27.0									CL				25.0			
BN	1982	UN	3	1	443041	875015	B23	796.0	30.0	31.0									SM-GM							
BN	1982	UN	3	1	443041	875015	B23	796.0	35.0	36.0									SM-GM							
BN	1982	UN	3	1	443041	875015	B23	796.0	40.0	41.0					43	72	28	0	SM-GM	16						
BN	1982	KEG1	3	1	443036	875015	B24	795.0	1.0	5.0									CL							
BN	1982	KEG1	3	1	443036	875015	B24	795.0	5.0	7.0									CL				15.0			
BN	1982	KEG1	3	1	443036	875015	B24	795.0	10.0	12.0	4.40E-09	i			11	31	46	22	CL	61				27	13	
BN	1982	KEG1	3	1	443036	875015	B24	795.0	15.0	16.5					15	41	46	13	CL	50						
BN	1982	KEG1	3	1	443036	875015	B24	795.0	20.0	22.0									CL				24.0			
BN	1982	KEG1	3	1	443036	875015	B24	795.0	25.0	26.5	5.40E-08	i			8	29	40	30	CL	64				33	18	
BN	1982	UN	3	1	443036	875015	B24	795.0	30.0	31.0									SM							
BN	1982	UN	3	1	443036	875015	B24	795.0	35.0	36.5									SM			41				
BN	1982	UN	3	1	443036	875015	B24	795.0	40.0	41.5					0	55	41	4	SM	47						
BN	1982	UN	13	1	443031	875015	B25	798.0	0.0	1.0									OL			32				
BN	1982	KEG1	3	1	443031	875015	B25	798.0	1.0	1.5									CL			34				
BN	1982	KEG1	3	1	443031	875015	B25	798.0	5.0	6.5									CL			18				
BN	1982	KEG1	3	1	443031	875015	B25	798.0	10.0	11.5									CL				13.0			3.5
BN	1982	KEG1	3	1	443031	875015	B25	798.0	15.0	17.0									CL							
BN	1982	KEG1	3	1	443031	875015	B25	798.0	17.0	18.5									CL			22				
BN	1982	KEG1	3	1	443031	875015	B25	798.0	20.0	22.0									CL				23.0			2.3
BN	1982	KEG1	3	1	443031	875015	B25	798.0	25.0	27.0					0	19	65	16	CL	83			26.0			1.5
BN	1982	UN	3	1	443031	875015	B25	798.0	30.0	32.0									CL				26.0			2.3
BN	1982	UN	3	1	443031	875015	B25	798.0	35.0	35.8					1	20	70	10	ML	82			15.0			
BN	1982	UN	3	1	443031	875015	B25	798.0	40.0	41.5									SM							
BN	1982	KEG1	3	1	443026	875015	B26	795.0	1.0	20.0									CL							
BN	1982	KEG1	3	1	443026	875015	B26	795.0	5.0	7.0									CL				15.0			
BN	1982	KEG1	3	1	443026	875015	B26	795.0	10.0	12.0									CL				14.0			
BN	1982	KEG1	3	1	443026	875015	B26	795.0	15.0	17.0									CL							

Appendix 3 - HYDROGEOLOGIC AND ENGINEERING DATA FOR BROWN COUNTY - BAETON SITE

IDENTITY County (code)	Year	Litho-strat. unit (code)	Nat. (code)	Site No.	Lat.	Long.	Brno. no.	Surf. Elev. (ft)	Sample top (ft)	Sample bottom (ft)	HYDRAULIC CONDUCTIVITY Lab K (cm/s)	Meth code	Fld K (cm/s)	Meth code	GRAINSIZE PERCENTAGES Bulk % >2.0mm	Matrix % sand (2.0 to 0.0625mm)	Matrix % silt (0.0625 to 0.002mm)	Matrix % clay (<0.002mm)	ENGINEERING PROPERTIES Unified Soil Class.	Bulk Percent P200	Dry Unit Wt. (pcf)	SPT (N)	Moist. cont.(%)	Liquid limit	Plastic. index	UC (tsf)
BN	1982	KEG1	3	i	443026	875015	B26	795.0	20.0	22.0									CL				26.0			
BN	1982	KEG1	3	i	443026	875015	B26	795.0	25.0	27.0									CL				27.0			
BN	1982	KEG1	3	i	443026	875015	B26	795.0	30.0	32.0									CL				27.0			
BN	1982	KEG1	3	i	443026	875015	B26	795.0	35.0	36.0									CL				9.0			
BN	1982	UN	3	i	443026	875015	B26	795.0	36.0	37.0									ML							
BN	1982	UN	3	i	443026	875015	B26	795.0	40.0	41.5									CL,ML			46				
BN	1982	KEG1	3	i	443021	875015	B27	796.7	1.0	2.0									CL							
BN	1982	KEG1	3	i	443021	875015	B27	796.7	5.0	7.0									CL				15.0			
BN	1982	KEG1	3	i	443021	875015	B27	796.7	10.0	12.0									CL				16.0			
BN	1982	KEG1	3	i	443021	875015	B27	796.7	15.0	17.0									CL				18.0			
BN	1982	KEG1	3	i	443021	875015	B27	796.7	20.0	22.0									CL				24.0			
BN	1982	KEG1	3	i	443021	875015	B27	796.7	25.0	27.0									CL				25.0			
BN	1982	KEG1	3	i	443021	875015	B27	796.7	30.0	32.0									CL				24.0			
BN	1982	UN	3	i	443021	875015	B27	796.7	35.0	36.5									ML			38				
BN	1982	UN	3	i	443021	875015	B27	796.7	40.0	41.5									ML			50				
BN	1982	KEG1	3	i	443021	875015	B27	796.7	6.0	21.0			3.52E-07	8												
BN	1982	KEG1	3	i	443044	875010	B28	797.4	1.0	4.0									CL							
BN	1982	KEG1	3	i	443044	875010	B28	797.4	5.0	7.0									CL				14.0			
BN	1982	KEG1	3	i	443044	875010	B28	797.4	10.0	12.0									CL				16.0			
BN	1982	KEG1	3	i	443044	875010	B28	797.4	15.0	17.0									CL				10.0			
BN	1982	KEG1	3	i	443044	875010	B28	797.4	20.0	22.0									CL							
BN	1982	KEG1	3	i	443044	875010	B28	797.4	25.0	27.0									CL				26.0			
BN	1982	KEG1	3	i	443044	875010	B28	797.4	30.0	32.0									CL				26.0			
BN	1982	UN	3	i	443044	875010	B28	797.4	35.0	37.0									ML				16.0			
BN	1982	UN	3	i	443044	875010	B28	797.4	40.0	41.5									SM							
BN	1982	KEG1	3	i	443044	875010	B28	797.4	5.0	20.0			2.17E-06	8												
BN	1982	KEG1	3	i	443039	875010	B29	796.0	1.0	5.0									CL							
BN	1982	KEG1	3	i	443039	875010	B29	796.0	5.0	6.5									CL				17.0			
BN	1982	KEG1	3	i	443039	875010	B29	796.0	10.0	12.0									CL				15.0			
BN	1982	KEG1	3	i	443039	875010	B29	796.0	15.0	17.0									CL				22.0			
BN	1982	KEG1	3	i	443039	875010	B29	796.0	20.0	22.0									CL				23.0			
BN	1982	KEG1	3	i	443039	875010	B29	796.0	25.0	27.0									CL				26.0			
BN	1982	UN	3	i	443039	875010	B29	796.0	30.0	31.5									CL,SM				8.0			
BN	1982	UN	3	i	443039	875010	B29	796.0	35.0	36.5									SM			26				
BN	1982	UN	3	i	443039	875010	B29	796.0	40.0	40.7									SM							
BN	1982	KEG1	3	i	443034	875010	B30	794.5	2.0	5.0									ML							
BN	1982	KEG1	3	i	443034	875010	B30	794.5	5.0	7.0									CL				16.0			
BN	1982	KEG1	3	i	443034	875010	B30	794.5	10.0	12.0									CL							
BN	1982	KEG1	3	i	443034	875010	B30	794.5	15.0	17.0									CL				21.0			
BN	1982	KEG1	3	i	443034	875010	B30	794.5	20.0	22.0									CL				25.0			
BN	1982	KEG1	3	i	443034	875010	B30	794.5	25.0	27.0									CL							
BN	1982	KEG1	3	i	443034	875010	B30	794.5	30.0	32.0									CL				25.0			
BN	1982	UN	3	i	443034	875010	B39	794.5	35.0	37.0									SM				11.0			
BN	1982	UN	3	i	443034	875010	B30	794.5	40.0	41.0									SM			88				
BN	1982	KEG1	3	i	443034	875010	B30	794.5	6.3	21.3			7.55E-06	8												
BN	1982	KEG1	3	i	443029	875010	B31	795.0	1.0	2.5									CL							

Appendix 3 - HYDROGEOLOGIC AND ENGINEERING DATA FOR BROWN COUNTY - BAETON SITE

IDENTITY											HYDRAULIC CONDUCTIVITY				GRAINSIZE PERCENTAGES				ENGINEERING PROPERTIES							
County (code)	Year	Litho-strat. unit (code)	Mat. (code)	Site No.	Lat.	Long.	Brng. no.	Surf. Elev. (ft)	Sample top (ft)	Sample bottom (ft)	Lab K (cm/s)	Meth code	Fld K (cm/s)	Meth code	Bulk % >2.0mm	Matrix % sand (2.0 to 0.0625mm)	Matrix % silt (0.0625 to 0.002mm)	Matrix % clay (<0.002mm)	Unified Soil Class.	Bulk Percent P200	Dry Unit Wt. (pcf)	SPT (N)	Moist. cont.(%)	Liquid limit	Plastic. index	UC (tsf)
BN	1982	KEGI	3	1	443029	875010	B31	795.0	5.0	6.5									CL			23				
BN	1982	KEGI	3	1	443029	875010	B31	795.0	10.0	11.5									CL				11.0			3.5
BN	1982	KEGI	3	1	443029	875010	B31	795.0	15.0	17.0									CL				18.0			3.0
BN	1982	KEGI	3	1	443029	875010	B31	795.0	20.0	22.0									CL				22.0			3.0
BN	1982	KEGI	3	1	443029	875010	B31	795.0	25.0	27.0									CL				27.0			1.8
BN	1982	KEGI	3	1	443029	875010	B31	795.0	30.0	32.0									CL				26.0			1.5
BN	1982	UN	3	1	443029	875010	B31	795.0	35.0	36.0									ML				14.0			4.5
BN	1982	UN	3	1	443029	875010	B31	795.0	40.0	42.0									ML				20.0			3.8

Appendix 3 - HYDROGEOLOGIC AND ENGINEERING DATA FOR BROWN COUNTY, DECASTER (BROWN COUNTY WEST) SITE

IDENTITY											HYDRAULIC CONDUCTIVITY				GRAINSIZE PERCENTAGES				ENGINEERING PROPERTIES							
County (code)	Year	Litho-strat. unit (code)	Mat. (code)	Site No.	Lat.	Long.	Brng. no.	Surf. Elev. (ft)	Sample top (ft)	Sample bottom (ft)	Lab K (cm/s)	Meth code	Fld K (cm/s)	Meth code	Bulk % >2.0mm	Matrix % sand (2.0 to 0.0625mm)	Matrix % silt (0.0625 to 0.002mm)	Matrix % clay (<0.002mm)	Unified Soil Class.	Bulk Percent P200	Dry Unit Wt. (pcf)	SPT (N)	Moist. cont. (%)	Liquid limit	Plastic. index	UC (tsf)
BN	1973	UN	8	2	443046	880921	DC1	660.5	0.0	0.5									OL			3				
BN	1973	UN	99	2	443046	880921	DC1	660.5	0.5	1.5									SM			5				
BN	1973	KE	5	2	443046	880921	DC1	660.5	2.0	4.0									CL-ML				20.0			3.5
BN	1973	KE	5	2	443046	880921	DC1	660.5	4.0	5.5									ML			24				
BN	1973	KE	5	2	443046	880921	DC1	660.5	6.0	7.5									CL-ML			25				
BN	1973	KE	5	2	443046	880921	DC1	660.5	10.0	12.0									CL-ML				22.0			3.5
BN	1973	KE	5	2	443046	880921	DC1	660.5	15.0	17.0									CL,CH				27.0			0.7
BN	1973	KE	5	2	443046	880921	DC1	660.5	20.0	22.0									CL,CH				36.0			0.5
BN	1973	KE	5	2	443046	880921	DC1	660.5	25.0	27.0									CL,CH				34.0			1.5
BN	1973	KE	5	2	443046	880921	DC1	660.5	30.0	32.0									CL,CH				23.0			
BN	1973	KE	99	2	443046	880921	DC1	660.5	35.0	36.5									SW			44				
BN	1973	KE	3	2	443046	880921	DC1	660.5	40.0	41.5									ML			103				
BN	1973	KE	5	2	443046	880921	DC1	660.5	45.0	46.5									CL			200				
BN	1973	KE	5	2	443046	880921	DC1	660.5	50.0	51.5									CL			57				
BN	1973	KE	5	2	443046	880921	DC1B	660.6	24.0	25.0			5.00E-07						ML							
BN	1973	UN	8	2	443103	880922	DC2	670.6	0.0	1.5									OL			12				
BN	1973	UN	99	2	443103	880922	DC2	670.6	2.0	3.5									CL			12				
BN	1973	KE	5	2	443103	880922	DC2	670.6	4.0	6.0									ML				25.0			3.5
BN	1973	KE	5	2	443103	880922	DC2	670.6	6.0	8.0									CL-ML				28.0			2.0
BN	1973	KE	3	2	443103	880922	DC2	670.6	10.0	12.0									SM-SC				15.0			2.3
BN	1973	KE	3	2	443103	880922	DC2	670.6	12.0	13.0									SM-SC			13				
BN	1973	KE	99	2	443103	880922	DC2	670.6	13.0	13.5									ML			8				
BN	1973	KE	99	2	443103	880922	DC2	670.6	15.0	17.0									ML				12.0			4.5
BN	1973	KE	3	2	443103	880922	DC2	670.6	20.0	22.0									CL				917.0			3.7
BN	1973	KE	3	2	443103	880922	DC2	670.6	25.0	26.5									CL							
BN	1973	KE	3	2	443103	880922	DC2	670.6	27.0	28.5									CL			47				
BN	1973	KE	3	2	443103	880922	DC2	670.6	30.0	31.5									CL			39				
BN	1973	KE	5	2	443103	880922	DC2	670.6	35.0	36.5									ML,CL			86				
BN	1973	KE	5	2	443103	880922	DC2	670.6	40.0	42.0									ML,CL							
BN	1973	KE	5	2	443103	880922	DC2	670.6	42.0	43.5									ML,CL			102				
BN	1973	UN	12	2	443103	880922	DC2	670.6	45.0	47.9									LS							
BN	1973	KE	3	2	443103	880922	DC2-B	670.6	24.0	25.0			2.00E-07						CL							
BN	1973	UN	99	2	443051	880940	DC3	690.4	0.0	1.5									OL,SM			16				
BN	1973	UN	99	2	443051	880940	DC3	690.4	2.0	3.5									SM			21				
BN	1973	UN	99	2	443051	880940	DC3	690.4	4.0	5.5									ML,SM			94				
BN	1973	UN	99	2	443051	880940	DC3	690.4	6.0	7.5									SM			82				
BN	1973	KE	5	2	443051	880940	DC3	690.4	10.0	12.0									CL-ML				19.0			4.5
BN	1973	KE	5	2	443051	880940	DC3	690.4	15.0	17.0									ML-SM				21.0			2.5
BN	1973	KE	5	2	443051	880940	DC3	690.4	20.0	21.5									ML			29				
BN	1973	KE	3	2	443051	880940	DC3	690.4	25.0	26.5									CL			28				
BN	1973	KE	3	2	443051	880940	DC3	690.4	30.0	32.0									CL				15.0			3.3
BN	1973	KE	3	2	443051	880940	DC3	690.4	35.0	36.5									CL			28				
BN	1973	KE	5	2	443051	880940	DC3	690.4	40.0	41.5									ML,CL			27				
BN	1973	UN	12	2	443051	880940	DC3	690.4	45.0	46.0									LS			60				
BN	1973	UN	12	2	443051	880940	DC3	690.4	46.0	47.5									LS							
BN	1973	UN	12	2	443051	880940	DC3	690.4	47.5	49.5									LS							

Appendix 3 - HYDROGEOLOGIC AND ENGINEERING DATA FOR BROWN COUNTY, DECASTER (BROWN COUNTY WEST) SITE

IDENTITY County (code)	Year	Litho-strat. unit (code)	Mat. (code)	Site No.	Lat.	Long.	Brng. no.	Surf. Elev. (ft)	Sample top (ft)	Sample bottom (ft)	HYDRAULIC CONDUCTIVITY Lab K (cm/s)	Meth code	Fld K (cm/s)	Meth code	GRAINSIZE PERCENTAGES Bulk % >2.0mm	Matrix % sand (2.0 to 0.0625mm)	Matrix % silt (0.0625 to 0.002mm)	Matrix % clay (<0.002mm)	ENGINEERING PROPERTIES Unified Soil Class.	Bulk Percent P200	Dry Unit Wt. (pcf)	SPT (N)	Moist. cont. (%)	Liquid limit	Plastic. index	UC (tsf)
BN	1973	UN	8	2	443059	880934	DC4	691.1	0.0	1.0									OL				20.0			
BN	1973	UN	99	2	443059	880934	DC4	691.1	1.0	2.0									SM				16.0			
BN	1973	KE	3	2	443059	880934	DC4	691.1	2.0	4.0									CL				18.0			1.5
BN	1973	KE	5	2	443059	880934	DC4	691.1	4.0	6.0									ML				22.0			1.0
BN	1973	KE	5	2	443059	880934	DC4	691.1	6.0	7.5									ML			74	18.0			
BN	1973	KE	5	2	443059	880934	DC4	691.1	10.0	11.5									ML			56	18.0			
BN	1973	KE	5	2	443059	880934	DC4	691.1	15.0	16.5									ML			60	19.0			
BN	1973	KE	3	2	443059	880934	DC4	691.1	20.0	21.0									CL			93	12.0			
BN	1973	KE	3	2	443059	880934	DC4	691.1	25.0	26.5									CL			43				
BN	1973	KE	3	2	443059	880934	DC4	691.1	30.0	31.5									CL			41				
BN	1973	KE	3	2	443059	880934	DC4	691.1	35.0	36.5									CL			20				
BN	1973	KE	3	2	443059	880934	DC4	691.1	40.0	40.5									CL				18.0			4.5
BN	1973	KE	5	2	443059	880934	DC4	691.1	40.5	42.0									ML,CH				15.0			4.5
BN	1973	UN	12	2	443059	880934	DC4	691.1	44.0	46.0									LS							
BN	1973	UN	12	2	443059	880934	DC4	691.1	46.0	48.0									LS							
BN	1973	UN	8	2	443051	880932	DC5	665.1	0.0	0.5									OL				30.0			
BN	1973	UN	99	2	443051	880932	DC5	665.1	0.5	2.0									SM				21.0			3.2
BN	1973	KE	5	2	443051	880932	DC5	665.1	2.0	4.0									CL-CH				34.0			2.0
BN	1973	KE	5	2	443051	880932	DC5	665.1	4.0	6.0									CL,CH				33.0			1.1
BN	1973	KE	5	2	443051	880932	DC5	665.1	6.0	8.0									CL,CH				33.0			1.1
BN	1974	KE	3	2	443051	880932	DC5	665.1	10.0	12.0									SC				15.0			1.5
BN	1974	KE	3	2	443051	880932	DC5	665.1	15.0	17.0									CL-SC				13.0			1.8
BN	1974	KE	5	2	443051	880932	DC5	665.1	20.0	22.0									ML				16.0			4.5
BN	1974	KE	3	2	443051	880932	DC5	665.1	25.0	27.0									CL				17.0			2.5
BN	1974	KE	5	2	443051	880932	DC5	665.1	30.0	32.0									CH,ML				16.0			4.4
BN	1974	KE	5	2	443051	880932	DC5	665.1	35.0	37.0									CH,ML				30.0			4.2
BN	1974	KE	3	2	443051	880932	DC5	665.1	40.0	41.0									CL							
BN	1974	UN	12	2	443051	880932	DC5	665.1	43.0	47.0									LS							
BN	1974	UN	8	2	443041	880939	DC6	683.7	0.0	0.8									OL							
BN	1974	UN	99	2	443041	880939	DC6	683.7	0.8	2.0									SM				13.0			
BN	1974	UN	99	2	443041	880939	DC6	683.7	2.0	4.0									SM							
BN	1974	KE	3	2	443041	880939	DC6	683.7	4.0	5.5									ML				12.0			
BN	1974	KE	3	2	443041	880939	DC6	683.7	6.0	7.5									ML				15.0			3.5
BN	1974	KE	5	2	443041	880939	DC6	683.7	7.5	8.0									ML				18.0			4.5
BN	1974	KE	5	2	443041	880939	DC6	683.7	10.0	11.5									ML				21.0			1.5
BN	1974	KE	5	2	443041	880939	DC6	683.7	15.0	16.0									ML,CL				18.0			4.5
BN	1974	KE	5	2	443041	880939	DC6	683.7	20.0	21.0									ML,CL				18.0			4.5
BN	1974	KE	3	2	443041	880939	DC6	683.7	25.0	27.0									CL				11.0			0.8
BN	1974	KE	3	2	443041	880939	DC6	683.7	30.0	32.0									CL				11.0			
BN	1974	KE	3	2	443041	880939	DC6	683.7	35.0	36.5									CL				13.0			
BN	1974	KE	5	2	443041	880939	DC6	683.7	40.0	41.0									CL				16.0			3.5
BN	1974	KE	5	2	443041	880939	DC6	683.7	45.0	46.5									ML,CH			22				
BN	1974	KE	5	2	443041	880939	DC6	683.7	50.0	51.5									ML,CH			31				
BN	1974	KE	5	2	443041	880924	DC7	657.4	2.0	4.0									CH				28.0			2.0
BN	1974	KE	5	2	443041	880924	DC7	657.4	4.0	6.0									CH				24.0			4.5
BN	1974	KE	5	2	443041	880924	DC7	657.4	6.0	8.0									CH				28.0			2.8

Appendix 3 - HYDROGEOLOGIC AND ENGINEERING DATA FOR BROWN COUNTY, DECASTER (BROWN COUNTY WEST) SITE

IDENTITY County (code)	Year	Litho-strat. unit (code)	Mat. (code)	Site No.	Lat.	Long.	Brng. no.	Surf. Elev. (ft)	Sample top (ft)	Sample bottom (ft)	HYDRAULIC CONDUCTIVITY Lab K (cm/s)	Meth code	Fld K (cm/s)	Meth code	GRAINSIZE PERCENTAGES Bulk % >2.0mm	Matrix % sand (2.0 to 0.0625mm)	Matrix % silt (0.0625 to 0.002mm)	Matrix % clay (<0.002mm)	ENGINEERING PROPERTIES Unified Soil Class.	Bulk Percent P200	Dry Unit Wt. (pcf)	SPT (N)	Moist. cont.(%)	Liquid limit	Plastic. index	UC (tsf)
BN	1974	KE	5	2	443041	880924	DC7	657.4	10.0	12.0									CH,ML				27.0			2.4
BN	1974	KE	5	2	443041	880924	DC7	657.4	15.0	16.5									SP-SM			34				
BN	1974	KE	5	2	443041	880924	DC7	657.4	20.0	21.5									SP-SM			30				
BN	1974	KE	4	2	443041	880924	DC7	657.4	25.0	26.5									SW			10				
BN	1974	KE	4	2	443041	880924	DC7	657.4	30.0	31.5									SW			28				
BN	1974	KE	4	2	443041	880924	DC7	657.4	35.0	36.5									SW-GW			91				
BN	1974	KE	4	2	443041	880924	DC7	657.4	40.0	40.5									SP			82				
BN	1974	KE	5	2	443041	880924	DC7	657.4	40.5	41.0									ML			148				
BN	1974	KE	3	2	443041	880924	DC7	657.4	45.0	45.5									ML			240				
BN	1974	KE	3	2	443041	880924	DC7	657.4	50.0	50.5									ML			400				
BN	1974	UN	8	2	443058	880920	DC8	665.2	0.0	1.0									OL							
BN	1974	UN	99	2	443058	880920	DC8	665.2	1.0	1.4													22.0			
BN	1974	KE	5	2	443058	880920	DC8	665.2	1.4	2.0									ML				22.0			
BN	1974	KE	5	2	443058	880920	DC8	665.2	2.0	3.0									ML				25.0			
BN	1974	KE	5	2	443058	880920	DC8	665.2	3.0	4.0									CL-ML,ML				23.0			2.0
BN	1974	KE	5	2	443058	880920	DC8	665.2	4.0	5.5									CL-ML,ML				22.0			1.5
BN	1974	KE	5	2	443058	880920	DC8	665.2	6.0	8.0									CL-ML,ML				22.0			3.5
BN	1974	KE	5	2	443058	880920	DC8	665.2	10.0	12.0									CL-ML,CH				32.0			1.8
BN	1974	KE	5	2	443058	880920	DC8	665.2	15.0	17.0									CL-ML,CH				29.0			0.8
BN	1974	KE	5	2	443058	880920	DC8	665.2	20.0	22.0									SM							
BN	1974	KE	5	2	443058	880920	DC8	665.2	25.0	27.0									CL,ML				21.0			0.5
BN	1974	KE	3	2	443058	880920	DC8	665.2	30.0	32.0									CL				18.0			
BN	1974	KE	3	2	443058	880920	DC8	665.2	35.0	37.0									CL				19.0			2.5
BN	1974	KE	5	2	443058	880920	DC8	665.2	40.0	41.5									CH,ML			21				
BN	1974	KE	5	2	443058	880920	DC8	665.2	45.0	45.8									CL,CH			100				
BN	1974	UN	12	2	443058	880920	DC8	665.2	47.5	50.8									Ls							
BN	1974	UN	99	2	443047	880913	DC9	628.0	2.0	4.0													28.0			1.5
BN	1974	UN	99	2	443047	880913	DC9	628.0	4.0	5.0									CL-ML				28.0			0.3
BN	1974	UN	13	2	443047	880913	DC9	628.0	5.0	6.0									OL				41.0			
BN	1974	UN	13	2	443047	880913	DC9	628.0	6.0	7.5									OL				28.0			
BN	1974	KE	5	2	443047	880913	DC9	628.0	7.5	8.0									SM				21.0			
BN	1974	KE	5	2	443047	880913	DC9	628.0	10.0	11.5									SM			13				
BN	1974	KE	5	2	443047	880913	DC9	628.0	15.0	16.5									CH,ML			15				
BN	1974	KE	5	2	443047	880913	DC9	628.0	20.0	22.0									CH,ML				28.0			2.5
BN	1978	KE	99	2	443046	880938	B1	685.0	2.0	3.5					7				CL	79		72		30	18	
BN	1978	KE	99	2	443046	880938	B1	685.0	4.0	5.5									CL	97		77		26	9	
BN	1978	KE	99	2	443044	880937	B2	683.0	2.0	3.5					9				CL	76		69		28	16	
BN	1978	KE	99	2	443044	880937	B2	683.0	4.0	5.5									CL			78		29	16	
BN	1978	KE	99	2	443046	880936	B3	678.0	2.0	3.5					29				CL	61		42		36	19	
BN	1978	KE	99	2	443046	880936	B3	678.0	4.0	5.5									CL			60		28	15	
BN	1978	KE	99	2	443043	880935	B4	679.0	2.0	3.5					39				SC-CL	39		52				
BN	1978	KE	99	2	443043	880935	B4	679.0	4.0	5.5	6.20E-07	i							CL			30		39	17	
BN	1978	KE	99	2	443046	880934	B5	673.0	2.0	3.5	2.20E-07	i							CL	96		20		31	14	
BN	1978	KE	99	2	443046	880934	B5	673.0	4.0	5.5									CL			22		29	13	
BN	1978	KE	5	2	443044	880932	B6	672.0	2.0	3.5	1.90E-07	i							CL-ML	45		8		18	6	
BN	1978	KE	5	2	443044	880932	B6	672.0	4.0	5.5									CL-ML					17	6	

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IDENTITY County (code)	Year	Litho-strat. unit (code)	Mat. (code)	Site No.	Lat.	Long.	Brng. no.	Surf. Elev. (ft)	Sample top (ft)	Sample bottom (ft)	HYDRAULIC CONDUCTIVITY Lab K (cm/s)	Meth code	Fld K (cm/s)	Meth code	GRAINSIZE PERCENTAGES Bulk % >2.0mm	Matrix % sand (2.0 to 0.0625mm)	Matrix % silt (0.0625 to 0.002mm)	Matrix % clay (<0.002mm)	ENGINEERING PROPERTIES Unified Soil Class.	Bulk Percent P200	Dry Unit Wt. (pcf)	SPT (N)	Moist. cont. (%)	Liquid limit	Plastic. index	UC (tsf)
BN	1978	KE	5	2	443046	880931	B7	669.0	2.0	4.0					12				CL-ML	51				19	5	
BN	1978	KE	5	2	443046	880931	B7	669.0	4.0	6.0					6				ML	65		10		18	3	
BN	1978	KE	5	2	443044	880930	B8	673.0	2.0	3.5	1.30E-06	1			1				ML	86				19	2	
BN	1978	KE	99	2	443044	880930	B8	673.0	4.0	5.5									CL					16	8	
BN	1978	KE	5	2	443046	880928	B9	670.0	2.0	4.0					2				CL-ML	79				21	5	
BN	1978	KE	5	2	443046	880928	B9	670.0	4.0	5.5									CL			5		26	8	
BN	1978	KE	5	2	443045	880926	B10	669.0	2.0	3.5	2.60E-06	1			0				ML	87		16		19	2	
BN	1978	KE	5	2	443045	880926	B10	669.0	4.0	5.5					7				ML-SM	47						
BN	1978	KE	5	2	443047	880924	B11	661.0	2.0	3.5	1.90E-06	1							ML	96				24	6	
BN	1978	KE	5	2	443047	880924	B11	661.0	4.0	5.5									ML-SM	55						
BN	1978	KE	5	2	443042	880937	B12	679.0	2.0	4.0	4.50E-07	1			12				ML-CL	63		19		21	7	
BN	1978	KE	5	2	443042	880937	B12	679.0	4.0	6.0									CL					23	10	
BN	1978	KE	5	2	443048	880924	B13	662.0	2.0	4.0					1				ML-CL,CH	75				20	4	
BN	1978	KE	5	2	443048	880924	B13	662.0	2.0	4.0	2.30E-06	1							CL-ML					27	6	
BN	1978	KE	99	2	443048	880924	B13	662.0	4.0	5.5									CL			9		23	8	
BN	1979	KE	99	2	443042	880937	B1	674.0	11.0	12.0					1				CL-ML	87		15		23	6	
BN	1979	KE	5	2	443042	880937	B1	674.0	14.0	15.0	4.00E-08	5			1				CL-ML	66		9		17	5	
BN	1979	KE	99	2	443042	880937	B1	674.0	5.0	6.0	9.80E-08	5			1				CL-ML	56		12		18	5	
BN	1979	KE	99	2	443042	880937	B1	674.0	3.0	4.0					3				CL	86		40		41	20	
BN	1979	KE	5	2	443044	880927	B10	662.1	12.0	13.0					0				CL	99		22		32	17	
BN	1979	KE	99	2	443044	880927	B10	662.1	2.0	3.0					0				CL	77		36		27	12	
BN	1979	KE	99	2	443044	880926	B11	660.1	12.0	13.0					0				ML	99		20		27	3	
BN	1979	KE	99	2	443044	880926	B11	660.1	2.0	3.0					0				CL	100		33		47	21	
BN	1979	KE	5	2	443044	880925	B12	659.8	12.0	13.0	4.20E-07	5			0				CL-ML	97		3		25	5	
BN	1979	KE	5	2	443044	880925	B12	659.8	4.0	5.0					0				CL	99		20		42	21	
BN	1979	KE	5	2	443044	880925	B12	659.8	14.0	15.0									CL-ML	64		8		20	8	
BN	1979	KE	5	2	443045	880925	B13	659.0	4.0	5.0	6.10E-08	5							CL	99		30		34	15	
BN	1979	KE	5	2	443045	880925	B13	659.0	12.0	13.0	9.20E-08	5			0				CL	99		5		36	16	
BN	1979	KE	5	2	443045	880924	B14	659.0	4.0	5.0					0				CL	99		16		39	19	
BN	1979	KE	5	2	443045	880924	B14	659.0	12.0	13.0					0				CH	98		7		54	29	
BN	1979	KE	5	2	443045	880923	B15	659.0	12.0	13.0					2				CL	95		6		48	20	
BN	1979	KE	5	2	443045	880923	B15	659.0	4.0	5.0					0				CL	95		12		48	20	
BN	1979	KE	5	2	443042	880936	B2	671.7	12.0	13.0					21				CL-ML	55		11		19	7	
BN	1979	KE	5	2	443042	880936	B2	671.7	14.0	15.0	7.80E-08	5			4				ML	80		63		19	4	
BN	1979	KE	99	2	443042	880936	B2	671.7	2.0	3.0					3				CL	65		69		26	11	
BN	1979	KE	5	2	443042	880936	B2	671.7	4.0	5.0					6				CL-ML	72		20		21	7	
BN	1979	KE	5	2	443042	880935	B3	669.4	14.0	15.0	2.00E-06	5			2				ML	69		42		16		
BN	1979	KE	5	2	443042	880935	B3	669.4	12.0	13.0					6				CL-ML	52		52		18	6	
BN	1979	KE	99	2	443042	880935	B3	669.4	2.0	3.0					10				CL	80		56		36	16	
BN	1979	KE	99	2	443042	880935	B3	669.4	4.0	5.0	1.20E-07	5			5				CL	54		9		26	11	
BN	1979	KE	99	2	443043	880933	B4	668.1	4.0	5.0	5.60E-08	5			4				CL	41		13		44	26	
BN	1979	KE	5	2	443043	880933	B4	668.1	12.0	13.0					10				CL-ML	51		9		19	6	
BN	1979	KE	99	2	443043	880931	B5	667.2	14.0	15.0					1				CL	92		18		29	13	
BN	1979	KE	99	2	443043	880931	B5	667.2	2.0	3.0					0				CL	97		62		37	15	
BN	1979	KE	5	2	443043	880931	B5	667.2	4.0	5.0	3.80E-08	5			6				ML	52		21		17	4	
BN	1979	KE	5	2	443043	880930	B6	666.5	14.0	15.0					0				CL	99		42		32	12	

Appendix 3 - HYDROGEOLOGIC AND ENGINEERING DATA FOR BROWN COUNTY, BECASTER (BROWN COUNTY WEST) SITE

IDENTITY											HYDRAULIC CONDUCTIVITY				GRAINSIZE PERCENTAGES				ENGINEERING PROPERTIES							
County (code)	Year	Litho-strat. unit (code)	Mat. (code)	Site No.	Lat.	Long.	Brng. no.	Surf. Elev. (ft)	Sample top (ft)	Sample bottom (ft)	Lab K (cm/s)	Meth code	Fld K (cm/s)	Meth code	Bulk % >2.0mm	Matrix % sand (2.0 to 0.0625mm)	Matrix % silt (0.0625 to 0.002mm)	Matrix % clay (<0.002mm)	Unified Soil Class.	Bulk Percent P200	Dry Unit Wt. (pcf)	SPT (N)	Moist. cont.(%)	Liquid limit	Plastic. index	UC (tsf)
BN	1979	KE	5	2	443044	880929	B7	665.9	12.0	13.0	3.30E-06	5			5				CL	69		30		23	9	
BN	1979	KE	99	2	443044	880929	B7	665.9	2.0	3.0	2.60E-08	5			2				CL	62		53		24	12	
BN	1979	KE	5	2	443044	880928	B8	665.4	12.0	13.0					0				CL	99		32		35	15	
BN	1979	KE	5	2	443044	880928	B8	665.4	2.0	3.0					3				CL	81		54		35	20	
BN	1979	KE	5	2	443044	880927	B9	663.1	12.0	13.0					0				CL-ML	99		27		28	7	
BN	1979	KE	5	2	443044	880927	B9	663.1	2.0	3.0					0				CL-ML	67		47		24	5	
BN	1979	KE	99	2	443099	880999	B37	669.0		2.5														35	19	
BN	1979	KE	99	2	443099	880999	B39	670.0		6.0														28	15	
BN	1979	KE	99	2	443099	880999	B47	691.0		9.0														28	16	
BN	1979	KE	99	2	443099	880999	B40	669.0	2.0	3.0	1.01E-05	5										10				
BN	1979	KE	99	2	443099	880999	B40	669.0	4.0	5.0	5.00E-08	5										14				

Appendix 3 - HYDROGEOLOGIC AND ENGINEERING DATA FOR BROWN COUNTY - DECLEENE SITE

IDENTITY County (code)	Year	Litho-strat. unit (code)	Nat. (code)	Site No.	Lat.	Long.	Brng. no.	Surf. Elev. (ft)	Sample top (ft)	Sample bottom (ft)	HYDRAULIC CONDUCTIVITY Lab K (cm/s)	Meth code	Fld K (cm/s)	Meth code	GRAINSIZE PERCENTAGES Bulk % >2.0mm	Matrix % sand (2.0 to 0.0625mm)	Matrix % silt (0.0625 to 0.002mm)	Matrix % clay (<0.002mm)	ENGINEERING PROPERTIES Unified Soil Class.	Bulk Percent P200	Dry Unit Wt. (pcf)	SPT (N)	Moist. cont.(%)	Liquid limit	Plastic. index	UC (tsf)
BN	1974	KE	4	3	442432	880028	D1A	811.5	18.5	20.0	6.80E-04								SM			23				
BN	1974	KE	4	3	442432	880028	D1A	811.5	0.0	1.5									SP			3				
BN	1974	KE	4	3	442432	880028	D1A	811.5	2.0	3.5									SP			14				
BN	1974	KE	4	3	442432	880028	D1A	811.5	4.0	55.0									SP			20				
BN	1974	KE	4	3	442432	880028	D1A	811.5	6.0	7.5									SP			24				
BN	1974	KE	4	3	442432	880028	D1A	811.5	10.0	11.5									ML			23				
BN	1974	KE	4	3	442432	880028	D1A	811.5	15.0	16.5									SM			18				
BN	1974	KE	4	3	442432	880028	D1A	811.5	20.0	21.5									SM			27				
BN	1974	KE	5	3	442432	880028	D1A	811.5	25.0	26.5									SM			20				
BN	1974	KE	5	3	442432	880028	D1A	811.5	30.0	31.5									SM			15				
BN	1974	KE	5	3	442432	880028	D1A	811.5	35.0	36.5									ML			9				
BN	1974	KE	5	3	442432	880028	D1A	811.5	40.0	41.5									CL			16				
BN	1974	KE	5	3	442432	880028	D1A	811.5	45.0	46.5									ML				14.0			1.7
BN	1974	KE	5	3	442432	880028	D1A	811.5	50.0	52.0									CL				16.0			4.5
BN	1974	KEGl	3	3	442422	880035	D2	821.4	0.0	1.0									CL			20				
BN	1974	KE	4	3	442422	880035	D2	821.4	1.0	1.5									SP			35				
BN	1974	KE	4	3	442422	880035	D2	821.4	2.0	3.5									SW			35				
BN	1974	KE	4	3	442422	880035	D2	821.4	4.0	5.5									SP			31				
BN	1974	KE	4	3	442422	880035	D2	821.4	6.0	7.5									SP			28				
BN	1974	KE	4	3	442422	880035	D2	821.4	10.0	11.5									SP			34				
BN	1974	KE	4	3	442422	880035	D2	821.4	15.0	16.5									SP			60				
BN	1974	KE	5	3	442422	880035	D2	821.4	20.0	21.5									ML			26				
BN	1974	KE	5	3	442422	880035	D2	821.4	25.0	26.5									SM				21.0			
BN	1974	KE	5	3	442422	880035	D2	821.4	27.5	29.0									SM			17				
BN	1974	KE	5	3	442422	880035	D2	821.4	30.0	31.5									SM			29				
BN	1974	KE	5	3	442422	880035	D2	821.4	35.0	36.5									SP			45				
BN	1974	KE	5	3	442422	880035	D2	821.4	40.0	41.5									SP			72				
BN	1974	KE	5	3	442422	880035	D2	821.4	45.0	46.5									SM			58				
BN	1974	KE	5	3	442422	880035	D2	821.4	50.0	51.5									CL			24				
BN	1974	KECh	399	3	442422	880035	D2	821.4	55.0	56.5									CL				15.0			3.5
BN	1974	KECh	399	3	442422	880035	D2	821.4	60.0	62.0									CL							3.0
BN	1983	KEGl	3	3	442499	880099	MW33	862.0	0.0	1.5									CL			39				
BN	1983	KEGl	3	3	442499	880099	MW33	862.0	3.5	4.0									CL			56				
BN	1983	KECh	345	3	442499	880099	MW33	862.0	4.0	4.8									SM,ML			70				
BN	1983	KECh	3	3	442499	880099	MW33	862.0	8.5	10.0									CL			48				
BN	1983	KECh	3	3	442499	880099	MW33	862.0	13.5	15.0									CL			29				
BN	1983	KE	4	3	442499	880099	MW33	862.0	18.5	20.0									SP							
BN	1983	KE	4	3	442499	880099	MW33	862.0	23.5	25.0									SP			93				
BN	1983	KE	4	3	442499	880099	MW33	862.0	28.5	30.0									SP			75				
BN	1983	KE	4	3	442499	880099	MW33	862.0	33.5	35.0									SP			69				
BN	1983	KE	4	3	442499	880099	MW33	862.0	38.5	40.0									SP			57				
BN	1983	KE	4	3	442499	880099	MW33	862.0	43.5	45.0									SP			50				
BN	1983	KE	4	3	442499	880099	MW33	862.0	48.5	50.0									SP			30				
BN	1983	KE	4	3	442499	880099	MW33	862.0	53.5	55.0									SP			21				
BN	1983	KE	5	3	442499	880099	MW33	862.0	58.5	60.0									SM			62				
BN	1983	KE	5	3	442499	880099	MW33	862.0	63.0	64.5									SM			78				

Appendix 3 - HYDROGEOLOGIC AND ENGINEERING DATA FOR BROWN COUNTY - DECLEENE SITE

IDENTITY											HYDRAULIC CONDUCTIVITY				GRAINSIZE PERCENTAGES				ENGINEERING PROPERTIES								
County (code)	Year	Litho-strat. unit (code)	Mat. (code)	Site No.	Lat.	Long.	Brng. no.	Surf. Elev. (ft)	Sample top (ft)	Sample bottom (ft)	Lab K (cm/s)	Meth code	Fld K (cm/s)	Meth code	Bulk % >2.0mm	Matrix % sand (2.0 to 0.0625mm)	Matrix % silt (0.0625 to 0.002mm)	Matrix % clay (<0.002mm)	Unified Soil Class.	Bulk Percent P200	Dry Unit Wt. (pcf)	SPT (N)	Moist. cont. (%)	Liquid limit	Plastic. index	UC (tsf)
BN	1983	KEGI	3	3	442499	880099	MW27a	842.1	0.0	1.5									CL			20				
BN	1983	KEGI	3	3	442499	880099	MW27a	842.1	5.0	6.5									CL			16				
BN	1983	KE	4	3	442499	880099	MW27a	842.1	10.0	11.5									SP			8				
BN	1983	KE	4	3	442499	880099	MW27a	842.1	15.0	16.5									SP			46				

Appendix 3 - HYDROGEOLOGIC AND ENGINEERING DATA FOR BROWN COUNTY - NORTHLAND SLUDGE SITE

IDENTITY County (code)	Year	Litho-strat. unit (code)	Mat. (code)	Site No.	Lat.	Long.	Brng. no.	Surf. Elev. (ft)	Sample top (ft)	Sample bottom (ft)	HYDRAULIC CONDUCTIVITY Lab K (cm/s)	Meth code	Fld K (cm/s)	Meth code	GRAINSIZE PERCENTAGES Bulk % >2.0mm	Matrix % sand (2.0 to 0.0625mm)	Matrix % silt (0.0625 to 0.002mm)	Matrix % clay (<0.002mm)	ENGINEERING PROPERTIES Unified Soil Class.	Bulk Percent P200	Dry Unit Wt. (pcf)	SPT (N)	Moist. cont.(%)	Liquid limit	Plastic. index	UC (tsf)
Bn		KEGI	3	4	443142	880000	B1	591.2	15.0	16.5									CL			33				
Bn		KE	5	4	443142	880000	B1	591.2	20.0	21.5									ML			88				
Bn		KE	5	4	443142	880000	B1	591.2	25.0	25.6	2.00E-07	i			4	24	71	5	ML	84		210				
Bn		KEGI	3	4	443142	875958	B2	590.3	12.0	13.0									CL			6				
Bn		KEGI	3	4	443142	875958	B2	590.3	13.0	13.5									CL			6				
Bn		KEGI	3	4	443142	875958	B2	590.3	15.0	17.0									ML				14.0			4.5
Bn		KEGI	3	4	443142	875958	B2	590.3	20.0	21.5									ML			77				
Bn		KE	5	4	443142	875958	B2	590.3	30.0	30.7									ML			200				
Bn		UN	99	4	443147	875959	B3	584.2	6.0	7.5									SP			7				
Bn		UN	99	4	443147	875959	B3	584.2	8.0	9.0									SP			14				
Bn		KEGI	3	4	443147	875959	B3	584.2	9.0	9.5									CL				25.0			4.5
Bn		KEGI	3	4	443147	875959	B3	584.2	10.0	11.0									CL				12.0			
Bn		KE	5	4	443147	875959	B3	584.2	15.0	16.0									ML			104				
Bn		KE	5	4	443147	875959	B3	584.2	20.0	20.8									ML			100				
Bn		KE	5	4	443147	875959	B3	584.2	25.0	26.5									CL-CH			31				
Bn		KE	5	4	443147	875959	B3	584.2	30.0	31.5									CL-CH			29				
Bn		UN	99	4	443144	880003	B4	585.4	6.0	7.5									SP			10				
Bn		KEGI	3	4	443144	880003	B4	585.4	8.0	9.5									CL			16				
Bn		KEGI	3	4	443144	880003	B4	585.4	10.0	12.0									CL				18.0			4.5
Bn		KE	5	4	443144	880003	B4	585.4	15.0	17.0									ML				15.0			
Bn		KE	5	4	443144	880003	B4	585.4	20.0	22.0									ML-CH				15.0			4.5
Bn		KE	5	4	443144	880003	B4	585.4	25.0	27.0									ML-CH				23.0			4.5
Bn		KE	5	4	443144	880003	B4	585.4	30.0	32.0									ML-CH				21.0			4.3
Bn		KEGI	3	4	443146	880003	B5	591.6	10.0	11.5									CL			9				
Bn		KEGI	3	4	443146	880003	B5	591.6	15.0	17.0	1.80E-07	i			0	16	32	52	CL	95			15.0			1.3
Bn		KEGI	3	4	443146	880003	B5	591.6	20.0	21.5									CL			38				
Bn		KE	5	4	443146	880003	B5	591.6	25.0	26.5									CL-CH			42				
Bn		KECh	3	4	443146	880003	B5	591.6	30.0	32.0	2.10E-08	i			0	12	30	58	CL							
Bn		KECh	3	4	443146	880003	B5	591.6	31.5	32.0					0	35	55	10	ML	88						
Bn		UN	99	4	443150	880005	B6	587.5	8.0	9.5									SP-SP			7				
Bn		KEGI	3	4	443150	880005	B6	587.5	10.0	11.5									ML-CL			14				
Bn		KE	5	4	443150	880005	B6	587.5	15.0	17.0									ML-CL,CH				19.0			4.5
Bn		KE	5	4	443150	880005	B6	587.5	20.0	22.0									ML-CL,CH				18.0			4.5
Bn		KE	5	4	443150	880005	B6	587.5	25.0	27.0									ML-CL,CH				23.0			4.5
Bn		KE	5	4	443150	880005	B6	587.5	30.0	32.0									ML-CL,CH				25.0			2.0
Bn		UN	99	4	443147	880012	B7	585.4	8.0	9.5									SP			26				
Bn		KEGI	3	4	443147	880012	B7	585.4	10.0	11.5									CL			17				
Bn		KEGI	3	4	443147	880012	B7	585.4	15.0	17.0									CL							
Bn		KE	5	4	443147	880012	B7	585.4	20.0	21.5									ML				13.0			
Bn		KE	5	4	443147	880012	B7	585.4	25.0	26.5									CL-CH			28				
Bn		KE	5	4	443147	880012	B7	585.4	30.0	32.0									CL-CH				27.0			3.0
Bn		KEGI	3	4	443150	880011	B8	589.0	10.0	12.0	1.30E-08	i			11	20	52	28	CL	83						
Bn		KEGI	3	4	443150	880011	B8	589.0	15.0	17.0									CL				15.0			4.5
Bn		KE	5	4	443150	880011	B8	589.0	20.0	20.6									ML				15.0			
Bn		KE	5	4	443150	880011	B8	589.0	25.0	26.5									CL-CH			47				
Bn		KE	5	4	443150	880011	B8	589.0	30.0	31.5									CL-CH			33				

Appendix 3 - HYDROGEOLOGIC AND ENGINEERING DATA FOR BROWN COUNTY - NORTHLAND SLUDGE SITE

IDENTITY											HYDRAULIC CONDUCTIVITY				GRAINSIZE PERCENTAGES				ENGINEERING PROPERTIES							
County (code)	Year	Litho-strat. unit (code)	Mat. (code)	Site No.	Lat.	Long.	Brng. no.	Surf. Elev. (ft)	Sample top (ft)	Sample bottom (ft)	Lab K (cm/s)	Meth code	Fld K (cm/s)	Meth code	Bulk % >2.0mm	Matrix % sand (2.0 to 0.0625mm)	Matrix % silt (0.0625 to 0.002mm)	Matrix % clay (<0.002mm)	Unified Soil Class.	Bulk Percent P200	Dry Unit Wt. (pcf)	SPT (N)	Moist. cont. (%)	Liquid limit	Plastic. index	UC (tsf)
Bn		KE	5	4	443150	880011	B8	589.0	5.0	15.0			6.50E-04	7					fill,CL							
Bn		KE	5	4	443150	880011	B8	589.0	28.0	30.0			2.70E-07	7					CL-CH							
Bn		KEGI	3	4	443151	880010	B9	586.5	10.0	11.5									CL			23				
Bn		KE	5	4	443151	880010	B9	586.5	15.0	15.5									ML				13.0			4.5

Appendix 3 - HYDROGEOLOGIC AND ENGINEERING DATA FOR CALUMET COUNTY

IDENTITY: County (code)	Year	Litho-strat. unit (code)	Mat. (code)	Site No.	Lat.	Long.	Brno. no.	Surf. Elev. (ft)	Sample top (ft)	Sample bottom (ft)	HYDRAULIC CONDUCTIVITY: Lab K (cm/s)	Meth code	Fld K (cm/s)	Meth code	GRAINSIZE PERCENTAGES: Bulk % >2.0mm	Matrix % sand (2.0 to 0.0625mm)	Matrix % silt (0.0625 to 0.002mm)	Matrix % clay (<0.002mm)	ENGINEERING PROPERTIES: Unified Soil Class.	Bulk Percent P200	Dry Unit Wt. (pcf)	SPT (N)	Moist. cont. (%)	Liquid limit	Plastic. index	UC (tsf)
CA	1981	KECh	3	5	440609	881136	MW2	916.6	10.0	12.0	8.30E-08	1			14	22	78		CL	71				38	20	
CA	1981	KECh	3	5	440616	881128	MW5	918.0	10.0	12.0	1.90E-08	1			0	24	76		CL	90				49	30	
CA	1982	KECh	3	5	440616	881128	MW5A		5.0	15.0			4.70E-07	7					CL				23.0			4.3
CA	1982	UN	99	5	440609	881128	MW6B	907.5	33.3	40.3			2.60E-06	7					CL,ML							
CA	1982	KECh	3	5	440616	881137	MW7A	922.4	8.0	10.0	2.30E-08	1			6	23	71	5	CL	77				34	18	
CA	1982	KECh	3	5	440616	881137	MW7B	922.4	34.5	39.5			7.50E-07	7					CL				20.0			3.5
CA	1982	KECh	3	5	440619	881133	MW10	925.4	15.0	17.0	3.40E-08	1			1	13	47	39	CL	92				46	24	
CA	1982	KECh	3	5	440619	881133	MW10	925.4	40.0	42.0	2.00E-09	1			1	18	51	31	CL	86				39	22	
CA	1982	KECh	3	5	440619	881133	MW10	925.4	4.4	14.4			5.20E-07	7					CL				15.0			4.5
CA	1982	KECh	3	5	440616	881133	MW11	923.0	28.5	30.5	3.20E-08	1			0	12	40	48	CL	94				42	23	
CA	1982	KECh	3	5	440613	881133	MW12	921.7	10.0	12.0	3.50E-08	1			4	15	51	34	CL	84				31	14	
CA	1982	KECh	3	5	440613	881133	MW12	921.7	53.5	55.5	4.50E-09	1			4	31	43	26	CH	73				54	27	
CA	1982	KECh	3	5	440613	881133	MW12	921.7	5.7	15.7			9.40E-07	7					CL							

Appendix 3 - HYDROGEOLOGIC AND ENGINEERING DATA FOR DANE COUNTY - HYDRITE CHEMICAL CORPORATION

IDENTITY											HYDRAULIC CONDUCTIVITY				GRAINSIZE PERCENTAGES				ENGINEERING PROPERTIES							
County (code)	Year	Litho-strat. unit (code)	Mat. (code)	Site No.	Lat.	Long.	Brng. no.	Surf. Elev. (ft)	Sample top (ft)	Sample bottom (ft)	Lab K (cm/s)	Meth code	Fld K (cm/s)	Meth code	Bulk % >2.0mm	Matrix % sand (2.0 to 0.0625mm)	Matrix % silt (0.0625 to 0.002mm)	Matrix % clay (<0.002mm)	Unified Soil Class.	Bulk Percent P200	Unit Dry Wt. (pcf)	SPT (N)	Moist. cont. (%)	Liquid limit	Plastic. index	UC (tsf)
DN	1984	HO	99	6	430438	891154	W3		15.4	23.0			1.07E-02	9					SM,SP-SM							
DN	1984	HO	99	6	430438	891154	W3		15.4	23.0			2.80E-03	9					SM,SP-SM							
DN	1984	HO	4	6	430438	891154	P6		38.0	48.0			3.47E-03	9												
DN	1984	HO	4	6	430438	891154	P6		38.0	48.0			9.84E-04	9												
DN	1984	HO	4	6	430438	891154	P6		38.0	48.0			1.76E-03	9												
DN	1984	HO	99	6	430438	891154	P22		48.0	65.0			5.88E-03	9												
DN	1984	HO	99	6	430438	891154	P22		48.0	65.0			1.50E-03	9												
DN	1984	HO	99	6	430438	891154	P22		48.0	65.0			1.32E-03	9												
DN	1980	UN	99	6	430440	891152	B2		1.0	2.5									CL			13	23.6	38	17	
DN	1982	UN	99	6	430438	891156	B1		1.0	2.5									CL-CH			11	24.7	57	35	1.5
DN	1982	UN	99	6	430438	891154	B3		1.0	2.5									CL			11	24.0			2.5
DN	1982	UN	99	6	430438	891154	B3		3.5	5.0									CL-CH			16	27.1			1.5
DN	1982	UN	99	6	430440	891150	B4		1.0	2.5									CL-CH				24.2			1.5
DN	1982	UN	99	6	430440	891150	B4		3.5	5.0									CL-CH			14	25.2	52	28	3.0
DN	1982	UN	99	6	430438	891154	B6		6.0	7.5									OL			13	24.9			1.0
DN	1983	HO	4	6	430438	891154	P6		33.5	35.0					18	84			SM,SP-SM	15		288				
DN	1983	HO	4	6	430438	891154	P6		38.0	48.0									SM,SP-SM							
DN	1983	HO	3	6	430437	891155	W7		9.0	15.0			7.01E-04	7					SM,SP-SM							
DN	1983	UN	7	6	430440	891142	W8		9.2	14.5			2.20E-04	7					SP,CL							
DN	1983	HO	3	6	430438	891150	W9		14.7	21.0			6.90E-04	7					SM,SP-SM							
DN	1983	HO	3	6	430438	891150	P10		35.0	45.0			9.00E-04	7					SM,SP-SM			180				
DN	1983	HO	99	6	430438	891150	P10		13.5	15.0					13	83			SM	16						
DN	1983	HO	4	6	430438	891150	P10		43.5	45.0					17	89			SP-SM	11						
DN	1983	UNHO	993	6	430434	891154	W11		7.6	12.5			1.40E-04	7					CL,GM,SM							
DN	1983	HO	3	6	430434	891154	W11			12.5					46	59			GM,SM	23		46				
DN	1983	HO	3	6	430437	891142	W12			53.0					2	92				11						
DN	1983	UN	7	6	430442	891156	W13		3.3	6.0			3.66E-04	7					CL					43	16	
DN	1983	UN	7	6	430442	891156	W13			5.0					0	2	65	33	CL	100						
DN	1983	HO	3	6	430445	891147	W14		13.1	29.0			3.38E-06	7					SP-SM,SP							

Appendix 3 - HYDROGEOLOGIC AND ENGINEERING DATA FOR DANE COUNTY LIBBY ROAD SITE

IDENTITY County (code)	Year	Litho-strat. unit (code)	Mat. (code)	Site No.	Lat.	Long.	Brng. no.	Surf. Elev. (ft)	Sample top (ft)	Sample bottom (ft)	HYDRAULIC CONDUCTIVITY Lab K (cm/s)	Meth code	Fld K (cm/s)	Meth code	GRAINSIZE PERCENTAGES Bulk % >2.0mm	Matrix % sand (2.0 to 0.0625mm)	Matrix % silt (0.0625 to 0.002mm)	Matrix % clay (<0.002mm)	ENGINEERING PROPERTIES Unified Soil Class.	Bulk Percent P200	Unit Dry Wt. (pcf)	SPT (N)	Moist. cont.(%)	Liquid limit	Plastic. index	UC (tsf)
DN	1981	HO	6	7	430125	892041	L1A		1.5	2.5					1				CL	91		36		45	22	4.5
DN	1981	HO	3	7	430125	892041	L1A		7.0	7.5					7					21						
DN	1981	HO	3	7	430125	892041	L1A		13.5	15.0					9				SM	32						
DN	1981	HO	99	7	430115	892035	L1B		3.5	5.0					0					99						
DN	1982	HO	99	7	430115	892022	L3A		29.5	38.0			2.60E-04	7												
DN	1982	HO	3	7	430131	892049	L4A		28.5	30.0					12	75	19	6	SM	26		55				
DN	1982	HO	99	7	430131	892028	L5A		13.5	15.0					8	61	29	10	SM	41						
DN	1982	HO	4	7	430126	892028	L8B		43.5	45.0					3				SM	18		127				
DN	1982	HO	3	7	430126	892028	L8B		58.5	60.0					11	85	9	6	SM	16		79				
DN	1982	HO	3	7	430125	892019	L9B		8.5	10.0									SM	15		52				
DN	1982	HO	4	7	430125	892019	L9B		43.5	45.0					2				SM	14		33				
DN	1982	HO	3	7	430120	892028	L11A		15.0	29.0			1.30E-04	7												
DN	1982	HO	3	7	430120	892028	L11B		13.5	15.0					25	89	5	5	SP-SM	10		34				
DN	1982	HO	3	7	430115	892043	L12A		12.1	24.0			3.00E-04	7												
DN	1982	HO	3	7	430115	892043	L12C		28.5	30.0					10	79	12	9	SM	24		17				
DN	1982	HO	3	7	430117	892026	L13		33.5	35.0					13	79	17	3	SM	21		19				
DN	1982	HO	3	7	430116	892007	L14C		13.5	15.0					7	68	25	8	SM	37		36				
DN	1982	HO	4	7	430116	892007	L14C		28.5	30.0					0	95			SP	5		33				
DN	1982	HO	4	7	430116	892007	L14C		58.5	60.0					13	94			SP-SM	6		70				
DN	1982	HO	5	7	430108	892043	L15A		8.5	10.0					12	45	49	6	CL	55		24		18	3	
DN	1982	HO	4	7	430108	892043	L15A		28.5	30.0					13	74	22	5	SM	28		64				
DN	1982	HO	4	7	430105	892028	L16B		18.5	20.0					0				SP-SM	11		33				
DN	1982	HO	5	7	430105	892028	L16B		33.5	35.0					1	16	74	10	CL	88		121		23	4	
DN	1982	HO	4	7	430107	892020	L17		8.5	10.0					4				SM	17		21				
DN	1982	HO	3	7	430107	892020	L17		13.5	15.0					8	70	25	5	SM	35		6				
DN	1982	HO	3	7	430109	892013	L18B		9.0	34.0			3.40E-03	7												
DN	1982	HO	3	7	430109	892013	L18C		13.5	15.0					4	73	21	6	SM	33		64				
DN	1982	HO	4	7	430109	892013	L18C		28.5	30.0					42	86			SP-SM	8		67				
DN	1982	HO	4	7	430109	892013	L18C		48.5	50.0					0	90			SM	13		118				
DN	1983	HO	3	7	430118	892022	L23		18.5	20.0									SM	20		45				
DN	1983	HO	4	7	430113	892030	L25		18.5	20.0									SP-SM	6		11				
DN	1981	HO	6	7	430131	892055	LTP1		5.0	5.0					0	13	64	23	CL	90			23.8	43	21	
DN	1981	HO	6	7	430131	892050	LTP2		6.0	6.0					0	13	69	18	CL	93			24.4	39	17	
DN	1981	HO	6	7	430117	892037	LTP13		4.0	4.0					0	8	71	21	CL	98			24.0	39	18	
DN	1981	HO	6	7	430120	892020	LTP16		3.0	3.0					0	12	68	20	CL	95			25.5	43	21	
DN	1981	HO	6	7	430107	892020	LTP17		3.0	3.0					0	12	69	19	CL	93			24.3	43	22	
DN	1981	HO	6	7	430120	892017	LTP19		4.0	4.0					0	29	59	12	CL	76			22.7	29	12	
DN	1981	HO	6	7	430117	892037	LTP22		4.0	4.0					0	14	65	21	CL	92			24.2	39	19	
DN	1981	HO	6	7	430113	892022	LTP31		3.0	3.0													24.3	41	20	
DN	1981	HO	6	7	430113	892017	LTP32		3.0	3.0					0	9	68	23	CL	94						
DN	1981	HO	6	7	430107	892022	LTP41		5.0	5.0					0	8	78	14	CL	96			21.0	32	12	

Appendix 3 - HYDROGEOLOGIC AND ENGINEERING DATA FOR DODGE COUNTY, CARL SCHMITT LANDFILL

IDENTITY: County (code)	Year	Litho-strat. unit (code)	Mat. (code)	Site No.	Lat.	Long.	Brng. no.	Surf. Elev. (ft)	Sample top (ft)	Sample bottom (ft)	HYDRAULIC CONDUCTIVITY: Lab K (cm/s)	Meth code	Fld K (cm/s)	Meth code	GRAINSIZE PERCENTAGES: Bulk % >2.0mm	Matrix % sand (2.0 to 0.0625mm)	Matrix % silt (0.0625 to 0.002mm)	Matrix % clay (<0.002mm)	ENGINEERING PROPERTIES: Unified Soil Class.	Bulk Percent P200	Dry Unit Wt. (pcf)	SPT (N)	Moist. cont.(%)	Liquid limit	Plastic. index	UC (tsf)
DG	1976	HO	3	8	432315	885248	B11		10.0											51		32				
DG	1976	HO	3	8	432315	885248	B11		19.5						13					51		104				
DG	1976	HO	3	8	432315	885248	B11		10.0		3.90E-07	3														
DG	1976	HO	3	8	432316	885252	B13		9.5											48		47				
DG	1976	HO	3	8	432316	885252	B13		30.0											48		194				
DG	1976	HO	3	8	432316	885252	B13		24.5		7.30E-09	3														
DG	1976	HO	3	8	432307	885301	B14		9.0											48		144				
DG	1976	HO	3	8	432307	885301	B14		23.0											45		120				
DG	1976	UN	99	8	432320	885253	B16		4.5														25.9	37	25	11.6
DG	1976	HO	3	8	432320	885253	B16		9.5											39		28				
DG	1976	HO	3	8	432320	885253	B16		7.5											40		25				
DG	1976	UN	99	8	432314	885259	B17		11.0		1.60E-06	3														
DG	1976	UN	99	8	432314	885259	B17		6.0		4.30E-08	3														
DG	1976	HO	3	8	432314	885259	B17		20.0											56		17				
DG	1976	UN	99	8	432329	885252	B18		4.5													8	19.2	28	25	2.4
DG	1976	HO	3	8	432329	885252	B18		7.0											66		16				
DG	1976	HO	3	8	432320	885259	B19		19.5						19											
DG	1976	UN	99	8	432320	885259	B19		4.5													6	27.0	43	19	
DG	1976	HO	3	8	432320	885259	B19		9.5										SC,SM							
DG	1976	HO	3	8	432307	885301	W14		17.9	24.6			1.13E-05	7												
DG	1976	HO	3	8	432307	885301	W14		14.0		9.10E-08	3														
DG	1976	HO	3	8	432329	885246	W15		14.0		5.90E-08	3														
DG	1976	HO	3	8	432320	885253	W16		5.7	16.8			2.05E-05	7												
DG	1976	UN	99	8	432314	885259	W17		4.6	18.7			6.99E-05	7												
DG	1976	UN	99	8	432314	885259	W17		8.0	10.0										99			19.8	22	18	4.5
DG	1976	HO	3	8	432329	885252	W18		9.5		1.00E-07	3														
DG	1976	UN	99	8	432320	885259	W19		10.0		1.20E-07	3														
DG	1976	HO	3	8	432320	885259	W19	5.7	23.5				5.18E-05	7												
DG	1976	HO	3	8	432320	885259	W19A	28.4	30.4				9.84E-05	7												
DG	1982	UN	5	8	432307	885253	B12		9.5		1.00E-07	3														
DG	1982	HO	3	8	432310	885255	B22	828.0	23.5	25.0					21	49	38	13	SM	50		81		15	4	
DG	1982	UN	99	8	432310	885255	B22	828.0	3.5	5.0					0	14	62	24	CL	90		12		48	26	1.5
DG	1982	UN	99	8	432312	885300	B24	824.3	3.5	5.0					0	15	63	22	CL	98		2		37	15	
DG	1982	HO	3	8	432312	885300	B24	824.3	13.5	15.0					16	50	36	14	SM	50		59		14	4	
DG	1982	UN	99	8	432315	885303	B25	835.9	1.0	2.5					0	5	75	20	CL	95		8		39	24	1.0
DG	1982	UN	99	8	432307	885305	B26	821.0	3.5	5.0					0	6	70	24	ML	100		5		38	11	0.5
DG	1982	UN	99	8	432333	885253	B30	852.0	1.0	2.5					4	29	47	24	CL	70		8		38	15	
DG	1982	UN	99	8	432330	885250	B32	855.0	1.0	2.5					0	9	74	17	CL-ML	98		6		28	8	
DG	1982	UN	99	8	432330	885244	B34	846.0	1.0	2.5					0	5	70	25	CL	95		7		39	17	1.0
DG	1982	HO	3	8	432307	885253	W12A	813.6	23.5	30.0			3.64E-06	7					SM							
DG	1982	HO	34	8	432312	885256	W27	839.8	44.0	56.5			1.31E-05	7												
DG	1982	HO	3	8	432312	885256	W27	839.8	43.5	45.0					12	52	26	22	ML	52		100		16	4	
DG	1982	HO	3	8	432310	885303	W28	826.4	9.0	20.0			9.80E-04	7												
DG	1982	HO	3	8	432314	885307	W29	841.3	8.0	19.5			6.67E-06	7												
DG	1982	HO	3	8	432314	885307	W29A	841.0	22.0	34.0			1.40E-05	7												
DG	1983	UN	99	8	432307	885256	B38		3.5	5.0					0	4	70	26	ML	100		7	28.0	35	10	0.7

Appendix 3 - HYDROGEOLOGIC AND ENGINEERING DATA FOR DODGE COUNTY, CARL SCHMITT LANDFILL

IDENTITY: County (code)	Year	Litho-strat. unit (code)	Mat. (code)	Site No.	Lat.	Long.	Brng. no.	Surf. Elev. (ft)	Sample top (ft)	Sample bottom (ft)	HYDRAULIC CONDUCTIVITY: Lab K (cm/s)	Meth code	Fld K (cm/s)	Meth code	GRAINSIZE PERCENTAGES: Bulk % >2.0mm	Matrix % sand (2.0 to 0.0625mm)	Matrix % silt (0.0625 to 0.002mm)	Matrix % clay (<0.002mm)	ENGINEERING PROPERTIES: Unified Soil Class.	Bulk Percent P200	Dry Unit Wt. (pcf)	SPT (N)	Moist. cont.(%)	Liquid limit	Plastic. index	UC (tsf)
DG	1983	UN	99	8	432307	885303	B39		3.5	5.0									ML			4	32.0	42	15	0.5
DG	1983	UN	5	8	432307	885303	B39		18.5	20.0									CL				23.0	31	13	
DG	1983	UN	99	8	432307	885303	B39		6.0	7.5					0	10	76	14	ML	100		4				
DG	1983	UN	99	8	432307	885303	B39		8.5	10.0					0	7	77	16	ML	100		6	23.0	24	1	0.5
DG	1983	UN	99	8	432310	885302	B40		6.0	7.5					0	6	74	20	ML	100		7	24.0	27	5	1.0
DG	1983	UN	99	8	432314	885301	B41		3.5	5.0					0	8	72	20	CL	100		8	21.0	34	13	1.5
DG	1983	UN	99	8	432316	885259	B42		1.0	2.5					0	7	62	31	CL	100		9	23.0	42	16	1.0
DG	1983	HO	3	8	432399	885299	G51		15.0						19	53	40	7	SM	43				15	3	
DG	1983	HO	3	8	432399	885299	G52		10.0						21	53	41	6	SM	42				15	3	
DG	1983	HO	3	8	432399	885299	G53		2.0						14	47	34	20	SC	48				24	8	
DG	1983	UN	99	8	432312	885252	TP4	830.0	3.0						0	4	68	28	CL	100				36	13	
DG	1983	UN	99	8	432308	885302	TP5	823.0	6.0						0	5	70	25	ML	100				33	9	
DG	1983	UN	99	8	432310	885259	TP6	834.0	5.0						2	22	59	18	ML	81				21	1	
DG	1983	UN	99	8	432313	885300	TP7	825.0	5.0						0	1	74	25	CL-ML	99				30	7	
DG	1983	UN	99	8	432324	885256	TP8	846.0	2.5						2	19	55	26	CL	82				30	9	
DG	1983	UN	99	8	432325	885250	TP9	841.0	6.0						0	3	70	27	CL	98				32	9	
DG	1985	UN	99	8	432047	885136	B6N		3.5	5.0					0	3	72	25	CL	100		14	28.0	31	11	0.6
DG	1985	UN	99	8	431854	890145	B6S		3.5	5.0					0	5	61	34	CL	100		10	27.0	44	25	1.5
DG	1985	UN	99	8	432043	885133	B8N		3.5	5.0					2	29	47	24	CL	74		15	21.0	31	15	
DG	1985	UN	99	8	432048	885135	TP13		1.0	4.0					0	5	67	28	CL	99			24.0	41	21	
DG	1985	UN	99	8	431857	890138	TP4		2.0	7.0					0	10	66	24	CL	96			24.0	41	21	

Appendix 3 - HYDROGEOLOGIC AND ENGINEERING DATA FOR DODGE COUNTY, HECHIMOVICH SITE

IDENTITY: County (code)	Year	Litho-strat. unit (code)	Mat. (code)	Site No.	Lat.	Long.	Brng. no.	Surf. Elev. (ft)	Sample top (ft)	Sample bottom (ft)	HYDRAULIC CONDUCTIVITY: Lab K (cm/s)	Meth code	Fld K (cm/s)	Meth code	GRAINSIZE PERCENTAGES: Bulk % >2.0mm	Matrix % sand (2.0 to 0.0625mm)	Matrix % silt (0.0625 to 0.002mm)	Matrix % clay (<0.002mm)	ENGINEERING PROPERTIES: Unified Soil Class.	Bulk Percent P200	Dry Unit Wt. (pcf)	SPT (N)	Moist. cont. (%)	Liquid limit	Plastic. index	UC (tsf)
DG	1984	UN	5	9	432744	883315	W1	930.0	4.1	17.0			3.40E-04	7					CL,ML,SP							
DG	1984	HO	99	9	432743	883326	W2	961.1	18.2	60.0			1.93E-04	7					SC-SM,ML.SM							
DG	1984	HO	3	9	432748	883326	W4	980.8	20.8	45.0			7.75E-06	7					CL,SM-SC							
DG	1984	HO	34	9	432748	883326	W4A	980.8	66.0	77.0			1.25E-05	7					SM-SC							
DG	1984	UN	3	9	432758	883314	W6	982.3	21.7	35.0			3.44E-05	7					ML							
DG	1984	HO	3	9	432808	883305	W7	935.2	14.0	25.0			1.54E-04	7					SM-SC							
DG	1984	UN	3	9	432808	883320	W8A	943.4	43.5	45.0					3	38			ML	66		62				
DG	1984	HO	3	9	432748	883316	W9	935.9	15.0	20.0			2.52E-04	7					SM							
DG	1984	HO	3	9	432801	883321	W11	976.9	24.0	35.0			1.49E-04	7					SM-SC							
DG	1984	HO	99	9	432801	883321	W11A	977.0	47.0	55.0			2.55E-04	7					SM,SM/ML							
DG	1984	HO	3	9	432803	883311	W12	989.4	34.0	45.0			3.05E-05	7					SW-SM,SM-SC							
DG	1984	HO	3	9	432803	883311	W12A	989.4	69.0	80.0			3.00E-06	7					ML-SM							
DG	1984	UN	3	9	432748	883319	B16	961.6	18.5	20.0					19	37			ML	52		100				
DG	1984	HO	3	9	432749	883315	B17	937.6	13.5	15.0					1	78			SM	23		72				
DG	1984	HO	3	9	432752	883326	B21	982.0	18.5	20.0					19	42			SM	49		100				
DG	1984	HO	3	9	432754	883314	B22	969.9	43.5	45.0					12	33			ML	60		240				
DG	1984	UN	3	9	432757	883311	B24	975.0	18.5	20.0					15	42			ML	52		150				
DG	1984	HO	3	9	432803	883315	B28	966.0	38.5	40.0					24	49			SM	41		171				
DG	1984	HO	3	9	432804	883306	B29	947.3	13.5	15.0					5	53			ML	49		300				
DG	1984	UN	3	9	432806	883310	B30	972.3	38.5	40.0					6	30			ML	70		120				
DG	1984	UN	3	9	432752	883323	B31	983.8	48.5	50.0					18	39			ML	52						
DG	1984	UN	99	9	432729	883333	B101		1.0	2.5					5	24	52	24	CL	75				45	20	
DG	1984	UN	99	9	432732	883335	B102		1.0	2.5					0	12	65	23	CL	92				45	21	
DG	1984	UN	99	9	432732	883335	B102		3.5	5.0					0	12	78	10	CL	93				30	19	
DG	1984	UN	99	9	432737	883335	B103		3.5	5.0					0	12	69	19	CL	92				40	18	
DG	1984	UN	99	9	432738	883330	B104		3.5	5.0					17	55	39	6	CL-SC	46				14	11	
DG	1984	UN	99	9	432739	883328	B105		1.0	2.5					0	13	78	19	CL	91				41	21	
DG	1984	UN	99	9	432739	883328	B105		3.5	5.0					1	23	67	10	CL	83				32	18	
DG	1984	UN	6	9	432735	883335	B106		3.5	5.0					0	22	72	6	ML	89				24	18	
DG	1984	UN	7	9	432742	883330	B107		1.0	2.5					0	10	67	23	CL	94				46	22	
DG	1984	UN	99	9	432743	883332	B108		3.5	5.0					0	22	63	15	CL	84				45	21	
DG	1984	UN	99	9	432743	883320	B109		3.5	5.0					0	18	67	15	CL	85				37	21	
DG	1984	UN	6	9	432757	883317	B111		1.0	2.5					0	19	67	14	CL	86				38	20	
DG	1984	UN	6	9	432808	883316	B112		1.0	2.5					0	13	68	19	CL	91				39	20	
DG	1984	UN	6	9	432806	883304	B113		1.0	2.5					0	9	68	23	CL	94				47	22	
DG	1984	UN	6	9	432806	883304	B113		3.5	5.0					0	13	67	20	CL	93				39	19	
DG	1984	UN	67	9	432759	883307	B118		1.0	2.5					0	17	75	8	CL-ML	87				29	19	

