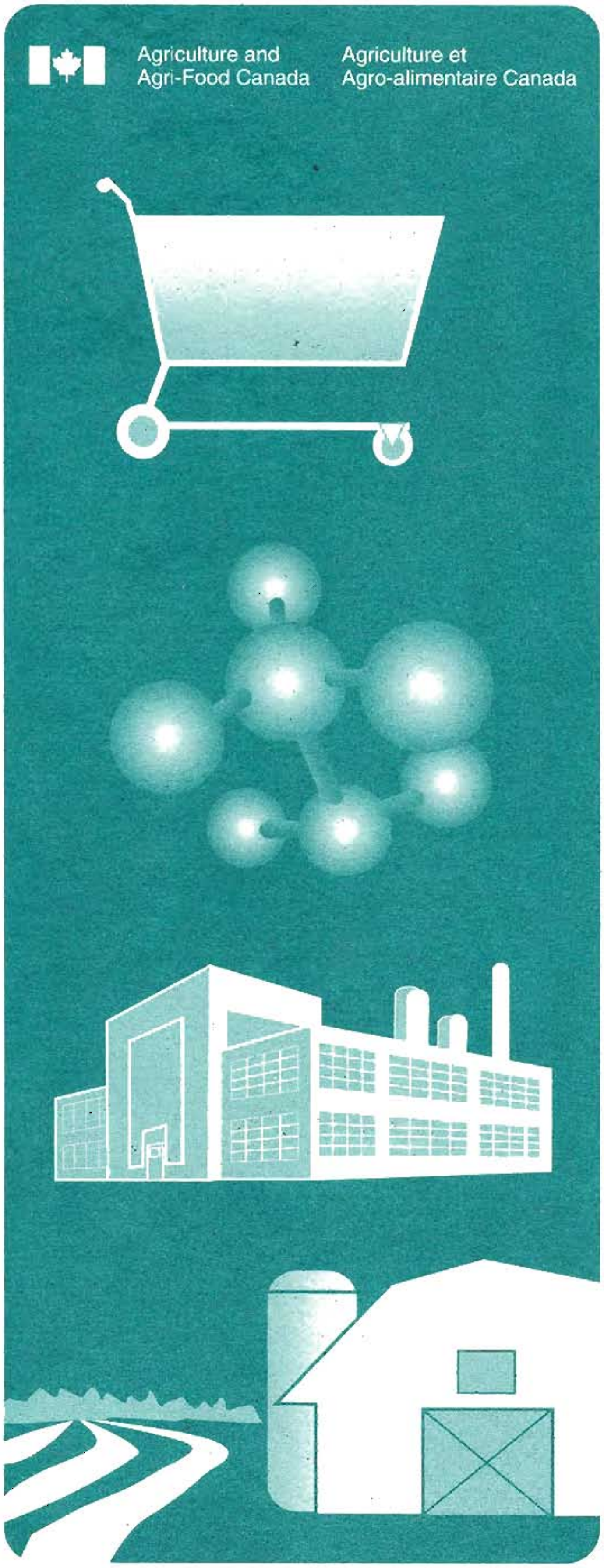

Research Branch
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Unified Soil Classification System for Engineering Applications

Soil Landscapes of Canada - Manitoba

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Canada

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Agriculture and Agri-Food Canada
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Soil Landscapes of Canada - Manitoba

Unified Soil Classification System for Engineering Applications

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Preface

This report presents a new application of the Manitoba - Soil Landscapes of Canada (SLC) Map. The Manitoba soil data base, derived from detailed soil survey profile data and reconnaissance map information, has been interpreted and presented in the context of the Unified Soil Classification System for Engineering Applications. The transformation and interpretation of soil information in engineering terms is depicted in standard figures in the text and on a generalized materials map (1:1 500 000 scale) contained in the attached pocket. The information shown on the map was derived from the dominant soils/non-soils information for each polygon. More details of the dominant soils and other conditions within each unique polygon (with corresponding unique map and data base numbers) are provided in the extended legend in the appendix.

This document is a first attempt to portray soils information in a generalized context for geo-technical applications. The aim of this document is to provide a guide for "broad brush" planning for geo-technical projects. It is envisioned that this information will have applications at various levels, for preliminary assessments of construction and infrastructure development such as pipelines, highways, roads, power line corridors, irrigation development, water retention and water conveyance structures. It may also have broad implications for rural development in remote areas where materials are difficult to characterize.

This document is the culmination of the efforts of many people over many years of collaborative interactions between the engineering community in both the public and private sectors including staff members of Manitoba Department of Highways, Manitoba Hydro, and private engineering consulting firms with soil scientists of the Land Resource Unit (Manitoba) of Agriculture and Agri-Food Canada.

The information, data, illustrations, writing and presentation however, are the sole responsibility of the authors and staff of the Land Resource Unit. All users are encouraged to comment on any portion of the technical or descriptive aspects of this publication. Comments should be forwarded to:

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W. Michalyna, Agriculture and Agri-Food Canada. Plate: 1a, 1b, 1c, 2c, 4a.
G. F. Mills, Manitoba Agriculture. Plate: 2d, 3b.

Introduction

This report and map is another in a series of interpretive and derived maps produced using the Soil Landscapes of Canada map and data base for Manitoba. The map portrays, at a broad level, a general interpretation of soil characteristics and parent material properties using the Unified Soil Classification System. The report describes, defines, and illustrates the interpretation methodology for the map and computerized legend containing information for each landscape unit in Manitoba. This report, with accompanying map and data base, provides an overview of soil resources with an interpretive application to engineering evaluations and project planning.

Why were the maps prepared?

Terrain information and land classification must serve a multitude of land uses, one of which is for engineering application. Soil data bases which describe the regional soils and their properties may be expressed in terms that are readily translated for engineering uses of land using the Unified Soil Classification System (USCS). The small scale map accompanying this report attempts to express the properties of the landscapes of Manitoba in a general geographic format that can be used for educational purposes and broad regional planning for various engineering applications.

The published map and legend provide a generalized overview of the soils of Manitoba in terms of the engineering (Unified) soils classification, as well as information on mode of deposition and surface landforms. The Land Resource Unit, Brandon Research Centre, Agriculture & Agri-Food Canada, and the Agricultural Resources Section, Soils and Crops Branch, Manitoba Agriculture, have conducted inventories and characterization of the near-surface soil condition for more than 50 years and published numerous reports describing the pedological development and properties of the unaltered soil materials. Since 1960, more detailed soil investigations have been carried out in Agro-Manitoba during which many soil and environmental properties were observed and measured. These properties were used to provide interpretations for a range of land uses including agriculture, engineering, and recreation. Also, many Reconnaissance and Exploratory Surveys in northern Manitoba were completed in the late 1970's and representative sites of soil landscapes were described in detail, sampled, and analyzed. As a result of these activities, a considerable data base has been compiled for the major soils throughout the province. The results of these studies have been generalized and have culminated in the publication of the Soil Landscapes of Canada series of 1:1 million scale maps.

Between 1987 and 1995, the Centre for Land and Biological Resource Research (CLBRR) of Agriculture & Agri-Food Canada, in cooperation with the Manitoba Soil Resources Section, prepared a series of generalized maps depicting various themes at a scale of 1:1 million. For each polygon delineated on these maps, an associated computerized data base was compiled which contains the attributes of the dominant soil in the landscape. This data base has been supplemented with additional information on soil classification and chemical and physical properties of the soil within the landscape. The soil landscape is defined as the full array of attributes that describe a distinct type of soil and its associated characteristics, such as geologic materials, landform, slope, watertable, permafrost, and lakes.

What can the information be used for?

The information on the map and in the data base can be used:

- as a reconnaissance tool to define soil types and properties for engineering applications, and to portray the spatial distribution of the various Unified soil classes.
- to assess the importance of soil properties

(Unified Soil Classification System) and landscapes features affecting various land uses associated with engineering applications.
- to inform users of various problems associated with soil drainage, peaty surfaces, bedrock conditions, high shrink-swell clays, and permafrost.
- to apply general research findings and design knowledge that are successful in one part of the province to other areas with similar attributes.
- to educate students of engineering, soils, geography, and environment at colleges and universities.

Note: The information contained in each map symbol is an estimate for the entire area of the polygon to which it refers and is not intended to apply to a site-specific land parcel within the polygon.

What information is recorded?

Map:

Map units depicting soil engineering classification and engineering properties are based on interpretation of soil and landscape attributes shown on the generalized Soil Landscape Map of Canada-Manitoba (SLC, 1989). The classification used is the Unified Soil Classification System (USCS), as presented in Table 1. The interpretation is based on attributes recorded for the dominant soil landscape found in each polygon. A brief description of these attributes is provided in the map legend, which utilizes symbols and color codes to convey the main geological materials and the Unified group. The geological materials are grouped according to the mode of deposition such as lacustrine, morainal, glacial fluvial, marine deposits, and bedrock. Within each group, specific Unified classes are described.

The colors on the map represent the mode of deposition of the dominant geologic material within the one to two meter depth. The shade of color represents the Unified class as identified in the map legend. A veneer or overlay, generally up to one meter in thickness for mineral soils, or up to 1.6 meters for organic soils, is represented by an overprinted hatch symbol according to Unified System classification standards.

Within each polygon, the map symbol consists of three lines. The symbols are as follows:

top line is given as one Unified class if the geologic material is relatively the same at depths of one to two meters, or, if two contrasting geologic materials occur, a dual Unified class symbol is separated by a slash (/); the first symbol indicates the classification of the veneer or overlay material, while the second symbol indicates the underlying geologic material.

middle line provides the SLC codes for the parent material mode of deposition, surface landform, and percent slope gradient.

bottom line provides the unique number used to identify each map polygon (or delineated area) on the SLC map and provides a linkage to the soil property and terrain data contained in the extended legend for the SLC map.

Extended legend:

The table in the back of this report describes, for each polygon, the attributes of the dominant soil landscapes and certain important non-soil features such as rock outcrops. It includes the following (where available):
- Unified class for parent materials, e.g. CH (inorganic clays of high plasticity)
- origin of parent or geologic materials
- surface form
- slope class
- drainage class
- depth to water table (dominant only)
- plastic limit
- liquid limit
- shrinkage limit
- optimum moisture

- maximum density
- distribution of permafrost
- dominant permafrost type
- degree of stoniness at surface
- the grid code for locating polygons on the map and
- the area (kilohectares) of each polygon

Why were these attributes chosen as map symbols?

The attributes shown in the map symbol and legend serve to differentiate one polygon from another. They were chosen for the following reasons:

Unified class of parent material - engineering properties vary according to particle size distribution, plasticity index and general workability, stability, or bearing properties.

origin of parent material - because it provides information on the surficial geology and linkages to mapping methods used on the source maps.

surface form - because of its influence on moisture movement and retention, surface water drainage, land use and soil development.

slope class - because of its influence on land use and water erosion risk or stability, particularly when coupled with long slopes on inclined or rolling surfaces.

kind of rock - because of its strength and hardness properties and influence on the chemistry of the drainage water and on the plant or aquatic growth.

plasticity - because it provides an estimate of the behavioural properties of the disturbed and remolded soil.

permafrost - because it provides an estimate as to its characteristics, occurrence and extent enabling interpretation of impact on engineering applications.

stoniness - because it provides an estimate as to the occurrence and degree of surface stones

How were the maps compiled?

The designated subdivisions (polygons) in the map have been derived from the Soil Landscape Map of Canada -Manitoba (Canada Soil Inventory, 1989), with subsequent adjustment as a result of the publication of the Eco-Stratification map of Canada (Environment Canada, 1995). In southern Manitoba, where reconnaissance and detailed soil maps were available, polygons for the soil landscape map were drawn and described by making generalizations from the available information on these large scale maps. In northern Manitoba only exploratory surveys had been carried out by helicopter; topographic maps and satellite imagery were used to complete SLC polygons. Available information from surficial deposit maps were also utilized, particularly in northern Manitoba. Compilation methods are described in the Soil Landscapes Procedures Manual and User's Handbook (1988).

The Unified soil classes and accompanying physical properties were derived from information published in Soil Survey Reports, unpublished data and analytical files (CanSIS detailed morphological, physical and chemical files) of soil pedons from all areas of Manitoba, selected data available from the Manitoba Highways Branch, and published Geological Reports for Northern Manitoba. A large volume of descriptive and analytical data on the dominant soils of each polygon has been compiled within the Manitoba Soil Survey database. This information included particle size distribution, physical properties including the Atterburg limits (plasticity), chemical properties and mineralogy.

How reliable are the maps?

Accuracy varied amongst the soil survey maps from which the information for the landscapes map was derived; information varied according to scale and age of the map and from one part of a map to another depending on the access for ground truthing. A general guide to the reliability of the information is given as a small inset on each soil landscapes map.

How often is the information updated?

As new information becomes available (for example, when a soil map for a previously unsurveyed area is produced), the attributes and eventually the soil landscape boundaries will be revised. The revisions will be recorded in the computerized data base stored in CanSIS. New maps will not be published on a regular basis. Therefore the information in CanSIS may differ from published hard copy products but can be supplied on request. The detailed computerized legends will also be made available on request (CanSIS - Canada Soil Information System).

What products are available?

It is possible to produce soil landscape information in various formats. The following products can be obtained from the Land Evaluation Section of the Eastern Cereals and Oilseeds Research Centre (ECORC) in Ottawa:

- printed full-color map and the short report containing the extended legend, packaged in a labelled binder.
- full-color map only.
- maps, legends, and lists of attributes for maps in preparation available in manuscript form.
- selected interpretive maps based on the attributes. Interpretive maps include:
  -water erosion risk (for all provinces).
  -wind erosion risk (for Alberta, Saskatchewan, Manitoba and Southern Ontario).
  -soil salinity (for Alberta, Saskatchewan and Manitoba).
  -acidification (for British Columbia, Southern Ontario and provinces eastward).
  -detailed computerized legends available on diskettes in ASCII format.

Description of Selected Unified Soil Classification for Various Landscape Units

Map Symbol	Description

CL -morainal, moderately calcareous landscape units (areas with theme of olive green on the map)

These units occupy extensive areas in the southwestern part of Manitoba. The symbol identifies all moderately calcareous morainal landscapes that have a composition of materials derived from the Precambrian (granitic), Paleozoic limestones, and the Cretaceous shales. These morainal materials occur above an elevation of 380-455 masl (1250-1500 ft) in the vicinity of, and west of, the Manitoba Escarpment and above 455 masl (1500 ft) to the south-west and the north-west regions. Local surface forms are commonly of the knob and kettle type. They have good surface drainage through the convex part of the landscape and poor drainage in the sloughs. In most landscapes the sloughs hold water temporarily throughout the summer season, and thus the water table is variable throughout the landscape.

Engineering properties such as particle size distribution (Fig. 1), liquid limit, and plastic limit are quite similar throughout this broad area. Particle size distribution indicates clay contents of commonly 19 to 25 percent and silt plus clay content of 60 to 79 percent. Liquid limit ranges from 31 to 39 percent and the plastic limit 16 to 23 percent. The soils are plastic with an index of 14 to 16.

Correlations were determined for the Atterberg limits in relation to the clay content on 50 samples from different areas comprising the Darlingford, Waskada-Ryerson, Newdale, Erickson and Waitville Soil Associations. The clay contents varied from 15 to 42 percent. The regression analyses were as follows using the parameters plastic index (PI), liquid limit (LL), plastic limit (PL), and percent clay content (%_C):

$$PI = -0.06 + 0.68\ \%\_C \qquad R^2 = 0.76$$
$$LL = 15.7 + 0.76\ \%\_C \qquad R^2 = 0.75$$
$$PL = 15.8 + 0.08\ \%\_C \qquad R^2 = 0.07$$
$$PI = -10.6 + 0.80\ LL \qquad R^2 = 0.87$$

ML -morainal, very strongly to extremely calcareous landscape units (areas with a theme of green on map)

These units occupy extensive areas in the Interlake, southeast, and northeast regions of Manitoba. It indicates the very strongly to extremely calcareous (calcium carbonate content varies from 35-60%) morainal areas with a composition mainly of Paleozoic limestone with minor inclusions of Precambrian granitic materials. These morainal materials commonly occur below an elevation of 260 masl (850 ft). A few smaller areas occur above the Manitoba escarpment at approx. elevations of 485 masl (1600 ft).

Engineering properties such as particle size (Fig. 2), liquid limit and plastic limit are quite similar throughout its area of occurrence. Particle size distribution indicates clay contents between 10 to 20 percent and silt plus clay content of 56 to 65 percent. The high calcite or dolomite present in the various size fractions, as well as the high stone content, contribute to the problems of handling these materials for engineering purposes. The liquid limit varies from 15 to 20 percent and the plastic limit is 11 to 15 percent. The soils are slightly plastic with an index of 3 to 8.

These materials have a high density in their natural state (1800-2000 kg per m^3) and have a relatively high stone content both at the surface and within the material. Workability is a problem since the moisture condition between the plastic limit and the liquid limit is so narrow. Optimum moisture for working and for compaction of these materials is approximately 13 percent.

CH -lacustrine landscape units (areas with a theme of blue on the map)

These units occupy extensive areas in the south-central part of Manitoba and in proximity to and north of Lake Winnipeg. These are lake sediment deposits from Glacial Lake Agassiz. They generally occur below an elevation of 305 masl (1000 ft). Because of the level terrain, these areas are imperfectly to poorly drained and subject to frequent surface ponding. Improved drainageways are common throughout the southern clay areas.

The materials are fine grained with clay contents of 40 to 80 percent. Liquid limits are high with moisture contents commonly between 52 and 75 percent. The plastic limits are also high with moisture values of 26 to 31 percent. Shrinkage limits are commonly 17 to 19 percent. Although most of the soils with high liquid limits classify as CH, some of the analyses indicate that they are MH. MH soils cannot be separated at this scale of presentation and have been included with the CH group. The grain size distribution for soils from the southern half of the province are provided in Figure 3, and for soils from the northern half of the province are provided in Figure 4.

SM -morainal, non-calcareous units (areas with a theme of light yellow on the map)

These units occur in the north-western part of Manitoba and are the dominant materials in extensive areas. They consist mainly of sandy sediments of dominantly granitic origin, volcanic and pelictic (fine-grained clayey) meta sedimentary rocks; some of the areas have a considerable amount of boulders. The till landforms are transected by numerous eskers and radial kames. Soils of the area are affected by permafrost.

The particle size of the matrix is dominantly sand and granules, 20 to 30 % silt, and 3 to 8 % clay; materials are non-plastic.

The till density ranges from loose to compact, but loose basal ablation till is most common. These areas have been described in more detail by Klassen (1976).

ML, SM -marine deposit landscape units (areas with a theme of light and dark mauve on the map)

These units occur in the north-eastern part of Manitoba, southwest of Hudson Bay. The area was inundated by the postglacial Tyrrell Sea. As the sea receded, it reworked, transported, and redeposited the underlying glacial sediment. Most of the deposits are thin, nonfossiliferous, and lie beneath a thin cover of peat. The exact limit of marine inundation is difficult to determine, but washing limits on till and eskers and the upper limit of blanket marine deposits suggests a limit defined by an approximate elevation of 160 masl (525 ft) at the south and an elevation of 180 masl (600 ft) in the northern part. A considerable portion of the area is affected by permafrost.

Marine deposits vary in their particle size distribution and Atterberg limits depending on the sorting agency and water depth. On the beach and littoral areas, the deposits are mainly sandy with a varying amount of fines; the Unified classes are dominantly SW and SM. In areas of shallower water depths, there is an increase in silts and clay particles with mainly sorted material of ML Unified class. Where the sea water was deeper, higher amounts of clay and silt particles were deposited resulting in material of CL Unified class. The main Unified classes are designated on the map. Grain size distribution is provided for the ML marine units in Figure 5.

Pt -peaty deposit landscape units (areas with a theme of gray on the map or with a horizontal overlay hatch)

Peaty deposits have been developed dominantly from organic materials (plant residue) that are saturated with water for most of the year or are artificially drained. They are the soils that in the past have been commonly identified in general descriptive terms such as shallow peats, deep peats, and muck soils of bogs, marshes, swamps, fens, moorlands, and muskeg areas. They occur dominantly east and north of the Manitoba Escarpment, below an elevation of 305 m (100ft). The distribution of peat increases as elevation decreases northerly towards Hudson Bay as the result of climate, topography, drainage conditions, and texture of underlying mineral materials. The Hudson Bay Lowland is dominantly a very poorly drained, level to depressional plain with deep peat. Similarly, the area along the east shore of Lake Winnipeg is also dominantly deep peat. Polygons in these areas have been designated as peat material with common thickness between 1.6 and 4 m or more. Deep peat materials are also distributed widely in other areas, especially in the Interlake region, and in the northern part of the Glacial Lake Agassiz basin. However, most of these peat deposits have been treated as overlays on mineral material since the average thickness is commonly less than 1.6 m.

