North Dakota Geological Survey
Geologic Investigation No. 114

Edward C. Murphy - State Geologist
Lynn D. Helms - Director, Department of Mineral Resources

The National Geochemical Survey

A summary of North Dakota datasets

Lorraine A. Manz
With assistance from David G. Hopkins and Michael G. Ulmer

2010

Contents

••◆••

Tables

••◆••

List of figures

Acknowledgements

The North Dakota Geological Survey portion of this project was funded by a grant from the United States Geological Survey (USGS Cooperative Agreement No. 02ERAG0063). This funding was important for completing the project; however, the NDGS gratefully appreciates the contributions made by the United States Department of Agriculture-Natural Resource Conservation Service Soil Survey Staff and the Department of Soil Science at North Dakota State University. These two groups spent hundreds of staff-hours collecting samples and describing sites. Without their dedicated involvement the project would not have been completed. Their work was done as part of the National Cooperative Soil Survey Program, a national effort to inventory the soil resources in the nation. Particularly, the NDGS would like to acknowledge the involvement of Paul Bendedict and Mike Ulmer of the USDA-Natural Resource Conservation Service and Dr. David Hopkins of the NDSU-Soil Science Department. These individuals helped organize the project and saw it through to completion.

Abstract

The United States Geological Survey (USGS), as part of its Mineral Resource Surveys Program, is engaged in a study to conduct a nationwide solid-phase geochemical survey based on an approximately 10- x10-mile (17- x 17-km) grid-cell. The project requires the collection and analysis of about 35,000 samples representing the continental U.S., Alaska, Hawaii, and several U.S. dependencies.

Although the principal sample medium for the study is stream sediment, North Dakota was the first of several states to sample soils as an alternative. In collaboration with the North Dakota Natural Resources Conservation Service (NRCS) and the Department of Soil Science at North Dakota State University (NDSU), the North Dakota Geological Survey (NDGS) developed a strategy whereby the more than 700 grid-cells into which the state was divided could be sampled in an efficient and consistent way using a set of protocols based on standard NRCS soil sampling procedures.

Sample collection commenced in the summer of 2003 and was completed in October 2004. A total of 3,248 samples (1,755 analytical and 1,493 archival), representing 715 individual sites, were collected and submitted to the USGS for elemental analysis and subsequent inclusion in the National Geochemical Survey database, maintained by the USGS.

1.0 Introduction

In collaboration with other federal and state agencies, industry and academia, the United States Geological Survey (USGS), as part of its Mineral Resource Surveys Program, is conducting the National Geochemical Survey (NGS) (USGS, 2004). This is a nationwide, solid-phase geochemical survey aimed at producing a set of baseline geochemical data derived from stream sediments, soils, and other surface materials using a consistent set of analytical procedures incorporated into a single database. The intent is to provide coverage of all 50 states on a scale equivalent to a minimum sample density of 1 per 100 square miles (289 km^2) based on a nationwide 10- x 10-mile (17- x 17-km) grid.

The amount of preexisting data that fits the NGS collection and analytical criteria is relatively small. Thus, in addition to the reanalysis of archival material from earlier sampling programs, this survey requires the collection and analysis of approximately 35,000 new samples. To date, the NGS database contains more than 77,000 entries, representing about 89% of the land area of the U.S. and the territory of Guam, the Federated States of Micronesia, and the Commonwealth of the Northern Marianas Islands.

In 2002, the North Dakota Geological Survey (NDGS), the North Dakota Natural Resources Conservation Service (NRCS) and the Department of Soil Science at North Dakota State University (NDSU) entered into a collaborative agreement with the USGS to assist with the geochemical mapping and baseline sampling of surface media that the NGS required for North Dakota. Recognizing the scarcity of permanent natural water bodies in the drier (mainly southwestern) parts of the state, and with nearly 90% of its land area given over to farming and ranching, the USGS agreed to allow the collection of only soils. Accordingly, the combined agencies devised a strategy and developed a set of protocols based on standard NRCS soil-sampling procedures whereby the more than 700 grid-cells could be sampled in an efficient and consistent way (Manz, 2005). These protocols were later adopted by other states, including Iowa and Minnesota, as part of their own contribution to the NGS.

Sample collection commenced in the summer of 2003 and was completed in October 2004. A total of 3,248 samples (1,755 analytical and 1,493 archival), representing more than 715 individual sites, were collected and submitted to the USGS for elemental analysis and subsequent inclusion in the NGS database. The full dataset was published online for the first time in 2007 and updated periodically during the next several months as errors were identified and corrected.

To facilitate the use and interpretation of the geochemical data from this study, the entire, raw dataset has been extracted from the NGS database and reorganized on a series of Excel spreadsheets (L.A. Manz, unpub. data, 2008). This report is a summary of those data, intended to serve as an unbiased source of reference on North Dakota's baseline soil and surface geochemistry. Site, sample, analytical, and basic statistical data are provided for 1,736 of the 1,755 soil samples originally collected and the statewide spatial distribution of 34 major, minor, and trace elements depicted in a series of classed point-symbol maps. The report also includes descriptions of the sampling and analytical methodologies used in this study and a short discussion on some preliminary observations.