Appendix 3 - HYDROGEOLOGIC AND ENGINEERING DATA FOR DOOR COUNTY BALEFILL

IDENTITY County (code)	Year	Litho-strat. unit (code)	Mat. (code)	Site No.	Lat.	Long.	Brng. no.	Surf. Elev. (ft)	Sample top (ft)	Sample bottom (ft)	HYDRAULIC CONDUCTIVITY Lab K (cm/s)	Meth code	Fld K (cm/s)	Meth code	GRAINSIZE PERCENTAGES Bulk % >2.0mm	Matrix % sand (2.0 to 0.0625mm)	Matrix % silt (0.0625 to 0.002mm)	Matrix % clay (<0.002mm)	ENGINEERING PROPERTIES Unified Soil Class.	Bulk Percent P200	Dry Unit Wt. (pcf)	SPT (N)	Moist. cont. (%)	Liquid limit	Plastic. index	UC (tsf)
DR	1979	KEGI	3	10	445148	872640	B5	662.0	8.0	10.0					7	32	41	27	CL	72						
DR	1979	KEGI	3	10	445148	872640	B5	662.0	15.0	17.0	7.10E-09	3							CL							
DR	1979	KEGI	3	10	445147	872652	B6	662.7	10.0	12.0	7.80E-09	3			6	38	34	28	CL	68						
DR	1979	KEGI	3	10	445142	872652	B9	659.0	20.0	22.0					0	34	36	30	CL	74						
DR	1979	KEGI	3	10	445142	872652	B9	659.0	25.1	35.1			8.00E-07	7												
DR	1979	KEGI	3	10	445142	872652	B9	659.0	25.1	35.1			4.10E-07	7												
DR	1979	KEGI	3	10	445141	872700	B10	647.5	8.0	10.0	1.10E-08	3							CL							
DR	1979	KEGI	3	10	445141	872700	B10	647.5	10.0	12.0					3	33	40	27	CL	73						
DR	1979	KEGI	3	10	445141	872700	B10	647.5	25.0	35.0			4.80E-07	7												
DR	1979	KEGI	3	10	445141	872700	B10	647.5	25.0	35.0			2.40E-07	7												
DR	1979	KEGI	3	10	445141	872709	B11	648.6	55.0	57.0					12	35	36	28	CL	65						
DR	1979	UN	4	10	445141	872709	B11	648.6	70.0	71.0					31	34			SM	38						
DR	1979	KEGI	3	10	445137	872703	B14	651.1	30.0	32.0					4	36	36	27	CL	69						
DR	1979	KEGI	3	10	445137	872654	B13	659.2	24.4	34.4			1.70E-07	7					CL							
DR	1979	KEGI	3	10	445132	872703	B17	668.4	26.0	36.0			8.10E-07	7					CL							
DR	1979	KEGI	3	10	445132	872709	B18	661.8	25.7	35.7			1.80E-06	7					CL							
DR	1979	KEGL	3	10	445141	872705	B19		35.0	40.0			2.10E-07	7												
DR	1973	UN	99	10	445147	872653	M1	656.3	0.0	1.0									OL				25.0			
DR	1973	KEGI	3	10	445147	872653	M1	656.3	1.0	2.0									CL				23.0			2.5
DR	1973	KEGI	3	10	445147	872653	M1	656.3	2.0	4.0									CL				15.0			2.9
DR	1973	KEGI	3	10	445147	872653	M1	656.3	4.0	5.5									CL			33				
DR	1973	KEGI	3	10	445147	872653	M1	656.3	6.0	8.0									CL				15.0			4.5
DR	1973	KEGI	3	10	445147	872653	M1	656.3	8.0	10.0									CL				15.0			4.5
DR	1973	KEGI	3	10	445147	872653	M1	656.3	10.0	12.0									CL				16.0			4.5
DR	1973	UN	99	10	445147	872644	M3	663.9	0.0	0.5									OL				24.0			1.8
DR	1973	KEGI	3	10	445147	872644	M3	663.9	0.5	2.0									CL				16.0			2.9
DR	1973	KEGI	3	10	445147	872644	M3	663.9	2.0	4.0									CL				15.0			4.5
DR	1973	KEGI	3	10	445147	872644	M3	663.9	4.0	6.0									CL				13.0			4.5
DR	1973	KEGI	3	10	445147	872644	M3	663.9	6.0	8.0									CL				15.0			4.5
DR	1973	KEGI	3	10	445147	872644	M3	663.9	10.0	11.5									CL							
DR	1973	UN	99	10	445147	872644	M3	663.9	15.0	17.0									CL				18.0			2.9
DR	1973	UN	99	10	445147	872644	M3	663.9	20.0	22.0									CL				18.0			2.3
DR	1973	UN	99	10	445142	872648	M5	662.1	0.0	0.3									OL				21.0			1.9
DR	1973	KEGI	3	10	445142	872648	M5	662.1	0.3	2.0									CL				18.0			2.5
DR	1973	KEGI	3	10	445142	872648	M5	662.1	2.0	4.0	1.20E-08	3							CL		115.0		16.7			
DR	1973	KEGI	3	10	445142	872648	M5	662.1	4.0	5.5									CL			37				
DR	1973	KEGI	3	10	445142	872648	M5	662.1	6.0	8.0									CL				14.0			4.5
DR	1973	KEGI	3	10	445142	872648	M5	662.1	8.0	9.5									CL			27				
DR	1973	KEGI	3	10	445142	872648	M5	662.1	10.0	12.0									CL				18.0			4.1
DR	1973	UN	3	10	445142	872648	M5	662.1	15.0	17.0									CL				19.0			2.0
DR	1973	UN	3	10	445142	872648	M5	662.1	20.0	22.0									CL				18.0			2.2
DR	1973	UN	99	10	445139	872653	M7	656.8	0.0	0.5									OL				25.0			0.3
DR	1973	KEGI	3	10	445139	872653	M7	656.8	0.5	2.0									CL				18.0			4.0
DR	1973	KEGI	3	10	445139	872653	M7	656.8	2.0	4.0									CL				15.0			4.5
DR	1973	KEGI	3	10	445139	872653	M7	656.8	4.0	6.0									CL				15.0			4.5
DR	1973	KEGI	3	10	445139	872653	M7	656.8	6.0	8.0									CL				16.0			4.5

Appendix 3 - HYDROGEOLOGIC AND ENGINEERING DATA FOR DOOR COUNTY BALEFILL

County (code)	Year	Litho-strat. unit (code)	Mat. (code)	Site No.	Lat.	Long.	Brng. no.	Surf. Elev. (ft)	Sample top (ft)	Sample bottom (ft)	Lab K (cm/s)	Meth code	Fld K (cm/s)	Meth code	Bulk % >2.0mm	Matrix % sand (2.0 to 0.0625mm)	Matrix % silt (0.0625 to 0.002mm)	Matrix % clay (<0.002mm)	Unified Soil Class.	Bulk Percent P200	Dry Unit Wt. (pcf)	SPT (N)	Moist. cont. (%)	Liquid limit	Plastic. index	UC (tsf)
IDENTITY											HYDRAULIC CONDUCTIVITY				GRAINSIZE PERCENTAGES				ENGINEERING PROPERTIES							
DR	1973	KEG1	3	10	445139	872653	M7	656.8	8.0	10.0									CL				18.0			4.3
DR	1973	KEG1	3	10	445139	872653	M7	656.8	10.0	12.0									CL				15.0			4.2
DR	1973	KEG1	3	10	445140	872644	M9	670.8	0.0	2.0													19.0			2.9
DR	1973	KEG1	3	10	445140	872644	M9	670.8	2.0	3.0													22.0			
DR	1973	KEG1	3	10	445140	872644	M9	670.8	3.0	4.0									ML				13.0			
DR	1973	KEG1	3	10	445140	872644	M9	670.8	4.0	6.0									CL				20.0			4.5

Appendix 3 - HYDROGEOLOGIC AND ENGINEERING DATA FOR DOOR COUNTY - TOWN OF WASHINGTON SITE

IDENTITY County (code)	Year	Litho-strat. unit (code)	Mat. (code)	Site No.	Lat.	Long.	Brng. no.	Surf. Elev. (ft)	Sample top (ft)	Sample bottom (ft)	HYDRAULIC CONDUCTIVITY Lab K (cm/s)	Meth code	Fld K (cm/s)	Meth code	GRAINSIZE PERCENTAGES Bulk % >2.0mm	Matrix % sand (2.0 to 0.0625mm)	Matrix % silt (0.0625 to 0.002mm)	Matrix % clay (<0.002mm)	ENGINEERING PROPERTIES Unified Soil Class.	Bulk Percent P200	Dry Unit Wt. (pcf)	SPT (N)	Moist. cont. (%)	Liquid limit	Plastic. index	UC (tsf)
Dr	1976	HOLg	3	11	452310	865315	TP1	640.0	2.0	10.0					57	95	5	0	SW	3						
Dr	1976	UN	4	11	452309	865315	TP2	638.0	2.0	4.0					2	100			SP	0						2.2
Dr	1976	HOLg	3	11	452309	865315	TP2	638.0	5.5	10.0					60	30	70		SW	28						
Dr	1976	HOLg	3	11	452312	865317	TP3	630.0	0.7	4.0					46	19	81	2	SP	44						
Dr	1976	UN	4	11	452399	865399	T4	638.0	13.5	19.0					1	96	4	0	SP	4						
Dr	1976	UN	4	11	452399	865399	T4	638.0	19.0						1	16	78	6	ML	84						
Dr	1976	UN	99	11	452399	865399	T5	625.0	0.0	4.0					4	98	2	0	SP	2						
Dr	1976	UN	99	11	452399	865399	T5	625.0	4.0	11.0					9	99	1	0	SP	1						
Dr	1976	UN	99	11	452399	865399	T5	625.0	11.0	14.0					2	62	33	5	ML	37						
Dr	1976	HOLg	3	11	452399	865399	T5	625.0	14.0						32	59	32	9	SW-SM	28						
Dr	1976	HOLg	3	11	452307	865308	TP6	640.0	0.0	6.0					2	98	2	0	SP	2						
Dr	1976	UN	99	11	452308	865319	TP7	635.0	0.0	2.5					1	82	17	1	SM	18						
Dr	1976	UN	99	11	452308	865319	TP7	635.0	2.5	3.0					2	67	28	5	SM	32						
Dr	1976	UN	99	11	452308	865319	TP7	635.0	3.0	6.0					3	99	1	0	SP	1						
Dr	1976	HOLg	3	11	452308	865319	TP7	635.0	6.0	7.0					24	51	43	5	SW-SM	37						
Dr	1977	HOLg	3	11	452308	865314	B9	635.6	5.0	6.5					57	77			SM	10		21				
Dr	1977	HOLg	3	11	452308	865314	B9	635.6	10.0	11.5					85	67			GP-GM	5		37				
Dr	1977	HOLg	3	11	452308	865314	B9	635.6	20.0	21.5					0	82			SM	20						
Dr	1977	HOLg	3	11	452309	865313	B11	647.9	5.0	6.5					69	71			SP-GP	9		71				
Dr	1977	HOLg	3	11	452309	865313	B11	647.9	15.0	16.5					83	88			GP	2		16				
Dr	1977	HOLg	3	11	452310	865313	B12	648.3	10.0	11.5					83	76			GM	4		32				
Dr	1977	HOLg	3	11	452310	865319	B14	635.3	2.5	3.5					26	58			SM	31						
Dr	1977	HOLg	3	11	452310	865319	B14	635.3	5.0	6.5					33	60			GM	27		35				
Dr	1977	HOLg	3	11	452306	865305	B17	642.3	12.5	14.0					69	81			GP	9						
Dr	1977	HOLg	3	11	452305	865304	B18	642.0	2.5	3.0					73	63			GM	10						
Dr	1977	HOLg	3	11	452308	865317	B19	625.8	5.0	6.5					0	92			SP	10		18				
Dr	1977	HOLg	3	11	452308	865317	B19	625.8	12.5	14.0					0	85			SM-SC	17						
Dr	1977	HOLg	3	11	452306	865317	B15	617.7	5.0	6.5					10	96			SP	4		8				
Dr	1977	HOLg	3	11	452306	865317	B15	617.7	10.0	11.5	1.30E-04				4	100			SP	0		31				
Dr	1977	HOLg	3	11	452306	865317	B15	617.7	15.0	16.5					0	6			ML	95		10				
Dr	1977	HOLg	3	11	452306	865317	B15	617.7	20.0	21.5					22	42			SC-SM	45		11				
Dr	1977	HOLg	3	11	452305	865308	B16	625.4	15.0	16.5					1	96			SP	4		32				
Dr	1977	HOLg	3	11	452305	865308	B16	625.4	20.0	22.0					0	13			SC-SM	88						
Dr	1977	HOLg	3	11	452305	865308	B16	625.4	22.5	24.0					41	61			SM	23		45				

Appendix 3 - HYDROGEOLOGIC AND ENGINEERING DATA FOR FOND DU LAC COUNTY - ELDORADO SITE

IDENTITY											HYDRAULIC CONDUCTIVITY				GRAINSIZE PERCENTAGES				ENGINEERING PROPERTIES							
County (code)	Year	Litho-strat. unit (code)	Mat. (code)	Site No.	Lat.	Long.	Brng. no.	Surf. Elev. (ft)	Sample top (ft)	Sample bottom (ft)	Lab K (cm/s)	Meth code	Fld K (cm/s)	Meth code	Bulk % >2.0mm	Matrix % sand (2.0 to 0.0625mm)	Matrix % silt (0.0625 to 0.002mm)	Matrix % clay (<0.002mm)	Unified Soil Class.	Bulk Percent P200	Unit Dry Wt. (pcf)	SPT (N)	Moist. cont.(%)	Liquid limit	Plastic. index	UC (tsf)
FL	1983	KEK1	3	12	434923	883158	MW1	818.4	2.0	3.5					1	5	51	44	CL	94		11		37	19	
FL	1983	KEK1	3	12	434923	883158	MW1	818.4	14.5	16.0					0	2	34	64	CH	98		14		51	31	
FL	1983	KEK1	3	12	434923	883158	MW1	818.4	34.5	36.0					10	11	33	56	CL	82		18		42	25	
FL	1983	KEK1	3	12	434923	883158	MW1A	816.6	4.0	10.0			2.92E-07	7					CL							
FL	1983	KEK1	3	12	434923	883158	MW1	818.4	29.5	40.0			8.43E-06	7					CL							
FL	1983	KEK1	3	12	434924	883151	MW2	818.4	14.5	16.0					11	15	37	48	CL	78		23		42	25	
FL	1983	UN	3	12	434924	883151	MW2	818.4	34.5	36.0					29	30	58	13	ML	53		69				
FL	1983	UN	3	12	434924	883151	MW2	818.4	39.5	40.0					37	32	46	22	ML	44		200				
FL	1983	UN	3	12	434924	883151	MW2	818.4	37.0	50.0			9.04E-07	7					ML							
FL	1983	KEK1	3	12	434920	883158	MW3	820.3	2.0	3.5					10	17	46	38	CL	76		9		33	17	
FL	1983	KEK1	3	12	434920	883158	MW3	820.3	22.5	24.0	2.00E-08	3							CL							
FL	1983	KEK1	3	12	434920	883158	MW3	820.3	24.5	26.0					15	22	39	39	CL	68		19		30	16	
FL	1983	UN	3	12	434920	883158	MW3	820.3	44.5	45.5					23	45	40	15	ML	39		53				
FL	1983	UN	3	12	434920	883158	MW3	820.3	38.0	50.0			4.35E-05	7					ML							
FL	1983	KEK1	3	12	434919	883151	MW4	817.5	9.5	11.0					18	17	39	44	CL	69		25		38	21	
FL	1983	KEK1	3	12	434919	883151	MW4	817.5	24.5	26.0					10	11	38	51	CL	80		15		39	22	
FL	1983	UN	3	12	434919	883151	MW4	817.5	39.5	40.5					26	30	54	16	ML	53		28				
FL	1983	K1,UN	3	12	434919	883151	MW4	817.5	27.4	40.4			1.77E-06	7					CL,ML							
FL	1983	KEK1	3	12	434919	883141	MW4A	816.4	5.0	10.0			5.31E-07	7					CL							
FL	1983	KEK1	3	12	434922	883146	B2	821.5	19.5	21.5	4.00E-08	3							CL		105		22	45	29	
FL	1983	UN	5	12	434923	883201	B11	818.5	36.0	38.0	7.00E-06	3			0	9	82	9	ML		104		23			
FL	1983	KEK1	3	12	434929	883158	B16	819.5	14.5	16.0	1.00E-07	3							CL		107		21	46	30	
FL	1983	UN	5	12	434929	883158	B16	819.5	39.5	41.5	1.00E-05	3			0	46	48	6	ML		108		22			
FL	1983	KEK1	3	12	434922	883141	MW5	822.3	8.0	31.5			4.34E-06	7					CL							
FL	1983	UN	5	12	434922	883141	MW6	822.0	44.5	50.5			3.51E-06	7					ML							
FL	1983	KEK1	3	12	434917	883138	MW7	817.7	9.0	31.0			8.86E-07	7					CL							
FL	1983	UN	3	12	434917	883138	MW8	818.0	45.0	51.2			2.61E-05	7					SM-GM							
FL	1983	KEK1	3	12	434917	883158	MW9	819.1	8.0	31.7			2.55E-07	7					CL							
FL	1983	UN	35	12	434917	883158	MW10	818.5	43.5	49.5			3.01E-06	7					SM-GM							
FL	1983	KEK1	3	12	434932	883201	MW11	819.6	8.0	31.3			7.49E-06	7					CL							
FL	1983	UN	3	12	434932	883201	MW12	819.5	44.3	50.3			2.64E-05	7					GM							
FL	1983	KEK1	3	12	434928	883146	MW13	820.9	8.0	32.7			1.87E-07	7					CL							
FL	1983	UN	99	12	434928	883146	MW14	820.4	42.6	48.6			7.90E-06	7					CL							

Appendix 3 - HYDROGEOLOGIC AND ENGINEERING DATA FOR GREEN LAKE COUNTY - COUNTY LANDFILL

IDENTITY: County (code)	Year	Litho-strat. unit (code)	Nat. (code)	Site No.	Lat.	Long.	Brng. no.	Surf. Elev. (ft)	Sample top (ft)	Sample bottom (ft)	HYDRAULIC CONDUCTIVITY: Lab K (cm/s)	Meth code	Fld K (cm/s)	Meth code	GRAINSIZE PERCENTAGES: Bulk % >2.0mm	Matrix % sand (2.0 to 0.0625mm)	Matrix % silt (0.0625 to 0.002mm)	Matrix % clay (<0.002mm)	ENGINEERING PROPERTIES: Unified Soil Class.	Bulk Percent P200	Dry Unit Wt. (pcf)	SPT (N)	Moist. cont. (%)	Liquid limit	Plastic. index	UC (tsf)
GL	1980	HO	3	13	435799	885499	TP3		15.5	16.0					19	70			SM	26						
GL	1980	HO	3	13	435799	885499	TP4		4.0	4.5					9	74			SM	26						
GL	1980	UN	99	13	435799	885499	TP5		2.0	2.5									CL-ML					21	6	
GL	1980	HO	3	13	435799	885499	TP7		6.0	6.5					8	76			SM	27						
GL	1980	HO	3	13	435799	885499	TP9		2.0	2.5					2	66	18	15	SM	38						
GL	1980	HO	3	13	435799	885499	TP13		5.5	6.0					14	66			SM	31						
GL	1980	HO	3	13	435799	885499	TP14		3.0	3.5					10	76	21	3	SM	25						
GL	1981	HO	3	13	435744	885445	B1	785.4	25.0	26.0	1.80E-04	1							SC			194				
GL	1981	HO	3	13	435744	885445	B1	785.4	5.0	6.5					10	56			SM	49		23				
GL	1981	UN	12	13	435740	885442	B2	807.6	15.0	16.5					1	95			SP-SM	6		87				
GL	1981	HO	3	13	435740	885437	B3	816.3	5.0	6.5					45	84			SM-SP	10		53				
GL	1981	HO	3	13	435740	885437	B3	816.3	15.0	16.0					13	32			ML	56		128				
GL	1981	HO	3	13	435735	885436	B4	831.1	10.0	11.5					15	67				30		44				
GL	1981	HO	3	13	435735	885443	B5	844.5	15.0	16.5					5	81			SM	21		102				
GL	1981	HO	3	13	435732	885445	B6	855.1	0.5	1.5					7	81			SM	24						
GL	1981	HO	3	13	435737	885443	OW9		15.0	16.0					8	66			SC	34						
GL	1981	HO	3	13	435737	885448	OW10		10.0	11.5					16	76			SC	22						
GL	1981	UN	12	13	435737	885448	OW10		35.0	35.3					8	86			ROCK	14						
GL	1981	HO	3	13	435735	885445	B11		25.0	25.4	1.80E-04	1			10	66			SC	34						
GL	1981	HO	3	13	435735	885445	B11		30.0	30.5					6	74			SC	25						
GL	1981	HO	3	13	435734	885443	B12		30.0	30.7	7.60E-05	1			5	73			SC	28						
GL	1981	HO	3	13	435734	885443	B12		35.0	35.6	2.50E-06	1			14	62			SC	35						
GL	1981	HO	3	13	435733	885448	OW13		30.0	30.5	2.00E-05	1			19	83			SC	16						
GL	1981	UN	12	13	435733	885448	OW13		50.0	50.4					1	95			ROCK	6						
GL	1985	UN	12	13	435729	885448	MW16A	864.3	51.8	58.3			1.17E-04	7								300				
GL	1985	HO	3	13	435728	885440	MW18A	866.8	34.0	35.0					6	76			SM-SC	26		133				
GL	1985	HO	4	13	435728	885440	MW18A	866.8	39.0	40.0					7	87			SM	13		108				
GL	1985	UN	12	13	435728	885440	MW18A	866.8	54.6	62.6			1.99E-04	7								999				
GL	1985	HO	3	13	435730	885431	MW19B	844.3	24.0	25.0					15	74			SM-SC	26		133				
GL	1985	UN	12	13	435730	885431	MW19B	844.3	39.0	40.0					0	95			SP	7		73				
GL	1985	HO	3	13	435734	885436	B20	845.7	24.0	25.0					18	72			SM-SC	29		100				
GL	1985	UN	12	13	435734	885436	B20	845.7	49.0	50.0					0	95			SP	6		150				
GL	1985	UN	12	13	435731	885430	MW21A	831.7	32.0	40.0			5.69E-05	7					SP			999				
GL	1985	HO	4	13	435735	885426	MW22A	817.2	30.6	39.3			3.43E-03	7					SP,SW,SM			27				
GL	1985	HO	4	13	435735	885426	MW22B	817.8	39.0	40.0					22	85			SM	16		40				
GL	1985	UN	12	13	435735	885426	MW22B	817.8	56.0	64.3			3.20E-05	7					SP,SP-SM			171				
GL	1985	HO	3	13	435736	885430	MW23A	813.4	17.0	28.5			1.93E-05	7					SM			26				
GL	1985	UN	12	13	435736	885436	B24	829.3	34.0	35.0					0	96			SP	7		200				
GL	1985	UN	12	13	435733	885452	MW27A	857.9	47.1	54.0			1.56E-04	7					ROCK							
GL	1985	HO	3	13	435733	885452	MW27B	857.8	19.0	20.0					11	82			SM	18		80				
GL	1985	UN	12	13	435733	885452	MW27B	857.8	69.3	76.3			2.53E-03	7					ROCK							
GL	1985	HO	4	13	435740	885431	MW28A	799.1	8.9	16.0			1.41E-03	7					SM			25				
GL	1985	HO	4	13	435740	885431	MW28B	799.0	9.0	10.0					6	84			SM	19		24				
GL	1985	HO	3	13	435740	885431	MW28B	799.0	35.9	42.9			7.31E-06	7					SM			218				
GL	1985	HO	3	13	435743	885434	MW29A	801.5	15.5	21.1			2.95E-04	7					SM			37				
GL	1985	HO	3	13	435743	885434	MW29A	801.5	15.5	21.1			3.02E-04	7					SM			37				

Appendix 3 - HYDROGEOLOGIC AND ENGINEERING DATA FOR KENOSHA COUNTY - PHEASANT RUN LANDFILL

IDENTITY: County (code)	Year	Litho-strat. unit (code)	Mat. (code)	Site No.	Lat.	Long.	Brng. no.	Surf. Elev. (ft)	Sample top (ft)	Sample bottom (ft)	HYDRAULIC CONDUCTIVITY: Lab K (cm/s)	Meth code	Fld K (cm/s)	Meth code	GRAINSIZE PERCENTAGES: Bulk % >2.0mm	Matrix % sand (2.0 to 0.0625mm)	Matrix % silt (0.0625 to 0.002mm)	Matrix % clay (<0.002mm)	ENGINEERING PROPERTIES: Unified Soil Class.	Bulk Percent P200	Dry Unit Wt. (pcf)	SPT (N)	Moist. cont.(%)	Liquid limit	Plastic. index	UC (tsf)
KE	1978	OC	3	14	423537	880243	TW30	764.7	6.0	7.5									CL			42		28	12	
KE	1978	OC	3	14	423537	880243	TW30	764.7	8.5	10.0									CL			32				4.0
KE	1978	OC	3	14	423537	880243	TW30	764.7	18.5	20.0									CL			15		25	9	
KE	1978	OC	3	14	423537	880243	TW30	764.7	23.5	25.0									CL			13				3.0
KE	1978	OC	3	14	423537	880243	TW30	764.7	57.0	58.5									CL			39		24	10	
KE	1978	OC	3	14	423526	880243	TW31	755.5	33.5	35.0									CL			21		26	13	
KE	1978	OC	3	14	423526	880243	TW31	755.5	23.5	25.0									CL			18				4.0
KE	1978	OC	3	14	423525	880234	TW32	711.1	6.0	7.5									CL			21		26	17	
KE	1978	OC	3	14	423525	880234	TW32	711.1	13.5	15.0									CL			14		22	14	4.5
KE	1978	OC	3	14	423525	880234	TW32	711.1	23.5	25.0									CL			18		26	15	
KE	1978	OC	3	14	423525	880234	TW32	711.1	28.5	30.0									CL			17				4.0
KE	1978	OC	3	14	423537	880227	TW33	718.1	3.5	5.0									CL			15				3.5
KE	1978	OC	3	14	423537	880227	TW33	718.1	18.5	20.0									CL			17				2.5
KE	1978	OC	3	14	423537	880227	TW33	718.1	28.5	30.0									CL			14				2.0
KE	1978	OC	3	14	423525	880219	TW34	706.8	3.5	5.0									CL			19				4.5
KE	1978	OC	3	14	423525	880219	TW34	706.8	8.5	10.0									CL			26				4.5
KE	1978	OC	3	14	423525	880219	TW34	706.8	13.5	15.0									CL			14				3.0
KE	1978	OC	3	14	423525	880219	TW34	706.8	18.5	20.0									CL			14				3.0
KE	1978	OC	3	14	423525	880219	TW34	706.8	23.5	25.0									CL			13		27	12	
KE	1978	OC	3	14	423531	880233	TW35	730.0	38.5	40.0									CL			35		22	10	
KE	1985	OC	5	14	423525	880244	B27D	756.7	105.0										SM			71				
KE	1978	OC	3	14	423526	880243	B31D	757.8	63.5	65.0									CL			26		27	14	2.5
KE	1978	OC	5	14	423525	880234	B32D	711.0	73.5	75.0	1.50E-06	3							SP-SM		137.1	187	9.3			
KE	1978	OC	5	14	423525	880219	B34D	706.8	78.5	80.0									CL			43		42	24	4.5
KE	1978	OC	3	14	423525	880219	B34D	706.8	53.5	55.0					5	11	55	35	CL	88		25				2.5
KE	1983	OC	3	14	423546	880239	TW36	750.1	8.5	10.0					3	24	41	35	CL	91		27		30	7	
KE	1983	OC	5	14	423546	880239	TW36	750.1	88.5	90.0					21	85	13	3	SM			24				
KE	1983	OC	3	14	423546	880239	TW36	750.1	21.4	31.4			6.12E-07	7												
KE	1983	OC	3	14	423542	880244	TW37	754.6	23.5	25.0					9	20	51	30	CL	75		13				
KE	1983	OC	3	14	423542	880244	TW37	754.6	88.5	90.0					0	2	48	50	CL	98				39	17	
KE	1983	OC	3	14	423542	880244	TW37	754.6	15.0	25.0			1.10E-07	7					CL							
KE	1983	OC	3	14	423539	880239	TW39	746.9	14.4	24.4			1.61E-07	7												
KE	1983	OC	3	14	423541	880224	P40B	719.2	2.5	7.5	4.00E-08	3			0	9	43	38	CL	92		33		33	12	
KE	1983	OC	3	14	423541	880224	P40B	719.2	28.5	30.0					0	10	54	36	CL	93		13		25	8	
KE	1983	OC	5	14	423541	880224	P40C	719.6	119.0	127.5			4.22E-04	7					SC-SM							
KE	1983	UN	12	14	423541	880224	P40D	719.3	162.0	170.0			3.79E-04	7					DOLOMITE							
KE	1983	OC	3	14	423537	880233	TW41	747.0	25.0	35.0			1.24E-06	7					CL							
KE	1984	OC	35	14	423537	880233	P41A	747.1	82.0	89.0			3.00E-04	7					CL,SP			40				
KE	1984	OC	5	14	423537	880233	P41B	746.5	99.0	106.2			2.52E-06	7					CL			29				
KE	1983	OC	3	14	423532	880244	TW42	740.1	3.5	5.0					22	35	41	24	ML	58		9				
KE	1983	OC	3	14	423532	880244	TW42	740.1	13.5	25.0					0	7	56	37	CL	96		16		23	3	
KE	1983	OC	3	14	423532	880244	TW42	740.1	17.0	27.0			7.20E-07	7					CL							
KE	1983	OC	3	14	423532	880244	TW42	740.1	13.5	15.0	1.10E-08	3							CL			15				
KE	1983	OC	5	14	423532	880244	P42A	740.1	78.0	86.0			8.32E-05	7					SP							
KE	1983	OC	3	14	423533	880235	TW43	743.6	23.5	25.0					0	1	34	65	CL			13		40	18	
KE	1983	OC	3	14	423533	880227	TW44	731.2	18.0	28.0			5.11E-07	7					CL							

Appendix 3 - HYDROGEOLOGIC AND ENGINEERING DATA FOR KENOSHA COUNTY - PHEASANT RUN LANDFILL

IDENTITY											HYDRAULIC CONDUCTIVITY				GRAINSIZE PERCENTAGES				ENGINEERING PROPERTIES							
County (code)	Year	Litho-strat. unit (code)	Nat. (code)	Site No.	Lat.	Long.	Brng. no.	Surf. Elev. (ft)	Sample top (ft)	Sample bottom (ft)	Lab K (cm/s)	Meth code	Fld K (cm/s)	Meth code	Bulk % >2.0mm	Matrix % sand (2.0 to 0.0625mm)	Matrix % silt (0.0625 to 0.002mm)	Matrix % clay (<0.002mm)	Unified Soil Class.	Bulk Percent P200	Dry Unit Wt. (pcf)	SPT (N)	Moist. cont. (%)	Liquid limit	Plastic. index	UC (tsf)
KE	1984	OC	5	14	423533	880227	B44D	731.2	88.5	90.0									CL			86		34	19	2.5
KE	1984	OC	3	14	423533	880227	B44D	731.2	73.5	75.0					4	8	50	42	CL	91		36				1.5
KE	1984	OC	3	14	423533	880227	B44D	731.2	113.5	115.0					30	46	39	16	SC	47						
KE	1983	OC	3	14	423529	880221	TW45	735.0	18.0	28.0			2.90E-07	7					CL			10				
KE	1983	OC	3	14	423550	880230	TW46	715.5	15.5	25.5			2.55E-07	7					CL			20				
KE	1984	OC	3	14	423550	880230	B46D	715.5	133.5	135.0					10	26	50	24	CL-ML	71		100		20	7	4.5
KE	1984	OC	5	14	423550	880230	B46D	715.5	123.5	125.0					0	0			SM	25		100				
KE	1983	OC	5	14	423546	880245	P47B	749.7	98.5	100.0					0	24	46	30	CL	94		180		23	8	
KE	1983	OC	3	14	423546	880245	P47B	749.7	88.5	90.0					7	86			SM	16		41				4.5
KE	1984	OC	3	14	423542	880247	P48B	763.4	53.5	55.0									CL			22		25	13	2.0
KE	1984	OC	3	14	423542	880247	P48B	763.4	68.5	70.0									CL			37		27	13	1.8
KE	1984	OC	3	14	423542	880247	P48B	763.4	68.5	75.0	1.80E-08	3							CL		119.4	35	17.0			
KE	1984	OC	3	14	423542	880247	P48B	763.4	63.5	75.0					3	6	56	38	CL	92						
KE	1984	OC	3	14	423542	880247	P48B	763.4	78.5	80.0					i	10	48	41	CL	93						
KE	1984	OC	3	14	423537	880247	TW49	761.1	11.2	20.3			1.70E-06	7					CL			33				
KE	1984	OC	3	14	423550	880239	TW51	746.6	11.0	20.0			1.01E-07	7												
KE	1984	OC	3	14	423530	880247	B52	743.0	58.5	60.0									CL			23		23	11	
KE	1984	OC	3	14	423530	880247	B52	743.0	78.5	80.0					3	6	44	49	CL	94		27				2.5
KE	1984	OC	5	14	423546	880224	P54B	708.3	72.0	80.0			1.02E-02	7					SP,CL			23				1.8
KE	1985	OC	3	14	423532	880219	TW55	714.6	11.0	20.0			9.23E-08	7					CL			12				2.3
KE	1983	OC	3	14	423525	880220	P56A	715.1	5.0	15.0			1.53E-07	7					CL			34				4.5
KE	1983	OC	3	14	423525	880220	P56B	715.3	73.0	80.0			3.49E-06	7					CL			31				
KE	1984	OC	3	14	423523	880239	P59A	721.5	11.7	20.7			4.22E-07	7					CL			24				
KE	1984	OC	5	14	423523	880239	P59B	721.4	80.0	89.0			2.11E-06	7					SP,CL							
KE	1984	OC	5	14	423523	880239	P59B	721.4	70.0	75.0	4.20E-08	3							CL							
KE	1984	OC	3	14	423523	880239	P59B	721.4	53.5	55.0									CL			40		29	15	2.5
KE	1984	OC	3	14	423523	880239	P59B	721.4	63.5	65.0					2	8	51	41	CL	92		39				4.5
KE	1984	OC	5	14	423523	880239	P59B	721.4	68.5	70.0					0	0	33	67	CL	99		25				2.8
KE	1984	OC	5	14	423523	880239	P59B	721.4	73.5	75.0									CL			51		40	19	4.5
KE	1984	OC	3	14	423534	880239	B60	733.3	58.5	60.0	2.00E-08	3							CL							2.3
KE	1984	OC	5	14	423536	880238	B62	750.9	113.5	115.0	1.10E-05	3							SP							
KE	1984	OC	3	14	423543	880239	B63	742.6	68.5	70.0									CL			30		26	12	3.0
KE	1984	OC	5	14	423534	880235	B67	728.9	68.5	70.0					55	84			SW-SM	8		82				
KE	1984	OC	3	14	423534	880235	B67	728.9	103.5	105.0					41	64	34	2	SM	26		109				
KE	1984	OC	3	14	423533	880230	B69	745.5	133.5	135.0					28	39	46	15	SC	44		200		16	4	
KE	1984	OC	3	14	423537	880230	B70	730.0	63.5	65.0	6.30E-08	3							CL							
KE	1984	OC	5	14	423527	880225	B74	733.8	68.5	70.0					0	i	64	35	CL	100		26				2.9
KE	1984	OC	3	14	423525	880225	P75A	732.9	11.0	20.0			1.54E-07	7					ML-CL			19				4.5
KE	1984	OC	3	14	423525	880225	P75B	732.9	40.0	50.0			3.39E-05	7					CL							
KE	1984	OC	3	14	423537	880224	TW76	707.6	11.0	20.3			1.27E-04	7					CL			18				3.0
KE	1984	OC	5	14	423547	880228	B77	709.4	83.5	85.0					20	11	44	44	CL	74		40				
KE	1978	OC	3	14	423512	880229	B4A	728.6	10.0	20.0			7.40E-07	7												
KE	1978	OC	3	14	423512	880229	B4B	728.6	25.9	28.9			1.20E-07	7												
KE	1978	OC	3	14	423506	880235	B6A	714.0	9.5	19.5			3.80E-07	7												
KE	1978	OC	3	14	423513	880244	B7A	765.4	12.6	22.6			4.20E-07	7												
KE	1978	OC	3	14	423506	880242	B9	733.9	19.5	20.5			5.50E-07	7												

Appendix 3 - HYDROGEOLOGIC AND ENGINEERING DATA FOR KENOSHA COUNTY - PHEASANT RUN LANDFILL

IDENTITY											HYDRAULIC CONDUCTIVITY				GRAINSIZE PERCENTAGES				ENGINEERING PROPERTIES							
County (code)	Year	Litho-strat. unit (code)	Mat. (code)	Site No.	Lat.	Long.	Brng. no.	Surf. Elev. (ft)	Sample top (ft)	Sample bottom (ft)	Lab K (cm/s)	Meth code	Fld K (cm/s)	Meth code	Bulk % >2.0mm	Matrix % sand (2.0 to 0.0625mm)	Matrix % silt (0.0625 to 0.002mm)	Matrix % clay (<0.002mm)	Unified Soil Class.	Bulk Percent P200	Dry Unit Wt. (pcf)	SPT (N)	Moist. cont.(%)	Liquid limit	Plastic. index	UC (tsf)
KE	1978	OC	3	14	423506	880242	B9	733.9	18.5	20.0					2	10	42	48	CL	88		15		31	16	
KE	1978	OC	3	14	423506	880242	B9	733.9	48.5	50.0					2	7	53	40	CL	91		24		37	20	
KE	1978	OC	3	14	423520	880240	B10	732.8	19.7	20.7			2.20E-07	7												
KE	1978	OC	3	14	423520	880240	B10	732.8	23.5	25.0					0	17	58	25	CL	84		15		25	10	
KE	1978	OC	35	14	423520	880237	B11A	719.2	35.7	38.7			3.25E-06	7												
KE	1978	OC	3	14	423520	880237	B11	719.2	24.0						4	19	52	29	CL	79		23		24	10	
KE	1978	OC	99	14	423513	880215	B12	701.1	6.3	16.3			1.60E-05	7												
KE	1978	OC	3	14	423513	880215	B12	701.1	23.5	25.0					0	14	53	33	CL	88		11		26	11	
KE	1978	OC	35	14	423513	880221	B13A	702.8	10.0	20.0			5.70E-06	7												
KE	1978	OC	3	14	423513	880221	B13B	702.8	28.5	30.0					0	1	37	62	CL	99		9		45	22	
KE	1978	OC	3	14	423510	880218	B14A	723.3	10.0	20.0			2.40E-07	7												
KE	1978	OC	3	14	423510	880218	B14C	723.3	6.0	7.5					0	11	53	36	CL	90				30	16	
KE	1978	OC	3	14	423510	880218	B14C	723.3	13.5	15.0					0	6	66	28	CL	93		9		34	16	
KE	1978	OC	99	14	423510	880218	B14C	723.3	23.5	25.0					0	16	60	24	CL	85		19		24	9	
KE	1978	OC	99	14	423510	880218	B14C	723.3	38.5	40.0					0	19	57	24	CL	83		21		26	11	3.0
KE	1978	OC	3	14	423508	880222	B15	708.9	18.5	20.0					1	11	51	38	CL	89		14		30	14	3.5
KE	1978	OC	35	14	423508	880222	B15	708.9	4.5	14.5			1.35E-06	7												
KE	1978	OC	3	14	423507	880213	B16	704.7	13.5	15.0					4	13	55	32		85		11		28	12	
KE	1978	OC	3	14	423507	880213	B16	704.7	5.6	15.6			5.60E-07	7												
KE	1978	OC	3	14	423510	880213	B17	709.6	6.0	7.5					0	14	56	30	CL	88		42		27	11	
KE	1978	OC	3	14	423510	880213	B17	709.6	23.5	25.0					0	16	54	30	CL	83		17		26	11	

Appendix 3 - HYDROGEOLOGIC AND ENGINEERING DATA FOR KEWAUNEE COUNTY LANDFILL

IDENTITY / HYDRAULIC CONDUCTIVITY

County (code)	Year	Litho-strat. unit (code)	Nat. (code)	Site No.	Lat.	Long.	Brng. no.	Surf. Elev. (ft)	Sample top (ft)	Sample bottom (ft)	Lab K (cm/s)	Meth code	Fld K (cm/s)	Meth code
KW	1980	KEHa	3	15	442835	873505	MW7C	764.9	49.0	51.0				
KW	1980	KETr	3	15	442827	873456	MW8C	759.3	1.0	2.0				
KW	1980	KETr	3	15	442827	873456	MW8C	759.3	2.0	4.0				
KW	1980	KETr	3	15	442827	873456	MW8C	759.3	4.0	6.0				
KW	1980	KETr	3	15	442827	873456	MW8C	759.3	6.0	8.0				
KW	1980	KETr	3	15	442827	873456	MW8C	759.3	8.0	10.0				
KW	1980	KEHa	3	15	442827	873456	MW8C	759.3	10.0	12.0				
KW	1980	KEHa	5	15	442827	873456	MW8C	759.3	15.0	17.0				
KW	1980	KEHa	3	15	442827	873456	MW8C	759.3	20.0	22.0				
KW	1980	KEHa	3	15	442827	873456	MW8C	759.3	25.0	27.0				
KW	1980	KEHa	3	15	442827	873456	MW8C	759.3	30.0	32.0				
KW	1980	KEHa	3	15	442827	873456	MW8C	759.3	35.0	37.0				
KW	1980	KEHa	3	15	442827	873456	MW8C	759.3	40.0	42.0				
KW	1980	KEHa	3	15	442827	873456	MW8C	759.3	45.0	47.0				
KW	1980	KEHa	3	15	442827	873456	MW8C	759.3	50.0	52.0				
KW	1980	UN	4	15	442827	873456	MW8C	759.3	55.0	56.5				
KW	1980	UN	4	15	442827	873456	MW8C	759.3	60.0	61.5	1.50E-04	i		
KW	1980	KEOz	99	15	442827	873456	MW8C	759.3	65.0	66.5				
KW	1980	KEOz	99	15	442827	873456	MW8C	759.3	70.0	72.0				
KW	1980	KEOz	99	15	442827	873456	MW8C	759.3	75.0	77.0				
KW	1980	KEOz	99	15	442827	873456	MW8C	759.3	80.0	82.0				
KW	1980	KEOz	99	15	442827	873456	MW8C	759.3	85.0	87.0				
KW	1980	UN	5	15	442827	873456	MW8C	759.3	90.0	91.5				
KW	1980	UN	5	15	442827	873456	MW8C	759.3	95.0	96.6				
KW	1980	UN	5	15	442827	873456	MW8C	759.3	100.0	102.0				
KW	1980	UN	99	15	442827	873456	MW8C	759.3	105.0	107.0				
KW	1980	NB	99	15	442827	873456	MW8C	759.3	115.0	116.5				
KW	1980	NB	99	15	442827	873456	MW8C	759.3	120.0	121.5	6.50E-05	i		
KW	1980	NB	99	15	442827	873456	MW8C	759.3	125.0	126.5				
KW	1980	NB	99	15	442827	873456	MW8C	759.3	130.0	131.5	5.80E-04	!		
KW	1980	NB	99	15	442827	873456	MW8C	759.3	135.0	136.5				
KW	1980	NB	99	15	442827	873456	MW8C	759.3	140.0	141.5				
KW	1980	UN	3	15	442827	873456	MW8C	759.3	145.0	146.5				
KW	1980	NB	99	15	442835	873456	MW1	756.3	30.0	31.5				
KW	1980	KEHa	99	15	442822	873456	MW2	761.7	30.0	32.0				
KW	1980	KEHa	99	15	442822	873456	MW2	761.7	35.0	37.0				
KW	1980	KEHa	99	15	442822	873456	MW2	761.7	40.0	42.0				
KW	1980	KETr	3	15	442827	873440	MW3	744.8	1.0	2.0				
KW	1980	KETr	3	15	442827	873440	MW3	744.8	2.0	4.0				
KW	1980	KETr	3	15	442827	873440	MW3	744.8	4.0	6.0				
KW	1980	KETr	3	15	442827	873440	MW3	744.8	6.0	8.0				
KW	1980	KETr	3	15	442827	873440	MW3	744.8	8.0	10.0				
KW	1980	KETr	3	15	442827	873440	MW3	744.8	10.0	12.0	4.60E-07	i		
KW	1980	KETr	3	15	442827	873440	MW3	744.8	15.0	17.0				
KW	1980	KETr	3	15	442827	873440	MW3	744.8	20.0	22.0				
KW	1980	KETr	3	15	442827	873440	MW3	744.8	25.0	26.0				

GRAINSIZE PERCENTAGES / ENGINEERING PROPERTIES

Brng. no.	Sample top (ft)	Bulk % >2.0mm	Matrix % sand (2.0 to 0.0625mm)	Matrix % silt (0.0625 to 0.002mm)	Matrix % clay (<0.002mm)	Unified Soil Class.	Bulk Percent P200	Dry Unit Wt. (pcf)	SPT (N)	Moist. cont. (%)	Liquid limit	Plastic. index	UC (tsf)
MW7C	49.0					CL				15.0			2.0
MW8C	1.0					CL				18.0			2.0
MW8C	2.0					CL				14.0			3.5
MW8C	4.0					CL				13.0			4.5
MW8C	6.0	5	38			CL	61			11.0	24	13	4.5
MW8C	8.0					CL				13.0			4.5
MW8C	10.0					CL				13.0			4.5
MW8C	15.0					CL				14.0			2.0
MW8C	20.0					ML-CL				17.0			2.3
MW8C	25.0					CL				15.0			2.0
MW8C	30.0					CL				15.0			2.5
MW8C	35.0					CL				13.0			2.5
MW8C	40.0					CL				13.0			2.0
MW8C	45.0					CL				13.0			2.0
MW8C	50.0					CL				13.0			1.8
MW8C	55.0					SM-SP			61				
MW8C	60.0					SM-SP			77				
MW8C	65.0					CL			24				
MW8C	70.0					CL				15.0			2.0
MW8C	75.0					CL				15.0			1.8
MW8C	80.0					CL				14.0			1.7
MW8C	85.0					CL				18.0			3.0
MW8C	90.0					ML-CL				17.0			
MW8C	95.0					ML-CL			21				
MW8C	100.0					ML-CL				24.0			2.0
MW8C	105.0					CL				22.0			2.0
MW8C	115.0					SP,SM-SP			88				
MW8C	120.0	14	99			SP,SM-SP	i		87				
MW8C	125.0					SP,SM-SP			122				
MW8C	130.0					SP,SM-SP			112				
MW8C	135.0					SP,SM-SP			52				
MW8C	140.0					SM-SP,ML			160				
MW8C	145.0					CL			141				
MW1	30.0	12	58	39	3	SM	37		53				
MW2	30.0					CL				13.0			1.5
MW2	35.0					CL				13.0			1.5
MW2	40.0					CL				14.0			1.0
MW3	1.0					CL				14.0			2.0
MW3	2.0					CL				18.0			1.6
MW3	4.0					CL				14.0			4.5
MW3	6.0					CL							3.5
MW3	8.0					CL				12.6			4.5
MW3	10.0					CL							
MW3	15.0	7	27	48	25	CL	68			15.0			2.5
MW3	20.0					CL				15.0			1.5
MW3	25.0					CL							

Appendix 3 - HYDROGEOLOGIC AND ENGINEERING DATA FOR KEWAUNEE COUNTY LANDFILL

IDENTITY County (code)	Year	Litho-strat. unit (code)	Mat. (code)	Site No.	Lat.	Long.	Brng. no.	Surf. Elev. (ft)	Sample top (ft)	Sample bottom (ft)	HYDRAULIC CONDUCTIVITY Lab K (cm/s)	Meth code	Fld K (cm/s)	Meth code	GRAINSIZE PERCENTAGES Bulk % >2.0mm	Matrix % sand (2.0 to 0.0625mm)	Matrix % silt (0.0625 to 0.002mm)	Matrix % clay (<0.002mm)	ENGINEERING PROPERTIES Unified Soil Class.	Bulk Percent P200	Dry Unit Wt. (pcf)	SPT (N)	Moist. cont.(%)	Liquid limit	Plastic. index	UC (tsf)
KW	1980	UN	99	15	442827	873440	MW3	744.8	26.0	27.0					1	62	29	9	SM	38			12.0			
KW	1980	UN	99	15	442827	873440	MW3	744.8	30.0	32.0									SM				11.0			
KW	1980	KEHa	3	15	442827	873440	MW3	744.8	35.0	37.0									CL			35				
KW	1980	KEHa	3	15	442827	873440	MW3	744.8	40.0	41.5									CL			28				
KW	1980	KETr	3	15	442827	873504	MW4A	763.2	2.0	4.0									CL				14.0			4.5
KW	1980	KETr	3	15	442827	873504	MW4A	763.2	4.0	6.0									CL				14.0			4.5
KW	1980	KETr	3	15	442827	873504	MW4A	763.2	6.0	8.0									CL				13.0			4.5
KW	1980	KETr	3	15	442827	873504	MW4A	763.2	8.0	10.0									CL				13.0			4.5
KW	1980	KE	4	15	442827	873504	MW4A	763.2	10.0	11.5	2.40E-07	1			39	80			SM	12		34				
KW	1980	KEHa	3	15	442827	873504	MW4A	763.2	15.0	17.0									CL				13.0			2.5
KW	1980	KEHa	3	15	442827	873504	MW4A	763.2	20.0	22.0									CL				15.0			1.5
KW	1980	KEHa	3	15	442827	873504	MW4A	763.2	25.0	27.0									CL				17.0			1.2
KW	1980	KEHa	3	15	442827	873504	MW4A	763.2	30.0	32.0									CL				17.0			1.0
KW	1980	KEHa	3	15	442827	873504	MW4A	763.2	35.0	37.0									CL				17.0			0.8
KW	1980	KEHa	3	15	442827	873504	MW4C	763.6	44.0	46.0									CL				15.0			1.1
KW	1980	KEHa	3	15	442827	873504	MW4C	763.6	49.0	51.0									CL				16.0			1.5
KW	1980	KETr	3	15	442822	873515	MW5	769.6	2.0	4.0									CL				14.0			4.5
KW	1980	KETr	3	15	442822	873515	MW5	769.6	4.0	6.0									CL				13.0			4.5
KW	1980	KETr	3	15	442822	873515	MW5	769.6	6.0	8.0									CL							4.5
KW	1980	KETr	3	15	442822	873515	MW5	769.6	8.0	10.0	3.60E-08	1			5	35	41	24	CL	64			9.0			4.5
KW	1980	KETr	3	15	442822	873515	MW5	769.6	10.0	12.0									CL							
KW	1980	KE	3	15	442822	873515	MW5	769.6	15.0	17.0									CL				14.0			1.8
KW	1980	KE	3	15	442822	873515	MW5	769.6	20.0	22.0									CL				16.0			1.3
KW	1980	KE	3	15	442822	873515	MW5	769.6	25.0	27.0									CL				16.0			0.8
KW	1980	KEHa	3	15	442822	873515	MW5	769.6	30.0	32.0									CL				16.0			1.2
KW	1980	KEHa	3	15	442822	873515	MW5	769.6	35.0	37.0									CL				15.0			1.2
KW	1980	KEHa	3	15	442822	873515	MW5	769.6	40.0	42.0									CL				17.0			1.3
KW	1980	KEHa	3	15	442835	873505	MW7B	764.8	29.0	39.5			6.00E-07	7					CL							
KW	1981	KETr	3	15	442822	873504	MW9	762.5	6.0	8.0					9	37			CL	62			12.0			3.5
KW	1981	KE	99	15	442829	873515	MW10C	769.6	10.0	12.0					7	27	48	25	CL	72				30	16	
KW	1981	KEHa	3	15	442829	873507	B11	769.1	15.0	17.0	1.40E-08	1			10	37	46	18	CL	59				28	16	
KW	1981	KETr	3	15	442827	873508	B12	765.6	4.0	6.0					4	31			CL	67			15.0			4.5
KW	1981	KEHa	3	15	442827	873508	B12	765.6	15.0	17.0	2.10E-08	1			8	37	32	32	CL	63				22	10	
KW	1981	KETr	3	15	442825	873508	B13	765.3	2.0	4.0					9	27			CL	67			18.0			4.5
KW	1982	KEHa	3	15	442823	873515	B20	766.7	8.0	10.0	2.70E-08	1			8	32	49	20	CL	66	117.8		15.0			2.0
KW	1982	KE	5	15	442824	873515	B21	768.6	10.0	12.0	2.80E-08	1			0	30	60	10	ML	70	121.6		13.0			2.0
KW	1982	KETr	3	15	442826	873513	B22	773.0	4.0	6.0	1.10E-08	1			4	36	48	16	CL	65	120.5		10.0			4.5
KW	1982	KE	5	15	442826	873513	B22	773.0	10.0	12.0					4	42	47	11	ML	58	108.0		36.0			3.0
KW	1982	KEHa	3	15	442823	873513	B23	766.8	13.0	15.0	3.70E-07	1			2	37	43	20	CL	71						2.5
KW	1982	KEHa	3	15	442823	873511	B24	765.2	4.0	6.0	2.30E-08	1							CL							4.0
KW	1982	KEHa	3	15	442823	873511	B24	765.2	13.0	15.0					2	26	48	27	CL	75	127.0		12.0			3.5
KW	1982	KEHa	3	15	442823	873509	B25	765.6	8.0	10.0	4.80E-09	1			11	40	44	16	CL	59	116.5		12.0			2.5
KW	1982	KETr	3	15	442823	873508	B26	762.5	2.0	4.0	2.50E-08	1														4.5
KW	1982	KETr	3	15	442823	873508	B26	762.5	4.0	6.0					1	38	43	18	CL	68			13.0			4.0
KW	1982	KE	99	15	442823	873507	B27	762.8	2.0	4.0	5.50E-09	1			7	36	46	18	ML	74			15.0			4.5
KW	1982	KETr	3	15	442823	873505	B28	763.5	6.0	8.0	8.70E-09	1			3	34	51	15	CL	70			10.0			4.5

Appendix 3 - HYDROGEOLOGIC AND ENGINEERING DATA FOR KEWAUNEE COUNTY LANDFILL

IDENTITY: County (code)	Year	Litho-strat. unit (code)	Mat. (code)	Site No.	Lat.	Long.	Brng. no.	Surf. Elev. (ft)	Sample top (ft)	Sample bottom (ft)	HYDRAULIC CONDUCTIVITY: Lab K (cm/s)	Meth code	Fld K (cm/s)	Meth code	GRAINSIZE PERCENTAGES: Bulk % >2.0mm	Matrix % sand (2.0 to 0.0625mm)	Matrix % silt (0.0625 to 0.002mm)	Matrix % clay (<0.002mm)	ENGINEERING PROPERTIES: Unified Soil Class.	Bulk Percent P200	Dry Unit Wt. (pcf)	SPT (N)	Moist. cont.(%)	Liquid limit	Plastic. index	UC (tsf)
KW	1982	KETr	5	15	442824	873505	B29	761.0	4.0	5.0	2.40E-08	1			0	36	52	12	ML	71	115.0		12.0			2.0
KW	1982	KETr	3	15	442826	873505	B30	761.9	6.0	7.5	1.40E-08	1			8	35	47	18	CL	64	124.3		12.0			4.0
KW	1982	KEHa	3	15	442827	873505	B31	763.8	10.0	11.5	3.14E-08	1			8	32	52	16	CL	66	123.0		14.0			2.5
KW	1982	KETr	3	15	442828	873505	B32	764.9	2.0	4.0	3.30E-07	1			6	35	51	14	CL	65	115.5		16.0			2.5
KW	1982	KEHa	3	15	442829	873505	B33	765.4	10.0	11.5	3.60E-08	1			6	41	50	9	CL	62	129.7		13.0			2.0
KW	1982	KEHa	3	15	442825	873513	B34	763.1	2.0	4.0	1.90E-08	1							CL	58						2.5
KW	1982	KEHa	3	15	442825	873511	B35	761.5	4.0	6.0	1.30E-08	1							CL	65						4.5
KW	1982	KEHa	99	15	442825	873509	B36	760.4	6.0	8.0	5.60E-07	1			16				SC-SM	49						1.0
KW	1982	KEHa	3	15	442825	873508	B37	759.5	8.0	10.0	2.30E-08	1							CL	67						1.8
KW	1982	KETr	3	15	442825	873507	B38	759.2	2.0	2.5	7.50E-09	1			8				CL	68						4.5
KW	1982	KEHa	3	15	442824	873506	B39	759.2	8.0	10.0	4.90E-09	1							CL	65						1.5
KW	1982	KEHa	3	15	442826	873506	B40	756.8	6.0	8.0	2.00E-08	1			10				CL	65						1.0
KW	1982	KEHa	3	15	442827	873506	B41	755.0	6.0	8.0	1.00E-08	1							CL	72						1.2
KW	1982	KEHa	3	15	442828	873506	B42	753.6	6.0	8.0									ML	59						
KW	1982	KEHa	3	15	442828	873506	B42	753.6	2.0	4.0	3.70E-08	1			10				CL	59						1.5
KW	1982	KETr	3	15	442829	873506	B43	753.9	2.0	4.0	3.90E-07	1							CL	68						2.0
KW	1982	KEHa	3	15	442829	873506	B44	753.8	12.0	14.0	1.20E-08	1			5.8				CL	67						2.0
KW	1982	KETr	3	15	442824	873507	TP45	760.0	0.0	1.0	6.70E-08	3			6.9				CL	67	122.0					
KW	1982	KEHa	3	15	442824	873508	TP46	761.0		6.5	7.80E-09	1			8.4				CL	64						
KW	1982	KEHa	3	15	442824	873508	TP46	761.0		1.5											115.4					
KW	1982	KEHa	3	15	442824	873508	TP46	761.0		3.5											126.7					
KW	1982	KETr	3	15	442824	873510	TP47	762.0		3.0	3.50E-08	3			6.4				CL	67			11.0			4.5
KW	1982	KETr	3	15	442824	873510	TP47	762.0		3.5											119.3					
KW	1982	KETr	3	15	442824	873512	TP48	763.0		1.0											127.9					
KW	1982	KETr	3	15	442824	873512	TP48	763.0		3.5											126.3					

Appendix 3 - HYDROGEOLOGIC AND ENGINEERING DATA FOR MANITOWOC COUNTY INCLUDING LEMBERGER, PROPOSED MANITOWOC COUNTY, AND RIDGEVIEW SITES

IDENTITY: County (code)	Year	Litho-strat. unit (code)	Mat. (code)	Site No.	Lat.	Long.	Brng. no.	Surf. Elev. (ft)	Sample top (ft)	Sample bottom (ft)	HYDRAULIC CONDUCTIVITY: Lab K (cm/s)	Meth code	Fld K (cm/s)	Meth code	GRAINSIZE PERCENTAGES: Bulk % >2.0mm	Matrix % sand (2.0 to 0.0625mm)	Matrix % silt (0.0625 to 0.002mm)	Matrix % clay (<0.002mm)	ENGINEERING PROPERTIES: Unified Soil Class.	Bulk Percent P200	Dry Unit Wt. (pcf)	SPT (N)	Moist. cont.(%)	Liquid limit	Plastic. index	UC (tsf)
MN		UN	99	16	441099	874999	CS1		20.0	30.0					42	90				8						
MN		UN	99	16	441099	874999	CS2		30.0	45.0					46	89				7						
MN		UN	99	16	441099	874999	CS3		30.0	45.0					52	100				0						
MN	1978	KEVA	3	16	441099	874999	B24		4.0	6.0					12	36	45	18	CL	59		24.0				
MN	1978	KEVA	3	16	441099	874999	B24		15.0	16.5					4	26	52	22	CL	74		50.0				
MN	1978	KE	3	16	441099	874999	B24		35.0	36.5					3	30	44	26	CL	71		53.0				
MN	1978	KEVA	3	16	441099	874999	B24		8.0	10.0					19	38	44	17	CL	50						
MN	1978	UN	4	16	441040	875012	B27		45.0	46.5									SM-GM	14						
MN	1978	KEVA	3	16	441040	875012	B27		25.0	26.5					4	30	44	26	CL	71		46.0				
MN	1978	UN	4	16	441040	875012	B27		30.0	30.5									SM-GM	19						
MN	1978	KEVA	3	16	441099	874999	TS1		0.0	2.0					6	39	49	12	CL	61						
MN	1978	KEVA	3	16	441099	874999	TS2		0.0	2.0					10	40	49	11	CL-ML	60						
MN	1979	KEVA	3	16	441030	875010	B29	875.3	4.0	16.0			3.00E-05	7												
MN	1979	UN	12	16	441030	875010	B29A	875.3	60.0	73.0			3.60E-06	7					DOLOMITE							
MN	1979	KEVA	3	16	441030	875010	B29A	875.3	13.0	15.0	1.80E-07	3							CL		132.1		11.6			3.1
MN	1979	KEVA	3	16	441030	875010	B30	875.3	38.5	40.0					3	15	48	36	CL	84		17.0		30	14	
MN	1979	KEVA	3	16	441030	875005	B31	880.5	6.0	16.0			3.60E-05	7					CL,ML-CL							
MN	1980	UN	4	16	441030	874950	B33		20.0	21.5					2	90			SP-SM	16		24.0				
MN	1980	UN	3	16	441030	874950	B33		25.0	26.5					6	35	40	24	ML-SM	69		27.0				
MN	1980	UN	3	16	441030	874944	B34		30.0	31.5					7	41	43	16	ML-SM	60		95.0				
MN	1980	UN	99	16	441030	874944	B34		15.0	15.7					19	86			SM	14		35.0				
MN	1980	UN	3	16	441030	874944	B34		10.0	11.5					18	45	40	15	SM	50		20.0				
MN	1982	UN	3	16	441032	875008	B59	881.1	31.0	33.0	1.25E-07	i			2	63			SM	40	122.2		11.4			
MN	1982	KE	4	16	441032	875008	B59	881.1	9.5	11.0	2.65E-05	i							SM-SP		125.4	24.0				2.5
MN	1982	UN	3	16	441032	875008	B59	881.1	44.5	46.0					47	53			SM	27		150.0	2.6			
MN	1982	KEVA	3	16	441032	875008	B59	881.1	4.5	6.0	4.61E-07	i			i	12	60	28	CL	89	118.9		16.0	24	13	4.5
MN	1982	KEVA	5	16	441034	875007	B60	889.0	11.0	12.5	2.21E-07	i							CL		121.3		13.0			
MN	1982	KEVA	5	16	441034	875007	B60	889.0	9.5	11.0					7	27	49	24	CL	69		21.0	11.8	23	12	3.0
MN	1982	KEVA	3	16	441034	875007	B60	889.0	24.5	26.0					0	99			SP	8		15.0	20.4			
MN	1982	UN	3	16	441034	875007	B60	889.0	44.5	46.0					48	67			SM	19		240.0	5.0			
MN	1982	KE	3	16	441099	875099	B61	906.3	29.5	32.0					9	32	48	20	CL	63	130.3		9.8	20	10	3.7
MN	1982	KE	3	16	441099	875099	B61	906.3	14.5	16.0					18	39	44	17	CL	52		19.0	10.8	19	10	4.5
MN	1982	KEVA	3	16	441099	875099	B61	906.3	4.5	6.5	1.58E-05	i			0				CL	70	105.4		21.4			2.0
MN	1982	KEVA	3	16	441034	875001	B62	918.2	4.5	6.0					22	36	45	19	SM-ML	51		19.0	10.5			3.4
MN	1982	UN	3	16	441034	875001	B62	918.2	44.5	46.0					56	64			SC-SM	17		60.0	3.5			
MN	1982	UN	3	16	441034	875001	B62	918.2	29.5	31.0					64	78			SM-ML	10		52.0	5.5			
MN	1982	UN	3	16	441035	875003	B63	903.3	44.5	46.0					57	72			SM-SW	15						
MN	1982	KEVA	3	16	441035	875003	B63	903.3	9.5	12.0	3.77E-06	i			15	28	48	24	CL	63				24	13	
MN	1982	UN	3	16	441035	875003	B63	903.3	24.5	26.0					53	60			SM-SW	20						
MN	1982	KEVA	3	16	441035	875003	B63	903.3		10.0					7	39	44	17	CL	60						
MN	1982	UN	4	16	441040	875003	B64	904.9	34.5	36.0					20	95			SM-SW	10		71.0	8.2			
MN	1982	UN	4	16	441040	875003	B64	904.9	29.5	31.0					21				SC-CL	59	128.7	88.0	9.1			
MN	1982	KEVA	3	16	441040	875003	B64	904.9	9.5	12.0	4.75E-06	i			32	13	66	29	CL	60	123.0		11.8	24	12	3.9
MN	1982	UN	3	16	441033	874953	B65	883.7	34.5	36.0					27	49			SC-SM	39		34.0	9.3			
MN	1982	KEVA	3	16	441033	874953	B65	883.7	19.5	21.0					16	18	26	32	CL	69			11.9	26	15	2.8
MN	1982	KEVA	3	16	441033	874953	B65	883.7	9.5	11.0	4.71E-06				23	29	47	25	CL	55	134.8		10.7	26	16	

Appendix 3 - HYDROGEOLOGIC AND ENGINEERING DATA FOR MANITOWOC COUNTY INCLUDING LEMBERGER, PROPOSED MANITOWOC COUNTY, AND RIDGEVIEW SITES

IDENTITY: County (code)	Year	Litho-strat. unit (code)	Mat. (code)	Site No.	Lat.	Long.	Brng. no.	Surf. Elev. (ft)	Sample top (ft)	Sample bottom (ft)	HYDRAULIC CONDUCTIVITY: Lab K (cm/s)	Meth code	Fld K (cm/s)	Meth code	GRAINSIZE PERCENTAGES: Bulk % >2.0mm	Matrix % sand (2.0 to 0.0625mm)	Matrix % silt (0.0625 to 0.002mm)	Matrix % clay (<0.002mm)	ENGINEERING PROPERTIES: Unified Soil Class.	Bulk Percent P200	Dry Unit Wt. (pcf)	SPT (N)	Moist. cont.(%)	Liquid limit	Plastic. index	UC (tsf)
MN	1982	KEVA	3	16	441038	874953	B66	903.7	24.5	26.0					9	24	51	25	CL	69			12.0	26	15	
MN	1982	UN	3	16	441038	874953	B66	903.7	54.5	56.0					37	57			SW	30			5.7			
MN	1982	KEVA	3	16	441038	874953	B66	903.7	8.5	10.5	4.72E-08	i			14	20	51	29	CL	70	125.9		12.2	26	15	2.5
MN	1982	UN	3	16	441043	874953	B67	915.2	39.5	41.0					50	58			SW-SM	21		167.0	2.3			
MN	1982	KEVA	3	16	441043	874953	B67	915.2	4.5	6.5					12	39	43	18	SM-SC	55			12.4			2.4
MN	1982	KEVA	3	16	441043	874953	B67	915.2	9.5	16.0					7	22	52	27	CL	73				28	18	
MN	1982	UN	3	16	441032	874946	B68	891.3	49.5	51.0					51	57			SC-SM	22		240.0	4.1			
MN	1982	KEVA	35	16	441032	874946	B68	891.3	23.5	25.5					4	19	52	29	CL	79		26.0	15.6	26	14	
MN	1982	KEVA	3	16	441032	874946	B68	891.3	13.5	15.5	1.76E-07	i			9	26	48	25	CL	68	122.1		12.9	25	15	
MN	1982	KEVA	3	16	441036	874946	B69	878.8	9.5	11.5	3.98E-06	i			12	22	55	24	CL	70				27	16	
MN	1982	UN	3	16	441036	874946	B69	878.8	39.5	41.0					28	54			SC-SM	35		35.0				
MN	1982	KEVA	4	16	441036	874946	B69	878.8	23.5	25.5					23	64			SP-SW	26	128.2		10.8			3.6
MN	1982	UN	3	16	441040	874948	B70	877.4	24.5	26.0					31	51			SC-SM	36		42.0	7.8			
MN	1982	UN	3	16	441040	874948	B70	877.4	34.5	36.0					29	54			SC-SM	35		50.0	7.3			
MN	1982	KEVA	3	16	441046	875008	B71	900.8	19.5	21.5					16	29	37	35	CL	61				19	9	4.5
MN	1982	UN	3	16	441046	875008	B71	900.8	24.5	26.5					10	46	36	19	CL	51	121.5		13.6	19	9	1.8
MN	1982	KEVA	3	16	441046	875008	B71	900.8	4.5	6.5					21	67			SC-SM	30	116.0		10.8			
MN	1982	UN	3	16	441046	875003	B72	923.3	24.5	26.0					26	51			SC-SM	39		55.0	7.2			
MN	1982	UN	3	16	441046	875003	B72	923.3	4.5	6.5	6.65E-08	i			26	38	46	16	SC-SM	47	134.1		10.3	19	9	4.5
MN	1982	UN	3	16	441046	874956	B73	936.6	23.5	25.0					45	47			SM-SC	30		92.0	5.0			
MN	1982	KEVA	3	16	441046	874956	B73	936.6	4.5	6.5	6.85E-06	i			17	27	48	25	CL	63	117.9		14.7	27	16	
MN	1982	UN	3	16	441046	874956	B73	936.6	4.5	17.0					21	25			ML-CL	60	137.6	55.0	8.4			
MN	1982	KEVA	3	16	441046	874948	B74	904.7	4.5	6.5					8	32			CL	65			12.2			4.1
MN	1982	KEVA	3	16	441046	874948	B74	904.7	14.5	16.5	2.14E-06				5	16	51	34	CL	81	117.5		15.8	24	13	3.6
MN	1982	KEVA	3	16	441041	874938	B75	863.5	3.0	8.0					7	33	46	20	CL	63				25	15	
MN	1982	UN	3	16	441041	874938	B75	863.5	18.5	20.0					45	62			SM	23		47.0	4.3			
MN	1982	KEVA	3	16	441041	874938	B75	863.5	6.0	7.5					14	30	47	23	CL	63		23.0	11.5	23	12	4.4
MN	1982	KEVA	3	16	441037	874938	B76	852.9	4.5	6.5	8.63E-07	i			7	24	47	29	CL	73	120.5		14.7	27	16	4.0
MN	1982	UN	3	16	441037	874938	B76	852.9		15.0					38	44			SM-SC	37		52.0	7.2			
MN	1982	KEVA	3	16	441028	874937	B77	850.8	8.5	10.0					10	42	47	22	CL	62		12.0	12.4	22	10	
MN	1982	KEVA	3	16	441029	874942	B78	856.4	5.0	7.0					7	22	49	29	CL	76	127.5		13.1	31	19	
MN	1982	UN	3	16	441029	874942	B78	856.4	23.5	25.0					40	48			SM-SC	32		27.0	7.1			
MN	1982	KEVA	3	16	441021	874937	B79	878.8	18.5	20.0					6	14	54	32	CL	81		22.0	14.3	28	17	
MN	1982	UN	5	16	441017	874937	B80	882.8	24.5	26.0					9	20	48	32	CL	75		60.0	13.1	27	16	4.5
MN	1982	KEVA	3	16	441014	874948	B81	903.7	4.5	6.5	7.47E-08	i			6	24	49	27	CL	71	118.5		17.4	24	13	2.7
MN	1982	KEVA	3	16	441023	874952	B82	894.8	9.5	11.0					6	32	45	23	CL	65		17.0	13.7	24	12	2.2
MN	1982	KEVA	3	16	441021	874946	B83		15.0	20.0					3	20	49	31	CL	80	122.6	23.0	18.5	25	15	3.5
MN	1983	KEVA	3	16	441039	875010	B84	905.6	5.0	7.0					13	43	41	16	CL	52	138.5		10.8	21	12	2.6
MN	1983	KE	5	16	441039	875010	B84	905.6	29.5	31.0					11	26	51	24	CL	67		26.0	12.0	22	13	
MN	1983	KEVA	3	16	441038	875007	B85	898.9	4.5	6.5	4.28E-07	i			13	29	47	24	CL	63	135.3		10.4	20	9	4.5
MN	1983	KE	4	16	441038	875007	B85	898.9	14.5	16.5					1	84			SM-SP	26			18.6			1.7
MN	1983	UN	5	16	441038	875007	B85	898.9	26.0	28.0					22	29	66	23	CL	53			10.1	22	12	2.5
MN	1983	KEVA	3	16	441038	875007	B85A	898.9	1.0	3.0					7	32	43	25	CL	64				24	15	
MN	1983	KE	4	16	441039	875001	B86	910.6	4.5	6.0					20	61			SM-SP	35		34.0	15.3			
MN	1983	UN	3	16	441039	875001	B86	910.6	34.5	36.0					32	50			SM-SP	36		70.0				
MN	1983	KE	4	16	441039	875001	B86	910.6	17.5	19.5					11	45	40	15	CL	50	121.9		12.9	20	9	