In an engineering context, peat deposits have been commonly referred to as muskeg, an indigenous term of Algonquin and Cree origin meaning a moss-covered muck or peat bog. Peat lands consist of large continuous tracts which are commonly wet or have a high moisture content, very low density, and little tractive strength when thawed.

SM/ML, ML/CR, SM/AR, etc.- landscape units consisting of mineral deposits overlying varying mineral deposits (morainal, lacustrine, alluvial, etc.) are depicted by appropriate hatching, while underlying mineral deposits (morainal, carbonate rock, acidic rock etc.) are depicted by corresponding theme colour on the map.

These units occur throughout the province and consist of significant areas dominated by veneers of mineral materials overlying unconsolidated mineral deposits or bedrock. Organic veneers overlying mineral deposits are discussed in the previous section (Pt). The mineral veneers are generally less than 1 m thick and are of different origin than the materials they rest upon. The Unified classes for both the overlay and the underlying material are presented in the symbol on the map. The engineering classification for the overlay may be strongly contrasting to that of the underlying material (e.g. CH/AR) or may be the same (ML/ML). Examples of the grain size distribution have been provided for the SM and SP sandy overlay units in Figure 6.

Permafrost considerations

A major consideration for construction purposes in areas of northern Manitoba is related to the permafrost conditions in the soil. This region is particularly sensitive to thermal dynamics because summer ground temperatures are usually only slightly above or below zero. Changing the soil temperature by a few degrees may result in a change of state. The principal construction problems are related to:

1. Heave and subsidence due to ground ice. Many of the difficulties associated with construction in permafrost are related to the aggradation or degradation of bodies of ground ice. Small disturbances leading to the removal of the surface cover of insulating peat or to fresh exposure of frozen, icy subsoils in cuts may cause rapid subsidence and consequently, considerable ponding. Conversely, draining of ponds may promote deep freezing and the growth of ground ice.

2. Liquefaction of soils. Most of the silty and clayey soils are of low plasticity. Liquid limits range from 20 to 24 and plastic limits are between 8 and 9. Moisture contents in thawed soils are generally between the liquid limit and plastic limits, but moisture contents are excessively high in some places where the soils are frozen. Newly excavated slopes are therefore potentially unstable in these areas.

3. Seasonal soil churning and frost heave of bedrock. All mineral soils except those on eskers, kames, beach ridges and blanket sands have enough fines to render them susceptible to frost churning (cryoturbation). The activeness of this process is manifested by the prevalence of unvegetated mudboils throughout the region, both in the taiga forest and on the barrens. Stony earth circles around the margins of lakes; solifluction lobes north of the treeline; fen palsas covered with dead sedges and not yet vegetated by terrestrial plants; and rock blisters and the presence of blockfields where moisture accumulates at the bottom of slopes are all indicators of seasonal soil churning frost heave.

Plate 1a. CL - Morainal till deposits.
CL - Morainal deposits of mixed origin, including shales, acidic and carbonate rock fragments. These CL materials are typical west of the Manitoba Escarpment in Southwestern Manitoba.

Plate 1b. CL - Morainal landscape.
CL- Undulating to hummocky landscape surface includes enclosed water filled depressions. These landscapes are typical of the CL materials in Southwestern Manitoba.

Plate 1c. ML - Extremely calcareous till deposits.
ML - Extremely calcareous, stony morainal till derived from carbonate bedrock. These materials are typical of the surface deposits throughout the Interlake region in Southern Manitoba. Till materials are non or only very weakly sorted, resulting in a material containing particles ranging from clay to cobbles and larger.

Plate 1d. ML - Ridge and swale topography.
ML - Ridge and swale topography is characteristic of high lime morainal till areas in the Interlake region of Southern Manitoba. The picture is an aerial photograph at the scale of 1:50 000 . Super imposed on the ridge and swale topography are striations caused by scouring icebergs during the inundation by Glacial Lake Agassiz following the retreat of the Wisconsin glacial ice.

Plate 1a. CL - Morainal till deposits.

Plate 1b. CL - Morainal landscape.

Plate 1c. ML - Extremely calcareous, morainal till deposits.

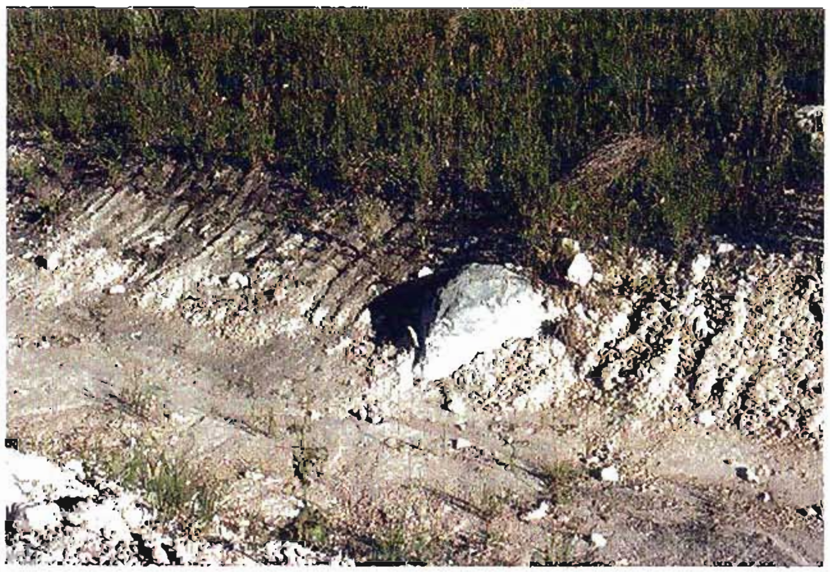


Plate 1d. ML - Ridge and swale topography.

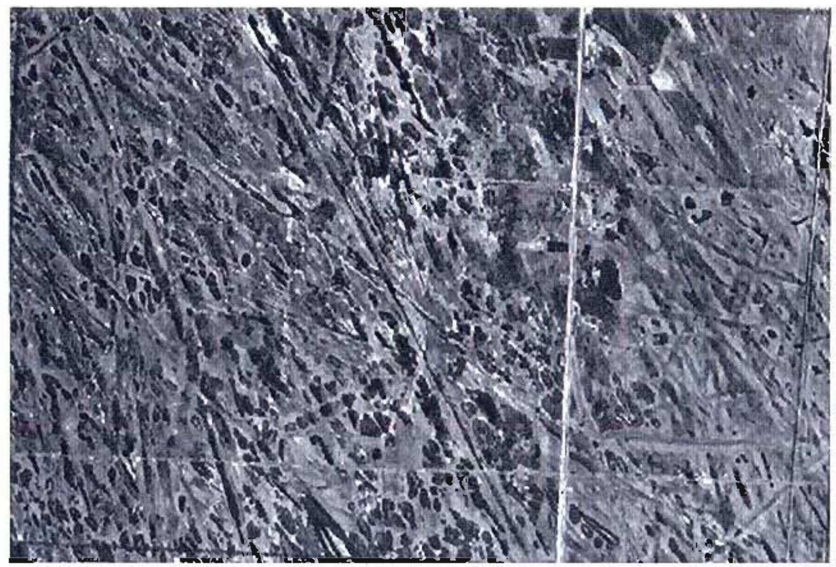


Plate 2a. CH - Glaciolacustrine deposits.

Plate 2b. CH - Slickensides.

Plate 2c. GW, SP, SW - Glaciofluvial deposits.

Plate 2d. SM, SP, SW - Coarse textured morainal till.

Plate 2a. CH - Glaciolacustrine deposits.
CH - Clays with high shrink-swell properties (montmorillonite or illite clay) typical of glaciolacustrine sediments deposited during the Glacial Lake Agassiz period. These sediments consists usually of a large number of paired, thin layers of clay and silt called varves. A varve consists of sediments deposited annually during fall/winter (clay) and spring/summer (silt). Clay content is generally over 60% and frequently over 80%.

Plate 2b. CH - Slickensides.
CH - Glaciolacustrine clays in Southern Manitoba commonly exhibit slickensides in the soil profile and in the subsoil. Slickensides are smoothed surfaces along planes of weakness that result from the movement of one mass of soil against another caused by shrink-swell cycles.

Plate 2c. GW, SP, SW - Glaciofluvial deposits.
GW, SP, SW - Stratified glaciofluvial deposits of limestone and/or granitic origin. Within the various layers the materials are sorted to some extent, but the range of particle sizes for the deposits as a whole may range from sand to cobbles. These materials are nonplastic.

Plate 2d. SM, SP, SW - Coarse textured morainal till.
SM,SP,SW - Till materials derived largely from granitic bedrock tend to be coarse textured. Clay and silt size fraction is small and the material is dominated by sands, gravels and cobbles in in a nonsorted mix. These materials are nonplastic.

Plate 3a. Thermokarsting.
Disturbance of the surface of permanently frozen, ice-rich materials may cause the permafrost to melt. This will cause subsidence of the land surface, resulting in an uneven or thermokarsted surface. Disturbance may be a natural phenomenon like wildfire, which removes insulating organic surface layers or it may be human disturbance of the surface through road construction, logging etc.. Depending on climate, soil materials and amount of ice present it can take many years before subsidence (thermokarsting) ceases.

Plate 3b. CR - Carbonate bedrock.
CR - Carbonate bedrock, mainly consisting of limestone, is common throughout the Interlake region of Southern Manitoba. This bedrock is generally very fractured, allowing water to move both vertically and horizontally.
This bedrock has generally little local relief, except along scarps.

Plate 3c. AR - Acidic bedrock.
AR - Acidic bedrock dominantly granitic is common throughout eastern and North-Central and Northern Manitoba. The bedrock may have strong local relief with steep slopes, but most bedrock occurs as outcrops or as hummocky uplands with local relief generally less than 30 m.

Plate 3a. Thermokarsting.

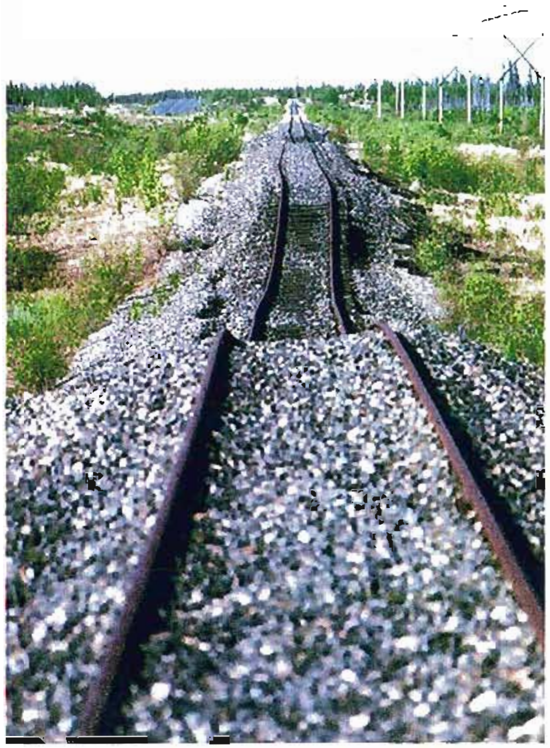


Plate 3b. CR - Carbonate bedrock.

Plate 3c. AR - Acidic bedrock.

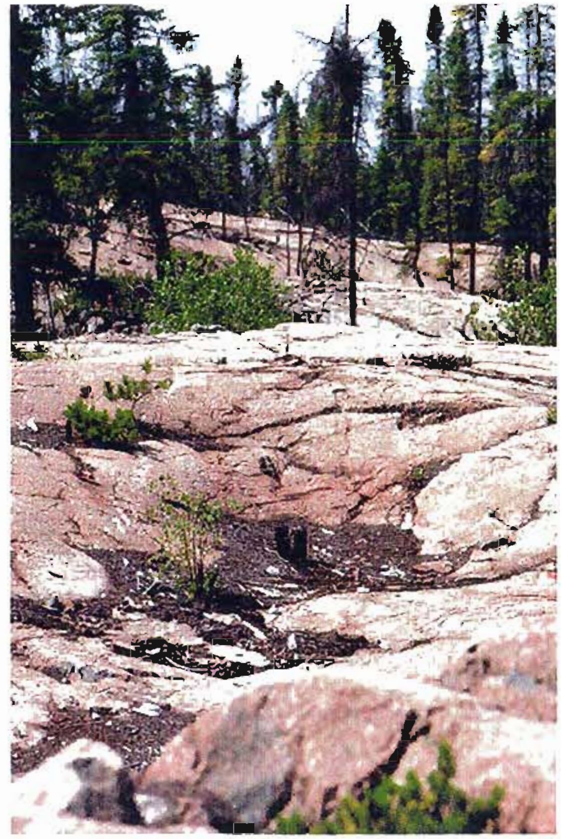


Plate 4a. SM, ML, CL - Alluvial sediments.

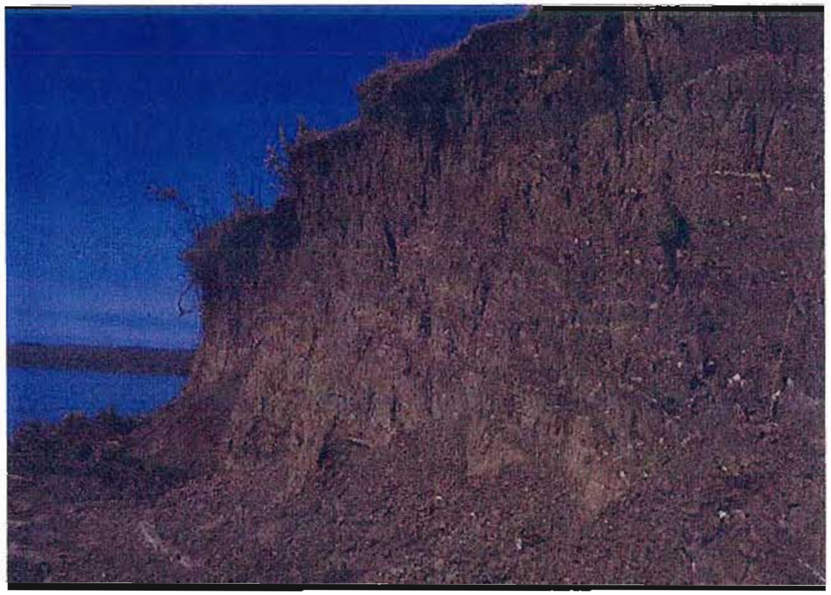


Plate 4b. Pt - Peat deposits.

Plate 4c. SM, SW - Sandy eolian deposits.

Plate 4d. Foundation construction.

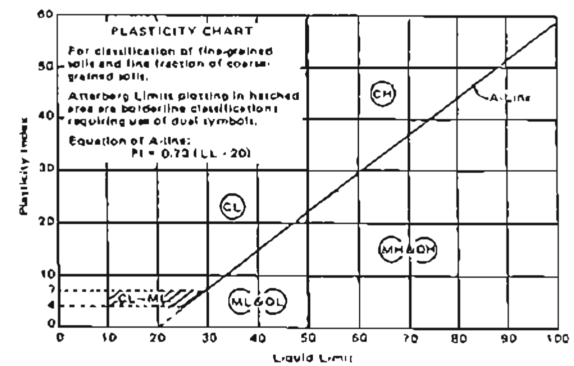
Plate 4a. SM, ML, CL - Alluvial sediments.
SM, ML, CL - Alluvial sediments in valleys and adjacent to rivers vary from non-plastic to plastic. These materials are often stratified, but textural differences between layers are generally within one or two classes.

Plate 4b. Pt - Peat deposits.
Pt - Peat deposits occur extensively throughout Manitoba and are poorly to very poorly drained, with water tables close to or at the surface. Peat deposits are especially widespread in the Interlake, east of Lake Winnipeg, in North-central Manitoba, and in the Hudson Bay Lowlands. They range from 0.4 m deep to 5 m deep or deeper. Materials vary from sedge to Sphagnum peat, and are very slightly to strongly decomposed. North of latitude 55° N many peatlands contain permafrost. Minor areas in the Southeast have been drained for agriculture.

Plate 4c. SM, SW - Sandy eolian deposits.
SM, SW - Sandy, eolian deposits occur throughout Manitoba. In most areas the surface has only slightly been modified by wind action, and most of these deposits have been stabilized by vegetation. In some areas wind action has created a landscape with dunes. In part of the Spruce Woods the landscape is still actively being modified by wind. Moving sands may encroach on vegetated areas, including forest stands.

Plate 4d. Foundation construction.
Concrete piles are often used for building foundation construction to mitigate the destructive forces of plastic, high shrink-swell clays in the City of Winnipeg. Stresses caused by the shrink-swell process may cause cracked footings and basement walls. Also excess moisture from rain and snowmelt moves down into the soil to the top of a clay layer and then seeps laterally. This excess moisture may reduce bearing capacity of the soil resulting in shifting structures.

Table 1. ASTM Soil Classification System (Unified)

Major Divisions			Group Symbols	Typical Names	Classification Criteria		
Coarse-Grained Soils More than 50% retained on No. 200 sieve*	Gravels 50% or more of coarse fraction retained on No. 4 sieve	Clean Gravels	GW	Well-graded gravels and gravel-sand mixtures, little or no fines	Classification on basis of percentage of fines: Less than 5% pass No. 200 sieve GW, GP, SW, SP; More than 12% pass No. 200 sieve GM, GC, SM, SC; 5% to 12% pass No. 200 sieve Borderline classification requiring use of dual symbols	$C_u = D_{60}/D_{10}$ Greater than 4; $C_z = \frac{(D_{30})^2}{D_{10} \times D_{60}}$ Between 1 and 3	
			GP	Poorly graded gravels and gravel-sand mixtures, little or no fines		Not meeting both criteria for GW	
		Gravels with Fines	GM	Silty gravels, gravel-sand-silt mixtures		Atterberg limits plot below "A" line or plasticity index less than 4	Atterberg limits plotting in hatched area are borderline classifications requiring use of dual symbols
			GC	Clayey gravels, gravel-sand-clay mixtures		Atterberg limits plot above "A" line and plasticity index greater than 7	
	Sands More than 50% of coarse fraction passes No. 4 sieve	Clean Sands	SW	Well-graded sands and gravelly sands, little or no fines		$C_u = D_{60}/D_{10}$ Greater than 6; $C_z = \frac{(D_{30})^2}{D_{10} \times D_{60}}$ Between 1 and 3	
			SP	Poorly graded sands and gravelly sands, little or no fines		Not meeting both criteria for SW	
		Sands with Fines	SM	Silty sands, sand-silt mixtures		Atterberg limits plot below "A" line or plasticity index less than 4	Atterberg limits plotting in hatched area are borderline classifications requiring use of dual symbols
			SC	Clayey sands, sand-clay mixtures		Atterberg limits plot above "A" line and plasticity index greater than 7	
Fine-Grained Soils 50% or more passes No. 200 sieve*	Silts and Clays Liquid limit 50% or less		ML	Inorganic silts, very fine sands, rock flour, silty or clayey fine sands			
			CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays			
			OL	Organic silts and organic silty clays of low plasticity			
	Silts and Clays Liquid limit greater than 50%		MH	Inorganic silts, micaceous or diatomaceous fine sands or silts, elastic silts			
			CH	Inorganic clays of high plasticity, fat clays			
			OH	Organic clays of medium to high plasticity			
Highly Organic Soils			PT	Peat, muck, and other highly organic soils	Visual-Manual Identification, see ASTM Designation D 2488.		

*Based on the material passing the 3-in. (75-mm.) sieve.