The archival samples are currently in storage at the Denver Federal Center in Denver, Colorado; but there are plans to move them to the USDA-NRCS National Soil Survey Laboratory in Lincoln, Nebraska where they will be available for further study.

2.0 Previous studies

The standard reference maps for the surface geochemistry of the conterminous United States are those constructed by Shacklette and others (Boerngen and Shacklette, 1981; Shacklette and Boerngen, 1984) and republished in 2001 by Gustavson and others. These maps, which depict the background distribution of more than forty major and trace elements (only twenty-two were republished) are based on the analyses of just 1,323 soil samples (equivalent to a sample density of 1 per 2,300 square miles or 1 per 6,000 km^2) and remain the most accurate and often-cited geochemical works of their kind.

Other studies, such as the National Uranium Resource Evaluation (NURE) program were never completed (Smith, 2001) and/or involved several laboratories, each utilizing its own analytical procedures.

A large-scale baseline geochemical survey on a suite of fifteen elements (1 major and 14 trace, including As, Cd, Hg, and Se) in agricultural soils was conducted in Manitoba, Canada (Haluschak and others, 1998). In the U.S., a similar study by Holmgren and others (1993) focused on Cd, Cu, Ni, Pb, and Zn. The results of this work continue to rank as a primary source of geochemical data for U.S. soils. More recently, the increasing demand for geochemical data by soil survey users and soil scientists has necessitated an approach to the geochemical characterization of soils that is applicable to a much broader range of landuses (Burt and others, 2003; Wilson and others, 2008). The Soil Geochemistry Spatial Dataset is a collection of geochemical data generated by the USDA-NRCS National Soil Survey Laboratory in Lincoln, Nebraska under the auspices of the National Cooperative Soil Survey Program (NCSSP) that is intended to address this problem. Stored on a database accessible through the USDA-NRCS website (USDA-NRCS, 2009), the dataset currently contains detailed elemental data for key soil pedons collected from more than 1,400 sites throughout the U.S. Data collection is ongoing and may eventually expand to include datasets from external sources such as the NGS.

In 2003 the USGS and NRCS launched the North American Geochemical Landscapes Survey, a continent-wide study aimed at establishing a comprehensive baseline geochemical dataset for North American soils (Smith and others, 2003, Lee and others, undated). The full study commenced in 2007 after pilot studies by the USGS, the Geological Survey of Canada (GSC) and the Servicio Geológico Mexicano (SGM) to evaluate and refine sampling and analytical protocols were successfully completed (Smith and others, 2009). The North American survey uses field procedures that are very similar to the ones described in this report, although the former includes instructions for the collection of additional samples for microbial, pH, and soil quality measurements. Sampling at the 118 randomly preselected sites in North Dakota was completed in 2009. Together with a small North Dakota dataset derived from the pilot studies that has already been published (Klassen, 2009), the elemental analyses of these samples will provide a useful supplement to the NGS data.

Surface geochemical data related specifically to North Dakota soils has been collected for a number of reasons including mine reclamation (Gough, 1984), wetland management (Martin and Hartman, 1984), and as part of a feasibility study for the Garrison Diversion project (Severson and Wilson, 1990). Trace element studies have also been conducted in response to interest in agricultural micronutrients such as copper (Cu) and zinc (Zn) (Franzen and others, 2006) and the potential human health risks posed by the bioaccumulation of cadmium (Cd) in certain crops (Garrett, 1994, Hopkins and Norvell, 2000; Wu and others, 2002, 2003).

3.0 General bedrock and surface geology of North Dakota

Most of North Dakota's exposed bedrock consists of a deeply eroded, essentially flat-lying succession of Cretaceous, Paleogene, and Neogene sediments (fig. 1). Pre-Cretaceous bedrock occurs within 1,000 feet (300 m) of the surface only in the far eastern part of the state where Jurassic, Ordovician and Precambrian basement rocks subcrop beneath the glacial deposits in a roughly 20-mile- (~ 30 km) wide zone along the Minnesota border. A progressive thickening of the rock column towards the Williston Basin in western North Dakota is reflected by a corresponding decrease in the age of the bedrock, with the youngest sediments (White River Group and Arikaree Formation) occurring near its center.

The oldest bedrock formations exposed in North Dakota are the Upper Cretaceous offshore marine shales of the Greenhorn, Carlile, Niobrara, and Pierre Formations (fig. 2). Cretaceous formations beneath the Greenhorn, including the Belle Fourche Formation and the Dakota Group, are present but not exposed. The only known outcrop of the Greenhorn Formation is a single, small exposure in the Pembina River Valley in northeastern North Dakota. The Carlile Formation is well-exposed in parts of the valley between Walhalla and the Canadian border and in one other location northwest of Walhalla. The Niobrara Formation outcrops along the Pembina River and several of its tributaries, and at several locations along the northern end of the Pembina Escarpment. It is also exposed in the Sheyenne River Valley between Kathryn and Fort Ransom in southeastern North Dakota. The Pierre Formation is one of the principal bedrock units in North Dakota. It underlies most of the glacial deposits in the eastern part of the state and outcrops in numerous places throughout eastern, southern, and southwestern North Dakota, including the Pembina escarpment, the James and Sheyenne River Valleys, the shores of Lake Oahe south of Fort Yates, and in the grasslands southwest of Marmarth.