Appendix 3 - HYDROGEOLOGIC AND ENGINEERING DATA FOR MANITOWOC COUNTY INCLUDING LEMBERGER, PROPOSED MANITOWOC COUNTY, AND RIDGEVIEW SITES

IDENTITY: County (code)	Year	Litho-strat. unit (code)	Mat. (code)	Site No.	Lat.	Long.	Brng. no.	Surf. Elev. (ft)	Sample top (ft)	Sample bottom (ft)	HYDRAULIC CONDUCTIVITY: Lab K (cm/s)	Meth code	Fld K (cm/s)	Meth code	GRAINSIZE PERCENTAGES: Bulk % >2.0mm	Matrix % sand (2.0 to 0.0625mm)	Matrix % silt (0.0625 to 0.002mm)	Matrix % clay (<0.002mm)	ENGINEERING PROPERTIES: Unified Soil Class.	Bulk Percent P200	Dry Unit Wt. (pcf)	SPT (N)	Moist. cont. (%)	Liquid limit	Plastic. index	UC (tsf)
MN	1983	KEVA	3	16	441037	874942	B87	870.0	9.5	11.0					8	32	48	21	ML-CL	65		22.0	13.2			
MN	1983	KEVA	3	16	441037	874942	B87	870.0	1.0	3.0					13	64			SM-SP	35	133.5		11.7			
MN	1983	UN	3	16	441037	874942	B87	870.0	34.5	36.0					45	55			SM-SP	27		100.0				
MN	1983	UN	5	16	441042	875010	B88	905.1	24.5	26.0					12	38	42	20	CL	57		43.0	11.0	21	11	
MN	1983	KEVA	3	16	441042	875010	B88	905.1	9.5	11.0					27	37	42	21	SM-ML	47				20	10	
MN	1983	UN	3	16	441042	875005	B89	910.4	9.5	11.5	4.95E-08	1			18	52	35	12	SC-CL	40	116.2		14.2	25	14	
MN	1983	UN	3	16	441042	875005	B89	910.4	24.5	26.0					26	32	45	23	CL	52		42.0	9.6	20	10	
MN	1983	KEVA	3	16	441042	875005	B89	910.4	4.5	6.5	1.51E-07	1			3	13	59	30	CL	88	128.7		13.0	23	13	3.3
MN	1983	KEVA	3	16	441045	874957	B90	923.4	5.0	7.0	3.96E-08	1			21	37	44	19	CL	51	109.1		17.8	35	23	
MN	1983	UN	3	16	441045	874957	B90	923.4	19.5	21.0					31	52			SM-GP	36		100.0	9.3			
MN	1983	UN	3	16	441042	874951	B91	906.9	24.5	26.0					25	35			SM-GP	49		79.0	7.9	27	17	
MN	1983	KEVA	3	16	441042	874951	B91	906.9	4.5	6.5	1.87E-08	1			7	26	48	26	CL	69	128.9		13.9	26	16	
MN	1983	KEVA	3	16	441044	875007	B92	904.5	24.5	26.0					14	33			ML-SM	59						
MN	1983	KEVA	3	16	441044	875007	B92	904.5	4.5	6.5					13	40	44	16	CL	53			11.3	21	9	4.2
MN	1983	KEVA	3	16	441043	875000	B93	909.2	9.5	11.5	2.92E-08				7	28	43	29	CL	68	99.7		25.1	37	26	1.0
MN	1983	UN	3	16	441043	875000	B93	909.2	29.5	31.0					49	57			SM-GP	24		61.0	8.8			
MN	1983	UN	3	16	441043	874949	B94	901.4	34.5	36.0					45	53			SM-GP	28		200.0				
MN	1983	KEVA	3	16	441043	874949	B94	901.4	19.5	21.0									CL	84		30.0	16.1	30	17	
MN	1983	KEVA	3	16	441043	874949	B94	901.4	4.5	6.5	5.56E-08				8	30	47	23	CL	65	120.6		15.5	25	15	
MN	1983	KEVA	4	16	441034	875010	TP1	887.8	9.0	10.0					31	65			SM-GP	27						
MN	1983	KE/UN	3	16	441045	875004	TP10	915.9	17.0	18.0					37	48			SP-SM	35						
MN	1983	KEVA	3	16	441045	875004	TP10	915.9	10.0	11.0					14	26	50	24	CL	66				23	14	
MN	1983	KEVA	3	16	441045	875000	TP11	915.9	7.0	8.0					29	51	37	13	SC	37				23	13	
MN	1983	KEVA	3	16	441037	874948	TP12	883.7	7.0	8.0					8	25	48	27	CL	71				27	16	
MN	1983	KEVA	3	16	441022	874946	TP13	889.6	9.0	10.0					7	27	48	25	CL	69				25	15	
MN	1983	KEVA	3	16	441025	874946	TP13A	883	6.0	7.0					15	26	48	26	CL	63				27	16	
MN	1983	UN	3	16	441017	874950	TP15	903.8	17.0	18.0					8	25	50	25	CL	69				25	15	
MN	1983	KEVA	3	16	441017	874950	TP15	903.8	8.0	9.0					7	23	48	29	CL	73						
MN	1983	KEVA	3	16	441019	874950	TP15A	898	7.0	8.0					6	23	46	31	CL	73				28	18	
MN	1983	UN	3	16	441034	874956	TP16	882	12.0	13.0					13	38	45	17	CL	55				21	11	
MN	1983	KEVA	3	16	441016	874951	TP17	908.3	2.0	3.0					5	26	47	26	CL	71				31	20	
MN	1983	KEVA	3	16	441016	874951	TP17	908.3	9.0	10.0					5	21	55	24	CL	76				28	17	
MN	1983	UN	3	16	441017	874945	TP18	904.6	14.0	15.0					5	20	49	31	CL	77				25	14	
MN	1983	KEVA	3	16	441017	874945	TP18	904.6	8.0	9.0					7	25	47	28	CL	70				28	16	
MN	1983	KEVA	3	16	441033	874948	TP19	886.6	5.0	6.0					7	31	45	24	CL	65				24	14	
MN	1983	KE	4	16	441033	874948	TP19	886.6	8.0	9.0					1	100			SM	40						
MN	1983	KE	4	16	441034	875008	TP2	889.4	20	21					19	88			SP-SM	15						
MN	1983	KEVA	3	16	441013	874951	TP20	919.8	14.0	15.0					4	20	49	31	CL	78						

Appendix 3 - HYDROGEOLOGIC AND ENGINEERING DATA FOR MANITOWOC COUNTY INCLUDING LEMBERGER, PROPOSED MANITOWOC COUNTY, AND RIDGEVIEW SITES

IDENTITY											HYDRAULIC CONDUCTIVITY				GRAINSIZE PERCENTAGES				ENGINEERING PROPERTIES							
County (code)	Year	Litho-strat. unit (code)	Mat. (code)	Site No.	Lat.	Long.	Brng. no.	Surf. Elev. (ft)	Sample top (ft)	Sample bottom (ft)	Lab K (cm/s)	Meth code	Fld K (cm/s)	Meth code	Bulk % >2.0mm	Matrix % sand (2.0 to 0.0625mm)	Matrix % silt (0.0625 to 0.002mm)	Matrix % clay (<0.002mm)	Unified Soil Class.	Bulk Percent P200	Dry Unit Wt. (pcf)	SPT (N)	Moist. cont.(%)	Liquid limit	Plastic. index	UC (tsf)
MN	1983	KEVA	3	16	441013	874951	TP20	919.8	10.0	11.0					13	24	47	29	CL	77				28	18	
MN	1983	KEVA	3	16	441014	874945	TP21	896.7	7.0	8.0					9	30	47	23	CL	66						
MN	1983	KEVA	3	16	441014	874940	TP22	888.8	8.0	9.0					11	39	44	17	CL	55				20	9	
MN	1983	KEVA	3	16	441008	874952	TP25	915.9	9.0	10.0					10	29	47	24	CL	65				23	13	
MN	1983	KEVA	3	16	441008	874946	TP26	896.6	5.0	6.0					9	20	46	34	CL	74				31	19	
MN	1983	KEVA	3	16	441004	874950	TP27	901	4.0	5.0					7	30	45	25	CL	67				23	13	
MN	1983	KEVA	3	16	441035	874945	TP28	874.7	9.0	10.0					10	38	43	19	CL	59				20	9	
MN	1983	UN	3	16	441037	875010	TP3	897.2	16.5	17.5					13	25	48	26	CL	66				23	14	
MN	1983	KEVA	3	16	441024	874942	TP30	865	7.0	8.0					11	26	47	27	CL	67				28	17	
MN	1983	KEVA	3	16	441032	874944	TP31	882	3.0	4.0					6				CL-ML	64						
MN	1983	KEVA	3	16	441032	874944	TP31	882	11.0	12.0					12	26	47	27	CL	63				28	17	
MN	1983	KE	4	16	441039	875007	TP4	899.1	17.0	18.0					12	59			SP-SM	40						
MN	1983	KEVA	3	16	441040	875004	TP6	908.3	6.0	7.0					21	38	43	19	SM	50				21	12	
MN	1983	UN	3	16	441040	875004	TP6	908.3	17.0	18.0					49	59			SM-GP	23						
MN	1983	UN	3	16	441044	875007	TP7	906.5	11.0	12.0					13	38	45	17	CL	55				19	9	
MN	1983	UN	3	16	441044	875007	TP7	906.5	19.0	20.0					9	23	49	27	CL	71				23	13	
MN	1983	KE	4	16	441044	875007	TP7	906.5	4.0	5.0					6	69			SM	35						
MN	1983	KEVA	3	16	441044	875003	TP8	913.2	10.0	11.0					14	41	44	15	CL	53				19	10	
MN	1983	UN	3	16	441044	875003	TP8	913.2	19.0	20.0					37	51	41	8	SM-GP	32						
MN	1983	UN	3	16	441045	875008	TP9	898.7	10.0	11.0					13	31	47	22	CL	61				22	11	
MN	1983	UN	5	16	441045	875008	TP9	898.7	23.0	24.0					0	10	49	41	CL	93				35	24	

Appendix 3 - HYDROGEOLOGIC AND ENGINEERING DATA FOR MARINETTE COUNTY

IDENTITY											HYDRAULIC CONDUCTIVITY				GRAINSIZE PERCENTAGES				ENGINEERING PROPERTIES							
County (code)	Year	Litho-strat. unit (code)	Mat. (code)	Site No.	Lat.	Long.	Brng. no.	Surf. Elev. (ft)	Sample top (ft)	Sample bottom (ft)	Lab K (cm/s)	Meth code	Fld K (cm/s)	Meth code	Bulk % >2.0mm	Matrix % sand (2.0 to 0.0625mm)	Matrix % silt (0.0625 to 0.002mm)	Matrix % clay (<0.002mm)	Unified Soil Class.	Bulk Percent P200	Dry Unit Wt. (pcf)	SPT (N)	Moist. cont. (%)	Liquid limit	Plastic. index	UC (tsf)
MT	1981	KE	3	17	451499	880599	N8B	787.6	20.0	20.5					6	28			CL	69	116.1	32	15.9	24	11	
MT	1981	KE	3	17	451499	880599	OW9	792.7	20.0	21.5					9	22			CL	73	126.7	86	12.5	23	11	
MT	DNR	KE	434	17	451499	880599	OW9	792.7	15.0	26.0			1.00E-06	7					CL							
MT	app.	KE	434	17	451499	880599	OW9	792.7	15.0	26.0			1.44E-05	7					CL							
MT	text	KE	434	17	451499	880599	OW9	792.7	15.0	26.0			2.05E-06	7					CL							
MT	1981	KE	3	17	451499	880599	B12		8.5	10.0					1	75			SM	36	100.6	25	8.0			
MT	1981	KE	4	17	451499	880599	B12		23.5	25.0												130				
MT	1981	KE	3	17	451499	880599	B13		10.0	11.5					18	63			SC	33		31	9.6			
MT	1981	KE	3	17	451499	880599	B13		15.0	16.5					10	62			SM	42		32	9.6			
MT	DNR	KE	3	17	451499	880599	N14B	785.5	45.0	51.0			9.30E-06	7					SC,Rock							
MT	1981	KE	3	17	451499	880599	N14B	785.5	45.0	51.0			1.81E-05	7					SC,Rock							
MT	1981	KE	3	17	451499	880599	B15		35.0	36.5					7	33			ML	65	119.0	120	13.0			
MT	DNR	KE	5	17	451499	880599	N16B	800.7	65.6	70.1			1.90E-05	7					ML							
MT	1981	KE	5	17	451499	880599	N16B	800.7	65.6	70.1			4.18E-05	7					ML							
MT	1981	KE	3	17	451499	880599	B19		15.0	16.5					5	86			SC	17		18				
MT	1981	KE	4	17	451499	880599	B22		45.0	46.5					0	98			SP-SM	5	104.1	93				
MT	1981	KE	4	17	451499	880599	B22		60.0	61.5									SP			77				
MT	1981	KE	5	17	451499	880599	B23		35.0	36.5					0	17			ML	86	113.7	150	22.4			
MT	DNR	KE	54	17	451499	880599	N24A	823.6	91.0	94.5			3.90E-06	7					SM							
MT	1981	KE	54	17	451499	880599	N24A	823.6	91.0	94.5			5.13E-04	7					SM							
MT	1981	KE	4	17	451499	880599	N24B	823.6	20.0	21.5					0	97			SP	4		107				
MT	1981	KE	5	17	451499	880599	B26		39.0	40.5					0	37			ML	69		220				
MT	1981	KE	4	17	451499	880599	OW27		10.0	11.5					0	96			SP-SM	6		20				
MT	1981	KE	5	17	451499	880599	OW27		30.0	31.3					1	28			ML	74		71				
MT	1981	KE	4	17	451499	880599	OW28		70.0	70.5									SP			180	17.7			
MT	1981	KE	4	17	451499	880599	B29		28.5	30.0					0	87			SM	21		18				
MT	1981	KE	3	17	451499	880599	B30	805.8	8.5	10.0					0	16			CL	87						
MT	1981	KE	3	17	451499	880599	B30	805.8	13.5	15.0					0	48			CL	54						
MT	1981	KE	4	17	451499	880599	B30	805.8	18.5	20.0					1	80			SM	27						
MT	DNR	KE	3	17	451499	880599	N34B	869.7	129.6	134.1			1.36E-05	7					SC							
MT	1981	KE	3	17	451499	880599	N34B	869.7	129.6	134.1			2.96E-05	7					SC							
MT	1981	KE	3	17	451429	880536	B3	805.0	27.5	28.5					11	75			SC	26		54				
MT	1981	KE	3	17	451429	880536	B3	805.0	35.0	36.0					3	27			CL	72		29				
MT	1981	KE	99	17	451429	880536	B3	805.0	40.0	41.0					1	16			CL	84		22				
MT	1981	KE	4	17	451411	880532	B4	823.0	5.0	6.0					0	100			SP	?		11				
MT	1981	KE	3	17	451415	880542	B5	804.6	15.0	16.0					46	76			SW-SM	16		24				
MT	1981	KE	4	17	451414	880532	B6	812.4	5.0	6.0					0	100			SP-SM	[illegible]		6				
MT	1981	KE	4	17	451414	880532	B6	812.4	10.0	11.0					0	100			SP	5		14				
MT	1981	KE	4	17	451415	880542	B7	806.4	20.0	21.5					0	100			SP	3		10				

Appendix 3 - HYDROGEOLOGIC AND ENGINEERING DATA FOR MARQUETTE COUNTY

IDENTITY: County (code)	Year	Litho-strat. unit (code)	Mat. (code)	Site No.	Lat.	Long.	Brng. no.	Surf. Elev. (ft)	Sample top (ft)	Sample bottom (ft)	HYDRAULIC CONDUCTIVITY: Lab K (cm/s)	Meth code	Fld K (cm/s)	Meth code	GRAINSIZE PERCENTAGES: Bulk % >2.0mm	Matrix % sand (2.0 to 0.0625mm)	Matrix % silt (0.0625 to 0.002mm)	Matrix % clay (<0.002mm)	ENGINEERING PROPERTIES: Unified Soil Class.	Bulk Percent P200	Dry Unit Wt. (pcf)	SPT (N)	Moist. cont. (%)	Liquid limit	Plastic. index	UC (tsf)
MQ	1979	UN	5	19	434710	892842	B7	816.7		10.0					2	46			CL	57				20	9	
MQ	1979	UN	5	19	434710	892842	B7	816.7		25.0					2	19			CL	79				32	16	
MQ	1979	UN	5	19	434709	892846	B8	836.4		5.0					0	21			CH	80				51	30	
MQ	1979	UN	5	19	434709	892846	B8	836.4		10.0					2	62			SM	43						
MQ	1979	UN	5	19	434709	892846	B8	836.4		15.0					0	19	49	32	CL	82				31	13	
MQ	1978	UN	5	19	434708	892851	B9	864.0		5.0					1	64			SC	39				23	11	
MQ	1978	UN	5	19	434708	892851	B9	864.0		20.0					0	67	23	10	SM	48						
MQ	1978	UN	5	19	434703	892854	B10	860.5		10.0					0	52	35	17	CL	49				22	8	
MQ	1978	UN	5	19	434703	892854	B10	860.5		15.0					6	32			CL	65				21	10	
MQ	1978	UN	5	19	434703	892854	B10	860.5		25.0					5	82			SM	19						
MQ	1978	UN	5	19	434712	892855	B12	869.7		20.0					6	32			CL	66				25	8	
MQ	1978	UN	5	19	434709	892858	B14	870.2		10.0					2	30			CL	70				24	8	
MQ	1978	UN	5	19	434709	892858	B14	870.2		25.0					3	84			SM	21						
MQ	1978	UN	5	19	434709	892858	B15	861.9		10.0					2	46			CL-ML	55				19	5	
MQ	1978	UN	5	19	434716	892846	B16	841.9		15.0					0	10			CL-ML	91				22	4	
MQ	1978	UN	5	19	434713	892846	B17	833.7		15.0					1	39			CL-ML	62				18	6	
MQ	1978	UN	5	19	434716	892841	B18	832.7		10.0					3	41			CL-ML	59				20	7	
MQ	1978	UN	5	19	434716	892841	B18	832.7		20.0					0	27			CL-ML	76				21	8	

Appendix 3 - HYDROGEOLOGIC AND ENGINEERING DATA FOR RACINE COUNTY - (WEPCO) CALEDONIA SITE

IDENTITY County (code)	Year	Litho-strat. unit (code)	Mat. (code)	Site No.	Lat.	Long.	Brng. no.	Surf. Elev. (ft)	Sample top (ft)	Sample bottom (ft)	HYDRAULIC CONDUCTIVITY Lab K (cm/s)	Meth code	Fld K (cm/s)	Meth code	GRAINSIZE PERCENTAGES Bulk % >2.0mm	Matrix % sand (2.0 to 0.0625mm)	Matrix % silt (0.0625 to 0.002mm)	Matrix % clay (<0.002mm)	ENGINEERING PROPERTIES Unified Soil Class.	Bulk Percent P200	Dry Unit Wt. (pcf)	SPT (N)	Moist. cont.(%)	Liquid limit	Plastic. index	UC (tsf)
Ra	1977	OC	3	20	425031	875028	C1	705.6	1.5						0	32	58	10		74		4				1.0
Ra	1977	OC	3	20	425031	875028	C1	705.6	5.0						0	11	64	25		91		23				4.5
Ra	1977	OC	3	20	425031	875028	C1	705.6	10.0						0	11	64	25		91		14				4.5
Ra	1977	OC	3	20	425031	875028	C1	705.6	15.0						0	11	69	30		92		15				4.0
Ra	1977	OC	3	20	425031	875028	C1	705.6	20.0						0	10	62	28		93		14				3.5
Ra	1977	OC	3	20	425031	875028	C1	705.6	25.0						0	8	65	27		94		16				
Ra	1977	OC	5	20	425031	875028	C1	705.6	30.0						13	84				15		11				
Ra	1977	OC	5	20	425031	875028	C1	705.6	35.0						3	11	68	21		88		19				4.5
Ra	1977	OC	5	20	425031	875028	C1	705.6	40.0						0	15	71	14		90		46				
Ra	1977	OC	99	20	425025	875033	C2	711.8	1.5						0	14	62	24		89		3				1.8
Ra	1977	OC	3	20	425025	875033	C2	711.8	5.0						0	13	64	23		91		22				4.5
Ra	1977	OC	3	20	425025	875033	C2	711.8	10.0						0	10	65	25		92		25				4.5
Ra	1977	OC	3	20	425025	875033	C2	711.8	15.0						0	8	62	30		94		18				4.5
Ra	1977	OC	3	20	425025	875033	C2	711.8	20.0						0	4	61	35		97		11				2.5
Ra	1977	OC	5	20	425025	875033	C2	711.8	25.0						0	1	92	7		100		20				2.8
Ra	1977	OC	3	20	425025	875033	C2	711.8	30.0						14	26	57	17		64		11				2.5
Ra	1977	OC	3	20	425025	875033	C2	711.8	35.0						0	9	71	20		92		15				1.8
Ra	1977	OC	3	20	425025	875033	C2	711.8	40.0						0	10	73	17		92		14				1.5
Ra	1977	OC	99	20	425024	875023	C3	696.9	1.5						2	19	51	30		82		3				1.5
Ra	1977	OC	3	20	425024	875023	C3	696.9	5.0						1	13	64	23		89		12				3.0
Ra	1977	OC	3	20	425024	875023	C3	696.9	10.0						1	9	68	23		92		21				4.5
Ra	1977	OC	3	20	425024	875023	C3	696.9	15.0						3	8	69	23		91		18				4.5
Ra	1977	OC	5	20	425024	875023	C3	696.9	20.0						0	3	89	8		98		15				2.5
Ra	1977	OC	99	20	425024	875023	C3	696.9	25.0						1	3	62	35		97		14				3.5
Ra	1977	OC	99	20	425024	875023	C3	696.9	30.0						0	10	55	35		91		13				3.0
Ra	1977	OC	99	20	425024	875023	C3	696.9	35.0						3	11	60	29		98		15				4.0
Ra	1977	OC	99	20	425024	875023	C3	696.9	40.0						3	15	64	21		84		10				2.0
Ra	1977	OC	5	20	425020	875047	C4	698.4	1.5						0	20	65	15		82		3				
Ra	1977	OC	5	20	425020	875047	C4	698.4	5.0						12	32	57	11		63		14				2.0
Ra	1977	OC	5	20	425020	875047	C4	698.4	10.0						16	26	60	14		54		15				2.0
Ra	1977	OC	5	20	425020	875047	C4	698.4	15.0						0	4	49	47		96		11				3.0
Ra	1977	OC	3	20	425020	875047	C4	698.4	20.0						0	1	49	50		99		14				3.5
Ra	1977	OC	5	20	425020	875047	C4	698.4	25.0						0	3	47	50		99		12				3.0
Ra	1977	OC	5	20	425020	875047	C4	698.4	30.0						0	2	53	45		99		9				2.0
Ra	1977	OC	5	20	425020	875047	C4	698.4	35.0						0	3	45	52		98		11				1.8
Ra	1977	OC	5	20	425020	875047	C4	698.4	40.0						0	2	48	50		99		9				2.8
Ra	1977	OC	3	20	425019	875032	C5	703.5	1.5						1	17	55	28		85		4				2.0
Ra	1977	OC	3	20	425019	875032	C5	703.5	5.0						2	10	64	26		90		18				4.5
Ra	1977	OC	5	20	425019	875032	C5	703.5	10.0						16	58	36	6		37		18				
Ra	1977	OC	5	20	425019	875032	C5	703.5	15.0						25	83	16	1		15		19				
Ra	1977	OC	5	20	425019	875032	C5	703.5	20.0						10	78	20	2		22		11				
Ra	1977	OC	5	20	425019	875032	C5	703.5	25.0						13	72	23	5		26		13				
Ra	1977	OC	5	20	425019	875032	C5	703.5	30.0						0	10	79	11		95		20				4.5
Ra	1977	OC	3	20	425019	875032	C5	703.5	35.0						0	7	49	44		96		11				3.0
Ra	1977	OC	3	20	425019	875032	C5	703.5	40.0						2	6	63	31		94		15				3.3
Ra	1977	OC	99	20	425016	875041	C6	696.0	1.5						0	15	65	20		89		2				

Appendix 3 - HYDROGEOLOGIC AND ENGINEERING DATA FOR RACINE COUNTY - (WEPCO) CALEDONIA SITE

IDENTITY County (code)	Year	Litho-strat. unit (code)	Mat. (code)	Site No.	Lat.	Long.	Brng. no.	Surf. Elev. (ft)	Sample top (ft)	Sample bottom (ft)	HYDRAULIC CONDUCTIVITY Lab K (cm/s)	Meth code	Fld K (cm/s)	Meth code	GRAINSIZE PERCENTAGES Bulk % >2.0mm	Matrix % sand (2.0 to 0.0625mm)	Matrix % silt (0.0625 to 0.002mm)	Matrix % clay (<0.002mm)	ENGINEERING PROPERTIES Unified Soil Class.	Bulk Percent P200	Dry Unit Wt. (pcf)	SPT (N)	Moist. cont. (%)	Liquid limit	Plastic. index	UC (tsf)
Ra	1977	OC	5	20	425016	875041	C6	696.0	5.0						9	56	35	9		44		10				1.8
Ra	1977	OC	5	20	425016	875041	C6	696.0	10.0						17	82	16	2		18		9				
Ra	1977	OC	3	20	425016	875041	C6	696.0	15.0						6	30	60	11		73		12				2.5
Ra	1977	OC	3	20	425016	875041	C6	696.0	20.0						6	22	62	16		77		13				2.5
Ra	1977	OC	3	20	425016	875041	C6	696.0	25.0						9	30	59	11		67		11				2.5
Ra	1977	OC	3	20	425016	875041	C6	696.0	30.0						9	29	56	15		67		10				2.0
Ra	1977	OC	3	20	425016	875041	C6	696.0	35.0						5	26	63	11		73		13				2.0
Ra	1977	OC	3	20	425016	875041	C6	696.0	40.0						6	32	52	16		67		12				2.8
Ra	1977	OC	99	20	425014	875024	C7	693.2	1.5						3	22	58	21		81		4				1.0
Ra	1977	OC	3	20	425014	875024	C7	693.2	5.0						3	15	59	26		85		28				4.5
Ra	1977	OC	3	20	425014	875024	C7	693.2	10.0						2	13	61	26		92		24				4.5
Ra	1977	OC	3	20	425014	875024	C7	693.2	15.0						3	10	61	31		92		16				4.5
Ra	1977	OC	3	20	425014	875024	C7	693.2	20.0						2	8	61	31		97		20				4.5
Ra	1977	OC	3	20	425014	875024	C7	693.2	25.0						3	7	62	31		93		14				2.5
Ra	1977	OC	3	20	425014	875024	C7	693.2	30.0						3	11	64	25		91		12				2.5
Ra	1977	OC	3	20	425014	875024	C7	693.2	35.0						1	9	64	27		93		19				4.0
Ra	1977	OC	3	20	425014	875024	C7	693.2	40.0						1	9	61	30		94		16				4.3
Ra	1977	OC	5	20	425013	875035	C8	705.8	1.5						14	14	64	22		75		4				1.0
Ra	1977	OC	5	20	425013	875035	C8	705.8	5.0						1	13	57	30		92		17				4.0
Ra	1977	OC	5	20	425013	875035	C8	705.8	10.0											56		18				4.5
Ra	1977	OC	5	20	425013	875035	C8	705.8	15.0						3	7	62	31		93		17				4.5
Ra	1977	OC	5	20	425013	875035	C8	705.8	20.0						0	7	63	30		96		14				3.0
Ra	1977	OC	5	20	425013	875035	C8	705.8	25.0						0	3	57	40		99		19				4.5
Ra	1977	OC	5	20	425013	875035	C8	705.8	30.0						0	13	60	27		92		23				4.5
Ra	1977	OC	5	20	425013	875035	C8	705.8	35.0						3	10	62	28		90		24				4.5
Ra	1977	OC	5	20	425013	875035	C8	705.8	40.0						0	2	55	43		100		19				4.5
Ra	1977	OC	99	20	425009	875043	C9	704.2	1.5						0	40	48	12		63		2				
Ra	1977	OC	5	20	425009	875043	C9	704.2	5.0						0	15	81	4		91		20				4.5
Ra	1977	OC	4	20	425009	875043	C9	704.2	10.0						0	86	13	1		20		14				
Ra	1977	OC	5	20	425009	875043	C9	704.2	15.0						0	11	80	9		93		7				0.5
Ra	1977	OC	3	20	425009	875043	C9	704.2	20.0						0	3	74	23		99		6				0.5
Ra	1977	OC	5	20	425009	875043	C9	704.2	25.0						0	70	27	3		42		18				
Ra	1977	OC	5	20	425009	875043	C9	704.2	30.0						0	86	13	1		18		16				
Ra	1977	OC	5	20	425009	875043	C9	704.2	35.0						0	87	12	1		18		18				
Ra	1977	OC	5	20	425009	875043	C9	704.2	40.0						0	74	17	9		30		19				
Ra	1977	OC	3	20	425099	875099	B1	701.0	1.5						0	28				75		4				
Ra	1977	OC	3	20	425099	875099	B1	701.0	5.0						0	9				93		24				4.5
Ra	1977	OC	3	20	425099	875099	B1	701.0	10.0						0	9				93		27				4.5
Ra	1977	OC	3	20	425099	875099	B1	701.0	15.0						0	7				95		12				4.0
Ra	1977	OC	3	20	425099	875099	B1	701.0	20.0						0	5				97		15				4.5
Ra	1977	OC	3	20	425099	875099	B1	701.0	25.0						0	3				98		14				4.0
Ra	1977	OC	99	20	425099	875099	B2	713.3	1.5						0	20				82		2				
Ra	1977	OC	5	20	425099	875099	B2	713.3	5.0						0	11				91		22				4.5
Ra	1977	OC	4	20	425099	875099	B2	713.3	10.0						18	57	33	10		36		16				
Ra	1977	OC	5	20	425099	875099	B2	713.3	15.0						5	40	51	9		60		17				
Ra	1977	OC	99	20	425099	875099	B2	713.3	20.0						36	52	42	6		33		18				

Appendix 3 - HYDROGEOLOGIC AND ENGINEERING DATA FOR RACINE COUNTY - (WEPCO) CALEDONIA SITE

+ IDENTITY											+ HYDRAULIC CONDUCTIVITY				+ GRAINSIZE PERCENTAGES				+ ENGINEERING PROPERTIES							
County (code)	Year	Litho-strat. unit (code)	Mat. (code)	Site No.	Lat.	Long.	Brng. no.	Surf. Elev. (ft)	Sample top (ft)	Sample bottom (ft)	Lab K (cm/s)	Meth code	Fld K (cm/s)	Meth code	Bulk % >2.0mm	Matrix % sand (2.0 to 0.0625mm)	Matrix % silt (0.0625 to 0.002mm)	Matrix % clay (<0.002mm)	Unified Soil Class.	Bulk Percent P200	Dry Unit Wt. (pcf)	SPT (N)	Moist. cont.(%)	Liquid limit	Plastic. index	UC (tsf)
Ra	1977	OC	5	20	425099	875099	B2	713.3	25.0						0	23	68	9		84		9				2.0
Ra	1977	OC	99	20	425099	875099	B3	688.3	1.5						0	18	66	16		86		3				
Ra	1977	OC	3	20	425099	875099	B3	688.3	5.0						0	12	53	35		90		10				2.8
Ra	1977	OC	3	20	425099	875099	B3	688.3	10.0						0	2	53	45		99		9				2.3
Ra	1977	OC	3	20	425099	875099	B3	688.3	15.0						0	11	61	28		91		13				4.3
Ra	1977	OC	99	20	425099	875099	B3	688.3	20.0						0	74	24	2		43		11				
Ra	1977	OC	3	20	425099	875099	B3	688.3	25.0						0	9	61	30		93		15				4.5
Ra	1977	OC	99	20	425099	875099	B4	699.6	1.5						1	25	57	18		76		3				
Ra	1977	OC	3	20	425099	875099	B4	699.6	5.0						2	7	67	26		93		25				4.5
Ra	1977	OC	3	20	425099	875099	B4	699.6	10.0						3	7	62	31		92		28				4.5
Ra	1977	OC	3	20	425099	875099	B4	699.6	15.0						3	5	69	26		84		12				3.5
Ra	1977	OC	5	20	425099	875099	B4	699.6	20.0						0	83	15	2		23		16				
Ra	1977	OC	3	20	425099	875099	B4	699.6	25.0						1	8	62	30		93		10				2.0
Ra	1980	OC	5	20	425018	875052	BA1		5.0	6.5					0				CL	99		28				4.5
Ra	1980	OC	3	20	425018	875052	BA1		10.0	11.5					0				CL	71		21				2.5
Ra	1980	OC	3	20	425018	875052	BA1		15.0	16.5					0				CL	99		25				2.6
Ra	1980	OC	3	20	425018	875052	BA1		20.0	21.5					0				CL	100		18				1.5
Ra	1980	OC	3	20	425018	875052	BA1		25.0	27.0	3.71E-08	1			0				CL	94						2.0
Ra	1980	OC	35	20	425018	875052	BA1		30.0	31.5					0				CL,SM	73		23				
Ra	1980	OC	3	20	425018	875052	BC1		5.0	6.5					0				CL	99		45				4.5
Ra	1980	OC	3	20	425018	875052	BC1		10.0	11.5					0				CL	96		31				4.0
Ra	1980	OC	3	20	425018	875052	BC1		15.0	16.5					0				CL	95		23				2.5
Ra	1980	OC	3	20	425018	875052	BC1		20.0	21.5					0				CL	88		22				4.5
Ra	1980	OC	3	20	425018	875052	BC1		25.0	26.5					0				CL	97		24				2.6
Ra	1980	OC	3	20	425018	875052	BC1		30.0	31.5					0				CL	97		17				3.0
Ra	1980	OC	3	20	425018	875052	BC1		35.0	36.5					0				CL	85		15				1.0
Ra	1980	OC	3	20	425018	875052	BC1		40.0	41.5					0				CL	76		8				1.0
Ra	1980	OC	3	20	425018	875052	BC1		40.0	41.0					0				SM-SC	42		10				
Ra	1980	OC	3	20	425018	875052	BC1		41.0	41.5					0				CL	89		14				1.3
Ra	1980	OC	3	20	425018	875052	BC1		45.0	47.0	1.55E-08	1			0				CL	90						2.3
Ra	1980	OC	3	20	425018	875052	BC1		50.5	51.5					0				CL	93		38				2.5
Ra	1980	OC	5	20	425028	875037	BA2		5.0	6.5					1				CL	93		37				4.5
Ra	1980	OC	3	20	425028	875037	BA2		10.0	11.0					1				CL	93		55				
Ra	1980	OC	5	20	425028	875037	BA2		11.0	11.5					29				SC	33		64				
Ra	1980	OC	5	20	425028	875037	BA2		15.0	16.5					23				SC	28		25				
Ra	1980	OC	3	20	425028	875037	BA2		20.0	21.5					2				CL	91		25				
Ra	1980	OC	3	20	425028	875037	BA2		25.0	27.0	2.01E-08	1			3				CL	87						3.0
Ra	1980	OC	3	20	425028	875037	BA2		30.0	31.5					5				CL	73		30				
Ra	1980	OC	5	20	425028	875037	BC2		5.0	6.5					1				CL	91		38				4.5
Ra	1980	OC	5	20	425028	875037	BC2		10.0	11.5					6				SM	53		52				
Ra	1980	OC	3	20	425028	875037	BC2		15.0	16.5					2				CL	91		19				2.5
Ra	1980	OC	3	20	425028	875037	BC2		20.0	21.5					2				CL	91		8				1.5
Ra	1980	OC	3	20	425028	875037	BC2		25.0	26.5					2				CL	87		16				3.0
Ra	1980	OC	3	20	425028	875037	BC2		30.0	31.5					1				CL	91		22				2.5
Ra	1980	OC	3	20	425028	875037	BC2		35.0	36.5					2				CL	91		32				2.2
Ra	1980	OC	3	20	425028	875037	BC2		40.0	41.5					0				CL	89		23				1.7

Appendix 3 - HYDROGEOLOGIC AND ENGINEERING DATA FOR RACINE COUNTY - (WEPCO) CALEDONIA SITE

IDENTITY County (code)	Year	Litho-strat. unit (code)	Mat. (code)	Site No.	Lat.	Long.	Brng. no.	Surf. Elev. (ft)	Sample top (ft)	Sample bottom (ft)	HYDRAULIC CONDUCTIVITY Lab K (cm/s)	Meth code	Fld K (cm/s)	Meth code	GRAINSIZE PERCENTAGES Bulk % >2.0mm	Matrix % sand (2.0 to 0.0625mm)	Matrix % silt (0.0625 to 0.002mm)	Matrix % clay (<0.002mm)	ENGINEERING PROPERTIES Unified Soil Class.	Bulk Percent P200	Dry Unit Wt. (pcf)	SPT (N)	Moist. cont.(%)	Liquid limit	Plastic. index	UC (tsf)
Ra	1980	OC	3	20	425028	875037	BC2		45.0	47.0					0				ML	90						
Ra	1980	OC	3	20	425028	875037	BC2		50.0	51.5					1				ML	89		27				2.0
Ra	1980	OC	5	20	425014	875017	BA3		4.0	5.5					2				CL	77		27				
Ra	1980	OC	5	20	425014	875017	BA3		9.0	9.5					1				SM	41		26				
Ra	1980	OC	3	20	425014	875017	BA3		9.5	10.5					0				CL	96		34				
Ra	1980	OC	3	20	425014	875017	BA3		14.0	16.0					0				CL	97						3.5
Ra	1980	OC	5	20	425014	875017	BA3		19.0	21.0					0				CL	95						4.5
Ra	1980	OC	5	20	425014	875017	BA3		24.0	26.0	1.87E-08	1			0				ML	82						3.6
Ra	1980	OC	5	20	425014	875017	BA3		29.0	30.5					0				SM	41		12				
Ra	1980	OC	3	20	425014	875017	BB3		4.0	5.5					1				CL	91		42				4.5
Ra	1980	OC	5	20	425014	875017	BB3		9.0	10.5					0				SM	41		28				
Ra	1980	OC	3	20	425014	875017	BB3		14.0	16.0	1.28E-08	1			0				CL	97						4.5
Ra	1980	OC	3	20	425014	875017	BB3		19.0	21.0					0				CL	98						3.0
Ra	1980	OC	3	20	425014	875017	BB3		24.0	26.0					0				CL	100						4.5
Ra	1980	OC	3	20	425014	875017	BC3		4.0	5.5					1				CL	91		24				
Ra	1980	OC	5	20	425014	875017	BC3		9.0	10.5					0				ML	71		17				
Ra	1980	OC	3	20	425014	875017	BC3		15.0	17.0					0				CL	99						4.5
Ra	1980	OC	3	20	425014	875017	BC3		20.0	22.0					0				CL	98						3.0
Ra	1980	OC	3	20	425014	875017	BC3		25.0	26.5					0				CL	96		22				2.4
Ra	1980	OC	5	20	425014	875017	BC3		30.0	32.0					0				CL	99						3.3
Ra	1980	OC	5	20	425014	875017	BC3		35.0	35.5					0				CL	99						4.5
Ra	1980	OC	5	20	425014	875017	BC3		45.0	45.8	1.97E-06	1			0				SM	33						4.5
Ra	1980	OC	5	20	425014	875017	BC3		50.0	51.5					0				CL	100						4.5
Ra	1980	OC	3	20	425007	875031	BA4		4.0	5.5					2				CL	86		20				4.5
Ra	1980	OC	3	20	425007	875031	BA4		9.0	10.5					2				CL	82		26				3.5
Ra	1980	OC	3	20	425007	875031	BA4		14.0	16.0					1				CL	94						4.2
Ra	1980	OC	3	20	425007	875031	BA4		19.0	21.0					0				CL	96						3.5
Ra	1980	OC	3	20	425007	875031	BA4		24.0	26.0	1.47E-08	1			0				CL	98						3.6
Ra	1980	OC	3	20	425007	875031	BA4		29.0	30.0					0				CL	99						3.0
Ra	1980	OC	5	20	425007	875031	BB4		4.0	5.5					1				CL	89		32				3.2
Ra	1980	OC	3	20	425007	875031	BB4		9.0	10.5					1				CL	94		43				4.5
Ra	1980	OC	3	20	425007	875031	BB4		14.0	16.0	8.87E-09	1			1				CL	93						3.5
Ra	1980	OC	3	20	425007	875031	BB4		19.0	21.0					0				CL	96						4.0
Ra	1980	OC	3	20	425007	875031	BB4		24.0	26.0					0				CL	99						2.5
Ra	1980	OC	3	20	425007	875031	BC4		5.0	6.5					0				CL	91		39				4.5
Ra	1980	OC	5	20	425007	875031	BC4		10.0	11.5					2				SM	56		30				
Ra	1980	OC	3	20	425007	875031	BC4		15.0	16.5					10				ML-CL	76		26				4.5
Ra	1980	OC	3	20	425007	875031	BC4		20.0	21.5					2				CL	86		24				3.0
Ra	1980	OC	3	20	425007	875031	BC4		25.0	26.5					1				CL	95		29				2.8
Ra	1980	OC	3	20	425007	875031	BC4		30.0	31.5					0				CL	100		24				3.0
Ra	1980	OC	3	20	425007	875031	BC4		35.0	36.5					0				CL	99		36				3.5
Ra	1980	OC	3	20	425007	875031	BC4		40.0	41.5					0				CL	99		34				3.7
Ra	1980	OC	3	20	425007	875031	BC4		45.0	47.0	1.72E-08	1			0				CL	99						2.5
Ra	1980	OC	3	20	425007	875031	BC4		50.0	51.5					0				CL	97		39				4.0
Ra	1980	OC	3	20	425016	875038	BA5		4.0	5.5					0				CL	85		15				4.5
Ra	1980	OC	5	20	425016	875038	BA5		9.0	10.5					0				SM	54		11				

Appendix 3 - HYDROGEOLOGIC AND ENGINEERING DATA FOR RACINE COUNTY - (WEPCO) CALEDONIA SITE

IDENTITY County (code)	Year	Litho-strat. unit (code)	Mat. (code)	Site No.	Lat.	Long.	Brng. no.	Surf. Elev. (ft)	Sample top (ft)	Sample bottom (ft)	HYDRAULIC CONDUCTIVITY Lab K (cm/s)	Meth code	Fld K (cm/s)	Meth code	GRAINSIZE PERCENTAGES Bulk % >2.0mm	Matrix % sand (2.0 to 0.0625mm)	Matrix % silt (0.0625 to 0.002mm)	Matrix % clay (<0.002mm)	ENGINEERING PROPERTIES Unified Soil Class.	Bulk Percent P200	Dry Unit Wt. (pcf)	SPT (N)	Moist. cont. (%)	Liquid limit	Plastic. index	UC (tsf)
Ra	1980	OC	3	20	425016	875038	BA5		14.0	16.0					1				CL	93						4.5
Ra	1980	OC	3	20	425016	875038	BA5		19.0	21.0					1				CL	92						2.0
Ra	1980	OC	3	20	425016	875038	BA5		24.0	26.0	2.34E-08	1			1				CL	93						2.5
Ra	1980	OC	3	20	425016	875038	BA5		29.0	31.0					1				CL	90						2.2
Ra	1980	OC	3	20	425016	875038	BB5		4.0	6.0					1				CL	88						4.5
Ra	1980	OC	3	20	425016	875038	BB5		9.0	11.0	1.67E-08	1			0				CL	95						2.0
Ra	1980	OC	3	20	425016	875038	BB5		14.0	16.0					1				CL	93						2.2
Ra	1980	OC	3	20	425016	875038	BB5		19.0	21.0					2				CL	90						2.0
Ra	1980	OC	3	20	425016	875038	BB5		24.0	26.0					1				CL	91						2.0
Ra	1980	OC	5	20	425016	875038	BC5	699.9	5.0	6.0					0				CL	99		13				3.5
Ra	1980	OC	5	20	425016	875038	BC5	699.9	6.0	6.5					0				SM	28		25				
Ra	1980	OC	5	20	425016	875038	BC5	699.9	10.0	11.5					0				SM	13		29				1.5
Ra	1980	OC	3	20	425016	875038	BC5	699.9	15.0	16.5					0				CL	100		19				2.0
Ra	1980	OC	3	20	425016	875038	BC5	699.9	20.0	21.5					2				CL	92		15				2.0
Ra	1980	OC	3	20	425016	875038	BC5	699.9	25.0	26.5					0				CL	96		15				
Ra	1980	OC	3	20	425016	875038	BC5	699.9	30.0	31.5					2				CL	97		15				1.0
Ra	1980	OC	3	20	425016	875038	BC5	699.9	35.0	36.5					1				CL	91		14				1.0
Ra	1980	OC	3	20	425016	875038	BC5	699.9	40.0	41.5					1				CL	93		21				1.5
Ra	1980	OC	5	20	425016	875038	BC5	699.9	45.0	47.0	1.76E-08	1			2				CL	89						2.2
Ra	1980	OC	3	20	425016	875038	BC5	699.9	50.0	51.5					1				CL	92		25				1.5
Ra	1980	OC	5	20	425020	875041	BB6		4.0	6.0					1				CL	88						4.5
Ra	1980	OC	5	20	425020	875041	BB6		9.0	11.0					2				CL	90						4.5
Ra	1980	OC	5	20	425020	875041	BB6		14.0	16.0	3.98E-08	1			1				CL	94						2.2
Ra	1980	OC	5	20	425020	875041	BB6		19.0	21.0					1				CL-ML	90						2.0
Ra	1980	OC	3	20	425020	875041	BB6		24.0	26.0					1				CL	92						2.0
Ra	1980	OC	3	20	425012	875035	BB7		4.0	5.5					1				CL	91		33				4.5
Ra	1980	OC	3	20	425012	875035	BB7		9.0	10.5					1				CL	89		33				4.5
Ra	1980	OC	3	20	425012	875035	BB7		14.0	16.0	7.95E-09	1			2				CL	92						3.2
Ra	1980	OC	5	20	425012	875035	BB7		19.0	21.0					2				CL	90						4.0
Ra	1980	OC	3	20	425012	875035	BB7		24.0	26.0					1				CL	94						3.5
Ra	1980	OC	5	20	425009	875023	BB8		4.0	5.5					9				CL	58		16				
Ra	1980	OC	3	20	425009	875023	BB8		9.0	10.5					0				CL	100		34				4.5
Ra	1980	OC	3	20	425009	875023	BB8		14.0	16.0					0				CL	99						3.0
Ra	1980	OC	3	20	425009	875023	BB8		19.0	21.0					0				CL	99						3.5
Ra	1980	OC	3	20	425009	875023	BB8		24.0	26.0					0				CL	97						4.5
Ra	1980	OC	5	20	425020	875021	BB9		4.0	5.5					8				CL	86		32				4.5
Ra	1980	OC	5	20	425020	875021	BB9		9.0	10.5					2				CL	89		54				4.5
Ra	1980	OC	3	20	425020	875021	BB9		14.0	16.0	1.77E-08				3				CL	89						2.5
Ra	1980	OC	3	20	425020	875021	BB9		19.0	21.0					2				CL	90						4.3
Ra	1980	OC	3	20	425020	875021	BB9		24.0	26.0					0				CL	92						3.5
Ra	1980	OC	3	20	425024	875022	BB10		4.0	5.5					2				CL	87		31				4.5
Ra	1980	OC	5	20	425024	875022	BB10		9.0	10.5					1				ML	80		39				
Ra	1980	OC	5	20	425024	875022	BB10		14.0	16.0	6.58E-05				5				ML	76						3.3
Ra	1980	OC	3	20	425024	875022	BB10		19.0	21.0	5.42E-08				2				CL	84						4.5
Ra	1980	OC	3	20	425024	875022	BB10		24.0	25.5					1				CL	89		33				2.5
Ra	1980	OC	3	20	425020	875028	BB11		4.0	5.5					2				CL	88		41				4.5

Appendix 3 - HYDROGEOLOGIC AND ENGINEERING DATA FOR RACINE COUNTY - (WEPCO) CALEDONIA SITE

IDENTITY: County (code)	Year	Litho-strat. unit (code)	Mat. (code)	Site No.	Lat.	Long.	Brng. no.	Surf. Elev. (ft)	Sample top (ft)	Sample bottom (ft)	HYDRAULIC CONDUCTIVITY: Lab K (cm/s)	Meth code	Fld K (cm/s)	Meth code	GRAINSIZE PERCENTAGES: Bulk % >2.0mm	Matrix % sand (2.0 to 0.0625mm)	Matrix % silt (0.0625 to 0.002mm)	Matrix % clay (<0.002mm)	ENGINEERING PROPERTIES: Unified Soil Class.	Bulk Percent P200	Dry Unit Wt. (pcf)	SPT (N)	Moist. cont. (%)	Liquid limit	Plastic. index	UC (tsf)
Ra	1980	OC	3	20	425020	875028	BB11		9.0	10.5					3				CL	87		31				3.2
Ra	1980	OC	3	20	425020	875028	BB11		14.0	16.0	1.49E-09				2				CL	86						2.7
Ra	1980	OC	3	20	425020	875028	BB11		19.0	21.0					1				CL	92						4.5
Ra	1980	OC	3	20	425020	875028	BB11		24.0	25.5					1				CL	93		24				2.0
Ra	1980	OC	5	20	425013	875028	BB12		4.0	5.5					0				CL	92		26				2.6
Ra	1980	OC	5	20	425013	875028	BB12		9.0	10.5					0				ML	97		72				
Ra	1980	OC	5	20	425013	875028	BB12		14.0	16.0					1				ML	93						4.5
Ra	1980	OC	5	20	425013	875028	BB12		19.0	21.0	1.71E-08				1				ML	94						4.0
Ra	1980	OC	3	20	425013	875028	BB12		24.0	25.5					2				CL	91		47				3.5
Ra	1984	OC	3	20	425010	875030	B13		3.5	5.0					1	11	56	33	CL	91		57		32	15	4.5
Ra	1984	OC	4	20	425010	875030	B13		20.5	22.0					36	72	20	8	SP-SM	19		36				
Ra	1984	OC	3	20	425010	875030	B13		26.0	27.0					1	11	54	35	CL	92				29	14	3.2
Ra	1984	OC	5	20	425014	875023	B14		28.0	29.5					0	0	78	22	CL-ML	94				20	4	
Ra	1984	OC	5	20	425014	875023	B14		32.5	34.0					0	10	81	9	ML	94						
Ra	1984	OC	5	20	425014	875023	B14		42.0	44.0					0	0	99	1	ML,SM	58						
Ra	1984	OC	3	20	425015	875035	B15		3.5	5.0					2	13	53	34	CL	87		35		28	12	4.0
Ra	1984	OC	3	20	425018	875031	B16		16.0	18.0					0	12	54	34	CL	92				25	11	2.7
Ra	1984	OC	3	20	425020	875029	B17		15.0	17.0					3	23	55	23	CL	78				21	8	
Ra	1984	OC	3	20	425020	875029	B17		18.5	20.0					13	54	34	11	SM	44		31		15	2	
Ra	1984	OC	3	20	425020	875029	B17		23.5	25.0					0	11	67	22	CL-ML	91		18		21	7	
Ra	1984	OC	3	20	425020	875034	B18		18.5	20.0					1	14	65	21	CL-ML	87		21		21	7	
Ra	1984	OC	3	20	425020	875034	B18		33.5	35.0					0	20	69	11	ML	85		37		19	2	
Ra	1984	OC	5	20	425020	875034	B18		38.5	40.0					0	49	44	7	SM,ML	55		38				
Ra	1984	OC	3	20	425030	875027	B19		8.5	10.0					1	13	58	29	CL	89		31		26	12	3.8
Ra	1984	OC	3	20	425030	875027	B19		30.0	32.0					32	56	34	10	SM	35		46				
Ra	1984	OC	3	20	425030	875027	B19		34.0	35.5					1	15	62	23	CL-ML	86		16		19	6	
Ra	1984	OC	3	20	425030	875027	B20		2.5	4.0					1	14	51	35	CL	88		38		30	16	
Ra	1984	OC	3	20	425030	875027	B20		13.5	15.0					2	11	53	36	CL	90		33		27	12	
Ra	1984	OC	3	20	425030	875027	B20		38.5	40.0					5	9	64	26	CL	87		49		21	7	
Ra	1984	OC	3	20	425030	875032	B21		3.5	5.0					1	15	49	35	CL	91		47		29	12	
Ra	1984	OC	3	20	425030	875032	B21		23.5	25.0					3	14	52	34	CL	86		16		26	10	
Ra	1984	OC	3	20	425030	875032	B21		33.5	35.0					2	14	55	31	CL	89		30		24	10	
Ra	1984	OC	3	20	425030	875032	B21		43.5	45.0					4	11	63	26	CL	88		36		23	10	
Ra	1984	OC	3	20	425013	875027	B22		8.5	10.0					1	6	66	28	CL	94		34		25	10	
Ra	1984	OC	5	20	425013	875027	B22		13.5	15.0					0	33	61	6	ML	79		36				
Ra	1984	OC	3	20	425013	875027	B22		23.5	25.0					0	10	53	37	CL	96		30		29	14	
Ra	1984	OC	3	20	425023	875041	B23		15.5	17.0					0	9	60	31	CL	94		11		26	12	
Ra	1984	OC	3	20	425023	875041	B23		48.5	50.0					2	9	64	27	CL	91		14		24	10	
Ra	1984	OC	3	20	425020	875021	B24		8.5	10.0					3	12	58	30	CL	88		31		28	13	
Ra	1984	OC	3	20	425020	875021	B24		33.5	35.0					2	12	56	32	CL	88		34		25	12	
Ra	1984	OC	3	20	425020	875021	B24		48.5	50.0					1	12	72	16	CL-ML	90		34		21	6	1.7
Ra	1984	OC	3	20	425010	875023	B25		13.5	15.0					0	12	44	44	CL	98		18		34	18	
Ra	1984	OC	5	20	425010	875023	B25		28.5	30.0					0	60	35	5	SM,ML	51		20				
Ra	1984	OC	3	20	425010	875023	B25		38.5	40.0					0	2	52	46	CL	99		10		31	16	
Ra	1984	OC	3	20	425012	875036	B26		13.5	15.0					2	20	64	15	CL-ML	80		66		19	5	
Ra	1984	OC	3	20	425012	875036	B26		43.5	45.0					0	3	53	44	CL	98		36		33	17	

Appendix 3 - HYDROGEOLOGIC AND ENGINEERING DATA FOR RACINE COUNTY - (WEPCO) CALEDONIA SITE

IDENTITY: County (code)	Year	Litho-strat. unit (code)	Mat. (code)	Site No.	Lat.	Long.	Brng. no.	Surf. Elev. (ft)	Sample top (ft)	Sample bottom (ft)	HYDRAULIC CONDUCTIVITY: Lab K (cm/s)	Meth code	Fld K (cm/s)	Meth code	GRAINSIZE PERCENTAGES: Bulk % >2.0mm	Matrix % sand (2.0 to 0.0625mm)	Matrix % silt (0.0625 to 0.002mm)	Matrix % clay (<0.002mm)	ENGINEERING PROPERTIES: Unified Soil Class.	Bulk Percent P200	Dry Unit Wt. (pcf)	SPT (N)	Moist. cont. (%)	Liquid limit	Plastic. index	UC (tsf)
Ra	1984	OC	3	20	425010	875035	TP1	711.0	8.0						4	15	54	31	CL	84			16.0	27	12	
Ra	1984	OC	3	20	425010	875035	TP1	711.0	13.0						2	11	51	38	CL	89			14.0	32	14	
Ra	1984	OC	3	20	425014	875029	TP2	696.5	2.0						1	10	53	37	CL	91			15.0	22	8	
Ra	1984	OC	3	20	425020	875029	TP4	707.3	9.0						1	7	65	28	CL	94			13.0	24	10	
Ra	1984	OC	3	20	425025	875034	TP5	717.5	7.0						5	17	52	32	CL-ML	80			18.0	20	5	
Ra	1984	OC	3	20	425025	875034	TP5	717.5	12.0						3	8	56	36	CL	90			17.0	26	12	
Ra	1984	OC	3	20	425030	875030	TP6	705.2	12.0						7	24	56	20	CL	73			16.0	26	11	
Ra	1985	OC	35	20	425018	875052	W1A	701.1	25.1	30.0			1.95E-04	7												
Ra	1985	OC	3	20	425018	875052	W1C	701.4	47.0	50.0			1.13E-06	7												
Ra	1985	OC	3	20	425028	875037	W2A	713.7	27.0	30.0			1.65E-06	7												
Ra	1985	OC	3	20	425028	875037	W2C	714.1	47.0	50.0			1.94E-06	7												
Ra	1985	OC	5	20	425014	875017	W3A	689.5	25.0	28.0			1.88E-06	7												
Ra	1985	OC	5	20	425014	875017	W3C	689.8	47.0	50.0			1.01E-06	7												
Ra	1985	OC	3	20	425016	875038	W5B	700.8	3.0	24.7			1.23E-05	7												
Ra	1985	OC	53	20	425016	875038	W5C	699.5	47.0	50.0			2.22E-06	7												
Ra	1985	OC	353	20	425012	875035	W7B	706.8	3.0	25.0			1.57E-06	7												

Appendix 3 - HYDROGEOLOGIC AND ENGINEERING DATA FOR MILWAUKEE COUNTY - METRO SITE

IDENTITY County (code)	Year	Litho-strat. unit (code)	Mat. (code)	Site No.	Lat.	Long.	Brng. no.	Surf. Elev. (ft)	Sample top (ft)	Sample bottom (ft)	HYDRAULIC CONDUCTIVITY Lab K (cm/s)	Meth code	Fld K (cm/s)	Meth code	GRAINSIZE PERCENTAGES Bulk % >2.0mm	Matrix % sand (2.0 to 0.0625mm)	Matrix % silt (0.0625 to 0.002mm)	Matrix % clay (<0.002mm)	ENGINEERING PROPERTIES Unified Soil Class.	Bulk Percent P200	Dry Unit Wt. (pcf)	SPT (N)	Moist. cont. (%)	Liquid limit	Plastic. index	UC (tsf)
MI	1978	OC	3	21	425053	880348	P28	872.9	85.0	87.0									CL	89						
MI	1978	OC	99	21	425056	880340	P29	792.7	15.0	17.0									CL	98				48	27	
MI	1978	OC	99	21	425056	880340	P29	792.7	20.0	22.0	1.89E-08	2							CL	92				36	22	
MI	1978	OC	99	21	425056	880404	P30	791.7	10.0	12.0									SM	38						4.5
MI	1981	OC	3	21	425050	880410	PB-AR	792.0	8.5	10.0									OL,CL			3				
MI	1981	OC	3	21	425050	880410	PB-AR	792.0	15.0	16.0									CL			11				
MI	1978	OC	99	21	425056	880404	P30	791.7	15.0	16.5									SM			21				
MI	1979	OC	99	21	425058	880348	P26C	881.8	88.5	90.0									CL			22				
MI	1979	OC	99	21	425058	880348	P26C	881.8	104.0										CL			18				
MI	1979	OC	99	21	425058	880348	P26C	881.8	118.0										CL			17				
MI	1981	OC	99	21	425056	880340	P29R	792.7	3.5	5.0									CL			14				4.5
MI	1981	OC	99	21	425056	880340	P29R	792.7	8.5	10.0									CL			21				4.5
MI	1981	OC	99	21	425056	880340	P29R	792.7	13.5	15.0									CL			18				4.0
MI	1981	OC	3	21	425056	880405	P30R	791.1	3.5	5.0									CL			4				
MI	1981	OC	3	21	425056	880405	P30R	791.1	8.5	10.0									CL			13				4.5
MI	1981	OC	3	21	425056	880405	P30R	791.1	13.5	15.0									CL			6				1.3
MI	1981	OC	99	21	425056	880405	P30R	791.1	18.5	20.0									CL,SM			5				
MI	1981	OC	99	21	425056	880405	P30R	791.1	23.5	25.0									CL,SM			4				
MI	1981	OC	99	21	425056	880405	P30R	791.1	28.5	30.0									CL,SM			5				
MI	1981	OC	99	21	425056	880405	P30R	791.1	33.5	35.0									CL,SM			4				
MI	1981	OC	99	21	425056	880405	P30R	791.1	38.5	40.0									CL,SM			14				1.8
MI	1981	OC	3	21	425037	880355	TW45	810.7	28.5	30.0									CL			11				2.0
MI	1981	OC	3	21	425037	880355	TW45	810.7	33.5	35.0									CL			19				2.0
MI	1981	OC	3	21	425037	880355	TW45	810.7	38.5	40.0									CL			20				3.5
MI	1981	OC	3	21	425037	880355	TW45	810.7	43.5	45.0									CL	94		33	21.7	42	22	3.5
MI	1981	OC	3	21	425037	880355	TW45	810.7	48.5	50.0									CL			17				2.0
MI	1981	OC	3	21	425037	880355	TW45	810.7	53.5	55.0									CL			17				1.8
MI	1981	OC	3	21	425037	880355	TW45	810.7	55.0	69.5			1.53E-06	7					CL							
MI	1981	OC	3	21	425037	880355	TW45	810.7	58.5	60.0									CL			53				2.3
MI	1981	OC	3	21	425037	880355	TW45	810.7	63.5	65.0									CL			34				1.5
MI	1981	OC	3	21	425037	880355	TW45	810.7	68.5	70.0									CL			35				1.5
MI	1981	OC	3	21	425037	880355	TW45	810.7	73.5	75.0									CL			27				
MI	1981	OC	3	21	425037	880355	TW45	810.7	78.5	80.0									CL			27				1.5
MI	1981	OC	3	21	425037	880355	TW45	810.7	83.5	85.0									CL-CH	97		40	22.6	54	29	2.3
MI	1981	OC	3	21	425037	880355	TW45	810.7	88.5	90.0									CL			41				2.8
MI	1981	OC	99	21	425037	880355	TW45	810.7	93.5	95.0									CL	93		26	20.0	34	15	1.6
MI	1981	OC	99	21	425037	880355	TW45	810.7	98.5	100.0									CL			23				1.5
MI	1982	OC	3	21	425038	880357	TW46	809.3	28.5	30.0									CL			13				2.0
MI	1982	OC	3	21	425038	880357	TW46	809.3	33.5	35.0									CL			12				2.0
MI	1982	OC	3	21	425038	880357	TW46	809.3	38.5	40.0									CL			14				1.9
MI	1982	OC	3	21	425039	880357	TW46	809.3	43.5	45.0									CL			13				1.9
MI	1982	OC	3	21	425038	880357	TW46	809.3	48.5	50.0									CL			14				2.4
MI	1982	OC	99	21	425038	880357	TW46	809.3	53.5	55.0									CL	94		15	22.5	44	23	2.9
MI	1982	OC	3	21	425038	880357	TW46	809.3	58.5	60.0									CL			17				3.3
MI	1982	OC	3	21	425038	880357	TW46	809.3	63.5	65.0									CL			15				3.1
MI	1982	OC	3	21	425038	880357	TW46	809.3	68.5	70.0									CL	92		32	23.5	42	23	3.5

Appendix 3 - HYDROGEOLOGIC AND ENGINEERING DATA FOR MILWAUKEE COUNTY - METRO SITE

IDENTITY: County (code)	Year	Litho-strat. unit (code)	Mat. (code)	Site No.	Lat.	Long.	Brng. no.	Surf. Elev. (ft)	Sample top (ft)	Sample bottom (ft)	HYDRAULIC CONDUCTIVITY: Lab K (cm/s)	Meth code	Fld K (cm/s)	Meth code	GRAINSIZE PERCENTAGES: Bulk % >2.0mm	Matrix % sand (2.0 to 0.0625mm)	Matrix % silt (0.0625 to 0.002mm)	Matrix % clay (<0.002mm)	ENGINEERING PROPERTIES: Unified Soil Class.	Bulk Percent P200	Dry Unit Wt. (pcf)	SPT (N)	Moist. cont. (%)	Liquid limit	Plastic. index	UC (tsf)
MI	1982	OC	3	21	425038	880357	TW46	809.3	73.5	75.0									CL			33				3.5
MI	1982	OC	3	21	425038	880357	TW46	809.3	78.5	80.0									CL			54				3.9
MI	1982	OC	3	21	425038	880357	TW46	809.3	83.5	85.0									CL			30				3.6
MI	1982	OC	3	21	425038	880357	TW46	809.3	88.5	90.0									CL			35				3.8
MI	1982	OC	3	21	425038	880357	TW46	809.3	90.0	97.0			2.09E-06	7					CL							
MI	1982	OC	3	21	425038	880357	TW46	809.3	93.5	95.0									CL			39				4.1
MI	1982	OC	3	21	425038	880357	TW46	809.3	98.5	100.0									CL			24				2.5
MI	1982	OC	3	21	425038	880357	TW46	809.3	103.5	105.0									CL			22				2.6
MI	1982	OC	3	21	425038	880357	TW46	809.3	113.5	115.0									CL			24				
MI	1982	OC	3	21	425038	880357	TW46	809.3	123.5	125.0									CL			26				
MI	1981	OC	3	21	425046	880400	TW47	807.3	28.5	30.0									CL			21				2.8
MI	1981	OC	3	21	425046	880400	TW47	807.3	33.5	35.0									CL			11				2.8
MI	1981	OC	3	21	425046	880400	TW47	807.3	38.5	40.0									CL			13				2.3
MI	1981	OC	3	21	425046	880400	TW47	807.3	43.5	45.0									CL			12				2.3
MI	1981	OC	3	21	425046	880400	TW47	807.3	49.0	51.0	5.10E-08	1			3	13	53	34	CL	88						
MI	1981	OC	3	21	425046	880400	TW47	807.3	53.5	55.0									CL			50				2.7
MI	1981	OC	3	21	425046	880400	TW47	807.3	59.0	60.0	3.60E-08	1			6	15	48	48	CL	85				34	15	
MI	1981	OC	3	21	425046	880400	TW47	807.3	60.0	79.0			2.29E-07	7												
MI	1981	OC	99	21	425046	880400	TW47	807.3	63.5	65.0									CL			61				3.0
MI	1981	OC	3	21	425046	880400	TW47	807.3	68.5	70.0									CL			30				4.3
MI	1981	OC	3	21	425046	880400	TW47	807.3	73.5	75.0									CL			35				3.9
MI	1981	OC	3	21	425046	880400	TW47	807.3	78.5	80.0									CL			41				3.8
MI	1981	OC	3	21	425046	880400	TW47	807.3	83.5	85.0					3	14	54	32	CL	91		43	15.7	27	12	
MI	1981	OC	3	21	425046	880400	TW47	807.3	88.5	90.0									CL			43				
MI	1981	OC	3	21	425049	880358	TW48	806.0	13.5	15.0									CL			18				3.8
MI	1981	OC	3	21	425049	880358	TW48	806.0	18.5	20.0									CL			16				1.3
MI	1981	OC	3	21	425049	880358	TW48	806.0	23.5	25.0									CL			15				1.8
MI	1981	OC	3	21	425049	880358	TW48	806.0	28.5	30.0									CL			15				1.8
MI	1981	OC	3	21	425049	880358	TW49	806.0	33.5	35.0									CL			14				1.8
MI	1981	OC	3	21	425049	880358	TW48	806.0	38.5	40.0									CL			15				
MI	1981	OC	3	21	425049	880358	TW48	806.0	43.5	45.0									CL			14				1.5
MI	1981	OC	3	21	425049	880358	TW48	806.0	48.5	50.0									CL			19				2.0
MI	1981	OC	3	21	425049	880358	TW48	806.0	53.5	55.0									CL			17				2.0
MI	1981	OC	3	21	425049	880358	TW48	806.0	58.5	60.0									CL			16				2.3
MI	1981	OC	3	21	425049	880358	TW48	806.0	63.5	65.0									CL			18				1.5
MI	1981	OC	3	21	425049	880358	TW48	806.0	67.0	78.0			1.12E-07	7					CL							
MI	1981	OC	3	21	425049	880358	TW48	806.0	68.5	70.0									CL			21				1.5
MI	1981	OC	3	21	425049	880358	TW48	806.0	73.5	75.0									CL			19				1.5
MI	1981	OC	3	21	425049	880358	TW48	806.0	78.5	80.0									CL			20				2.3
MI	1981	OC	3	21	425049	880358	TW48	806.0	83.5	85.0									CL			17				2.3
MI	1981	OC	3	21	425049	880358	TW48	806.0	88.5	90.0									CL			20				2.0
MI	1982	OC	3	21	425048	880348	TW49	803.4	50.0	70.0			1.29E-07	7												
MI	1982	OC	3	21	425048	880348	TW49A	803.1	90.0	100.0			1.93E-06	7												
MI	1982	OC	3	21	425048	880348	TW49B	803.8	173.0	185.0			2.05E-06	7					CL							
MI	1982	OC	3	21	425048	880348	TW49B	803.8	28.5	30.0									CL			23				
MI	1982	OC	3	21	425048	880348	TW49B	803.8	33.5	35.0									CL			18				

Appendix 3 - HYDROGEOLOGIC AND ENGINEERING DATA FOR MILWAUKEE COUNTY - METRO SITE

IDENTITY County (code)	Year	Litho-strat. unit (code)	Mat. (code)	Site No.	Lat.	Long.	Brng. no.	Surf. Elev. (ft)	Sample top (ft)	Sample bottom (ft)	HYDRAULIC CONDUCTIVITY Lab K (cm/s)	Meth code	Fld K (cm/s)	Meth code	GRAINSIZE PERCENTAGES Bulk % >2.0mm	Matrix % sand (2.0 to 0.0625mm)	Matrix % silt (0.0625 to 0.002mm)	Matrix % clay (<0.002mm)	ENGINEERING PROPERTIES Unified Soil Class.	Bulk Percent P200	Dry Unit Wt. (pcf)	SPT (N)	Moist. cont. (%)	Liquid limit	Plastic. index	UC (tsf)
MI	1982	OC	3	21	425048	880348	TW49B	803.8	38.5	40.0					5	19	58	23	CL	79		13	16.0	26	12	
MI	1982	OC	3	21	425048	880348	TW49B	803.8	43.5	45.0									CL			10				
MI	1982	OC	3	21	425048	880348	TW49B	803.8	48.5	50.0									CL			11				
MI	1982	OC	3	21	425048	880348	TW49B	803.8	53.5	55.0												7				
MI	1982	OC	3	21	425048	880348	TW49B	803.8	58.5	60.0					0	0	58	42	CL	100		8	21.1	41	21	
MI	1982	OC	3	21	425048	880348	TW49B	803.8	63.5	65.0									CL			7				
MI	1982	OC	3	21	425048	880348	TW49B	803.8	68.5	70.0									CL			11				
MI	1982	OC	3	21	425048	880348	TW49B	803.8	73.5	75.0									CL			10				
MI	1982	OC	3	21	425048	880348	TW49B	803.8	78.5	80.0									CL			16				
MI	1982	OC	3	21	425048	880348	TW49B	803.8	83.5	85.0									CL			12				
MI	1982	OC	3	21	425048	880348	TW49B	803.8	88.5	90.0									CL			14				
MI	1982	OC	3	21	425048	880348	TW49B	803.8	93.5	95.0					0	10	38	42	CL	100		16	22.0	24	8	
MI	1982	OC	3	21	425048	880348	TW49B	803.8	98.5	100.0									CL			16				
MI	1982	OC	3	21	425048	880348	TW49B	803.8	108.5	110.0									CL			40				
MI	1982	OC	3	21	425048	880348	TW49B	803.8	118.5	120.0									CL			29				
MI	1982	OC	3	21	425048	880348	TW49B	803.8	128.5	130.0									CL			25				
MI	1982	OC	3	21	425048	880348	TW49B	803.8	138.5	140.0									CL			24				
MI	1982	OC	3	21	425048	880348	TW49B	803.8	148.5	150.0									CL			23				
MI	1982	OC	3	21	425048	880348	TW49B	803.8	158.5	160.0					0	0	40	60	CL	100		20	27.9	40	16	3.4
MI	1982	OC	3	21	425048	880348	TW49B	803.8	168.5	170.0									CL			18				
MI	1982	OC	3	21	425048	880348	TW49B	803.8	178.5	180.0									CL			32				
MI	1981	OC	3	21	425048	880337	TW52	802.8	13.5	15.0									CL			8				4.3
MI	1981	OC	3	21	425048	880337	TW52	802.8	18.5	20.0									CL			8				1.6
MI	1981	OC	3	21	425048	880337	TW52	802.8	23.5	25.0									CL			16				2.1
MI	1981	OC	3	21	425048	880337	TW52	802.8	28.5	30.0									CL			6				0.6
MI	1981	OC	3	21	425048	880337	TW52	802.8	33.5	35.0									CL			5				
MI	1981	OC	3	21	425048	880337	TW52	802.8	38.5	40.0									CL			9				1.0
MI	1981	OC	3	21	425048	880337	TW52	802.8	43.5	45.0									CL			8				2.2
MI	1981	OC	3	21	425048	880337	TW52	802.8	48.5	50.0					0	1	49	50	CL	100				39	18	
MI	1981	OC	3	21	425048	880337	TW52	802.8	53.5	55.0									CL			9				
MI	1981	OC	3	21	425048	880337	TW52	802.8	58.5	60.0									CL							
MI	1981	OC	3	21	425048	880337	TW52	802.8	63.5	65.0									CL			10				2.0
MI	1981	OC	3	21	425048	880337	TW52	802.8	68.5	70.0					1	10	47	41	CL	93				35	16	
MI	1981	OC	3	21	425048	880337	TW52	802.8	73.5	75.0									CL			12				2.2
MI	1981	OC	3	21	425048	880337	TW52	802.8	78.5	80.0									CL			15				
MI	1981	OC	3	21	425048	880337	TW52	802.8	83.5	85.0									CL			14				
MI	1981	OC	3	21	425048	880337	TW52	802.8	88.5	90.0									CL			16				
MI	1981	OC	3	21	425048	880337	TW52	802.8	93.5	95.0									CL			22				
MI	1981	OC	3	21	425048	880337	TW52	802.8	98.5	100.0									CL			20				
MI	1981	OC	3	21	425048	880337	TW52	802.8	60.0	77.1			3.39E-07	?					CL							
MI	1981	OC	3	21	425038	880329	TW53	811.8	3.5	5.0									CL			16				4.5
MI	1981	OC	3	21	425038	880329	TW53	811.8	23.5	25.0									CL			11				1.5
MI	1981	OC	3	21	425038	880329	TW53	811.8	28.5	30.0									CL			11				
MI	1981	OC	3	21	425038	880329	TW53	811.8	33.5	35.0									CL			15				
MI	1981	OC	3	21	425038	880329	TW53	811.8	38.5	40.0									CL			21				4.0
MI	1981	OC	3	21	425038	880329	TW53	811.8	43.5	45.0									CL			11				2.0