Figure 1. Grain size distribution on CL -Morainal, moderately calcareous units

			Location	LL	PL	PI	Unified
1.	Waskada	till	1.SW 8-05-21W	34	19	15	CL
2.	Ryerson	till	2.SE 13-03-24W	30	16	14	CL
3.	Darlingford	till	3.SE 8-03-07W	39	23	16	CL
4.	Newdale	till	4.SW 34-20-28W	31	17	15	CL
5.	Erickson	till	5.NE 32-25-28W	33	17	15	CL

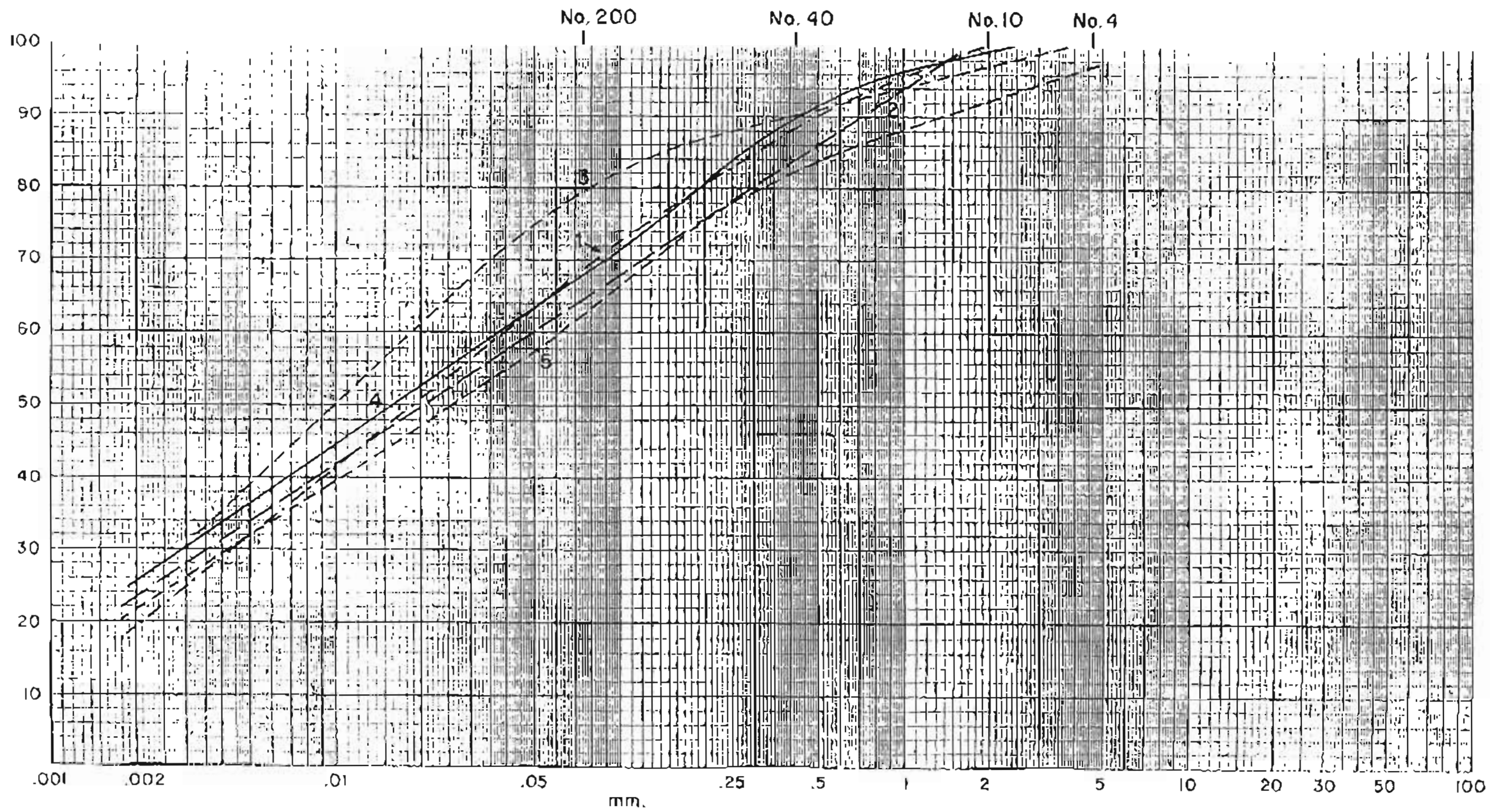


Figure 2. Grain size distribution on ML -Morainal, strongly to extremely calcareous units.

Location	LL	PL	PI	Unified
1.NW 35-08-07E	15	11	4	ML
2.SW 14-09-07E	15	11	4	ML
3.SE 02-11-07E	29	12	8	CL-ML

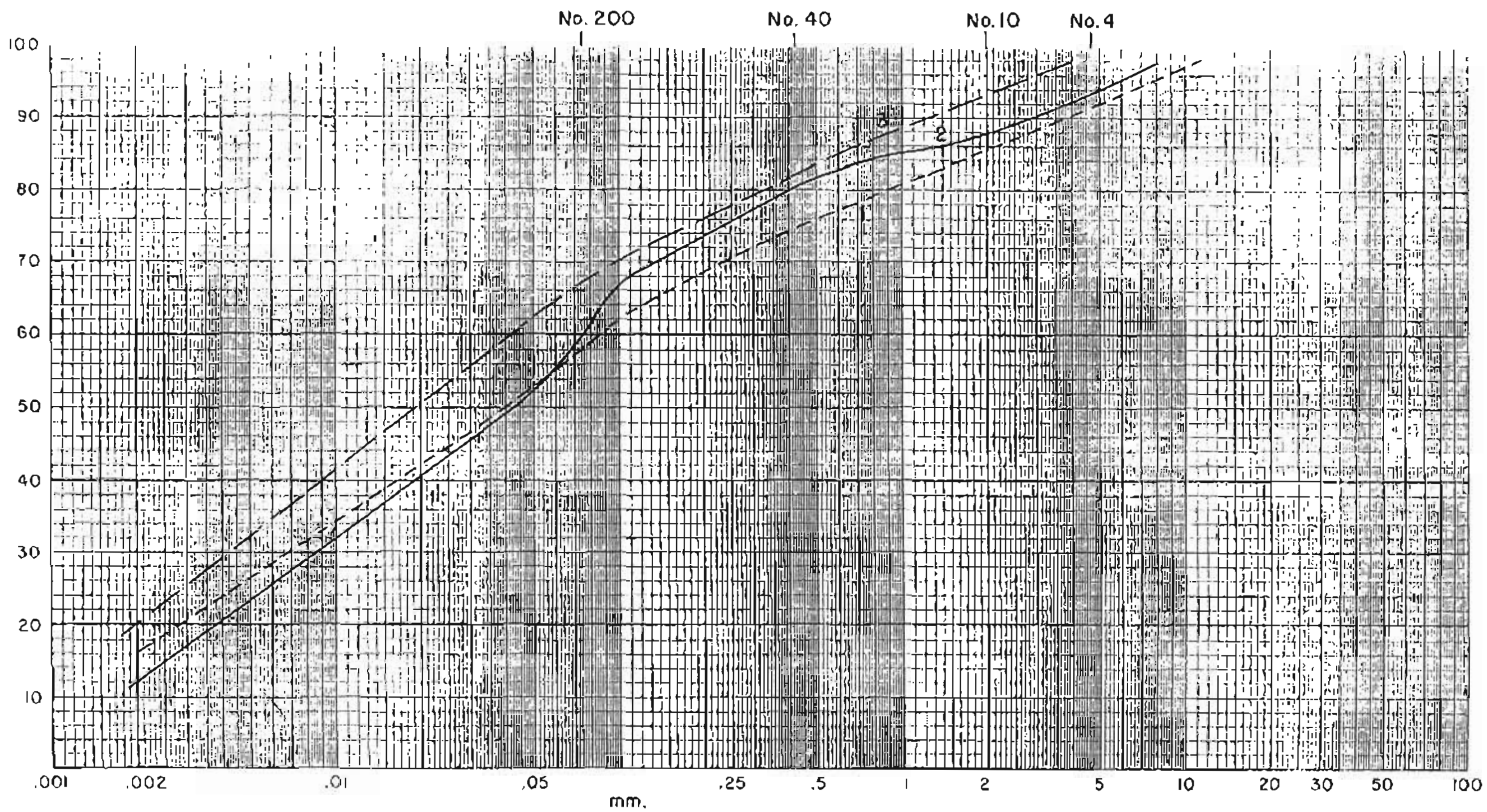


Figure 3. Grain size distribution on CH -Lacustrine clay units.

	Location	LL	PL	PI	Unified
1. St.Norbert Series	1.SW 05-22-04E	66	32	17	CH
2. Arborg Series	2.SE 12-28-04E	63	32	17	MH
3. Lettonia Series	3.EC 29-05W	66	30	13	CH
4. Red River Series	4.NE 36-12-05W	62	33	16	MH
5 Scanterbury Series	5.SE 11-04-04W	57	26	17	CH

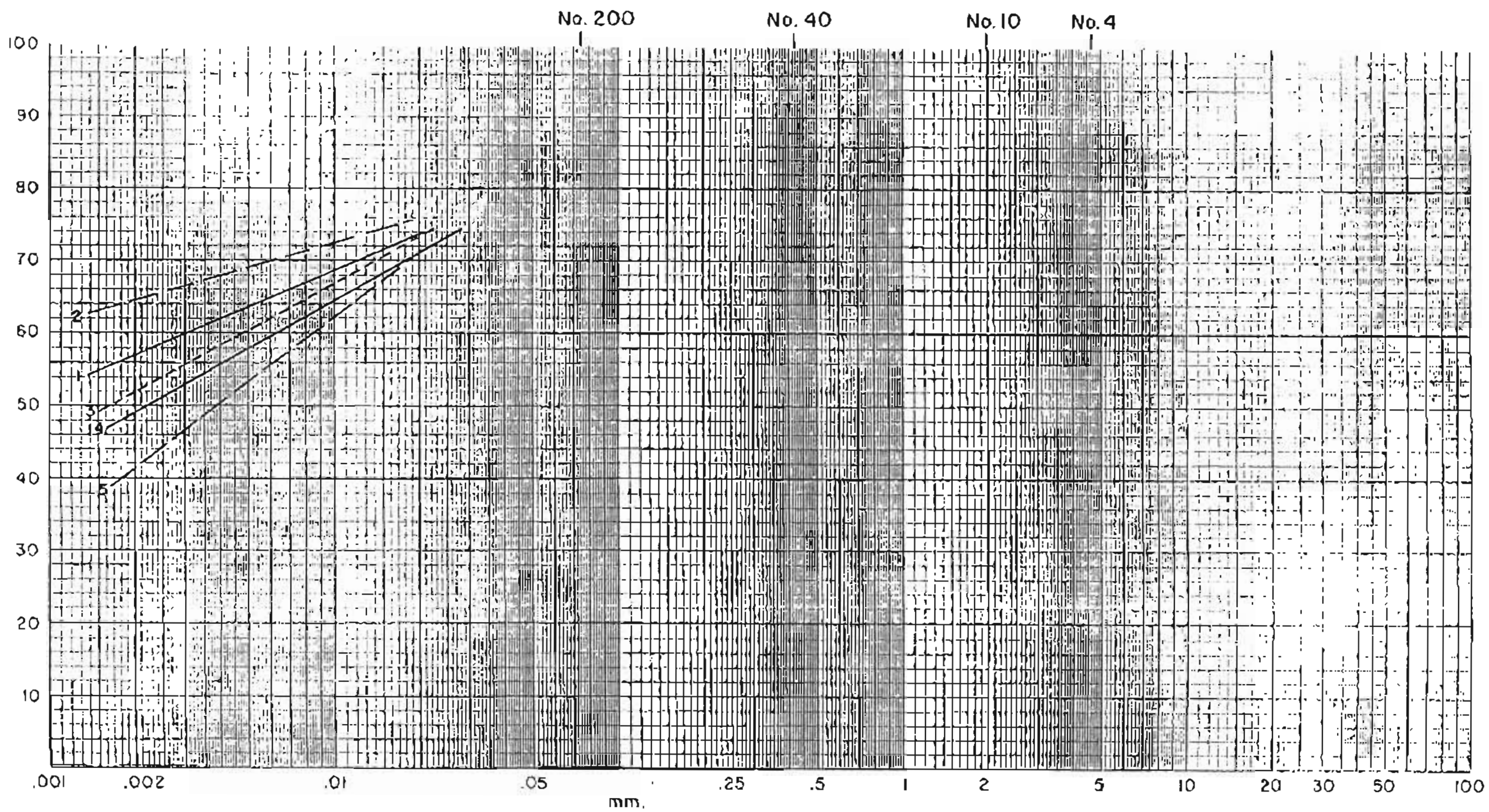


Figure 4. Grain size distribution on CH -Northern lacustrine clay units.

Location	LL	PL	PI	Unified
4.SE 16-68-03W	66	27	21	CH

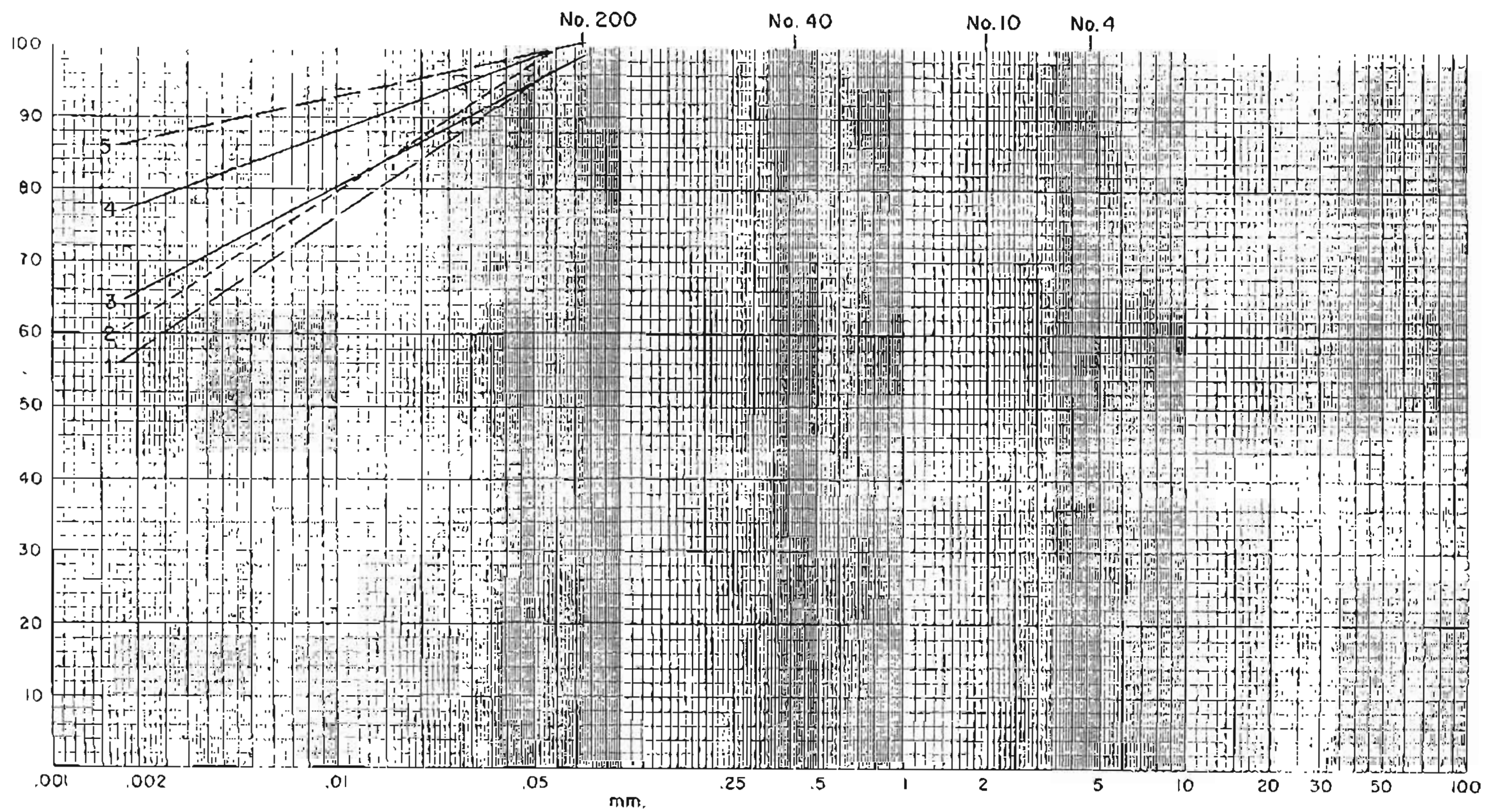


Figure 5. Grain size distribution on ML -Marine units.

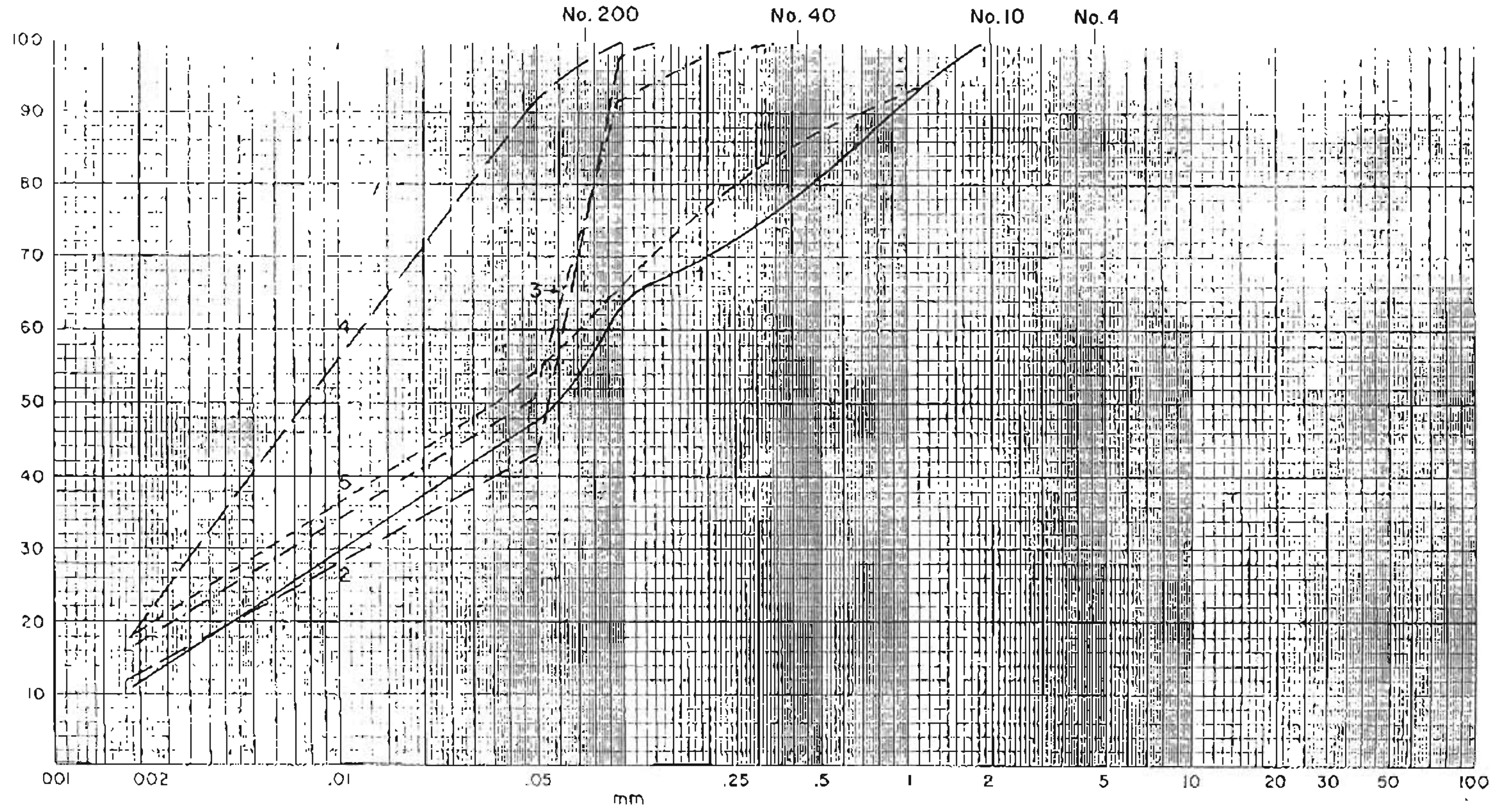
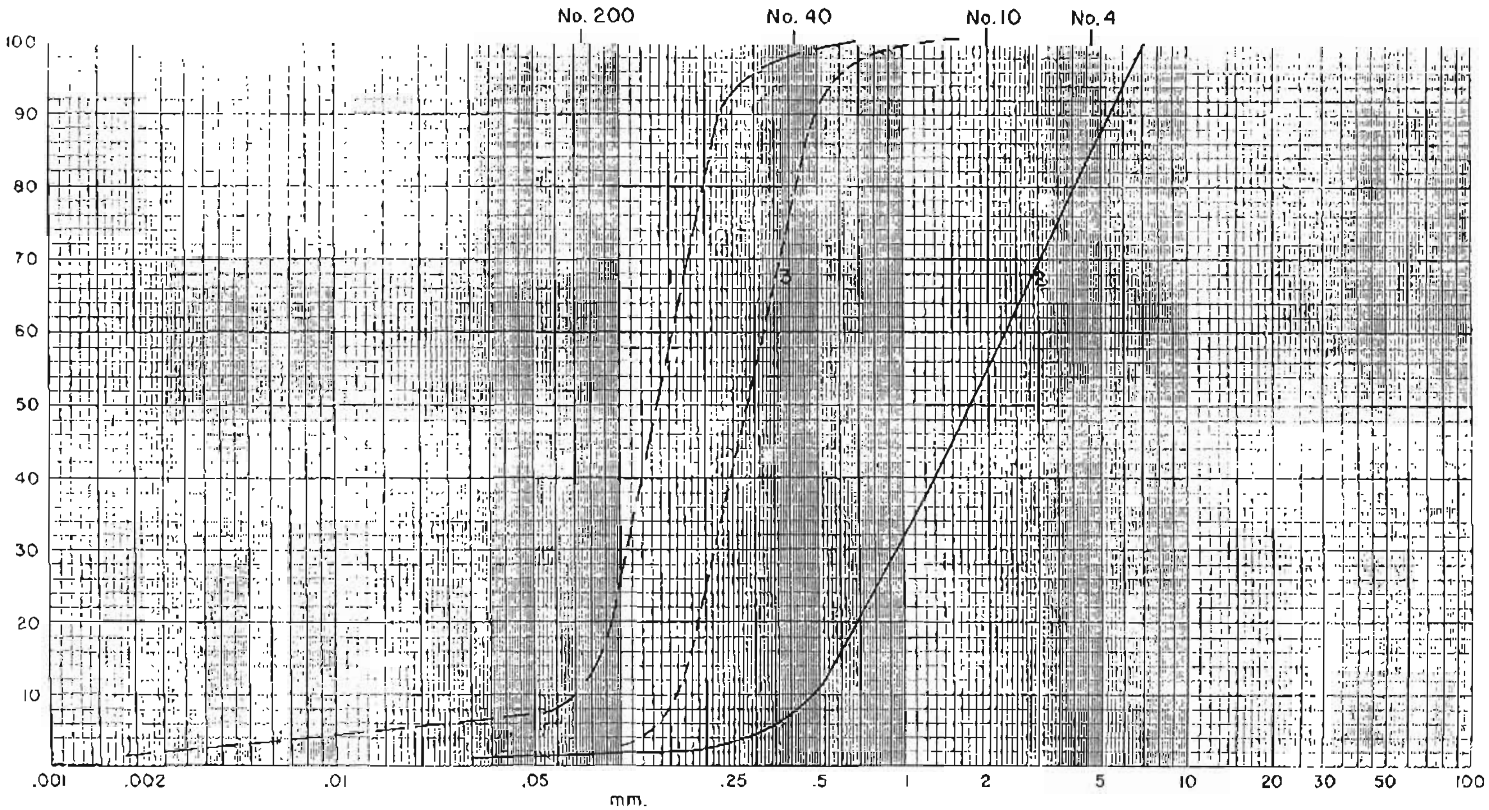


Figure 6. Grain size distribution on SM and SP -Sandy overlay units.

Series	Location	Unified
1.Poppleton	SE 14-11-07E	SM-SP
2.Leary	SW 15-08-07E	GW
3.Leary	SW 15-08-07E	SP



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Glossary

Alluvium - A general term for all deposits of rivers and streams.

Association - A sequence of soils of about the same age, derived from similar parent material, and occurring under similar climatic conditions but showing different characteristics due to variations in relief and in drainage.

Bearing capacity - Capacity of soil (in moist to wet conditions) to support loads such as buildings, people, vehicles and animals.

Bedrock - The solid rock that underlies soil and regolith or that is exposed at the surface; a layer that is too hard to break with the hands (>3 on the Moh's scale) or to dig with a spade when moist.

Bulk density - The weight of ovendry soil (105 degrees C) divided by its volume at field moisture conditions, expressed in grams per cubic centimeter, or kilograms per cubic meter.

Calcareous soil - Soil containing sufficient calcium carbonate (often with magnesium carbonate) to effervesce visibly when treated with hydrochloric acid.

Calcium Carbonate Equivalent - Refers to the percent of carbonates in the soil expressed on the basis of calcium carbonate. Terms used to express the carbonate contents of soils are:

noncalcareous	<1%
weakly calcareous	1-5%
moderately calcareous	6-15%
strongly calcareous	16-25%
very strongly calcareous	26-40%
extremely calcareous	>40%

Clay - As a soil separate, the mineral soil particles less than 0.002 mm in diameter; usually consisting largely of clay minerals. As a soil textural class, soil materials that contain 40 or more percent clay, less than 45 percent sand and less than 40 percent silt.

Creep (soil) - Slow mass movement of soil and soil material down rather steep slopes primarily under the influence of gravity, but aided by saturation with water and by alternate freezing and thawing.

Cryoturbation - The condition of disrupted, mixed, or broken surface horizons due to the action of frost and ice. It may be indicated by patterned ground features such as sorted and nonsorted nets, circles, polygons, stripes, and earth hummocks.

Delta - A fluvial or glaciofluvial fan shaped deposit at the mouth of a river that empties into a lake or sea.

Drainage (soil) - (1) The rapidity and extent of the removal of water from the soil by runoff and flow through the soil to underground spaces. (2) As a condition of the soil, it refers to the frequency and duration of periods when the soil is free of saturation.

Drainage in soil reports is described on the basis of actual moisture content in excess of field capacity and length of the saturation period within the plant root zone. The terms are as follows:

Very rapidly drained - Water is removed from the soil very rapidly in relation to supply. Excess water flows downward very rapidly if underlying material is pervious. There may be very rapid subsurface flow during heavy rainfall provided there is a steep gradient. Soils have very low available water storage capacity (usually less than 2.5 cm) within the control section (upper 1.2 m depth) and are usually coarse in texture, or shallow, or both. Water source is precipitation.

Rapidly drained - Water is removed from the soil rapidly in relation to supply. Excess water flows downward if underlying material is pervious. Subsurface flow may occur on steep gradients during heavy rainfall. Soils have low available water storage capacity (2.5-4 cm) within the control section, and are usually coarse in texture, or shallow, or both. Water source is precipitation.

Well drained - Water is removed from the soil readily but not rapidly. Excess water flows downward readily into underlying pervious material or laterally as subsurface flow. Soils have intermediate available water storage capacity (4-5 cm) within the control section, and are generally intermediate in texture and depth. Water source is precipitation. On slopes, subsurface flow may occur for short durations but additions are equalled by losses. These soils are usually free of iron mottles within 100 cm of the surface but may be mottled below this depth. Soil horizons are usually bright colored.

Moderately well drained - Water is removed from the soil somewhat slowly in relation to supply. Excess water is removed somewhat slowly due to low perviousness, shallow water table, lack of gradient, or some combination of these. Soils have intermediate to high water storage capacity (5-6 cm) within the control section and are usually medium to fine in texture. Soils are commonly mottled in the 50 to 100 cm depth. Colors are dull brown in the subsoil with stains and mottles.

Imperfectly drained - Water is removed from the soil sufficiently slowly in relation to supply to keep the soil wet for a significant part of the growing season. Excess water moves slowly downward if precipitation is major supply. If subsurface water or groundwater, or both, is the main source, flow rate may vary but the soil remains wet for a significant part of the growing season. Precipitation is the main source if available water storage capacity is high; contribution by subsurface flow or groundwater flow, or both, increases as available water storage capacity decreases. Soils have a wide range in available water supply, texture, and depth, and are gleyed phases of well drained subgroups. These soils generally have mottling below the surface layers and generally have duller colors with depth, generally brownish gray with mottles of yellow and gray.

Poorly drained - Water is removed so slowly in relation to supply that the soil remains wet for a comparatively large part of the time the soil is not frozen. Excess water is evident in the soil for a large part of the time. Subsurface flow or groundwater flow, or both, in addition to precipitation are main water sources. There may also be a perched water table with precipitation exceeding evapotranspiration. Poorly drained soils have a wide range in available water storage capacity, texture, and depth, and are gleyed subgroups, Gleysols, and Organic soils.

Very poorly drained - Water is removed from the soil so slowly that the water table remains at or on the surface for the greater part of the time the soil is not frozen. Excess water is present in the soil for the greater part of the time. Groundwater flow and subsurface flow are major water sources. Precipitation is less important except where there is a perched water table with precipitation exceeding evapotranspiration. These soils have a wide range in available water storage capacity, texture, and depth, and are either Gleysolic or Organic.

Drumlin - an elongated or oval hill of glacial drift, commonly glacial till, deposited by glacier ice and having its long axis parrallel to the direction of ice movement.

Eolian - Soil material accumulated through wind action.

Esker - A winding ridge of irregularly stratified sand, gravel and cobbles deposited under the ice by a rapidly moving glacial stream.

Fibric - Organic layer that has a large amount of weakly decomposed fiber whose botanical origin is readily identifiable. It has >40% rubbed fiber by volume. (Fiber is defined as the organic material retained on a 100 mesh sieve (0.15 mm), except for wood fragments that cannot be crushed in the hand).

Field capacity - The percentage of water remaining in the soil 2 to 3 days after the soil has been saturated and free drainage has practically ceased. The percentage may be expressed in terms of weight or volume.

Fluvial deposits - All sediments past and present, deposited by flowing water, including glaciofluvial deposits.

Frost heave - The raising of the surface caused by ice in the subsoil.

Glaciofluvial deposits - Material moved by glaciers and subsequently sorted and deposited by streams flowing from the melting ice. These deposits are stratified and may occur in the form of outwash plains, deltas, kames, eskers and kame terraces.

Ground Moraine - An unsorted mixture of rocks, boulders, sand, silt and clay deposited by glacial ice. The predominant material is till; most till is thought to have accumulated under the ice by lodgment, but some till has been let down from the upper surface of the ice by ablation. Resorting and modification may have taken place to some extent by wave-action of glacial melt waters. The topography is most commonly in the form of undulating plains with gently sloping hills and enclosed depressions.

Groundwater - Water beneath the soil surface, usually under conditions where the voids are completely filled with water (saturation).

Humic - Organic layers that have an advanced stage of decomposition, a low fiber content (<10% rubbed fiber).

Impeded drainage - A condition that hinders the movement of water by gravity through the soils.

Kame - An irregular ridge or hill of stratified glacial drift deposited by glacial meltwater.

Kettle - Depression left after the melting of a detached mass of glacier ice buried in drift (commonly referred to as sloughs in morainic landscapes).

Lacustrine deposits - Material deposited by or settled out of lake waters and exposed by lowering of the water levels or elevation of the land. These sediments range in texture from sand to clay and are usually varved (layered annual deposits).

Landforms - The various shapes of the land surface resulting from a variety of actions such as deposition or sedimentation, erosion, and earth crust movements.

Landscape - All the natural features such as fields, hills, forest, water, etc., which distinguish one part of the earth's surface from another part.

Liquid limit (upper plastic limit) -The water content corresponding to an arbitrary limit between the liquid and plastic states of consistency of a soil. The water content at this boundary is defined as that at which a pat of soil cut by a groove of standard dimensions will flow together for a distance of 1.25 cm under the impact of 25 blows in a standard liquid limit apparatus.

Mesic - Organic layer which has a stage of decomposition intermediate between fibric and humic; it is altered both physically and chemically.

Mesophyte - Plants which require intermediate moisture conditions and are not very resistant to drought.

Minerotrophic - Wetland sites that receive mineral nutrients, in addition to precipitation, from flowing or percolating groundwater that has been in contact with mineral soil. The sites include fen, marsh and swamp.

Ombrotrophic - Acid peatlands, usually with convex surface, that depend upon precipitation for water and minerals. Peat accumulation or relief prevents the inflow of mineral soil water and results in a condition of low pH and mineral deficiencies.

Organic matter - The fraction of the soil which consists of plant and animal residues at various stages of decomposition, cells and tissues of soil organisms, and substances synthesized by the soil population. It is determined on soils that have been sieved through a 2.0 mm sieve. It is estimated by multiplying the organic carbon by a factor of 1.72.

Outwash - Sediments "washed out" beyond the glacier by flowing water and laid down in thin beds or strata. Particle size may range from boulders to silt.

Ovendry soil - Soil that has been dried at 105 degrees C until it has reached constant weight.

Parent material - The unaltered or essentially unaltered mineral or organic material from which the soil profile develops by pedogenic processes.

Pedology - The aspects of soil science dealing with the origin, morphology, genesis, distribution, mapping, taxonomy of soils, and classification in terms of their use.

Permafrost -

1. Perennially frozen material underlying the solum.
2. A perennially frozen soil horizon.

Plastic Limit - The water content corresponding to an arbitrary limit between the plastic and the semisolid states of consistency of a soil. The water content at which a soil will just begin to crumble when rolled into a thread approximately 3 mm in diameter.

Plasticity Index - The numerical difference between the liquid and the plastic limit. The plasticity index gives the range of moisture contents within which a soil exhibits plastic properties.

Regolith - The unconsolidated mantle of weathered rock and soil material on the earth's surface.

Shrinkage limit - This is the moisture content at which an equilibrium condition of volume change is reached and further reduction in moisture content will not cause a decrease in the volume of the soil mass.

Shrinkage ratio - This is the ratio between the volume change and a corresponding change in moisture content. It equals the apparent specific gravity of the dried soil.

Slickenside - Smoothed surfaces along planes of weakness resulting from the movement of one mass of soil against another in soils dominated by swelling clays.

Soil - The unconsolidated mineral material on the immediate surface of the earth that serves as a natural medium for the growth of land plants. Soil has been subjected to and influenced by genetic and environmental factors of: parent material, climate (including moisture and temperature effects), macro- and microorganisms, and topography, all acting over a period of time.

Soil landscape - The full array of attributes that describe a distinct type of soil and its associated characteristics such as geologic materials, landform, slope, watertable, permafrost, and water bodies.

Stoniness - The percentage of land surface occupied by stones. The classes of stoniness are defined as follows:

Stones O. Nonstony -- Land having less than 0.01% of surface occupied by stones.

Stones 1. Slightly stony -- Land having 0.01-0.1% of surface occupied by stones. Stones 15-30 cm in diameter, 10-30 m apart. The stones offer only slight to no hindrance to cultivation.

Stones 2. Moderately stony -- Land having 0.1-3% of surface occupied by stones. Stones 15-30 cm in diameter, 2-10 m apart. Stones cause some interference with cultivation.

Stones 3. Very stony -- Land having 3-15% of surface occupied by stones. Stones 15-30 cm in diameter, 1-2 m apart. There are sufficient stones to constitute a serious handicap to cultivation.

Stones 4. Exceedingly stony -- Land having 15-50% of surface occupied by stones. Stones 15-30 cm in diameter, 0.7-1.5 m apart. There are sufficient stones to prevent cultivation until considerable clearing has been done.

Stones 5. Excessively stony -- Land having more than 50% of surface occupied by stones. Stones 15-30 cm in diameter, less than 0.7 m apart. The land is too stony to permit cultivation.

Stratified materials - Unconsolidated sand, silt and clay arranged in strata or layers. In stratified materials, a bed is a unit layer distinctly separable from other layers and is one or more cm thick but a lamina is a similar layer less than 1 cm thick.

Soil Survey - The systematic examination, description, classification, and mapping of soil in an area.

Swamp - An area saturated with water throughout much of the year, but with the surface of the soil usually not deeply submerged. It is generally characterized by tree or shrub vegetation.

Till, glacial - Unstratified glacial deposits consisting of clay, sand, gravel, and boulders intermingled in any proportion.

Unified Soil Classification System (engineering) - A classification system based on the identification of soils according to their particle size, gradation, plasticity index and liquid limit.

Urban Land - Areas so altered or obstructed by urban works or structures that identification of soils is not feasible.

Water table (groundwater surface; free water surface; groundwater elevation) - Elevation at which the pressure in the water is zero with respect to the atmospheric pressure.

Dominant Soil Landscape Files

attribute list and structure

Data Field Names	Date Field No.	Attribute	Type	Width	Dec	Column Number
POLYNUMB	01	Polygon number	C	4	-	1-4
GRIDLOCN	02	Grid code for locating polygon	C	3	-	5-7
AREAKHA	03	Area of polygon (kilohectares)	N	7	1	8-14
DOMKDMAT	04	Kind of rock outcrop or other material at the surface	C	2	-	15-16
UNIFIED	05	Unified classification of surface material	C	2	-	17-18
UNIFIED2	06	Unified classification of secondary material	C	2	-	19-20
DOMREGFM	07	Regional landform	C	1	-	21
DOMLOCSF	08	Local surface form	C	3	-	22-24
DOMSLOPE	09	Slope gradiant class	C	1	-	25
DOMPMDEP	10	Parent material or overlay, mode of deposition	C	2	-	26-27
DOMPMDP2	11	Secondary parent material below overlay, mode of deposition	C	2	-	28-29
DOMDRAIN	12	Drainage class	C	1	-	30
DOMWATAB	13	Depth to water table, average	C	1	-	31
PLASL1	14	Plastic limit of parent material or overlay	C	2	0	32-33
LIQL1	15	Liquid limit of parent material or overlay	C	2	0	34-35
SHRL1	16	Shrinkage limit of parent material or overlay	C	2	0	36-37

Data Field Names	Date Field No.	Attribute	Type	Width	Dec	Column Number
OPTM1	17	Optimum moisture content at maximum compaction	C	2	0	38-39
OPTD1	18	Optimum density at maximum compaction	C	2	0	40-43
PLASL2	19	Plastic limit of secondary material below overlay	C	2	0	44-45
LIQL2	20	Liquid limit of secondary material below overlay	C	2	0	46-47
SHRL2	21	Shrinkage limit of secondary material below overlay	C	2	0	48-49
OPTM2	22	Optimum moisture content at compaction, secondary material	C	2	0	50-51
OPTD2	23	Optimum density at maximum compaction, secondary material	C	4	0	52-55
DPERMTYP	24	Type of permafrost, if present	C	1	-	62
PERMDIST	25	Permafrost distribution, if present	C	1	-	63
STONINESS	26	Stoniness condition, if present	C	1	-	64

Definitions of Extended Legend Attributes

Dominant soil landscape file:
Attributes, their classes, codes, and descriptors

Classes for all dominant landscape attributes or specific values are provided unless they either do not occur or are not applicable, in which case one of the following conventions are used:

- Code with a dash (-) was used to indicate where data was not required or not available
- Code with the character # to indicate the attribute is not applicable to describing the dominant soil landscape
- Code with blanks " " was used to indicate that the information was not available or not pertinent for the attribute

Column No., Data Field Name and Brief Description are provided.

01 POLYNUM - Polygon number
All delineated landscape units in Manitoba have been assigned a number to which all other attributes are appended.

02 GRIDLOCN - Grid code for locating polygons
Location of the landscape units are referenced by an alpha-numeric grid from south to north at every 1^0latitude and west to east at every 2^0 longitude, respectively.

03 Area of the landscape unit, in kilohectares (col.8-14)

04 Kind of rock or other material at the surface (col.15-16)

05 Unified classification of the surface rock or soil material (col.17-18)
Provides the Unified material designation of the dominant material if similar to depth of 1-2m or identifies the overlay if two contrasting materials are present.

06 Unifed classification of secondary material (col.19-20)
Provides the unified material designation of the secondary material below the overlay, if present

07 Dominant regional landform (col.21)
Provides a code for the dominant regional landform present in the landscape unit

Code	*Class*	*Description*
H	Hilland dominated	Natural elevation rising prominently above the surrounding plain.
O	Organic dominated	Areas dominated by organic materials >40 cm thick; contains >30% organic matter by weight; occurs in a variety of wetland forms.
P	Plain dominated	Flat to very gently undulating areas having few or no prominent irregularities; formed by erosional or depositional (or constructional) processes; slopes are generally <6%; relief generally <10 m; extent generally >5 km in one direction.
V	Valley dominated	Terrain dominated by major spillways, drainageways, or mountain trenches separated from surrounding landforms by a significant and abrupt break in slope; the valley may be the V- or U-shaped with an extensive valley floor and flood plain up to about 5 km wide; valley profile may also include eroded terraces and their irregular slope segments.
#	N/A	(Urban land)

08 Local surface form (col.22-24)
Defines classes of local physical surface forms (assemblages of slopes) or recurring patterns of forms occurring on the earth's surface.