Appendix 3 - HYDROGEOLOGIC AND ENGINEERING DATA FOR MILWAUKEE COUNTY - METRO SITE

IDENTITY											HYDRAULIC CONDUCTIVITY				GRAINSIZE PERCENTAGES				ENGINEERING PROPERTIES							
County (code)	Year	Litho-strat. unit (code)	Mat. (code)	Site No.	Lat.	Long.	Brng. no.	Surf. Elev. (ft)	Sample top (ft)	Sample bottom (ft)	Lab K (cm/s)	Meth code	Fld K (cm/s)	Meth code	Bulk % >2.0mm	Matrix % sand (2.0 to 0.0625mm)	Matrix % silt (0.0625 to 0.002mm)	Matrix % clay (<0.002mm)	Unified Soil Class.	Bulk Percent P200	Dry Unit Wt. (pcf)	SPT (N)	Moist. cont. (%)	Liquid limit	Plastic. index	UC (tsf)
MI	1981	OC	3	21	425038	880329	TW53	811.8	63.5	65.0									CL			35				4.5
MI	1981	OC	3	21	425038	880329	TW53	811.8	68.5	70.0									CL			30				4.3
MI	1981	OC	3	21	425038	880329	TW53	811.8	73.5	75.0									CL			40				
MI	1981	OC	3	21	425038	880329	TW53	811.8	78.5	80.0									CL			42				4.5
MI	1981	OC	3	21	425038	880329	TW53	811.8	83.5	85.0									CL			30				2.5
MI	1981	OC	3	21	425038	880329	TW53	811.8	88.5	90.0									CL			35				2.5
MI	1981	OC	3	21	425038	880329	TW53	811.8	93.5	95.0									CL			31				1.8
MI	1981	OC	3	21	425038	880329	TW53	811.8	98.5	100.0									CL			32				2.0
MI	1981	OC	3	21	425038	880329	TW53	811.8	108.5	110.0									CL			47				2.5
MI	1981	OC	3	21	425038	880329	TW53	811.8	118.5	120.0									CL			38				2.5
MI	1981	OC	3	21	425038	880329	TW53	811.8	123.5	125.0									CL			43				3.0
MI	1981	OC	3	21	425038	880329	TW53	811.8	104.0	110.0			1.07E-06	7					CL							
MI	1981	OC	3	21	425038	880329	TW53	811.8	53.0	55.0	3.70E-08	1			0	0	49	51	CL	100						
MI	1981	OC	3	21	425038	880329	TW53	811.8	58.0	60.0	4.60E-08	1			1	9	58	43	CL	93				35	15	
MI	1983	OC	3	21	425042	880357	P80	809.4	3.5	5.0									CL			39				4.5
MI	1983	OC	3	21	425042	880357	P80	809.4	8.5	10.0									CL			46				
MI	1983	OC	3	21	425042	880357	P80	809.4	13.5	15.0									CL			19				2.8
MI	1983	OC	3	21	425042	880357	P80	809.4	18.5	20.0									CL			17				3.0
MI	1983	OC	3	21	425042	880357	P80	809.4	23.5	25.0									CL			19				
MI	1983	OC	3	21	425042	880357	P80	809.4	28.5	30.0									CL							1.8
MI	1983	OC	3	21	425042	880357	P80	809.4	33.5	35.0									CL			13				1.0
MI	1983	OC	3	21	425042	880357	P80	809.4	38.5	40.0									CL			20				
MI	1983	OC	99	21	425042	880357	P80	809.4	43.5	45.0									CL			22				
MI	1983	OC	99	21	425042	880357	P80	809.4	48.5	50.0									CL			30				1.5
MI	1983	OC	3	21	425042	880357	P80	809.4	53.5	55.0					3	12	46	41	CL	88		26	19.0	30	15	3.5
MI	1983	OC	3	21	425042	880357	P80	809.4	58.0	60.0	1.04E-08	1							CL		135.00		10.0			4.5
MI	1983	OC	3	21	425042	880357	P80	809.4	60.0	61.5	1.36E-08	1							CL		117.50		16.3			3.0
MI	1983	OC	3	21	425042	880357	P80	809.4	63.5	65.0									CL			22				3.5
MI	1983	OC	3	21	425042	880357	P80	809.4	68.5	70.0									CL			42				2.8
MI	1983	OC	3	21	425042	880357	P80	809.4	73.5	75.0									CL			22				3.0
MI	1983	OC	3	21	425042	880357	P80	809.4	78.5	80.0									CL			37				3.0
MI	1983	OC	3	21	425042	880357	P80	809.4	83.5	85.0									CL			37				3.5
MI	1983	OC	3	21	425042	880357	P80	809.4	88.5	90.0									CL			34				2.8
MI	1983	OC	3	21	425042	880357	P80	809.4	93.5	95.0									CL			38				3.0
MI	1983	OC	3	21	425047	880357	P81	804.7	3.5	5.0									CL			10				3.7
MI	1983	OC	3	21	425047	880357	P81	804.7	8.5	10.0									CL			37				4.5
MI	1983	OC	3	21	425047	880357	P81	804.7	13.5	15.0									CL			28				4.5
MI	1983	OC	3	21	425047	880357	P81	804.7	18.5	20.0									CL			24				4.2
MI	1983	OC	3	21	425047	880357	P81	804.7	23.5	25.0									CL			27				
MI	1983	OC	3	21	425047	880357	P81	804.7	28.5	30.0									CL			29				4.5
MI	1983	OC	3	21	425047	880357	P81	804.7	33.5	35.0									CL			26				3.2
MI	1983	OC	3	21	425047	880357	P81	804.7	38.5	40.0									CL			14				2.7
MI	1983	OC	3	21	425047	880357	P81	804.7	43.5	45.0									CL			12				2.2
MI	1983	OC	3	21	425047	880357	P81	804.7	48.5	50.0									CL			13				2.5
MI	1983	OC	3	21	425047	880357	P81	804.7	53.5	55.0									CL			17				2.5
MI	1983	OC	3	21	425047	880357	P81	804.7	58.5	60.0									CL			17				2.2

Appendix 3 - HYDROGEOLOGIC AND ENGINEERING DATA FOR MILWAUKEE COUNTY - METRO SITE

IDENTITY County (code)	Year	Litho-strat. unit (code)	Mat. (code)	Site No.	Lat.	Long.	Brng. no.	Surf. Elev. (ft)	Sample top (ft)	Sample bottom (ft)	HYDRAULIC CONDUCTIVITY Lab K (cm/s)	Meth code	Fld K (cm/s)	Meth code	GRAINSIZE PERCENTAGES Bulk % >2.0mm	Matrix % sand (2.0 to 0.0625mm)	Matrix % silt (0.0625 to 0.002mm)	Matrix % clay (<0.002mm)	ENGINEERING PROPERTIES Unified Soil Class.	Bulk Percent P200	Dry Unit Wt. (pcf)	SPT (N)	Moist. cont.(%)	Liquid limit	Plastic. index	UC (tsf)
MI	1983	OC	3	21	425047	880357	PB1	804.7	63.5	65.0					0	i	42	57	CL	99		27	23.0	35	19	3.2
MI	1983	OC	3	21	425047	880357	PB1	804.7	68.5	70.0									CL			20				2.0
MI	1983	OC	3	21	425047	880357	PB1	804.7	73.5	75.0									CL			30				2.5
MI	1983	OC	3	21	425047	880357	PB1	804.7	78.5	80.0									CL			22				2.5
MI	1983	OC	3	21	425047	880357	PB1	804.7	83.5	85.0									CL			35				2.5
MI	1983	OC	3	21	425047	880357	PB1	804.7	88.5	90.0									CL			47				4.5
MI	1983	OC	3	21	425047	880357	PB1	804.7	93.5	95.0									CL			60				
MI	1983	OC	3	21	425047	880357	PB1	804.7	98.5	100.0									CL			36				
MI	1983	OC	3	21	425047	880357	PB1	804.7	89.0	100.0			4.92E-07	7												
MI	1983	OC	3	21	425047	880357	TW81	805.0	3.0	19.0			4.81E-07	7												
MI	1983	OC	3	21	425047	880359	PB2	807.2	3.5	5.0									CL			60				4.5
MI	1983	OC	99	21	425047	880359	PB2	807.2	8.5	10.0									CL			27				4.2
MI	1983	OC	99	21	425047	880359	PB2	807.2	13.5	15.0									CL			40				4.5
MI	1983	OC	3	21	425047	880359	PB2	807.2	18.5	20.0									CL			38				3.5
MI	1983	OC	99	21	425047	880359	PB2	807.2	23.5	25.0									CL			14				2.7
MI	1983	OC	99	21	425047	880359	PB2	807.2	28.5	30.0									CL			20				2.5
MI	1983	OC	3	21	425047	880359	PB2	807.2	33.5	35.0									CL			23				2.8
MI	1983	OC	3	21	425047	880359	PB2	807.2	38.5	40.0									CL			26				2.3
MI	1983	OC	3	21	425047	880359	PB2	807.2	43.5	45.0									CL			18				2.5
MI	1983	OC	3	21	425047	880359	PB2	807.2	48.5	50.0									CL			21				1.5
MI	1983	OC	3	21	425047	880359	PB2	807.2	53.5	55.0									CL			24				1.5
MI	1983	OC	3	21	425047	880359	PB2	807.2	58.5	60.0									CL			27				1.5
MI	1983	OC	3	21	425047	880359	PB2	807.2	63.5	65.0									CL			29				3.5
MI	1983	OC	3	21	425047	880359	PB2	807.2	68.5	70.0					0	i	51	48	CL	99		32	22.0	33	16	2.5
MI	1983	OC	3	21	425047	880359	PB2	807.2	73.5	75.0									CL			29				3.0
MI	1983	OC	3	21	425047	880359	PB2	807.2	78.5	80.0									CL			43				3.5
MI	1983	OC	3	21	425047	880359	PB2	807.2	83.5	85.0									CL			50				
MI	1983	OC	3	21	425047	880359	PB2	807.2	88.5	90.0									CL			47				
MI	1983	OC	3	21	425047	880359	PB2	807.2	93.5	95.0									CL			51				4.3
MI	1983	OC	3	21	425047	880359	PB2	807.2	98.5	100.0									CL			64				4.3
MI	1983	OC	3	21	425047	880359	PB2	807.2	93.0	100.0			7.84E-06	7					CL							
MI	1983	OC	3	21	425047	880359	TW82	807.2	3.0	19.0			1.71E-06	7					CL							
MI	1983	OC	99	21	425050	880352	TW83	802.6	8.5	10.0									OL,PT			4				
MI	1983	OC	99	21	425050	880352	TW83	802.6	13.5	15.0									CL			25				
MI	1983	OC	99	21	425050	880352	TW83	802.6	18.5	20.0									ML			17				
MI	1983	OC	99	21	425050	880352	TW83	802.6	23.5	25.0					0	i	65	34	CL	99		19	21.0	27	11	2.0
MI	1983	OC	99	21	425108	880410	PB4B	805.2	250.0						i	75	20	5	SM	29						
MI	1983	OC	3	21	425199	880499	B85	783.5	3.5	5.0												22				3.5
MI	1983	OC	3	21	425199	880499	B85	783.5	8.5	10.0												26				2.5
MI	1983	OC	3	21	425199	880499	B85	783.5	13.5	15.0												25				2.8
MI	1983	OC	3	21	425199	880499	B85	783.5	18.5	20.0																
MI	1983	OC	3	21	425199	880499	B85	783.5	23.5	25.0												14				1.8
MI	1983	OC	3	21	425199	880499	B85	783.5	28.5	30.0												12				1.8
MI	1983	OC	3	21	425199	880499	B85	783.5	33.5	35.0																2.2
MI	1983	OC	3	21	425199	880499	B85	783.5	38.5	40.0												16				1.7
MI	1983	OC	3	21	425199	880499	B85	783.5	43.5	45.0												17				2.5

Appendix 3 - HYDROGEOLOGIC AND ENGINEERING DATA FOR MILWAUKEE COUNTY - METRO SITE

IDENTITY											HYDRAULIC CONDUCTIVITY				GRAINSIZE PERCENTAGES				ENGINEERING PROPERTIES							
County (code)	Year	Litho-strat. unit (code)	Nat. (code)	Site No.	Lat.	Long.	Brng. no.	Surf. Elev. (ft)	Sample top (ft)	Sample bottom (ft)	Lab K (cm/s)	Meth code	Fld K (cm/s)	Meth code	Bulk % >2.0mm	Matrix % sand (2.0 to 0.0625mm)	Matrix % silt (0.0625 to 0.002mm)	Matrix % clay (<0.002mm)	Unified Soil Class.	Bulk Percent P200	Dry Unit Wt. (pcf)	SPT (N)	Moist. cont. (%)	Liquid limit	Plastic. index	UC (tsf)
MI	1983	OC	3	21	425199	880499	B85	783.5	48.5	50.0												18				2.5
MI	1983	OC	3	21	425199	880499	B85	783.5	53.5	55.0												24				1.5
MI	1983	OC	3	21	425199	880499	B85	783.5	58.5	60.0	1.53E-07										125.00		15.8			2.0
MI	1983	OC	3	21	425199	880499	B85	783.5	63.5	65.0					2	12	50	38	CL	85		29	19.0	25	10	2.5
MI	1983	OC	3	21	425199	880499	B85	783.5	68.5	70.0																2.0
MI	1983	OC	3	21	425199	880499	B85	783.5	73.5	75.0												37				
MI	1983	OC	99	21	425199	880499	B85	783.5	78.5	80.0												33				2.8
MI	1983	OC	3	21	425199	880499	B86	789.6	3.5	5.0									CL							
MI	1983	OC	3	21	425199	880499	B86	789.6	8.5	10.0									CL							
MI	1983	OC	3	21	425199	880499	B86	789.6	13.5	15.0									CL							
MI	1983	OC	3	21	425199	880499	B86	789.6	18.5	20.0									CL							
MI	1983	OC	3	21	425199	880499	B86	789.6	23.5	25.0									CL							
MI	1983	OC	3	21	425199	880499	B86	789.6	28.5	30.0									CL							
MI	1983	OC	99	21	425199	880499	B86	789.6	33.5	35.0									CL							
MI	1983	OC	3	21	425199	880499	B86	789.6	38.5	40.0									CL							
MI	1983	OC	3	21	425199	880499	B86	789.6	43.5	45.0									CL							
MI	1983	OC	3	21	425199	880499	B86	789.6	48.5	50.0									CL							
MI	1983	OC	3	21	425199	880499	B86	789.6	53.5	55.0					0	i	39	60	CL	98				39	21	
MI	1983	OC	3	21	425199	880499	B86	789.6	58.5	60.0	2.02E-08	i							CL		118.10		17.3			
MI	1983	OC	3	21	425199	880499	B86	789.6	63.5	65.0									CL							
MI	1983	OC	3	21	425199	880499	B86	789.6	68.5	70.0									CL							
MI	1983	OC	99	21	425199	880499	B86	789.6	73.5	75.0					0	39	53	8	ML	68						
MI	1983	OC	99	21	425199	880499	B86	789.6	78.5	80.0									ML							
MI	1983	OC	3	21	425199	880499	B86	789.6	83.5	85.0									CL							
MI	1983	OC	99	21	425199	880499	B86	789.6	88.5	90.0					0	50	44	6	ML	76						
MI	1983	OC	3	21	425101	880340	TWSRR	809.4	3.0	34.0			1.00E-07	7					CL							
MI	1985	OC	3	21	425050	880400	B101	802.8	23.0											73			23.6			
MI	1985	OC	3	21	425050	880400	B101	802.8	33.0														28.5			
MI	1985	OC	3	21	425050	880400	B101	802.8	43.0														18.5			
MI	1985	OC	3	21	425050	880400	B101	802.8	53.3														23.9			
MI	1985	OC	3	21	425050	880400	B101	802.8	68.0														22.0			
MI	1985	OC	3	21	425050	880400	B101	802.8	92.7														18.9			
MI	1985	OC	3	21	425102	880338	B104	808.6	14.7														23.8			
MI	1985	OC	3	21	425102	880338	B104	808.6	50.0														20.8			
MI	1985	OC	3	21	425102	880338	B104	808.6	74.7														17.2			
MI	1985	OC	3	21	425102	880338	B104	808.6	94.8														18.1			
MI	1985	OC	3	21	425049	880337	B106	804.4	10.0														27.5			3.5
MI	1985	OC	3	21	425049	880337	B106	804.4	20.0														18.0			3.0
MI	1985	OC	3	21	425049	880337	B106	804.4	28.0		1.80E-08	i			85								21.5	31	14	
MI	1985	OC	3	21	425049	880337	B106	804.4	40.0														26.6			1.8
MI	1985	OC	3	21	425049	880337	B106	804.4	50.0														24.5			1.8
MI	1985	OC	3	21	425049	880337	B106	804.4	60.0														21.7			1.6
MI	1985	OC	3	21	425049	880337	B106	804.4	70.0														17.6			2.0
MI	1985	OC	99	21	425049	880337	B106	804.4	80.0														15.0			3.3
MI	1985	OC	99	21	425049	880337	B106	804.4	85.1											61			17.5			
MI	1985	OC	99	21	425049	880337	B106	804.4	93.1														16.4			

Appendix 3 - HYDROGEOLOGIC AND ENGINEERING DATA FOR MILWAUKEE COUNTY - METRO SITE

IDENTITY											HYDRAULIC CONDUCTIVITY				GRAINSIZE PERCENTAGES				ENGINEERING PROPERTIES							
County (code)	Year	Litho-strat. unit (code)	Mat. (code)	Site No.	Lat.	Long.	Brng. no.	Surf. Elev. (ft)	Sample top (ft)	Sample bottom (ft)	Lab K (cm/s)	Meth code	Fld K (cm/s)	Meth code	Bulk % >2.0mm	Matrix % sand (2.0 to 0.0625mm)	Matrix % silt (0.0625 to 0.002mm)	Matrix % clay (<0.002mm)	Unified Soil Class.	Bulk Percent P200	Dry Unit Wt. (pcf)	SPT (N)	Moist. cont. (%)	Liquid limit	Plastic. index	UC (tsf)
MI	1985	OC	99	21	425049	880337	B106	804.4	99.1														19.8			
MI	1985	OC	3	21	425112	880346	B108	822.7	7.0														16.2			4.5
MI	1985	OC	3	21	425112	880346	B108	822.7	24.8														16.2			2.5
MI	1985	OC	3	21	425112	880346	B108	822.7	35.0														19.5			2.0
MI	1985	OC	3	21	425112	880346	B108	822.7	38.0														12.1			1.0
MI	1985	OC	3	21	425112	880346	B108	822.7	51.0														15.3			
MI	1985	OC	3	21	425112	880346	B108	822.7	62.0														15.6			2.0
MI	1985	OC	3	21	425112	880346	B108	822.7	75.0														21.3			2.0
MI	1985	OC	3	21	425112	880346	B108	822.7	88.0														17.8			2.0
MI	1985	OCKB	99	21	425112	880346	B108	822.7	280.0														17.6	35	17	4.5
MI	1985	OC	3	21	425112	880346	108A		16.0											84				35	16	
MI	1985	OC	3	21	425112	880346	108B		46.0											90				28	9	
MI	1985	OC	3	21	425112	880346	108C		95.0															27	12	
MI	1985	OC	3	21	425112	880346	TW108A		9.0	19.2	6.50E-08		1.47E-06	7												
MI	1985	OC	3	21	425112	880346	P108B		38.6	48.8	2.40E-08		6.78E-07	7												
MI	1985	OC	3	21	425112	880346	P108C		89.2	99.4			1.45E-07	7												
MI	1985	OC	3	21	425112	880346	P108D		139.8	150.0			1.01E-06	7												

Appendix 3 - HYDROGEOLOGIC AND ENGINEERING DATA FOR OCONTO COUNTY, CITY OF OCONTO FALLS LANDFILL

IDENTITY											HYDRAULIC CONDUCTIVITY				GRAINSIZE PERCENTAGES				ENGINEERING PROPERTIES							
County (code)	Year	Litho-strat. unit (code)	Mat. (code)	Site No.	Lat.	Long.	Brng. no.	Surf. Elev. (ft)	Sample top (ft)	Sample bottom (ft)	Lab K (cm/s)	Meth code	Fld K (cm/s)	Meth code	Bulk % >2.0mm	Matrix % sand (2.0 to 0.0625mm)	Matrix % silt (0.0625 to 0.002mm)	Matrix % clay (<0.002mm)	Unified Soil Class.	Bulk Percent P200	Dry Unit Wt. (pcf)	SPT (N)	Moist. cont. (%)	Liquid limit	Plastic. index	UC (tsf)
OC	1983	KE	5	22	445151	880928	B1	706.2	25.00	26.50					0.00	5.00	92.00	3.00	ML	99		25				
OC	1983	KE	5	22	445151	880928	B1	706.2	23.40	29.40			1.00E-05	7					ML							
OC	1985	KE	5	22	445151	880928	B1A	706.2	5.00	6.50					0.00				SM	34		9				
OC	1983	KE	3	22	445147	880923	B2	698.9	35.00	37.00					0.00				SM	39			18.0			
OC	1983	KE	3	22	445147	880923	B2	698.9	28.50	35.00			5.00E-04	7					ML-CL							
OC	1983	KE	4	22	445147	880923	B2A	698.9	20.00	21.50					19.00	99.00	1.00	0.00	SP	2		65				
OC	1983	KEKI	3	22	445142	880925	B3	726.1	20.00	22.00					3.00	28.00	46.00	26.00	CL	75			13.0	36.0	20.0	4.5
OC	1983	KE	5	22	445142	880925	B3	726.1	45.00	47.00	2.00E-08	i			0.00	3.00	67.00	31.00	CL	99				36.0	19.0	
OC	1985	KEKI	3	22	445142	880925	B3B	725.1	15.50	19.50			3.00E-03	7												
OC	1985	KEKJ	3	22	445142	880925	B3B	725.1	17.00	19.00	2.80E-09	i			19.00	38.00	38.00	23.00	CL	53				36.0	22.1	
OC	1983	KE	4	22	445147	880932	B4	735.0	40.00	41.50					0.00	94.00			SM-SP	7		84				
OC	1985	KE	4	22	445147	880932	B4B	734.9	42.80	49.10			1.40E-03	7					SM-SP							
OC	1985	KE	4	22	445147	880932	B4C	734.6	73.50	80.00			1.60E-03	7					SP-GP							
OC	1983	KE	5	22	445154	880935	B5	742.4	55.00	57.00	2.00E-07	i			0.00	14.00	61.00	15.00	ML	89						
OC	1983	KE	3	22	445154	880935	B5A	742.4	25.00	26.00					2.00	19.00	45.00	25.00	CL	73		82		35.0	19.0	
OC	1983	KE	5	22	445154	880935	B5A	742.4	35.00	36.50					0.00	2.00	74.00	24.00	ML	99		33				
OC	1983	KE	4	22	445151	880924	B6	692.6	20.00	21.50					0.00				SM	25		19				
OC	1983	KE	4	22	445151	880924	B6	692.6	34.00	40.00			9.50E-02	7												
OC	1983	KE	4	22	445154	880938	B7	748.1	15.00	16.50					80.00				SP-GP	2		36				
OC	1983	KE	3	22	445154	880938	B7	748.1	25.00	26.50					7.00	32.00	51.00	17.00	CL	69		28		27.0	15.0	
OC	1985	KE	4	22	445149	880924	B8	689.1	37.30	44.30			2.90E-04	7					SM-GM							
OC	1983	KE	5	22	445152	880925	B9	700.4	25.00	26.50	1.10E-04	3			0.00	24.00	73.00	3.00	ML	81						4.5
OC	1983	KE	99	22	445152	880925	B9	700.4	65.00	66.50					0.00	6.00	54.00	40.00	CL	96		52		29.7	16.1	1.5
OC	1983	KE	99	22	445152	880925	B9	700.4	73.90	79.90			6.80E-06	7					CL&ML-CH							3.0
OC	1985	KE	4	22	445148	880929	B10		5.00	6.50					42.00	91.00			sm-sp	6		29				
OC	1985	KE	3	22	445148	880929	B10		10.00	11.00					10.00	47.00	34.00	19.00	SM	49		20				
OC	1985	KE	5	22	445148	880929	B10		15.00	16.50	3.50E-08	i			0.00	3.00	67.00	30.00	ML	99						
OC	1985	KE	5	22	445150	880924	B11	691.7	40.00	41.50					0.00	98.00			SP	4		31				
OC	1985	KE	5	22	445150	880924	B11	691.7	33.50	40.00			4.70E-04	7												
OC	1985	KE	4	22	445148	880924	B12	690.3	40.00	41.50					29.00	99.00			SP	2		28				
OC	1985	KE	4	22	445148	880924	B12	690.3	31.10	38.10			1.30E-03	7					SP							
OC	1985	KE	4	22	445148	880940	B13	749.7	28.50	30.00					40.00	92.00			SM-SW	6		42				
OC	1985	KE	3	22	445146	880935	B14	740.2	23.50	25.00					4.00	26.00	38.00	36.00	CL	73		93		32.7	19.3	4.5

Appendix 3 - HYDROGEOLOGIC AND ENGINEERING DATA FOR OCONTO COUNTY LANDFILL

IDENTITY											HYDRAULIC CONDUCTIVITY				GRAINSIZE PERCENTAGES				ENGINEERING PROPERTIES							
County (code)	Year	Litho-strat. unit (code)	Mat. (code)	Site No.	Lat.	Long.	Brng. no.	Surf. Elev. (ft)	Sample top (ft)	Sample bottom (ft)	Lab K (cm/s)	Meth code	Fld K (cm/s)	Meth code	Bulk % >2.0mm	Matrix % sand (2.0 to 0.0625mm)	Matrix % silt (0.0625 to 0.002mm)	Matrix % clay (<0.002mm)	Unified Soil Class.	Bulk Percent P200	Dry Unit Wt. (pcf)	SPT (N)	Moist. cont. (%)	Liquid limit	Plastic. index	UC (tsf)
OC	1983	KE	3	23c	445016	880614	B1	722.6	10.0	11.0					28				SC	36		66				
OC	1983	KE	99	23c	445014	880602	B2	714.5	15.0	16.0					0				SM	39		16				
OC	1983	KE	4	23c	445024	880606	B5	704.1	10.0	11.5					0				SP	6		28				
OC	1983	KE	3	23c	445021	880604	B6	715.6	4.5	6.0					29				SC	30		32				
OC	1983	KEKI	3	23c	445012	880611	B8	718.0	4.5	6.0					1				CL	65		15				
OC	1983	KEKI	3	23c	445012	880611	B8	718.0	5.5	6.0	6.00E-08	53							CL							
OC	1983	KE	99	23c	445024	880612	MW11	709.8	5.0	40.0					0				SP-SM	6						
OC	1983	KEKI	3	23c	445016	880619	B14		9.5	11.0					18				CL	73		65				
OC	1983	KEMi	3	23c	445012	880618	MW15	720.6	3.0	4.0	6.00E-06	53							SC							
OC	1983	KE	99	23c	445012	880618	MW15	720.6	35.0	41.0			1.31E-04	8					SP			84				
OC	1983	KEMi	3	23c	445016	880625	B18	719.0	0.5	2.0	2.00E-05	53							SC			4				
OC	1983	KEKI	3	23c	445016	880625	B18	719.0	4.5	6.0					1				CL	55		4				
OC	1983	KEKI	3	23c	445016	880625	B18	719.0	7.0	7.5	1.00E-07	53														
OC	1983	KE	5	23c	445016	880625	B18	719.0	14.5	16.0					6				CL	66		62				
OC	1983	KE	99	23c	445026	880627	MW21	710.9	5.0	40.0					0				SP	6						
OC	1984	KEKI	3	23b	444113	881019	B1		2.0	7.0					8	34	51	15	CL	66				31	14	
OC	1984	KE	3	23b	444114	881020	B4		16.0	24.0					4	25	49	26	CL	78				39	23	
OC	1984	KE	3	23b	444111	881024	B6		9.0	15.0					7	18	44	38	CL	78				33	19	
OC	1984	KEKI	3	23b	444110	881027	B8		3.0	14.0					2	20	45	35	CL	81				42	21	
BN	1984	KEKI	3	23a	443921	880902	B1		8.0	12.0					73	22	44	33	CL	73				44	27	
BN	1984	KEKI	3	23a	443921	880907	B2		3.0	9.0					78	33	45	26	CL	78				33	19	

Appendix 3 - HYDROGEOLOGIC AND ENGINEERING DATA FOR OUTAGAMIE COUNTY, OUTAGAMIE COUNTY LANDFILL

IDENTITY: County (code)	Year	Litho-strat. unit (code)	Mat. (code)	Site No.	Lat.	Long.	Brng. no.	Surf. Elev. (ft)	Sample top (ft)	Sample bottom (ft)	HYDRAULIC CONDUCTIVITY: Lab K (cm/s)	Meth code	Fld K (cm/s)	Meth code	GRAINSIZE PERCENTAGES: Bulk % >2.0mm	Matrix % sand (2.0 to 0.0625mm)	Matrix % silt (0.0625 to 0.002mm)	Matrix % clay (<0.002mm)	ENGINEERING PROPERTIES: Unified Soil Class.	Bulk Percent P200	Dry Unit Wt. (pcf)	SPT (N)	Moist. cont. (%)	Liquid limit	Plastic. index	UC (tsf)
OU	1986	UN	12	24	441755	882053	P301A	730.8	81.5	101.5			1.18E-05	7					DOLOMITE							
OU	1986	KEMi	3	24	441755	882053	DW301B	731.5	7.0	20.0			1.75E-07	7												
OU	1986	KE	5	24	441755	882053	P301C	731.5	44.0	50.0			3.20E-07	7												
OU	1986	UN	12	24	441735	882003	P303A	733.9	62.8	82.5			5.20E-08	7												
OU	1986	KE	3	24	441735	882003	DW303B	733.3	7.0	20.0			8.31E-06	7												
OU	1986	KEUN	99	24	441735	882003	P303C	733.4	38.0	44.0			5.15E-08	7												
OU	1986	UN	12	24	441726	882018	P305A	734.2	68.0	88.5			4.58E-07	7					DOLOMITE							
OU	1986	KE	99	24	441726	882018	DW305B	734.2	4.3	20.0			1.20E-05	7												
OU	1986	KE	5	24	441726	882018	P305C	733.4	35.0	41.0			2.62E-05	7												
OU	1986	UN	12	24	441724	882041	P307A	737.1	61.0	85.0			2.49E-06	7					BEDROCK							
OU	1986	KE	99	24	441724	882041	DW307B	737.1	7.0	20.0			8.64E-06	7												
OU	1986	KE	99	24	441724	882041	P307C	737.3	32.7	38.7			1.40E-03	7												
OU	1986	UN	12	24	441719	882050	P316A	729.8	51.0	71.0			4.99E-08	7												
OU	1986	KE	3513	24	441719	882050	DW316B	728.7	4.9	20.0			7.55E-07	7					CL,Pt,CL&CH							
OU	1986	UN	3	24	441719	882050	P316C	728.7	27.9	35.5			8.29E-05	7												
OU	1982	KEMi	3	24	441737	882034	B201		14.5	16.0					0	21	61	18	CL	82		9		27	13	
OU	1982	KE	5	24	441737	882010	B202		39.5	41.0					0	2	35	63	CL	98		14		48	27	2.0
OU	1982	KEMi	3	24	441733	882022	B203		18.0	19.0					1	17	61	22	CL	84		13		25	11	2.5
OU	1982	KE	5	24	441729	882034	B204		39.5	41.0					1	1	32	67	CL	98		13		48	27	
OU	1982	KEMi	3	24	441728	882010	B205		19.5	21.0					1	1	54	45	CL	98		22		45	23	5.0
OU	1982	KEMi	53	24	441733	882022	MW203A		39.0	50.0			5.84E-07	8					CL							
OU	1982	KEMi	3	24	441739	882038	B206		13.5	15.0					1	24	58	18	CL	86				36	14	
OU	1982	KEMi	3	24	441739	882038	MW206B		19.0	25.0			6.93E-07	8					CL							
OU	1982	KEMi	3	24	441738	882020	B208		10.0	12.0	3.59E-09	3							CL		119.8		18.0			
OU	1982	KEMi	3	24	441738	882020	B208		18.5	20.0					3	26	56	19	CL	79		2		26	13	
OU	1982	KE	313	24	441738	882020	MW208A		39.0	50.0			5.50E-07	8					CL&PT							
OU	1982	KEMi	3	24	441738	882003	B209		18.5	20.0					7	44	51	5	CL	62				24	12	
OU	1982	UN	3	24	441738	882003	MW209B		49.0	55.0			1.25E-05	8					ML-SM							
OU	1982	KEMi	3	24	441735	882035	B210		23.5	25.0					1	21	45	23	CL	89				40	15	
OU	1982	KEMi	3	24	441736	882025	B211		13.5	15.0					4	41	51	8	CL	75		13		26	12	
OU	1982	UN	3	24	441736	882025	B211		48.5	50.0					5	39	57	4	CL-ML	74		388		18	11	
OU	1982	UN	3	24	441736	882006	B213		48.5	50.0					5	41	57	2	CL-ML	71		240		16	12	
OU	1982	KE	5	24	441733	882038	B214		30.0	32.0	1.42E-08	3							CL		94.4		29.9			
OU	1982	KEMi	3	24	441733	882030	B215		10.0	12.0	3.28E-08	3							CL		133.1		16.5			
OU	1982	KEkl	3	24	441733	882020	B216		38.5	40.0					1	4	66	30	CH	99		18		50	17	
OU	1982	KEkl	3	24	441733	882020	B216		32.0	34.0	2.79E-08	3							CL		97.7		28.9			
OU	1982	KEkl	3	24	441733	882010	B217		3.5	5.0					1	16	71	13	CL	92		16		31	16	
OU	1982	KEMi	3	24	441733	882010	B217		32.0	34.0	4.28E-08	3							CL		61.1		61.8			
OU	1982	KE,UN	312	24	441733	882003	MW218A		51.0	57.0			2.85E-06	8					ML,ROCK							47.2
OU	1982	KEMi	3	24	441733	882003	MW218B		19.0	25.0			1.00E-05	8					CL							18.0
OU	1982	KEMi	3	24	441729	882035	B219		13.5	15.0					5	25	60	15	CL	79		7		27	13	
OU	1982	KE	5	24	441729	882025	B220		23.5	25.0					0	5	32	63	CH	99				67	21	
OU	1982	KEMi	3	24	441729	882015	B221		10.0	12.0	8.80E-09	3									111.5		25.9			
OU	1982	KE	5	24	441729	882006	B222		28.5	30.0					0	13	53	34	CH	96		14		53	20	
OU	1982	UN	3	24	441729	882006	B222		43.5	45.0					36	63	34	3	SM-SC	30		240		16	11	
OU	1982	KE-UN	35	24	441727	882038	MW223A		39.0	50.0			3.34E-06	7					CL,SM-SC							

Appendix 3 - HYDROGEOLOGIC AND ENGINEERING DATA FOR OUTAGAMIE COUNTY, OUTAGAMIE COUNTY LANDFILL

+ IDENTITY											+ HYDRAULIC + CONDUCTIVITY				+ GRAINSIZE PERCENTAGES				+ ENGINEERING PROPERTIES							
+ County (code)	Year	Litho-strat. unit (code)	Mat. (code)	Site No.	Lat.	Long.	Brng. no.	Surf. Elev. (ft)	Sample top (ft)	Sample bottom (ft)	Lab K (cm/s)	Meth code	Fld K (cm/s)	Meth code	Bulk % >2.0mm	Matrix % sand (2.0 to 0.0625mm)	Matrix % silt (0.0625 to 0.002mm)	Matrix % clay (<0.002mm)	Unified Soil Class.	Bulk Percent P200	Dry Unit Wt. (pcf)	SPT (N)	Moist. cont.(%)	Liquid limit	Plastic. index	UC (tsf) +
OU	1982	KE	3	24	441727	882029	B224		45.0	47.0	1.07E-08										92.1	14	32.4			
OU	1982	UN	3	24	441727	882029	B224		48.5	50.0					27	55	41	4	SM-SC	41		112		15	11	
OU	1982	KEMi	3	24	441727	882020	B225		18.5	20.0					1	11	44	44	CL	94		12		48	17	
OU	1982	KEMi	3	24	441727	882003	B226		18.5	20.0					1	22	46	31	CL	86		14		37	15	
OU	1982	KEMi	3	24	441733	882030	B215B		5.0	7.0									CL		107.0		14.7			
OU	1982	KEMi	3	24	441733	882030	B215B		10.0	12.0									CL		113.5		16.4			
OU	1982	KEMi	3	24	441733	882030	B215B		15.0	17.0									CL		115.1		16.4			
OU	1982	KEMi	3	24	441733	882030	B215B		20.0	22.0									CL		103.2		19.4			
OU	1982	UN	3	24	441733	882010	B217		48.5	50.0					11	45	45	10	ML	55		240		15	12	
OU	1982	UN	3	24	441729	882035	B219		48.5	50.0					44	54			SM-SC	28		240		16	11	
OU	1982	UN	3	24	441729	882025	B220		48.5	50.0					15	51	35	14	CL	50		180		19	12	
OU	1982	UN	3	24	441729	882015	B221		48.5	50.0					17	67	27	6	SM	31		49		13	12	
OU	1982	UN	3	24	441729	882006	B222		48.5	50.0					10	60	31	9	SM-SC	44		300				
OU	1982	UN	3	24	441727	882038	B223		48.5	50.0					29	49	39	11	SM-SC	41		300		16	11	
OU	1981	KEMi	3	24	441799	882199	B100		14.5	17.0									CL		109.2		20.5	29	13	1.2
OU	1981	KE	313	24	441799	882199	B101		24.5	26.0	1.70E-08	5							CH		74.3		47.9	67	40	
OU	1981	KE	3513	24	441799	882199	B101		21.6	27.1			3.20E-06	7					CL,CH							
OU	1981	KEMi	3	24	441799	882199	B102		14.5	17.0	1.10E-08	5							CL		104.7		22.9	36	19	
OU	1981	KE	5	24	441799	882199	B103		19.5	21.5	1.50E-08	5							CL		108.4		21.0	32	17	
OU	1981	KE	5	24	441799	882199	B103		16.2	21.7			2.38E-06	7					CL,ML,CL							
OU	1981	KEMi	3	24	441799	882199	B104		17.0	19.0	1.70E-08	5							CL		111.8		19.4	27	13	
OU	1981	KEMi	3	24	441799	882199	B105		19.5	21.5	1.30E-08	5							CL		109.8		20.6	34	18	1.9
OU	1981	KEMi	3	24	441799	882199	B105		15.4	20.9			7.40E-06	7					CL			8				1.8
OU	1981	KEMi	3	24	441726	882047	TP1	713.9	0.5	4.0					0	9	42	49	CL	92			24.9	39	21	
OU	1981	KE	5	24	441726	882047	TP1	713.9	6.5		2.70E-07	24			0	1	37	62	CL	99				49	22	
OU	1981	KEMi	3	24	441724	882047	TP2	713.1	0.7	3.6					0	7	13	80	CH	93			42.1	57	34	
OU	1981	KE	5	24	441724	882047	TP2	713.1	4.7		2.90E-08	1			0	1	35	64	CL	99				48	24	
OU	1981	KE	5	24	441723	882047	TP3	711.5	0.2	3.2					0	1	39	60	CL	99			24.0	47	25	4.0
OU	1981	KE	5	24	441723	882047	TP3	711.5	4.4		1.70E-07	1			0	1	34	65	CL	99				37	13	
OU	1981	KE	99	24	441725	882051	TP4	719.3	5.0	9.2					0	9	39	52	CL	92			27.9	40	23	
OU	1981	KE	513	24	441725	882051	TP4	719.3	10.5		4.30E-08	1			0	10	40	50	CL	91				36	18	
OU	1981	KEMi	3	24	441724	882051	TP5	718.1	4.0	7.0					0	13	41	46	CL	88			17.0	33	18	
OU	1981	KE	99	24	441724	882051	TP5	718.1	8.0		1.90E-08	1			0	9	40	51	CL	92				38	20	
OU	1981	KE	99	24	441723	882051	TP6	713.0	2.6	5.6					0	3	41	56	CH	99			31.5	56	32	
OU	1981	KE	99	24	441723	882051	TP6	713.0	6.6		3.30E-08	1			0	1	47	52	CL	99				41	21	4.0
OU	1981	KEMi	3	24	441799	882199	TP7		6.3	9.3					0	13	46	41	CL	89			20.0	32	16	
OU	1981	KEMi	3	24	441799	882199	TP7		10.3		7.90E-08	1			0	14	44	42	CL	88				33	17	
OU	1981	KEMi	3	24	441799	882199	TP8		8.0	11.0					0	15	43	42		87			18.0	31	16	
OU	1981	KEMi	3	24	441799	882199	TP8		12.0		4.50E-08	1			0	7	39	54	CL	94				42	23	
OU	1981	KEMi	3	24	441799	882199	TP9		6.4	9.4					0	9	43	48	CL	92			25.0	38	21	
OU	1981	KEMi	3	24	441799	882199	TP9		10.4		3.60E-08	1			0	9	43	48	CL	92				39	21	
OU	1981	KE	5	24	441726	882107	B15A	736.6	35.0	40.0			1.36E-05	7												
OU	1981	KEMi	3	24	441726	882107	B15B	736.6	4.2	20.0			5.26E-05	7												
OU	1981	KEMi	3	24	441726	882107	B15B	736.6	4.2	20.0			4.16E-05	7												
OU	1981	KEMi	3	24	441718	882044	B17B	735.6	6.0	20.0			2.16E-07	7												
OU	1981	KEMi	353	24	441717	882047	B18B	733.8	6.4	20.0			3.33E-06	7												

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Appendix 3 - HYDROGEOLOGIC AND ENGINEERING DATA FOR OUTAGAMIE COUNTY, OUTAGAMIE COUNTY LANDFILL

IDENTITY County (code)	Year	Litho-strat. unit (code)	Nat. (code)	Site No.	Lat.	Long.	Brng. no.	Surf. Elev. (ft)	Sample top (ft)	Sample bottom (ft)	HYDRAULIC CONDUCTIVITY Lab K (cm/s)	Meth code	Fld K (cm/s)	Meth code	GRAINSIZE PERCENTAGES Bulk % >2.0mm	Matrix % sand (2.0 to 0.0625mm)	Matrix % silt (0.0625 to 0.002mm)	Matrix % clay (<0.002mm)	ENGINEERING PROPERTIES Unified Soil Class.	Bulk Percent P200	Dry Unit Wt. (pcf)	SPT (N)	Moist. cont. (%)	Liquid limit	Plastic. index	UC (tsf)
OU	1981	KE	5	24	441728	882042	B4C	740.3					3.93E-07	7												
OU	1981			24	441733	882050	B6C	744.0					1.05E-05	7												
OU	1981	KE	3513	24	441799	882199	B101		21.6	27.1			1.78E-06	7												
OU	1981	KE	5	24	441799	882199	B103		16.2	21.7			3.13E-06	7												
OU	1981	KEMi	3	24	441799	882199	B105		15.4	20.9			1.00E-05	7												
OU	1980	KE	5	24	441799	882199	B20	737.7	25.0	26.0					0	2	26	72	CH	99		4				
OU	1980	KEMi	3	24	441799	882199	B21	732.0	20.0	21.0					1	9	42	48	CL	92		14				3.0
OU	1980	KEMi	3	24	441727	882103	B22	735.2	15.0	16.0					1	18	50	31	CL	83		6				
OU	1980	KEMi	3	24	441799	882199	B23	737.0	20.0	21.0					1	16	50	33	CL	99		9				
OU	1980	KE	5	24	441725	882055	B1A	736.6	35.0	45.0			2.04E-06	7					CH,ML-CL,CL-CH							
OU	1980	KE	5	24	441728	882042	B4C	740.3					2.91E-06	7					CH,ML-CL							
OU	1980	KE	3	24	441733	882050	B6B	744.2					2.19E-05	7					SM,ML-CL,CL							
OU	1980	KEMi	3	24	441733	882040	B7A	736.4	26.0	32.0			1.58E-06	7					CL-CH				26.0			1.5
OU	1980	KE	3	24	441733	882040	B7B	737.0					8.40E-07	7					CL							
OU	1980			24	441738	882051	B9C	739.1					3.18E-05	7												
OU	1980			24	441739	882042	B10C	735.4					6.72E-05	7												
OU	1980	KEMi	3	24	441721	882059	B12B	736.8	8.6	20.0			1.99E-05	7					CL				16.0			
OU	1980	KEkl	35	24	441721	882107	B13A	737.9	33.5	38.5			1.84E-05	7					CL-CH							
OU	1980	KEMi	3	24	441721	882107	B13B	737.9	6.4	20.0			2.26E-05	7					CL							
OU	1980	KE	5	24	441724	882104	B14A	737.2	35.0	40.0			2.24E-06	7					CL,CH							
OU	AppE	KE	5	24	441724	882104	B14A	737.2	35.0	40.0			6.98E-06	7					CL,CH							
OU	1980	KEMi	3	24	441724	882104	B14B	737.2	5.4	20.0			8.11E-05	7					ML,CL							
OU	1985	KEMi	3	24	441724	882104	B14B	737.2	5.4	20.0			4.30E-07	7					ML,CL							
OU	1980	KE	5	24	441726	882107	B15A	736.6	35.0	40.0			2.17E-06	7					CL,CH							
OU	1980	KEMi	3	24	441726	882107	B15B	736.6	4.2	20.0			4.77E-04	7					CL,ML							
OU	1980	KEMi	353	24	441724	882044	B16B	736.8	3.0	20.0			4.57E-04	7					CL-CH,ML,CL							
OU	1980	KEMi	3	24	441718	882044	B17B	735.6	6.0	20.0			3.85E-05	7					CL							
OU	1980	KEMi	353	24	441717	882047	B18B	733.8	6.4	20.0			1.94E-04	7					CL,ML,CL							
OU	1980	KEMi	3	24	441721	882050	B19B	735.9	15.7	20.0			1.79E-06	7					CL				17.0			2.7
OU	1980	UN	3	24	441799	882199	B20B		38.9				2.05E-06	7												
OU	1980	UN	3	24	441799	882199	B21B		33.6				5.74E-05	7												
OU	1980	KEkl	3	24	441799	882199	B22B		28.4	39.4			4.90E-06	7												
OU	1980	KEMi	3	24	441799	882199	B23B		19.6				4.32E-05	7												
OU	1979	KEkl	3	24	441724	882104	B14A		25.0	27.0					14	23	77	0	ML	71						
OU	1979	KE	5	24	441717	882047	B1B		35.0	37.0					0	11	68	21	CL	98						
OU	1979	KEMi	3	24	441728	882050	B3	737.0	4.0	6.0									ML		119.0		16.0			4.5
OU	1974	UN	99	24	441737	882046	B5	742.1	0.0	1.3									OL		111.0		15.0			
OU	1974	KEMi	3	24	441737	882046	B5	742.1	2.0	4.0									ML		112.0		14.0			4.5
OU	1974	KEMi	3	24	441737	882046	B5	742.1	6.0	7.0									ML,SP		112.0		18.0			
OU	1974	KEMi	3	24	441737	882046	B5	742.1	8.0	9.5					0	58	33	9	SM	42		40				
OU	1974	KEMi	3	24	441737	882046	B5	742.1	15.0	16.5					0	78	20	2	SM	26		34				
OU	1974	KEMi	3	24	441733	882050	B6	740.1	4.0	6.0											128.0		14.0			
OU	1974	KEMi	3	24	441733	882042	B7	737.0	2.0	4.0									ML		113.0		13.0			4.5
OU	1974	KEMi	3	24	441733	882042	B7	737.0	10.0	12.0					0	31	38	31	CL	71			16.0			2.0
OU	1974	KEMi	3	24	441799	882199	B8	736.6	2.0	4.0									ML		114.0		15.0			4.5
OU	1974	KEMi	3	24	441799	882199	B8	736.6	4.0	6.0									CL-ML		119.0		18.0			3.5

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Appendix 3 - HYDROGEOLOGIC AND ENGINEERING DATA FOR OUTAGAMIE COUNTY, OUTAGAMIE COUNTY LANDFILL

IDENTITY											HYDRAULIC CONDUCTIVITY				GRAINSIZE PERCENTAGES				ENGINEERING PROPERTIES							
County (code)	Year	Litho-strat. unit (code)	Mat. (code)	Site No.	Lat.	Long.	Brng. no.	Surf. Elev. (ft)	Sample top (ft)	Sample bottom (ft)	Lab K (cm/s)	Meth code	Fld K (cm/s)	Meth code	Bulk % >2.0mm	Matrix % sand (2.0 to 0.0625mm)	Matrix % silt (0.0625 to 0.002mm)	Matrix % clay (<0.002mm)	Unified Soil Class.	Bulk Percent P200	Dry Unit Wt. (pcf)	SPT (N)	Moist. cont.(%)	Liquid limit	Plastic. index	UC (tsf)
OU	1974	KEMi	3	24	441799	882199	B8	736.6	6.0	8.0									CL-ML		109.0		23.0			3.5
OU	1974	KEMi	3	24	441733	882046	B11	737.3	25.0	27.0					0	56	.28	16	CL	45			25.0			1.0
OU	1974	KEMi	3	24	441733	882046	B11	737.3	30.0	31.0									CL		112.0		25.0			1.0
OU	1974	KEMi	3	24	441733	882046	B11	737.3	30.0	32.0	7.48E-07	1							CL							
OU	1974	KE	5	24	441733	882046	B11	737.3	40.0	42.0					0	27	11	62	CL-CH	73						
OU	1974	KE	5	24	441733	882046	B11	737.3	40.0	42.0					0	64	32	4	CL	36						
OU	1975	KE	5	24	441728	882050	B3A		30.0	31.0									CL-CH		97.5		32.0			2.3
OU	1975	KE	5	24	441728	882050	B3A		30.0	32.0	5.38E-08	1							CL-CH							
OU	1975	KE	5	24	441728	882042	B4A		33.0	34.0	4.53E-09	1							CL		110.0		15.0			4.0
OU	1975	KEMi	3	24	441738	882050	B9A		20.0	21.0									CL		111.0		23.0			1.0
OU	1975	KEMi	3	24	441738	882050	B9A		20.0	22.0	1.68E-08	1							CL							
OU	1979	KEMi	3	24	441721	882107	B13A	737.9	25.0	27.0	1.53E-07	3			3	19	45	36	CL	79						
OU	1979	KE	5	24	441726	882107	B15A	736.6	40.0	42.0					0	11	45	44	CL,CH	89			40.0			2.3
OU	1979	KE	5	24	441717	882047	B18B	733.8	35.0	37.0	3.87E-08	3							CL,CH							

Appendix 3 - HYDROGEOLOGIC AND ENGINEERING DATA FOR OZAUKEE COUNTY, INCLUDING ANDERSON, DIDIER, AND WEPCO PROPOSED SITES

IDENTITY											HYDRAULIC CONDUCTIVITY				GRAINSIZE PERCENTAGES				ENGINEERING PROPERTIES							
County (code)	Year	Litho-strat. unit (code)	Nat. (code)	Site No.	Lat.	Long.	Brng. no.	Surf. Elev. (ft)	Sample top (ft)	Sample bottom (ft)	Lab K (cm/s)	Meth code	Fld K (cm/s)	Meth code	Bulk % >2.0mm	Matrix % sand (2.0 to 0.0625mm)	Matrix % silt (0.0625 to 0.002mm)	Matrix % clay (<0.002mm)	Unified Soil Class.	Bulk Percent P200	Dry Unit Wt. (pcf)	SPT (N)	Moist. cont.(%)	Liquid limit	Plastic. index	UC (tsf)
OZ	1981	OC	3	25	432151	875427	MW1	155.6	31.0	41.0			6.90E-05	7					ML-CL							
OZ	1981	OC	3	25	432151	875427	MW1	155.6	15.0	17.0					0	19	59	22	CL	89						
OZ	1981	OC	3	25	432141	875429	MW2		31.5	41.5			1.70E-05	7					ML-CL							
OZ	1981	OC	3	25	432141	875429	MW2		15.0	17.0					10	42	47	11	ML-CL	58						
OZ	1982	KEOz	3	26	432539	875121	MW1	724.4	5.5	15.5			7.50E-06	7					CL							
OZ	1982	KEOz	3	26	432539	875121	MW1	724.4	15.0	17.0					7	33	47	19	CL	66				23	11	
OZ	1982	KEOz	3	26	432539	875121	MW2	718.6	40.0	42.0					0	16	48	36	CL	88				38	20	
OZ	1982	KEOz	3	26	432600	875104	MW4	718.3	5.3	15.3			5.20E-06	7					CL							
OZ	1982	KEOz	3	26	432600	875104	MW4	718.3	5.0	7.0					1	36	46	17	CL	72				25	12	
OZ	1983	KEOz	3	27	432646	815143	MW1	737.3	10.6	20.6			1.90E-07	7												
OZ	1983	KEOz	3	27	432646	815143	MW1	737.3	5.0	7.0						28	54	18	CL	62			19.3	27	11	4.5
OZ	1983	KEOz	3	27	432646	815143	MW1	737.3	15.0	17.0	1.10E-07	i							CL		114.4		15.8			
OZ	1983	KEOz	3	27	432647	875155	MW2	736.5	10.4	20.4			1.50E-07	7					CL							
OZ	1983	KEOz	3	27	432627	875155	MW2	736.5	20.0	22.0	3.20E-08	i				26	52	22	CL	70	116.1		18.0	33	18	
OZ	1983	KEOz	3	27	432654	875152	MW3	734.1	10.1	20.1			6.30E-07	7					CL							
OZ	1983	KEOz	3	27	432654	875152	MW3	734.1	25.0	27.0	2.50E-08	i							CL		111.3		19.9			
OZ	1983	KEOz	3	27	432702	875147	B19	734.0		7.5					12	34			CL	68	121.3		14.0	23	10	3.8
OZ	1983	KEOz	3	27	432702	875147	B19	734.0		27.0					2	12			CL	87	114.0		18.0	31	17	3.6
OZ	1983	KEOz	3	27	432702	875147	B19	734.0		31.0					4	11			CL	86	110.5		21.0	32	18	3.0
OZ	1983	KEOz	3	27	432654	875147	B20	734.6		3.0					3	24	42	34	CL	80	116.7		17.0	30	15	4.5
OZ	1983	KEOz	3	27	432654	875147	B20	734.6		8.0					7	30	43	27	CL	83	123.0		14.0	25	13	4.2
OZ	1983	KEOz	3	27	432654	875147	B20	734.6		26.0					6	18	45	37	CL	83	117.7		18.0	31	17	4.5
OZ	1983	KEOz	3	27	432654	875147	B20	734.6		37.0					8	16	50	34	CL	82	111.4		20.0	33	20	3.7
OZ	1983	KEOz	3	27	432654	875147	B20	734.6		47.0					3	11	58	31	CL	88	109.2		24.0	19	7	4.5
OZ	1983	KEOz	3	27	432648	875153	B23	738.1		3.5					0	7	61	32	CL	98				35	18	3.3
OZ	1983	KEOz	3	27	432648	875153	B23	738.1		8.5					2	37	43	20	CL	77	116.1		17.0	21	8	3.0
OZ	1983	KEOz	3	27	432648	875153	B23	738.1		14.0					10	34	39	27	ML	62			14.0	24	13	4.5
OZ	1983	KEOz	3	27	432648	875153	B23	738.1		18.5					24	29	43	28	ML	60	117.7		18.0	24	13	2.8
OZ	1983	KEOz	3	27	432648	875153	B23	738.1		28.5					3	24	41	35	CL	82			18.0	30	17	4.0
OZ	1983	KEOz	3	27	432648	875153	B23	738.1		38.5					2	11	47	42	CL	86				31	17	4.5
OZ	1983	KEOz	3	27	432648	875153	B23	738.1		48.5					3	13	44	42	CL	86	112.2		19.0	32	19	2.7
OZ	1983	KEOz	3	27	432649	875138	B24	732.8		1.5					10	28	47	26	ML	69			14.0	27	13	3.4
OZ	1983	KEOz	3	27	432649	875138	B24	732.8		7.0					5	22	57	21	ML	74	113.7		15.0	26	12	4.5
OZ	1983	KEOz	3	27	432649	875138	B24	732.8		27.0					8	25	46	29	ML	72	120.7		16.0	23	11	1.1
OZ	1983	KEOz	3	27	432649	875138	B24	732.8		47.5					2	14	43	43	CL	81	111.1		20.0	32	18	3.5
OZ	1983	KEOzUN	3	27	432649	875138	B24	732.8		68.0					4				CL		118.4		17.0	29	15	4.5
OZ	1983	KEOz	3	27	432637	875156	B25	754.1		8.5					11	29	48	22	ML	66	122.7		14.0	21	9	2.6
OZ	1983	KEOz	3	27	432637	875156	B25	754.1		18.7					5	15			CL	83			18.7			

Appendix 3 - HYDROGEOLOGIC AND ENGINEERING DATA FOR RACINE COUNTY - LAND RECLAMATION SITE

IDENTITY County (code)	Year	Litho-strat. unit (code)	Mat. (code)	Site No.	Lat.	Long.	Brng. no.	Surf. Elev. (ft)	Sample top (ft)	Sample bottom (ft)	HYDRAULIC CONDUCTIVITY Lab K (cm/s)	Meth code	Fld K (cm/s)	Meth code	GRAINSIZE PERCENTAGES Bulk % >2.0mm	Matrix % sand (2.0 to 0.0625mm)	Matrix % silt (0.0625 to 0.002mm)	Matrix % clay (<0.002mm)	ENGINEERING PROPERTIES Unified Soil Class.	Bulk Percent P200	Dry Unit Wt. (pcf)	SPT (N)	Moist. cont.(%)	Liquid limit	Plastic. index	UC (tsf)
RA	1976	OC	3	28	424220	875130	B3	705.0	29.0		1.40E-06								ML	100			21.9			
RA	1976	OC	3	28	424220	875130	B3	705.0	5.0													12				3.3
RA	1976	OC	3	28	424220	875130	B3	705.0	10.0													27				3.3
RA	1976	OC	3	28	424220	875130	B3	705.0	15.0													18				2.6
RA	1976	OC	3	28	424220	875130	B3	705.0	34.0													9				2.7
RA	1976	OC	3	28	424220	875130	B3	705.0	39.0													14				2.7
RA	1976	OC	3	28	424220	875130	B3	705.0	43.5													20				3.7
RA	1976	OC	3	28	424220	875130	B3	705.0	48.5													16				2.5
RA	1976	OC	3	28	424220	875130	B3	705.0	53.5													18				2.5
RA	1976	OC	3	28	424220	875130	B3	705.0	58.5													13				3.3
RA	1976	OC	3	28	424220	875130	B3	705.0	68.5													37				3.4
RA	1976	OC	3	28	424232	875153	B4	671.0	29.5		4.40E-08								CL	100						
RA	1976	OC	3	28	424232	875153	B4	671.0	19.5													10				2.0
RA	1976	OC	3	28	424232	875153	B4	671.0	24.5													14				1.5
RA	1976	OC	3	28	424232	875153	B4	671.0	28.5														27.6			
RA	1976	OC	3	28	424232	875153	B4	671.0	39.5													34				4.5
RA	1976	OC	3	28	424232	875132	B5	705.8	4.5													25				4.5
RA	1976	OC	3	28	424232	875132	B5	705.8	9.5													30				4.5
RA	1976	OC	3	28	424232	875132	B5	705.8	14.5													14				2.3
RA	1976	OC	3	28	424232	875132	B5	705.8	19.5													12				2.4
RA	1976	OC	3	28	424232	875132	B5	705.8	24.5													25				2.0
RA	1976	OC	99	28	424232	875132	B5	705.8	29.5													23				3.5
RA	1976	OC	99	28	424232	875132	B5	705.8	34.5													18				
RA	1976	OC	99	28	424232	875132	B5	705.8	48.5														24.7			
RA	1976	OC	99	28	424232	875132	B5	705.8	50.5		1.60E-08								CL				27.1			
RA	1976	OC	99	28	424232	875132	B5	705.8	54.5													15				3.9
RA	1976	OC	99	28	424232	875132	B5	705.8	64.0													34				4.5
RA	1976	OC	99	28	424232	875132	B5	705.8	69.0													47				
RA	1976	OC	99	28	424232	875120	B6	723.2	49.2		6.30E-06								ML	99			19.2			
RA	1976	OC	99	28	424232	875120	B6	723.2	51.7		4.20E-08								CL							
RA	1976	OC	99	28	424218	875154	B8	677.5	28.0		1.10E-04				17				SP	7						
RA	1976	OC	99	28	424218	875154	B8	677.5	29.5						4					5						
RA	1976	OC	99	28	424218	875154	B8	677.5	30.5						42					34						
RA	1980	OC	3	28	424220	875130	B3	705.5	13.5	15.0									CL			16				
RA	1980	OC	4	28	424220	875130	B3	705.5	28.5	30.0									SP	12		12				
RA	1980	OC	5	28	424220	875130	B3	705.5	38.5	40.0	2.00E-08	3							CL	93	104.5	13	21.6			
RA	1980	OC	5	28	424220	875130	B3	705.5	48.5	50.0									CL	95		22	29.3			
RA	1980	OC	5	28	424220	875130	B3	705.5	53.5	55.0									CL	95		17	21.6			
RA	1980	OC	5	28	424220	875130	B3	705.5	78.5	80.0									ML	87		41	19.0			
RA	1980	OC	4	28	424220	875130	B3A	705.5	28.0	36.0			3.00E-06	7					SW,SC,CL							
RA	1980	OC	3	28	424232	875132	B5	705.8	4.0	5.0									CL		108.6	24	19.1			
RA	1980	OC	3	28	424232	875132	B5	705.8	9.0	9.5									CL			23	15.3			
RA	1980	OC	3	28	424232	875132	B5	705.8	14.0	15.0									CL		117.6	11	17.3	23	8	
RA	1980	OC	3	28	424232	875132	B5	705.8	19.0	20.0	5.00E-08	3			10	20			CL	76	125.1	21	13.7	24	9	
RA	1980	OC	99	28	424232	875132	B5	705.8	24.0	25.0									CL		122.0	21	14.4			
RA	1980	OC	3	28	424232	875132	B5	705.8	29.0	30.0									CL		119.1	13		26	11	

Appendix 3 - HYDROGEOLOGIC AND ENGINEERING DATA FOR RACINE COUNTY - LAND RECLAMATION SITE

IDENTITY: County (code)	Year	Litho-strat. unit (code)	Nat. (code)	Site No.	Lat.	Long.	Brng. no.	Surf. Elev. (ft)	Sample top (ft)	Sample bottom (ft)	HYDRAULIC CONDUCTIVITY: Lab K (cm/s)	Meth code	Fld K (cm/s)	Meth code	GRAINSIZE PERCENTAGES: Bulk % >2.0mm	Matrix % sand (2.0 to 0.0625mm)	Matrix % silt (0.0625 to 0.002mm)	Matrix % clay (<0.002mm)	ENGINEERING PROPERTIES: Unified Soil Class.	Bulk Percent P200	Dry Unit Wt. (pcf)	SPT (N)	Moist. cont. (%)	Liquid limit	Plastic. index	UC (tsf)
RA	1980	OC	99	28	424232	875132	B5	705.8	34.0	35.0					0	20	78	2	ML	86		14				
RA	1980	OC	99	28	424232	875132	B5	705.8	39.0	40.0					0	19	80	1	ML	83		11				
RA	1980	OC	99	28	424232	875132	B5	705.8	44.0	45.0									CL		103.9	11	23.8	41	19	
RA	1980	OC	99	28	424232	875132	B5	705.8	49.0	50.0									CL			17	21.9			
RA	1980	OC	99	28	424232	875132	B5	705.8	54.0	55.0									CL			14	23.1			
RA	1980	OC	99	28	424232	875132	B5	705.8	59.0	60.0									CL		117.9	14	14.2	26	11	
RA	1980	OC	99	28	424232	875132	B5	705.8	64.0	65.0									CL			16	14.8			
RA	1980	OC	99	28	424232	875132	B5	705.8	69.0	70.0									CL		99.6	14	26.4	27	10	
RA	1980	OC	99	28	424232	875132	B5	705.8	74.0	75.0									CL			19	13.1			
RA	1980	OC	99	28	424232	875132	B5	705.8	79.0	80.0									CL		121.8	33	15.2	24	10	
RA	1980	OC	99	28	424232	875132	B5	705.8	84.0	85.0									CL,SM			32	14.3			
RA	1980	OC	99	28	424232	875132	B5	705.8	38.0	45.0			1.00E-06	7					SM,CL							
RA	1980	OC	99	28	424232	875132	B5	705.8	78.5	86.5			6.00E-07	7					CL,SM							
RA	1980	OC	99	28	424229	875154	B10	675.6	8.5	10.0					16	64			SM	30						
RA	1980	OC	99	28	424229	875154	B10	675.6	23.5	25.0	3.00E-08	3							CL	96		11				
RA	1980	OC	99	28	424229	875154	B10	675.6	43.5	45.0					4				ML	69	101.3	10	22.8	36	18	
RA	1980	OC	99	28	424229	875154	B10	675.6	53.5	55.0	2.00E-08	3			5	23	54	23	CL			17	16.2			
RA	1980	OC	99	28	424229	875154	B10	675.6	39.0	46.0			2.00E-06	7					SM		126.5	18	15.7	24	16	
RA	1981	OC	3	28	424232	875141	B14	685.6	4.0	5.0									CL			14	23.3			
RA	1981	OC	3	28	424232	875141	B14	685.6	9.0	10.0									CL		122.5	14	14.2	27	11	
RA	1981	OC	3	28	424232	875141	B14	685.6	14.0	14.5	2.00E-08	3							CL	85	123.4	11	14.3	23	8	
RA	1981	OC	99	28	424232	875141	B14	685.6	19.0	20.0									SM			14	13.2	16	2	
RA	1981	OC	99	28	424232	875141	B14	685.6	24.0	25.0									CL			14	12.6	21	8	
RA	1981	OC	99	28	424232	875141	B14	685.6	29.0	30.0					9	92			SP	8		16				
RA	1981	OC	99	28	424232	875141	B14	685.6	39.0	39.5									CL		120.0	27	16.6	27	10	
RA	1981	OC	99	28	424232	875141	B14	685.6	44.0	45.0									CL,SM			25	18.3			
RA	1981	OC	99	28	424232	875141	B14	685.6	54.0	55.0					3				SM	33		13				
RA	1981	OC	99	28	424232	875141	B14	685.6	69.0	69.5									CL			18				
RA	1981	OC	3	-28	424232	875141	B14A	685.6	1.0	13.0									CL,CL							
RA	1981	OC	99	28	424232	875141	B14B	685.6	27.0	35.0			2.00E-05	7					SP-SM							
RA	1981	OC	99	28	424232	875141	B14C	685.6	53.0	60.0			1.00E-05	7					SP-SM							
RA	1981	OC	5	28	424226	875141	B15	674.3	9.0	10.0					0	17	76	7	ML			10				
RA	1981	OC	5	28	424226	875141	B15	674.3	23.5	25.0	2.00E-08	3			0	2	46	52	CL		100.6	10	23.6	44	25	
RA	1981	OC	99	28	424226	875141	B15	674.3	34.0	35.0									CL			15				
RA	1981	OC	5	28	424226	875141	B15	674.3	59.0	60.0									ML	60		21				
RA	1981	OC	99	28	424226	875141	B15C	674.3	31.0	38.0			1.00E-05	7					CL,CL,CL							
RA	1981	OC	99	28	424226	875141	B15D	674.3	47.0	60.0			8.00E-07	7					CL							
RA	1981	OC	99	28	424225	875127	B16	657.7	8.5	10.0					0	0	45	55	CL		96.3	8	28.1	43	23	
RA	1981	OC	99	28	424225	875127	B16	657.7	13.5	15.0									SM-SC			10	15.3	21	5	
RA	1981	OC	99	28	424225	875127	B16	657.7	18.5	20.0									SM-ML			13	14.1			
RA	1981	OC	99	28	424225	875127	B16	657.7	23.5	25.0									CL,ML,SM		115.3	8	17.9			
RA	1981	OC	99	28	424225	875127	B16	657.7	28.5	30.0									CL		111.2	14	19.9	28	10	
RA	1981	OC	99	28	424225	875127	B16	657.7	33.5	35.0					3	14	55	31	CL			18	15.9	27	11	
RA	1981	OC	99	28	424225	875127	B16	657.7	38.5	40.0					5	43	41	16	CL-ML			17	19.8	17	5	
RA	1981	OC	99	28	424225	875127	B16B	657.7	34.0	41.0			3.00E-03	7					CL,ML,SM							
RA	1981	OC	3	28	424224	875120	B17	727.2	18.5	20.0					6	32	51	17	CL			12	18.5	21	9	

Appendix 3 - HYDROGEOLOGIC AND ENGINEERING DATA FOR RACINE COUNTY - LAND RECLAMATION SITE

IDENTITY											HYDRAULIC CONDUCTIVITY				GRAINSIZE PERCENTAGES				ENGINEERING PROPERTIES							
County (code)	Year	Litho-strat. unit (code)	Mat. (code)	Site No.	Lat.	Long.	Brno. no.	Surf. Elev. (ft)	Sample top (ft)	Sample bottom (ft)	Lab K (cm/s)	Meth code	Fld K (cm/s)	Meth code	Bulk % >2.0mm	Matrix % sand (2.0 to 0.0625mm)	Matrix % silt (0.0625 to 0.002mm)	Matrix % clay (<0.002mm)	Unified Soil Class.	Bulk Percent P200	Dry Unit Wt. (pcf)	SPT (N)	Moist. cont.(%)	Liquid limit	Plastic. index	UC (tsf)
RA	1981	OC	99	28	424224	875120	B17	727.2	58.5	60.0	5.00E-08	3			0	3	47	50	CL		105.8	16	22.1	42	26	
RA	1981	OC	99	28	424224	875120	B17	727.2	83.5	85.0												15	13.0	22	7	
RA	1981	OC	99	28	424224	875120	B17	727.2	103.5	105.0	7.00E-07	3			4	44	52	4	ML		120.7	16	16.3			
RA	1981	OC	3	28	424224	875120	B17B	727.2	42.0	50.0			1.00E-07	7					CL							
RA	1981	OC	99	28	424219	875142	B18	695.8	23.8	25.0					4	90			SP	10		18				
RA	1981	OC	99	28	424219	875142	B18	695.8	28.5	30.0									CL	80		11	14.6	21	7	
RA	1981	OC	99	28	424219	875142	B18	695.8	43.5	45.0	3.00E-08	3							CL	93	101.8	21	23.2	35	17	
RA	1981	OC	99	28	424219	875142	B18	695.8	48.5	50.0									CL-ML	75		14		20	4	
RA	1981	OC	99	28	424219	875142	B18	695.8	78.5	80.0									SM	19		37				
RA	1981	OC	99	28	424219	875142	B18	695.8	83.5	85.0									ML	85		38	12.2	17	1	
RA	1985	OC	3	28	424234	875150	B65	673.8	5.0										CL			15				3.5
RA	1985	OC	99	28	424234	875150	B65	673.8	10.0										CL			13				3.0
RA	1985	OC	99	28	424234	875150	B65	673.8	15.0										ML	67		11				
RA	1985	OC	99	28	424234	875150	B65	673.8	20.0										CL			14				
RA	1985	OC	99	28	424234	875150	B65	673.8	25.0										CL			17				1.5
RA	1985	OC	3	28	424234	875150	B65	673.8	30.0						26	49	38	14	CL	40		18				2.5
RA	1985	OC	99	28	424234	875150	B65	673.8	35.0										ML			57				
RA	1985	OC	99	28	424234	875150	B65	673.8	40.0										SM			74				
RA	1985	OC	99	28	424234	875150	B65	673.8	45.0						2	42	55	3	ML	66		12				
RA	1985	OC	99	28	424234	875150	B65	673.8	50.0										ML			30				
RA	1985	OC	99	28	424234	875150	B65	673.8	55.0										CL			22				2.8
RA	1985	OC	99	28	424234	875150	B65	673.8	60.0										CL			42				3.5
RA	1985	OC	99	28	424234	875150	B65	673.8	65.0						20	18	56	26	CL	66		46				3.5
RA	1985	OC	3	28	424234	875150	B65	673.8	70.0										CL			56				3.5
RA	1985	OC	3	28	424234	875150	B65	673.8	75.0										CL			36				4.2
RA	1985	OC	3	28	424233	875145	B66	687.6	2.5										CL			7				1.5
RA	1985	OC	3	28	424233	875145	B66	687.6	5.0							22	43	35	CL	82		8				1.8
RA	1985	OC	99	28	424233	875145	B66	687.6	10.0										ML			10				
RA	1985	OC	3	28	424233	875145	B66	687.6	15.0										CL			10				1.8
RA	1985	OC	3	28	424233	875145	B66	687.6	20.0	22.0									CL			19				
RA	1985	OC	3	28	424233	875145	B66	687.6	23.0	25.0	8.10E-08								CL							1.8
RA	1985	OC	3	28	424233	875145	B66	687.6	28.5	30.5	4.60E-08								CL							1.5
RA	1985	OC	3	28	424233	875145	B66	687.6	35.0										CL			12				1.8
RA	1985	OC	99	28	424233	875145	B66	687.6	40.0										ML			74				
RA	1985	OC	99	28	424233	875145	B66	687.6	45.0										ML			64				
RA	1985	OC	3	28	424233	875145	B66	687.6	50.0										CL			17				1.8
RA	1985	OC	3	28	424233	875145	B66	687.6	53.5	55.5	3.70E-08								CL-ML							2.0
RA	1985	OC	99	28	424233	875145	B66	687.6	60.0										ML			27				
RA	1985	OC	99	28	424233	875145	B66	687.6	65.0										ML			16				
RA	1985	OC	99	28	424233	875145	B66	687.6	70.0										CL			29				3.0
RA	1985	OC	99	28	424233	875145	B66	687.6	75.0										CL			89				3.5
RA	1985	OC	99	28	424233	875145	B66	687.6	80.0										CL			62				4.2
RA	1984	OC	3	28	424232	875120	B6N	723.1	3.5	5.0									CL			17				
RA	1984	OC	3	28	424232	875120	B6N	723.1	8.5	10.0									ML-CL			8				
RA	1984	OC	3	28	424232	875120	B6N	723.1	13.5	15.0									CL/ML-CL			15				
RA	1984	OC	3	28	424232	875120	B6N	723.1	16.5	20.0									ML	92		15		19	3	