Mineral surface forms

Code	Class	Description
D	Dissected	A dissected (or gullied) pattern providing external drainage for an area.
H	Hummocky (or irregular)	A very complex sequence of slopes extending from somewhat rounded concavities (or swales) of various sizes to irregular, conical knolls (or knobs) and short discontinuous ridges; there is a general lack of concordance between knolls and swales; slopes are 4-70%.
K	Knoll and kettle	A very chaotic sequence of knolls and numerous kettles (or sloughs), which occupy 15-20% of an area and which have no external drainage; slopes are generally >3%.
L	Level	A flat or very gently sloping undirectional surface with a generally constant slope not broken by marked elevations and depressions; slopes generally <2%.
R	Ridged	A long, narrow elevation of the surface, usually distinctly crested with steep sides; ridges may be parallel, subparallel, or intersecting.
U	Undulating	A very regular sequence of gentle slopes that extends from rounded and, in some places, confined concavities to broad, rounded convexities producing a wavelike pattern of low local relief; slope length is generally <0.8 km and the dominant gradient of slopes is usually 2-5%; it lacks an external drainage pattern.

Wetland surface forms

B04 Domed bog - A bog with a convex surface that may rise several metres above the surrounding terrain; the centre of the bog usually drains in all directions; peat development is usually >3m.

B05 Polygonal peat plateau bog - A perennially frozen bog, rising about 1m above the surrounding fen; the surface is relatively flat, scored by polygonal pattern of trenches that developed over ice wedges.

B07 Peat plateau bog - A perennially frozen bog, rising abruptly about 1m from the surrounding unfrozen fen; the surface is relatively flat and even; the bog is usually associated with collapse scar bogs and fens.

B14 Flat bog - A bog having a flat, featureless surface and occurring in broad, poorly defined depressions; the depth of peat is generally uniform

B19 Veneer bog - A bog occurring on gently sloping terrain and containing discontinuous to very sporadic permafrost; although drainage is predominantly below the surface, overland flow occurs in poorly defined drainageways during peak runoff; peat thickness is usually between 0.4m and 1.6m.

F01 Northern ribbed - A fen with parallel, low peat ridges alternating with wet hollows or shallow pools, oriented across the Major slope at right angles to water movement; the depth of peat is >1m.

F13 Horizontal Fen - A fen with a very gently sloping, featureless surface; this fen occupies broad, often ill-defined depressions and may interconnect with other fens; peat accumulation is generally uniform.

09 Slope gradiant class

Provides the dominant slope class within the landscape unit

Code	Class
A	1-3% (includes slopes <1%)
B	4-9%
C	10-15%
D	16-30%
E	31-60%
F	>60%
#	N/A (water)

10 Soil parent material mode of deposition (or origin)

Provides a code for the mode of deposition of mineral materials and undifferentiated organic materials of the dominant material if similar to depths of 1-2 m, or identifies the overlay if two contrasting materials are present.

Code	Class	Description
A	Alluvial	Sediment ranging in texture from gravel to clay; alluvial sediments may be well to moderately sorted

	and usually display stratification.
E Eolian	Sediment, generally consisting of medium to fine sand and coarse silt particle sizes that are well sorted, poorly compacted, and may show internal structures such as cross bedding or ripple laminae or may be massive; these materials have been transported and deposited by wind action.
F Fluvio-glacial	Material moved by glaciers and subsequently sorted and deposited by streams flowing from melting ice; deposits are stratified and may occur in the form of outwash plains, deltas, kames, eskers, and kame terraces.
L Lacustrine	Sediment generally consisting of either stratified fine sand, silt, and clay deposited on lake bed or moderately well sorted and stratified sand and coarser materials that are beach and other nearshore sediments transported and deposited by wave action; these materials either have settled from suspension in bodies of standing fresh water or have accumulated at the margins through wave action.
M Morainal	Sediment generally consisting of well compacted material that is nonstratified and contains a heterogenous mixture of sand, silt, and clay particle sizes and coarse fragments in a mixture that has been transported beneath, beside, on, within or in front of a glacier and not modified by any intermediate agent.
U Undiffer-entiated	A sequence of more than three types of genetic mineral materials outcropping on a steep erosional escarpment; this complex is to be used where units relating to individual genetic materials cannot be delimited separately at the scale of mapping.
W Marine	Unconsolidated deposits of clay, silt, sand, or gravel that are well to moderately well sorted (in some places containing shells); they have settled from suspension in salt or brackish water bodies or have accumulated at their margins through shoreline processes such as wave action and longshore drift.

Specified organic materials

11 Fibric sphagnum - Sphagnum organic material in a fibric degree of decomposition in which the fibric materials are readily identifiable as to botanical origin.
21 Mesic sedge - Sedge organic material in a mesic (or intermediate) degree of decomposition; peat composed dominantly of sedge (Carex spp.).
22 Mesic woody sedge - Woody sedge organic material in a mesic degree of decomposition; peat is composed of sedge peat with subdominant amounts of woody materials.
23 Mesic woody forest - Woody forest organic materials in a mesic degree of decomposition; peat is composed dominantly (>50%) of woody material derived from both coniferous and deciduous tree species.

11 **Soil parent material (below overlay) mode of deposition** (col.28-29)
Provides the mode of deposition of the underlying secondary material below the overlay (see codes above).

12 **Drainage class** (col.30)
Provides the soil drainage characteristics of the dominant condition in the landscape.

Code	*Class*	*Description*
R	Rapid	Water is removed from the soil rapidly in relation to supply; excess water flows downward if underlying material is pervious; subsurface flow may occur on steep gradients during heavy rainfall; source of water is precipitation
W	Well	Water is removed from the soil readily but not rapidly; excess water flows downward readily into underlying pervious material or laterally as subsurface flow.
M	Moderately well	Water is removed from the soil somewhat slowly in relation to supply; excess water is removed

		somewhat slowly due to low perviousness, shallow water table, lack of gradient, or some combination of these; precipitation is the dominant source of water.
I	Imperfect	Water is removed from the soil sufficiently slowly in relation to supply to keep the soil wet for a significant part of the growing season; excess water moves slowly downward if precipitation is the major supply.
P	Poor	Water is removed so slowly in relation to supply that the soil remains wet for a comparatively large part of the time that the soil is not frozen; excess water is evident in the soil for much of the time; subsurface flow or groundwater flow, or both, in addition to precipitation are the main source of water.
V	Very poor	Water is removed from the soil so slowly that the water table remains at or above the surface for most of the time that the soil is not frozen; groundwater flow and subsurface flow are the major sources of water.

13 **Depth to water table** (col.31)
Provides a code which represents the depth of water table (in meters) within the dominant part of the landscape.

Code	*Class*	*Description*
1	0-2 m	The most shallow water table during the growing season
2	2-3 m	id.
3	>3 m	id.
4	0-1 m	id.
5	1-2 m	id.
6	0-1 m	With pereniallly frozen subsoil
#	N/A	(water, ice, rock)

14 **Plasticity limit** (col.32-33)
Provides a value of the plastic limit (if applicable) of the uniform soil material or overlay; it is the water content, expressed as a percentage of the weight of oven-dried soil.

15 **Liquid limit** (col.34-35)
Provides the liquid limit (if applicable) of the uniform soil material or overlay; it is the water content, expressed as a percentage of the weight of oven-dried soil.

16 **Shrinkage limit** (col.36-37)
Provides the shrinkage limit (if applicable) of the uniform soil material or overlay; it is the water content, expressed as a percentage of the weight of oven-dried soil.

17 **Optimum moisture at optimum density** (col.38-39)
Provides a value of the optimum moisture content (if applicable) of the uniform soil material or overlay when the density is maximum; it is the water content, expressed as a percentage of the weight of oven-dried soil.

18 **Optimum density at optimum moisture** (col.40-43)
Provides a value of the optimum density (Standard Proctor Density), if applicable, of the uniform material or overlay at the optimum moisture content, expressed as kilograms per cubic meter.

19 **Plastic limit of secondary material** (col.44-45)
Provides a value of the plastic limit of the secondary soil material below the overlay (if applicable).

20 **Liquid limit of secondary material** (col.46-47)
Provides a value of the liquid limit of the secondary soil material below the overlay (if applicable).

21 **Shrinkage limit of secondary material** (col.48-49)
Provides a value of the shrinkage limit of the secondary soil material below the overlay (if applicable).

22 **Optimum moisture of secondary material** (col.50-51)
Provides a value of the optimum moisture at maximum density of the secondary material below the overlay (if applicable).

23 **Optimum density of secondary material** (col.52-55)
Provides a value of the optimum density (Standard

Proctor Density) at optimum moisture of the secondary material below the overlay (if applicable).

24 Permafrost type (col.62)
Designates the type of permafrost, if present.

Code	*Type*	*Description*
O	Organic	Mainly frozen organic soils (includes palsas, peat polygons, and high centre polygons-plateaus).
S	Static Cryosol	Frozen mineral soils that have minimal cryoturbation; they occur mainly in coarse textured materials; organic soils in the area have permafrost.
T	Turbic Cryosol	Frozen mineral soils that have marked evidence of cryoturbation; they generally occur on patterned ground, which includes such cryogenic forms as sorted and nonsorted circles, nets, polygons, stripes, and steps in stony or coarse textured material and nonsorted units such as earth hummocks in medium and fine textured materials; organic soils in the area commonly have permafrost.
#	N/A	

25 Permafrost distribution or occurrence (col.63)
Designates the distribution of permafrost within the landscape unit, if applicable.

Code	*Class*	*Description*
C	Continuous	Permafrost occurring everywhere (or almost everywhere) (>80% of polygon) beneath the exposed land surface throughout a geographic region.
D	Discontinuous	Permafrost occurring in some areas (20-80%) beneath the exposed land surface throughout a geographic region.
S	Sporadic	The occurrence of isolated patches or islands of permafrost (5-20%) near the southern boundary of the discontinuous permafrost zone.
V	Very sporadic	Sparse patches of permafrost (5%) occurring near the southern limit of permafrost occurrence.
#	N/A	Areas not affected by permafrost.

26 Stoniness (col.64)
Designates the amount of stones, if present, within the landscape unit.

Code	*Class*	*Description*
A	Appreciably stony	Land surface having greater than 3% (3 to >50%) of the surface occupied by stones; stones 15-30 cm in dia. are less than 1.5 m apart (stoniness class 3, 4 and 5).
M	Moderately stony	Land having 0.01 to 3% of the surface occupied by stones; stones 15-30 cm in dia. are 2-30 m apart (stoniness class 1, 2 and 3).
N	Non stony	Land having less than 0.01% of surface occupied by stones (stoniness class 0).
#	N/A	Peaty conditions, urban lands.

Extended Legend

Data Supplied By

Land Resource Unit
Brandon Research Centre
Research Branch
Agriculture & Agri-Food Canada

POLYNUMB	GRIDLOCN	AREAKHA	DOMKDMAT	UNIFIED	UNIFIED2	DOMREGFM	DOMLOCSF	DOMSLOPE	DOMPMDEP	DOMPMDP2	DOMDRAIN	DOMWATAB	PLASL1	LIQL1	SHRL1	OPTM1	OPTD1	PLASL2	LIQL2	SHRL2	OPTM2	OPTD2	DPERMTYP	PERMDIST	STONINES
0001	AI	18.7	SO	SM	CL	P	U	A	F	M	W	2	N	-	-	-	-	17	35	18	16	1700	#	#	M
0002	AI	50.4	SO	SW	-	P	U	A	F	-	W	2	N	-	-	-	1900	-	-	-	-	-	#	#	M
0003	AI	103.2	SO	CL	-	P	K	A	M	-	W	3	17	35	18	17	1700	-	-	-	-	-	#	#	M
0004	AIB	17.5	SO	CL	-	P	K	B	M	-	W	3	17	35	18	17	1700	-	-	-	-	-	#	#	M
0005	BI	33.7	SO	CL	-	P	H	B	M	-	W	3	17	35	18	17	1700	-	-	-	-	-	#	#	M
0006	BI	13.5	SO	SW	-	P	D	A	F	-	W	3	N	-	-	-	1900	-	-	-	-	-	#	#	N
0007	BI	8.0	SO	SW	-	P	D	B	F	-	W	3	N	-	-	-	1900	-	-	-	-	-	#	#	N
0008	BIC	17.4	SO	CL	-	P	U	A	M	-	W	3	17	35	17	17	1700	-	-	-	-	-	#	#	M
0009	CI	65.4	SO	CL	-	P	K	B	M	-	W	3	17	35	17	17	1700	-	-	-	-	-	#	#	M
0010	CI	31.7	SO	CH	CL	H	K	C	L	M	W	3	24	50	13	-	-	17	35	17	17	1700	#	#	M
0011	CI	321.2	SO	CL	-	H	K	C	M	-	W	3	17	35	17	17	1700	-	-	-	-	-	#	#	M
0012	DI	0.6	SO	CH	-	P	D	A	M	-	W	3	24	64	16	26	1450	-	-	-	-	-	#	#	N
0013	DI	108.2	SO	CL	-	H	K	D	M	-	W	3	17	35	17	17	1700	-	-	-	-	-	#	#	M
0014	DI	71.7	SO	ML	-	S	D	D	M	-	W	3	15	18	14	14	1900	-	-	-	-	-	#	#	M
0015	DI	41.0	SO	ML	-	P	L	A	A	-	I	I	19	25	19	18	1700	-	-	-	-	-	#	#	N
0016	DI	20.1	SO	CL	-	H	K	C	M	-	W	3	17	35	17	17	1700	-	-	-	-	-	#	#	M
0017	AI	68.8	SO	ML	CL	P	L	A	L	M	I	2	N	23	-	-	-	17	35	18	17	1700	#	#	N
0018	AI	11.2	SO	CH	-	P	L	A	L	-	I	I	27	99	13	-	-	-	-	-	-	-	#	#	N
0019	AI	101.6	SO	SM	-	P	L	A	L	-	I	I	N	-	-	-	-	-	-	-	-	-	#	#	N
0020	AI	27.8	SO	SW	-	P	H	B	E	-	W	3	N	-	-	-	-	-	-	-	-	-	#	#	N
0021	AI	13.2	SO	ML	SW	P	L	A	L	L	P	4	N	23	-	-	-	N	-	-	-	-	#	#	N
0023	DI	77.2	SO	SW	ML	P	U	A	L	M	I	2	N	-	-	-	-	15	18	14	14	1900	#	#	M
0024	AI	21.5	SO	SW	-	P	H	A	L	-	I	2	N	-	-	-	-	-	-	-	-	-	#	#	N
0025	AI	8.7	SO	SW	-	P	U	A	L	-	W	3	N	-	-	-	-	-	-	-	-	-	#	#	N
0026	BI	18.9	SO	CL	-	P	U	A	M	-	I	2	17	35	18	-	-	-	-	-	-	-	#	#	M
0027	AIB	47.6	SO	CL	-	P	H	B	M	-	W	2	17	35	18	-	-	-	-	-	-	-	#	#	N
0028	B3	42.9	OR	Pt	CH	O	F13	#	21	L	V	4	#	#	#	#	#	31	75	17	-	-	#	#	N
0029	AIB	42.2	SO	CL	-	P	D	B	L	-	W	3	22	45	17	-	-	-	-	-	-	-	#	#	N
0030	AIB	17.4	SO	SW	-	P	L	A	F	-	W	3	N	-	-	-	-	-	-	-	-	-	#	#	N
0031	AI	32.6	SO	CL	-	P	H	A	L	-	W	3	22	45	17	-	-	-	-	-	-	-	#	#	N
0032	AI	125.4	SO	CL	-	P	U	A	L	-	W	2	22	45	17	-	-	-	-	-	-	-	#	#	N
0033	AI	21.2	SO	SM	-	P	L	A	L	-	I	2	N	-	-	16	1850	-	-	-	-	-	#	#	N

POLYNUMB	GRIDLOCN	AREAKHA	DOMKDMAT	UNIFIED	UNIFIED2	DOMREGFM	DOMLOCSF	DOMSLOPE	DOMPMDEP	DOMPMDP2	DOMDRAIN	DOMWATAB	PLASLI	LIQLI	SHRLI	OPTMI	OPTDI	PLASL2	LIQL2	SHRL2	OPTM2	OPTD2	DPERMTYP	PERMDIST	STONINES
0034	A1	13.1	SO	SW	-	P	L	A	F	-	W	3	N	-	-	-	2000	-	-	-	-	-	#	#	N
0035	A1	13.7	SO	SW	-	P	L	A	L	-	I	1	N	-	-	-	2000	-	-	-	-	-	#	#	N
0036	A1	52.0	SO	ML	-	P	L	A	L	-	I	2	N	23	-	16	1850	-	-	-	-	-	#	#	N
0037	A1	219.3	SO	CL	-	P	H	B	M	-	W	3	17	35	18	-	-	-	-	-	-	-	#	#	M
0038	A1	81.0	SO	CL	-	P	D	B	M	-	W	3	17	35	18	-	-	-	-	-	-	-	#	#	M
0039	A1	23.2	SO	CH	-	P	L	A	L	-	P	1	17	35	18	17	1700	26	56	17	26	1400	#	#	N
0040	A1	32.8	SO	CL	-	H	D	C	M	-	W	3	17	35	18	-	-	-	-	-	-	-	#	#	M
0041	A1	31.2	SO	CL	-	H	K	C	M	-	W	3	17	35	18	-	-	-	-	-	-	-	#	#	M
0042	A2	50.0	SO	CL	CL	P	L	A	L	M	W	3	22	45	17	-	-	17	35	18	-	-	#	#	N
0043	A2	90.8	SO	UD	-	V	D	D	U	-	W	3	V	V	-	-	-	-	-	-	-	-	#	#	N
0044	A2	99.4	SO	CL	-	P	K	B	M	-	W	3	16	29	25	14	1900	-	-	-	-	-	#	#	M
0045	A2	14.5	SO	CL	-	P	H	B	M	-	W	3	17	35	18	-	-	-	-	-	-	-	#	#	M
0046	B3	78.6	SO	SM	ML	P	H	A	L	M	W	1	N	-	-	-	-	13	16	16	14	1900	#	#	M
0047	A1	87.6	SO	CL	-	P	L	A	M	-	W	3	17	35	18	19	1600	-	-	-	-	-	#	#	M
0048	A3	17.3	OR	Pt	CH	O	F13	#	21	L	V	4	#	#	#	#	#	31	75	17	26	1400	#	#	N
0049	A1	12.9	SO	CL	-	H	H	C	M	-	W	3	16	29	25	14	1900	-	-	-	-	-	#	#	N
0050	A2	21.5	SO	CL	-	H	H	C	M	-	W	3	16	29	25	14	1900	-	-	-	-	-	#	#	M
0051	B3	118.5	SO	CL	CH	P	L	A	L	L	I	1	19	34	17	16	1600	31	75	17	26	1400	#	#	N
0052	A2	35.5	SO	CL	SW	P	L	A	L	L	I	2	22	45	17	-	-	N	-	-	-	-	#	#	N
0053	B1	103.4	SO	CL	-	P	K	A	M	-	W	2	17	35	17	17	1700	-	-	-	-	-	#	#	M
0054	C2	23.7	SO	CL	ML	P	L	A	M	M	I	2	19	37	17	17	1750	15	18	14	-	-	#	#	M
0055	A2	27.3	SO	SW	-	P	H	B	E	-	W	3	N	-	-	-	-	-	-	-	-	-	#	#	N
0056	A2B	156.7	SO	SW	-	P	H	B	E	-	W	3	N	-	-	-	-	-	-	-	-	-	#	#	N
0057	A2	11.9	SO	SW	-	P	L	A	F	-	W	3	N	-	-	-	-	-	-	-	-	-	#	#	N
0058	A2	39.3	SO	SW	-	P	L	A	F	-	W	3	N	-	-	-	-	-	-	-	-	-	#	#	N
0059	A2B	57.0	SO	CL	SW	P	L	A	L	L	W	3	19	34	19	-	-	N	-	-	-	-	#	#	N
0060	B2	24.2	SO	CL	-	P	D	B	M	-	W	3	17	35	17	17	1700	-	-	-	-	-	#	#	M
0061	A2B	34.9	SO	CL	-	S	D	B	L	-	W	3	21	43	18	22	1600	-	-	-	-	-	#	#	N
0062	A2	77.8	SO	CL	-	H	H	C	M	-	W	3	19	39	18	19	1600	-	-	-	-	-	#	#	N
0063	A2	75.2	SO	CL	-	P	H	B	M	-	W	3	19	39	18	19	1600	-	-	-	-	-	#	#	M
0064	A2	11.1	SO	CL	-	P	H	B	M	-	W	3	19	39	18	19	1600	-	-	-	-	-	#	#	M
0065	A2	22.7	SO	CL	-	P	L	A	L	-	W	3	22	45	17	-	-	-	-	-	-	-	#	#	N
0066	A2	71.5	SO	CL	-	P	U	A	M	-	W	3	19	39	18	-	-	-	-	-	-	-	#	#	M