Appendix 3 - HYDROGEOLOGIC AND ENGINEERING DATA FOR RACINE COUNTY - LAND RECLAMATION SITE

IDENTITY County (code)	Year	Litho-strat. unit (code)	Mat. (code)	Site No.	Lat.	Long.	Brng. no.	Surf. Elev. (ft)	Sample top (ft)	Sample bottom (ft)	HYDRAULIC CONDUCTIVITY Lab K (cm/s)	Meth code	Fld K (cm/s)	Meth code	GRAINSIZE PERCENTAGES Bulk % >2.0mm	Matrix % sand (2.0 to 0.0625mm)	Matrix % silt (0.0625 to 0.002mm)	Matrix % clay (<0.002mm)	ENGINEERING PROPERTIES Unified Soil Class.	Bulk Percent P200	Dry Unit Wt. (pcf)	SPT (N)	Moist. cont. (%)	Liquid limit	Plastic. index	UC (tsf)
RA	1984	OC	3	28	424232	875120	B6N	723.1	23.5	25.0									ML			16				
RA	1984	OC	3	28	424232	875120	B6N	723.1	28.5	30.0									ML	95		17		20	3	
RA	1984	OC	3	28	424232	875120	B6N	723.1	33.5	35.0									CL			14				
RA	1984	OC	99	28	424232	875120	B6N	723.1	38.5	40.0									ML			14				
RA	1984	OC	99	28	424232	875120	B6N	723.1	43.5	45.0									ML	97		17		20	6	
RA	1984	OC	99	28	424232	875120	B6N	723.1	48.5	50.0									CL			16				
RA	1984	OC	99	28	424232	875120	B6N	723.1	51.0	52.5									CL			17				
RA	1984	OC	99	28	424232	875120	B6N	723.1	53.0	55.0									CL			17				
RA	1984	OC	99	28	424232	875120	B6N	723.1	58.5	60.0									CL			18				
RA	1984	OC	99	28	424232	875120	B6N	723.1	27.0	41.0			5.75E-06	7					CL-ML,ML							
RA	1984	OC	99	28	424232	875120	B6N	723.9	35.0	36.5									ML			9		19	3	
RA	1984	OC	99	28	424232	875120	B6N	723.9	37.5	39.0									ML	92		7				
RA	1984	OC	99	28	424232	875120	B6N	723.9	40.0	41.5									ML,CL			9				
RA	1984	OC	99	28	424232	875120	B6N-1	723.9	82.8	90.0			1.89E-05	7												
RA	1985	OC	99	28	424232	875120	B6N	723.9	30.0										ML			14				
RA	1985	OC	99	28	424232	875120	B6N	723.9	35.0										CL			15				2.5
RA	1985	OC	99	28	424232	875120	B6N	723.9	40.0										CL			18				2.5
RA	1980	OC	99	28	424232	875153	B4N	672.9	3.0	14.5			4.82E-05	7												
RA	1980	OC	3	28	424232	875153	B4N	672.9	5.0										CL			9				3.5
RA	1980	OC	99	28	424232	875153	B4N	672.9	9.0	10.5									ML			12				
RA	1980	OC	99	28	424232	875153	B4N	672.9	14.0	15.5									SM			9				
RA	1980	OC	3	28	424232	875153	B4N	672.9	19.0	20.5									CL			7				1.5
RA	1980	OC	3	28	424232	875153	B4N	672.9	24.0	25.5									CL			6				2.2
RA	1980	OC	99	28	424232	875153	B4N	672.9	29.0	30.5									CL			6				1.2
RA	1980	OC	99	28	424232	875153	B4N	672.9	34.0	35.5									ML			53				
RA	1980	OC	99	28	424232	875153	B4N	672.9	39.0	40.5									SM			23				
RA	1980	OC	3	28	424232	875153	B4N	672.9	44.0	45.5									CL-ML,CL			13				2.5
RA	1980	OC	3	28	424232	875153	B4N	672.9	49.0	50.5									CL-ML,CL			13				2.0
RA	1980	OC	3	28	424232	875153	B4N	672.9	54.0	55.5									CL-ML,CL			12				1.5
RA	1980	OC	99	28	424232	875153	B4N-1	672.9	35.0	43.0			2.03E-04	7												
RA	1985	OC	3	28	424240	875145	B47	679.8	2.5										CL			10				3.5
RA	1985	OC	99	28	424240	875145	B47	679.8	5.0										ML			18				
RA	1985	OC	99	28	424240	875145	B47	679.8	10.0										SM			15				
RA	1985	OC	99	28	424240	875145	B47	679.8	15.0										CL			16				2.5
RA	1985	OC	99	28	424240	875145	B47	679.8	20.0										CL			14				3.0
RA	1985	OC	99	28	424240	875145	B47	679.8											SP							
RA	1985	OC	99	28	424240	875145	B47	679.8	25.0										ML			21				
RA	1985	OC	3	28	424240	875145	B47	679.8	28.5	30.5	5.80E-08								CL							4.5
RA	1985	OC	99	28	424240	875145	B47	679.8	35.0										ML			37				
RA	1985	OC	3	28	424240	875145	B47	679.8	40.0										CL			15				2.2
RA	1985	OC	99	28	424240	875145	B47	679.8	45.0										SP-SM			67				
RA	1985	OC	99	28	424240	875145	B47	679.8	50.0										SP-SM,CL			42				
RA	1985	OC	99	28	424240	875145	B47	679.8	53.5	54.5	6.00E-08															4.0
RA	1985	OC	99	28	424240	875145	B47	679.8	60.0										CL			58				4.5
RA	1985	OC	3	28	424240	875145	B47	679.8	65.0										SP			134				
RA	1985	OC	99	28	424240	875145	B47	679.8	69.0	69.5																

Appendix 3 - HYDROGEOLOGIC AND ENGINEERING DATA FOR RACINE COUNTY - LAND RECLAMATION SITE

IDENTITY												HYDRAULIC CONDUCTIVITY				GRAINSIZE PERCENTAGES				ENGINEERING PROPERTIES							
County (code)	Year	Litho-strat. unit (code)	Mat. (code)	Site No.	Lat.	Long.	Brng. no.	Surf. Elev. (ft)	Sample top (ft)	Sample bottom (ft)		Lab K (cm/s)	Meth code	Fld K (cm/s)	Meth code	Bulk % >2.0mm	Matrix % sand (2.0 to 0.0625mm)	Matrix % silt (0.0625 to 0.002mm)	Matrix % clay (<0.002mm)	Unified Soil Class.	Bulk Percent P200	Dry Unit Wt. (pcf)	SPT (N)	Moist. cont. (%)	Liquid limit	Plastic. index	UC (tsf)
RA	1985	OC	99	28	424240	875145	B47	679.8	70.0											ML			67				
RA	1985	OC	3	28	424240	875138	B53	695.5	2.5											CL			9				1.7
RA	1985	OC	3	28	424240	875138	B53	695.5	5.0											CL			16				4.0
RA	1985	OC	3	28	424240	875138	B53	695.5	10.0											CL			24				2.8
RA	1985	OC	99	28	424240	875138	B53	695.5	15.0											CL			13				2.2
RA	1985	OC	3	28	424240	875138	B53	695.5	20.0							12	30	48	23	CL	69		28				3.0
RA	1985	OC	3	28	424240	875138	B53	695.5	25.0											CL			20				3.5
RA	1985	OC	3	28	424240	875138	B53	695.5	30.0											CL			27				4.0
RA	1985	OC	3	28	424240	875138	B53	695.5	35.0											CL			17				3.0
RA	1985	OC	3	28	424240	875138	B53	695.5	40.0							0	2	42	56	CL	98		11				2.5
RA	1985	OC	99	28	424240	875138	B53	695.5	45.0											CL			17				1.5
RA	1985	OC	99	28	424240	875138	B53	695.5	50.0											CL			20				2.5
RA	1985	OC	3	28	424240	875138	B53	695.5	55.0											CL			70				4.5
RA	1985	OC	3	28	424240	875138	B53	695.5	60.0											CL			18				
RA	1985	OC	3	28	424240	875138	B53	695.5	65.0							0	6	69	25		94		23				3.5
RA	1985	OC	99	28	424240	875138	B53	695.5	70.0														28				
RA	1985	OC	99	28	424240	875138	B53	695.5	75.0														31				
RA	1985	OC	99	28	424240	875138	B53	695.5	80.0											ML,CL-ML			133				4.5
RA	1985	OC	99	28	424240	875138	B53	695.5	85.0											ML,CL-ML			73				4.5
RA	1985	OC	99	28	424237	875151	B56	673.3	2.5											ML			11				
RA	1985	OC	99	28	424237	875151	B56	673.3	5.0											CL			4				
RA	1985	OC	99	28	424237	875151	B56	673.3	10.0							44	39			SW-SM	17		31				
RA	1985	OC	99	28	424237	875151	B56	673.3	15.0														19				
RA	1985	OC	99	28	424237	875151	B56	673.3	20.0											SP-SM			20				
RA	1985	OC	3	28	424237	875151	B56	673.3	25.0											CL			11				1.5
RA	1985	OC	3	28	424237	875151	B56	673.3	30.0							0	9	39	52	CL	93		15				0.8
RA	1985	OC	3	28	424237	875151	B56	673.3	35.0											CL			21				3.0
RA	1985	OC	99	28	424237	875151	B56	673.3	40.0											SM			86				
RA	1985	OC	3	28	424237	875151	B56	673.3	45.0											CL			66				4.5
RA	1985	OC	3	28	424237	875151	B56	673.3	50.0											CL			29				2.6
RA	1985	OC	3	28	424237	875151	B56	673.3	55.0											CL			63				4.5
RA	1985	OC	99	28	424237	875151	B56	673.3	60.0											SP-SM	62		109				
RA	1985	OC	99	28	424237	875151	B56	673.3	65.0											SP-SM			100				
RA	1985	OC	99	28	424237	875151	B56	673.3	70.0											SP-SM			150				
RA	1985	OC	3	28	424237	875151	B56	673.3	75.0											CL			76				4.5
RA	1985	OC	3	28	424235	875148	B59	675.0	2.5											CL-ML/CL			6				1.0
RA	1985	OC	3	28	424235	875148	B59	675.0	5.0											CL-ML/CL			10				1.5
RA	1985	OC	3	28	424235	875148	B59	675.0	10.0											CL			12		25	9	2.2
RA	1985	OC	99	28	424235	875148	B59	675.0	15.0											ML			9				
RA	1985	OC	99	28	424235	875148	B59	675.0	20.0											ML			16				
RA	1985	OC	3	28	424235	875148	B59	675.0	25.0											CL			14		36	18	2.2
RA	1985	OC	3	28	424235	875148	B59	675.0	30.0											CL			12				2.2
RA	1985	OC	99	28	424235	875148	B59	675.0	35.0											CL			12				3.0
RA	1985	OC	99	28	424235	875148	B59	675.0	40.0											ML			79				
RA	1985	OC	99	28	424235	875148	B59	675.0	45.0											ML			71				
RA	1985	OC	3	28	424235	875148	B59	675.0	50.0											CL			18				3.5

Appendix 3 - HYDROGEOLOGIC AND ENGINEERING DATA FOR RACINE COUNTY - LAND RECLAMATION SITE

+ IDENTITY											+ HYDRAULIC CONDUCTIVITY				+ GRAINSIZE PERCENTAGES				+ ENGINEERING PROPERTIES							+
+ County (code)	Year	Litho-strat. unit (code)	Mat. (code)	Site No.	Lat.	Long.	Brng. no.	Surf. Elev. (ft)	Sample top (ft)	Sample bottom (ft) +	Lab K (cm/s)	Meth code	Fld K (cm/s)	Meth code	+ Bulk % >2.0mm	Matrix % sand (2.0 to 0.0625mm)	Matrix % silt (0.0625 to 0.002mm)	Matrix % clay (<0.002mm) +	+ Unified Soil Class.	Bulk Percent P200	Dry Unit Wt. (pcf)	SPT (N)	Moist. cont.(%)	Liquid limit	Plastic. index	UC (tsf) +
RA	1985	OC	3	28	424235	875148	B59	675.0	55.0										CL			25				
RA	1985	OC	99	28	424235	875148	B59	675.0	60.0										ML			82				
RA	1985	OC	99	28	424235	875148	B59	675.0	65.0										ML			77				
RA	1985	OC	99	28	424235	875148	B59	675.0	70.0										CL			39				2.5
RA	1985	OC	99	28	424235	875148	B59	675.0	75.0										ML			62				
RA	1985	OC	3	28	424236	875137	B60	690.5	2.5										CL			21				1.5
RA	1985	OC	3	28	424236	875137	B60	690.5	5.0										CL			10		30	14	2.8
RA	1985	OC	3	28	424236	875137	B60	690.5	10.0										CL			26				4.5
RA	1985	OC	99	28	424236	875137	B60	690.5	15.0										ML			15				
RA	1985	OC	3	28	424236	875137	B60	690.5	18.5	20.5	2.70E-08								CL							2.7
RA	1985	OC	3	28	424236	875137	B60	690.5	25.0										CL			28		23	11	3.8
RA	1985	OC	99	28	424236	875137	B60	690.5	30.0										CL			13				1.7
RA	1985	OC	99	28	424236	875137	B60	690.5	36.0										CL			7				2.1
RA	1985	OC	99	28	424236	875137	B60	690.5	40.0										ML			19				
RA	1985	OC	3	28	424236	875137	B60	690.5	45.0										CL			33				4.2
RA	1985	OC	99	28	424236	875137	B60	690.5	48.5	50.0									SP-SM							
RA	1985	OC	3	28	424236	875137	B60	690.5	55.0										CL			22				2.0
RA	1985	OC	3	28	424236	875137	B60	690.5	60.0										CL			29		21	9	1.0
RA	1985	OC	99	28	424236	875137	B60	690.5	65.0										SM			19				
RA	1985	OC	99	28	424236	875137	B60	690.5	70.0										SM			49				
RA	1985	OC	99	28	424236	875137	B60	690.5	75.0										CL/ML			82				4.5
RA	1985	OC	99	28	424236	875137	B60	690.5	80.0										CL/ML			133				
RA	1985	OC	99	28	424236	875132	B61	690.5	2.5										CL			16				1.6
RA	1985	OC	3	28	424236	875132	B61	690.5	5.0										CL			33				4.5
RA	1985	OC	3	28	424236	875132	B61	690.5	10.0										CL			53		25	13	3.6
RA	1985	OC	3	28	424236	875132	B61	690.5	15.0										CL			76				
RA	1985	OC	3	28	424236	875132	B61	690.5	18.0	20.0	8.20E-08								CL							4.0
RA	1985	OC	99	28	424236	875132	B61	690.5	25.0										ML			56		15	2	
RA	1985	OC	99	28	424236	875132	B61	690.5	30.0										ML			43				
RA	1985	OC	99	28	424236	875132	B61	690.5	33.5	34.5									ML							
RA	1985	OC	3	28	424236	875132	B61	690.5	40.0										CL			16				2.4
RA	1985	OC	3	28	424236	875132	B61	690.5	45.0										CL			18				2.6
RA	1985	OC	3	28	424236	875132	B61	690.5	50.0										CL			20		39	23	2.4
RA	1985	OC	3	28	424236	875132	B61	690.5	54.0	55.5									CL			62				2.7
RA	1985	OC	3	28	424236	875132	B61	690.5	60.0										CL			63				
RA	1985	OC	99	28	424236	875132	B61	690.5	65.0										SP			70				
RA	1985	OC	99	28	424236	875132	B61	690.5	70.0										SP			67				
RA	1985	OC	3	28	424236	875132	B61	690.5	75.0										CL			51				2.9
RA	1985	OC	99	28	424236	875132	B61	690.5	80.0										ML			37				
RA	1985	OC	99	28	424236	875132	B61	690.5	85.0										CL			27				2.4
RA	1985	OC	3	28	424236	875132	B61	690.5	90.0										CL			126				4.0
RA	1985	OC	3	28	424233	875137	B67	698.3	2.5										CL			10				1.5
RA	1985	OC	3	28	424233	875137	B67	698.3	5.0										CL			20		28	10	4.5
RA	1985	OC	3	28	424233	875137	B67	698.3	10.0										CL			19				4.5
RA	1985	OC	3	28	424233	875137	B67	698.3	15.0						20	45	39	16	CL	45		26				4.2
RA	1985	OC	99	28	424233	875137	B67	698.3	20.0										CL			26				

Appendix 3 - HYDROGEOLOGIC AND ENGINEERING DATA FOR RACINE COUNTY - LAND RECLAMATION SITE

IDENTITY County (code)	Year	Litho-strat. unit (code)	Mat. (code)	Site No.	Lat.	Long.	Brng. no.	Surf. Elev. (ft)	Sample top (ft)	Sample bottom (ft)	HYDRAULIC CONDUCTIVITY Lab K (cm/s)	Meth code	Fld K (cm/s)	Meth code	GRAINSIZE PERCENTAGES Bulk % >2.0mm	Matrix % sand (2.0 to 0.0625mm)	Matrix % silt (0.0625 to 0.002mm)	Matrix % clay (<0.002mm)	ENGINEERING PROPERTIES Unified Soil Class.	Bulk Percent P200	Dry Unit Wt. (pcf)	SPT (N)	Moist. cont.(%)	Liquid limit	Plastic. index	UC (tsf)
RA	1985	OC	99	28	424233	875137	B67	698.3	25.0										CL			30				3.5
RA	1985	OC	99	28	424233	875137	B67	698.3	30.0						i	17	77	6	CL-ML	84		12				
RA	1985	OC	99	28	424233	875137	B67	698.3	35.0										CL-ML			38				
RA	1985	OC	99	28	424233	875137	B67	698.3	40.0										CL			15				3.5
RA	1985	OC	99	28	424233	875137	B67	698.3	45.0										CL			14				2.8
RA	1985	OC	99	28	424233	875137	B67	698.3	50.0										SP-SC			35				3.2
RA	1985	OC	3	28	424233	875137	B67	698.3	55.0										CL			47				4.5
RA	1985	OC	99	28	424233	875137	B67	698.3	60.0						0	7	73	20	CL	95		37				3.0
RA	1985	OC	3	28	424233	875137	B67	698.3	65.0										CL			38		20	8	2.8
RA	1985	OC	99	28	424233	875137	B67	698.3	70.0										ML			22				
RA	1985	OC	99	28	424233	875137	B67	698.3	75.0										ML	83		18				
RA	1985	OC	3	28	424233	875137	B67	698.3	80.0										CL			38				4.0
RA	1985	OC	99	28	424233	875137	B67	698.3	85.0										ML			110				
RA	1985	OC	3	28	424233	875132	B68	706.7	2.5										CL			12				2.0
RA	1985	OC	3	28	424233	875132	B68	706.7	5.0										CL			39				4.5
RA	1985	OC	3	28	424233	875132	B68	706.7	10.0										CL			59				4.5
RA	1985	OC	3	28	424233	875132	B68	706.7	15.0										CL			29				2.5
RA	1985	OC	3	28	424233	875132	B68	706.7	20.0										CL			30				1.8
RA	1985	OC	3	28	424233	875132	B68	706.7	25.0										CL			19				1.8
RA	1985	OC	99	28	424233	875132	B68	706.7	29.0	30.0									CL-ML			22				1.8
RA	1985	OC	99	28	424233	875132	B68	706.7	35.0										ML			38		not plastic		
RA	1985	OC	99	28	424233	875132	B68	706.7	39.0										SM			30				1.5
RA	1985	OC	3	28	424233	875132	B68	706.7	45.0										CL			15				1.5
RA	1985	OC	99	28	424233	875132	B68	706.7	50.0										CL			24				1.5
RA	1985	OC	99	28	424233	875132	B68	706.7	55.0										CL			27				2.1
RA	1985	OC	99	28	424233	875132	B68	706.7	60.0										CL			26				0.6
RA	1985	OC	3	28	424233	875132	B68	706.7	65.0										CL			34				2.5
RA	1985	OC	99	28	424233	875132	B68	706.7	70.0										SP			73				
RA	1985	OC	3	28	424233	875132	B68	706.7	75.0										CL			26		16	5	1.5
RA	1985	OC	99	28	424233	875132	B68	706.7	80.0										CL			42				3.9
RA	1985	OC	3	28	424233	875132	B68	706.7	85.0										CL			43				3.6
RA	1985	OC	3	28	424233	875132	B68	706.7	90.0										CL			68				3.8
RA	1985	OC	3	28	424233	875130	B69	709.2	2.5										CL			12				3.5
RA	1985	OC	3	28	424233	875130	B69	709.2	5.0										CL			33		27	13	4.5
RA	1985	OC	3	28	424233	875130	B69	709.2	10.0										CL			30				4.5
RA	1985	OC	3	28	424233	875130	B69	709.2	15.0										CL			14				2.2
RA	1985	OC	99	28	424233	875130	B69	709.2	20.0						3	19	68	26	CL	81		16				2.0
RA	1985	OC	3	28	424233	875130	B69	709.2	25.0										CL			14		20	7	1.5
RA	1985	OC	3	28	424233	875130	B69	709.2	30.0										CL			12				1.5
RA	1985	OC	3	28	424233	875130	B69	709.2	35.0										CL			21				2.5
RA	1985	OC	3	28	424233	875130	B69	709.2	40.0										CL			26				3.5
RA	1985	OC	99	28	424233	875130	B69	709.2	45.0						0	21	69	10	ML	84		33				
RA	1985	OC	3	28	424233	875130	B69	709.2	50.0										CL			21		37	22	2.5
RA	1985	OC	3	28	424233	875130	B69	709.2	55.0										CL	95		15				2.5
RA	1985	OC	99	28	424233	875130	B69	709.2	60.0										CL			9				2.0
RA	1985	OC	99	28	424233	875130	B69	709.2	65.0										CL			11				2.5

Appendix 3 - HYDROGEOLOGIC AND ENGINEERING DATA FOR RACINE COUNTY - LAND RECLAMATION SITE

IDENTITY: County (code)	Year	Litho-strat. unit (code)	Mat. (code)	Site No.	Lat.	Long.	Brng. no.	Surf. Elev. (ft)	Sample top (ft)	Sample bottom (ft)	HYDRAULIC CONDUCTIVITY: Lab K (cm/s)	Meth code	Fld K (cm/s)	Meth code	GRAINSIZE PERCENTAGES: Bulk % >2.0mm	Matrix % sand (2.0 to 0.0625mm)	Matrix % silt (0.0625 to 0.002mm)	Matrix % clay (<0.002mm)	ENGINEERING PROPERTIES: Unified Soil Class.	Bulk Percent P200	Dry Unit Wt. (pcf)	SPT (N)	Moist. cont. (%)	Liquid limit	Plastic. index	UC (tsf)
RA	1985	OC	99	28	424233	875130	B69	709.2	70.0						2	21	72	6	ML	82		46				
RA	1985	OC	99	28	424233	875130	B69	709.2	75.0										CL			42				2.5
RA	1985	OC	3	28	424233	875130	B69	709.2	80.0										CL-ML			19				2.5
RA	1985	OC	3	28	424233	875130	B69	709.2	85.0										CL			22				2.5
RA	1985	OC	3	28	424233	875130	B69	709.2	90.0										CL			48				2.5
RA	1985	OC	99	28	424233	875130	B69	709.2	95.0										CL			27				2.5

Appendix 3 - HYDROGEOLOGIC AND ENGINEERING DATA FOR SAUK COUNTY, BAAP SITE

IDENTITY: County (code)	Year	Litho-strat. unit (code)	Mat. (code)	Site No.	Lat.	Long.	Brng. no.	Surf. Elev. (ft)	Sample top (ft)	Sample bottom (ft)	HYDRAULIC CONDUCTIVITY: Lab K (cm/s)	Meth code	Fld K (cm/s)	Meth code	GRAINSIZE PERCENTAGES: Bulk % >2.0mm	Matrix % sand (2.0 to 0.0625mm)	Matrix % silt (0.0625 to 0.002mm)	Matrix % clay (<0.002mm)	ENGINEERING PROPERTIES: Unified Soil Class.	Bulk Percent P200	Dry Unit Wt. (pcf)	SPT (N)	Moist. cont.(%)	Liquid limit	Plastic. index	UC (tsf)
SK	1982	HD	4	29	432226	894308	DBB01	895.3	6.0	7.5					11	89			SP-SM	11		24				
SK	1982	HD	4	29	432226	894308	DBB01	895.3	8.5	10.0	1.40E-02	3			3	98			SP	2	110.0	26				
SK	1982	HD	4	29	432226	894308	DBB01	895.3	13.5	15.0	1.06E-03	3			1	99			SP	3	106.4	20				
SK	1982	HD	4	29	432226	894308	DBB01	895.3	18.5	20.0	2.87E-05	3			13	90			SP-SM	9	116.6	15				
SK	1982	HD	4	29	432226	894308	DBB01	895.3	23.5	25.0	1.08E-04	3			3	95			SP-SM	7	120.0	49				
SK	1982	HD	4	29	432226	894308	DBB01	895.3	28.5	30.0	1.70E-06	3			23	88			SP-SM	9	127.2	32				
SK	1982	HD	4	29	432226	894308	DBB01	895.3	48.5	50.0					22	92			SP-SM	8		43				
SK	1982	HD	3	29	432227	894311	DBB02	898.5	6.0	7.5					37	62			SM	24		8				
SK	1982	HD	4	29	432227	894311	DBB02	898.5	8.5	10.0	2.13E-03	3							SP		111.8	30				
SK	1982	HD	4	29	432227	894311	DBB02	898.5	13.5	15.0	2.16E-03	3							SP		117.2	40				
SK	1982	HD	4	29	432227	894311	DBB02	898.5	18.5	20.0	4.62E-03	3			34	100			SP	2	104.7	24				
SK	1982	HD	4	29	432227	894311	DBB02	898.5	23.5	25.0					62	89			SP-SM	5		42				
SK	1982	HD	4	29	432227	894311	DBB02	898.5	28.5	30.0	8.57E-05	3			0	98			SP-SM	11	107.8	18				
SK	1982	HD	4	29	432227	894311	DBB02	898.5	48.5	50.0	2.30E-06	3			17	89			SP-SM	10	126.9	60				
SK	1982	HD	4	29	432226	894313	DBB03	897.2	3.5	5.0	1.23E-02	3							SP		104.5	17				
SK	1982	HD	4	29	432226	894313	DBB03	897.2	6.0	7.5	8.29E-03	3			13	100			SP	2	112.4	13				
SK	1982	HD	4	29	432226	894313	DBB03	897.2	8.5	10.0	7.82E-03	3			31	94			SP	5	110.2	22				
SK	1982	HD	4	29	432226	894313	DBB03	897.2	18.5	20.0	2.27E-03	3			0	99			SP	4	104.9	24				
SK	1982	HD	4	29	432226	894313	DBB03	897.2	23.5	25.0					0	99			SM	17		24				
SK	1982	HD	5	29	432226	894313	DBB03	897.2	28.5	30.0					0	20	75	5	ML	87		24				1.0
SK	1982	HD	4	29	432226	894313	DBB03	897.2	48.5	50.0	1.77E-05	3			22	92			SP-SM	8	120.7	39				
SK	1982	HD	4	29	432226	894311	DBB04	898.4	8.5	10.0	7.97E-03	3			0	99			SP	3	104.6	12				
SK	1982	HD	3	29	432226	894311	DBB04	898.4	13.5	15.0	3.01E-03	3			0	65			SM	36	108.4	12				
SK	1982	HD	4	29	432226	894311	DBB04	898.4	18.5	20.0	2.83E-03	3			0	100			SP	3	107.4	20				
SK	1982	HD	4	29	432226	894311	DBB04	898.4	23.5	25.0	9.62E-04	3			7	96			SP	5	123.5	19				
SK	1982	HD	3	29	432226	894311	DBB04	898.4	28.5	30.0	1.74E-03	3			0	82			SM	26	104.7	32				
SK	1982	HD	4	29	432226	894311	DBB04	898.4	48.5	50.0	1.75E-04	3			20	94			SP-SM	7	119.1	58				
SK	1982	HD	6	29	432227	894314	DBM01	917.0	3.0	5.0	1.72E-04	3							CL		94.8					1.5
SK	1982	HD	4	29	432227	894314	DBM01	917.0	6.0	7.5					21	90			SP-SM	11		6				
SK	1982	HD	4	29	432227	894314	DBM01	917.0	8.5	10.0	1.41E-05	3							SP-SM		132.7	26				
SK	1982	HD	4	29	432227	894314	DBM01	917.0	13.5	15.0					52	88			SP-SM	7		40				
SK	1982	HD	4	29	432227	894314	DBM01	917.0	18.5	20.0					9	93			SP-SM	8		30				
SK	1982	HD	4	29	432227	894314	DBM01	917.0	23.5	25.0	4.59E-03	3							SP-SM		111.6	30				
SK	1982	HD	4	29	432227	894314	DBM01	917.0	28.5	30.0					4	100			SP	4		40				
SK	1982	HD	4	29	432227	894314	DBM01	917.0	53.5	55.0	4.94E-04	3			0	90			SM	28	105.8	82				
SK	1982	HD	4	29	432227	894314	DBM01	917.0	78.5	80.0	8.84E-05	3			11	97			SP-SM	5	115.3	125				
SK	1982	HD	4	29	432227	894314	DBM01	917.0	103.5	105.0					8	92			SP-SM	8		119				
SK	1982	HD	4	29	432227	894314	DBM01	917.0	128.5	130.0	6.55E-06	3			2	96			SP-SM	6	118.2	125				
SK	1982	HD	6	29	432229	894313	DBM02	918.2	3.0	5.0	1.08E-07	3							CL		100.7			42	20	
SK	1982	HD	4	29	432229	894313	DBM02	918.2	6.0	7.5					6	96			SP	4		22				
SK	1982	HD	4	29	432229	894313	DBM02	918.2	8.5	10.0	1.99E-04	3			49	82			SP-SM	9	127.5	42				
SK	1982	HD	3	29	432229	894313	DBM02	918.2	13.5	15.0	6.25E-05	3							SM		123.9	65				
SK	1982	HD	3	29	432229	894313	DBM02	918.2	18.5	20.0					40	77			SM	14		26				
SK	1982	HD	4	29	432229	894313	DBM02	918.2	28.5	30.0	4.73E-04	3			21	89			SM	15	117.3	38				
SK	1982	HD	4	29	432229	894313	DBM02	918.2	53.5	55.0	3.85E-04	3			28	89			SW-SM	9	117.1	95				
SK	1982	HD	4	29	432229	894313	DBM02	918.2	78.5	80.0	2.97E-03	3			6	100			SP	2	109.4	79				

Appendix 3 - HYDROGEOLOGIC AND ENGINEERING DATA FOR SAUK COUNTY, BAAP SITE

IDENTITY County (code)	Year	Litho-strat. unit (code)	Mat. (code)	Site No.	Lat.	Long.	Brng. no.	Surf. Elev. (ft)	Sample top (ft)	Sample bottom (ft)	HYDRAULIC CONDUCTIVITY Lab K (cm/s)	Meth code	Fld K (cm/s)	Meth code	GRAINSIZE PERCENTAGES Bulk % >2.0mm	Matrix % sand (2.0 to 0.0625mm)	Matrix % silt (0.0625 to 0.002mm)	Matrix % clay (<0.002mm)	ENGINEERING PROPERTIES Unified Soil Class.	Bulk Percent P200	Dry Unit Wt. (pcf)	SPT (N)	Moist. cont.(%)	Liquid limit	Plastic. index	UC (tsf)
SK	1982	HO	4	29	432229	894313	DBM02	918.2	103.5	105.0	3.39E-03	3			2	98			SP	3	116.1	145				
SK	1982	HO	4	29	432229	894313	DBM02	918.2	128.5	130.0	3.18E-03	3							SP		107.1	98				
SK	1982	HO	4	29	432244	894306	ELB01	899.2	6.0	7.5	1.38E-04	3			59	80			GW-GM	9	127.4	10				
SK	1982	HO	4	29	432244	894306	ELB01	899.2	8.5	10.0	4.27E-04	3			47	89			SP-SM	10	115.3	18				
SK	1982	HO	5	29	432244	894306	ELB01	899.2	13.5	15.0	1.10E-06	3			1	38			ML	67	125.0	20				
SK	1982	HO	5	29	432244	894306	ELB01	899.2	18.5	20.0	1.16E-05	3							ML		118.3	20				
SK	1982	HO	4	29	432244	894306	ELB01	899.2	23.5	25.0					0	94			SP-SM	9		16				
SK	1982	HO	4	29	432244	894306	ELB01	899.2	28.5	30.0					3	90			SM	14		27				
SK	1982	HO	99	29	432247	894302	ELB02	902.8	6.0	7.5	4.61E-05	3							SP-SM		134.7	15				
SK	1982	HO	99	29	432247	894302	ELB02	902.8	8.5	10.0	8.21E-05	3							SP-SM		129.3	21				
SK	1982	HO	4	29	432247	894302	ELB02	902.8	13.5	15.0	2.31E-04	3			40	93			SP-SM	7	129.7	28				
SK	1982	HO	4	29	432247	894302	ELB02	902.8	18.5	20.0	2.41E-04	3			0	97			SP-SM	8	109.1	13				
SK	1982	HO	4	29	432247	894302	ELB02	902.8	23.5	25.0	1.01E-03	3			28	96			SP	5	134.1	26				
SK	1982	HO	5	29	432247	894302	ELB02	902.8	28.5	30.0	3.39E-06	3			0	43			ML	64	119.9	27				
SK	1982	HO	4	29	432240	894303	ELB03	910.4	6.0	7.5	8.69E-04	3			3	96			SP-SM	6	112.4	41				
SK	1982	HO	4	29	432240	894303	ELB03	910.4	8.5	10.0	2.55E-04	3							SP-SM		119.6	40				
SK	1982	HO	4	29	432240	894303	ELB03	910.4	13.5	15.0					59	80			GP-GM	8		80				
SK	1982	HO	4	29	432240	894303	ELB03	910.4	18.5	20.0	5.48E-03	3			0	100			SP-SM	6	99.3	14				
SK	1982	HO	4	29	432240	894303	ELB03	910.4	23.5	25.0	9.40E-03	3			19	96			SP	4	110.5	32				
SK	1982	HO	4	29	432240	894303	ELB03	910.4	28.5	30.0	2.53E-03	3			0	99			SM	18	104.4	27				
SK	1982	HO	4	29	432240	894303	ELB03	910.4	48.5	50.0					0	91			SM	19		17				
SK	1982	HO	6	29	432237	894300	ELB04	906.6	5.0	7.0	8.61E-08	3							CL		109.7					1.4
SK	1982	HO	4	29	432237	894300	ELB04	906.6	8.5	10.0	1.18E-04	3			51	76			SM	15	121.6	15				
SK	1982	HO	4	29	432237	894300	ELB04	906.6	13.5	15.0					69	77			GW-GM	8		39				
SK	1982	HO	4	29	432237	894300	ELB04	906.6	23.5	25.0					0	58			SM	49		20				
SK	1982	HO	4	29	432237	894300	ELB04	906.6	28.5	30.0	7.97E-03	3			2	97			SP	3	114.1	17				
SK	1982	HO	99	29	432237	894300	ELB04	906.6	48.5	50.0	1.55E-05	3							SM		115.3	26				
SK	1982	HO	3	29	432234	894258	ELB05	919.6	13.5	15.0					43	79			SM	13		58				
SK	1982	HO	4	29	432234	894258	ELB05	919.6	18.5	20.0					0	93			SP-SM	12		24				
SK	1982	HO	4	29	432234	894258	ELB05	919.6	28.5	30.0	3.65E-03	3			0	100			SP-SM	7	98.4	26				
SK	1982	HO	4	29	432234	894258	ELB05	919.6	48.5	50.0	6.61E-03	3			0	100			SP	5	104.5	12				
SK	1982	HO	4	29	432235	894250	ELB06	922.7	8.5	10.0	5.52E-05	3			54	80			GP-GM	10	134.1	19				
SK	1982	HO	4	29	432235	894250	ELB06	922.7	13.5	15.0	1.63E-03	3			0	99			SP-SM	6	107.7	14				
SK	1982	HO	4	29	432235	894250	ELB06	922.7	18.5	20.0	1.40E-03	3							SP-SM		106.2	17				
SK	1982	HO	4	29	432235	894250	ELB06	922.7	23.5	25.0					0	88			SM	23		29				
SK	1982	HO	4	29	432235	894250	ELB06	922.7	28.5	30.0	4.18E-03	3							SM		107.8	25				
SK	1982	HO	4	29	432235	894250	ELB06	922.7	48.5	50.0	1.38E-03	3			0	97			SP	4	106.1	30				
SK	1982	HO	99	29	432241	894307	ELN01A	902.8	6.0	7.5	1.37E-05	3			26	86			SM	12	121.8	30				
SK	1982	HO	4	29	432241	894307	ELN01A	902.8	8.5	10.0	1.22E-04	3			66	85			GP-GM	6	126.9	18				
SK	1982	HO	99	29	432241	894307	ELN01A	902.8	13.5	15.0	1.08E-05	3									123.9	32				
SK	1982	HO	99	29	432241	894307	ELN01A	902.8	18.5	20.0	8.71E-06	3			10	86			SM	17	129.4	18				
SK	1982	HO	99	29	432241	894307	ELN01A	902.8	23.5	25.0	8.03E-05	3			1	86			SM	22	117.3	31				
SK	1982	HO	99	29	432241	894307	ELN01A	902.8	28.5	30.0	3.86E-05	3							SM		120.1	25				
SK	1982	HO	4	29	432241	894307	ELN01A	902.8	78.5	80.0					21	96			SP-SM	6	101.4	188				
SK	1982	HO	4	29	432241	894307	ELN01A	902.8	103.5	105.0	9.06E-04	3			0	99			SP-SM	11		77				
SK	1982	HO	4	29	432237	894252	ELN02A	912.1	13.5	15.0	1.77E-05	3			51	86			SP-SM	8	126.6	25				

Appendix 3 - HYDROGEOLOGIC AND ENGINEERING DATA FOR SAUK COUNTY, BAAP SITE

County (code)	Year	Litho-strat. unit (code)	Mat. (code)	Site No.	Lat.	Long.	Brng. no.	Surf. Elev. (ft)	Sample top (ft)	Sample bottom (ft)	Lab K (cm/s)	Meth code	Fld K (cm/s)	Meth code	Bulk % >2.0mm	Matrix % sand (2.0 to 0.0625mm)	Matrix % silt (0.0625 to 0.002mm)	Matrix % clay (<0.002mm)	Unified Soil Class.	Bulk Percent P200	Dry Unit Wt. (pcf)	SPT (N)	Moist. cont.(%)	Liquid limit	Plastic. index	UC (tsf)
SK	1982	HO	4	29	432237	894252	ELN02A	912.1	18.5	20.0					72	61			GM	12		46				
SK	1982	HO	4	29	432237	894252	ELN02A	912.1	23.5	25.0					60	65			GM	16		38				
SK	1982	HO	4	29	432237	894252	ELN02A	912.1	53.5	55.0	1.86E-03	3			0	100			SP	4	103.5	41				
SK	1982	HO	4	29	432237	894252	ELN02A	912.1	103.5	105.0	5.60E-04	3			10	97			SP	4	114.1	110				
SK	1982	HO	4	29	432237	894252	ELN02A	912.1	140.5	142.0					2	100			SP	1		37				
SK	1982	HO	6	29	432233	894250	ELN03A	925.2	2.5	4.5	3.08E-07	3			0	11	65	24	CL	92	116.4			42	23	2.3
SK	1982	HO	99	29	432233	894250	ELN03A	925.2	6.0	7.5	2.98E-05	3							SP-SM		111.6	25				
SK	1982	HO	4	29	432233	894250	ELN03A	925.2	8.5	10.0					50	84			SP-SM	9		44				
SK	1982	HO	4	29	432233	894250	ELN03A	925.2	18.5	20.0	1.66E-03	3			0	95			SP-SM	10	110.7	18				
SK	1982	HO	4	29	432233	894250	ELN03A	925.2	23.5	25.0	6.12E-03	3			0	100			SP	4	102.1	16				
SK	1982	HO	4	29	432233	894250	ELN03A	925.2	28.5	30.0	1.53E-03	3			1	95			SM	12	116.2	28				
SK	1982	HO	4	29	432233	894250	ELN03A	925.2	53.5	55.0	4.20E-04	3			13	95			SP-SM	9	109.5	90				
SK	1982	HO	4	29	432233	894250	ELN03A	925.2	78.5	80.0					46	91			SP-SM	10		200				
SK	1982	HO	4	29	432233	894250	ELN03A	925.2	103.5	105.0	5.00E-05	3			10	88			SM	12	115.5	188				
SK	1982	HO	4	29	432233	894250	ELN03A	925.2	128.5	130.0	2.01E-03	3			7	99			SP	4	107.0	147				
SK	1982	HO	6	29	432235	894306	ELN04A	921.4	3.0	5.0	1.26E-07	3			0	5	74	21	CL	97	88.4			43	20	1.5
SK	1982	HO	3	29	432235	894306	ELN04A	921.4	6.0	7.5					6	68			SC	36		5				
SK	1982	HO	99	29	432235	894306	ELN04A	921.4	8.5	10.0	4.64E-04								SM		122.4	16				
SK	1982	HO	4	29	432235	894306	ELN04A	921.4	13.5	15.0					51	71			SM	17		74				
SK	1982	HO	4	29	432235	894306	ELN04A	921.4	18.5	20.0	1.19E-04	3			59	80			SP-SM	9	124.0	42				
SK	1982	HO	4	29	432235	894306	ELN04A	921.4	23.5	25.0	8.89E-05	3			56	80			GP-GM	11	130.8	44				
SK	1982	HO	4	29	432235	894306	ELN04A	921.4	28.5	30.0	1.43E-04	3			44	77			SM	14	125.7	36				
SK	1982	HO	4	29	432235	894306	ELN04A	921.4	53.5	55.0	3.88E-04	3			57	88			SP-SM	6	128.2	44				
SK	1982	HO	4	29	432235	894306	ELN04A	921.4	80.0	81.5	6.43E-03	3			16	99			SP	2	108.5	50				
SK	1982	HO	4	29	432235	894306	ELN04A	921.4	103.5	105.0	6.21E-04	3			7	96			SP-SM	7	113.0	357				
SK	1982	HO	4	29	432235	894306	ELN04B	921.4	150.5	152.0	8.47E-05	3			0	86			SM	14	117.2	78				
SK	1982	HO	3	29	432058	894456	PBB01	876.8	6.0	7.5	1.98E-04	3							SM		126.8	51				
SK	1982	HO	3	29	432058	894456	PBB01	876.8	8.5	10.0					30	61			SM	29		61				
SK	1982	HO	4	29	432058	894456	PBB01	876.8	13.5	15.0					24	93			SP-SM	8		28				
SK	1982	HO	4	29	432058	894456	PBB01	876.8	18.5	20.0	1.42E-03	3							SP-SM		110.3	20				
SK	1982	HO	4	29	432058	894456	PBB01	876.8	28.5	30.0	7.61E-04	5			24	96			SP-SM	5	117.5	65				
SK	1982	HO	4	29	432058	894456	PBB01	876.8	48.5	50.0	4.81E-05	3			12	97			SP	5	112.7	38				
SK	1982	HO	4	29	432102	894501	PBB02	883.9	6.0	7.5					29	90			SP-SM	9		16				
SK	1982	HO	4	29	432102	894501	PBB02	883.9	8.5	10.0	1.61E-03	3							SP-SM		119.9	10				
SK	1982	HO	4	29	432102	894501	PBB02	883.9	13.5	15.0					7	97			SP-SM	7		35				
SK	1982	HO	4	29	432102	894501	PBB02	883.9	18.5	20.0	1.17E-04	3							SP-SM		112.0	42				
SK	1982	HO	4	29	432102	894501	PBB02	883.9	23.5	25.0					9	99			SP-SM	7		72				
SK	1982	HO	4	29	432102	894501	PBB02	883.9	28.5	30.0	2.83E-03	3							SP-SM		110.4	24				
SK	1982	HO	4	29	432102	894501	PBB02	883.9	48.5	50.0					50	92			SP-SM	6		26				
SK	1982	HO	4	29	432057	894501	PBB03	877.4	6.0	7.5					62	100			GW	1		30				
SK	1982	HO	4	29	432057	894501	PBB03	877.4	8.5	10.0	5.75E-04	3							GW		120.0	71				
SK	1982	HO	4	29	432057	894501	PBB03	877.4	13.5	15.0	2.15E-04	3							SP		119.8	38				
SK	1982	HO	4	29	432057	894501	PBB03	877.4	18.5	20.0					11	97			SP	4		39				
SK	1982	HO	4	29	432057	894501	PBB03	877.4	23.5	25.0					52	92			SM	5		101				
SK	1982	HO	4	29	432057	894501	PBB03	877.4	28.5	30.0	2.44E-03	3			25	96			SP-SM	5	113.5	151				
SK	1982	HO	4	29	432057	894501	PBB03	877.4	48.5	50.0	2.46E-03	3			10	97			SP	4	107.4	32				

Appendix 3 - HYDROGEOLOGIC AND ENGINEERING DATA FOR SAUK COUNTY, BAAP SITE

IDENTITY County (code)	Year	Litho-strat. unit (code)	Mat. (code)	Site No.	Lat.	Long.	Brng. no.	Surf. Elev. (ft)	Sample top (ft)	Sample bottom (ft)	HYDRAULIC CONDUCTIVITY Lab K (cm/s)	Meth code	Fld K (cm/s)	Meth code	GRAINSIZE PERCENTAGES Bulk % >2.0mm	Matrix % sand (2.0 to 0.0625mm)	Matrix % silt (0.0625 to 0.002mm)	Matrix % clay (<0.002mm)	ENGINEERING PROPERTIES Unified Soil Class.	Bulk Percent P200	Dry Unit Wt. (pcf)	SPT (N)	Moist. cont.(%)	Liquid limit	Plastic. index	UC (tsf)
SK	1982	HO	6	29	432056	894454	PBB04	881.0	1.0	2.5					8	68			SC	34		19				
SK	1982	HO	4	29	432056	894454	PBB04	881.0	6.0	7.5					48	87			SP-SM	8		66				
SK	1982	HO	4	29	432056	894454	PBB04	881.0	13.5	15.0					57	88			SP-SM	6		86				
SK	1982	HO	4	29	432056	894454	PBB04	881.0	23.5	25.0	1.39E-04	3							SP		115.2	140				
SK	1982	HO	4	29	432056	894454	PBB04	881.0	28.5	30.0					28	94			SP	4		101				
SK	1982	HO	4	29	432056	894454	PBB04	881.0	48.5	50.0	8.28E-04	3			1	99			SP	4	107.3	111				
SK	1982	HO	4	29	432048	894457	PBB05	872.9	6.0	7.5	1.86E-06	3			8	92			SM	12	132.7	7				
SK	1982	HO	4	29	432048	894457	PBB05	872.9	8.5	10.0	8.64E-05	3							SP-SM		116.3	33				
SK	1982	HO	4	29	432048	894457	PBB05	872.9	13.5	15.0					55	87			SP-SM	7		105				
SK	1982	HO	4	29	432048	894457	PBB05	872.9	23.5	25.0	2.56E-04	3							SP		114.5	67				
SK	1982	HO	4	29	432048	894457	PBB05	872.9	28.5	30.0					9	98			SP	3		100				
SK	1982	HO	4	29	432048	894457	PBB05	872.9	48.5	50.0	1.86E-06	3			0	100			SP-SM	7	132.7	83				
SK	1982	HO	4	29	432104	894502	PBB06	866.8	8.5	10.0					51	84			SP-SM	10		58				
SK	1982	HO	4	29	432104	894502	PBB06	866.8	13.5	15.0	4.85E-04	3			32	93			SM-SW	7	119.6	49				
SK	1982	HO	4	29	432104	894502	PBB06	866.8	18.5	20.0	4.11E-05	3							SP		124.4	44				
SK	1982	HO	4	29	432104	894502	PBB06	866.8	23.5	25.0	5.06E-05	3			8	97			SP	5	111.7	92				
SK	1982	HO	4	29	432104	894502	PBB06	866.8	28.5	30.0					4	99			SP	3		37				
SK	1982	HO	4	29	432104	894502	PBB06	866.8	48.5	50.0	8.23E-05	3							SP		110.1	88				
SK	1982	HO	4	29	432199	894599	PBB07	865.4	6.0	7.5	8.83E-04	3							SP-SM		119.3	33				
SK	1982	HO	4	29	432199	894599	PBB07	865.4	13.5	15.0					3	97			SP	5		44				
SK	1982	HO	4	29	432199	894599	PBB07	865.4	18.5	20.0					40	87			SP-SM	10		56				
SK	1982	HO	4	29	432199	894599	PBB07	865.4	23.5	25.0	3.10E-06	3			18	94			SP-SM	6	114.1	96				
SK	1982	HO	4	29	432199	894599	PBB07	865.4	28.5	30.0	2.44E-06	3			10	94			SP-SM	6	110.1	83				
SK	1982	HO	4	29	432199	894599	PBB07	865.4	48.5	50.0	1.40E-03	3			1	98			SP	4	106.7	98				
SK	1982	HO	99	29	432041	894459	PBB08	871.9	1.0	2.5					25	67			SM	28		41				
SK	1982	HO	4	29	432041	894459	PBB08	871.9	6.0	7.5	1.74E-04	3							SP-SM		123.9	14				
SK	1982	HO	4	29	432041	894459	PBB08	871.9	13.5	15.0					8	99			SP-SM	6		20				
SK	1982	HO	4	29	432041	894459	PBB08	871.9	18.5	20.0	1.41E-04	3			27	96			SP	5	122.3	34				
SK	1982	HO	4	29	432041	894459	PBB08	871.9	23.5	25.0	9.08E-04	3			16	99			SP	4	106.5	63				
SK	1982	HO	4	29	432041	894459	PBB08	871.9	28.5	30.0	3.02E-05	3			45	96			SP	3	119.8	60				
SK	1982	HO	4	29	432041	894459	PBB08	871.9	48.5	50.0					26	80			SM	19		65				
SK	1982	HO	7	29	432113	894505	PBM01	855.7	3.5	5.0	1.97E-05	3			0	89			SM	18	121.4	7				
SK	1982	HO	4	29	432113	894505	PBM01	855.7	8.5	10.0					24	92			SP-SM	7		19				
SK	1982	HO	4	29	432113	894505	PBM01	855.7	13.5	15.0	1.62E-03	3							SW		106.3	15				
SK	1982	HO	4	29	432113	894505	PBM01	855.7	18.5	20.0					32	97			SP	3		20				
SK	1982	HO	4	29	432113	894505	PBM01	855.7	23.5	25.0	6.59E-04	3							SW		100.8	20				
SK	1982	HO	4	29	432113	894505	PBM01	855.7	28.5	30.0					24	99			SP	5		19				
SK	1982	HO	4	29	432113	894505	PBM01	855.7	53.5	55.0	4.46E-05	3							SP-SM		125.5	129				
SK	1982	HO	4	29	432113	894505	PBM01	855.7	78.5	80.0	6.05E-03	3			17	98			SP	2	112.4	122				
SK	1982	HO	4	29	432113	894505	PBM01	855.7	98.5	100.0	7.52E-03	3			0	100			SP	2	105.8	16				
SK	1982	HO	6	29	432053	894557	PBM02	870.9	3.0	5.0	4.30E-07	3							CH		93.4			52	27	
SK	1982	HO	99	29	432053	894557	PBM02	870.9	6.0	7.5	7.23E-07	3							SC		123.8	11				
SK	1982	HO	4	29	432053	894557	PBM02	870.9	8.5	10.0	1.70E-03	3							SW		116.7	49				
SK	1982	HO	4	29	432053	894557	PBM02	870.9	23.5	25.0	1.66E-03	3							SW		111.5	37				
SK	1982	HO	4	29	432053	894557	PBM02	870.9	28.5	30.0					18	95			SP-SM	6		44				
SK	1982	HO	4	29	432053	894557	PBM02	870.9	53.5	55.0	1.28E-03	3			2	98			SP	3	107.6	106				

Appendix 3 - HYDROGEOLOGIC AND ENGINEERING DATA FOR SAUK COUNTY, BAAP SITE

IDENTITY: County (code)	Year	Litho-strat. unit (code)	Mat. (code)	Site No.	Lat.	Long.	Brng. no.	Surf. Elev. (ft)	Sample top (ft)	Sample bottom (ft)	HYDRAULIC CONDUCTIVITY: Lab K (cm/s)	Meth code	Fld K (cm/s)	Meth code	GRAINSIZE PERCENTAGES: Bulk % >2.0mm	Matrix % sand (2.0 to 0.0625mm)	Matrix % silt (0.0625 to 0.002mm)	Matrix % clay (<0.002mm)	ENGINEERING PROPERTIES: Unified Soil Class.	Bulk Percent P200	Dry Unit Wt. (pcf)	SPT (N)	Moist. cont.(%)	Liquid limit	Plastic. index	UC (tsf)
SK	1982	HO	4	29	432053	894557	PBM02	870.9	78.5	80.0	4.42E-04	3			29	94			SP	5	128.9	120				
SK	1982	HO	4	29	432053	894557	PBM02	870.9	113.5	115.0	1.24E-02	3							SP		109.1	173				
SK	1982	HO	4	29	432053	894557	PBM02	870.9	18.5	10.0					15	99			SP	3		52				
SK	1982	HO	99	29	432107	894403	PBM03	862.7	3.5	5.0					0	78			SC	24		6				2.0
SK	1982	HO	4	29	432107	894403	PBM03	862.7	6.0	7.5					15	92			SP-SM	10		10				
SK	1982	HO	4	29	432107	894403	PBM03	862.7	18.5	20.0					19	96			SP	3		40				
SK	1982	HO	4	29	432107	894403	PBM03	862.7	23.5	25.0	6.25E-03	1							SM		111.0	44				
SK	1982	HO	4	29	432107	894403	PBM03	862.7	29.5	30.0	2.98E-03	3							SM		108.6	28				
SK	1982	HO	4	29	432107	894403	PBM03	862.7	53.5	55.0	1.06E-03	3			0	100			SP	5	105.4	177				
SK	1982	HO	4	29	432107	894403	PBM03	862.7	78.5	80.0	1.37E-03	3			6	93			SP-SM	7	113.9	130				
SK	1982	HO	4	29	432107	894403	PBM03	862.7	106.5	107.0	4.71E-03	3			1	99			SP	2	101.0	132				
SK	1982	HO	99	29	432199	894499	PBM04	869.0	6.0	7.5	1.38E-04	3			29	77			SM	20	118.9	24				
SK	1982	HO	99	29	432199	894499	PBM04	869.0	13.5	15.0	1.24E-04	3			7	90			SM	15	109.6	20				
SK	1982	HO	4	29	432199	894499	PBM04	869.0	18.5	20.0	6.12E-03	1									100.2	28				
SK	1982	HO	4	29	432199	894499	PBM04	869.0	23.5	25.0	3.38E-03	1			41	95			SP	3	105.5	32				
SK	1982	HO	4	29	432199	894499	PBM04	869.0	53.5	55.0	1.06E-05	3			3	98			SP-SM	7	118.0	82				
SK	1982	HO	4	29	432199	894499	PBM04	869.0	78.5	80.0					55	91			SP-SM	5		91				
SK	1982	HO	4	29	432199	894499	PBM04	869.0	111.5	113.0	4.55E-04	3							SP-SM		124.7	100				
SK	1982	HO	99	29	432045	894458	PBM05	873.7	3.5	5.0					17	86			SC	14		6				
SK	1982	HO	99	29	432045	894458	PBM05	873.7	8.5	10.0					39	80			SM	16		52				
SK	1982	HO	99	29	432045	894458	PBM05	873.7	13.5	15.0	1.97E-04	3							SM		128.8	41				
SK	1982	HO	99	29	432045	894458	PBM05	873.7	18.5	20.0	2.50E-04	3			26	78			SM	19	123.1	52				
SK	1982	HO	4	29	432045	894458	PBM05	873.7	23.5	25.0					46	87				8		62				
SK	1982	HO	4	29	432045	894458	PBM05	873.7	28.5	30.0	3.58E-03	3							SP-SM		115.7	45				
SK	1982	HO	4	29	432045	894458	PBM05	873.7	53.5	55.0	5.74E-04	3			15	95			SP-SM	6	112.8	159				
SK	1982	HO	4	29	432045	894458	PBM05	873.7	119.5	121.0	1.27E-02	3							SP-SM		109.7	177				
SK	1982	HO	6	29	432101	894454	PBN01A	881.5	4.0	6.0	4.39E-07	3							CL		98.7	4				1.0
SK	1982	HO	4	29	432101	894454	PBN01A	881.5	8.5	10.0					17	92			SP-SM	11		24				
SK	1982	HO	4	29	432101	894454	PBN01A	881.5	13.5	15.0	1.53E-03	3			39	93			SP	4	113.6	20				
SK	1982	HO	4	29	432101	894454	PBN01A	881.5	23.5	25.0					32	96			SP-SM	5		43				
SK	1982	HO	4	29	432101	894454	PBN01A	881.5	113.5	115.0	5.80E-05	3			5	96			SP	4	113.8	101				
SK	1982	HO	6	29	432055	894454	PBN02A	882.9	2.5	4.5	5.09E-06	3							CH		96.7	14				2.2
SK	1982	HO	99	29	432055	894454	PBN02A	882.9	6.0	7.5	8.26E-03	3			2	81			SC	25	115.3	7				1.2
SK	1982	HO	4	29	432055	894454	PBN02A	882.9	8.5	10.0	1.62E-04	3							SM-SW		153.2	300				
SK	1982	HO	4	29	432055	894454	PBN02A	882.9	13.5	15.0					57	91			SM-SW	6		143				
SK	1982	HO	4	29	432055	894454	PBN02A	882.9	18.5	20.0					1	96			SP-SM	9		44				
SK	1982	HO	4	29	432055	894454	PBN02A	882.9	23.5	25.0	5.55E-03	1							SP-SM		109.2	150				
SK	1982	HO	4	29	432103	894505	PBN03A	857.6	13.5	15.0					25	95			SP	4		30				
SK	1982	HO	4	29	432103	894505	PBN03A	857.6	18.5	20.0	3.65E-03	1							SW		112.3	22				
SK	1982	HO	4	29	432103	894505	PBN03A	857.6	28.5	30.0	3.30E-03	3			24	96			SW,SP	4	110.5	41				
SK	1982	HO	4	29	432103	894505	PBN03A	857.6	92.5	94.0	3.82E-03	3			1	97			SP-SM	5	107.7	75				
SK	1982	HO	7	29	432041	894459	PBN04A	873.0	1.0	2.5	6.14E-05	3			16	80			SM	21	120.0	46				
SK	1982	HO	7	29	432041	894459	PBN04A	873.0	3.5	5.0	5.48E-04	3			7	86			SM	17	113.2	8				
SK	1982	HO	99	29	432041	894459	PBN04A	873.0	6.0	7.5					15	82			SM	19		9				
SK	1982	HO	99	29	432041	894459	PBN04A	873.0	8.5	10.0	2.01E-04	3							SM		120.0	14				
SK	1982	HO	99	29	432041	894459	PBN04A	873.0	13.5	15.0					17	80			SM	21		30				

Appendix 3 - HYDROGEOLOGIC AND ENGINEERING DATA FOR SAUK COUNTY, BAAP SITE

IDENTITY											HYDRAULIC CONDUCTIVITY				GRAINSIZE PERCENTAGES				ENGINEERING PROPERTIES							
County (code)	Year	Litho-strat. unit (code)	Mat. (code)	Site No.	Lat.	Long.	Brng. no.	Surf. Elev. (ft)	Sample top (ft)	Sample bottom (ft)	Lab K (cm/s)	Meth code	Fld K (cm/s)	Meth code	Bulk % >2.0mm	Matrix % sand (2.0 to 0.0625mm)	Matrix % silt (0.0625 to 0.002mm)	Matrix % clay (<0.002mm)	Unified Soil Class.	Bulk Percent P200	Dry Unit Wt. (pcf)	SPT (N)	Moist. cont. (%)	Liquid limit	Plastic. index	UC (tsf)
SK	1982	HO	99	29	432041	894459	PBN04A	873.0	18.5	20.0	3.14E-04	3							SM		115.4	44				
SK	1982	HO	99	29	432041	894459	PBN04A	873.0	23.5	25.0					17	77			SM	23		60				
SK	1982	HO	3	29	432043	894458	PBN05A	875.8	13.5	15.0	2.15E-06	3			9	85			SM	19	128.1	2				
SK	1982	HO	4	29	432043	894458	PBN05A	875.8	23.5	25.0					16	89			SP-SM	9		33				
SK	1982	HO	4	29	432043	894458	PBN05A	875.8	28.5	30.0	1.15E-03	3							SP-SM		114.2	37				

Appendix 3 - HYDROGEOLOGIC AND ENGINEERING DATA FOR SHAWANO COUNTY LANDFILL

IDENTITY											HYDRAULIC CONDUCTIVITY				GRAINSIZE PERCENTAGES				ENGINEERING PROPERTIES							
County (code)	Year	Litho-strat. unit (code)	Mat. (code)	Site No.	Lat.	Long.	Brng. no.	Surf. Elev. (ft)	Sample top (ft)	Sample bottom (ft)	Lab K (cm/s)	Meth code	Fld K (cm/s)	Meth code	Bulk % >2.0mm	Matrix % sand (2.0 to 0.0625mm)	Matrix % silt (0.0625 to 0.002mm)	Matrix % clay (<0.002mm)	Unified Soil Class.	Bulk Percent P200	Dry Unit Wt. (pcf)	SPT (N)	Moist. cont.(%)	Liquid limit	Plastic. index	UC (tsf)
SH	1973	KE	4	30	444610	883338	B7	841.1	6.0	7.5					24	88			SP-SM	11		48				
SH	1973	KE	4	30	444610	883344	B9	826.9	4.0	5.5					1	97			SP	3		19				
SH	1982	KE	3	30	444614	883330	B11		20.0	21.0	4.50E-08	1							SM							
SH	1982	KE	3	30	444613	883332	B13		20.0	20.9	5.00E-07	1							SM							
SH	1982	KE	4	30	444610	883345	B31	827.0	10.0	11.0					42	48			SM-SP	11		52				
SH	1982	KE	3	30	444610	883345	B31	827.0	25.0	26.5					17				SM	38		94				
SH	1982	KE	3	30	444610	883345	B31	827.0	33.4	39.4			5.90E-04	7					SM							
SH	1982	KE	34	30	444610	883345	W31A	827.0	5.1	20.6			2.00E-03	7					SP,SM,CL							
SH	1982	KE	5	30	444608	883343	W32	826.3	5.3	21.0			9.10E-05	7												
SH	1982	KE	3	30	444616	883343	W33	842.5	25.6	31.0			9.00E-05	7												
SH	1983	KE	3	30	444612	883345	B34	828.6	20.0	21.5					24				SM	30		18				
SH	1983	KE	3	30	444612	883345	B34	828.6	33.5	40.0			3.00E-04	7												
SH	1983	KE	45	30	444612	883345	B34A	829.0	7.0	20.0			4.00E-05	7												
SH	1983	KE	3	30	444610	883343	B35	828.4	15.0	16.5					10				SM	42		10				
SH	1983	KE	3	30	444610	883343	B35	828.4	33.6	39.3			5.60E-05	7												
SH	1983	KE	45	30	444610	883343	B35A	828.3	6.3	20.0			3.20E-04	7												
SH	1982	KESi	3	30	444613	883335	B12	850.3	5.0	6.5					1	90			SM	20		22				
SH	1982	HO	3	30	444613	883335	B12	850.3	10.0	11.5					13	67			SM	32		51				
SH	1982	HOUN	312	30	444613	883335	B12	850.3	25.0	35.0			1.20E-04	7					SP							
SH	1982	HO	3	30	444613	883332	B13	850.7	10.0	10.7					14	67			SM	31		320				
SH	1982	UN	12	30	444699	883399	B14	842.2	15.0	15.5					1	97			SP	6		135				
SH	1982	HO	3	30	444609	883335	B15	840.6	10.0	11.3					9				SM	39		67				
SH	1982	UN	12	30	444609	883335	B15	840.6	20.0	21.2					0	97			SP	5		180				
SH	1982	UN	12	30	444699	883399	B16	839.9	10.0	11.5	1.10E-05	1							SP			149				
SH	1982	UN	12	30	444699	883399	B17	844.0	0.5	1.5					0	99			SP	2		4				
SH	1982	UN	12	30	444699	883399	B17	844.0	15.0	15.7					3	96			SP	5		328				
SH	1982	UN	12	30	444699	883399	B17	844.0	22.0	32.0			9.80E-03	7												
SH	1982	UN	99	30	444699	883399	B18	832.2	0.5	1.5					4	83			SM	19		5				
SH	1982	UN	12	30	444699	883399	B19	835.1	10.0	11.5	1.70E-06	1							SP							
SH	1982	UN	12	30	444699	883399	B19	835.1	15.0	16.5	1.70E-05	1							SP							
SH	1982	UN	12	30	444699	883399	B19	835.1	20.0	20.6	3.30E-06	1							SP							
SH	1982	UN	12	30	444699	883399	B19	835.1	45.0	50.0			7.60E-03	7					ROCK							
SH	1985	KEK1	3	30	444815	883617	N1	851.0	4.0	6.0					0	42	48	10	CL	68			21.0	29.0	15.0	1.5
SH	1985	KEK1	3	30	444816	883623	N3	840.0	8.0	10.0					0	35	51	14	CL	72			15.0	29.0	12.0	4.5
SH	1985	KEK1	3	30	444821	883622	N4	836.0	1.0	15.0					0	35	50	15	CL	69				27.0	14.0	
SH	1985	KEK1	3	30	444821	883622	N4	836.0	10.0	12.0					2	38	48	14	CL	66			15.0	26.0	13.0	4.0
SH	1985	KEK1	3	30	444820	883617	N5	837.0	10.0	12.0					1	36	47	16	CL	69			17.0	26.0	14.0	3.0
SH	1985	KEK1	3	30	444820	883614	N6	845.0	2.0	4.0					0	36	57	7	CL	70			20.0	31.0	12.0	2.0
SH	1985	KEK1	3	30	444899	883699	TP1	840.0	1.0	4.0					0	34	52	14	CL	72				24.0	11.0	
SH	1985	KEK1	3	30	444899	883699	N7	839.9	2.5	4.5					0	31	52	17	CL	74			23.0	36.0	20.0	1.5
SH	1985	KEK1	3	30	444899	883699	N9	839.9	1.5	7.5					1	27	56	17	CL	74				30.0	16.0	
SH	1985	KEK1	3	30	444899	883699	N8	839.9	2.5	4.5					1	23	58	19	CL	78			21.0	30.0	14.0	1.0
SH	1985	KEK1	3	30	444899	883699	N10	833.2	1.5	9.5					1	34	47	18	CL	70			15.0	23.0	8.0	
SH	1985	KEK1	3	30	444899	883699	N11	831.0	4.0	10.0					1	38	46	15	CL	64				25.0	11.0	
SH	1985	KEK1	3	30	444899	883699	N11	831.0	2.5	4.5					2	33	50	17	CL-ML	66			18.0	22.0	6.0	0.8
SH	1985	KEK1	3	30	444899	883699	N12	833.9	7.5	9.5					1	30	57	13	CL	73			17.0	24.0	8.0	3.5

Appendix 3 - HYDROGEOLOGIC AND ENGINEERING DATA FOR SHAWANO COUNTY LANDFILL

IDENTITY											HYDRAULIC CONDUCTIVITY				GRAINSIZE PERCENTAGES				ENGINEERING PROPERTIES							
County (code)	Year	Litho-strat. unit (code)	Mat. (code)	Site No.	Lat.	Long.	Brng. no.	Surf. Elev. (ft)	Sample top (ft)	Sample bottom (ft)	Lab K (cm/s)	Meth code	Fld K (cm/s)	Meth code	Bulk % >2.0mm	Matrix % sand (2.0 to 0.0625mm)	Matrix % silt (0.0625 to 0.002mm)	Matrix % clay (<0.002mm)	Unified Soil Class.	Bulk Percent P200	Dry Unit Wt. (pcf)	SPT (N)	Moist. cont.(%)	Liquid limit	Plastic. index	UC (tsf)
SH	1985	KEK1	3	30	444899	883699	N13	834.9	2.5	4.5					5	34	53	14	CL	63			15.0	24.0	8.0	2.3
SH	1985	KEK1	3	30	444899	883699	N14	833.2	1.5	10.0					1	37	51	12	CL	64				25.0	13.0	
SH	1985	KEK1	3	30	444899	883699	N14	833.2	5.0	6.5					3	36	44	20	CL	63			16.0	23.0	8.0	3.5

Appendix 3 - HYDROGEOLOGIC AND ENGINEERING DATA FOR SHEBOYGAN COUNTY LANDFILL

IDENTITY											HYDRAULIC CONDUCTIVITY				GRAINSIZE PERCENTAGES				ENGINEERING PROPERTIES							
County (code)	Year	Litho-strat. unit (code)	Mat. (code)	Site No.	Lat.	Long.	Brng. no.	Surf. Elev. (ft)	Sample top (ft)	Sample bottom (ft)	Lab K (cm/s)	Meth code	Fld K (cm/s)	Meth code	Bulk % >2.0mm	Matrix % sand (2.0 to 0.0625mm)	Matrix % silt (0.0625 to 0.002mm)	Matrix % clay (<0.002mm)	Unified Soil Class.	Bulk Percent P200	Dry Unit Wt. (pcf)	SPT (N)	Moist. cont.(%)	Liquid limit	Plastic. index	UC (tsf)
SB	1981	KEHa	3	31	434136	874722	B1	704.7	19.5	21.0									CL					32	14	
SB	1981	KEHa	3	31	434136	874722	B1	704.7	24.5	26.0					4	19	46	35	CL	80		20		27	10	
SB	1981	KEHa	3	31	434136	874710	B2	699.5	9.5	11.0					1	24	42	33	CL	77		43				
SB	1981	KEHa	4	31	434136	874710	B2	699.5	24.5	26.0					0	98			SP	3		30				
SB	1981	KEHa	3	31	434146	874716	B3	698.6	19.5	21.0	4.10E-05	3			2	18	49	33	CL	82		16		33	21	
SB	1981	KEHa	3	31	434146	874716	B3	698.6	21.0	23.5					6	17	45	38	CL	80				35	21	
SB	1981	KEHa	4	31	434154	874722	B4	700.5	24.5	26.0					0	94			SP-SM	7		80				
SB	1981	KEHa	3	31	434154	874711	B5	702.0	9.5	11.0					1	22	43	34	CL	79		29		29	18	4.5
SB	1982	KEHa	3	31	434154	874711	WB5A	702.0	20.0	25.0			5.30E-06	7					CL							
SB	1982	KEHa	3	31	434155	874721	B6	704.0	19.5	22.0	8.27E-08	3							CL							
SB	1982	KEHa	5	31	434155	874721	B6	704.0	34.5	37.0	3.35E-03	3							SP-SM							
SB	1982	KEHa	3	31	434150	874721	B8	705.7	24.5	27.0	3.27E-08	3							CL							
SB	1982	KEHa	3	31	434144	874720	B10	694.3	19.0	21.5	1.36E-07	3							CL							
SB	1982	KEHa	3	31	434156	874717	B11	712.3	7.0	8.5					0	21	51	28	CL	82		12		24	13	3.2
SB	1982	KEHa	3	31	434154	874717	B12	708.5	9.5	12.0	1.88E-07	3							CL							4.2
SB	1982	KEHa	3	31	434154	874717	B12	708.5	14.5	17.0	3.97E-07	3							CL							
SB	1982	KEHa	4	31	434154	874717	B12	708.5	39.5	41.0					0	96			SM	5		46				
SB	1982	KEHa	4	31	434147	874717	B14	704.5	34.5	36.0					0	94			SP-SM	5		45				
SB	1982	KEHa	3	31	434144	874715	B15	698.4	7.0	8.5					4	22	47	31	CL	79		13		24	12	
SB	1982	KEHa	3	31	434157	874712	B16	702.5	4.5	6.0					5	18	52	31	CL	77		14		28	15	
SB	1982	KEHa	3	31	434153	874712	B17	707.3	4.5	6.0					3	21	49	30	CL	81		18		25	11	
SB	1982	KEHa	3	31	434153	874712	WB17	707.3	9.5	12.0	9.78E-06	3							CL							4.5
SB	1982	KEHa	4	31	434153	874712	B17	707.3	44.5	46.0					0	95			SM	8		17				
SB	1982	KEHa	3	31	434148	874712	B19	698.7	24.5	26.0					4	18	49	33	CL	77		20		34	21	
SB	1982	KEHa	3	31	434145	874712	B20	698.2	19.5	22.0	6.22E-08	3							CL							1.2
SB	1982	KEHa	3	31	434145	874712	WB20A	698.2	15.0	20.0			2.20E-06	7					CL							
SB	1982	KEHa	3	31	434156	874707	B21	695.1	19.5	22.0	4.74E-08	3							CL							
SB	1982	KEHa	3	31	434154	874707	B22	694.9	9.5	11.0					1	20	46	33	CL	82		16		26	14	
SB	1982	KEHa	3	31	434152	874706	B23	698.1	7.0	8.5					2	19	44	37	CL	81		18		27	14	
SB	1982	KEHa	3	31	434152	874706	B23	698.1	19.5	22.0	1.29E-08	3							CL							
SB	1982	KEHa	34	31	434149	874706	WB24	696.7	21.0	32.0			1.50E-07	7					CL,SM-SP							
SB	1982	KEHa	5	31	434149	874706	B24	696.7	39.5	41.0					0	90			SM-SP	11		25				
SB	1983	KE	99	31	434155	874721	WB6A	704.0	48.0	53.5			7.60E-06	7					SP-SM							
SB	1983	KE	99	31	434144	874720	WB10	694.3	32.0	44.0			1.20E-04	7					SM							
SB	1983	KE	99	31	434149	874706	WB24A	696.7	43.0	48.0			3.20E-05	7					SM-SP							
SB	1983	KEHa	3	31	434143	874712	WB26	694.7	3.0	15.0			2.90E-05	7					CL							
SB	1983	KEHa	3	31	434150	874725	WB27	701.4	3.0	14.5			1.30E-05	7					CL							
SB	1983	KEHa	3	31	434157	874714	WB28	707.8	3.0	15.0			1.70E-05	7					CL							
SB	1983	KEHa	3	31	434151	874703	WB29	694.6	3.0	15.0			1.20E-05	7					CL							
SB	1983	KEHa	3	31	434150	874714	WB30	704.7	3.0	15.0			2.10E-05	7					CL							

Appendix 3 - HYDROGEOLOGIC AND ENGINEERING DATA FOR WALWORTH COUNTY, EAST TROY SITE

+ IDENTITY County (code)	Year	Litho-strat. unit (code)	Mat. (code)	Site No.	Lat.	Long.	Brng. no.	Surf. Elev. (ft)	Sample top (ft)	Sample bottom (ft)	+ HYDRAULIC CONDUCTIVITY Lab K (cm/s)	Meth code	Fld K (cm/s)	Meth code	+ GRAINSIZE PERCENTAGES Bulk % >2.0mm	Matrix % sand (2.0 to 0.0625mm)	Matrix % silt (0.0625 to 0.002mm)	Matrix % clay (<0.002mm)	+ ENGINEERING PROPERTIES Unified Soil Class.	Bulk Percent P200	Dry Unit Wt. (pcf)	SPT (N)	Moist. cont. (%)	Liquid limit	Plastic. index	UC (tsf)
Ww		UN	4	32	424519	882459	B1	984.3		45.3									SM	11						
Ww		UN	3	32	424519	882454	B10	1018.0											SM-SC	47						
Ww		UN	4	32	424519	882454	B10	1018.0											SM-SP	12						
Ww	1979	UN	3	32	424603	882505	B11	1012.0	53.5	55.0					7	49	38	13	CL-ML	53		52		16	5	
Ww	1979	UN	3	32	424603	882505	B11	1012.0	58.5	60.0					2	45	40	15	CL	60		35		17	6	
Ww	1979	ZEti	3	32	424603	882459	B12	985.4	33.5	35.0					4	47	38	16	CL-ML	57		27		18	7	
Ww	1979	ZEti	3	32	424603	882459	B12	985.4	23.5	25.0					5	47	37	16	CL-ML	55		51		17	6	
Ww	1979	UN	3	32	424553	882454	B18	1010.5	53.5	55.0					14	52	36	12	CL-ML	51		32		17	6	
Ww	1979	ZEti	3	32	424553	882454	B18	1010.5	42.0	55.4			8.00E-05													
Ww	1979	UN	3	32	424553	882454	B18	1010.5	48.5	50.0					14	49	41	10	ML	50		40				
Ww	1979	ZEti	3	32	424558	882454	B19A	998.6	23.0	43.1			4.00E-05													
Ww	1979	UN	3	32	424558	882454	B19B	998.7	38.5	40.0					11	48	40	11	ML	51		27				
Ww	1979	UN	3	32	424558	882454	B19B	998.7	49.0	55.2			7.00E-05													
Ww	1979	UN	3	32	424558	882454	B19B	998.7	48.5	50.0					8	43	43	13	ML	56		31				
Ww		UN	99	32	424529	882511	B2	959.5	63.5	65.0									ML	64						
Ww		UN	4	32	424529	882511	B2	959.9	43.5	45.0									SM	12						
Ww	1979	UN	3	32	424559	882505	B20	991.5	38.5	40.0					6	48	37	15	CL-ML	56		72		17	7	
Ww	1979	ZEti	3	32	424559	882505	B20	991.5	28.5	30.0					4	51	35	14	CL-ML	53		52		16	6	
Ww	1979	UN	3	32	424557	882459	B21	1007.4	53.5	55.0					4	47	38	16	CL-ML	57		34		18	7	4.5
Ww	1979	UN	4	32	424557	882459	B21	1007.4	43.5	45.0					8	85	15	0	SM	17		41				
Ww	1979	UN	513	32	424553	882500	B22	987.6	33.5	35.0					0	21	66	13	CL-ML	81		120				
Ww	1979	UN	99	32	424558	882449	B23	961.0		8.0			9.00E-05													
Ww	1979	UN	99	32	424557	882449	B24	979.2		5.0			5.00E-04													
Ww	1979	UN	99	32	424554	882449	B25	971.1		5.0			4.00E-03													
Ww	1979	UN	99	32	424553	882447	B26	958.6		5.0			9.00E-04													
Ww	1979	UN	99	32	424559	882449	B28	959.1		5.0			5.00E-05													
Ww	1979	UN	99	32	424558	882449	B29	959.5		5.0			2.00E-05													
Ww		UN	4	32	424557	882501	B3	984.6	43.5	45.0									SM	18						
Ww		UN	3	32	424557	882501	B3	984.6		25.6					6	54	33	13	CL-ML	52				16	6	
Ww		UN	5	32	424567	882501	B3	984.6	58.5	60.0									CL	85				26	8	
Ww		UN	3	32	424557	882501	B3	984.6	18.5	20.0									SM-SC	46				15	5	
Ww		UN	3	32	424557	882501	B3	984.6	33.5	35.0									CL	57				17	7	
Ww	1979	UN	3	32	424604	882451	B30	986.3	33.5	35.0					20	70	19	11	SM-SC	25		24				3.0
Ww	1979	UN	99	32	424604	882451	B30	986.3	53.5	55.0					0	10	76	14	ML-CL	95		60				4.0
Ww	1979	NB	4	32	424602	882503	B32	1016.3	18.5	20.0					59	78			SM-SP	9		120				
Ww	1979	UN	3	32	424602	882503	B32	1016.3	53.5	55.0					0	4	40	56	CL	99		/		44	25	
Ww	1982	UN	3	32	424601	882458	B33	1015.9							4	42	22	20	CL	65				18	8	
Ww	1979	ZEti	3	32	424601	882458	B33A	1015.9	43.5	45.0					15	55	38	7	SM	43				11	1	
Ww	1979	UN	3	32	424601	882458	B33A	1015.9	74.0	74.3					16	43	43	14	CL-ML	50			9.4	16	5	
Ww	1979	ZEti	3	32	424601	882458	B33A	1016.2	48.8	72.7			9.00E-04													
Ww	1979	UN	3	32	424601	882458	B33A	1015.9	64.0	66.0	1.31E-07	3			8	33	50	17	CL-ML	64	136.3		11.7	17	5	
Ww	1979	ZEti	3	32	424601	882458	B33B	1016.2	43.5	45.0					10	52	39	9	ML	53		12	11.4	15	4	1.5
Ww	1979	ZEti	3	32	424601	882458	B33B	1016.2	52.7	59.7			2.00E-04													
Ww	1979	ZEti	3	32	424601	882458	B33C	1016.2	66.7	72.7			7.00E-05													
Ww	1979	UN	3	32	424554	882458	B35	999.3	48.5	50.0					7	42	43	15	CL-ML	60		27		17	6	
Ww	1979	NB	4	32	424554	882458	B35	999.3	13.5	15.0					56	77			SM-SP	9		57				

Appendix 3 - HYDROGEOLOGIC AND ENGINEERING DATA FOR WALWORTH COUNTY, EAST TROY SITE

IDENTITY: County (code)	Year	Litho-strat. unit (code)	Mat. (code)	Site No.	Lat.	Long.	Brng. no.	Surf. Elev. (ft)	Sample top (ft)	Sample bottom (ft)	HYDRAULIC CONDUCTIVITY: Lab K (cm/s)	Meth code	Fld K (cm/s)	Meth code	GRAINSIZE PERCENTAGES: Bulk % >2.0mm	Matrix % sand (2.0 to 0.0625mm)	Matrix % silt (0.0625 to 0.002mm)	Matrix % clay (<0.002mm)	ENGINEERING PROPERTIES: Unified Soil Class.	Bulk Percent P200	Dry Unit Wt. (pcf)	SPT (N)	Moist. cont. (%)	Liquid limit	Plastic. index	UC (tsf)
Wa	1979	UN	3	32	424554	882458	B35	999.3	38.5	40.0					5	47	38	15	CL-ML	56		46		17	6	4.0
Wa	1979	ZEti	3	32	424555	882453	B37	1003.0	53.5	55.0					22	44	42	14	SM-SC	48		26				
Wa	1979	NB	[illegible]	32	424555	882453	B37	1003.0	8.5	10.0					59	85			SM-SC	7		41				
Wa	1979	ZEti	3	32	424555	882453	B37	1003.0	43.5	45.0					7	48	37	15	CL-ML	52		27		17	6	3.0
Wa	1979	UN	5	32	424555	882453	B37	1003.0	68.5	70.0					0	5	82	13	ML	100		32				
Wa		UN	5	32	424557	882511	B4	964.2		20.2									ML-CL	95				29	7	
Wa		UN	3	32	424557	882511	B4	964.2		10.2									CL	69				22	11	
Wa		UN	3	32	424557	882511	B4	964.2		15.2									CL	68				21	8	
Wa		UN	5	32	424557	882511	B4	964.2	38.5	40.0									CL	85				26	8	
Wa	1979	ZE	3	32	424558	882456	B40	1010.5	58.5	60.0					9	43	44	13	CL-ML	54		57				4.5
Wa	1979	NB	4	32	424558	882456	B40	1010.5	6.0	7.5					65	83			SW			180				
Wa	1979	UN	5	32	424558	882456	B40	1010.5	78.5	80.0					0	3	94	3	ML	100		48				2.5
Wa	1979	ZE	3	32	424558	882456	B40	1010.5	48.5	50.0					10	48	37	16	CL-ML	53		47		17	6	4.5
Wa	1979	NB	4	32	424558	882456	B40	1010.5	13.5	15.0									SM-SP	6		180				
Wa	1979	ZEti	3	32	424600	882501	B41	1011.5	58.5	60.0					4	46	39	16	CL-ML	58		21		18	6	3.0
Wa	1979	ZEti	3	32	424600	882501	B41	1011.5	53.5	55.0					4	46	38	17	CL-ML	57		23		18	7	3.0
Wa	1979	NB	4	32	424699	882599	B42	1018.5	8.5	10.0					55	91			SM-SP	6		30				
Wa	1982	ZEti	3	32	424553	882452	B44	1010.6	48.5	50.0					6	51	38	11	CL-ML	51		19		15	4	
Wa	1982	ZEti	3	32	424553	882452	B44	1010.6	58.5	60.0					4	48	40	13	CL	57				19	7	4.0
Wa	1979	UN	5	32	424543	882510	B46	972.2	18.5	20.0					5	61	26	13	SW-SM	39			17.6	18	4	2.0
Wa	1979	ZEti	3	32	424543	882510	B46	972.2	10.0	12.0					0	4	79	17	CL-ML	100			17.7	26	7	4.5
Wa	1979	ZEti	3	32	424538	882501	B47	997.6	28.5	30.0					9	46	46	8		52		180	7.9	14	3	4.5
Wa	1980	ZE	99	32	424538	882501	B47	997.6	43.5	45.0					6	57	33	10		42		33				4.0
Wa	1979	ZEti	3	32	424538	882501	B47	997.6	18.5	20.0					13	52	41	7		46		14	9.6	14	3	2.5
Wa		UN	3	32	424549	882450	B5	986.0											CL-ML	53						
Wa		UN	5	32	424549	882450	B5	986.0											ML-CL	95				21	8	
Wa		UN	3	32	424549	882450	B5	986.0											CL	53				17	7	
Wa		UN	3	32	424549	882450	B5	986.0											SM-SC	46				15	5	
Wa		UN	4	32	424549	882450	B5	986.0											SM	28						
Wa		UN	3	32	424549	882450	B5	986.0											SM-SC	45				15	5	
Wa	1979	UN	3	32	424553	882448	B50	965.0	13.5	15.0					10	48	38	14	CL-ML	55		43		18	6	3.0
Wa	1979	UN	3	32	424553	882448	B50	965.0	3.5	5.0					6	52	36	12	CL-ML	53		15		18	6	2.0
Wa	1980	ZE	3	32	424545	882501	B51	978.8	18.5	20.0					0	42	51	7	CL-ML	58		62	9.9	14	0	4.0
Wa	1982	ZE	3	32	424601	882452	B52	981.0	20.0	22.0					10	47	40	13	CL-ML	51				18	6	
Wa	1982	ZE	3	32	424601	882452	B52	981.0	27.0	28.5					2	43	41	16	CL-ML	62		22		18	7	
Wa	1982	ZE	3	32	424601	882452	B52	981.0	17.0	18.5					6	50	36	14	CL-ML	53		13		18	6	
Wa	1982	ZEti	3	32	424555	882450	B53	984.0	26.0	27.5					5	48	39	13	CL-ML	53		75		17	5	
Wa	1982	ZE	3	32	424555	882450	B53	984.0	29.0	30.0					11	45	40	15	CL-ML	52		240		18	7	
Wa	1982	ZE	3	32	424555	882450	B53	984.0	36.0	37.5					6	48	37	15	CL-ML	56		82		18	6	
Wa	1979	UN	3	32	424555	882450	B53	984.0			2.00E-06															
Wa	1979	ZEti	3	32	424557	882503	B55	979.0	22.5	25.0	1.00E-07															
Wa	1982	ZEti	3	32	424557	882503	B55	979.0	22.0	24.0					9	45	40	15	CL-ML	53		125		17	6	
Wa	1982	ZEti	3	32	424605	882459	B56	984.0	26.0	27.0					13	47	39	14	CL-ML	50		260		17	5	
Wa	1979	ZE	3	32	424600	882456	B57	1012.0	51.0	52.0	2.10E-08															
Wa	1982	ZE	3	32	424600	882456	B57	1012.0	51.0	52.0					8	51	35	14	CL-ML	49				16	5	
Wa		UN	4	32	424549	882441	B6	943.0											SM	23						

Appendix 3 - HYDROGEOLOGIC AND ENGINEERING DATA FOR WALWORTH COUNTY, EAST TROY SITE

IDENTITY: County (code)	Year	Litho-strat. unit (code)	Mat. (code)	Site No.	Lat.	Long.	Brng. no.	Surf. Elev. (ft)	Sample top (ft)	Sample bottom (ft)	HYDRAULIC CONDUCTIVITY: Lab K (cm/s)	Meth code	Fld K (cm/s)	Meth code	GRAINSIZE PERCENTAGES: Bulk % >2.0mm	Matrix % sand (2.0 to 0.0625mm)	Matrix % silt (0.0625 to 0.002mm)	Matrix % clay (<0.002mm)	ENGINEERING PROPERTIES: Unified Soil Class.	Bulk Percent P200	Dry Unit Wt. (pcf)	SPT (N)	Moist. cont.(%)	Liquid limit	Plastic. index	UC (tsf)
Ww		UN	3	32	424549	882441	B6	943.0											CL	93				25	8	
Ww		UN	4	32	424558	882440	B7	927.6	28.5	30.0									SM	13						
Ww		UN	99	32	424557	882455	B8	1005.0											SM-SP	48						
Ww		UN	4	32	424610	882449	B9	908.0											SM	13						
Ww		UN	99	32	424699	882599	TP1												SM-SC	46						
Ww		UN	99	32	424699	882599	TP1												SM	41						
Ww		UN	5	32	424699	882599	TP10												CL	95				32	24	
Ww		UN	5	32	424699	882599	TP10												SM-SC	46						
Ww		UN	3	32	424699	882599	TP11												CL	66				18	13	
Ww		UN	3	32	424699	882599	TP15												CL	51						
Ww		UN	3	32	424699	882599	TP16												SM-SC					17	6	
Ww		UN	4	32	424699	882599	TP7												SM	41				45	21	
Ww		UN	3	32	424699	882599	TP9												ML	94						

Appendix 3 - HYDROGEOLOGIC AND ENGINEERING DATA WALWORTH COUNTY, GREIDANUS SITE

IDENTITY County (code)	Year	Litho-strat. unit (code)	Mat. (code)	Site No.	Lat.	Long.	Brng. no.	Surf. Elev. (ft)	Sample top (ft)	Sample bottom (ft)	HYDRAULIC CONDUCTIVITY Lab K (cm/s)	Meth code	Fld K (cm/s)	Meth code	GRAINSIZE PERCENTAGES Bulk % >2.0mm	Matrix % sand (2.0 to 0.0625mm)	Matrix % silt (0.0625 to 0.002mm)	Matrix % clay (<0.002mm)	ENGINEERING PROPERTIES Unified Soil Class.	Bulk Percent P200	Dry Unit Wt. (pcf)	SPT (N)	Moist. cont. (%)	Liquid limit	Plastic. index	UC (tsf)
Ww	1983	UN	99	33	423999	884399	TP2	967.1	1.0	4.5					12				SC	26			14.3			
Ww	1983	UN	99	33	423999	884399	TP4	973.7	0.3	2.0					10				SC	39			13.3			
Ww	1983	UN	99	33	423999	884399	TP12	962.1	2.0	4.5					0	10	74	16	CL	99			18.8	25	10	
Ww	1983	UN	99	33	423999	884399	TP13	956.5	0.9	4.6					0	9	61	25	CL	96			19.3	45	21	
Ww	1983	UN	99	33	423999	884399	TP17	959.0	0.8	3.2					0	15	56	29	CL	86			13.0	36	18	
Ww	1983	UN	99	33	423999	884399	TP24	959.1	0.8	3.3					0	13	62	25	CL	88			19.8	48	30	
Ww	1983	UN	99	33	423999	884399	TP29	957.3	0.5	3.5					2	7			CL,CH	91			17.9	51	27	
Ww	1983	UN	99	33	423999	884399	TP31	962.4	1.0	3.4					4	27	52	21	CL	72			16.3	44	25	
Ww	1983	UN	99	33	423999	884399	TP34	964.5	1.5	6.5					0	8	71	21	CL	94			24.6	41	21	
Ww	1983	UN	99	33	423999	884399	TP40	959.4	0.9	4.7					0	4	71	25	CL	98			24.9	40	20	
Ww	1983	UN	99	33	423999	884399	TP48		1.5	6.0					0	13	77	10	CL	90				36	15	
Ww	1983	UN	99	33	423999	884399	TP49		0.0	4.0					0	14	68	18	CL	88				50	32	
Ww	1983	NB	3	33	423999	884399	B55	967.4	34.0	35.5					29	90			SM	29		64				
Ww	1983	NB	4	33	423999	884399	B55	967.4	59.0	60.0					55	87			SW-SM	6		158				
Ww	1983	NB	3	33	423999	884399	B58	967.1	20.0	21.5					29	66			SM	26		93				
Ww	1983	NB	4	33	423999	884399	B58	967.1	45.0	46.5					49	88			SP-SM	7		130				
Ww	1983	NB	3	33	423999	884399	B58	967.1	50.0	51.5					30	64			SW-SM	6		118				
Ww	1982	UN	4	33	423859	884314	B4A								10	93				8						
Ww	1982	UN	4	33	423909	884323	B7A	969.0							2	98				3						
Ww	1982	NB	3	33	423913	884314	B40	982.0	49.0	49.5					15	62	32	6	SM-GM	42		200				
Ww	1982	NB	4	33	423913	884314	B40	982.0	78.5	80.0					2	91			SP	11		63				
Ww	1982	NB	4	33	423913	884314	B40	982.0	103.5	105.0					36	88			SW	10		36				
Ww	1982	NB	3	33	423905	884322	B41		68.5	70.0					50	64			SM-GM	19		83				
Ww	1982	NB	3	33	423905	884322	B41		68.0	83.0			6.03E-05	7												
Ww	1982	NB	3	33	423905	884315	B42		49.0	49.5									SC-CL	34		200				
Ww	1982	NB	4	33	423905	884315	B42		74.0	74.5					50	78			SW-GW	13		400				
Ww	1982	NB	4	33	423905	884315	B42		76.0	91.0			1.42E-04	7												
Ww	1982	NB	4	33	423918	884322	B43	969.0							51	80				11						
Ww	1982	NB	4	33	423918	884322	B43	969.0							2	99				2						
Ww	1982	NB	4	33	423918	884322	B43	969.0	76.0	91.0			4.58E-04	7												
Ww	1982	NB	3	33	423924	884314	B44	970.0	38.5	40.0					15	60			SM-GM	35		53				
Ww	1982	NB	4	33	423924	884314	B44	970.0	98.5	100.0					4	97			SW	3		55				
Ww	1982	NB	4	33	423910	884318	B45								2	97				4						
Ww	1982	NB	3	33	423904	884317	B46		38.5	40.0					26	59			SM	32		162				
Ww	1982	NB	3	33	423901	884318	B47		28.5	30.0									SM	44		60				
Ww	1982	NB	3	33	423901	884318	B47								26	65			SM	29		60				
Ww	1982	NB	4	33	423913	884319	B48								55	87				8						
Ww	1982	NB	34	33	423918	884318	B49	978.0	53.5	55.0					45	75	22	4	SP-GP	18		99				
Ww	1982	NB	3	33	413918	884314	B50		28.5	30.0					44	79	16	5	SM	21		55				
Ww	1982	NB	4	33	413918	884314	B50		38.5	40.0					49	82			SW-GW	10		180				
Ww	1982	NB	4	33	413918	884314	B50		38.5	40.0					61	87			SW-GW	/		180				
Ww	1982	NB	3	33	423922	884318	B51		33.5	35.0					39	69	26	5	SP-SM	22		66				
Ww	1982	NB	3	33	423924	884318	B52		28.5	30.0					17	66	28	6	SM	31		46				
Ww	1982	NB	3	33	423924	884322	B53		28.5	30.0					37	63			SM	27		38				
Ww	1982	NB	4	33	423924	884322	B53		39.0	39.5					56	80			SW-GW	11		200				
Ww	1982	UN	99	33	423902	884319	TP1	968.0							[illegible]	14	56	30	CL	90						

Appendix 3 - HYDROGEOLOGIC AND ENGINEERING DATA WALWORTH COUNTY, GREIDANUS SITE

County (code)	Year	Litho-strat. unit (code)	Mat. (code)	Site No.	Lat.	Long.	Brng. no.	Surf. Elev. (ft)	Sample top (ft)	Sample bottom (ft)	Lab K (cm/s)	Meth code	Fld K (cm/s)	Meth code	Bulk % >2.0mm	Matrix % sand (2.0 to 0.0625mm)	Matrix % silt (0.0625 to 0.002mm)	Matrix % clay (<0.002mm)	Unified Soil Class.	Bulk Percent P200	Dry Unit Wt. (pcf)	SPT (N)	Moist. cont.(%)	Liquid limit	Plastic. index	UC (tsf)
Ww	1982	UN	99	33	423900	884324	TP2	968.0											CL	86						
Ww	1982	UN	99	33	423856	884329	TP3												CL	89						
Ww	1982	UN	99	33	423922	884317	TP4	965.0											CL	51						
Ww	1982	UN	99	33	423918	884320	TP5	972.0											CL	87						
Ww	1982	UN	99	33	423917	884318	TP6	968.0							0	0	79	21	CL	100						
Ww	1982	UN	99	33	423924	884321	TP7	959.0											CL	79						
Ww	1977	UN	99	33	423905	884313	TP1			4.0					3	28	44	28		76						
Ww	1977	NB	3	33	423905	884313	TP1			12.0					0	22	71	7		88						
Ww	1977	NB	3	33	423905	884310	TP2			5.0					24	57	36	8		39						
Ww	1977	NB	3	33	423905	884310	TP2			10.0					18	56	35	9		41						
Ww	1977	NB	3	33	423905	884310	TP2			16.0					31	70	26	4		24						
Ww	1977	NB	3	33	423905	884306	TP3			5.0					17	53	40	7		40						
Ww	1977	NB	3	33	423905	884306	TP3			10.0					19	33	58	9		57						
Ww	1977	NB	3	33	423905	884306	TP3			15.0					29	63	28	8		33						
Ww	1977	UN	99	33	423908	884305	TP4			5.0					1	17	51	32		82						
Ww	1977	NB	3	33	423908	884305	TP4			10.0					16	58	32	10		42						
Ww	1977	NB	3	33	423908	884305	TP4			15.0					14	56	35	9		44						
Ww	1978	NB	3	33	423857	884309	B11			5.0					23	56			SM	37						
Ww	1978	NB	3	33	423857	884309	B11			15.0					20	53			SM	39						
Ww	1978	NB	3	33	423857	884309	B11			85.0					34	33			SM	45						
Ww	1978	NB	3	33	423857	884309	B11			110.0					2				SM							
Ww	1978	UN	99	33	423910	884313	B12			5.0													23.8	55	22	
Ww	1978	NB	3	33	423910	884313	B12			24.0					15	52			SM	44						
Ww	1978	UN	99	33	423910	884313	B12			34.0					0	23	68	9	ML	83			16.4	17	2	
Ww	1978	NB	3	33	423910	884313	B12			49.0					31	52			SM	35						
Ww	1978	UN	99	33	423908	884313	B13			4.0													23.4	47	21	
Ww	1978	NB	3	33	423908	884313	B13			20.0					26	53			SM	37						
Ww	1978	NB	3	33	423908	884313	B13			30.0					21	76			SM	20						
Ww	1978	NB	3	33	423908	884313	B13			45.0					35	58			SM	28						
Ww	1978	UN	99	33	423905	884313	B14			5.0													24.4	53	23	
Ww	1978	NB	99	33	423905	884313	B14			15.0					0	16	70	14	ML	87						
Ww	1978	NB	3	33	423905	884313	B14			30.0					28	50			SM	38						
Ww	1978	UN	99	33	423911	884309	B15			10.0													19.4	45	21	
Ww	1978	NB	3	33	423911	884309	B15			20.0					14	48			SM	47						
Ww	1978	NB	3	33	423911	884309	B15			30.0					23	56			SM	36						
Ww	1978	NB	3	33	423907	884309	B16			10.0					10	53			SM	45						
Ww	1978	NB	3	33	423907	884309	B16			30.0					32	60			SM	30						
Ww	1978	NB	3	33	423907	884309	B16			35.0					25	57			SM	34						
Ww	1978	NB	3	33	423999	884399	B17			10.0					42	62			SM	24						
Ww	1978	UN	99	33	423859	884319	B18			5.0													21.3	46	17	
Ww	1978	NB	3	33	423859	884319	B18			10.0					36	59			SM	28						
Ww	1978	NB	3	33	423859	884319	B18			25.0					18	50			SM	44						
Ww	1978	NB	43	33	423859	884319	B18			35.0					47	64			SM	21						
Ww	1978	UN	99	33	423903	884318	B19			5.0													21.3	47	21	
Ww	1978	NB	3	33	423903	884318	B19			20.0					25	53			SM	37						
Ww	1978	NB	99	33	423903	884318	B19			30.0					1	35	53	12	ML	71			13.2	14	1	

Appendix 3 - HYDROGEOLOGIC AND ENGINEERING DATA WALWORTH COUNTY, BREIDANUS SITE

IDENTITY: County (code)	Year	Litho-strat. unit (code)	Mat. (code)	Site No.	Lat.	Long.	Brng. no.	Surf. Elev. (ft)	Sample top (ft)	Sample bottom (ft)	HYDRAULIC CONDUCTIVITY: Lab K (cm/s)	Meth code	Fld K (cm/s)	Meth code	GRAINSIZE PERCENTAGES: Bulk % >2.0mm	Matrix % sand (2.0 to 0.0625mm)	Matrix % silt (0.0625 to 0.002mm)	Matrix % clay (<0.002mm)	ENGINEERING PROPERTIES: Unified Soil Class.	Bulk Percent P200	Dry Unit Wt. (pcf)	SPT (N)	Moist. cont.(%)	Liquid limit	Plastic. index	UC (tsf)
Wa	1978	NB	99	33	423903	884318	B19			35.0													11.9	15	13	
Wa	1978	NB	3	33	423906	884319	B20			15.0					36	61			SM	27						
Wa	1978	NB	99	33	423906	884319	B20			25.0					0	14			ML	94						
Wa	1978	NB	3	33	423999	884399	B21			10.0					12	48			SM	47						
Wa	1978	NB	3	33	423999	884399	B21			20.0					12	51			SM	45						
Wa	1977	NB	4	33	423901	884309	B1	937.7		15.0					50	78	22	0	SM	11						
Wa	1977	NB	4	33	423901	884309	B1	937.7		45.0					25	84	16	0	SM-SP	8						
Wa	1977	NB	4	33	423901	884309	B1	937.7		60.0					8	93			SM-SP	6						
Wa	1977	UN	99	33	424000	884306	B2	956.5		2.0									CL				13.9	42	21	
Wa	1977	NB	3	33	424000	884306	B2	956.5		20.0					39	62	31	7	SM	26						
Wa	1977	NB	3	33	424000	884306	B2	956.5		40.0					40	60	32	8	SM	26						
Wa	1977	NB	3	33	424000	884306	B2	956.5		55.0					63	62	30	8	SM	15						
Wa	1977	UN	99	33	423900	884314	B4	965.0		3.0									CL				23.8	57	19	
Wa	1977	UN	99	33	423900	884314	B4	965.0		10.0									CL				15.5	20	14	
Wa	1977	NB	3	33	423900	884314	B4	965.0		20.0					23	70	25	5	SM	34						
Wa	1977	NB	3	33	423911	884306	B3	957.0		10.0					35	52	38	9	SM	36						
Wa	1977	NB	3	33	423911	884306	B3	957.0		20.0					16	79	17	5	SM	22						
Wa	1977	UN	99	33	423999	884399	B5	945.0		2.0									CL				31.9	40	21	
Wa	1977	UN	99	33	423999	884399	B5	945.0		5.0									CL-ML				18.9	28	20	
Wa	1977	NB	3	33	423999	884399	B5	945.0		15.0					27	48			SM	41						
Wa	1977	NB	3	33	423999	884399	B5	945.0		25.0					40	60			SM	26						
Wa	1977	NB	3	33	423999	884399	B6	979.7		15.0					15	52			SM	43						
Wa	1977	UN	99	33	423999	884399	B7	969.0		3.0									CL				9.7	40	22	
Wa	1977	NB	3	33	423999	884399	B7	969.0		15.0					13	75			SM	44						
Wa	1977	NB	3	33	423999	884399	B7	969.0		60.0					17	53			SM	42						
Wa	1977	NB	4	33	423999	884399	B7	969.0		80.0					45	78			SM-SP	13						
Wa	1977	UN	99	33	423900	884322	B8	959.3		8.0									CL				19.8	27	19	
Wa	1977	NB	3	33	423900	884322	B8	959.3		15.0					20	46			SM	45						
Wa	1977	NB	4	33	423900	884322	B8	959.3		60.0					67	79			SM-SP	8						
Wa	1977	NB	4	33	423900	884322	B8	959.3		90.0					24	91			SM-SP	7						
Wa	1977	NB	4	33	423910	884323	B9	967.0		5.0					54	70			SM-SP	15						
Wa	1977	NB	3	33	423910	884323	B9	967.0		15.0					10	47			SM	50						

Appendix 3 - HYDROGEOLOGIC AND ENGINEERING DATA FOR WASHINGTON AND WAUKESHA COUNTIES. INCLUDES DATA FOR OMEGA HILLS NORTH AND SOUTH AND PRECEDING LANDFILLS.

IDENTITY											HYDRAULIC CONDUCTIVITY				GRAINSIZE PERCENTAGES				ENGINEERING PROPERTIES							
County (code)	Year	Litho-strat. unit (code)	Nat. (code)	Site No.	Lat.	Long.	Brng. no.	Surf. Elev. (ft)	Sample top (ft)	Sample bottom (ft)	Lab K (cm/s)	Meth code	Fld K (cm/s)	Meth code	Bulk % >2.0mm	Matrix % sand (2.0 to 0.0625mm)	Matrix % silt (0.0625 to 0.002mm)	Matrix % clay (<0.002mm)	Unified Soil Class.	Bulk Percent P200	Dry Unit Wt. (pcf)	SPT (N)	Moist. cont.(%)	Liquid limit	Plastic. index	UC (tsf)
WaWk	1983	OC	3	35	431138	880446	B1	812.5	3.5	5.0									CL			20	16.0			4.5
WaWk	1983	OC	3	35	431138	880446	B1	812.5	8.5	10.0									CL			21	17.0	29	13	4.5
WaWk	1983	OC	99	35	431138	880446	B1	812.5	28.5	30.0									SM-ML-CL			20	21.0	32	16	3.0
WaWk	1983	OC	3	35	431138	880441	B7	819.5	3.5	5.0									CL			18	16.0			4.0
WaWk	1983	OC	3	35	431138	880441	B7	819.5	8.5	10.0									CL				18.0			
WaWk	1983	OC	3	35	431138	880441	B7	819.5	13.5	15.0									CL			33	14.0	23	8	4.0
WaWk	1983	OC	3	35	431138	880441	B7	819.5	38.5	40.0									CL			16	20.0	28	13	2.5
WaWk	1983	OC	3	35	431133	880441	L1		13.5	15.0									CL			12	16.0	24	9	3.0
WaWk	1983	OC	3	35	431133	880448	L2		3.5	5.0									CL			14	17.0	29	11	4.5
WaWk	1983	OC	3	35	431133	880448	L2		8.5	10.0									CL			14	20.0	33	14	2.5
WaWk	1983	OC	3	35	431134	880448	L3		3.5	5.0									CL			14	18.0	32	13	3.5
WaWk	1983	OC	3	35	431134	880448	L3		8.5	10.0									CL			13	21.0	34	15	4.0
WaWk	1983	UN	12	35	431144	880435	N22A	819.2	45.0	51.5			8.64E-04	7					DOLOMITE							
WaWk	1983	UN	12	35	431144	880435	N22B	819.4	68.0	75.2			1.61E-04	7					BEDROCK							
WaWk	1983	UN	12	35	431152	880418	N30A	803.1	46.0	52.0			3.64E-05	7					BEDROCK							
WaWk	1983	UN	12	35	431144	880435	N22C	818.2	92.0	98.9			1.18E-05	7					DOLOMITIC LS							
WaWk	1983	UN	99	35	431140	880405	N35A						6.38E-05	7												
WaWk	1983	UN	12	35	431149	880433	N51A	816.6	40.0	45.4			5.75E-05	7					DOLOMITE							
WaWk	1983	UN	99	35	431131	880410	N54A						2.67E-04	7												
WaWk	1983	UN	99	35	431131	880410	N54B						2.05E-03	7												
WaWk	1983	UN	99	35	431131	880334	N61B						3.73E-05	7												
WaWk	1983	UN	12	35	431133	880442	N66B	804.0	133.0				9.91E-06	7					DOLOMITE							
WaWk	1983	UN	12	35	431143	880453	N67B	774.2	56.0	62.5			4.87E-05	7					DOLOMITE							
WaWk	1983	OC	99	35	431147	880413	N4	776.0	20.0	24.0			6.81E-04	7					CL							
WaWk	1983	OC	3	35	431152	880418	N30	803.3	34.0	40.0			4.94E-05	7					CL							
WaWk	1983	OC	3	35	431149	880425	N81	804.6	14.5	24.5			7.07E-06	7					CL							
WaWk	1984	OC	3	35	431141	880437	N71	821.9	18.5	20.0									CL			24		29	17	
WaWk	1984	OC	3	35	431143	880437	N72	819.9	23.5	25.0									CL			58		21	9	
WaWk	1984	OC	3	35	431143	880437	N72	819.9	33.5	35.0									CL			22		18	9	
WaWk	1984	OC	5	35	431142	880439	N73	819.9	38.5	40.0									ML			24		14	3	
WaWk	1984	OC	3	35	431145	880437	N74	814.3	6.0	7.5									CL			18		34	19	
WaWk	1984	OC	3	35	431145	880437	N74	814.3	13.5	15.0									CL			16		27	12	
WaWk	1984	OC	3	35	431145	880436	N75	818.3	8.5	10.0									CL			19		34	18	
WaWk	1984	OC	5	35	431149	880437	N76	812.3	8.5	10.0									CL			9		21	7	
WaWk	1984	OC	5	35	431149	880437	N76	812.3	18.5	20.0									CL-ML			5		20	7	
WaWk	1984	OC	3	35	431148	880430	N79	817.0	18.5	20.0									CL			27		28	13	
WaWk	1984	OC	3	35	431148	880430	N79	817.0	33.5	35.0									CL			31		30	16	
WaWk	1984	OC	3	35	431152	880426	N80	804.7	13.5	15.0									CL			29		24	10	
WaWk	1984	OC	3	35	431149	880425	N81	804.6	6.0	7.5									CL			22		22	9	4.5
WaWk	1985	OC	3	35	431199	880499	BA1	817.0											CL	90				27	10	
WaWk	1985	OC	3	35	431199	880499	BA2	816.0											CL	90				23	6	
WaWk	1985	OC	3	35	431199	880499	BA3	813.0												81						
WaWk	1985	OC	3	35	431199	880499	BA4	814.0												84						
WaWk	1985	OC	3	35	431199	880499	BA5	821.0											CL	86				28	14	
WaWk	1985	OC	3	35	431199	880499	BA6	819.0												86						
WaWk	1985	OC	3	35	431199	880499	BA7	819.0											CL	88				29	13	

Appendix 3 - HYDROGEOLOGIC AND ENGINEERING DATA FOR WASHINGTON AND WAUKESHA COUNTIES. INCLUDES DATA FOR OMEGA HILLS NORTH AND SOUTH AND PREC EDING LANDFILLS.

IDENTITY County (code)	Year	Litho-strat. unit (code)	Mat. (code)	Site No.	Lat.	Long.	Brng. no.	Surf. Elev. (ft)	Sample top (ft)	Sample bottom (ft)	HYDRAULIC CONDUCTIVITY Lab K (cm/s)	Meth code	Fld K (cm/s)	Meth code	GRAINSIZE PERCENTAGES Bulk % >2.0mm	Matrix % sand (2.0 to 0.0625mm)	Matrix % silt (0.0625 to 0.002mm)	Matrix % clay (<0.002mm)	ENGINEERING PROPERTIES Unified Soil Class.	Bulk Percent P200	Dry Unit Wt. (pcf)	SPT (N)	Moist. cont. (%)	Liquid limit	Plastic. index	UC (tsf)
WnWk	1985	OC	3	35	431199	880499	BA8	815.0												88						
WnWk	1985	OC	3	35	431199	880499	BA9	821.0												89						
WnWk	1985	OC	3	35	431199	880499	BA10	820.0												92						
WnWk	1985	OC	3	35	431199	880499	BA11	819.0											CL	88				28	12	
WnWk	1985	OC	3	35	431199	880499	BA12	814.0												99						
WnWk	1985	OC	3	35	431199	880499	BA13	816.0												90						
WnWk	1985	OC	3	35	431199	880499	BA14	809.0												73						
WnWk	1985	OC	3	35	431199	880499	BA15	811.0											CL	83				28	13	
WnWk	1985	OC	3	35	431199	880499	BA16	806.0												85						
WnWk	1985	OC	3	35	431199	880499	BA17	808.0												89						
WnWk	1985	OC	3	35	431199	880499	BA18	814.0												90						
WnWk	1985	OC	3	35	431199	880499	BA19	813.0												88						
WnWk	1985	OC	3	35	431199	880499	BA20	814.0											CL	93				33	15	
WnWk	1985	OC	3	35	431199	880499	BA21	816.0												88						
WnWk	1985	OC	3	35	431199	880499	BA22	816.0												83						
WnWk	1985	OC	3	35	431199	880499	BA23	817.0												84						
WnWk	1985	OC	3	35	431199	880499	BA24	808.0											CL	91						
WnWk	1985	OC	3	35	431199	880499	BA25	808.0																30	14	
WnWk	1985	OC	3	35	431199	880499	BA26	807.0												88						
WnWk	1985	OC	3	35	431199	880499	BA27	812.0												79						
WnWk	1985	OC	3	35	431199	880499	BA28	812.0												75						
WnWk	1985	OC	3	35	431199	880499	BA29	817.0												85						
WnWk	1985	OC	3	35	431199	880499	BA30	817.0												90						
WnWk	1985	OC	3	35	431129	880402	S9	747.0	5.0	15.0			3.90E-05	7					CL							
WnWk	1985	OC	5	35	431129	880402	S9A	747.0	52.0	60.0			3.20E-06	10					ML&SM,CL							3.3
WnWk	1985	OC	53	35	431129	880415	S10	741.0	1.5	10.0			3.30E-06	7					ML,CL			13				
WnWk	1985	OC	3	35	431128	880409	S11	740.0	2.0	10.0			2.30E-05	7					CL							3.3
WnWk	1985	OC	3	35	431120	880413	S13	756.0	5.0	20.0			4.30E-06	7					CL							
WnWk	1985	OC	99	35	431199	880499	S19	750.3	3.0	35.0			1.40E-04	7					CL,ML,CL							
WnWk	1985	OC	99	35	431199	880499	S21	743.2	3.0	20.0			3.60E-04	7					CL,ML,CL							
WnWk	1985	OC	99	35	431199	880499	S23	739.9	45.0	51.0			1.50E-04	7					SP-SM,CL							
WnWk	1985	OC	3	35	431199	880499	S24	759.8	65.0	70.4			2.40E-06	7					CL							
WnWk	1985	OC	3	35	431199	880499	S26	754.1	65.0	70.6			2.10E-05	7					CL							4.5
WnWk	1985	OC	99	35	431131	880408	N9	779.3	74.0	89.0			9.60E-05	7					CL							
WnWk	1985	OC	99	35	431131	880413	N10	780.3	24.0	30.0			4.80E-05	7					SM,CL							
WnWk	1985	OC	99	35	431131	880416	N11	781.4	45.0	57.0			2.70E-04	7					CL,SM							
WnWk	1982	OC	4	35	431131	880408	N9B	779.1	13.5	15.0					67	70			SP-SM	11		28				
WnWk	1982	OC	3	35	431131	880408	N9B	779.1	33.5	35.0					5	3	67	29	CL	86		26	14.0	29	15	2.3
WnWk	1982	OC	5	35	431131	880408	N9B	779.1	48.5	50.0					0	30	68	2	ML	85		8	17.0			
WnWk	1982	OC	99	35	431131	880408	N9B	779.1	58.5	60.0					0	82			SM	15		44				
WnWk	1982	OC	99	35	431132	880430	N15	788.4	28.5	30.0					2	6	63	31	CL	93		22	17.0	29	15	2.0
WnWk	1982	OCNB	99	35	431144	880435	N22B	819.4	38.5	40.0					38	79			SP-SM	14		36				
WnWk	1982	OC	3	35	431143	880409	N33B		13.5	15.0					9				CL	73		18	19.0			0.9
WnWk	1982	OC	3	35	431143	880409	N33B		18.5	20.0					0	5	72	23	CL	99		34	16.0	26	15	1.5
WnWk	1982	OC	4	35	431143	880409	N33B		28.5	30.0					0				ML	88		13	19.0			
WnWk	1982	OC	3	35	431140	880405	N35A	781.5	23.5	25.0					8	10	60	30	CL	85		13	19.0	27	14	1.5

Appendix 3 - HYDROGEOLOGIC AND ENGINEERING DATA FOR WASHINGTON AND WAUKESHA COUNTIES. INCLUDES DATA FOR OMEGA HILLS NORTH AND SOUTH AND PRECEDING LANDFILLS.

IDENTITY: County (code)	Year	Litho-strat. unit (code)	Mat. (code)	Site No.	Lat.	Long.	Brng. no.	Surf. Elev. (ft)	Sample top (ft)	Sample bottom (ft)	HYDRAULIC CONDUCTIVITY: Lab K (cm/s)	Meth code	Fld K (cm/s)	Meth code	GRAINSIZE PERCENTAGES: Bulk % >2.0mm	Matrix % sand (2.0 to 0.0625mm)	Matrix % silt (0.0625 to 0.002mm)	Matrix % clay (<0.002mm)	ENGINEERING PROPERTIES: Unified Soil Class.	Bulk Percent P200	Dry Unit Wt. (pcf)	SPT (N)	Moist. cont. (%)	Liquid limit	Plastic. index	UC (tsf)
WaWk	1982	OC	5	35	431140	880405	N35A	781.5	68.5	70.0					0				ML	75		120	12.0			
WaWk	1982	OCNB	99	35	431130	880423	S6B	762.5	18.5	20.0					65	54			GM	16		33				
WaWk	1982	OCNS	99	35	431131	880422	S17	761.8	28.5	30.0					0	82			SM	21		32				
WaWk	1983	OC	3	35	431199	880499	S32	754.5	3.5	5.0									CL			26				3.0
WaWk	1983	OC	3	35	431199	880499	S32	754.5	8.5	10.0									CL			22	15.5	28	13	3.5
WaWk	1983	OC	3	35	431199	880499	S32	754.5	13.5	15.0									CL			24	18.3			3.5
WaWk	1983	OC	3	35	431199	880499	S32	754.5	18.5	20.0									CL			22				3.0
WaWk	1983	OC	3	35	431199	880499	S32	754.5	23.5	25.0									CL			24	16.7			2.5
WaWk	1983	OC	3	35	431199	880499	S32	754.5	28.5	30.0									CL			21	19.4			2.0
WaWk	1983	OC	5	35	431199	880499	S32	754.5	33.5	35.0									CL.SM			41				3.0
WaWk	1983	OC	5	35	431199	880499	S32	754.5	35.0	38.5									ML			28	15.2			
WaWk	1983	OC	5	35	431199	880499	S32	754.5	38.5	40.0									ML.CL			41				
WaWk	1983	OC	3	35	431199	880499	S32	754.5	43.5	45.0									CL			65				4.5
WaWk	1983	OC	3	35	431199	880499	S32	754.5	48.5	50.0									CL			72				4.5
WaWk	1983	OC	3	35	431115	880315	S34	750.5	3.5	5.0									CL			24				4.0
WaWk	1983	OC	3	35	431115	880315	S34	750.5	8.5	10.0									CL			38				4.0
WaWk	1983	OC	3	35	431115	880315	S34	750.5	13.5	15.0									ML-CL			44	15.1	22	5	3.5
WaWk	1983	OC	35	35	431115	880315	S34	750.5	18.5	20.0									CL			24				2.5
WaWk	1983	OC	35	35	431115	880315	S34	750.5	23.5	25.0									CL			18				
WaWk	1983	OC	5	35	431115	880315	S34	750.5	28.5	30.0									SP-SM			18				
WaWk	1983	OC	53	35	431115	880315	S34	750.5	33.5	35.0									SP-SM,CL			61				
WaWk	1983	OC	3	35	431115	880315	S34	750.5	38.5	40.0									CL			120				4.5
WaWk	1983	OC	3	35	431115	880315	S34	750.5	43.5	45.0									CL			60				4.5
WaWk	1983	OC	3	35	431115	880315	S34	750.5	48.5	50.0									CL			48				4.0
WaWk	1981	OC	5	35	431131	880408	N9	779.3	78.5	80.0					0	45			ML	59		40				
WaWk	1981	OC	4	35	431131	880413	N10	780.3	73.5	75.0					0	87			SM	17		26				
WaWk	1981	OC	5	35	431131	880416	N11	781.6	43.5	45.0					0	0	62	38	CL	100		41		35	23	4.0
WaWk	1981	OC	5	35	431131	880416	N11	781.6	53.5	55.0					0	65			SM	41		37				
WaWk	1981	OCNB	4	35	431131	880418	N12	783.6	78.5	80.0					8	80			SM	18		86				
WaWk	1981	OC	5	35	431131	880421	N13	784.7	28.5	30.0					0	25			ML	89		72				
WaWk	1981	OC	5	35	431132	880430	N15	790.0	13.5	15.0					0	2	55	43	CL	100		19		34	19	
WaWk	1981	OC	3	35	431132	880436	N16	802.0	3.5	5.0					3	8	56	36	CL	80		20		31	14	
WaWk	1981	OC	4	35	431135	880437	N19	818.2	33.5	35.0					34	91			SP-SM	8		14				
WaWk	1981	OC	99	35	431141	880439	N20	821.6	18.5	20.0					10	36			ML	70		25				
WaWk	1981	OC	99	35	431141	880439	N20	821.6	43.5	45.0					i	55			SM	44		8				
WaWk	1981	OC	4	35	431144	880435	N22	819.2	38.5	40.0					45	89			SP-SM	6		30				
WaWk	1981	OC	3	35	431145	880425	N25	811.1	18.5	20.0					2	7	58	35	CL	92		24		32	17	
WaWk	1981	OC	5	35	431146	880424	N26	802.1	38.5	40.0					7	18	48	27	CL	79		67		25	12	
WaWk	1981	OC	5	35	431148	880424	N27	802.4	23.5	25.0					0	16			ML	89		36				
WaWk	1981	OC	3	35	431153	880422	N28	817.2	18.5	20.0					2	16	55	29	CL	88		26		28	15	
WaWk	1981	OC	3	35	431149	880429	N31	784.2	18.5	20.0					26	38	53	9	ML	53		41		18	4	
WaWk	1981	OC	3	35	431143	880429	N33	774.2	8.5	10.6					i	13	56	30	CL	91		13		44	24	
WaWk	1981	OC	4	35	431143	880429	N33	774.2	43.5	45.0					0	80			SM	27						
WaWk	1981	OC	4	35	431136	880401	N37	781.2	18.5	20.0					70	80			SP-SM	27		16				
WaWk	1981	OC	3	35	431136	880401	N37	781.2	28.5	30.0					4	19	48	33	CL	78		18		30	14	
WaWk	1981	OC	3	35	431155	880428	N40	814.3	8.5	10.0					0	16	48	36	CL	84		32		40	22	

Appendix 3 - HYDROGEOLOGIC AND ENGINEERING DATA FOR WASHINGTON AND WAUKESHA COUNTIES. INCLUDES DATA FOR OMEGA HILLS NORTH AND SOUTH AND PRECEDING LANDFILLS.

IDENTITY											HYDRAULIC CONDUCTIVITY				GRAINSIZE PERCENTAGES				ENGINEERING PROPERTIES							
County (code)	Year	Litho-strat. unit (code)	Mat. (code)	Site No.	Lat.	Long.	Brng. no.	Surf. Elev. (ft)	Sample top (ft)	Sample bottom (ft)	Lab K (cm/s)	Meth code	Fld K (cm/s)	Meth code	Bulk % >2.0mm	Matrix % sand (2.0 to 0.0625mm)	Matrix % silt (0.0625 to 0.002mm)	Matrix % clay (<0.002mm)	Unified Soil Class.	Bulk Percent P200	Dry Unit Wt. (pcf)	SPT (N)	Moist. cont.(%)	Liquid limit	Plastic. index	UC (tsf)
WaWk	1981	OC	3	35	431148	880427	N41	808.6	8.5	10.0					4	10	55	34	CL	87		30		33	19	
WaWk	1981	OC	3	35	431148	880427	N41	808.6	18.5	20.0					0	16	48	36	CL	84		41		36	23	
WaWk	1981	OC	3	35	431148	880427	N41	808.6	28.5	30.0					7	24	51	26	CL	76		48		22	11	
WaWk	1981	OC	3	35	431157	880436	N42	788.1	8.5	10.0					4	23	54	23	CL	79		45		24	12	
WaWk	1981	OC	3	35	431157	880436	N42	788.1	13.5	15.0					2	21	61	17	CL-ML	87		15		20	7	
WaWk	1981	OC	3	35	431199	880499	N43		8.5	10.0					1	17	53	30	CL	88		15		22	9	
WaWk	1981	OC	3	35	431199	880499	N43		18.5	20.0					8	17	54	28	CL	81		25		25	11	
WaWk	1981	OC	99	35	431199	880499	N44		8.5	10.0					24	43			ML	46		8				
WaWk	1981	OC	3	35	431199	880499	N45		3.5	5.0					0	4	54	42	CL	96		11		37	17	
WaWk	1981	OC	5	35	431199	880499	N45		8.5	10.0					11	11			CL	80		84				
WaWk	1981	OC	3	35	431147	880439	N46	800.4	3.5	5.0					3	20	55	26	CL	82		11		30	13	
WaWk	1981	OC	3	35	431147	880439	N46	800.4	8.5	10.0					0	8	51	41	CL	92		60		38	18	
WaWk	1981	OC	5	35	431136	880442	N47	812.5	8.5	10.0					0					75		19				
WaWk	1981	OC	3	35	431136	880442	N47	812.5	13.5	15.0					0	3	72	25	CL	98		14		23	8	
WaWk	1981	OC	3	35	431136	880442	N47	812.5	33.5	35.0					0	8	61	31	CL	99		35		33	17	
WaWk	1981	OC	4	35	431143	880444	N48	808.0	18.5	20.0					58	60			SM	18		34				
WaWk	1981	OC	99	35	431133	880422	N50	773.6	23.5	25.0					0	58			SM	46		35				
WaWk	1981	OC	3	35	431199	880499	A	782.7	30.0	32.0	7.20E-08	3							CL							
WaWk	1981	OC	3	35	431199	880499	A	782.7	35.0	37.0	1.60E-08	3							CL	98						
WaWk	1981	OC	3	35	431199	880499	B	775.7	25.0	27.0	6.10E-08	3							CL	98						
WaWk	1981	OC	3	35	431199	880499	B	775.7	30.0	32.0	1.80E-08	3							CL	98						
WaWk	1973	OC	3	35	431133	880438	B1	805.2	25.0	27.0	4.00E-08								CL		118.0		17.0	32	10	
WaWk	1973	OC	3	35	431133	880438	B1	805.2	40.0	42.0	1.00E-07								CL		115.0		17.0	33	13	
WaWk	1973	OC	3	35	431143	880438	B2	820.6	40.0	40.5	5.00E-08								CL		115.0		15.0	27	14	
WaWk	1976	OC	5	35	431199	880499	H2			10.0									CL	96		20				
WaWk	1976	OC	5	35	431199	880499	H2			26.0	3.00E-07								CL							
WaWk	1976	OC	3	35	431199	880499	H5			25.0									CL	96						
WaWk	1976	OC	3	35	431199	880499	H6			25.0									CL	86		31				
WaWk	1976	OC	3	35	431199	880499	B50B		63.0	65.0									CL	98			21.0			
WaWk	1976	OC	3	35	431199	880499	B50B		65.0	67.0									CL	98						
WaWk	1976	OC	3	35	431199	880499	B50C		65.0	67.0										98			21.0			
WaWk	1976	OC	5	35	431199	880499	B50C		67.0	69.0	9.00E-07								ML-CL							
WaWk	1976	OC	4	35	431199	880499	B50C		70.0	70.5									ML-CL	79						
WaWk	1976	OC	99	35	431199	880499	B50C		70.0	71.0									SM	14						
WaWk	1976	OC	4	35	431199	880499	B50C		72.0	74.0	1.00E-07								SM	12						
WaWk	1976	OC	5	35	431199	880499	B50C		75.0	78.0									ML-CL	89						
WaWk	1973	OC	3	35	431125	880352	B1	766.7	35.0	37.0	7.00E-09								CL		110.0		21.0	37	14	
WaWk	1973	OC	3	35	431115	880355	B2	765.9	17.5	19.3	1.00E-08								CL		116.0		18.0	37	10	
WaWk	1973	OC	3	35	431117	880419	B4	761.1	35.0	35.5	5.00E-07								ML		140.0		12.0	14	2	
WaWk	1980	OC	3	35	431130	880423	B6A	764.6	10.0	12.0	2.00E-07								CL		104.0			30	10	
WaWk	1980	OC	99	35	431130	880423	B6A	764.6	35.0	37.0	9.00E-09								CL		121.0			29	16	
WaWk	1980	OC	99	35	431199	880499	B2B		65.0	67.0									CL					42	25	
WaWk	1980	OC	5	35	431130	880423	B6R	765.0	65.0	67.0									CL					22	10	
WaWk	1976	OC	99	35	431199	880499	HB1	759.2	15.0	17.0									ML	70			18.0			
WaWk	1976	OC	4	35	431199	880499	HB1	759.2	20.0	21.0	1.00E-05								SM	15			18.0			
WaWk	1976	OC	4	35	431199	880499	HB2	758.7	20.0	21.0	2.00E-04								SM	10						

Appendix 3 - HYDROGEOLOGIC AND ENGINEERING DATA FOR WASHINGTON AND WAUKESHA COUNTIES. INCLUDES DATA FOR OMEGA HILLS NORTH AND SOUTH AND PRECEDING LANDFILLS.

IDENTITY											HYDRAULIC CONDUCTIVITY				GRAINSIZE PERCENTAGES				ENGINEERING PROPERTIES							
County (code)	Year	Litho-strat. unit (code)	Mat. (code)	Site No.	Lat.	Long.	Brng. no.	Surf. Elev. (ft)	Sample top (ft)	Sample bottom (ft)	Lab K (cm/s)	Meth code	Fld K (cm/s)	Meth code	Bulk % >2.0mm	Matrix % sand (2.0 to 0.0625mm)	Matrix % silt (0.0625 to 0.002mm)	Matrix % clay (<0.002mm)	Unified Soil Class.	Bulk Percent P200	Dry Unit Wt. (pcf)	SPT (N)	Moist. cont. (%)	Liquid limit	Plastic index	UC (tsf)
WaWk	1976	OC	5	35	431199	880499	HB3	761.0	25.0	27.0	6.00E-07									50			20.0			
WaWk	1976	OC	5	35	431199	880499	HB4	759.0	25.0	27.0	4.00E-08									70			20.0			
WaWk	1977	OC	5	35	431199	880499	E3	759.4	20.0	22.0									ML	97						
WaWk	1977	OC	3	35	431199	880499	E11	763.4	15.0	17.0	1.00E-06								CL							
WaWk	1977	OC	5	35	431199	880499	E11	763.4	55.0	57.0	5.10E-03								SP							
WaWk	1977	OC	5	35	431199	880499	E13	760.7	15.0	17.0	4.00E-07								CL,ML							
WaWk	1977	OC	3	35	431130	880357	N1	772.0	30.0	32.0	2.80E-08								CL							
WaWk	1977	OC	99	35	431130	880357	N1	772.0	80.0	81.0									SM							
WaWk	1977	OC	5	35	431124	880413	N2	757.2	30.0	32.0	4.50E-05								CL-ML,SP							
WaWk	1977	OC	5	35	431124	880413	N2	757.2	35.0	37.0									SM							
WaWk	1977	OC	3	35	431124	880413	N2	757.2	45.0	47.0	8.90E-08								CL							
WaWk	1977	OC	3	35	431124	880413	N2	757.2	50.0	52.0	2.80E-09								CL							
WaWk	1977	OC	99	35	431124	880413	N2	757.2	65.0	66.5									SP							
WaWk	1977	OC	5	35	431199	880499	N3	763.5	25.0	27.0									ML							
WaWk	1977	OC	5	35	431199	880499	N3	763.5	40.0	42.0	3.50E-08								ML							
WaWk	1977	OC	4	35	431199	880499	R1		7.0	20.5									SM-GM	15						
WaWk	1977	OC	3	35	431199	880499	R1		20.5	33.0									CL	91				27	17	
WaWk	1977	OC	5	35	431199	880499	R1		33.0	44.0									ML	91						
WaWk	1977	OC	3	35	431199	880499	R1		44.0	59.0									CL	90				22	11	
WaWk	1977	OC	5	35	431199	880499	R1		59.0	60.5									ML,SM	55						
WaWk	1977	OC	3	35	431199	880499	R1		60.5	74.0									CL	98				32	18	
WaWk	1977	OC	99	35	431199	880499	R1		74.0	89.0										10						
WaWk	1977	OC	99	35	431199	880499	R1		89.0	94.0										10						
WaWk	1977	DCNB	99	35	431199	880499	R1		94.0	100.0										80						
WaWk	1977	OC	99	35	431199	880499	R2	749.4	0.0	51.0									CL	95				23	14	
WaWk	1977	OC	5	35	431199	880499	R2	749.4	54.0	58.0									ML	96				28	15	
WaWk	1977	OC	3	35	431199	880499	R3	743.8	9.0	23.0									CL	94				22	11	
WaWk	1977	OC	3	35	431199	880499	R3	743.8	44.0	49.0									CL-ML	75				20	8	
WaWk	1977	OC	3	35	431199	880499	R4	743.5	0.0	11.0									CL	99				25	12	
WaWk	1977	OC	3	35	431199	880499	R4	743.5	19.0	34.0									CL	97				34	19	
WaWk	1977	OC	3	35	431199	880499	R4	743.5	49.0	54.0									ML-CL	91				18	6	
WaWk	1977	OC	3	35	431199	880499	R5	762.2	0.0	14.0									CL	95				33	18	
WaWk	1977	OC	3	35	431199	880499	R5	762.2	23.0	38.0									CL	99				27	14	
WaWk	1977	OC	3	35	431199	880499	R5	762.2	44.0	71.0									CL	96				28	16	
WaWk	1977	OC	3	35	431199	880499	R5.S12	762.2	79.0	81.5									CL-ML	75				19	8	
WaWk	1977	OC	3	35	431199	880499	R7		0.0	12.0									CL	97				26	13	
WaWk	1977	OC	3	35	431199	880499	R7		34.0	47.0									CL	98				37	22	
WaWk	1983	UN	12	35	431199	880499	N20A						2.94E-06	7					BEDROCK							
WaWk	1983	UN	12	35	431199	880499	N22A						6.89E-04	7					BEDROCK							
WaWk	1983	UN	12	35	431199	880499	N30A						1.44E-06	7					BEDROCK							
WaWk	1983	UN	12	35	431199	880499	N33B						1.96E-05	7					BEDROCK							
WaWk	1983	UN	12	35	431199	880499	N35A						9.96E-06	7					BEDROCK							
WaWk	1983	UN	12	35	431199	880499	N46A						6.26E-05	7					BEDROCK							
WaWk	1983	UN	12	35	431199	880499	N22B						6.56E-05	7					BEDROCK							
WaWk	1983	UN	12	35	431199	880499	N51A						1.64E-06	7					BEDROCK							

Appendix 3 - HYDROGEOLOGIC AND ENGINEERING DATA FOR WASHINGTON COUNTY. INCLUDES MERTENS AND SCHOWALTER PROPERTIES

IDENTITY											HYDRAULIC CONDUCTIVITY				GRAINSIZE PERCENTAGES				ENGINEERING PROPERTIES							
County (code)	Year	Litho-strat. unit (code)	Mat. (code)	Site No.	Lat.	Long.	Brng. no.	Surf. Elev. (ft)	Sample top (ft)	Sample bottom (ft)	Lab K (cm/s)	Meth code	Fld K (cm/s)	Meth code	Bulk % >2.0mm	Matrix % sand (2.0 to 0.0625mm)	Matrix % silt (0.0625 to 0.002mm)	Matrix % clay (<0.002mm)	Unified Soil Class.	Bulk Percent P200	Dry Unit Wt. (pcf)	SPT (N)	Moist. cont. (%)	Liquid limit	Plastic. index	UC (tsf)
WN	1981	UN	99	36	431744	881155	B1	999.0	20.0	21.5					41	42	58	0	SC	37		49		13	9	
WN	1981	UN	5	36	431756	881158	B2	971.0	6.0	7.5					7	33	67	0	CL-ML	67		19		23	5	
WN	1981	UN	5	36	431756	881158	B2	971.0	10.0	11.5	3.30E-08	1			11	18			ML-CL	73						
WN	1981	NB	3	36	431750	881139	B3	975.0	25.0	26.5					12	28			CL	67		300		20	11	
WN	1981	NB	3	36	431744	881128	B4	946.0	30.0	31.5	3.60E-08	1			8	23			CL	73		77				
WN	1981	UN	99	36	431750	881131	B5	940.0	10.0	11.5					6	39	50	11	CL-ML	63		36		19	5	
WN	1981	NB	3	36	431750	881131	B5	940.0	40.0	41.5					25	9	91	0	CL-ML	71		120		23	4	
WN	1981	NB	3	34	431755	881041	MW3	905.0	25.0	25.4					11	29	58	12	ML-CL	66						
WN	1981	NB	3	34	431802	881037	MW5	873.9	8.0	9.0					19	42	52	6	ML-CL	51		37				
WN	1981	NB	3	34	431747	881037	MW2	901.4	29.5	35.0			1.70E-04	7												

Appendix 3 - HYDROGEOLOGIC AND ENGINEERING DATA FOR WAUKESHA COUNTY - BROOKFIELD SITE

IDENTITY: County (code)	Year	Litho-strat. unit (code)	Mat. (code)	Site No.	Lat.	Long.	Brng. no.	Surf. Elev. (ft)	Sample top (ft)	Sample bottom (ft)	HYDRAULIC CONDUCTIVITY: Lab K (cm/s)	Meth code	Fld K (cm/s)	Meth code	GRAINSIZE PERCENTAGES: Bulk % >2.0mm	Matrix % sand (2.0 to 0.0625mm)	Matrix % silt (0.0625 to 0.002mm)	Matrix % clay (<0.002mm)	ENGINEERING PROPERTIES: Unified Soil Class.	Bulk Percent P200	Dry Unit Wt. (pcf)	SPT (N)	Moist. cont. (%)	Liquid limit	Plastic. index	UC (tsf)
WK	1982	OC	3	37	430248	880847	W5A	840.6	8.5	10.0									CL				22.0	33	28	
WK	1982	OC	3	37	430248	880847	W5A	840.6	29.0	40.0			5.41E-05	7					CL							
WK	1982	OCNB	3	37	430248	880906	W6A	843.1	44.0	55.9			6.51E-05	7					ML.SW							
WK	1982	OCNB	3	37	430250	880908	W14B	903.2	64.0	70.0			3.97E-06	7					GM							
WK	1982	OCNB	34	37	430258	880847	W19	954.0	40.8	115.0			6.39E-06	7					CL,GW.GM							
WK	1982	OC	34	37	430245	880858	W20	828.4	4.2	26.1			3.04E-04	7					CL,GM,GW,SP,CL							
WK	1982	OC	53	.37	430245	880847	W21	833.4	5.0	25.3			4.19E-04	7					PT,ML.SM							
WK	1982	OC	3	37	430245	880847	W21A	833.4	38.5	40.0									CL				19.0	28	12	
WK	1982	OC	3	37	430245	880847	W21A	833.4	39.0	46.3			1.43E-06	7					CL							
WK	1982	NB	3	37	430253	880847	W22	875.8	31.1	45.5			2.16E-04	7					SM							
WK	1982	NB	99	37	430253	880847	W22A	875.8	65.0	71.3			2.33E-05	7					SM							
WK	1982	OC	3	37	430249	880858	W23	858.7	23.5	25.0									CL-ML				11.0	18	7	
WK	1982	UN	3	37	430249	880858	W23	858.7	15.0	40.0			7.04E-05	7					SM,CL-ML.SM							
WK	1975	OC	3	37	430249	880858	B2B	860.2	10.0	12.0									SW	23						
WK	1975	OC	3	37	430249	880858	B2B	860.2	20.0	22.0									SW-CL	46	130.0		13.0	17	5	
WK	1975	OC	3	37	430249	880858	B2B	860.2	30.0	31.0									CL	58	138.0		9.0	18	11	
WK	1975	OC	3	37	430248	880911	B6	843.5	19.0	20.0									CL					22	9	
WK	1975	OC	3	37	430250	880908	B12	870.6	4.0	5.0									CL		108.0		15.0	40	23	
WK	1975	OC	3	37	430250	880908	B12	870.6	24.0	25.0									CL					19	7	
WK	1975	OC	3	37	430250	880908	B12	870.6	14.0	15.0									CL					18	7	

Appendix 3 - HYDROGEOLOGIC AND ENGINEERING DATA FOR WAUPACA COUNTY, KEMPF SITE

IDENTITY: County (code)	Year	Litho-strat. unit (code)	Mat. (code)	Site No.	Lat.	Long.	Brng. no.	Surf. Elev. (ft)	Sample top (ft)	Sample bottom (ft)	HYDRAULIC CONDUCTIVITY: Lab K (cm/s)	Meth code	Fld K (cm/s)	Meth code	GRAINSIZE PERCENTAGES: Bulk % >2.0mm	Matrix % sand (2.0 to 0.0625mm)	Matrix % silt (0.0625 to 0.002mm)	Matrix % clay (<0.002mm)	ENGINEERING PROPERTIES: Unified Soil Class.	Bulk Percent P200	Dry Unit Wt. (pcf)	SPT (N)	Moist. cont. (%)	Liquid limit	Plastic. index	UC (tsf)
WP	1983	KEKI	3	38	442628	885824	B4	904.4	9.5	11.0					4	26	59	15	CL	74		13		26	11	
WP	1983	HO	4	38	442628	885824	B4	904.4	19.5	21.0					45	78			SP-SM	12		60				
WP	1983	KEKI	3	38	442627	885831	B5	903.2	9.5	11.0					14	37	47	16	CL	56		23		24	11	
WP	1983	KEKI	3	38	442630	885837	B6	904.7	5.0						4	28	51	21	CL	71			16.0	26	11	
WP	1983	KEKI	3	38	442630	885837	B6	904.7	10.0		3.00E-07	3			11	26	48	26	CL	68			12.0	29	15	
WP	1983	KEKI	3	38	442630	885837	B6	904.7	15.0						3	28	58	14	CL	77				23	7	
WP	1983	HO	4	38	442630	885837	OW6A	904.7	55.2	64.5			1.87E-04	7					SP							
WP	1983	KEKI	3	38	442630	885829	B8	901.8	5.5		1.00E-07	3			2	34	45	21	CL	68			22.0	30	15	
WP	1983	KEKI	3	38	442630	885829	B8	901.8	10.5						5	29	46	24	CL	69			16.0	27	14	
WP	1983	KEKI	3	38	442630	885826	B9	905.2	15.5		5.00E-07	3			28	31	53	17	CL	52				24	9	
WP	1983	KEKI	3	38	442630	885822	B10		5.5						4	26	53	21	CL	75			19.0	29	14	
WP	1983	KEKI	3	38	442630	885822	B10		10.5						6	28	50	22	CL	72			14.0	26	12	
WP	1983	HO	4	38	442630	885822	OW10A	906.9	58.8	69.5			7.73E-04	7					SP							
WP	1983	HO	4	38	442628	885837	B11	900.8	34.5	36.0					54				SP-SM	7		100				
WP	1983	KEKI	99	38	442628	885834	B12	893.6	5.5		2.00E-07	3			1	64	20	16	SC	38			22.0	24	10	
WP	1983	KEKI	3	38	442628	885829	B13	903.2	1.0						5	52	36	13	CL	48			16.0	18	2	
WP	1983	KEKI	99	38	442628	885826	B14	904.7	5.5						31	64	28	9	SC	28		26				
WP	1983	KEKI	3	38	442628	885822	B15	903.9	5.5						2	43	33	24	CL	58		4				
WP	1983	HO	4	38	442628	885822	B15	903.9	14.5	16.0					30				SC	13		8				
WP	1983	KEKI	3	38	442626	885837	B16	890.9	5.5		2.00E-07	3			4	31	52	17	CL	78			14.0	26	11	
WP	1983	KEKI	3	38	442626	885837	B16	890.9	10.5						5	29	48	22	CL	70			14.0	25	9	
WP	1983	KEKI	99	38	442626	885834	B17	895.8	5.5						3	59	23	19	SC	45			21.0	23	11	
WP	1983	KEKI	3	38	442626	885829	B18	899.5	5.5		6.00E-08	3			8	43	43	13	CL	57			15.0	24	11	
WP	1983	HO	4	38	442626	885829	OW18A	899.5	51.0	69.0			4.20E-04	7					SP							
WP	1983	KEKI	3	38	442626	885827	B19	901.1	10.5		6.00E-08	3			5	29	43	27	CL	69				30	16	
WP	1983	KEKI	3	38	442626	885824	B20	903.1	5.5						4	38	44	19	CL	65			18.0	30	13	
WP	1983	KEKI	3	38	442626	885824	B20	903.1	10.5		2.00E-08	3			5	35	42	23	CL	68			13.0	30	15	
WP	1983	HO	4	38	442624	885829	B23	894.9	10.5						29	82	13	6	SM-SP	15		30				
WP	1983	HO	4	38	442621	885824	B25	902.1	29.5	31.0					36				SP-SM	7		73				
WP	1983	KEKI	3	38	442621	885837	B26	891.1	5.5						5	36	44	20	CL	65		65	17.0	25	11	
WP	1983	KEKI	3	38	442621	885837	B26	891.1	10.5		8.00E-08	3			9	32	51	18	CL	66		65	12.0	32	19	
WP	1983	HO	4	38	442621	885837	OW26A	891.1	41.6	53.0			4.21E-04	7					SP,SM-SP,SP							
WP	1983	KEKI	3	38	442621	885829	B28	892.3	5.5		4.00E-08	3			1	33	43	23	CL	71			23.0	27	10	
WP	1983	HO	4	38	442621	885829	OW28A	892.3	50.3	59.5			5.47E-04	7					SP							
WP	1983	KEKI	3	38	442621	885824	B30	899.9	5.5						3	39	42	18	CL	60			22.0	28	11	
WP	1983	KEKI	3	38	442621	885824	B30	899.9	10.5						7	30	42	28	CL	69			13.0	29	13	
WP	1983	KEKI	3	38	442621	885824	B30	899.9	15.5						11	30	40	29	CL	65		22				

Appendix 3 - HYDROGEOLOGIC AND ENGINEERING DATA FOR WAUPACA COUNTY, TOWN OF ROYALTON SITE

IDENTITY: County (code)	Year	Litho-strat. unit (code)	Mat. (code)	Site No.	Lat.	Long.	Brng. no.	Surf. Elev. (ft)	Sample top (ft)	Sample bottom (ft)	HYDRAULIC CONDUCTIVITY: Lab K (cm/s)	Meth code	Fld K (cm/s)	Meth code	GRAINSIZE PERCENTAGES: Bulk % >2.0mm	Matrix % sand (2.0 to 0.0625mm)	Matrix % silt (0.0625 to 0.002mm)	Matrix % clay (<0.002mm)	ENGINEERING PROPERTIES: Unified Soil Class.	Bulk Percent P200	Dry Unit Wt. (pcf)	SPT (N)	Moist. cont.(%)	Liquid limit	Plastic. index	UC (tsf)
WP	1982	KEKI	3	39	442034	885655	B1	811.7	2.0	3.5					2	35	43	22	CL	66		20		26	11	1.5
WP	1982	KE	5	39	442034	885655	B1	811.7	14.5	16.0					0	14	77	9	ML	91		38				
WP	1982	KE	3	39	442034	885655	B1	811.7	39.6	51.0			3.79E-05	7					CL-ML,CL							4.0
WP	1982	KEKI	3	39	442029	885655	B2	803.8	4.5	6.0					7	37	37	27	ML-CL	63		19		21	7	4.5
WP	1982	KE	4	39	442029	885655	B2	803.8	34.5	36.0					3	94	2	4	SP	7		75				
WP	1982	KEKI	3	39	442023	885655	B3	801.4	9.5	11.0					2	31	49	20	ML-CL	71		40		20	7	
WP	1982	KE	4	39	442023	885655	B3	801.4	19.5	21.0					0	3	76	21	ML-CL	97		44		30	7	
WP	1982	KEKI	3	39	442017	885655	B4	791.8	4.5	6.0					3	31	51	19	ML-CL	70		12		20	7	4.0
WP	1982	KE	4	39	442017	885655	B4	791.8	14.5	16.0					0	89	10	1	SP	15		35				
WP	1982	KE	5	39	442023	885706	B5	788.6	19.5	21.0					0	2	80	18	CL-ML	99		42		29	7	
WP	1982	KE	4	39	442023	885706	B5	788.6	29.5	31.0					22	92	3	5	SP	6		42				