POLYNUMB	GRIDLOCN	AREAKHA	DOMKDMAT	UNIFIED	UNIFIED2	DOMRFGFM	DOMLOCSF	DOMSLOPE	DOMPMDEP	DOMPMDP2	DOMDRAIN	DOMWATAB	PLASL1	LIQL1	SHRL1	OPTM1	OPTD1	PLASL2	LIQL2	SHRL2	OPTM2	OPTD2	DPERMTYP	PERMDIST	STONINES
0067	A2	30.3	SO	CL	-	P	U	A	M	-	W	3	19	39	18	19	1600	-	-	-	-	-	#	#	M
0068	A2	44.3	SO	CL	-	P	U	B	M	-	W	3	32	47	32	22	1550	-	-	-	-	-	#	#	N
0069	A3	90.7	SO	CH	-	P	L	A	L	-	P	1	30	72	17	26	1400	-	-	-	-	-	#	#	N
0070	A3	71.1	SO	CH	-	P	L	A	L	-	I	1	30	72	17	26	1400	-	-	-	-	-	#	#	N
0071	A3	47.5	SO	CH	-	P	L	A	L	-	P	1	30	72	17	26	1400	-	-	-	-	-	#	#	N
0072	A2	42.4	SO	UD	CL	S	D	B	L	M	W	3	V	V	-	-	-	19	39	18	-	-	#	#	M
0073	A2	74.0	SO	ML	-	P	L	A	L	-	I	1	N	-	-	-	-	-	-	-	-	-	#	#	N
0074	A3	111.8	SO	CL	CH	P	L	A	L	L	I	1	20	36	20	16	1700	30	72	17	26	1400	#	#	N
0075	A3	69.7	SO	CL	CH	P	L	A	L	L	I	2	19	37	17	16	1700	30	72	17	26	1400	#	#	N
0076	A3	22.2	SO	ML	ML	P	L	A	L	M	I	1	18	24	16	16	1800	13	16	16	13	2000	#	#	M
0077	A3	76.5	SO	SM	ML	P	L	A	L	M	I	2	N	-	-	-	-	13	16	16	13	2000	#	#	M
0078	A3	16.7	OR	Pt	SM	O	F13	#	21	L	V	4	#	#	#	#	#	N	-	-	-	-	#	#	N
0079	A3	240.6	SO	SM	ML	P	L	A	L	M	I	1	N	-	-	-	-	13	16	16	-	-	#	#	A
0080	C2	32.4	OR	Pt	ML	O	B14	#	23	M	P	4	#	#	#	#	#	15	18	14	13	2000	#	#	#
0081	B3	337.2	SO	CH	ML	P	L	A	L	M	I	2	30	72	17	26	1350	15	18	14	-	-	#	#	M
0082	A3	127.5	OR	Pt	SM	O	F13	#	21	L	V	4	#	#	#	#	#	N	-	-	-	-	#	#	#
0083	A3	116.5	SO	SW	-	P	U	A	L	-	W	3	N	-	-	-	-	-	-	-	-	-	#	#	N
0084	B3	5.8	SO	SW	-	P	H	B	F	-	W	3	N	-	-	-	-	-	-	-	-	-	#	#	N
0085	B3	48.5	SO	CL	CH	P	L	A	L	L	P	2	20	43	21	16	1600	31	75	17	26	1350	#	#	N
0086	B3	28.2	SO	CL	CH	P	L	A	L	L	P	1	19	37	17	17	1750	27	67	19	26	1350	#	#	N
0087	B3	9.8	SO	SW	-	P	H	B	F	-	W	3	N	-	-	-	-	-	-	-	-	-	#	#	N
0088	B3	37.4	SO	SW	-	P	H	B	F	-	W	3	N	-	-	-	-	-	-	-	-	-	#	#	N
0089	A3	479.4	SO	CH	-	P	L	A	L	-	I	1	30	72	17	26	1350	-	-	-	-	-	#	#	N
0090	A3	117.0	SO	CH	-	P	L	A	L	-	P	1	30	72	17	26	1350	-	-	-	-	-	#	#	N
0091	A3	18.4	SO	CL	CH	P	L	A	L	L	I	1	19	37	17	16	1600	30	72	17	26	1350	#	#	N
0092	B2	35.7	SO	CL	ML	P	L	A	L	M	I	1	19	37	17	16	1600	15	18	14	14	1900	#	#	A
0093	D2	34.7	OR	Pt	-	O	B04	#	11	-	P	4	#	#	#	#	#	-	-	-	-	-	#	#	#
0094	C3	33.8	SO	CH	-	P	L	A	L	-	P	1	26	56	17	26	1350	-	-	-	-	-	#	#	N
0095	C3	233.5	SO	SM	-	P	H	A	M	-	W	3	N	-	-	-	-	-	-	-	-	-	#	#	N
0096	B3	50.0	SO	CL	CH	P	L	A	L	L	P	1	19	37	17	-	-	30	72	17	-	-	#	#	N
0097	B3	52.9	SO	CL	ML	P	L	A	L	M	I	1	19	37	17	16	1600	15	18	14	-	-	#	#	N
0098	B3	57.5	SO	CH	ML	P	L	A	L	M	I	1	30	72	17	26	1400	15	18	14	-	-	#	#	N
0099	A2B	102.4	SO	CL	-	P	L	A	L	-	I	2	21	30	21	16	1600	-	-	-	-	-	#	#	N

POLYNUMB	GRIDLOCN	AREAKHA	DOMKDMAT	UNIFIED	UNIFIED2	DOMREGFM	DOMLOCSF	DOMSLOPE	DOMPMDEP	DOMPMDP2	DOMDRAIN	DOMWATAB	PLASL1	LIQL1	SHRL1	OPTM1	OPTD1	PLASL2	LIQL2	SHRL2	OPTM2	OPTD2	DPERMTYP	PERMDIST	STONINES
0100	A2	79.2	SO	SM	-	P	L	A	L	-	I	1	N	-	-	-	-	-	-	-	-	-	#	#	N
0101	A2	18.9	SO	SW	-	P	H	B	E	-	W	3	N	-	-	-	-	-	-	-	-	-	#	#	N
0102	A4	87 2	SO	SM	ML	P	U	A	L	M	I	1	N	20	20	-	-	13	16	16	-	-	#	#	N
0103	A2B	149 1	SO	SM	-	P	L	A	L	-	I	1	N	20	20	-	-	-	-	-	-	-	#	#	N
0104	A2B	32 8	SO	SM	-	P	L	A	L	-	P	1	N	-	-	-	-	-	-	-	-	-	#	#	N
0105	B2	77.9	SO	CL	-	P	L	A	L	-	I	1	19	34	17	16	1600	-	-	-	-	-	#	#	N
0106	B2	35 4	SO	CL	-	P	L	A	L	-	P	1	19	37	17	-	-	-	-	-	-	-	#	#	N
0107	B2	121.4	SO	CL	-	P	K	A	M	-	W	3	17	35	17	17	1700	-	-	-	-	-	#	#	M
0108	B1	28.3	SO	UD	-	V	D	D	U	-	W	3	V	V	-	-	-	-	-	-	-	-	#	#	#
0109	B1	251.4	SO	CL	-	P	K	A	M	-	W	3	17	35	17	17	1700	-	-	-	-	-	#	#	M
0110	B1	29.7	SO	CL	-	P	D	A	M	-	W	3	17	35	17	17	1700	-	-	-	-	-	#	#	N
0111	B1	112 7	SO	CL	-	P	K	B	M	-	W	3	17	35	17	17	1750	-	-	-	-	-	#	#	M
0112	A4	344 4	OR	Pt	-	O	B14	#	23	-	P	4	#	#	#	#	#	-	-	-	-	-	#	#	#
0113	B1	12.2	SO	SW	-	P	D	A	F	-	W	3	N	-	-	-	-	-	-	-	-	-	#	#	N
0114	B1	50 8	SO	UD	-	V	D	D	U	-	W	3	V	V	-	-	-	-	-	-	-	-	#	#	#
0116	B1	160.6	SO	CL	-	H	K	B	M	-	W	3	17	35	17	17	1700	-	-	-	-	-	#	#	M
0117	B1	374.8	SO	CL	-	H	K	D	M	-	W	3	17	36	14	17	1700	-	-	-	-	-	#	#	M
0118	C1D	33 3	SO	SW	ML	P	U	A	L	M	I	1	N	-	-	-	-	15	18	14	14	1900	#	#	N
0119	C1D	61.4	OR	Pt	SM	O	B14	#	23	F	P	4	#	#	#	#	#	N	-	-	-	-	#	#	M
0120	B2	89 1	SO	CL	-	S	D	D	M	-	W	3	17	35	17	-	-	-	-	-	-	-	#	#	M
0121	B2	59 2	SO	CL	ML	P	U	A	L	M	W	1	25	47	21	26	1400	15	18	14	14	1900	#	#	N
0122	B2	28 9	SO	CL	ML	P	L	A	L	M	I	1	25	56	21	-	-	15	18	14	13	2000	#	#	N
0123	C2	9 4	SO	CL	-	P	L	A	L	-	P	1	19	37	17	16	1700	-	-	-	-	-	#	#	N
0124	B2C	54 6	SO	ML	ML	P	L	A	L	M	I	1	20	23	25	-	-	15	18	14	13	2000	#	#	N
0125	C1	32.6	SO	CH	-	P	L	A	L	-	I	1	37	73	17	26	1400	-	-	-	-	-	#	#	N
0126	C1	133 5	SO	CL	ML	P	U	A	L	M	W	3	21	37	24	-	-	15	18	14	14	1900	#	#	M
0127	C1	28.1	SO	SW	-	P	U	A	L	-	W	3	N	-	-	-	-	-	-	-	-	-	#	#	N
0128	C1	44 1	SO	ML	-	P	D	B	M	-	W	3	15	18	14	13	2000	-	-	-	-	-	#	#	M
0129	C1	104 6	SO	ML	-	S	D	D	M	-	W	3	15	18	14	14	1900	-	-	-	-	-	#	#	M
0130	D1	103 7	SO	CL	-	P	L	A	L	-	I	1	21	37	24	16	1700	-	-	-	-	-	#	#	N
0131	D1	77 4	SO	SM	-	P	L	A	L	-	I	1	17	19	20	15	1800	-	-	-	-	-	#	#	N
0132	D1	64 8	SO	ML	-	P	R	A	M	-	I	1	15	18	14	13	2000	-	-	-	-	-	#	#	A
0133	C1	57 0	SO	SM	ML	P	L	A	L	M	I	1	N	20	20	-	-	15	18	14	13	2000	#	#	M

POLYNUMB	GRIDLOCN	AREAKHA	DOMKDMAT	UNIFIED	UNIFIED2	DOMREGFM	DOMLOCSF	DOMSLOPE	DOMPMDEP	DOMPMDP2	DOMDRAIN	DOMWATAB	PLASLI	LIQLI	SHRLI	OPTMI	OPTDI	PLASL2	LIQL2	SHRL2	OPTM2	OPTD2	DPERMTYP	PERMDIST	STONINES
0134	C1	117.9	SO	ML	-	P	R	A	M	-	I	1	15	18	14	13	2000	-	-	-	-	-	#	#	A
0135	C1	112.0	SO	ML	ML	P	L	A	L	M	I	1	20	23	25	16	1700	15	18	14	13	2000	#	#	N
0136	B2C	24.5	SO	ML	ML	P	L	A	L	M	I	1	20	23	25	16	1700	15	18	14	13	2000	#	#	N
0137	B2	33.3	SO	ML	ML	P	L	A	L	M	I	1	20	23	25	16	1700	15	18	14	13	2000	#	#	N
0138	B2C	713.0	SO	ML	-	P	R	A	M	-	I	1	15	18	14	13	2000	-	-	-	-	-	#	#	A
0139	B2	74.0	SO	ML	-	P	U	A	M	-	I	1	15	18	14	13	2000	-	-	-	-	-	#	#	A
0140	B3	99.7	SO	ML	-	P	R	A	M	-	I	1	15	18	14	13	2000	-	-	-	-	-	#	#	A
0141	B2	25.7	SO	ML	-	P	L	A	M	-	P	1	15	18	14	13	2000	-	-	-	-	-	#	#	A
0142	C2D	774.2	SO	ML	-	P	R	A	M	-	I	2	15	18	14	13	2000	-	-	-	-	-	#	#	A
0143	C2D	179.5	SO	ML	-	P	U	A	M	-	I	2	15	18	14	13	2000	-	-	-	-	-	#	#	A
0144	B3	55.6	SO	ML	-	P	U	A	M	-	I	1	15	18	14	13	2000	-	-	-	-	-	#	#	A
0145	B3	76.8	SO	ML	-	P	R	A	M	-	I	2	15	18	14	13	2000	-	-	-	-	-	#	#	A
0146	B3	35.7	SO	ML	-	P	R	A	L	-	I	2	15	18	14	13	2000	-	-	-	-	-	#	#	A
0147	B3	32.4	SO	ML	-	P	L	A	M	-	P	1	15	18	14	13	2000	-	-	-	-	-	#	#	A
0148	B3C	61.3	SO	CH	ML	P	L	A	L	M	I	2	26	56	17	26	1400	15	18	14	13	2000	#	#	N
0149	B3C	82.2	SO	CH	ML	P	L	A	L	M	P	1	26	56	17	26	1400	15	18	14	13	2000	#	#	N
0150	C3	46.0	SO	ML	-	P	R	A	M	-	I	1	15	18	14	13	2000	-	-	-	-	-	#	#	A
0151	C3	14.2	SO	ML	CR	P	L	A	M	R	I	3	15	18	14	13	2000	#	#	#	#	#	#	#	A
0152	C3	234.4	OR	Pt	-	O	B04	#	11	-	P	4	#	#	#	#	#	-	-	-	-	-	#	#	#
0153	C3	29.0	OR	Pt	CH	O	F13	#	21	L	V	4	#	#	#	#	#	27	67	19	26	1400	#	#	M
0154	C3	50.1	SO	CH	ML	P	L	A	L	M	W	3	27	67	19	26	1400	15	18	14	13	2000	#	#	N
0155	C3	123.6	SO	CH	ML	P	R	A	L	M	W	3	28	61	16	26	1400	15	18	14	13	2000	#	#	N
0156	C3D	123.6	OR	Pt	-	O	B04	#	11	-	P	4	#	#	#	#	#	19	37	17	16	1700	#	#	#
0157	C2	126.8	SO	ML	-	P	R	A	M	-	I	2	15	18	14	13	2000	-	-	-	-	-	#	#	A
0158	C2D	1764.4	OR	Pt	CH	O	B14	#	23	L	P	4	#	#	#	#	#	26	56	17	26	1400	#	#	#
0159	D2	112.8	OR	Pt	ML	O	B14	#	23	M	P	4	#	#	#	#	#	15	18	14	13	2000	#	#	M
0160	B3	150.1	SO	ML	-	P	R	A	M	-	I	1	15	18	14	13	2000	-	-	-	-	-	#	#	A
0161	C2	223.2	SO	ML		P	R	A	M	-	I	1	15	18	14	13	2000	-	-	-	-	-	#	#	A
0162	B2C	63.1	SO	ML	-	P	R	A	M	-	I	2	15	18	14	13	2000	-	-	-	-	-	#	#	A
0163	C2	33.8	SO	ML	-	P	R	A	M	-	W	2	15	18	14	13	2000	-	-	-	-	-	#	#	A
0164	C2	85.8	SO	ML	-	P	R	A	M	-	I	2	15	18	14	13	2000	-	-	-	-	-	#	#	A
0165	C2	76.8	SO	ML	-	P	R	A	M	-	I	3	15	18	14	13	2000	-	-	-	-	-	#	#	A
0166	E1	21.6	OR	Pt	CH	O	F13	#	21	L	V	4	#	#	#	#	#	19	37	17	16	1700	#	#	#

POLYNUMB	GRIDLOCN	AREAKHA	DOMKDMAT	UNIFIED	UNIFIED2	DOMREGFM	DOMLOCSF	DOMSLOPE	DOMPMDEP	DOMPMDP2	DOMDRAIN	DOMWATAB	PLASL1	LIQL1	SHRL1	OPTM1	OPTD1	PLASL2	LIQL2	SHRL2	OPTM2	OPTD2	DPERMTYP	PERMDIST	STONINES
0167	C3	24.9	OR	Pt	CH	O	F13	#	21	L	V	4	#	#	#	#	#	28	61	16	26	1400	#	#	#
0168	C2	48.8	SO	ML	CR	P	L	A	M	R	W	3	15	18	14	13	2000	#	#	#	#	#	#	#	A
0169	C3	73.7	SO	ML	-	P	R	A	M	-	I	2	15	18	14	13	2000	-	-	-	-	-	#	#	A
0170	D2	43.7	OR	Pt	-	O	B14	#	23	-	P	4	#	#	#	#	#	-	-	-	-	-	#	#	#
0171	D2	74.4	SO	CL	-	P	U	A	M	-	W	2	22	41	18	-	-	-	-	-	-	-	#	#	A
0172	D1	12.0	SO	ML	-	P	R	A	M	-	W	1	15	18	14	13	2000	-	-	-	-	-	#	#	A
0173	D1	30.5	OR	Pt	-	O	B14	#	23	-	P	4	#	#	#	#	#	-	-	-	-	-	#	#	#
0174	D1	34.2	SO	ML	-	P	R	A	M	-	I	1	15	18	14	13	2000	-	-	-	-	-	#	#	A
0175	D1	40.0	SO	ML	CR	P	L	A	M	R	W	2	15	18	14	13	2000	#	#	#	#	#	#	#	#
0176	E1	30.7	SO	ML	-	P	U	A	M	-	I	1	15	18	14	13	2000	-	-	-	-	-	#	#	A
0177	D1	38.3	OR	Pt	-	O	B14	#	23	-	P	4	#	#	#	#	#	-	-	-	-	-	#	#	#
0178	D1	57.4	OR	Pt	-	O	B14	#	23	-	P	4	#	#	#	#	#	-	-	-	-	-	#	#	#
0179	D2	102.9	SO	ML	-	P	R	A	M	-	W	2	15	18	14	13	2000	-	-	-	-	-	#	#	A
0180	D2	54.6	SO	ML	-	P	U	A	M	-	W	2	15	18	14	13	2000	-	-	-	-	-	#	#	A
0181	D2	61.2	SO	CL	-	P	L	A	M	-	W	1	22	41	18	-	-	-	-	-	-	-	#	#	M
0182	E1	211.1	OR	Pt	CH	O	B14	#	23	L	P	4	#	#	#	#	#	26	56	17	26	1400	#	#	#
0183	E1	41.4	SO	CL	-	P	L	A	M	-	P	1	22	41	18	-	-	-	-	-	-	-	#	#	N
0184	B4	103.1	R2	AR	-	P	H	B	L	R	#	#	#	#	#	#	#	-	-	-	-	-	#	#	#
0185	F1	288.0	OR	Pt	ML	O	B14	#	23	M	P	4	#	#	#	#	#	15	18	14	13	2000	#	#	#
0186	C1D	68.9	SO	CL	-	P	L	A	L	-	W	3	25	53	23	-	-	-	-	-	-	-	#	#	N
0187	C3	10.1	SO	ML	CR	P	H	A	M	R	W	3	15	18	14	13	2000	#	#	#	#	#	#	#	M
0188	A3	17.8	SO	SM	ML	P	H	B	L	M	I	1	N	-	-	-	-	13	16	16	16	1800	#	#	N
0189	B4	50.1	R2	AR	-	P	H	C	R	-	#	#	#	#	#	#	#	-	-	-	-	-	#	#	A
0190	B4	15.0	SO	CH	AR	P	H	B	L	R	W	2	28	61	16	26	1400	#	#	#	#	#	#	#	N
0191	B3	96.6	SO	CH	-	P	H	B	L	-	W	2	28	61	16	26	1400	-	-	-	-	-	#	#	N
0192	B3	52.8	OR	Pt	-	O	B14	#	23	-	P	4	#	#	#	#	#	-	-	-	-	-	#	#	#
0193	B3	59.0	R2	AR	-	P	H	D	R	-	#	#	#	#	#	#	#	-	-	-	-	-	#	#	M
0194	C3	70.2	SO	CH	-	P	L	A	L	-	W	2	28	61	16	26	1400	-	-	-	-	-	#	#	N
0195	C3D	1726.6	SO	CH	AR	P	H	C	L	R	I	1	24	52	21	-	-	#	#	#	#	#	#	#	M
0196	D3E	730.1	OR	Pt	-	O	B14	#	23	-	P	4	#	#	#	#	#	-	-	-	-	-	#	#	#
0197	E4	524.2	SO	CH	-	P	H	B	L	-	W	1	24	52	21	-	-	-	-	-	-	-	O	V	N
0198	E3	291.0	SO	CH	AR	P	H	B	L	R	I	1	24	52	21	-	-	#	#	#	#	#	O	V	N
0199	E3	457.8	OR	Pt	CH	O	B14	#	23	L	P	4	#	#	#	#	#	36	51	27	-	-	O	V	#