Appendix 3 - HYDROGEOLOGIC AND ENGINEERING DATA FOR WINNEBAGO COUNTY - BARTLETT SITE

IDENTITY											HYDRAULIC CONDUCTIVITY				GRAINSIZE PERCENTAGES				ENGINEERING PROPERTIES							
County (code)	Year	Litho-strat. unit (code)	Mat. (code)	Site No.	Lat.	Long.	Brng. no.	Surf. Elev. (ft)	Sample top (ft)	Sample bottom (ft)	Lab K (cm/s)	Meth code	Fld K (cm/s)	Meth code	Bulk % >2.0mm	Matrix % sand (2.0 to 0.0625mm)	Matrix % silt (0.0625 to 0.002mm)	Matrix % clay (<0.002mm)	Unified Soil Class.	Bulk Percent P200	Dry Unit Wt. (pcf)	SPT (N)	Moist. cont.(%)	Liquid limit	Plastic. index	UC (tsf)
WI	1984	KEkl	3	40	440513	883315	B34	761.3	25.0						2	2	32	66	CL	96		8		45	25	
WI	1984	UN	5	40	440513	883315	B34	761.3	45.0						0	5	59	36	CL	99		7		26	11	
WI	1984	UN	5	40	440513	883315	B34	761.3	60.0						1	66			SM	37		65				
WI	1984	KEkl	3	40	440513	883315	B34	761.3	15.0						0	4	30	66	CL	99		9				
WI	1985	KEkl	3	40	440513	883315	P34B	761.3	10.0	12.5	1.00E-08	3							CH					50	27	
WI	1984	KEkl	3	40	440517	883252	B37	763.0	20.0						0	2	27	71	CL	99		10		47	24	
WI	1984	UN	3	40	440517	883252	B39	762.3	55.0						59	59			GM	18						
WI	1985	KEkl	3	40	440517	883252	P39B	762.3	20.0	21.8	4.00E-08	3							CH							
WI	1984	KEkl	3	40	440517	883309	B40	762.5	30.0		4.00E-07	3			2	4	27	69	CL	94		15		40	20	
WI	1985	KEkl	3	40	440523	883252	P42	765.3	15.0	17.0	4.00E-08	3			3	6	36	58	CH	96				48	27	
WI	1985	KE	5	40	440523	883252	P42	765.3	38.0	40.0	3.00E-08	3														
WI	1985	UN	3	40	440523	883252	P42	765.3	53.0	55.0	2.00E-04	1			0	4	69	27	ML	99						
WI	1984	KEkl	3	40	440504	883327	B43	763.0	25.0													10		39	19	
WI	1985	KEkl	3	40	440508	883322	B45	752.6	30.0						0	88			SM	13		5				
WI	1985	KEkl	3	40	440508	883322	P45B	752.6	29.0	31.7	2.00E-07	3							CH							
WI	1985	UN	99	40	440504	883327	P46	750.7	55.0						0	38			ML	64		14				
WI	1985	KE	5	40	440502	883309	B51	751.0	32.0						2	2	39	59	CH	97		11		54	36	
WI	1985	UN	3	40	440504	883319	B52	752.5	55.0						32	43			SM	39						
WI	1985	KEkl	3	40	440511	883252	B62	761.0	7.0						7	17			CL	77		28				
WI	1985	KEkl	3	40	440511	883252	B62	761.0	11.0						0	1			CH	99		18				
WI	1985	KEkl	3	40	440511	883252	B62	761.0	15.0						0	3			CH	97						
WI	1985	KEkl	3	40	440511	883252	B62	761.0	17.0						0	1			CH	99						
WI	1985	KEkl	3	40	440511	883252	B62	761.0	21.0						0	2			CH	98						
WI	1985	KEkl	3	40	440511	883252	B62	761.0	25.0						0	1			CH	99						
WI	1985	KEkl	3	40	440511	883252	B62	761.0	29.0						0	3			CH	97						
WI	1985	KE	513	40	440511	883252	B62	761.0	35.0						0	2			OL	98						
WI	1984	UN	3	40	440500	883315	B5	750.8	50.0	50.5					21	70			SM	44						
WI	1984	UN	3	40	440500	883258	B8	758.4	30.0						43	51			SM	30						
WI	1984	KEkl	3	40	440504	883245	B14	768.5	8.0	10.0					1	1	28	71	CL	99		8		37	11	
WI	1984	UN	3	40	440504	883258	B16	761.5	35.0	36.0					60	38	50	13	GC-GM	26		15		18	6	
WI	1984	UN	3	40	440504	883258	B16	761.5	40.0	41.0					16				SM	49		125				
WI	1984	UN	3	40	440504	883258	B16	761.5	44.0	46.0					37	54	37	10	SC-SM	32		206		16	4	
WI	1985	KEkl	3	40	440504	883258	P16		14.0	16.0	2.00E-08	3			2	0	28	72	CH	98				57	33	
WI	1985	KE	35	40	440504	883258	P16		29.0	31.0	2.00E-08	3			1	1	27	72	CH	98				61	35	
WI	1984	KEkl	3	40	440504	883304	B17	754.0	20.0						0	2	25	73	CL	98		9		44	21	
WI	1984	KEkl	3	40	440504	883315	B19	752.0	25.0						0	2	43	55	CL	98		15		37	18	
WI	1984	KEkl	3	40	440504	883315	B19	752.0	30.0										CL			7		24	12	
WI	1984	KEkl	3	40	440508	883252	B23	762.7	15.0						0	4	30	66	CL	97		11		45	23	
WI	1984	KE	5	40	440599	883399	B24	760.0	39.0						0	4	38	58	CH	97		22		53	36	
WI	1984	KEkl	3	40	440508	883309	B26	759.9	25.0						1	2	29	69	CL	97		25		41	20	
WI	1985	KEkl	3	40	440508	883309	P26B	759.9	15.0	17.8	3.00E-08	3			0	1	37	62	CH	99				50	27	
WI	1985	KEkl	3	40	440508	883309	P26B	759.9	30.0	32.8	1.00E-08	3			1	3	27	70	CH	97						
WI	1985	KE	5	40	440508	883309	P26B	759.9	40.0	42.5	8.00E-08	3							CL,ML			17				
WI	1984	KEkl	3	40	440508	883315	B27	753.5	25.0										CH			8		51	28	
WI	1984	KE	5	40	440508	883315	B27	753.5	40.0										CL,ML			7		26	11	
WI	1985	UN	3	40	440513	883252	B30	762.5	60.0						39	34			SM	41		143				

Appendix 3 - HYDROGEOLOGIC AND ENGINEERING DATA FOR WINNEBAGO COUNTY - BARTLETT SITE

IDENTITY: County (code)	Year	Litho-strat. unit (code)	Mat. (code)	Site No.	Lat.	Long.	Brno. no.	Surf. Elev. (ft)	Sample top (ft)	Sample bottom (ft)	HYDRAULIC CONDUCTIVITY: Lab K (cm/s)	Meth code	Fld K (cm/s)	Meth code	GRAINSIZE PERCENTAGES: Bulk % >2.0mm	Matrix % sand (2.0 to 0.0625mm)	Matrix % silt (0.0625 to 0.002mm)	Matrix % clay (<0.002mm)	ENGINEERING PROPERTIES: Unified Soil Class.	Bulk Percent P200	Dry Unit Wt. (pcf)	SPT (N)	Moist. cont.(%)	Liquid limit	Plastic. index	UC (tsf)
WI	1985	KEK1	3	40	440513	883258	P31	762.4	10.0	12.5	7.00E-09	3							CL					49	33	
WI	1985	KEk1	3	40	440513	883258	P31B	762.4	25.0	27.6	3.00E-08	3							CL					45	29	
WI	1985	UN	5	40	440513	883258	P31C	762.4	53.0	55.0	7.00E-08	3							CL							
WI	1984	UN	5	40	440513	883258	B31	762.4	55.0						0	1	49	50	CL	99		11		29	14	
WI	1984	KE	5	40	440513	883304	B32	763.0	50.0						1	3	42	55	CL	96		19		49	32	
WI	1985	KE	5	40	440511	883252	B62	761.0	37.0						0	11			ML&CH	89						
WI	1985	KE	5	40	440511	883252	B62	761.0	39.0						0	11			ML&CH	91						
WI	1985	KE	5	40	440511	883252	B62	761.0	41.0						0	16			ML&CH	86						
WI	1985	KE	5	40	440511	883252	B62	761.0	45.0						0	12			CH&ML	89						
WI	1985	KE	5	40	440511	883252	B62	761.0	49.0						0	11			CH&ML	89						
WI	1985	KE	99	40	440508	883302	B64	761.1	54.5	55.0					0	2			CL-ML	98		19				
WI	1985	UN	3	40	440515	883309	B74	763.5	50.0						34	52			SM	32						
WI	1985	KEk1	3	40	440520	883302	B78	764.6	26.5	28.5	3.00E-08	3														
WI	1985	KEk1	3	40	440520	883302	B78	764.6	30.0															66	40	
WI	1985	KE	513	40	440520	883302	B78	764.6	38.0						0	2	44	54	CL	99		4		47	29	
WI	1985	UN	4	40	440520	883302	B78	764.6	45.0						0	70	30	0	SM	43		22				
WI	1985	UN	4	40	440520	883302	B78	764.6	50.0						0	67	33	0	SM	44		22				
WI	1985	UN	4	40	440520	883302	B78	764.6	55.0						28	90			SP-SM	8		62				
WI	1985	UN	5	40	440520	883309	B79	760.2	45.0						0	4			CL	96		14				
WI	1985	UN	4	40	440520	883309	B79	760.2	55.0						0	75			SM	29		15				
WI	1984	KEk1	3	40	440523	883239	OW1A	774.6	4.0	20.5			5.87E-07	7					CL,CH							
WI	1985	KEk1	3	40	440523	883239	P1B	774.5	34.1	40.1			4.54E-07	7					CL,CH							
WI	1984	KEk1	3	40	440500	883239	OW4A	775.8	12.1	20.0			1.52E-05	7					CL,CH							
WI	1984	UN	12	40	440500	883239	P4B	776.0	37.0	43.0			2.02E-04	7					dolLS							
WI	1984	KEk1	3	40	440500	883315	OW5A	750.7	5.2	20.0			4.88E-07	7					CH&ML,CL&CH							
WI	1985	UN	3	40	440500	883315	P5C	750.4	53.5	60.0			2.28E-04	7					ML							
WI	1985	KEK1	3	40	440500	883258	OW8A	758.2	7.1	20.0			2.14E-06	7					CL,CL							
WI	1985	UN	3	40	440500	883258	P8B	758.6	29.0	33.0			7.53E-05	7					SM							
WI	1985	UN	12	40	440500	883258	P8C	758.2	44.0	50.0			1.29E-03	7					LS							
WI	1984	KEK1	3	40	440504	883258	OW16A	761.3	7.0	19.9			2.89E-06	7					CL							
WI	1984	UN	3	40	440504	883258	P16B	761.2	39.0	45.0			3.89E-05	7					ML							
WI	1984	KEk1	3	40	440504	983309	OW18A	752.9	6.0	20.0			1.03E-05	7					CL							
WI	1984	KEk1	3	40	440508	883239	OW21A	770.1	7.0	20.0			2.67E-06	7					CL							
WI	1994	KEUN	3	40	440508	883239	P21B	770.6	21.5	27.0			4.09E-05	7					CL,ML							
WI	1984	KEk1	3	40	440508	883252	OW23A	762.6	6.0	20.3			1.69E-07	7					CL							
WI	1984	KEKL	3	40	440508	893309	OW26A	760.1	12.0	20.5			1.73E-06	7					CL&ML							
WI	1984	KE	5	40	440508	883309	P26B	759.9	38.0	45.9			5.80E-05	7					ML,CL&ML,ML							
WI	1984	KEk1	3	40	440513	883245	OW29A	764.7	7.0	20.0			2.45E-07	7					CL							
WI	1984	KEk1	3	40	440513	883258	OW31A	761.9	7.0	20.0			1.18E-05	7					CL							
WI	1985	KE	5	40	440513	883258	P31B	762.0	38.8	45.0			2.69E-05	7					CL,ML							
WI	1985	KE	5	40	440513	883258	P31C	761.9	55.4	60.0			7.35E-05	7					CL							
WI	1985	KEk1	3	40	440513	983215	OW34A	761.0	7.0	20.0			3.65E-06	7					CL,CH,CL							
WI	1985	KE	5	40	440513	883215	P34B	761.4	37.6	45.0			1.25E-04	7					CL,CL&ML,CL							
WI	1985	UN	4	40	440513	883215	P34C	761.2	59.8	64.0			3.01E-04	7					SM							
WI	1985	KEk1	3	40	440517	883239	OW35A	768.7	7.0	19.8			2.17E-07	7					CL							
WI	1985	KE	35	40	440517	893239	P35B	768.5	33.9	40.0			4.51E-06	7					CL,ML							

Appendix 5 - HYDROGEOLOGIC AND ENGINEERING DATA FOR WINNEBAGO COUNTY - BARTLETT SITE

IDENTITY											HYDRAULIC CONDUCTIVITY				GRAINSIZE PERCENTAGES				ENGINEERING PROPERTIES							
County (code)	Year	Litho-strat. unit (code)	Mat. (code)	Site No.	Lat.	Long.	Brng. no.	Surf. Elev. (ft)	Sample top (ft)	Sample bottom (ft)	Lab K (cm/s)	Meth code	Fld K (cm/s)	Meth code	Bulk % >2.0mm	Matrix % sand (2.0 to 0.0625mm)	Matrix % silt (0.0625 to 0.002mm)	Matrix % clay (<0.002mm)	Unified Soil Class.	Bulk Percent P200	Dry Unit Wt. (pcf)	SPT (N)	Moist. cont. (%)	Liquid limit	Plastic. index	UC (tsf)
WI	1985	UN	3	40	440517	883239	P35C	768.7	46.7	53.0			9.49E-05	7					ML							
WI	1985	KEkl	3	40	440517	883258	OW38A	763.0	6.2	20.2			4.41E-07	7					CL							
WI	1985	KEkl	3	40	440517	883304	OW39A	762.4	7.0	20.0			5.22E-07	7					CL,CH							
WI	1985	KEkl	3	40	440523	883252	OW42A	764.8	5.5	20.0			2.98E-06	7					CL.CH							
WI	1985	KE	5	40	440523	883252	P42B	764.6	33.0	40.0			1.63E-06	7					CH,ML-CL,CL							
WI	1985	UN	3	40	440523	883252	P42C	764.8	51.5	55.0			7.57E-04	7					ML							
WI	1985	KEkl	3	40	440523	883304	OW43A	752.5	7.0	18.6			3.04E-07	7					CL							
WI	1985	KE	5	40	440523	883304	P43B		38.0	45.0			6.75E-05	7					CL							
WI	1985	KEkl	35	40	440508	883322	OW45A	753.4	6.5	20.0			2.63E-05	7					CL,CL&ML							
WI	1985	KE	35	40	440504	883327	OW46A	749.9	6.5	19.5			3.79E-05	7					CL,CL&ML							
WI	1985	KE	35	40	440500	883307	OW47A	751.1	7.0	29.9			1.05E-06	7					CL,CH&ML-CL,CL.CH							
WI	1985	KEkl	35	40	440504	883319	OW52A	753.2	7.0	20.0			4.85E-06	7					CH,CL							
WI	1985	KEkl	3	40	440508	883302	OW64A	761.2	13.4	19.7			1.86E-06	7					CH							
WI	1985	KEkl	3	40	440512	883307	OW68A	766.6	7.3	20.0			2.93E-07	7					CL,CH							
WI	1985	KEkl	3	40	440517	883312	OW75A	759.9	6.0	20.0			3.80E-07	7					CH							
WI	1985	KEkl	3	40	440520	883242	OW76A	766.7	5.0	20.0			2.72E-05	7					CL,CL,CH							
WI	1985	KEkl	3	40	440520	883256	OW77A	767.5	7.0	20.0			1.25E-07	7					CL,CL,CH							
WI	1985	KEkl	3	40	440520	883302	OW78A	764.7	11.1	20.0			2.14E-06	7					CH							
WI	1985	KEkl	3	40	440520	883309	OW79A	760.3	13.5	20.0			8.60E-07	7					CH							
WI	1985	KE	99	40	440520	883309	P79B	759.9	37.6	44.6			1.45E-04	7					CH&ML,CH,CL							
WI	1985	KEkl	3	40	440523	883258	OW80A	763.0	12.5	20.0			2.94E-06	7					CH							

Appendix 3 - HYDROGEOLOGIC AND ENGINEERING DATA FOR WINNEBAGO COUNTY, WINNEBAGO COUNTY LANDFILL

+ IDENTITY											+ HYDRAULIC CONDUCTIVITY				+ GRAINSIZE PERCENTAGES				+ ENGINEERING PROPERTIES							
County (code)	Year	Litho-strat. unit (code)	Mat. (code)	Site No.	Lat.	Long.	Bring. no.	Surf. Elev. (ft)	Sample top (ft)	Sample bottom (ft)	Lab K (cm/s)	Meth code	Fld K (cm/s)	Meth code	Bulk % >2.0mm	Matrix % sand (2.0 to 0.0625mm)	Matrix % silt (0.0625 to 0.002mm)	Matrix % clay (<0.002mm)	Unified Soil Class.	Bulk Percent P200	Dry Unit Wt. (pcf)	SPT (N)	Moist. cont.(%)	Liquid limit	Plastic. index	UC (tsf)
WI	1983	UN	3	41	470350	883355	D5-1	772.3	15.0	16.5					26	46			SM	45						
WI	1983	UN	3	41	470399	883499	D5-2	771.7	20.0	21.5					23	35			ML	52						
WI	1983	UN	3	41	470399	883499	D5-2A	771.7	15.0	16.5					18	39			ML-CL	53						
WI	1983	UN	3	41	470399	883499	D5-3	771.8	20.0	20.8					6	31			ML	69						
WI	1983	UN	3	41	470399	883499	D5-4	773.0	15.0	16.0					20	46			ML	50						
WI	1983	UN	3	41	470399	883499	D5-6	774.8	20.0	20.5					24	47			SM	41						
WI	1983	UN	3	41	470399	883499	D5-7	774.0	7.5	9.0					25	43			SM	44						
WI	1983	UN	3	41	470399	883499	D5-7	774.0	20.0	21.5					40	60			SM	25						
WI	1983	UN	3	41	470399	883499	D5-8	774.5	7.5	9.0					75	56			SM	35						
WI	1983	UN	99	41	470399	883499	D5-8	774.5	20.0	21.5					18	39			ML	52						
WI	1983	UN	3	41	470399	883499	D5-9	776.3	7.5	9.0					23	48			SM	41						
WI	1983	UN	99	41	470399	883499	D5-9	776.3	25.0	26.0					32	43			SM	38						
WI	1983	UN	99	41	470399	883499	D5-10	778.5	25.0	25.5					32	43			SM	38						
WI	1983	UN	99	41	470399	883499	D5-11	780.7	7.5	9.0					28	44			SM	40						
WI	1983	UN	99	41	470399	883499	D5-11	780.7	30.0	30.6					20	44			SM	47						
WI	1983	UN	99	41	470399	883499	D5-12	781.4	25.0	25.5					21	49			SM	45						
WI	1983	UN	99	41	470399	883499	D5-13	781.4	10.0	11.5					19	57			SM	38						
WI	1983	UN	99	41	470399	883499	D5-13	781.4	25.0	26.5					48	58			SM	21						
WI	1983	UN	99	41	470399	883499	D5-14	780.0	25.0	25.6					40	50			SM	31						
WI	1983	UN	99	41	470399	883499	D5-15	778.7	10.0	11.5					55	78			GM	15						
WI	1983	UN	99	41	470399	883499	D5-15	778.7	25.0	25.6					28	40			SM	46						
WI	1983	UN	4	41	470399	883499	D5-16	778.6	10.0	11.5					3	95			SP	8						
WI	1983	UN	3	41	470399	883499	D5-16	778.6	35.0	35.5					20	44			SM	47						
WI	1983	UN	3	41	470399	883499	D5-17	778.3	6.0	7.5					21	31			ML	50						
WI	1983	UN	3	41	470399	883499	D6-3	768.0	19.0	19.5					25	40			ML	49						
WI	1983	UN	3	41	470399	883499	D6-4	768.4	25.0	25.5					22	42			ML	48						
WI	1983	UN	3	41	470399	883499	D6-5	768.5	20.0	21.0					20	31			ML	59						
WI	1983	UN	3	41	470399	883499	D6-6	769.2	20.0	21.0					23	42			ML	47						
WI	1983	UN	3	41	470399	883499	D6-7	769.1	20.0	21.0					21	43			ML	49						
WI	1983	UN	3	41	470399	883499	D6-8	768.8	20.0	21.0					21	39			ML	50						
WI	1983	UN	3	41	470399	883499	D6-9	768.9	20.0	21.0					20	38			ML	51						
WI	1983	UN	3	41	470399	883499	D6-10	769.2	20.0	21.5					7	14			ML	82						
WI	1983	UN	3	41	470399	883499	D6-11	769.3	30.0	31.5					17	28			ML	62						
WI	1983	UN	3	41	470399	883499	D6-12	770.2	15.0	16.0					26	46			SM	46						
WI	1982	UN	3	41	470344	883355	B-C-1	774.5	25.0	26.5					12	32			ML	61						
WI	1982	HO	3	41	470344	883355	B-C-1	774.5	35.0	36.5					7				SM	12						
WI	1982	UN	3	41	470342	883407	B-C-2	769.7	20.0	21.0					7	19			ML	78						
WI	1982	UN	3	41	470342	883407	B-C-2	769.7	30.0	31.5					21	43			ML	49						
WI	1982	UN	3	41	470350	883350	B-C-3	772.7	15.0	16.5					26	46			SM	44						
WI	1982	UN	3	41	470350	883350	B-C-3	772.7	25.0	26.5					24	41			SM	47						
WI	1982	UN	5	41	470344	883407	B-C-4	768.1	10.0	11.0					18	39			ML	54						
WI	1982	UN	3	41	470344	883407	B-C-4	768.1	20.0	21.5					25	33			ML	51						
WI	1982	UN	5	41	470344	883407	P29	768.1	37.0	40.0			1.70E-05	/					ML							
WI	1982	UN	3	41	470344	883407	P29A	768.0	11.5	15.0			2.10E-06	7					CL							
WI	1982	UN	3	41	470347	883350	B-C-5	773.3	10.0	11.0					42	48			SM	33						
WI	1982	UN	3	41	470347	883350	B-C-5	773.3	20.0	21.0					21	37			ML	51						

Appendix 3 - HYDROGEOLOGIC AND ENGINEERING DATA FOR WINNEBAGO COUNTY, WINNEBAGO COUNTY LANDFILL

IDENTITY											HYDRAULIC CONDUCTIVITY				GRAINSIZE PERCENTAGES				ENGINEERING PROPERTIES							
County (code)	Year	Litho-strat. unit (code)	Nat. (code)	Site No.	Lat.	Long.	Brng. no.	Surf. Elev. (ft)	Sample top (ft)	Sample bottom (ft)	Lab K (cm/s)	Meth code	Fld K (cm/s)	Meth code	Bulk % >2.0mm	Matrix % sand (2.0 to 0.0625mm)	Matrix % silt (0.0625 to 0.002mm)	Matrix % clay (<0.002mm)	Unified Soil Class.	Bulk Percent P200	Dry Unit Wt. (pcf)	SPT (N)	Moist. cont.(%)	Liquid limit	Plastic. index	UC (tsf)
WI	1982	UN	3	41	470347	883401	B-C-6	769.7	25.0	26.0					80	38			ML	51						
WI	1982	UN	3	41	470347	883401	B-C-6	769.7	35.0	36.5					0	2			ML	98						
WI	1982	UN	3	41	470347	883407	B-C-7	770.3	8.0	9.5					25	33			ML	51						
WI	1982	UN	3	41	470347	883407	B-C-7	770.3	20.0	21.5					22	41			SM	48						
WI	1982	UN	3	41	470350	883350	B-C-8	773.2	20.0	21.0					18	39			SM.ML	53						
WI	1982	UN	5	41	470350	883350	B-C-8	773.2	30.0	31.5					i	4			ML-CH	96						
WI	1982	UN	3	41	470350	883355	B-C-9	773.0	20.0	20.8					21	47			SM	48						
WI	1982	UN	3	41	470350	883355	B-C-9	773.0	30.0	30.8					30	36			SM	46						
WI	1982	UN	3	41	470350	883355	P30	773.0	39.5	42.5			7.40E-06	7					SM							
WI	1982	UN	3	41	470350	883355	P30A	773.0	17.8	20.3			1.50E-06	7					SM.ML							
WI	1982	UN	3	41	470350	883407	BC-10	765.6	8.0	9.5					15	28			ML	63						
WI	1982	UN	3	41	470350	883407	BC-10	765.6	15.0	16.5					22	36			ML	51						
WI	1982	UN	5	41	470350	883407	P28	765.6	25.5	27.5			3.20E-06	7					ML-CH							
WI	1982	UN	3	41	470350	883407	P28A	765.6	11.0	13.5			2.30E-05	7					ML							
WI	1982	UN	3	41	470352	883344	BC-11	768.2	20.0	21.0					24	34			ML	51						
WI	1982	UN	3	41	470352	883350	BC-12	770.9	8.0	9.0					30	43			SM	41						
WI	1982	UN	3	41	470352	883350	BC-12	770.9	19.0	20.0					30	43			SM	42						
WI	1982	UN	3	41	470352	883355	BC-13	772.2	10.0	11.5					i	14			ML	89						
WI	1982	UN	3	41	470352	883355	BC-13	772.2	20.0	21.0					30	43			SM	42						
WI	1982	UN	3	41	470352	883401	BC-14	765.1	10.0	11.0					22	36			ML	51						
WI	1982	UN	5	41	470352	883401	BC-14	765.1	19.0	20.5					22	4			ML-CH	76						
WI	1982	UN	3	41	470352	883407	BC-15	763.7	8.0	9.5					24	34			SM	46						
WI	1982	UN	3	41	470352	883407	BC-15	763.7	15.0	16.5					35	46			SM,ML	36						
WI	1982	UN	3	41	470354	883355	BC-16	763.4	14.0	14.5					25	40			SM	47						
WI	1982	UN	3	41	470354	883355	BC-16	763.4	24.5	25.0					32	49			SM.GM	38						
WI	1982	UN	3	41	470354	883355	P26	763.4	30.2	32.7			6.40E-06	7												
WI	1982	UN	3	41	470354	883355	P26A	763.4	10.1	12.6			2.90E-05	7												
WI	1982	UN	3	41	470354	883401	BC-17	763.3	15.0	16.0					16	33			ML	57						
WI	1982	HO	3	41	470354	883401	P27	763.3	31.0	34.0			1.60E-04	10					GM							
WI	1982	KEKIUN	3	41	470354	883401	P27A	763.3	9.9	12.4			1.90E-06	7					CL.ML							
WI	1979	HO	3	41	470344	883344	P19	782.2	20.8	23.3			2.30E-03	7					SP-SM							
WI	1979	KEKI	3	41	470349	883344	P20	770.6	15.2	17.2			1.80E-07	7					CL				17.6			1.8
WI	1979	UN	3	41	470342	883335	P21	775.2	18.0	21.0			3.10E-07	7					SM-ML		141.9		9.0			
WI	1979	UN	3	41	470342	883335	P21	775.2	20.0	21.5	6.10E-07	3							SM-ML		141.9					
WI	1979	KEKI	3	41	470342	883335	P21A	775.2	7.7	10.2			2.90E-07	7					CL				14.4			4.5
WI	1979	KEKI	3	41	470354	883335	P22	772.6	19.5	22.0			4.40E-07	7					CL							
WI	1979	KEKI	3	41	470354	883335	P22A	772.6	9.0	11.0			1.40E-07	7					CL							
WI	1979	UN	3	41	470343	883327	P23	775.1	17.9	20.4			3.80E-07	7					ML		125.8		14.0			
WI	1979	UN	3	41	470343	883327	P23	775.1	18.5	19.5	2.30E-04	3							ML		125.8					
WI	1979	UN	3	41	470343	883327	P24	777.8	19.0	21.5			3.50E-07	7					SM-ML							
WI	1979	KEKI	3	41	470347	883327	P24A	777.8	9.5	11.5			6.50E-07	7					CL				15.8			4.5
WI	1979	UN	5	41	470346	883333	B05	773.8	20.0	21.5	2.40E-04	3							ML-CL		144.7					
WI	1979	KEKI	3	41	470342	883331	B06	773.7	15.0	16.5	1.10E-08	3							CL		112.9					
WI	1981	UN	3	41	470354	883350	P25			33.0			3.80E-06	7					ML							
WI	1981	UN	3	41	470354	883350	P25A			13.3			3.60E-05	7					SM							
WI	1978	UN	3	41	470399	883499	B7.1E	772.8	10.0	11.0					24	47			ML	42						

Appendix 3 - HYDROGEOLOGIC AND ENGINEERING DATA FOR WINNEBAGO COUNTY, WINNEBAGO COUNTY LANDFILL

IDENTITY											HYDRAULIC CONDUCTIVITY				GRAINSIZE PERCENTAGES				ENGINEERING PROPERTIES							
County (code)	Year	Litho-strat. unit (code)	Mat. (code)	Site No.	Lat.	Long.	Brno. no.	Surf. Elev. (ft)	Sample top (ft)	Sample bottom (ft)	Lab K (cm/s)	Meth code	Fld K (cm/s)	Meth code	Bulk % >2.0mm	Matrix % sand (2.0 to 0.0625mm)	Matrix % silt (0.0625 to 0.002mm)	Matrix % clay (<0.002mm)	Unified Soil Class.	Bulk Percent P200	Dry Unit Wt. (pcf)	SPT (N)	Moist. cont.(%)	Liquid limit	Plastic. index	UC (tsf)
WI	1978	UN	3	41	470399	883499	B8E	764.7	6.0	6.3					24	34			ML	51						
WI	1978	UN	3	41	470399	883499	B8.8E	763.3	10.5	11.0					21	29			ML	52						
WI	1978	KEKI	3	41	470399	883499	B10E	763.7	2.0	3.2					8	29			CL	70						
WI	1978	UN	3	41	470399	883499	B11E	762.6	4.0	5.0					17	58			ML	44						
WI	1978	UN	99	41	470399	883499	B12E	762.8	4.0	4.9					15	35			ML	58						
WI	1978	UN	3	41	470399	883499	B12.6E	765.2	10.0	10.5					22	42			ML	49						
WI	1978	UN	3	41	470399	883499	B13E	774.5	15.0	15.5					19	44			ML	48						
WI	1978	UN	3	41	470399	883499	B7.1F	768.1	15.0	15.8					16	40			ML	53						
WI	1978	UN	3	41	470399	883499	B8F	764.6	10.0	10.5					16	40			ML	53						
WI	1978	UN	3	41	470399	883499	B8.8F	762.9	6.0	6.7					16	40			ML	53						
WI	1978	UN	3	41	470399	883499	B10F	761.8	6.0	6.8					22	49			ML	45						
WI	1978	UN	3	41	470399	883499	B11F	761.6	9.0	9.5					24	41			ML	50						
WI	1978	UN	3	41	470399	883499	B12F	761.9	6.0	6.8					30	50			SM-ML	40						
WI	1978	UN	3	41	470399	883499	B12F	761.9	9.0	10.0					26	46			ML	43						
WI	1978	UN	3	41	470399	883499	B12.6F	761.4	6.0	6.8					24	47			ML	44						
WI	1978	UN	3	41	470399	883499	B13F	774.4	5.0	5.8					16	52			ML	48						
WI	1978	UN	3	41	470399	883499	B7.5G	769.1	8.0	8.5					3	33			ML	70						
WI	1978	UN	3	41	470399	883499	B8.8G	768.6	10.0	10.5					16	46			ML	50						
WI	1978	UN	3	41	470399	883499	B10G	767.8	8.0	8.5					10	56			ML	48						
WI	1978	UN	3	41	470399	883499	B11G	768.0	6.0	6.4					17	58			ML	45						
WI	1978	UN	3	41	470399	883499	B12G	767.6	8.0	9.0					22	36			ML	55						
WI	1978	UN	3	41	470399	883499	B12.6G	767.7	16.5	17.0					22	55			ML	43						
WI	1978	UN	3	41	470399	883499	B13G	774.3	15.0	15.5					23	56			ML	37						
WI	1978	UN	3	41	470399	883499	B7.5H	773.8	21.5	22.5					30	44			ML	43						
WI	1978	UN	3	41	470399	883499	B8.8H	774.2	22.0	22.5					28	47			ML	43						
WI	1978	UN	3	41	470399	883499	B10H	773.1	21.0	21.5					28	51			ML	40						
WI	1978	UN	3	41	470399	883499	B11H	774.7	20.0	20.4					18	51			ML	44						
WI	1978	UN	3	41	470399	883499	B11H	774.7	23.0	23.4					23	55			ML	42						
WI	1978	UN	3	41	470399	883499	B12H	774.3	20.0	20.3					15	46			ML	53						
WI	1978	UN	3	41	470399	883499	B12.6H	771.4	20.0	20.4					23	48			ML	44						
WI	1978	UN	3	41	470399	883499	B13H	773.4	15.0	15.5					18	60			SM-ML	38						
WI	1978	UN	3	41	470399	883499	B7-I	773.6	15.0	15.7					19	63			ML-SM	35						
WI	1978	UN	3	41	470399	883499	B7-I	773.6	17.0	17.3					25	47			ML	43						
WI	1978	UN	3	41	470399	883499	B8-I	773.8	15.0	15.8					25	47			ML	43						
WI	1978	UN	3	41	470399	883499	B8.8I	774.1	15.7	16.0					14	48			ML	49						
WI	1978	UN	3	41	470399	883499	B8.8I	774.1	18.0	18.5					17	46			ML	49						
WI	1978	UN	3	41	470399	883499	B10-I	773.2	15.0	15.8					14	48			ML	49						
WI	1978	UN	3	41	470399	883499	B11-I	773.3	15.0	15.8					16	49			ML	45						
WI	1978	UN	3	41	470399	883499	B12-I	773.5	17.5	18.0					17	46			ML	50						
WI	1978	UN	3	41	470399	883499	B13-I	775.1	8.0	9.0					0	85			SM	25						
WI	1978	UN	3	41	470399	883499	B13-I	775.1	20.0	20.5					12	55			ML	42						
WI	1977	UN	3	41	470399	883499	B1.3	761.3	6.0	9.0					12	38			SM	59						
WI	1977	UN	99	41	470399	883499	B2.2	760.1	0.0	5.0					20	54			SM	43						
WI	1977	UN	3	41	470399	883499	B2.6	762.3	3.0	6.0					12	38			SM	57						
WI	1977	UN	4	41	470399	883499	B3.4	761.0	3.0	3.8					41	71	27	2	SM	19						
WI	1977	KE	3	41	470399	883499	B3.7	771.9	11.0	19.5					14	53			SM	44						

Appendix 3 - HYDROGEOLOGIC AND ENGINEERING DATA FOR WINNEBAGO COUNTY, WINNEBAGO COUNTY LANDFILL

IDENTITY: County (code)	Year	Litho-strat. unit (code)	Mat. (code)	Site No.	Lat.	Long.	Brno. no.	Surf. Elev. (ft)	Sample top (ft)	Sample bottom (ft)	HYDRAULIC CONDUCTIVITY: Lab K (cm/s)	Meth code	Fld K (cm/s)	Meth code	GRAINSIZE PERCENTAGES: Bulk % >2.0mm	Matrix % sand (2.0 to 0.0625mm)	Matrix % silt (0.0625 to 0.002mm)	Matrix % clay (<0.002mm)	ENGINEERING PROPERTIES: Unified Soil Class.	Bulk Percent P200	Dry Unit Wt. (pcf)	SPT (N)	Moist. cont.(%)	Liquid limit	Plastic. index	UC (tsf)
WI	1977	UN	3	41	470399	883499	B4.2	760.5	0.0	5.0					27	45			SM	44						
WI	1977	UN	3	41	470399	883499	B4.5	761.9	6.0	9.0					20	55			SM	28						
WI	1977	UN	3	41	470399	883499	B5.3	766.3	0.0	4.5					34	47			SM	40						
WI	1977	UN	5	41	470399	883499	B5.7	771.0	7.0	11.0					0	25			CL	82						
WI	1977	UN	99	41	470399	883499	B1.2	760.7	3.0	6.0					6	28			CL-ML	71						
WI	1977	UN	3	41	470399	883499	B1.2	760.7	6.0	9.0					8	51			SM	52						
WI	1977	UN	3	41	470399	883499	B1.6	767.2	14.0	15.5					6	41			SM	58						
WI	1977	UN	3	41	470399	883499	B1.7	773.0	6.0	12.5					37	49			SM	35						
WI	1977	UN	3	41	470399	883499	B2.1	760.4	0.0	3.0					12	43			SM	54						
WI	1977	UN	4	41	470399	883499	B2.2	760.1	0.0	5.0					20	50			SM							
WI	1977	UN	3	41	470399	883499	B2.4	760.5	0.0	5.0					13	43			SM	51						
WI	1977	UN	3	41	470399	883499	B2.6	762.3	3.0	6.0					12	38			ML	58						
WI	1977	UN	3	41	470399	883499	B2.7	772.5	5.0	15.4					34	58			SM	32						
WI	1977	UN	3	41	470399	883499	B3.1	760.8	9.0	9.5					13	48			SM	49						
WI	1977	UN	4	41	470399	883499	B3.2	759.9	0.0	5.0					85	47			SM	49						
WI	1977	UN	3	41	470399	883499	B3.3	760.7	0.0	5.0					29	36			SM	43						
WI	1977	UN	3	41	470399	883499	B3.4	761.0	3.0	3.8					41	69	29	2	SM	19						
WI	1977	UN	3	41	470399	883499	B3.5	762.1	3.0	6.0					15	53			SM	45						
WI	1977	UN	3	41	470399	883499	B3.6	760.3	0.0	5.0					22	53			SM	41						
WI	1977	KE	3	41	470399	883499	B3.7	771.9	10.5						10	61			SP	46						
WI	1977	UN	3	41	470399	883499	B4.3	760.8	0.0	5.0					14	48			SM	52						
WI	1977	UN	3	41	470399	883499	B4.4	761.4	0.0	5.0					13	48			SM	50						
WI	1977	UN	3	41	470399	883499	B4.6	760.1	0.0	3.0					14	48			SM-SC	49						
WI	1977	UN	4	41	470399	883499	B4.7	771.5	9.0	14.0					0				CL-ML	88						
WI	1977	UN	3	41	470399	883499	B5.1	778.3	21.5	26.5									SM		142.0		8.8			
WI	1977	UN	3	41	470399	883499	B5.1	778.3	24.0	25.5					19	54			SM	42						
WI	1977	UN	3	41	470399	883499	B5.5	765.9	6.0	9.0					23	61			SM	34						
WI	1977	UN	3	41	470399	883499	B5.6	767.6	6.0	9.0					40	53			SM	30						
WI	1977	UN	3	41	470399	883499	BW1-9		15.0	20.5					14	45			SM	52						
WI	1977	KEKI	3	41	470332	883335	B7C	762.9	2.0	3.5	1.80E-06	3							CL		102.2		27.5	33	12	
WI	1977	UN	3	41	470334	883331	B10D	766.2	2.0	3.5	1.30E-07	3							ML		150.6		10.7	15	4	
WI	1978	UN	3	41	470335	883331	B10E	763.7	4.0	5.0	9.80E-05	3							ML							
WI	1978	UN	5	41	470335	883335	B7.1E	772.8	10.0	11.0	3.90E-05	3							ML							
WI	1978	UN	3	41	470335	883327	B12.6E	765.2	8.0	8.7	9.70E-05	3							ML							
WI	1979	UN	3	41	470335	883342	B2	767.0	8.5	10.0	1.80E-07	3							ML					16	5	
WI	1979	UN	3	41	470338	883338	B26	759.1	7.5	8.5	1.40E-04	3							SM					15	7	
WI	1975	KEKI	3	41	470339	883407	P-1C	767.5	4.0	5.0									CL		95.2		13.9			
WI	1975	UN	99	41	470339	883407	P-1C	767.5	9.0	10.0									SC-CL		132.8		9.0			
WI	1975	UN	99	41	470339	883407	P-1C	767.5	14.0	15.0									SC-CL		130.6		8.5			
WI	1975	UN	3	41	470339	883407	P-1-20	767.5	36.0	37.0			6.30E-05	7												
WI	1975	UN	3	41	470339	883407	P-1-40	767.5	43.5	46.0			8.40E-05	7												
WI	1975	KEKI	3	41	470345	883355	P-2C	772.5	4.0	5.0									CL		115.9		16.1			
WI	1975	KEKI	3	41	470345	883355	P-2C	772.5	9.0	10.0									CL		119.8		13.8			
WI	1975	UN	35	41	470345	883355	P-2C	772.5	14.0	15.0									CL-GP		123.0		5.9			
WI	1975	UN	35	41	470345	883355	P-2-20	772.5	39.0	40.0			4.00E-07	7					CL-GP							
WI	1975	UN	99	41	470345	883355	P-2-40	772.5	42.5	45.0			4.70E-07	7					GP							

Appendix 3 - HYDROGEOLOGIC AND ENGINEERING DATA FOR WINNEBAGO COUNTY, WINNEBAGO COUNTY LANDFILL

IDENTITY: County (code)	Year	Litho-strat. unit (code)	Mat. (code)	Site No.	Lat.	Long.	Brng. no.	Surf. Elev. (ft)	Sample top (ft)	Sample bottom (ft)	HYDRAULIC CONDUCTIVITY: Lab K (cm/s)	Meth code	Fld K (cm/s)	Meth code	GRAINSIZE PERCENTAGES: Bulk % >2.0mm	Matrix % sand (2.0 to 0.0625mm)	Matrix % silt (0.0625 to 0.002mm)	Matrix % clay (<0.002mm)	ENGINEERING PROPERTIES: Unified Soil Class.	Bulk Percent P200	Dry Unit Wt. (pcf)	SPT (N)	Moist. cont.(%)	Liquid limit	Plastic. index	UC (tsf)
WI	1975	KE	99	41	470345	883355	P3	761.8	4.0	5.0					4	28	44	28	CL-ML							
WI	1975	UN	3	41	470354	883346	P-4-20	769.7	16.0	17.0			6.80E-07	7					GC-CL							
WI	1975	UN	12	41	470354	883346	P-4-40	769.7	36.0	37.0			1.30E-06	7					LS							
WI	1975	UN	12	41	470354	883346	P-4-60	769.7	31.0	32.0			5.90E-05	7					LS							
WI	1975	KEKI	3	41	470338	883344	P-5C	782.8	4.0	5.0									CL		116.8		13.6			
WI	1975	KEKI	3	41	470338	883344	P-5C	782.8	9.0	10.0									CL				9.1			
WI	1975	UN	3	41	470338	883327	P-6C	775.0	29.0	30.0									CL-GP		135.5		8.0	16	4	
WI	1975	KEKI	3	41	470338	883327	P-6	775.0	9.0	10.0					7	27	55	18	CL							
WI	1975	KEKI	3	41	470330	883327	P-7C	777.7	4.0	5.0									CL		117.5		13.6	38	11	
WI	1975	UN	3	41	470330	883344	P-8C	777.2	34.0	35.0									CL-GP		133.0		6.7	17	5	
WI	1975	UN	3	41	470332	883354	P-9C	782.4	49.0	50.0									SC-GP		132.7		9.4	13	1	
WI	1975	KEKI	3	41	470331	883404	P-10C	775.8	9.0	10.0									CL					14	1	
WI	1975	KEKI	3	41	470331	883404	P-10C	775.8	14.0	15.0					10	61			SC	50						
WI	1975	UN	3	41	470338	883344	P5-20	782.8	19.0	20.0			2.60E-07	7					GC-CL							
WI	1975	UN	3	41	470338	883344	P5-40	782.8	29.0	30.0			4.30E-05	7					SM-ML							
WI	1975	UN	12	41	470338	883344	P5-60	782.8	46.5	49.0			3.00E-07	7					LS							
WI	1975	UN	3	41	470354	883407	P3-20	761.8	18.0	19.0			2.70E-06	7					CL							
WI	1975	UN	12	41	470354	883407	P3-35		33.0	34.0			2.10E-06	7					LS							
WI	1975	UN	3	41	470354	883407	P11	786.0	19.0	20.0											145.0		6.7			
WI	1975	UN	5	41	470354	883407	P12	773.3	24.0	25.0										68	111.0		17.3			
WI	1976	UN	3	41	470399	883499	T4		34.0	35.0					4	64			SC	40						
WI	1976	UN	99	41	470399	883499	T4		39.0	40.0					14	59			SC	41						
WI	1976	UN	3	41	470399	883499	T4		31.0	32.0					1	55			CL	54						
WI	1976	UN	4	41	470399	883499	T4		8.0	10.0					9	70			SC	33						
WI	1976	UN	3	41	470399	883499	T1		18.0	20.0					16	33	55	12	SC-CL	60						
WI	1976	UN	3	41	470399	883499	T1		20.0	22.0					11	44			CL	54						
WI	1976	UN	3	41	470399	883499	T2		24.0	25.0					10	34	54	11	CL	59						
WI	1976	UN	3	41	470399	883499	T2		18.0	20.0					11	61			SC	39						
WI	1976	UN	3	41	470399	883499	T2		28.0	30.0					3	31	58	11	SC	70						
WI	1976	KEKI	3	41	470399	883499	T3		10.0	12.0					7	38	52	11	CL	61						

Appendix 3 - HYDROGEOLOGIC AND ENGINEERING DATA FOR MILWAUKEE COUNTY - BENDER PARK

IDENTITY County (code)	Year	Litho-strat. unit (code)	Mat. (code)	Site No.	Lat.	Long.	Brng. no.	Surf. Elev. (ft)	Sample top (ft)	Sample bottom (ft)	HYDRAULIC CONDUCTIVITY Lab K (cm/s)	Meth code	Fld K (cm/s)	Meth code	GRAINSIZE PERCENTAGES Bulk % >2.0mm	Matrix % sand (2.0 to 0.0625mm)	Matrix % silt (0.0625 to 0.002mm)	Matrix % clay (<0.002mm)	ENGINEERING PROPERTIES Unified Soil Class.	Bulk Percent P200	Dry Unit Wt. (pcf)	SPT (N)	Moist. cont.(%)	Liquid limit	Plastic. index	UC (tsf)
ML	1984	OC	3	50	425216	875106	BP-1	709.3	0.0	1.5									CL			9				3.0
ML	1984	OC	5	50	425216	875106	BP-1	709.3	5.0	6.5									ML/SM	47.4		15	13.8			4.5
ML	1984	OC	3	50	425216	875106	BP-1	709.3	10.0	11.5									CL			21	16.6	30	15	4.5
ML	1984	OC	3	50	425216	875106	BP-1	709.3	15.0	16.5									CL	85.1		19	15.4	24	11	2.5
ML	1984	OC	3	50	425216	875106	BP-1	709.3	20.0	21.5									CL			15	12.0	21	9	3.5
ML	1984	OC	3	50	425216	875106	BP-1	709.3	25.0	26.5									CL			18				2.5
ML	1984	OC	5	50	425216	875106	BP-1	709.3	30.0	31.5									ML			21	21.2			
ML	1984	OC	3	50	425216	875106	BP-1	709.3	35.0	36.5									CL			11				2.1
ML	1984	OC	3	50	425216	875106	BP-1	709.3	40.0	41.5									CL			11	18.0	34	20	2.5
ML	1984	OC	3	50	425216	875106	BP-1	709.3	45.0	46.5									CL			22				2.5
ML	1984	OC	3	50	425216	875106	BP-1	709.3	50.0	51.5									CL			16	18.1			2.5
ML	1984	OC	5	50	425216	875106	BP-1	709.3	55.0	56.5									SP			62				
ML	1984	NB	3	50	425216	875106	BP-1	709.3	60.0	61.5									SM	23.4		40	20.5			
ML	1984	OC	3	50	425214	875055	BP-2	699.8	0.0	1.5									CL			5				1.5
ML	1984	OC	3	50	425214	875055	BP-2	699.8	5.0	6.5									CL			12				3.0
ML	1984	OC	3	50	425214	875055	BP-2	699.8	10.0	11.5									CL			16	16.8			3.0
ML	1984	OC	3	50	425214	875055	BP-2	699.8	15.0	16.5									ML	60.0		15	18.4			4.5
ML	1984	OC	3	50	425214	875055	BP-2	699.8	20.0	21.5									CL			15	15.0			2.3
ML	1984	OC	3	50	425214	875055	BP-2	699.8	25.0	26.5									CL			15	16.4	26	12	2.2
ML	1984	OC	3	50	425214	875055	BP-2	699.8	30.0	31.5									CL			17				3.5
ML	1984	OC	5	50	425214	875055	BP-2	699.8	35.0	36.5									CL/ML			15				2.6
ML	1984	OC	3	50	425214	875055	BP-2	699.8	40.0	41.5									CL			20	14.8	27	14	3.5
ML	1984	OC	3	50	425214	875055	BP-2	699.8	45.0	46.5									CL			21				3.4
ML	1984	OC	3	50	425214	875055	BP-2	699.8	50.0	51.5									CL			19				2.5
ML	1984	OC	3	50	425214	875055	BP-2	699.8	55.0	56.5									CL			25				2.5
ML	1984	OC	3	50	425214	875055	BP-2	699.8	60.0	61.5									CL			19				3.0
ML	1984	OC	3	50	425212	875041	BP-3	689.1	0.0	1.5									CL			6				1.5
ML	1984	OC	3	50	425212	875041	BP-3	689.1	5.0	6.5									CL			39				4.5
ML	1984	OC	3	50	425212	875041	BP-3	689.1	10.0	11.5									CL			19	17.8	31	16	3.5
ML	1984	OC	3	50	425212	875041	BP-3	689.1	15.0	16.5									CL			21	15.8			3.1
ML	1984	OC	3	50	425212	875041	BP-3	689.1	20.0	21.5									CL			18				2.5
ML	1984	OC	3	50	425212	875041	BP-3	689.1	25.0	26.5									CL			21	17.3			2.5
ML	1984	OC	3	50	425212	875041	BP-3	689.1	30.0	31.5									CL			20	15.4	27	14	3.5
ML	1984	OC	3	50	425212	875041	BP-3	689.1	35.0	36.5									CL			21				3.0
ML	1984	OC	3	50	425212	875041	BP-3	689.1	40.0	41.5									CL			15	15.9			1.8
ML	1984	OC	3	50	425212	875041	BP-3	689.1	45.0	46.5									CL			21				2.5
ML	1984	OC	3	50	425212	875041	BP-3	689.1	50.0	51.5									CL			22	16.2	27	14	2.5
ML	1984	OC	3	50	425212	875041	BP-3	689.1	55.0	56.5									CL			22				2.1
ML	1984	OC	3	50	425212	875041	BP-3	689.1	60.0	61.5									CL			25	16.8			2.1
ML	1984	OC	3	50	425205	875057	BP-4	689.2	0.0	1.5									CL			12				1.5
ML	1984	OC	5	50	425205	875057	BP-4	689.2	5.0	6.5									ML/CL	52.6		20	13.4			1.5
ML	1984	OC	5	50	425205	875057	BP-4	689.2	10.0	11.5									ML/CL			15	9.4			2.1
ML	1984	OC	3	50	425205	875057	BP-4	689.2	15.0	16.5									CL			25	16.2			3.5
ML	1984	OC	3	50	425205	875057	BP-4	689.2	20.0	21.5									CL			31	16.0			3.0
ML	1984	OC	3	50	425205	875057	BP-4	689.2	25.0	26.5									CL			21	14.0	31	17	2.5
ML	1984	OC	3	50	425205	875057	BP-4	689.2	30.0	31.5									CL			26	19.2			3.8

Appendix 3 - HYDROGEOLOGIC AND ENGINEERING DATA FOR MILWAUKEE COUNTY - BENDER PARK

IDENTITY: County (code)	Year	Litho-strat. unit (code)	Mat. (code)	Site No.	Lat.	Long.	Brng. no.	Surf. Elev. (ft)	Sample top (ft)	Sample bottom (ft)	HYDRAULIC CONDUCTIVITY: Lab K (cm/s)	Meth code	Fld K (cm/s)	Meth code	GRAINSIZE PERCENTAGES: Bulk % >2.0mm	Matrix % sand (2.0 to 0.0625mm)	Matrix % silt (0.0625 to 0.002mm)	Matrix % clay (<0.002mm)	ENGINEERING PROPERTIES: Unified Soil Class.	Bulk Percent P200	Dry Unit Wt. (pcf)	SPT (N)	Moist. cont. (%)	Liquid limit	Plastic. index	UC (tsf)
ML	1984	OC	3	50	425205	875057	BP-4	689.2	35.0	36.5									CL	81.5		31	12.9			4.5
ML	1984	OC	3	50	425205	875057	BP-4	689.2	40.0	41.5									CL			30				4.0
ML	1984	OC	3	50	425205	875057	BP-4	689.2	45.0	46.5									CL			30				3.5
ML	1984	OC	3	50	425205	875057	BP-4	689.2	50.0	51.5									CL	87.2		35	13.0	25	12	4.0
ML	1984	OC	3	50	425205	875057	BP-4	689.2	55.0	56.5									CL			35	19.3	33	17	4.2
ML	1984	OC	3	50	425205	875057	BP-4	689.2	60.0	61.5									CL			47				2.1
ML	1984	OC	3	50	425205	875057	BP-4	689.2	65.0	66.5									CL			49	17.3			4.3
ML	1984	OC	3	50	425205	875057	BP-4	689.2	70.0	71.5									CL			25	21.9			4.5
ML	1984	OC	3	50	425205	875057	BP-4	689.2	75.0	76.5									CL			36				4.5
ML	1984	OC	3	50	425205	875057	BP-4	689.2	80.0	81.5									CL			36				4.5
ML	1984	OC	3	50	425205	875057	BP-4	689.2	85.0	86.5									CL			40				3.1
ML	1984	OC	3	50	425205	875057	BP-4	689.2	90.0	91.5									CL			100				
ML	1984	OC	3	50	425205	875057	BP-4	689.2	95.0	96.5									CL/ML			51				4.0
ML	1984	OC	3	50	425205	875057	BP-4	689.2	100.0	101.5									CL			40				2.5
ML	1984	OC	3	50	425205	875057	BP-4	689.2	105.0	106.5									CL			145	10.2			4.5
ML	1984	OC	3	50	425205	875057	BP-4	689.2	110.0	111.5									CL			100				4.5
ML	1984	OC	3	50	425152	875057	BP-5	686.4	0.0	1.5									CL			5				2.0
ML	1984	OC	3	50	425152	875057	BP-5	686.4	5.0	6.5									CL			18	14.9	26	12	4.0
ML	1984	OC	5	50	425152	875057	BP-5	686.4	10.0	11.5									SP			10				2.8
ML	1984	OC	3	50	425152	875057	BP-5	686.4	15.0	16.5									CL			15	18.3	28	15	2.5
ML	1984	OC	3	50	425152	875057	BP-5	686.4	20.0	21.5									CL			12	21.3			3.0
ML	1984	OC	3	50	425152	875057	BP-5	686.4	25.0	26.5									CL			21				4.5
ML	1984	OC	35	50	425152	875057	BP-5	686.4	30.0	31.5									CL			12	20.4			2.8
ML	1984	OC	35	50	425152	875057	BP-5	686.4	35.0	36.5									CL			15				2.8
ML	1984	OC	35	50	425152	875057	BP-5	686.4	40.0	41.5									CL			15				2.8
ML	1984	OC	35	50	425152	875057	BP-5	686.4	45.0	46.5									CL			20	21.7	40	23	3.0
ML	1984	OC	35	50	425152	875057	BP-5	686.4	50.0	51.5									CL			15				2.5
ML	1984	OC	35	50	425152	875057	BP-5	686.4	55.0	56.5									CL			15	23.9			2.0
ML	1984	OC	35	50	425152	875057	BP-5	686.4	60.0	61.5									CL			15				3.8
ML	1982	OC	3	50	425149	875053	B-1	695.0	1.5	2.0									CL				18.0			
ML	1982	OC	3	50	425149	875053	B-1	695.0	3.5	4.0									CL				20.0			
ML	1982	OC	3	50	425149	875053	B-1	695.0	5.0	5.5									CL				19.0			
ML	1982	OC	3	50	425149	875053	B-1	695.0	7.5	8.0									ML-CL				16.0			
ML	1982	OC	3	50	425149	875053	B-1	695.0	10.0	11.0									CL				16.0			
ML	1982	OC	3	50	425149	875053	B-1	695.0	15.0	15.5									ML							
ML	1982	OC	3	50	425149	875053	B-1	695.0	20.0	22.0									CL-CH							
ML	1982	OC	3	50	425149	875053	B-1	695.0	25.0	27.0									CL-CH							
ML	1982	OC	3	50	425149	875053	B-1	695.0	30.0	32.0									CL-CH							
ML	1982	OC	3	50	425149	875053	B-1	695.0	35.0	36.0									CL-CH							
ML	1982	OC	3	50	425150	875047	B-2	687.0	1.5	2.0									CL				25.0			
ML	1982	OC	3	50	425150	875047	B-2	687.0	3.5	4.0									CL				15.0			
ML	1982	OC	3	50	425150	875047	B-2	687.0	5.0	5.1									CL				15.0			
ML	1982	OC	3	50	425150	875047	B-2	687.0	7.0	8.0									CL				15.0			
ML	1982	OC	3	50	425150	875047	B-2	687.0	10.0	11.5									CL				14.0			
ML	1982	OC	3	50	425150	875047	B-2	687.0	15.0	16.5									CL							
ML	1982	OC	3	50	425150	875047	B-2	687.0	20.0	21.5									CL							

Appendix 3 - HYDROGEOLOGIC AND ENGINEERING DATA FOR MILWAUKEE COUNTY - BENDER PARK

IDENTITY											HYDRAULIC CONDUCTIVITY				GRAINSIZE PERCENTAGES				ENGINEERING PROPERTIES							
County (code)	Year	Litho-strat. unit (code)	Mat. (code)	Site No.	Lat.	Long.	Brng. no.	Surf. Elev. (ft)	Sample top (ft)	Sample bottom (ft)	Lab K (cm/s)	Meth code	Fld K (cm/s)	Meth code	Bulk % >2.0mm	Matrix % sand (2.0 to 0.0625mm)	Matrix % silt (0.0625 to 0.002mm)	Matrix % clay (<0.002mm)	Unified Soil Class.	Bulk Percent P200	Dry Unit Wt. (pcf)	SPT (N)	Moist. cont.(%)	Liquid limit	Plastic. index	UC (tsf)
ML	1982	OC	3	50	425150	875047	B-2	687.0	25.0	26.5									CL							
ML	1982	OC	3	50	425150	875047	B-2	687.0	30.0	31.5									CL							
ML	1982	OC	3	50	425150	875047	B-2	687.0	35.0	36.0									CL							
ML	1982	OC	3	50	425147	875046	B-4	692.0	0.0	1.0									CL				20.0			
ML	1982	OC	3	50	425147	875046	B-4	692.0	1.5	3.0									ML-CL				11.0			
ML	1982	OC	3	50	425147	875046	B-4	692.0	4.0	5.5									ML-CL				12.0			
ML	1982	OC	3	50	425147	875046	B-4	692.0	6.0	7.0									CL				12.0			
ML	1982	OC	3	50	425147	875046	B-4	692.0	10.0	10.5									CL				12.0			
ML	1982	OC	3	50	425147	875046	B-4	692.0	15.0	15.5									CL							
ML	1982	OC	3	50	425147	875046	B-4	692.0	20.0	20.5									CL							
ML	1982	OC	3	50	425147	875046	B-4	692.0	25.0	27.0									CL							
ML	1982	OC	3	50	425147	875046	B-4	692.0	30.0	32.0									CL							
ML	1982	OC	3	50	425147	875046	B-4	692.0	35.0	37.0									CL							
ML	1982	OC	3	50	425146	875054	B-5	701.0	0.0	1.5									CL				25.0			
ML	1982	OC	3	50	425146	875054	B-5	701.0	2.0	3.5									CL				29.0			
ML	1982	OC	3	50	425146	875054	B-5	701.0	4.0	5.5									CL				15.0			
ML	1982	OC	3	50	425146	875054	B-5	701.0	6.0	7.5									CL				15.0			
ML	1982	OC	3	50	425146	875054	B-5	701.0	10.0	11.5									CL				14.0			
ML	1982	OC	3	50	425146	875054	B-5	701.0	15.0	16.5									CL							
ML	1982	OC	3	50	425146	875054	B-5	701.0	20.0	21.0									CL							
ML	1982	OC	3	50	425146	875054	B-5	701.0	25.0	27.0									CL							
ML	1982	OC	3	50	425146	875054	B-5	701.0	30.0	31.5									CL							
ML	1982	OC	3	50	425146	875054	B-5	701.0	35.0	36.5									CL							
ML	1982	OC	3	50	425145	875048	B-6	695.0	0.0	1.5									CL				19.0			
ML	1982	OC	3	50	425145	875048	B-6	695.0	2.0	3.0									CL				11.0			
ML	1982	OC	3	50	425145	875048	B-6	695.0	4.0	5.5									CL				18.0			
ML	1982	OC	3	50	425145	875048	B-6	695.0	6.0	7.5									CL				15.0			
ML	1982	OC	3	50	425145	875048	B-6	695.0	10.0	11.0									CL-SM				19.0			
ML	1982	OC	3	50	425145	875048	B-6	695.0	11.0	11.5									ML-CL				20.0			
ML	1982	OC	3	50	425145	875048	B-6	695.0	11.5	12.0									CL				19.0			
ML	1982	OC	3	50	425145	875048	B-6	695.0	15.0	16.5									CL							
ML	1982	OC	3	50	425145	875048	B-6	695.0	20.0	22.0									ML							
ML	1982	OC	3	50	425145	875048	B-6	695.0	25.0	27.0									SM							
ML	1982	OC	3	50	425145	875048	B-6	695.0	30.0	31.5									ML-SM							
ML	1982	OC	3	50	425145	875048	B-6	695.0	35.0	36.5									CL							

Appendix 3 - HYDROGEOLOGIC AND ENGINEERING DATA FOR MILWAUKEE COUNTY - DEROSSO SITE (ISR)

IDENTITY County (code)	Year	Litho-strat. unit (code)	Mat. (code)	Site No.	Lat.	Long.	Brng. no.	Surf. Elev. (ft)	Sample top (ft)	Sample bottom (ft)	HYDRAULIC CONDUCTIVITY Lab K (cm/s)	Meth code	Fld K (cm/s)	Meth code	GRAINSIZE PERCENTAGES Bulk % >2.0mm	Matrix % sand (2.0 to 0.0625mm)	Matrix % silt (0.0625 to 0.002mm)	Matrix % clay (<0.002mm)	ENGINEERING PROPERTIES Unified Soil Class.	Bulk Percent P200	dry Unit Wt. (pcf)	SPT (N)	Moist. cont.(%)	Liquid limit	Plastic. index	UC (tsf)
ML	1980	OC	3	51	425209	875247	BH4	666.0	17.0	17.5					0	0	58	42	CL	100				29.1	11.0	
ML	1980	OC	3	51	425213	875252	BH8	666.0	10.0	10.5					0	0	62	38	CL	100				30.2	12.6	
ML	1980	OC	3	51	425213	875252	BH8	666.0	10.0	10.5					0	0	62	38	CL	100				32.2	14.4	
ML	1980	OC	3	51	425215	875257	BH12	666.0	7.0	7.5					53	85	9	6	SM	?						
ML	1980	OC	4	51	425207	875258	B38	666.0	3.5	5.0									SM			11				
ML	1980	OC	4	51	425207	875258	B38	666.0	8.5	10.0									SM			18				
ML	1980	OC	3	51	425207	875258	B38	666.0	13.5	15.0									CL			12				3.0
ML	1980	OC	3	51	425207	875258	B38	666.0	17.5	20.0									CL			8				2.0
ML	1980	OC	5	51	425207	875258	B38	666.0	23.5	25.0									CL-ML			6				1.3
ML	1980	OC	5	51	425207	875258	B38	666.0	28.5	30.0									CL-ML			4				0.8
ML	1980	OC	5	51	425207	875258	B38	666.0	33.5	35.0									CL-ML			3				0.3
ML	1980	OC	5	51	425207	875258	B38	666.0	38.5	40.0									ML			9				
ML	1980	OC	3	51	425207	875258	B38	666.0	43.5	45.0									CL			14				3.0
ML	1980	OC	5	51	425206	875248	B4	666.0	3.5	5.0									OL			8				
ML	1980	OC	5	51	425206	875248	B4	666.0	8.5	10.0									SM-ML			9				
ML	1980	OC	5	51	425206	875248	B4	666.0	13.5	15.0									SM-ML			10				
ML	1980	OC	5	51	425206	875248	B4	666.0	17.5	20.0									SM-ML			14				
ML	1980	OC	5	51	425206	875248	B4	666.0	23.5	25.0									SM			15				3.0
ML	1980	OC	99	51	425206	875248	B4	666.0	28.5	30.0									ML-CL			16				4.5
ML	1980	OC	99	51	425206	875248	B4	666.0	33.5	35.0									ML			34				4.5
ML	1980	OC	3	51	425206	875248	B4	666.0	38.5	40.0									CL			18				4.5
ML	1980	OC	3	51	425206	875248	B4	666.0	43.5	45.0									CL			18				4.5
ML	1980	OC	5	51	425210	875254	B5	666.0	3.5	5.0									ML			9				
ML	1980	OC	5	51	425210	875254	B5	666.0	8.5	10.0									SW-SM			42				
ML	1980	OC	3	51	425210	875254	B5	666.0	13.5	15.0									CL			15				3.5
ML	1980	OC	3	51	425210	875254	B5	666.0	17.5	20.0									CL			12				3.0
ML	1980	OC	3	51	425210	875254	B5	666.0	23.5	25.0									CL			13				3.0
ML	1980	OC	5	51	425210	875254	B5	666.0	28.5	30.0									CL-SP			13				3.0
ML	1980	OC	5	51	425210	875254	B5	666.0	33.5	35.0									CL-SP			15				
ML	1980	OC	5	51	425210	875254	B5	666.0	38.5	40.0									ML-SM			50				
ML	1980	OC	5	51	425210	875254	B5	666.0	43.5	45.0									ML			48				
ML	1980	OC	4	51	425213	875258	B6	666.0	3.5	5.0									SM			13				
ML	1980	OC	5	51	425213	875258	B6	666.0	8.5	10.0									ML			9				
ML	1980	OC	5	51	425213	875258	B6	666.0	13.5	15.0									CL-ML			8				1.5
ML	1980	OC	5	51	425213	875258	B6	666.0	17.5	20.0									SP			19				
ML	1980	OC	5	51	425213	875258	B6	666.0	23.5	25.0									SM			10				
ML	1980	OC	5	51	425213	875258	B6	666.0	28.5	30.0									ML			11				
ML	1980	OC	5	51	425213	875258	B6	666.0	33.5	35.0									ML-CL			13				
ML	1980	OC	3	51	425213	875258	B6	666.0	38.5	40.0									CL			11				1.5
ML	1980	OC	5	51	425213	875258	B6	666.0	43.5	45.0									ML-SM			13				
ML	1980	OC	4	51	425214	875245	B7	666.0	3.5	5.0									SM			5				
ML	1980	OC	4	51	425214	875245	B7	666.0	8.5	10.0									SP			19				1.5
ML	1980	OC	5	51	425214	875245	B7	666.0	13.5	15.0									ML-CL			17				1.0
ML	1980	OC	5	51	425214	875245	B7	666.0	17.5	20.0									ML-CL			22				
ML	1980	OC	3	51	425214	875245	B7	666.0	23.5	25.0									CL			23				3.0
ML	1980	OC	3	51	425214	875245	B7	666.0	28.5	30.0									CL			11				1.0
ML	1980	OC	5	51	425214	875245	B7	666.0	33.5	35.0									ML			68				
ML	1980	OC	5	51	425214	875245	B7	666.0	38.5	40.0									SP			98				
ML	1980	OC	5	51	425214	875245	B7	666.0	43.5	45.0									ML			61				

Appendix 3 - HYDROGEOLOGIC AND ENGINEERING DATA FOR MILWAUKEE COUNTY - FALK LANDFILL

IDENTITY County (code)	Year	Litho-strat. unit (code)	Mat. (code)	Site No.	Lat.	Long.	Brng. no.	Surf. Elev. (ft)	Sample top (ft)	Sample bottom (ft)	HYDRAULIC CONDUCTIVITY Lab K (cm/s)	Meth code	Fld K (cm/s)	Meth code	GRAINSIZE PERCENTAGES Bulk % >2.0mm	Matrix % sand (2.0 to 0.0625mm)	Matrix % silt (0.0625 to 0.002mm)	Matrix % clay (<0.002mm)	ENGINEERING PROPERTIES Unified Soil Class.	Bulk Percent P200	Dry Unit Wt. (pcf)	SPT (N)	Moist. cont.(%)	Liquid limit	Plastic. index	UC (tsf)
ML	1979	OC	3	52	425503	875200	B-1	659.9	3.5	5.0												13				
ML	1979	OC	4	52	425503	875200	B-1	659.9	7.5	8.5																
ML	1979	OC	3	52	425503	875200	B-1	659.9	8.5	10.0												22				
ML	1979	OC	3	52	425503	875200	B-1	659.9	14.0	15.0												20				
ML	1979	OC	3	52	425503	875200	B-1	659.9	19.0	20.0									CL	75		22		26	11	
ML	1979	OC	3	52	425503	875200	B-1	659.9	23.0	24.0																
ML	1979	OC	5	52	425503	875200	B-1	659.9	24.0	25.0												23				
ML	1979	OC	3	52	425503	875200	B-1	659.9	14.0	20.0			7.80E-05						CL							
ML	1979	OC	99	52	425504	875156	B-2	654.8	3.5	5.0												14				
ML	1979	OC	3	52	425504	875156	B-2	654.8	9.0	10.0												14				
ML	1979	OC	3	52	425504	875156	B-2	654.8	13.5	15.0												14				
ML	1979	OC	3	52	425504	875156	B-2	654.8	18.5	20.0												14				
ML	1979	OC	3	52	425504	875156	B-2	654.8	23.5	25.0												13				
ML	1979	OC	5	52	425504	875156	B-2	654.8	28.5	30.0												11				
ML	1979	OC	5	52	425511	875200	B-3	639.3	2.5	3.5												7				
ML	1979	OC	5	52	425511	875200	B-3	639.3	8.5	10.0												16				
ML	1979	OC	5	52	425511	875200	B-3	639.3	13.5	15.0									ML	74		10				
ML	1979	OC	5	52	425511	875200	B-3	639.3	8.5	20.0			2.20E-03						ML							
ML	1979	OC	5	52	425511	875200	B-3	639.3	8.5	15.0																
ML	1979	OC	99	52	425506	875156	B-4	650.5	4.0	5.0												2				
ML	1979	OC	99	52	425506	875156	B-4	650.5	6.0	7.0												3				
ML	1979	OC	3	52	425506	875156	B-4	650.5	8.5	10.0												7				
ML	1979	OC	5	52	425506	875156	B-4	650.5	13.5	15.0												9				
ML	1979	OC	5	52	425506	875156	B-4	650.5	18.5	20.0									SP			15				
ML	1979	OC	5	52	425506	875156	B-4	650.5	23.5	25.0												16				
ML	1979	OC	5	52	425506	875156	B-4	650.5	28.5	30.0												10				
ML	1979	OC	3	52	425506	875156	B-4	650.5	33.5	35.0												22				
ML	1979	OC	3	52	425506	875156	B-4	650.5	38.5	40.0												57				
ML	1979	OC	3	52	425506	875156	B-4	650.5	43.5	45.0												59				
ML	1979	OC	5	52	425506	875156	B-4	650.5	8.5	20.0			1.40E-03						SP							
ML	1979	OC	5	52	425509	875152	B-5	634.0	3.5	5.0												9				
ML	1979	OC	3	52	425509	875152	B-5	634.0	8.5	10.0												17				
ML	1979	OC	3	52	425509	875152	B-5	634.0	13.5	15.0									CL	83		23		24	10	
ML	1979	OC	3	52	425509	875152	B-5	634.0	18.5	20.0												23				
ML	1979	OC	3	52	425509	875152	B-5	634.0	8.5	20.0			3.50E-05													
ML	1979	OC	5	52	425513	875157	B-6	629.0	3.5	5.0												15				
ML	1979	OC	3	52	425513	875157	B-6	629.0	8.5	10.0												12				
ML	1979	OC	3	52	425513	875157	B-6	629.0	13.5	15.0									CL	90		39		31	15	
ML	1979	OC	3	52	425513	875157	B-6	629.0	18.5	20.0												64				
ML	1979	OC	3	52	425513	875157	B-6	629.0	23.5	25.0												54				
ML	1979	OC	5	52	425513	875157	B-6	629.0	28.5	30.0												78				
ML	1979	OC	3	52	425513	875157	B-6	629.0	33.5	35.0												70				
ML	1979	OC	3	52	425513	875157	B-6	629.0	8.5	25.0			2.10E-06						CL							
ML	1980	OC	4	52	425515	875201	B-7	630.8	3.5	5.0									SM			11				
ML	1980	OC	4	52	425515	875201	B-7	630.8	8.5	10.0									SM			12				
ML	1980	OC	4	52	425515	875201	B-7	630.8	13.5	15.0									SM			13				