POLYNUMB	GRIDLOCN	AREAKHA	DOMKDMAI	UNIFIED	UNIFIED2	DOMREGFM	DOMLOCSF	DOMSLOPE	DOMPMDEP	DOMPMDP2	DOMDRAIN	DOMWATAB	PLASLI	LIQLI	SHRLI	OPTMI	OPTDI	PLASL2	LIQL2	SHRL2	OPTM2	OPTD2	DPERMTYP	PERMDIST	STONINES
0200	E2	154.7	OR	Pt	-	O	F13	#	21	-	V	4	#	#	#	#	#	-	-	-	-	-	O	V	#
0201	E2	255.9	R3	CR	-	P	L	A	R	-	#	#	#	#	#	#	#	-	-	-	-	-	#	#	A
0202	E2	576.5	SO	ML	CR	P	L	A	M	R	W	3	15	18	14	-	-	#	#	#	#	#	#	#	A
0203	E1	218.9	OR	Pt	CH	O	F13	#	21	L	V	4	#	#	#	#	#	26	56	17	26	1400	#	#	#
0204	E1	122.1	SO	CL	-	P	L	A	A	-	P	1	19	37	17	16	1600	-	-	-	-	-	#	#	N
0205	F1	92.2	SO	CH	ML	P	L	A	L	-	W	1	24	52	21	-	-	15	18	14	-	-	O	V	N
0207	F1	146.6	SO	ML	-	P	H	B	M	-	I	1	15	18	14	13	2000	-	-	-	-	-	#	#	M
0208	F2	510.0	OR	Pt	-	O	B14	#	23	-	P	4	#	#	#	#	#	-	-	-	-	-	O	S	#
0209	F3G	1463.2	SO	CH	-	P	H	C	L	-	I	1	24	52	21	-	-	-	-	-	-	-	O	S	N
0210	F3	262.0	SO	CH	AR	P	H	B	L	R	I	1	24	52	21	-	-	#	#	#	#	#	O	S	N
0211	E4	454.7	SO	SM	AR	P	H	C	M	R	W	1	N	-	-	-	-	#	#	#	#	#	O	V	M
0212	E3	216.7	SO	SM	AR	P	H	C	M	R	W	1	N	#	#	#	#	-	-	-	-	-	O	V	M
0213	F3	197.3	SO	SM	-	P	H	C	M	-	W	3	N	-	-	-	-	-	-	-	-	-	O	V	M
0214	E4	62.0	SO	CH	-	P	H	C	L	-	W	2	24	52	21	-	-	-	-	-	-	-	O	V	N
0215	E5	225.6	SO	SM	-	P	H	D	M	-	W	3	N	-	-	-	-	-	-	-	-	-	O	V	M
0216	E4	113.6	SO	CH	-	P	H	C	L	-	W	1	24	52	21	-	-	-	-	-	-	-	O	V	#
0217	F4	398.1	SO	SM	-	P	H	C	M	-	W	3	N	-	-	-	-	-	-	-	-	-	O	V	M
0218	F4	932.3	SO	ML	-	P	H	B	M	-	W	2	15	18	14	13	2000	-	-	-	-	-	O	S	M
0220	F4	14.6	SO	SM	-	P	K	D	L	-	W	3	N	-	-	-	-	-	-	-	-	-	O	V	M
0221	F4	125.2	SO	ML	-	P	H	B	M	-	W	2	15	18	14	13	2000	-	-	-	-	-	O	S	M
0222	F3G	611.6	OR	Pt	CH	O	B19	#	23	L	P	6	#	#	#	#	#	24	52	21	-	-	O	D	#
0223	G2	467.2	OR	Pt	-	O	B14	#	23	-	P	4	#	#	#	#	#	-	-	-	-	-	O	S	#
0224	F2G	339.0	R2	AR	-	P	H	D	R	-	#	#	#	#	#	#	#	-	-	-	-	-	O	S	#
0225	F1	581.7	SO	SM	AR	P	H	D	M	R	W	1	N	-	-	-	-	#	#	#	#	#	O	S	A
0226	G1	46.0	OR	Pt	-	O	B14	#	23	-	P	4	#	#	#	#	#	-	-	-	-	-	O	S	#
0227	G1	362.5	SO	SM	AR	P	H	D	M	R	W	3	N	-	-	-	-	#	#	#	#	#	O	S	M
0228	G1	121.1	R2	AR	-	P	H	D	R	-	#	#	#	#	#	#	#	-	-	-	-	-	O	S	#
0229	G1H	493.0	SO	CH	AR	P	H	C	L	R	W	2	24	52	21	-	-	#	#	#	#	#	O	S	N
0230	G1	117.2	R2	AR	-	P	H	D	R	-	#	#	#	#	#	#	#	-	-	-	-	-	O	V	#
0231	G1H	181.2	R2	AR	-	P	H	D	R	-	#	#	#	#	#	#	#	-	-	-	-	-	O	V	#
0232	H11	1037.8	SO	SM	AR	P	H	C	M	R	W	3	N	-	-	-	-	#	#	#	#	#	O	S	M

POLYNUMB	GRIDLOCN	AREAKHA	DOMKDMAT	UNIFIED	UNIFIED2	DOMREGFM	DOMLOCSF	DOMSLOPE	DOMPMDEP	DOMPMDP2	DOMDRAIN	DOMWATAB	PLASL1	LIQL1	SHRL1	OPTM1	OPTD1	PLASL2	LIQL2	SHRL2	OPTM2	OPTD2	DPERMTYP	PERMDIST	STONINES
0233	H1	51.4	SO	SM	-	P	H	C	M	-	W	3	N	-	-	-	-	-	-	-	-	-	O	S	M
0234	G1	539 3	SO	CH	AR	P	H	D	L	R	W	1	24	52	21	-	-	#	#	#	#	#	O	S	N
0235	G2 H	297 0	SO	CH	-	P	H	C	L	-	W	1	24	52	21	-	-	-	-	-	-	-	O	D	N
0236	G3 H	379.3	SO	CH	-	P	H	C	L	-	W	2	24	52	21	-	-	-	-	-	-	-	O	D	N
0237	G3	779 9	OR	Pt	CH	O	B19	#	23	L	P	6	#	#	#	#	#	24	52	21	-	-	O	D	#
0238	G4	234 5	OR	Pt	-	O	B19	#	23	-	P	6	#	#	#	#	#	-	-	-	-	-	O	D	#
0239	G4	33 4	SO	SM	-	P	R	D	F	-	W	3	N	-	-	-	-	-	-	-	-	-	#	#	N
0240	G4	723 7	OR	Pt	ML	O	B19	#	23	M	P	6	#	#	#	#	#	13	15	11	13	2000	O	D	#
0241	F5G	654 5	OR	Pt	-	O	B07	#	23	-	P	6	#	#	#	#	#	-	-	-	-	-	O	D	#
0242	F5G	34 0	SO	SM	-	P	R	C	F	-	W	3	N	-	-	-	-	-	-	-	-	-	O	V	N
0243	F5	60 6	OR	Pt	-	O	B07	#	23	-	P	6	#	#	#	#	#	-	-	-	-	-	O	D	#
0244	G5	213 1	OR	Pt	-	O	B07	#	23	-	P	6	#	#	#	#	#	-	-	-	-	-	O	D	#
0245	G6 H	374 5	OR	Pt	ML	O	B19	#	23	M	P	6	#	#	#	#	#	N	-	18	12	1800	O	D	#
0246	H5 G	1765 3	OR	Pt	-	O	B07	#	23	-	P	6	#	#	#	#	#	-	-	-	-	-	O	D	#
0247	H5	33 1	SO	SM	-	P	R	C	W	-	W	2	N	-	-	-	-	-	-	-	-	-	O	S	N
0248	H5	243 4	OR	Pt	ML	O	B19	#	23	M	P	6	#	#	#	#	#	N	-	18	13	1800	O	D	#
0249	G5	10 5	SO	SM	-	P	R	B	W	-	W	2	N	-	-	-	-	-	-	-	-	-	O	S	N
0250	H6	142.9	OR	Pt	ML	O	B19	#	23	M	P	6	#	#	#	#	#	N	-	18	13	1800	O	D	#
0251	H41	636 3	OR	Pt	-	O	B07	#	23	-	P	6	#	#	#	#	#	-	-	-	-	-	O	D	#
0252	H4	63 8	SO	ML	-	P	R	C	M	-	I	2	N	-	18	13	1800	-	-	-	-	-	S	S	N
0253	G4 H	632 0	OR	Pt	ML	O	B19	#	23	M	P	6	#	#	#	#	#	13	15	11	13	2000	O	D	#
0254	G4 H	94 9	OR	Pt	ML	O	B19	#	23	M	P	6	#	#	#	#	#	N	-	18	13	1800	O	D	#
0255	G4	454 8	OR	Pt	CH	O	B19	#	23	L	P	6	#	#	#	#	#	24	52	21	-	-	O	D	#
0256	G4	28 8	SO	SM	-	P	R	D	F	-	W	3	N	-	-	-	-	-	-	-	-	-	O	V	N
0257	H3	394.7	OR	Pt	CH	O	B19	#	23	L	P	6	#	#	#	#	#	24	52	20	-	-	O	D	#
0258	H3	273.8	SO	SM	-	P	R	D	F	-	W	3	N	-	-	-	-	-	-	-	-	-	O	V	N
0259	H3	265.5	SO	CH	-	P	H	C	L	-	I	1	24	52	21	-	-	-	-	-	-	-	O	S	N
0260	H2	431 9	SO	CH	-	P	H	C	L	-	I	1	24	52	21	-	-	-	-	-	-	-	O	S	N

POLYNUMB	GRIDLOCN	AREAKHA	DOMKDMAT	UNIFIED	UNIFIED2	DOMREGFM	DOMLOCSF	DOMSLOPE	DOMPMDEP	DOMPMDPZ	DOMDRAIN	DOMWATAB	PLASL1	LIQL1	SHRL1	OPTM1	OPTD1	PLASL2	LIQL2	SHRL2	OPTM2	OPTD2	DPERMTYP	PERMDIST	STONINES
0261	H2I	274 7	OR	Pt	CH	P	B19	B	23	L	P	6	#	#	#	#	#	24	52	21	-	-	S	D	N
0262	H2	331 4	SO	CH		P	H	C	L		I	2	24	52	21	-	-	-	-	-	-	-	S	D	N
0263	I1	421.4	OR	Pt	SM	O	B19	#	23	M	P	6	#	#	#	#	#	N	-	-	-	-	O	D	M
0264	I1	143 2	SO	SM	-	P	H	B	M	-	W	3	N	-	-	-	-	-	-	-	-	-	O	S	A
0265	I1	32 7	R2	AR	-	P	H	C	R	-	#	#	#	#	#	#	#	-	-	-	-	-	O	S	M
0266	I2	82.8	SO	SM	AR	P	H	C	M	R	W	3	N	-	-	-	-	#	#	#	#	#	O	S	A
0267	I2	163 4	SO	SM	AR	P	H	B	M	R	I	3	N	-	-	-	-	#	#	#	#	#	O	S	A
0268	I2	173 2	SO	CH	ML	P	H	B	L	M	I	2	24	52	21	-	-	15	18	14	-	-	O	D	N
0269	I2	7 1	SO	SW	-	P	R	C	F	-	W	3	N	-	-	-	-	-	-	-	-	-	#	#	N
0270	I2	177.2	SO	SM	-	P	H	B	M	-	W	3	N	-	-	-	-	-	-	-	-	-	O	S	A
0271	I3	163 7	SO	CH	ML	P	H	B	L	M	I	2	24	52	21	13	-	15	18	14	-	-	O	D	N
0272	I3	96 6	SO	CH	-	P	H	C	L	-	I	2	24	52	21	-	-	-	-	-	-	-	O	D	N
0274	H3I	856.3	OR	Pt	ML	O	B19	#	23	M	P	6	#	#	#	#	#	13	15	11	-	-	O	D	#
0275	I4	190 1	OR	Pt	ML	O	B19	#	23	M	P	6	#	#	#	#	#	13	15	11	-	-	O	D	#
0276	H4I	589 6	OR	Pt	ML	O	B19	#	23	M	P	6	#	#	#	#	#	13	15	11	13	1800	O	D	#
0277	I4	60 7	OR	Pt	-	O	B07	#	23	-	P	6	#	#	#	#	#	-	-	-	-	-	O	D	#
0278	I4J	53.6	SO	SW	-	P	R	C	W	-	W	2	N	-	-	-	-	-	-	-	-	-	O	S	N
0279	I5	52 2	OR	Pt	-	O	B07	#	23	-	P	6	#	#	#	#	#	-	-	-	-	-	O	D	#
0280	I5	51 8	OR	Pt	-	O	B07	#	23	-	P	6	#	#	#	#	#	-	-	-	-	-	O	D	#
0281	H6I	793.8	SO	SM	-	P	R	B	W	-	I	2	N	-	-	-	-	-	-	-	-	-	S	D	N
0282	H6I	635 6	OR	Pt	-	O	F13	#	21	-	V	4	#	#	#	#	#	-	-	-	-	-	O	D	#
0283	H6	304 3	OR	Pt	-	O	B07	#	23	-	P	6	#	#	#	#	#	-	-	-	-	-	O	D	#
0284	H6	30.2	SO	SM	-	P	R	C	W	-	W	2	N	-	-	-	-	-	-	-	-	-	O	I	N
0285	H5	42.1	OR	Pt	-	O	F01	#	21	-	V	4	#	#	#	#	#	-	-	-	-	-	O	D	#
0286	I5	159.5	OR	Pt	-	O	F01	#	21	-	V	4	#	#	#	#	#	-	-	-	-	-	O	D	#
0287	I5	158 7	SO	SM	-	P	R	A	W	-	I	2	N	-	-	-	-	-	-	-	-	-	S	V	N
0288	I5	21 2	SO	SM	-	P	R	C	W	-	W	2	N	-	-	-	-	-	-	-	-	-	O	D	N
0289	I5	85 2	SO	SM	-	P	R	B	W	-	I	2	N	-	-	-	-	-	-	-	-	-	S	V	N
0290	I5J	258 2	OR	Pt	-	O	F13	#	21	-	V	4	#	#	#	#	#	-	-	-	-	-	O	D	#
0291	I5J	1170 3	OR	Pt	-	O	B05	#	11	-	P	6	#	#	#	#	#	-	-	-	-	-	O	C	#
0292	J5	402.5	SO	SM	-	P	R	B	W	-	I	2	N	-	-	-	-	-	-	-	-	-	S	V	N
0293	J5	152 3	OR	Pt	-	O	B05	#	21	-	P	6	#	#	#	#	#	-	-	-	-	-	O	D	#
0294	J4	211.6	OR	Pt	-	O	B07	#	23	-	P	6	#	#	#	#	#	-	-	-	-	-	O	D	#

POLYNUMB	GRIDLOCN	AREAKHA	DOMKDMAT	UNIFIED	UNIFIED2	DOMREGFM	DOMLOCSF	DOMSLOPF	DOMPMDEP	DOMPMDP2	DOMDRAIN	DOMWATAB	PLASLI	LIQLI	SHRLI	OPTMI	OPTDI	PLASL2	LIQL2	SHRL2	OPTM2	OPTD2	DPERMTYP	PERMDIST	STONINES
0295	I3J	432.2	OR	Pt	ML	O	B19	#	23	M	P	6	#	#	#	#	#	N	-	18	13	1800	O	D	#
0296	I3	118 5	OR	Pt	SM	O	B19	#	23	M	P	6	#	#	#	#	#	N	-	-	-	-	O	D	#
0297	I3J	324 0	OR	Pt	SM	O	B19	#	23	M	P	6	#	#	#	#	#	N	-	-	-	-	O	D	M
0298	J2	787.0	OR	Pt	SM	O	B19	#	23	M	P	6	#	#	#	#	#	N	-	-	-	-	O	D	M
0299	I1J	720 5	SO	SM	-	P	R	C	M	-	W	3	N	-	-	-	-	-	-	-	-	-	T	S	A
0300	K1	407 3	SO	SM	-	P	R	C	M	-	W	3	N	-	-	-	-	-	-	-	-	-	T	S	A
0301	K1	60 2	SO	SM	-	P	R	C	M	-	W	3	N	-	-	-	-	-	-	-	-	-	T	S	A
0302	K1	44 2	SO	SM	-	P	R	B	M	-	W	3	N	-	-	-	-	-	-	-	-	-	T	S	A
0303	J2K	1510 3	SO	SM	-	P	H	C	M	-	W	3	N	-	-	-	-	-	-	-	-	-	T	S	A
0304	J2	408 8	SO	SM	-	P	R	B	M	-	W	3	N	-	-	-	-	-	-	-	-	-	O	S	A
0305	J3	118 5	OR	Pt	-	O	B19	#	23	-	P	6	#	#	#	#	#	-	-	-	-	-	O	D	M
0306	J3	139 1	SO	SM	-	P	H	B	M	-	W	3	N	-	-	-	-	-	-	-	-	-	T	S	A
0307	J3	272.5	SO	SM	-	P	H	B	M	-	I	6	N	-	-	-	-	-	-	-	-	-	T	D	A
0308	J4K	214 2	OR	Pt	SM	O	B05	#	22	M	P	6	#	#	#	#	#	N	-	-	-	-	O	D	#
0309	J4K	69 1	SO	ML	-	P	L	A	W	-	I	6	13	18	13	13	1700	-	-	-	-	-	T	D	N
0310	K4	108.3	SO	SM	-	P	H	B	M	-	I	6	N	-	-	-	-	-	-	-	-	-	T	D	A
0311	K4	45.4	SO	SM	-	P	R	C	M	-	I	6	N	-	-	-	-	-	-	-	-	-	T	C	A
0312	K3	383.7	SO	SM	-	P	H	B	M	-	I	6	N	-	-	-	-	-	-	-	-	-	T	D	A
0313	K3	75.6	SO	SM	-	P	R	C	M	-	I	1	N	-	-	-	-	-	-	-	-	-	T	D	A
0314	K3	249 1	SO	SM	-	P	H	C	M	-	I	1	N	-	-	-	-	-	-	-	-	-	T	D	N
0315	K3	398.9	SO	SM	-	P	H	C	M	-	I	1	N	-	-	-	-	-	-	-	-	-	T	D	A
0316	K2	273 6	SO	SM	-	P	R	C	M	-	I	1	N	-	-	-	-	-	-	-	-	-	T	D	A
0317	K2	112 1	SO	SM	-	P	R	D	M	-	W	3	N	-	-	-	-	-	-	-	-	-	T	D	A
0318	K1	124.0	SO	SM	-	P	R	D	M	-	I	6	N	-	-	-	-	-	-	-	-	-	T	D	A
0319	K1	341 9	SO	SM	-	P	H	D	M	-	W	3	N	-	-	-	-	-	-	-	-	-	T	D	A
0320	A1	10 5	SO	UD	CL	V	D	D	U	M	W	3	V	V	-	-	-	17	35	18	17	1700	#	#	M
0321	A1	110 7	SO	CL	-	P	K	A	M	-	W	3	17	35	18	-	-	-	-	-	-	-	#	#	M
0322	D3	16 8	SO	SM	-	P	H	A	M	-	I	2	N	-	-	-	-	-	-	-	-	-	#	#	N
0323	D3	10 7	OR	Pt	-	O	B14	#	23	-	P	4	#	#	#	#	#	-	-	-	-	-	#	#	#
0324	B1	43 3	SO	CL	-	P	K	A	M	-	W	2	17	35	17	-	-	-	-	-	-	-	#	#	M
0325	B2	23 6	SO	CH	ML	P	L	A	L	M	I	1	23	48	17	-	-	15	18	14	-	-	#	#	N
0326	A1	17 6	SO	CL	-	P	D	B	L	-	W	3	22	45	17	16	1700	-	-	-	-	-	#	#	N
0327	B3	5 3	SO	ML	-	P	L	A	M	-	I	1	13	16	16	13	2000	-	-	-	-	-	#	#	M

POLYNUMB	GRIDLOCN	AREAKHA	DOMKDMAT	UNIFIED	UNIFIED2	DOMREGFM	DOMLOCSF	DOMSLOPE	DOMPMDEP	DOMPMDP2	DOMDRAIN	DOMWATAB	PLASL1	LIQL1	SHRL1	OPTM1	OPTD1	PLASL2	LIQL2	SHRL2	OPTM2	OPTD2	DEPERMTYP	PERMDIST	STONINES
0328	F1	26.0	SO	ML	CR	P	L	A	M	R	W	3	N	-	-	-	-	#	#	#	#	#	#	#	A
0329	F1	15.0	R3	CR	-	P	U	A	R	-	#	#	#	#	#	#	#	-	-	-	-	-	#	#	A
0330	E1	42.4	SO	CH	ML	P	L	A	L	M	W	3	2	-	-	-	-	15	18	14	13	1700	#	#	M
0331	B3	4.6	SO	SW	-	P	H	B	F	-	W	3	N	-	-	-	-	-	-	-	-	-	#	#	M
0332	B2	18.2	SO	CL	-	P	K	A	M	-	W	3	17	35	17	18	1800	-	-	-	-	-	#	#	M
0333	A1B	24.9	SO	CL	-	P	H	A	M	-	W	3	17	35	17	18	1800	-	-	-	-	-	#	#	M
0334	G3	20.3	SO	SM	-	P	R	D	F	-	W	3	N	-	-	-	-	-	-	-	-	-	#	#	N
0335	G2	67.8	SO	CH	-	P	H	C	L	-	W	2	24	52	21	-	-	-	-	-	-	-	O	V	N
0336	H1	459.2	SO	CH	-	P	H	C	L	-	I	I	24	52	21	-	-	-	-	-	-	-	O	S	N
0337	H21	91.9	SO	CH	-	P	H	C	L	-	I	I	24	52	21	-	-	-	-	-	-	-	O	S	N
0338	I1	275.5	SO	SM	AR	P	H	C	M	R	W	3	N	-	-	-	-	#	#	#	#	#	O	S	A
0339	I3	192.0	SO	CH	-	P	H	C	L	-	I	2	24	52	21	-	-	-	-	-	-	-	O	D	N
0340	I2	155.3	SO	CH	-	P	H	B	L	-	I	2	24	52	21	-	-	-	-	-	-	-	O	D	N
0341	A4B	19.4	SO	CH	-	P	H	B	L	-	W	2	28	61	16	26	1400	-	-	-	-	-	S	#	N
0342	J4	162.6	OR	Pt	-	O	F01	#	21	-	V	6	#	#	#	#	#	-	-	-	-	-	O	D	#
0343	J4	74.8	SO	ML	-	P	L	A	W	-	I	6	13	18	13	13	1700	-	-	-	-	-	T	D	N
0345	J3	34.8	SO	SW	-	P	R	C	F	-	W	3	N	-	-	-	-	-	-	-	-	-	#	#	A
0346	J1	36.0	SO	SW	-	P	R	C	F	-	W	3	N	-	-	-	-	-	-	-	-	-	#	#	A
0347	K1	17.6	SO	SW	-	P	R	C	F	-	W	3	N	-	-	-	-	-	-	-	-	-	#	#	A
0348	K1	14.3	SO	SW	-	P	R	C	F	-	W	3	N	-	-	-	-	-	-	-	-	-	#	#	A
0349	K1	7.2	SO	SW	-	P	R	C	F	-	W	3	N	-	-	-	-	-	-	-	-	-	#	#	A
0350	K1	40.6	SO	SW	-	P	R	C	F	-	W	3	N	-	-	-	-	-	-	-	-	-	#	#	A
0351	K1	15.3	SO	SW	-	P	R	C	F	-	W	3	N	-	-	-	-	-	-	-	-	-	#	#	A
0352	K1	15.3	SO	SW	-	P	R	C	F	-	W	3	N	-	-	-	-	-	-	-	-	-	#	#	A
0354	K2	10.7	SO	SW	-	P	R	C	F	-	W	3	N	-	-	-	-	-	-	-	-	-	#	#	A
0355	K2	5.9	SO	SW	-	P	R	C	F	-	W	3	N	-	-	-	-	-	-	-	-	-	#	#	A
0357	K3	29.6	SO	SW	-	P	R	C	F	-	W	3	N	-	-	-	-	-	-	-	-	-	#	#	A
0358	K4	16.6	SO	SW	-	P	R	B	F	-	W	3	N	-	-	-	-	-	-	-	-	-	S	D	A
0359	K4	14.1	SO	SW	-	P	R	B	F	-	W	3	N	-	-	-	-	-	-	-	-	-	S	D	A
0360	K2	85.1	SO	SM	-	P	H	C	M	-	I	I	N	-	-	-	-	-	-	-	-	-	T	D	A
0361	K2	78.5	SO	SM	-	P	H	C	M	-	W	3	N	-	-	-	-	-	-	-	-	-	T	S	A
0362	K2	89.3	SO	SM	-	P	H	C	M	-	W	3	N	-	-	-	-	-	-	-	-	-	T	S	A
0363	K2	100.5	SO	SM	-	P	R	D	M	-	W	3	N	-	-	-	-	-	-	-	-	-	T	D	A

POLYNUMB	GRIDLOCN	AREAKHA	DOMKDMAT	UNIFIED	UNIFIED2	DOMREGFM	DOMLOCSF	DOMSLOPE	DOMPMDEP	DOMPMDP2	DOMDRAIN	DOMWATAB	PLASL1	LIQL1	SHRL1	OPTM1	OPTD1	PLASL2	LIQL2	SHRL2	OPTM2	OPTD2	DPERMTYP	PERMDIST	SYONINES
0364	K1	48.2	SO	SM	-	P	R	D	M	-	W	3	N	-	-	-	-	-	-	-	-	-	T	D	A
0365	K2	15.6	SO	SM	-	P	R	C	M	-	I	1	N	-	-	-	-	-	-	-	-	-	T	D	A
0366	K2	10.3	SO	SM	-	P	R	C	M	-	I	1	N	-	-	-	-	-	-	-	-	-	T	D	A
0367	I2	6.1	SO	CH	-	P	H	B	L	-	W	2	24	52	21	-	-	-	-	-	-	-	O	S	N
0368	H2	7.7	SO	CH	-	P	H	B	L	-	W	1	24	52	21	-	-	-	-	-	-	-	O	S	N
0369	H2	8.2	SO	CH	-	P	H	B	L	-	W	1	24	52	21	-	-	-	-	-	-	-	O	S	N
0370	H2	3.7	SO	CH	-	P	H	B	L	-	W	1	24	52	21	-	-	-	-	-	-	-	O	S	N
0371	H2	5.6	SO	CH	-	P	H	B	L	-	W	1	24	52	21	-	-	-	-	-	-	-	O	S	N
0372	H1	1.9	SO	CH	-	P	H	B	L	-	W	1	24	52	21	-	-	-	-	-	-	-	O	S	N
0373	H1	31.9	SO	CH	-	P	H	B	L	-	W	1	24	52	21	-	-	-	-	-	-	-	O	S	N
0375	I1	17.6	SO	SM	-	P	R	C	M	-	W	3	N	-	-	-	-	-	-	-	-	-	T	V	A
0376	H1	2.5	SO	SM	AR	P	H	C	M	R	W	3	N	-	-	-	-	#	#	#	#	#	O	V	#
0377	G1	15.0	SO	CH	-	P	H	C	L	-	W	2	24	52	21	-	-	-	-	-	-	-	O	S	N
0378	G1	7.0	SO	CH	-	P	H	C	L	-	W	2	24	52	21	-	-	-	-	-	-	-	O	S	#
0379	G1	49.5	SO	CH	-	-	H	C	L	-	W	2	24	52	21	-	-	-	-	-	-	-	O	S	#
0380	E1	159.3	SO	ML	CR	P	L	A	M	R	W	3	15	18	14	13	2000	#	#	#	#	#	#	#	A
0381	E2	5.1	SO	ML	CR	P	L	A	M	R	W	3	15	18	14	13	2000	#	#	#	#	#	#	#	A
0382	E1	11.4	SO	ML	-	P	L	A	M	-	W	3	15	18	14	13	2000	-	-	-	-	-	#	#	A
0383	F2	191.3	OR	Pt	CH	O	B14	#	23	L	P	4	#	#	#	#	#	36	51	27	-	-	O	V	#
0384	F2	72.5	OR	Pt	CH	O	B14	#	23	L	P	4	#	#	#	#	#	36	51	27	-	-	O	V	#
0385	F2	102.2	OR	Pt	CH	O	B14	#	23	L	P	4	#	#	#	#	#	24	52	21	-	-	O	V	#
0386	E3	10.6	OR	Pt	CH	O	B14	#	23	L	P	4	#	#	#	#	#	36	51	27	-	-	O	V	#
0387	E5	12.8	SO	CH	-	P	H	C	L	-	W	2	24	52	21	-	-	-	-	-	-	-	#	#	N
0388	E5	5.8	SO	CH	-	P	H	C	L	-	W	2	24	52	21	-	-	-	-	-	-	-	#	#	N
0389	E4	5.8	SO	CH	-	P	H	C	L	-	W	2	24	52	21	-	-	-	-	-	-	-	#	#	N
0390	E4	4.9	SO	CH	-	P	H	C	L	-	W	2	24	52	21	-	-	-	-	-	-	-	#	#	N
0391	E4	61.9	SO	CH	-	P	H	C	L	-	W	2	28	52	21	-	-	-	-	-	-	-	#	#	N
0393	F4	10.4	SO	CH	-	P	H	B	L	-	I	2	24	52	21	-	-	-	-	-	-	-	#	#	N
0395	F2	22.1	SO	CH	-	P	H	C	L	-	I	1	24	52	21	-	-	-	-	-	-	-	O	V	N
0396	F3	6.2	SO	CH	-	P	H	C	L	-	I	1	24	52	21	-	-	-	-	-	-	-	O	V	N
0397	F3	4.2	SO	CH	-	P	H	C	L	-	I	1	24	52	21	-	-	-	-	-	-	-	O	V	N
0398	F3	3.0	SO	CH	-	P	H	C	L	-	I	1	24	52	21	-	-	-	-	-	-	-	O	V	N
0399	F3	4.8	SO	CH	-	P	H	C	L	-	I	1	24	52	21	-	-	-	-	-	-	-	O	V	N

POLYNUMB	GRIDLOCN	AREAKHA	DOMKDMAT	UNIFIED	UNIFIED2	DOMREGFM	DOMLOCSF	DOMSLOPE	DOMPMDEP	DOMPMDP2	DOMDRAIN	DOMWATAB	PLASLI	LIQLI	SHRLI	OPTMI	OPTDI	PLASL2	LIQL2	SHRL2	OPTM2	OPTD2	DPERMTYP	PERMDIST	STONINES
0400	E2	3.8	SO	ML	CR	P	U	B	M	R	I	1	15	18	14	13	2000	#	#	#	#	#	#	#	A
0401	E2	1.4	OR	Pt	CH	O	B14	#	23	L	P	4	#	#	#	#	#	24	52	21	-	-	#	#	M
0402	E2	11.4	SO	SW	-	P	R	B	L	-	W	1	N	-	-	-	-	-	-	-	-	-	#	#	N
0403	C3	26.8	SO	CH	-	P	L	A	L	-	W	2	28	61	16	26	1400	-	-	-	-	-	#	#	N
0404	C3	4.8	SO	CH	-	P	L	A	L	-	W	2	28	61	16	26	1400	-	-	-	-	-	#	#	N
0405	C3	7.9	OR	Pt	CH	O	B14	#	23	L	P	4	#	#	#	#	#	26	56	17	26	1400	#	#	#
0406	C3	3.0	SO	CH	-	P	L	A	L	-	I	1	28	61	16	26	1400	-	-	-	-	-	#	#	N
0407	A4	128.9	R2	AR	-	P	H	C	R	-	#	#	#	#	#	#	#	-	-	-	-	-	#	#	A
0408	E1	6.0	SO	CL	-	P	U	A	A	-	P	4	19	37	17	16	1700	-	-	-	-	-	#	#	N
0409	E1	126.8	SO	ML	-	P	R	C	M	-	I	1	15	18	14	13	2000	-	-	-	-	-	#	#	A
0410	E1	6.0	SO	SW	-	P	R	A	L	-	I	1	N	-	-	-	-	-	-	-	-	-	#	#	N
0411	F1	59.9	R2	AR	-	P	H	B	R	-	#	#	#	#	#	#	#	-	-	-	-	-	#	#	#
0412	F1	11.7	R2	AR	-	P	H	D	R	-	#	#	#	#	#	#	#	-	-	-	-	-	#	#	#
0413	G1	8.4	R2	AR	-	P	R	D	R	-	#	#	#	#	#	#	#	-	-	-	-	-	#	#	#
0414	E4	49.0	SO	CH	-	P	H	C	L	-	W	2	24	52	21	-	-	-	-	-	-	-	O	V	N
0416	I3	9.1	SO	CH	ML	P	H	C	L	M	I	2	24	52	21	-	-	-	-	-	-	-	S	D	N
0417	I2	7.0	SO	SW	-	P	R	C	F	-	W	2	N	-	-	-	-	-	-	-	-	-	#	#	N
0418	J2	2.6	SO	SM	-	P	H	C	M	-	W	3	N	-	-	-	-	-	-	-	-	-	T	S	A
0419	H1	1.3	SO	CH	AR	P	H	C	L	R	W	2	24	52	21	-	-	#	#	#	#	#	#	#	#
0420	H1	3.0	SO	CH	AR	P	H	C	L	R	W	2	24	52	21	-	-	#	#	#	#	#	#	#	#
0421	F4	6.3	SO	ML	-	P	H	B	M	-	W	2	15	18	14	13	2000	-	-	-	-	-	#	#	A
0422	H3	1.8	OR	Pt	CH	O	B19	#	23	L	P	4	#	#	#	#	#	26	56	17	26	1400	O	D	#
0423	H4	2.0	OR	Pt	CH	O	B19	#	23	L	P	4	#	#	#	#	#	26	56	17	26	1400	O	D	#
0424	G3	6.3	SO	CH	-	P	H	C	L	-	I	1	24	52	21	-	-	-	-	-	-	-	O	S	N
0425	G3	3.5	SO	CH	-	P	H	C	L	-	I	1	24	52	21	-	-	-	-	-	-	-	O	S	N
0426	G3	5.8	SO	CH	-	P	H	C	L	-	I	1	24	52	21	-	-	-	-	-	-	-	O	S	N
0427	K2	2.7	SO	SW	-	P	R	C	F	-	W	3	N	-	-	-	-	-	-	-	-	-	#	#	N
0428	K4	36.1	SO	SM	-	P	R	C	M	-	I	6	N	-	-	-	-	-	-	-	-	-	T	C	A
0429	K4	175.0	SO	ML	-	P	L	A	W	-	I	6	13	18	13	13	1700	-	-	-	-	-	T	D	N
0430	J3K	393.5	SO	SM	-	P	H	B	M	-	W	3	N	-	-	-	-	-	-	-	-	-	T	D	A
0431	J4	10.7	OR	Pt	-	O	B07	#	23	-	P	6	#	#	#	#	#	-	-	-	-	-	O	D	#
0432	I2	5.5	SO	SM	-	P	H	B	M	-	W	3	N	-	-	-	-	-	-	-	-	-	O	S	A
0433	F1	406.9	SO	ML	-	P	H	B	M	-	I	1	15	18	14	13	2000	-	-	-	-	-	#	#	M

POLYNUMB	GRIDLOCN	AREAKHA	DOMKDMAT	UNIFIED	UNIFIED2	DOMREGFM	DOMLOCSF	DOMSLOPE	DOMPMDEP	DOMPMDP2	DOMDRAIN	DOMWATAB	PLASL1	LIQL1	SHRL1	OPTM1	OPTD1	PLASL2	LIQL2	SHRL2	OPTM2	OPTD2	DPERMTYP	PERMDIST	STONINES
0434	D1	13.0	SO	ML	-	P	R	A	M	-	I	1	15	18	14	13	2000	-	-	-	-	-	#	#	A
0435	D1	335.2	SO	ML	-	P	R	A	M	-	I	1	15	18	14	13	2000	-	-	-	-	-	#	#	A
0436	D1	35.6	OR	Pt	-	O	B14	#	23	-	P	4	#	#	#	#	#	-	-	-	-	-	#	#	#
0437	D1	71.4	SO	ML	-	P	R	A	M	-	W	1	15	18	14	13	2000	-	-	-	-	-	#	#	A
0438	C1	11.5	SO	UD	-	V	D	D	U	-	W	3	-	-	-	-	-	-	-	-	-	-	#	#	N
0439	C1	12.6	SO	UD	-	V	D	D	U	-	W	3	V	V	-	-	-	-	-	-	-	-	#	#	N
0440	C1	20.6	SO	UD	-	V	D	D	U	-	W	3	V	V	-	-	-	-	-	-	-	-	#	#	N
0441	C1	12.9	SO	ML	-	P	U	A	M	-	W	3	15	18	14	14	1900	-	-	-	-	-	#	#	A
0442	C1	6.0	SO	ML	ML	P	L	A	L	M	I	1	20	23	25	16	1700	15	18	14	13	2000	#	#	N
0443	C4D	633.3	SO	SM	AR	P	H	D	M	R	W	3	N	-	-	-	-	#	#	#	#	#	#	#	A
0444	A4	23.4	SO	SW	-	P	U	A	L	-	W	3	N	-	-	-	-	-	-	-	-	-	#	#	N
0445	A4	75.9	SO	UD	-	V	U	A	A	-	I	2	V	V	-	-	-	-	-	-	-	-	#	#	N
0446	A2	7.9	SO	ML	-	V	U	A	A	-	I	2	V	V	-	-	-	-	-	-	-	-	#	#	N
0447	A4B	168.2	R2	AR	-	P	H	D	R	-	#	#	#	#	#	#	#	-	-	-	-	-	#	#	A
0448	B4C	232.3	R2	AR	-	P	H	D	R	-	#	#	#	#	#	#	#	-	-	-	-	-	#	#	A
0449	F4	9.7	SO	SM	-	P	R	D	F	-	W	3	N	-	-	-	-	-	-	-	-	-	#	#	A
0450	G4	14.4	SO	SM	-	P	R	D	F	-	W	3	N	-	-	-	-	-	-	-	-	-	#	#	M
0451	I3	1.8	SO	SM	-	P	R	D	F	-	W	3	N	-	-	-	-	-	-	-	-	-	#	#	M
0452	I3	99.7	SO	SW	-	P	R	C	F	-	W	3	N	-	-	-	-	-	-	-	-	-	#	#	A
0453	I2	4.6	SO	SW	-	P	R	C	F	-	W	3	N	-	-	-	-	-	-	-	-	-	#	#	A
0454	J2	23.2	SO	SW	-	P	R	C	F	-	W	3	N	-	-	-	-	-	-	-	-	-	#	#	A
0455	K2	25.3	SO	SW	-	P	R	C	F	-	W	3	N	-	-	-	-	-	-	-	-	-	#	#	A
0456	K2	2.5	SO	SW	-	P	R	C	F	-	W	3	N	-	-	-	-	-	-	-	-	-	#	#	A
0457	J1	3.3	SO	SM	-	P	H	C	M	-	W	3	N	-	-	-	-	-	-	-	-	-	T	S	A