Appendix 3 - HYDROGEOLOGIC AND ENGINEERING DATA FOR MILWAUKEE COUNTY - FALK LANDFILL

IDENTITY: County (code)	Year	Litho-strat. unit (code)	Mat. (code)	Site No.	Lat.	Long.	Brng. no.	Surf. Elev. (ft)	Sample top (ft)	Sample bottom (ft)	HYDRAULIC CONDUCTIVITY: Lab K (cm/s)	Meth code	Fld K (cm/s)	Meth code	GRAINSIZE PERCENTAGES: Bulk % >2.0mm	Matrix % sand (2.0 to 0.0625mm)	Matrix % silt (0.0625 to 0.002mm)	Matrix % clay (<0.002mm)	ENGINEERING PROPERTIES: Unified Soil Class.	Bulk Percent P200	Dry Unit Wt. (pcf)	SPT (N)	Moist. cont. (%)	Liquid limit	Plastic. index	UC (tsf)
ML	1980	OC	3	52	425515	875201	B-7	630.8	18.5	20.0									CL			54	15.8			
ML	1980	OC	3	52	425515	875201	B-7	630.8	23.5	25.0									CL			62				
ML	1980	OC	5	52	425515	875201	B-7	630.8	28.5	30.0									ML			100				
ML	1980	OC	5	52	425515	875201	B-7	630.8	33.5	35.0									ML			100				
ML	1980	OC	5	52	425515	875201	B-7	630.8	38.5	40.0									ML			100	8.9			
ML	1980	OC	5	52	425515	875201	B-7	630.8	31.0	34.0			2.40E-05						ML							
ML	1980	OC	4	52	425515	875153	B-8	628.5	3.5	5.0									SM			28				
ML	1980	OC	4	52	425515	875153	B-8	628.5	8.5	10.0									SM			34				
ML	1980	OC	3	52	425515	875153	B-8	628.5	13.5	15.0									CL			63	14.7			
ML	1980	OC	3	52	425515	875153	B-8	628.5	18.5	20.0									CL			82				
ML	1980	OC	4	52	425515	875153	B-8	628.5	23.5	25.0									SM			100				
ML	1980	OC	3	52	425515	875153	B-8	628.5	28.5	30.0									CL			87				
ML	1980	OC	3	52	425515	875153	B-8	628.5	33.5	35.0									CL			72				
ML	1980	OC	3	52	425515	875153	B-8	628.5	38.5	40.0									CL			63				
ML	1980	OC	4	52	425519	875156	B-9	631.3	3.5	5.0					48	76	18	6	SW	12						
ML	1980	OC	4	52	425519	875156	B-9	631.3	8.5	10.0									SW							
ML	1980	OC	4	52	425519	875156	B-9	631.3	13.5	15.0									ML							
ML	1980	OC	5	52	425519	875156	B-9	631.3	18.5	20.0					0	0	93	7	ML	100			22.3	20	2	
ML	1980	OC	3	52	425519	875156	B-9	631.3	23.5	25.0							65	35	CL	100			11.9	28	12	
ML	1980	OC	4	52	425519	875156	B-9	631.3	28.5	30.0									SM							
ML	1980	OC	4	52	425519	875156	B-9	631.3	33.5	35.0									SW							
ML	1980	OC	4	52	425519	875156	B-9	631.3	38.5	40.0									SW							
ML	1980	OC	5	52	425519	875156	B-9	631.3	43.5	45.0						54	38	8	ML	54						
ML	1980	OC	45	52	425519	875156	B-9	631.3	38.5	45.0			2.70E-04						SW-ML							
ML	1980	OC	4	52	425522	875156	B-10	629.6	3.5	5.0						49	41	10	ML	54		12	12	20	7	
ML	1980	OC	5	52	425522	875156	B-10	629.6	8.5	10.0									GM-GC			20				
ML	1980	OC	4	52	425522	875156	B-10	629.6	13.5	15.0					58	64	24	12	SM-GC	15		20	7.8			
ML	1980	OC	3	52	425522	875156	B-10	629.6	18.5	20.0									CL			22	14.6			
ML	1980	OC	3	52	425522	875156	B-10	629.6	23.5	25.0									CL-ML			73				
ML	1980	OC	3	52	425522	875156	B-10	629.6	27.5	30.0									CL			61				
ML	1980	OC	4	52	425522	875156	B-10	629.6	33.5	35.0					2	96	2	2	SP	4		29				
ML	1980	OC	4	52	425522	875156	B-10	629.6	38.5	40.0									SP			15				
ML	1980	OC	99	52	425511	875156	B-11	633.7	3.5	5.0												7				
ML	1980	OC	99	52	425511	875156	B-11	633.7	8.5	10.0												1				
ML	1980	OC	3	52	425511	875156	B-11	633.7	13.5	15.0									CL			2				
ML	1980	OC	3	52	425511	875156	B-11	633.7	18.5	20.0									CL			20				
ML	1980	OC	3	52	425511	875156	B-11	633.7	23.5	25.0									CL			22				
ML	1980	OC	3	52	425511	875156	B-11	633.7	27.5	30.0					0	12	46	42	CL	88		35	16.2	33	15	
ML	1980	OC	3	52	425511	875156	B-11	633.7	33.5	35.0									CL			21				
ML	1980	OC	3	52	425511	875156	B-11	633.7	38.5	40.0									CL			24				
ML	1980	OC	4	52	425524	875153	B-12	639.6	3.5	5.0									SP			13				
ML	1980	OC	4	52	425524	875153	B-12	639.6	8.5	10.0									SW-GW			35				
ML	1980	OC	4	52	425524	875153	B-12	639.6	13.5	15.0									SP			11				
ML	1980	OC	4	52	425524	875153	B-12	639.6	18.5	20.0									SP			12				
ML	1980	OC	3	52	425524	875153	B-12	639.6	23.5	25.0									CL			15	16.8			
ML	1980	OC	3	52	425524	875153	B-12	639.6	28.5	30.0									CL			24				

Appendix 3 - HYDROGEOLOGIC AND ENGINEERING DATA FOR MILWAUKEE COUNTY - FALK LANDFILL

IDENTITY											HYDRAULIC CONDUCTIVITY				GRAINSIZE PERCENTAGES				ENGINEERING PROPERTIES							
County (code)	Year	Litho-strat. unit (code)	Mat. (code)	Site No.	Lat.	Long.	Bron. no.	Surf. Elev. (ft)	Sample top (ft)	Sample bottom (ft)	Lab K (cm/s)	Meth code	Fld K (cm/s)	Meth code	Bulk % >2.0mm	Matrix % sand (2.0 to 0.0625mm)	Matrix % silt (0.0625 to 0.002mm)	Matrix % clay (<0.002mm)	Unified Soil Class.	Bulk Percent P200	Dry Unit Wt. (pcf)	SPT (N)	Moist. cont.(%)	Liquid limit	Plastic. index	UC (tsf)
ML	1980	OC	3	52	425524	875153	B-9	639.6	26.0	31.0			7.30E-05						CL							
ML	1980	OC	4	52	425519	875159	B-13	633.2	3.5	5.0									SW-ML			6				
ML	1980	OC	4	52	425519	875159	B-13	633.2	8.5	10.0									GW-SW			18				
ML	1980	OC	5	52	425519	875159	B-13	633.2	13.5	15.0									CL			37	10.1	20	7	
ML	1980	OC	4	52	425519	875159	B-13	633.2	18.5	20.0									SP			35				
ML	1980	OC	4	52	425519	875159	B-13	633.2	23.5	25.0									SP			23				
ML	1980	OC	3	52	425519	875159	B-13	633.2	28.5	30.0									CL			91	15.5			
ML	1980	OC	4	52	425519	875159	B-13	633.2	33.5	35.0									SM			71				
ML	1980	OC	4	52	425519	875159	B-13	633.2	38.5	40.0									SP			46				
ML	1980	OC	4	52	425515	875158	B-14	633.2	3.5	5.0									SP			16				
ML	1980	OC	4	52	425515	875158	B-14	633.2	8.5	10.0									SP			21				
ML	1980	OC	3	52	425515	875158	B-14	633.2	13.5	15.0									CL			19				
ML	1980	OC	3	52	425515	875158	B-14	633.2	18.5	20.0									CL			42	15.9			
ML	1980	OC	3	52	425515	875158	B-14	633.2	22.5	25.0									CL			46				
ML	1980	OC	4	52	425515	875158	B-14	633.2	28.5	30.0					0	75	20	5	SM	25		18				
ML	1980	OC	4	52	425515	875158	B-14	633.2	33.5	35.0									SM			30				
ML	1980	OC	4	52	425515	875158	B-14	633.2	38.5	40.0									SM			25				
ML	1980	OC	4	52	425516	875156	B-15	630.0	3.5	5.0									SM			29				
ML	1980	OC	5	52	425516	875156	B-15	630.0	8.5	10.0					0	25	67	8	ML	87		9	17.3	14	2	
ML	1980	OC	3	52	425516	875156	B-15	630.0	13.5	15.0									CL			10				
ML	1980	OC	3	52	425516	875156	B-15	630.0	18.5	20.0					0	13	40	47	CL	65		19	18.3	27	11	
ML	1980	OC	3	52	425516	875156	B-15	630.0	23.5	25.0									CL			56				
ML	1980	OC	3	52	425516	875156	B-15	630.0	28.5	30.0									CL			66				
ML	1980	OC	5	52	425516	875156	B-15	630.0	33.5	35.0									ML			100				
ML	1980	OC	5	52	425516	875156	B-15	630.0	38.5	40.0									ML			100				
ML	1980	OC	5	52	425516	875156	B-15	630.0	43.5	45.0									ML			100	7.8			
ML	1980	OC	5	52	425516	875156	B-15	630.0	5.0	10.0			6.30E-05						ML							

Appendix 3 - HYDROGEOLOGIC AND ENGINEERING DATA FOR WAUKESHA COUNTY - FUTURE PARKLAND SITE

IDENTITY												HYDRAULIC CONDUCTIVITY				GRAINSIZE PERCENTAGES				ENGINEERING PROPERTIES							
County (code)	Year	Litho-strat. unit (code)	Mat. (code)	Site No.	Lat.	Long.	Brng. no.	Surf. Elev. (ft)	Sample top (ft)	Sample bottom (ft)		Lab K (cm/s)	Meth code	Fld K (cm/s)	Meth code	Bulk % >2.0mm	Matrix % sand (2.0 to 0.0625mm)	Matrix % silt (0.0625 to 0.002mm)	Matrix % clay (<0.002mm)	Unified Soil Class.	Bulk Percent P200	Dry Unit Wt. (pcf)	SPT (N)	Moist. cont.(%)	Liquid limit	Plastic. index	UC (tsf)
WK	1984	OC	3	53	425127	880446	MW1B	788.0	3.5	5.0										CL			30				
WK	1984	OC	3	53	425127	880446	MW1B	788.0	8.5	10.0										CL			18				
WK	1984	OC	3	53	425127	880446	MW1B	788.0	13.5	15.0										CL			17				
WK	1984	OC	3	53	425127	880446	MW1B	788.0	18.5	20.0										CL			15				
WK	1984	OC	3	53	425127	880446	MW1B	788.0	23.5	25.0										CL			23				
WK	1984	OC	3	53	425127	880446	MW1B	788.0	28.5	30.0										CL			17				
WK	1984	OC	3	53	425127	880446	MW1B	788.0	33.5	35.0										CL			15				
WK	1984	OC	2	53	425127	880446	MW1B	788.0	38.5	40.0						0	23	72	5	ML	76.9		12				
WK	1984	OC	3	53	425127	880446	MW1B	788.0	43.5	45.0										CL			11				
WK	1984	OC	3	53	425127	880446	MW1B	788.0	48.5	50.0										CL			10				
WK	1984	OC	3	53	425127	880446	MW1B	788.0	53.5	55.0										CL			12				
WK	1984	OC	3	53	425127	880446	MW1B	788.0	58.5	60.0										CL			16				
WK	1984	OC	3	53	425116	880441	MW4A/B	792.0	3.5	5.0										CL			19				
WK	1984	OC	3	53	425116	880441	MW4A/B	792.0	8.5	10.0										CL			18				
WK	1984	OC	3	53	425116	880441	MW4A/B	792.0	13.5	15.0										CL			14				
WK	1984	OC	3	53	425116	880441	MW4A/B	792.0	18.5	20.0										CL			14				
WK	1984	OC	3	53	425116	880441	MW4A/B	792.0	23.5	25.0										CL			16				
WK	1984	OC	3	53	425116	880441	MW4A/B	792.0	28.5	30.0										CL			15		47	25	
WK	1984	OC	3	53	425116	880441	MW4A/B	792.0	33.5	35.0										CL			14				
WK	1984	OC	3	53	425116	880441	MW4A/B	792.0	38.5	40.0										CL			16				
WK	1984	OC	3	53	425116	880441	MW4A/B	792.0	43.5	45.0										CL			16				
WK	1984	OC	3	53	425116	880441	MW4A/B	792.0	48.5	50.0										CL			16				
WK	1984	OC	3	53	425116	880441	MW4A/B	792.0	53.5	55.0										CL			16				
WK	1984	OC	3	53	425116	880441	MW4A/B	792.0	58.5	60.0										CL			14				
WK	1984	OC	3	53	425116	880441	MW4A/B	792.0	58.5	65.0				2.80E-08	7					CL							
WK	1984	OC	3	53	425128	880436	MW5A	781.0	3.5	5.0										CL			17				
WK	1984	OC	3	53	425128	880436	MW5A	781.0	8.5	10.0										CH			26		51	29	
WK	1984	OC	3	53	425128	880436	MW5A	781.0	13.5	15.0										CL			11				
WK	1984	OC	3	53	425128	880436	MW5A	781.0	18.5	20.0										CL			10				
WK	1984	OC	3	53	425128	880436	MW5A	781.0	23.5	25.0										CL			11				
WK	1984	OC	3	53	425128	880436	MW5A	781.0	28.5	30.0										CL			11				
WK	1984	OC	3	53	425128	880436	MW5A	781.0	33.5	35.0										CL			13				
WK	1984	OC	3	53	425128	880436	MW5A	781.0	38.5	40.0										CL			12				
WK	1984	OC	3	53	425128	880436	MW5A	781.0	43.5	45.0										CL			11				
WK	1984	OC	3	53	425128	880436	MW5A	781.0	48.5	50.0										CL			12				
WK	1984	OC	3	53	425128	880436	MW5A	781.0	53.5	55.0										CL			11				
WK	1984	OC	3	53	425128	880436	MW5A	781.0	58.5	60.0										CL			13				
WK	1985	OC	3	53	425131	880452	MW6A/B	777.6	3.5	5.0										CL			8				
WK	1985	OC	3	53	425131	880452	MW6A/B	777.6	8.5	10.0										CL			21				
WK	1985	OC	3	53	425131	880452	MW6A/B	777.6	13.5	15.0										CL			18				
WK	1985	OC	3	53	425131	880452	MW6A/B	777.6	18.5	20.0										CL			21				
WK	1985	OC	3	53	425131	880452	MW6A/B	777.6	23.5	25.0										CL			5				
WK	1985	OC	3	53	425131	880452	MW6A/B	777.6	28.5	30.0										CL							
WK	1985	OC	3	53	425131	880452	MW6A/B	777.6	33.5	35.0										CL			6				
WK	1985	OC	3	53	425131	880452	MW6A/B	777.6	38.5	40.0										CL			10				
WK	1985	OC	3	53	425131	880452	MW6A/B	777.6	43.5	45.0										CL			11				

Appendix 3 - HYDROGEOLOGIC AND ENGINEERING DATA FOR WAUKESHA COUNTY - FUTURE PARKLAND SITE

IDENTITY: County (code)	Year	Litho-strat. unit (code)	Mat. (code)	Site No.	Lat.	Long.	Brng. no.	Surf. Elev. (ft)	Sample top (ft)	Sample bottom (ft)	HYDRAULIC CONDUCTIVITY: Lab K (cm/s)	Meth code	Fld K (cm/s)	Meth code	GRAINSIZE PERCENTAGES: Bulk % >2.0mm	Matrix % sand (2.0 to 0.0625mm)	Matrix % silt (0.0625 to 0.002mm)	Matrix % clay (<0.002mm)	ENGINEERING PROPERTIES: Unified Soil Class.	Bulk Percent P200	Dry Unit Wt. (pcf)	SPT (N)	Moist. cont. (%)	Liquid limit	Plastic. index	UC (tsf)
WK	1985	OC	3	53	425131	880452	MW6A/B	777.6	47.5	50.0									CL			13				
WK	1985	OC	3	53	425131	880452	MW6A/B	777.6	9.0	21.0			1.50E-05	7					CL							
WK	1985	OC	3	53	425131	880452	MW6A/B	777.6	43.0	50.0			6.80E-08	7					CL							
WK	1985	OC	3	53	425131	880427	MW7A/B	788.9	3.5	5.0									CL			8				
WK	1985	OC	3	53	425131	880427	MW7A/B	788.9	8.5	10.0									CL			16				
WK	1985	OC	3	53	425131	880427	MW7A/B	788.9	13.5	15.0									CL			13				
WK	1985	OC	3	53	425131	880427	MW7A/B	788.9	18.5	20.0									CL			14				
WK	1985	OC	3	53	425131	880427	MW7A/B	788.9	23.5	25.0									CL			18				
WK	1985	OC	3	53	425131	880427	MW7A/B	788.9	28.5	30.0									CL			15				
WK	1985	OC	3	53	425131	880427	MW7A/B	788.9	33.5	35.0									CL			12				
WK	1985	OC	3	53	425131	880427	MW7A/B	788.9	38.5	40.0									CL			12				
WK	1985	OC	3	53	425131	880427	MW7A/B	788.9	43.5	45.0									CL			15				
WK	1985	OC	3	53	425131	880427	MW7A/B	788.9	47.5	50.0									CL			12				
WK	1985	OC	3	53	425131	880427	MW7A/B	788.9	53.5	55.0									CL			19				
WK	1985	OC	3	53	425131	880427	MW7A/B	788.9	58.5	60.0									CL			16				
WK	1985	OC	3	53	425131	880427	MW7A/B	788.9	15.0	26.0			3.90E-07	7					CL							
WK	1985	OC	3	53	425131	880427	MW7A/B	788.9	53.0	60.0			6.30E-08	7					CL							
WK	1985	OC	3	53	425126	880435	MW9A	786.2	3.5	5.0									CL			12				
WK	1985	OC	3	53	425126	880435	MW9A	786.2	8.5	10.0									CL			13				
WK	1985	OC	3	53	425126	880435	MW9A	786.2	13.5	15.0									CL			4				
WK	1985	OC	3	53	425126	880435	MW9A	786.2	18.5	20.0									CL			5				
WK	1985	OC	3	53	425126	880435	MW9A	786.2	23.5	25.0									CL			6				
WK	1985	OC	3	53	425126	880435	MW9A	786.2	28.5	30.0									CL			5				
WK	1985	OC	3	53	425126	880435	MW9A	786.2	33.5	35.0									CL			5				
WK	1985	OC	3	53	425126	880435	MW9A	786.2	38.5	40.0					0		50	50	CL	100.0	99.3		27.1	46	24	
WK	1985	OC	3	53	425126	880435	MW9A	786.2	43.5	45.0									CL			18				
WK	1985	OC	3	53	425126	880435	MW9A	786.2	47.5	50.0									CL			13				
WK	1985	OC	3	53	425126	880435	MW9A	786.2	53.5	55.0									CL			14				
WK	1985	OC	3	53	425126	880435	MW9A	786.2	14.0	26.0			3.60E-07	7					CL							
WK	1985	OC	3	53	425123	880441	MW8A	793.9	3.5	5.0									CL			26				
WK	1985	OC	3	53	425123	880441	MW8A	793.9	8.5	10.0									CL			34				
WK	1985	OC	3	53	425123	880441	MW8A	793.9	13.5	15.0									CL			30				
WK	1985	OC	3	53	425123	880441	MW8A	793.9	18.5	20.0									CL			35				
WK	1985	OC	3	53	425123	880441	MW8A	793.9	23.5	25.0									CL			18				
WK	1985	OC	3	53	425123	880441	MW8A	793.9	28.5	30.0									CL			16				
WK	1985	OC	3	53	425123	880441	MW8A	793.9	33.5	35.0									CL			13				
WK	1985	OC	3	53	425123	880441	MW8A	793.9	37.5	40.0									CL			13				
WK	1985	OC	3	53	425123	880441	MW8A	793.9	43.5	45.0									CL			11				
WK	1985	OC	3	53	425123	880441	MW8A	793.9	48.5	50.0									CL			14				
WK	1985	OC	3	53	425123	880441	MW8A	793.9	53.5	55.0									CL			14				
WK	1985	OC	3	53	425123	880441	MW8A	793.9	58.5	60.0									CL			12				
WK	1985	OC	3	53	425123	880441	MW8A	793.9	63.5	65.0									CL			12				
WK	1985	OC	3	53	425123	880441	MW8A	793.9	19.0	31.0			3.60E-07	7					CL							
WK	1985	OC	3	53	425121	880452	MW10A	781.9	3.5	5.0									CL			21				
WK	1985	OC	3	53	425121	880452	MW10A	781.9	8.5	10.0									CL			35				
WK	1985	OC	3	53	425121	880452	MW10A	781.9	13.5	15.0									CL			23				

Appendix 3 - HYDROGEOLOGIC AND ENGINEERING DATA FOR WAUKESHA COUNTY - FUTURE PARKLAND SITE

IDENTITY: County (code)	Year	Litho-strat. unit (code)	Mat. (code)	Site No.	Lat.	Long.	Brng. no.	Surf. Elev. (ft)	Sample top (ft)	Sample bottom (ft)	HYDRAULIC CONDUCTIVITY: Lab K (cm/s)	Meth code	Fld K (cm/s)	Meth code	GRAINSIZE PERCENTAGES: Bulk % >2.0mm	Matrix % sand (2.0 to 0.0625mm)	Matrix % silt (0.0625 to 0.002mm)	Matrix % clay (<0.002mm)	ENGINEERING PROPERTIES: Unified Soil Class.	Bulk Percent P200	Dry Unit Wt. (pcf)	SPT (N)	Moist. cont. (%)	Liquid limit	Plastic. index	UC (tsf)
WK	1985	OC	3	53	425121	880452	MW10A	781.9	18.5	20.0									CL							
WK	1985	OC	3	53	425121	880452	MW10A	781.9	23.5	25.0									CL			13				
WK	1985	OC	3	53	425121	880452	MW10A	781.9	28.5	30.0									CL			9				
WK	1985	OC	3	53	425121	880452	MW10A	781.9	33.5	35.0									CL			10				
WK	1985	OC	3	53	425121	880452	MW10A	781.9	37.5	40.0									CL			12				
WK	1985	OC	3	53	425121	880452	MW10A	781.9	43.5	45.0									CL			11				
WK	1985	OC	3	53	425121	880452	MW10A	781.9	48.5	50.0									CL			13				
WK	1985	OC	3	53	425121	880452	MW10A	781.9	9.0	21.0			5.60E-07	7					CL							
WK	1985	OC	3	53	425123	880433	MW11A	787.2	3.5	5.0									CL			15				
WK	1985	OC	3	53	425123	880433	MW11A	787.2	8.5	10.0									CL			14				
WK	1985	OC	3	53	425123	880433	MW11A	787.2	13.5	15.0									CL			11				
WK	1985	OC	3	53	425123	880433	MW11A	787.2	18.5	20.0									CL			11				
WK	1985	OC	3	53	425123	880433	MW11A	787.2	23.5	25.0									CL			12				
WK	1985	OC	3	53	425123	880433	MW11A	787.2	28.5	30.0									CL			11				
WK	1985	OC	3	53	425123	880433	MW11A	787.2	33.5	35.0									CL			11				
WK	1985	OC	3	53	425123	880433	MW11A	787.2	37.5	40.0									CL			11				
WK	1985	OC	3	53	425123	880433	MW11A	787.2	43.5	45.0									CL			13				
WK	1985	OC	3	53	425123	880433	MW11A	787.2	48.5	50.0									CL			14				
WK	1985	OC	3	53	425123	880433	MW11A	787.2	53.5	55.0									CL			14				
WK	1985	OC	3	53	425123	880433	MW11A	787.2	14.0	26.0			4.60E-08	7					CL			14				
WK	1985	OC	3	53	425115	880445	MW12A	784.1	3.5	5.0									CL			7				
WK	1985	OC	3	53	425115	880445	MW12A	784.1	8.5	10.0									CL			5				
WK	1985	OC	3	53	425115	880445	MW12A	784.1	13.5	15.0									CL			21				
WK	1985	OC	3	53	425115	880445	MW12A	794.1	18.5	20.0									CL			10				
WK	1985	OC	3	53	425115	880445	MW12A	784.1	23.5	25.0									CL			7				
WK	1985	OC	3	53	425115	880445	MW12A	784.1	28.5	30.0									CL			8				
WK	1985	OC	3	53	425115	880445	MW12A	784.1	33.5	35.0									CL			9				
WK	1985	OC	3	53	425115	880445	MW12A	784.1	38.5	40.0									CL			11				
WK	1985	OC	3	53	425115	880445	MW12A	784.1	43.5	45.0									CL			14				
WK	1985	OC	3	53	425115	880445	MW12A	784.1	48.5	50.0									CL			16				
WK	1985	OC	3	53	425115	880445	MW12A	784.1	9.0	21.0			2.00E-06	7					CL							
WK	1985	OC	3	53	425117	880428	MW13AB	803.4	3.5	5.0									CL			15				
WK	1985	OC	3	53	425117	880428	MW13AB	803.4	8.5	10.0									CL			40				
WK	1985	OC	3	53	425117	880428	MW13AB	803.4	13.5	15.0									CL			22				
WK	1985	OC	3	53	425117	880428	MW13AB	803.4	18.5	20.0									CL			22				
WK	1985	OC	3	53	425117	880428	MW13AB	803.4	23.5	25.0									CL			16				
WK	1985	OC	3	53	425117	880428	MW13AB	803.4	28.5	30.0									CL			22				
WK	1985	OC	3	53	425117	880428	MW13AB	803.4	33.5	35.0									CL			17				
WK	1985	OC	3	53	425117	880428	MW13AB	803.4	38.5	40.0									CL			16				
WK	1985	OC	3	53	425117	880428	MW13AB	803.4	43.5	45.0									CL			15				
WK	1985	OC	3	53	425117	880428	MW13AB	803.4	48.5	50.0									CL			16				
WK	1985	OC	3	53	425117	880428	MW13AB	803.4	53.5	55.0									CL			16				
WK	1985	OC	3	53	425117	880428	MW13AB	803.4	58.5	60.0									CL			17				
WK	1985	OC	3	53	425117	880428	MW13AB	803.4	63.5	65.0									CL			17				
WK	1985	OC	3	53	425117	880428	MW13AB	803.4	67.5	70.0									CL			36				
WK	1985	OC	3	53	425117	880428	MW13AB	803.4	73.5	75.0					0	0	50	50	CL	100.0	107.0		21.5	43	22	

Appendix 3 - HYDROGEOLOGIC AND ENGINEERING DATA FOR WAUKESHA COUNTY - FUTURE PARKLAND SITE

IDENTITY County (code)	Year	Litho-strat. unit (code)	Mat. (code)	Site No.	Lat.	Long.	Brng. no.	Surf. Elev. (ft)	Sample top (ft)	Sample bottom (ft)	HYDRAULIC CONDUCTIVITY Lab K (cm/s)	Meth code	Fld K (cm/s)	Meth code	GRAINSIZE PERCENTAGES Bulk % >2.0mm	Matrix % sand (2.0 to 0.0625mm)	Matrix % silt (0.0625 to 0.002mm)	Matrix % clay (<0.002mm)	ENGINEERING PROPERTIES Unified Soil Class.	Bulk Percent P200	Dry Unit Wt. (pcf)	SPT (N)	Moist. cont.(%)	Liquid limit	Plastic. index	UC (tsf)
WK	1985	OC	3	53	425117	880428	MW13AB	803.4	69.0	76.0			2.20E-07	7					CL							
WK	1985	OC	3	53	425126	880425	B-7	788.0	3.5	5.0									CL			4				
WK	1985	OC	3	53	425126	880425	B-7	788.0	8.5	10.0									CL			8				
WK	1985	OC	3	53	425126	880425	B-7	788.0	13.5	15.0									CL			11				
WK	1985	OC	3	53	425126	880425	B-7	788.0	18.5	20.0					0	2	61	27	CL	98.0		7		33	15	
WK	1985	OC	3	53	425126	880425	B-7	788.0	23.5	25.0									CL			5				
WK	1985	OC	3	53	425126	880425	B-7	788.0	28.5	30.0									CL			5				
WK	1985	OC	3	53	425126	880425	B-7	788.0	33.5	35.0									CL			10				
WK	1985	OC	3	53	425126	880425	B-7	788.0	38.5	40.0									CL			10				
WK	1985	OC	3	53	425126	880425	B-7	788.0	43.5	45.0									CL			9				
WK	1985	OC	3	53	425126	880425	B-7	788.0	48.5	50.0									CL			9				
WK	1985	OC	3	53	425126	880425	B-7	788.0	53.5	55.0									CL			9				
WK	1985	OC	3	53	425126	880435	B-9	787.0	3.5	5.0									CL			10				
WK	1985	OC	3	53	425126	880435	B-9	787.0	8.5	10.0									CL			25				
WK	1985	OC	3	53	425126	880435	B-9	787.0	13.5	15.0									CL			15				
WK	1985	OC	3	53	425126	880435	B-9	787.0	18.5	20.0									CL			10				
WK	1985	OC	3	53	425126	880435	B-9	787.0	23.5	25.0									CL			12				
WK	1985	OC	3	53	425126	880435	B-9	787.0	28.5	30.0									CL			17				
WK	1985	OC	3	53	425126	880435	B-9	787.0	33.5	35.0									CL			12				
WK	1985	OC	3	53	425126	880435	B-9	787.0	38.5	40.0									CL			13				
WK	1985	OC	3	53	425126	880435	B-9	787.0	43.5	45.0					0	0	40	60	CL	100.0			23.9	47	25	
WK	1985	OC	3	53	425126	880435	B-9	787.0	48.5	50.0									CL			20				
WK	1985	OC	3	53	425126	880435	B-9	787.0	53.5	55.0									CL			19				
WK	1985	OC	3	53	425126	880435	B-9	787.0	58.5	60.0									CL			16				
WK	1985	OC	3	53	425116	880434	B-12	795.0	3.5	5.0									CL			11				
WK	1985	OC	3	53	425116	880434	B-12	795.0	8.5	10.0									CL			20				
WK	1985	OC	3	53	425116	880434	B-12	795.0	13.5	15.0									CL			12				
WK	1985	OC	3	53	425116	880434	B-12	795.0	18.5	20.0									CL			15				
WK	1985	OC	3	53	425116	880434	B-12	795.0	23.5	25.0									CL			10				
WK	1985	OC	3	53	425116	880434	B-12	795.0	28.5	30.0					0	2	40	58	CL	98.0		7		44	23	
WK	1985	OC	3	53	425116	880434	B-12	795.0	33.5	35.0									CL			8				
WK	1985	OC	3	53	425116	880434	B-12	795.0	38.5	40.0									CL			12				
WK	1985	OC	3	53	425116	880434	B-12	795.0	43.5	45.0									CL			12				
WK	1985	OC	3	53	425116	880434	B-12	795.0	48.5	50.0									CL			15				
WK	1985	OC	3	53	425116	880434	B-12	795.0	53.5	55.0									CL			15				
WK	1985	OC	3	53	425116	880434	B-12	795.0	58.5	60.0									CL			18				
WK	1985	OC	3	53	425116	880434	B-12	795.0	63.5	65.0									CL			20				
WK	1984	OC	3	53	425117	880420	TP-1	800.0	0.0	4.0									CL							
WK	1984	OC	3	53	425115	880420	TP-1	800.0	10.0	12.0									CL							
WK	1984	OC	3	53	425115	880420	TP-1	800.0	14.0	15.5									CL					48	26	
WK	1984	OC	3	53	425117	880431	TP-2	801.0	0.0	5.0									CL							
WK	1984	OC	3	53	425117	880431	TP-2	801.0	6.0	10.0									CL							
WK	1984	OC	3	53	425117	880431	TP-2	801.0	13.0	15.5									CL					46	25	
WK	1984	OC	2	53	425122	880443	TP-3	791.0	2.0	4.0									SM							
WK	1984	OC	3	53	425122	880443	TP-3	791.0	6.0	10.0									SM							
WK	1984	OC	3	53	425122	880443	TP-3	791.0	15.0	19.0					10	69	20	11	SM	30.0						

Appendix 3 - HYDROGEOLOGIC AND ENGINEERING DATA FOR WAUKESHA COUNTY - FUTURE PARKLAND SITE

IDENTITY											HYDRAULIC CONDUCTIVITY				GRAINSIZE PERCENTAGES				ENGINEERING PROPERTIES							
County (code)	Year	Litho-strat. unit (code)	Mat. (code)	Site No.	Lat.	Long.	Brng. no.	Surf. Elev. (ft)	Sample top (ft)	Sample bottom (ft)	Lab K (cm/s)	Meth code	Fld K (cm/s)	Meth code	Bulk % >2.0mm	Matrix % sand (2.0 to 0.0625mm)	Matrix % silt (0.0625 to 0.002mm)	Matrix % clay (<0.002mm)	Unified Soil Class.	Bulk Percent P200	Dry Unit Wt. (pcf)	SPT (N)	Moist. cont.(%)	Liquid limit	Plastic. index	UC (tsf)
WK	1984	OC	3	53	425123	880438	TP-6	788.0	0.0	4.0									CL							
WK	1984	OC	3	53	425123	880438	TP-6	788.0	11.0	13.0									CL							
WK	1984	OC	3	53	425123	880438	TP-6	788.0	14.0	17.0									CH					52	30	
WK	1984	OC	3	53	425123	880427	TP-7	788.0	0.0	5.0									CL							
WK	1984	OC	3	53	425123	880427	TP-7	788.0	7.0	10.0					0	3	41	56	CL	97.0				50	27	
WK	1984	OC	3	53	425123	880427	TP-7	788.0	11.0	13.0									CL							

Appendix 3 - HYDROGEOLOGIC AND ENGINEERING DATA FOR MILWAUKEE COUNTY - (WEPCO) CALEDONIA EXPANSION

IDENTITY: County (code)	Year	Litho-strat. unit (code)	Mat. (code)	Site No.	Lat.	Long.	Brng. no.	Surf. Elev. (ft)	Sample top (ft)	Sample bottom (ft)	HYDRAULIC CONDUCTIVITY: Lab K (cm/s)	Meth code	Fld K (cm/s)	Meth code	GRAINSIZE PERCENTAGES: Bulk % >2.0mm	Matrix % sand (2.0 to 0.0625mm)	Matrix % silt (0.0625 to 0.002mm)	Matrix % clay (<0.002mm)	ENGINEERING PROPERTIES: Unified Soil Class.	Bulk Percent P200	Dry Unit Wt. (pcf)	SPT (N)	Moist. cont.(%)	Liquid limit	Plastic. index	UC (tsf)
RA	1986	OC	3	54	425020	875050	1-D	700.0	3.5	5.0									CL			28				4.5
RA	1986	OC	3	54	425020	875050	1-D	700.0	8.5	10.0									CL			29				4.0
RA	1986	OC	3	54	425020	875050	1-D	700.0	10.0	12.0	1.31E-08	3							CL		109.0		2.0	40	22	3.5
RA	1986	OC	3	54	425020	875050	1-D	700.0	18.5	20.0									CL		111.0	20	21.0	36	17	
RA	1986	OC	3	54	425011	875020	8-A	696.0	31.5	33.5									CL		109.0		21.0	37	19	
RA	1986	OC	3	54	425010	875021	8-A	696.0	3.5	5.0	5.25E-08	3							CL			23	16.0			4.5
RA	1986	OC	3	54	425010	875021	8-A	696.0	8.5	10.0									CL			43				
RA	1986	OC	3	54	425010	875021	8-A	696.0	13.5	15.0									CL			27				3.8
RA	1986	OC	3	54	425010	875021	8-A	696.0	18.5	20.0									CL			21				3.3
RA	1986	OC	3	54	425010	875021	8-A	696.0	23.5	25.0									CL			28				4.5
RA	1986	OC	3	54	425010	875021	8-A	696.0	28.5	30.0									CL			12				
RA	1986	OC	3	54	425010	875021	8-A	696.0	33.5	35.0									CL			16				1.0
RA	1986	OC	3	54	425010	875021	8-A	696.0	38.5	40.0									CL		115.0	24	19.0			2.3
RA	1986	OC	3	54	425010	875021	8-A	696.0	43.5	45.0									CL		104.0	25	21.0	35	18	2.0
RA	1986	OC	3	54	425010	875021	8-A	696.0	47.0	48.5									CL							
RA	1986	OC	3	54	425017	875019	9-A	696.0	32.5	33.5	4.56E-08	3							CL		122.0		15.0	25	11	
RA	1986	OC	3	54	425016	875019	9-C	696.0	3.5	5.0									CL			28				4.5
RA	1986	OC	3	54	425016	875019	9-C	696.0	8.5	10.0									CL		122.0	29	16.0			4.5
RA	1986	OC	3	54	425016	875019	9-C	696.0	13.5	15.0									CL			33				
RA	1986	OC	3	54	425016	875019	9-C	696.0	18.5	20.0									CL			16				3.5
RA	1986	OC	3	54	425016	875019	9-C	696.0	23.5	25.0									CL		122.0	19	16.0			3.0
RA	1986	OC	3	54	425016	875019	9-C	696.0	28.5	30.0									CL			24				3.3
RA	1986	OC	3	54	425016	875019	9-C	696.0	33.5	35.0									CL			27				2.0
RA	1986	OC	3	54	425016	875019	9-C	696.0	38.5	40.0									CL		133.0	25	15.0	22	7	2.0
RA	1986	OC	3	54	425016	875019	9-C	696.0	43.5	45.0									CL			25				4.0
RA	1986	OC	3	54	425016	875019	9-C	696.0	45.0	46.5	1.89E-08	3							CL		118.0		16.0	29	14	
RA	1986	OC	3	54	425022	875021	10-A	698.0	30.5	31.5	5.70E-08	3							CL		89.0		32.0	36	14	
RA	1986	OC	3	54	425029	875028	W-27	706.0	2.5	4.0									CL			35				
RA	1986	OC	3	54	425029	875028	W-27	706.0	8.5	10.0									CL			26				
RA	1986	OC	3	54	425029	875028	W-27	706.0	12.5	14.0									CL			15				
RA	1986	OC	3	54	425021	875021	10-C	699.0	3.5	5.0									CL			11				
RA	1986	OC	3	54	425021	875021	10-C	699.0	8.5	10.0									ML		119.0	38	15.0			4.0
RA	1986	OC	5	54	425021	875021	10-C	699.0	13.5	15.0									ML			56				
RA	1986	OC	5	54	425021	875021	10-C	699.0	18.5	20.0									CL			70				
RA	1986	OC	3	54	425021	875021	10-C	699.0	23.5	25.0									CL			18	15.0	28	13	3.5
RA	1986	OC	3	54	425021	875021	10-C	699.0	28.5	30.0									CL			14				2.0
RA	1986	OC	3	54	425021	875021	10-C	699.0	33.5	35.0									CL			29				2.0
RA	1986	OC	3	54	425021	875021	10-C	699.0	38.5	40.0									CL			29	20.0			3.3
RA	1986	OC	3	54	425021	875021	10-C	699.0	43.5	45.0									CL		123.0	44	16.0	27	12	2.8
RA	1986	OC	3	54	425021	875021	10-C	699.0	46.5	48.5									CL							
RA	1986	OC	3	54	425024	875029	W-28	709.0	3.5	5.0									CL			16				2.5
RA	1986	OC	3	54	425024	875029	W-28	709.0	8.5	10.0									CL		121.0	43	16.0			4.5
RA	1986	OC	3	54	425024	875029	W-28	709.0			5.87E-08	3							CL		126.0		14.0	25	11	
RA	1986	OC	3	54	425024	875029	W-28	709.0	13.5	15.0									CL		117.0	19	17.0	28	13	
RA	1986	OC	3	54	425019	875032	W-29	707.5	3.5	5.0									CL		115.0	13	20.0			2.3
RA	1986	OC	3	54	425019	875032	W-29	707.5	8.5	10.0									CL			36				1.5

Appendix 3 - HYDROGEOLOGIC AND ENGINEERING DATA FOR MILWAUKEE COUNTY - (WEPCO) CALEDONIA EXPANSION

IDENTITY County (code)	Year	Litho-strat. unit (code)	Mat. (code)	Site No.	Lat.	Long.	Brng. no.	Surf. Elev. (ft)	Sample top (ft)	Sample bottom (ft)	HYDRAULIC CONDUCTIVITY Lab K (cm/s)	Meth code	Fld K (cm/s)	Meth code	GRAINSIZE PERCENTAGES Bulk % >2.0mm	Matrix % sand (2.0 to 0.0625mm)	Matrix % silt (0.0625 to 0.002mm)	Matrix % clay (<0.002mm)	ENGINEERING PROPERTIES Unified Soil Class.	Bulk Percent P200	Dry Unit Wt. (pcf)	SPT (N)	Moist. cont.(%)	Liquid limit	Plastic. index	UC (tsf)
RA	1986	OC	3	54	425019	875032	W-29	707.5	10.0	12.0	2.59E-08	3							CL		118.0		16.0	28	12	
RA	1986	OC	3	54	425019	875032	W-29	707.5	13.5	15.0									CL			20	17.0			2.0
RA	1986	OC	3	54	425014	875037	W-30	703.0	3.5	5.0									CL		119.0	23	16.0	29	13	2.3
RA	1986	OC	3	54	425014	875037	W-30	703.0	8.5	10.0									CL		114.0	27	18.0	32	15	4.5
RA	1986	OC	3	54	425014	875037	W-30	703.0	10.0	12.0	9.99E-08	3							CL							
RA	1986	OC	3	54	425014	875037	W-30	703.0	13.5	15.0									CL		120.0	16	17			3.3
RA	1986	OC	3	54	425010	875040	W-31	705	3.5	5.0									CL		121.0	40	15	31	14	4.5
RA	1986	OC	3	54	425010	875040	W-31	705	8.5	10.0									CL			34				
RA	1986	OC	3	54	425010	875040	W-31	705	10.0	12.0	2.61E-08	3							CL		117.0		17	30	15	
RA	1986	OC	3	54	425010	875040	W-31	705	13.5	15.0									CL			18				
RA	1986	OC	3	54	425005	875031	W-32B	692	12.5	14.0	9.45E-08	3							CL		103.0		24	41	23	
RA	1986	OC	3	54	425005	875031	W-32C	692	3.5	5.0									CL			26				4.5
RA	1986	OC	3	54	425005	875031	W-32C	692	8.5	10.0									CL			26				4.5
RA	1986	OC	3	54	425005	875031	W-32C	692	13.5	15.0									CL			18				
RA	1986	OC	3	54	425005	875031	W-32C	692	18.5	20.0									CL		108.0	15				3
RA	1986	OC	3	54	425005	875031	W-32C	692	23.5	25.0									CL			20				3.3
RA	1986	OC	3	54	425005	875031	W-32C	692	28.5	30.0									CL			16				2
RA	1986	OC	5	54	425005	875031	W-32C	692	33.5	35.0									ML			30				
RA	1986	OC	3	54	425005	875031	W-32C	692	38.5	40.0									CL		108.0	12	21			1.5
RA	1986	OC	5	54	425005	875031	W-32C	692	43.5	45.0									ML			22				
RA	1986	OC	5	54	425005	875031	W-32C	692	48.5	50.0									ML							
RA	1986	OC	5	54	425005	875031	W-32C	692	50.0	51.5					0	30	60	10	ML	78		60				

IDENTITY County (code)	Year	Litho-strat. unit (code)	Mat. (code)	Site No.	Lat.	Long.	Brng. no.	Surf. Elev. (ft)	Sample top (ft)	Sample bottom (ft)	HYDRAULIC CONDUCTIVITY Lab K (cm/s)	Meth code	Fld K (cm/s)	Meth code	GRAINSIZE PERCENTAGES Bulk % >2.0mm	Matrix % sand (2.0 to 0.0625mm)	Matrix % silt (0.0625 to 0.002mm)	Matrix % clay (<0.002mm)	ENGINEERING PROPERTIES Unified Soil Class.	Bulk Percent P200	Dry Unit Wt. (pcf)	SPT (N)	Moist. cont.(%)	Liquid limit	Plastic. index	UC (tsf)
MK	1982	OC	3	55	425328	881047	TW-65	823.0	3.5	5.0									CL			11				3.5
MK	1982	OC	3	55	425328	881047	TW-65	823.0	8.5	10.0					0.0	0.0	70.0	30.0	CL	100		20		37	17	4.0
MK	1982	OC	3	55	425328	881047	TW-65	823.0	13.5	15.0									CL			14				3.5
MK	1982	OC	3	55	425328	881047	TW-65	823.0	18.5	20.0									CL			13				3.0
MK	1982	OC	3	55	425328	881047	TW-65	823.0	23.5	25.0									CL			13				3.5
MK	1982	OC	3	55	425328	881047	TW-65	823.0	12.0	25.0			1.16E-05	7					CL							
MK	1982	OC	3	55	425333	881041	P-64B	817.7	3.0	5.0									CL			16				
MK	1982	OC	3	55	425333	881041	P-64B	817.7	8.5	10.0									CL			38				
MK	1982	OC	3	55	425333	881041	P-64B	817.7	13.5	15.0									CL			22				
MK	1982	OC	3	55	425333	881041	P-64B	817.7	18.5	20.0									CL			13				
MK	1982	OC	3	55	425333	881041	P-64B	817.7	23.5	25.0									CL			17				
MK	1982	OC	4	55	425333	881041	P-64B	817.7	28.5	30.0									SM			22				
MK	1982	OC	3	55	425333	881041	P-64B	817.7	33.5	35.0					2.0	14.0	53.0	33.0	CL	87		13		29	13	
MK	1982	OC	3	55	425333	881041	P-64B	817.7	38.5	40.0									CL			13				
MK	1982	OC	3	55	425333	881041	P-64B	817.7	43.5	45.0									CL			19				
MK	1982	OC	3	55	425333	881041	P-64B	817.7	48.5	50.0									CL			23				
MK	1982	OC	3	55	425333	881041	P-64B	817.7	53.5	55.0									CL			16				
MK	1982	OC	3	55	425333	881041	P-64B	817.7	58.5	60.0									CL			23				
MK	1982	OC	3	55	425333	881041	P-64B	817.7	63.5	65.0					0.0	4.0	38.0	58.0	CL	100		17				
MK	1982	OC	3	55	425333	881041	P-64B	817.7	68.5	70.0									CL			20				
MK	1982	OC	3	55	425333	881041	P-64B	817.7	62.5	68.5			2.53E-06	7					CL							
MK	1982	OC	3	55	425324	881052	P-66A	829.9	3.0	47.4			2.71E-06	7					CL							
MK	1982	OC	3	55	425333	881040	P-64A	817.7	24.0	35.0			4.26E-06	7					CL							
MK	1982	OC	4	55	425324	881053	P66-B	829.9	64.0	71.8			5.11E-04	7					SP-SM							
MK	1982	OC	3	55	425324	881053	P66-B	829.9	3.5	5.0									CL			7				
MK	1982	OC	3	55	425324	881053	P66-B	829.9	8.5	10.0									CL			8				
MK	1982	OC	3	55	425324	881053	P66-B	829.9	13.5	15.0									CL			7				
MK	1982	OC	3	55	425324	881053	P66-B	829.9	18.5	20.0									CL			20				
MK	1982	OC	3	55	425324	881053	P66-B	829.9	23.5	25.0									CL			28				
MK	1982	OC	3	55	425324	881053	P66-B	829.9	28.5	30.0									CL			10				
MK	1982	OC	3	55	425324	881053	P66-B	829.9	33.5	35.0									CL			20				
MK	1982	OC	3	55	425324	881053	P66-B	829.9	38.5	40.0									CL			20				
MK	1982	OC	3	55	425324	881053	P66-B	829.9	43.5	45.0									CL			23				
MK	1982	OC	3	55	425324	881053	P66-B	829.9	48.5	50.0									CL			23				
MK	1982	OC	3	55	425324	881053	P66-B	829.9	53.5	55.0					1.0	11.0	57.0	32.0	CL	90		21				
MK	1982	OC	3	55	425324	881053	P66-B	829.9	58.5	60.0									CL			26				
MK	1982	OC	3	55	425324	881053	P66-B	829.9	63.5	65.0									CL			28				
MK	1982	OC	3	55	425324	881053	P66-B	829.9	68.5	70.0					54.0	74.0	20.0	6.0	SP-SM	15		40				
MK	1982	OC	3	55	425338	881046	TW-62	837.6	3.5	5.0									CL			5				0.5
MK	1982	OC	3	55	425338	881046	TW-62	837.6	8.5	10.0									CL			8				2.5
MK	1982	OC	3	55	425338	881046	TW-62	837.6	13.5	15.0									CL			13				2.0
MK	1982	OC	3	55	425338	881046	TW-62	837.6	18.5	20.0									CL			31				1.5
MK	1982	OC	3	55	425338	881046	TW-62	837.6	23.5	25.0									CL			25				3.0
MK	1982	OC	3	55	425338	881046	TW-62	837.6	28.5	30.0									CL			14				1.8
MK	1982	OC	3	55	425338	881046	TW-62	837.6	33.5	35.0									CL			21				2.5
MK	1982	OC	3	55	425338	881046	TW-62	837.6	38.5	40.0									CL			26				3.3

Appendix 3 - HYDROGEOLOGIC AND ENGINEERING DATA FOR MILWAUKEE COUNTY - MUSKEGO

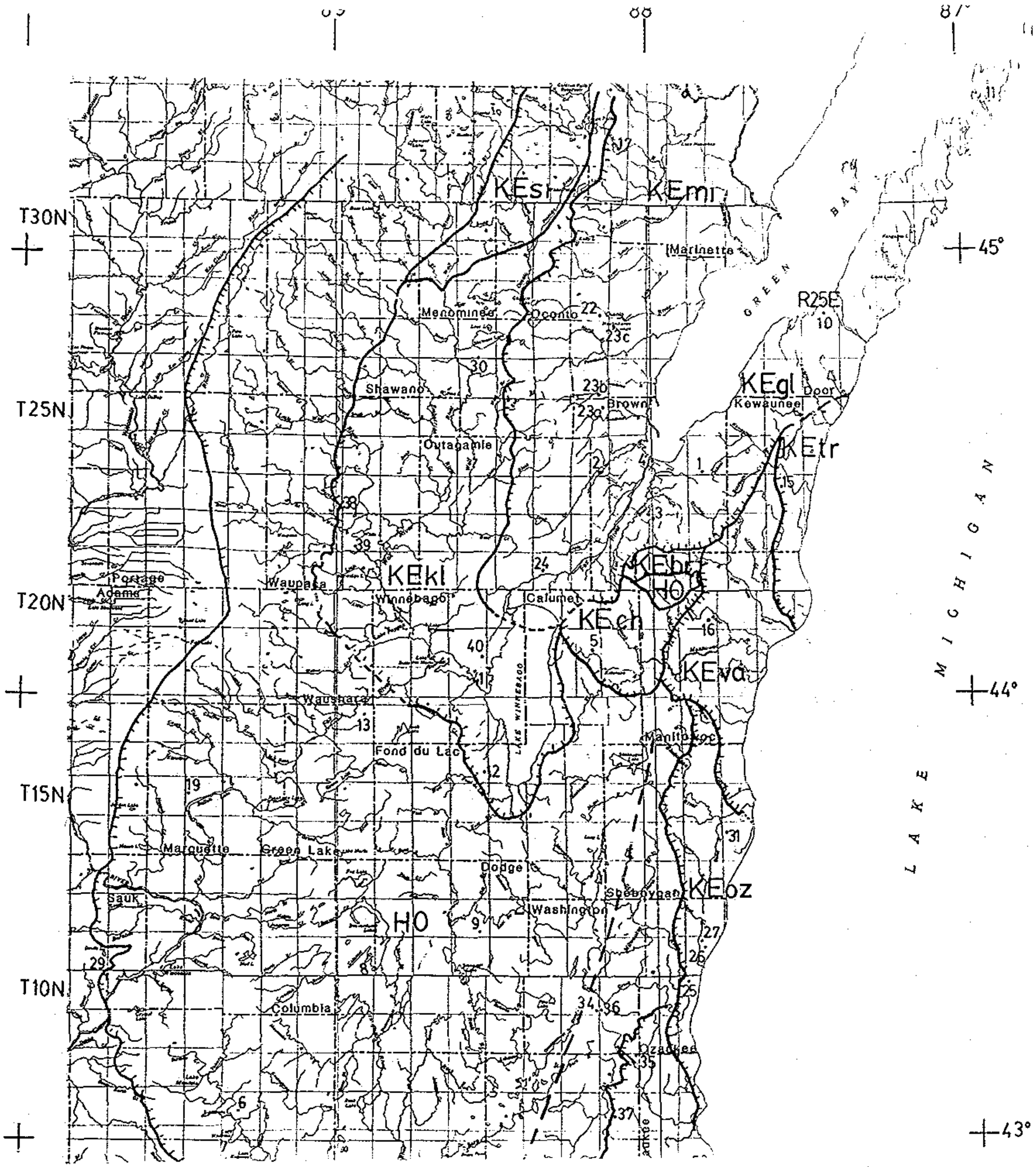
IDENTITY											HYDRAULIC CONDUCTIVITY				GRAINSIZE PERCENTAGES				ENGINEERING PROPERTIES							
County (code)	Year	Litho-strat. unit (code)	Mat. (code)	Site No.	Lat.	Long.	Brno. no.	Surf. Elev. (ft)	Sample top (ft)	Sample bottom (ft)	Lab K (cm/s)	Meth code	Fld K (cm/s)	Meth code	Bulk % >2.0mm	Matrix % sand (2.0 to 0.0625mm)	Matrix % silt (0.0625 to 0.002mm)	Matrix % clay (<0.002mm)	Unified Soil Class.	Bulk Percent P200	Dry Unit Wt. (pcf)	SPT (N)	Moist. cont.(%)	Liquid limit	Plastic. index	UC (tsf)
WK	1982	OC	3	55	425338	881046	TW-62	837.6	43.5	45.0									CL			24				3.3
WK	1982	OC	3	55	425338	881046	TW-62	837.6	48.5	50.0									CL			26				
WK	1982	OC	3	55	425338	881046	TW-62	837.6	52.5	55.0									CL			39				
WK	1982	OC	4	55	425338	881046	TW-62	837.6	58.5	60.0					77.0	70.0	18.0	12.0	GW-GM	10		54				
WK	1982	OC	4	55	425338	881046	TW-62	837.6	62.5	65.0									GW-GM			70				
WK	1982	OC	3	55	425348	881030	P-63B	868.4	3.5	5.0									CL			31				
WK	1982	OC	3	55	425348	881030	P-63B	868.4	8.5	10.0									CL			32				
WK	1982	OC	3	55	425348	881030	P-63B	868.4	13.5	15.0									CL			32				
WK	1982	OC	3	55	425348	881030	P-63B	868.4	18.5	20.0									CL			27				
WK	1982	OC	5	55	425348	881030	P-63B	868.4	23.5	25.0									CL			23				
WK	1982	OC	5	55	425348	881030	P-63B	868.4	28.5	30.0					16.0	49.0	36.0	15.0	SM-ML	50		28				
WK	1982	OC	5	55	425348	881030	P-63B	868.4	33.5	35.0									ML			20				
WK	1982	OC	5	55	425348	881030	P-63B	868.4	38.5	40.0									ML			28				
WK	1982	OC	5	55	425348	881030	P-63B	868.4	43.5	45.0									ML			27				
WK	1982	OC	5	55	425348	881030	P-63B	868.4	48.5	50.0									SM-GM			60				
WK	1982	OC	5	55	425348	881030	P-63B	868.4	53.5	55.0									SM-GM			60				
WK	1982	OC	5	55	425348	881030	P-63B	868.4	58.5	60.0									SM-GM			61				
WK	1982	OC	5	55	425348	881030	P-63B	868.4	63.5	65.0									SM-GM			60				
WK	1982	OC	3	55	425348	881030	P-63B	868.4	68.5	70.0					53.0	72.0	21.0	7.0	SM-GM	15		44				
WK	1982	OC	3	55	425348	881030	P-63B	868.4	73.5	75.0									SM-GM			60				
WK	1982	OC	4	55	425348	881030	P-63B	868.4	78.5	80.0									SM			60				
WK	1982	OC	4	55	425348	881030	P-63B	868.4	83.5	85.0					0.0	83.0	15.0	2.0	SM	18		55				
WK	1982	OC	4	55	425348	881030	P-63B	868.4	88.5	90.0									SM			60				
WK	1982	OC	3	55	425356	881029	TW-61	897.1	3.5	5.0									CL			22				
WK	1982	OC	3	55	425356	881029	TW-61	897.1	8.5	10.0									CL			25				
WK	1982	OC	3	55	425356	881029	TW-61	897.1	13.5	15.0									CL			17				
WK	1982	OC	3	55	425356	881029	TW-61	897.1	18.5	20.0									CL			13				
WK	1982	OC	3	55	425356	881029	TW-61	897.1	23.5	25.0									CL			14				
WK	1982	OC	3	55	425356	881029	TW-61	897.1	28.5	30.0									CL			26				
WK	1982	OC	3	55	425356	881029	TW-61	897.1	19.0	30.0			2.90E-05	7					CL/SP							
WK	1982	NB	3	55	425356	881050	TW-60	863.9	3.5	5.0									SP-SM			47				
WK	1982	NB	3	55	425356	881050	TW-60	863.9	8.5	10.0									SP-SM			50				
WK	1982	NB	3	55	425356	881050	TW-60	863.9	13.5	15.0									SP-SM			60				
WK	1982	NB	3	55	425356	881050	TW-60	863.9	18.5	20.0					67.0	79.0	15.0	6.0	SM	15		37				
WK	1982	NB	4	55	425356	881050	TW-60	863.9	23.5	25.0									ML			60				
WK	1982	NB	4	55	425356	881050	TW-60	863.9	28.5	30.0									ML			60				
WK	1982	NB	3	55	425327	881109	P-67B	838.6	3.5	5.0									SM			35				
WK	1982	NB	3	55	425327	881109	P-67B	838.6	8.5	10.0									SM			27				
WK	1982	NB	3	55	425327	881109	P-67B	838.6	13.5	15.0									SM			29				
WK	1982	NB	3	55	425327	881109	P-67B	838.6	18.5	20.0									SM			26				
WK	1982	NB	3	55	425327	881109	P-67B	838.6	23.5	25.0									SM			20				
WK	1982	NB	3	55	425327	881109	P-67B	838.6	28.5	30.0					25.0	69.0	25.0	6.0	SM	25		16				
WK	1982	NB	3	55	425327	881109	P-67B	838.6	33.5	35.0									SM			60				
WK	1982	NB	3	55	425327	881109	P-67B	838.6	38.5	40.0									GP			18				
WK	1982	NB	3	55	425327	881109	P-67B	838.6	43.5	45.0									GP			60				
WK	1982	NB	4	55	425327	881109	P-67B	838.6	48.5	50.0					79.0	81.0	14.0	5.0	SW-SP	5		60				

Appendix 3 - HYDROGEOLOGIC AND ENGINEERING DATA FOR MILWAUKEE COUNTY - MUSKEGO

IDENTITY County (code)	Year	Litho-strat. unit (code)	Nat. (code)	Site No.	Lat.	Long.	Brng. no.	Surf. Elev. (ft)	Sample top (ft)	Sample bottom (ft)	HYDRAULIC CONDUCTIVITY Lab K (cm/s)	Meth code	Fld K (cm/s)	Meth code	GRAINSIZE PERCENTAGES Bulk % >2.0mm	Matrix % sand (2.0 to 0.0625mm)	Matrix % silt (0.0625 to 0.002mm)	Matrix % clay (<0.002mm)	ENGINEERING PROPERTIES Unified Soil Class.	Bulk Percent P200	Dry Unit Wt. (pcf)	SPT (N)	Moist. cont. (%)	Liquid limit	Plastic. index	UC (tsf)
WK	1982	NB	4	55	425327	881109	P-67B	838.6	53.5	55.0									SW-SP			60				
WK	1982	NB	4	55	425327	881109	P-67B	838.6	58.5	60.0									SP-SM			60				
WK	1982	NB	4	55	425327	881109	P-67B	838.6	63.5	65.0									SP-SM			53				
WK	1982	NB	4	55	425327	881109	P-67B	838.6	68.5	70.0									SP-SM			60				
WK	1982	NB	4	55	425327	881109	P-67B	838.6	73.5	75.0					52.0	79.0	19.0	2.0	SP-SM	11		60				
WK	1984	OC	3	55	425341	881046	P-69	855.6	8.5	10.0									CL			14				1.5
WK	1984	OC	3	55	425341	881046	P-69	855.6	18.5	20.0									CL			26				2.5
WK	1984	NB	3	55	425341	881046	P-69	855.6	23.5	25.0									SM			120				
WK	1984	NB	3	55	425341	881046	P-69	855.6	28.5	30.0									SM			100				
WK	1984	NB	3	55	425341	881046	P-69	855.6	33.5	35.0									SM			100				
WK	1984	NB	3	55	425341	881046	P-69	855.6	38.5	40.0									SM			100				
WK	1984	NB	3	55	425341	881046	P-69	855.6	43.5	45.0					60.0	68.0	25.0	7.0	SM	14		100				
WK	1984	NB	5	55	425341	881046	P-69	855.6	48.5	50.0									SM			55				
WK	1984	NB	5	55	425341	881046	P-69	855.6	53.5	55.0									ML			100				3.5
WK	1984	NB	5	55	425341	881046	P-69	855.6	58.5	60.0					0.0	82.0	17.0	1.0	SM	21		100				
WK	1984	NB	5	55	425341	881046	P-69	855.6	63.5	65.0									SM			100				
WK	1984	NB	5	55	425341	881046	P-69	855.6	68.5	70.0									SM			100				
WK	1984	NB	5	55	425341	881046	P-69	855.6	70.0	72.0									SM			100				
WK	1984	OC	3	55	425340	881048	TW-70	846.8	8.5	10.0									CL			7				
WK	1984	OC	3	55	425340	881048	TW-70	846.8	13.5	15.0									CL			40				4.5
WK	1984	OC	3	55	425340	881048	TW-70	846.8	18.5	20.0									CL			53				4.5
WK	1984	NB	3	55	425340	881048	TW-70	846.8	23.5	25.0									SM			100				
WK	1984	NB	3	55	425340	881048	TW-70	846.8	28.5	30.0									SM			70				
WK	1984	NB	3	55	425340	881048	TW-70	846.8	33.5	35.0					84.0	75.0	19.0	6.0	SP,GP-GM	5		100				
WK	1984	NB	3	55	425340	881048	TW-70	846.8	38.5	40.0									SP,GP-GM			100				
WK	1984	NB	3	55	425340	881048	TW-70	846.8	43.5	45.0									SP,GP-GM			90				
WK	1984	NB	3	55	425340	881048	TW-70	846.8	48.5	50.0									SP,GP-GM							
WK	1984	NB	3	55	425340	881048	TW-70	846.8	53.5	55.0					43.0	73.0	24.0	3.0	SP,GP-GM	12		100				
WK	1984	OC	3	55	425339	881051	TW-71	829.8	3.5	5.0									CL			9				
WK	1984	OC	5	55	425339	881051	TW-71	829.8	8.5	10.0									SM			39				
WK	1984	OC	3	55	425339	881051	TW-71	829.8	13.5	15.0									CL			10				
WK	1984	OC	3	55	425339	881051	TW-71	829.8	18.5	20.0									CL			27				
WK	1984	OC	3	55	425339	881051	TW-71	829.8	23.5	25.0									CL			26				
WK	1984	NB	3	55	425339.	881051	TW-71	829.8	28.5	30.0									SP-SM			45				
WK	1984	NB	3	55	425339	881051	TW-71	829.8	33.5	35.0					27.0	79.0	17.0	4.0	SP-SM	16		40				
WK	1984	OC	3	55	425340	881046	B-72	852.7	8.5	10.0									CL			22				
WK	1984	OC	3	55	425340	881046	B-72	852.7	13.5	15.0									CL			20				
WK	1984	OC	3	55	425340	881046	B-72	852.7	18.5	20.0									CL			22				
WK	1984	NB	3	55	425340	881046	B-72	852.7	23.5	25.0									GW-GM			100				
WK	1984	NB	3	55	425340	881046	B-72	852.7	28.5	30.0									GW-GM			100				
WK	1984	NB	3	55	425340	881046	B-72	852.7	33.5	35.0									GW-GM			100				
WK	1984	NB	3	55	425340	881046	B-72	852.7	38.5	40.0									GW-GM			100				
WK	1984	NB	3	55	425340	881046	B-72	852.7	43.5	45.0					62.0	79.0	16.0	5.0	GW-GM	10		92				
WK	1984	NB	3	55	425340	881046	B-72	852.7	48.5	50.0																
WK	1984	NB	3	55	425340	881046	B-72	852.7	53.5	55.0																
WK	1984	NB	3	55	425340	881046	B-72	852.7	58.5	60.0																

Appendix 3 - HYDROGEOLOGIC AND ENGINEERING DATA FOR MILWAUKEE COUNTY - MUSKEGO

IDENTITY											HYDRAULIC CONDUCTIVITY				GRAINSIZE PERCENTAGES				ENGINEERING PROPERTIES							
County (code)	Year	Litho-strat. unit (code)	Mat. (code)	Site No.	Lat.	Long.	Brng. no.	Surf. Elev. (ft)	Sample top (ft)	Sample bottom (ft)	Lab K (cm/s)	Meth code	Fld K (cm/s)	Meth code	Bulk % >2.0mm	Matrix % sand (2.0 to 0.0625mm)	Matrix % silt (0.0625 to 0.002mm)	Matrix % clay (<0.002mm)	Unified Soil Class.	Bulk Percent P200	Dry Unit Wt. (pcf)	SPT (N)	Moist. cont.(%)	Liquid limit	Plastic. index	UC (tsf)
MK	1984	NB	3	55	425340	881046	B-72	852.7	63.5	65.0																
MK	1984	NB	3	55	425340	881046	B-72	852.7	68.5	70.0																
MK	1984	NB	3	55	425340	881046	B-72	852.7	73.5	75.0					44.0	77.0	16.0	7.0	GW-GM	10						
MK	1984	NB	3	55	425340	881046	B-72	852.7	78.5	80.0																
MK	1984	NB	3	55	425340	881046	B-72	852.7	83.5	85.0																
MK	1984	NB	3	55	425340	881046	B-72	852.7	88.5	90.0									GW-GM							
MK	1984	NB	5	55	425340	881046	B-72	852.7	93.5	95.0									ML			120				
MK	1984	NB	5	55	425340	881046	B-72	852.7	98.5	100.0									ML			120				
MK	1982	OC	3	55	425337	881049	B-73	836.5	3.5	5.0												25				2.5
MK	1982	OC	3	55	425337	881049	B-73	836.5	8.5	10.0												29				3.0
MK	1982	OC	3	55	425337	881049	B-73	836.5	13.5	15.0												32				3.0
MK	1982	OC	3	55	425337	881049	B-73	836.5	18.5	20.0					5.0	21.0	67.0	12.0	CL	77		14		22	9	1.3
MK	1982	OC	3	55	425337	881049	B-73	836.5	23.5	25.0												16				1.5
MK	1982	OC	4	55	425337	881049	B-73	836.5	28.5	30.0												40				
MK	1982	OC	3	55	425337	881049	B-73	836.5	33.5	35.0												33				
MK	1982	OC	3	55	425337	881049	B-73	836.5	38.5	40.0																
MK	1982	OC	3	55	425337	881049	B-73	836.5	43.5	45.0																
MK	1982	OC	3	55	425337	881049	B-73	836.5	48.5	50.0												22				
MK	1982	OC	3	55	425337	881049	B-73	836.5	53.5	55.0												23				
MK	1982	OC	3	55	425337	881049	B-73	836.5	58.5	60.0												21				
MK	1982	OC	4	55	425337	881049	B-73	836.5	63.5	65.0																
MK	1982	OC	5	55	425337	881049	B-73	836.5	68.5	70.0												52				
MK	1982	OC	3	55	425336	881036	P-76	826.5	3.5	5.0									CL			23				4.5
MK	1982	OC	3	55	425336	881036	P-76	826.5	8.5	10.0									CL			18				4.5
MK	1982	OC	3	55	425336	881036	P-76	826.5	13.5	15.0									CL			16				2.0
MK	1982	OC	3	55	425336	881036	P-76	826.5	18.5	20.0									CL			14				2.3
MK	1982	OC	3	55	425336	881036	P-76	826.5	23.5	25.0									CL			12				2.0
MK	1982	OC	3	55	425336	881036	P-76	826.5	28.5	30.0									CL			15				2.5
MK	1982	OC	3	55	425336	881036	P-76	826.5	33.5	35.0									CL			13				2.3
MK	1982	OC	3	55	425336	881036	P-76	826.5	38.5	40.0									CL			16				3.3
MK	1982	OC	3	55	425336	881036	P-76	826.5	43.5	45.0									CL			16				3.3
MK	1982	OC	3	55	425336	881036	P-76	826.5	48.5	50.0									CL			18				3.5
MK	1982	OC	3	55	425336	881036	P-76	826.5	53.5	55.0									SM			28				
MK	1982	OC	4	55	425336	881036	P-76	826.5	58.5	60.0									SM			49				
MK	1982	OC	4	55	425336	881036	P-76	826.5	63.5	65.0									SM			51				
MK	1982	OC	3	55	425336	881036	P-76	826.5	68.5	70.0									CL			36				



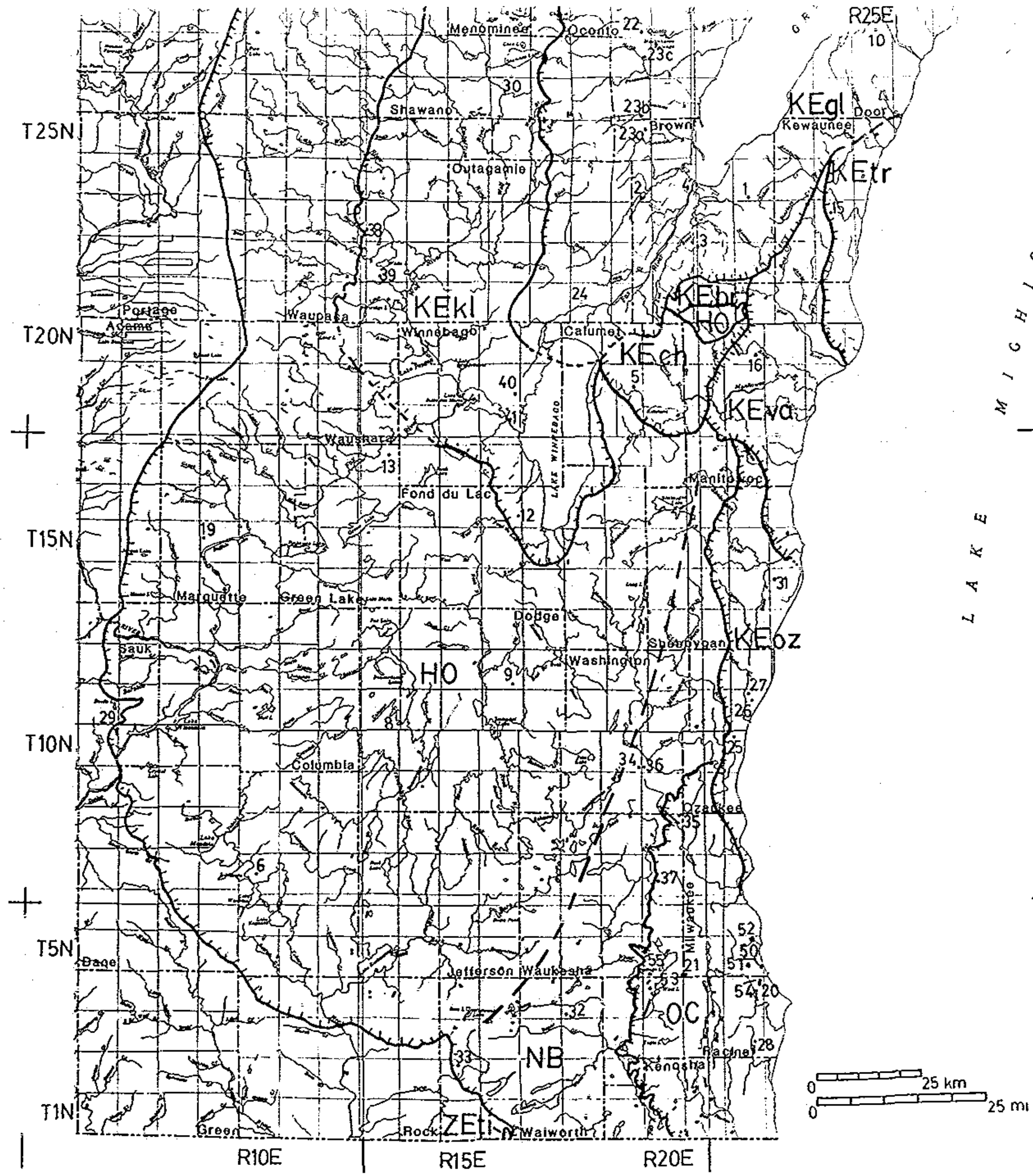
EXTENT OF ICE ADVANCES RESPONSIBLE FOR LITHOSTRATIGRAPHIC UNITS

The extent of ice advances responsible for lithostratigraphic units is after Mickelson et al. (1984). Ice marginal positions are indicated by moraines; these were traced from Lineback et al. (1983) and Farrand et al. (1984). The tills in lithostratigraphic units were deposited by ice within the approximate margins drawn on this figure, but tills are not always present at the land surface within the margins. For example, till of the Glenmore Member does not cover all the land surface of the Door Peninsula (the peninsula separating Green Bay and Lake Michigan), but the ice advance that deposited the Glenmore Member covered the Door Peninsula entirely.

The southern extent of the glacial advance that deposited the Haven Member of the Kewaunee Formation is problematic. Mickelson et al. illustrate the Haven Member as extending farther south than the Valders Member. No southern ice margin associated with the Haven Member is shown here, and the mapped location in Mickelson et al. (1984) is "purely diagrammatic" (Mickelson, personal communication, 1987).

Site numbers are consistent throughout the text, illustrations, and appendices. Appendix 2 includes township and range coordinates for each site.

• 2	location of land disposal site studied
(line)	inferred position of the ice margin
(hachured line)	ice marginal position indicated by a moraine
KE	Kewaunee Fm.
KEmi	Middle Inlet M.
KEkl	Kirby Lake M.
KEsi	Silver Cliff M.
KEgl	Glenmore M.
KEch	Chilton M.
KEbr	Branch River M.
KEtr	Two Rivers M.
KEva	Valders M.
KEha	Haven M.
KEoz	Ozaukee M.
OC	Oak Creek Fm.
NB	New Berlin Fm.



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KEch	Chilton M.
KEbr	Branch River M.
KEtr	Two Rivers M.
KEva	Valders M.
KEha	Haven M.
KEoz	Ozaukee M.
OC	Oak Creek Fm.
NB	New Berlin Fm.
HO	Horicon Fm.
ZE	Zenda Fm.
ZEti	Tiskilwa M.