The Fox Hills Formation conformably and gradationally overlies the Pierre Formation. It is a regressive sequence of occasionally tuffaceous marine sandstone and shale that was deposited as the Late Cretaceous epicontinental seas began to recede from western North Dakota. These sediments, and those of all the overlying bedrock formations, were derived primarily from material shed from the rising Rocky Mountains and volcanism associated with Laramide uplift in Montana and Wyoming. The contact between the Fox Hills and Hell Creek Formations is gradual and represents a transition from coastal marine to an onshore depositional regime. The Hell Creek Formation consists of organic-rich claystone, siltstone, and sandstone that were deposited in a broad delta and brackish coastal swamps on the eastern margin of an alluvial lowland that extended westward from central North Dakota to the Rocky Mountains. The Fox Hills and Hell Creek Formations outcrop extensively in south-central North Dakota, and to a lesser extent, in the southwest corner of the state. The Fox Hills Formation subcrops beneath the Late Wisconsinan glacial deposits in central North Dakota. Isolated exposures occur in the upper Sheyenne River Valley, the outlet channels of glacial Lake Souris in southern Pierce County; and in some ice-thrust masses, where remnants of the Hell Creek Formation may also be present.

In central and western North Dakota the Cretaceous rocks are overlain by sediments of the Fort Union Group. Most of these are fluviolacustrine and swamp deposits that formed part of a broad coastal lowland adjacent to the Paleocene Cannonball Sea. The Fort Union Group is composed of the Ludlow, Cannonball, Slope, Bullion Creek, and Sentinel Butte Formations, all of which outcrop extensively throughout western North Dakota and in north-central North Dakota where streams such as the Des Lacs and Souris Rivers have incised through the overlying glacial sediment. The Cannonball Formation is the only marine stratigraphic unit in the group. It is lithologically similar to the Fox Hills Formation, and is the only formation in the Fort Union Group in which lignite is absent.

Above the Fort Union Group, kaolinitic claystones, mudstones, and sandstones of the Bear Den Member of the Golden Valley Formation constitute a paleosol that developed during a period of intense weathering at the end of the Paleocene. The upper (Camels Butte) member is early Eocene in age and is lithologically identical to the Sentinel Butte Formation except that it is generally more micaceous. The most extensive exposures of the Golden Valley Formation are in the Killdeer Mountains, the badlands south of Dickinson, and areas west of its eponym in Mercer County. Numerous smaller exposures, mainly in flat-topped hills and buttes, occur throughout Dunn,

Mercer, Stark, and other counties in southwestern North Dakota. In Mountrail County the Golden Valley Formation outcrops in a few isolated locations in the valleys of the Little Knife and White Earth Rivers.

The Fort Union Group and, where it is present, the Golden Valley Formation are unconformably overlain by the Eocene/Oligocene White River Group (Chadron and Brule Formations). This unconformity represents a gap of more than 14 million years in the rock record indicating that, for much of the Eocene, North Dakota underwent a period of prolonged erosion and nondeposition. The Chadron and Brule Formations consist of interbedded, fluvial conglomeratic sandstones, siltstones, and mudstones; freshwater limestones, and tuffs.

The White River Group is not well-exposed in North Dakota. Outcrops only occur in the Little Badlands south of Dickinson, and on isolated buttes such as the Chalky Buttes and the Killdeer Mountains. In places it is unconformably overlain by the Arikaree Formation (Miocene), a lithologically variable sequence of tuffaceous sandstones, siltstones, claystones, and carbonates that forms a resistant cap rock on several of the larger buttes. The Arikaree Formation is overlain by a thin deposit of unconsolidated gravel of indeterminate age and origin, but which are probably the remnants of channel sediments deposited by late Miocene or Pliocene streams.

The bedrock surface in North Dakota is covered in many places by sediments of the Coleharbor Group and Oahe Formation (fig. 3). These sediments mainly consist of unconsolidated Pleistocene glacial deposits, Pleistocene and Holocene fluviolacustrine deposits, and eolian silt and sand. The Coleharbor Group includes all sediment associated with glacial deposition in North Dakota. It consists of up to 800 feet (250 m) of bedded clay, silt, sand, and gravel and unsorted sandy, silty clay with pebbles, cobbles, and boulders of Precambrian granite, gneiss, and basalt from the Canadian Shield, limestone and dolomite from Paleozoic formations on the western flanks of the Canadian Shield, Cretaceous shales from eastern North Dakota and southern Manitoba and Saskatchewan, and lesser amounts of local Paleocene bedrock.

Most of the surface deposits of the Coleharbor Group were deposited by Late Wisconsinan glaciers between about 20,000 and 10,000 years B.P. Older deposits, thought to be pre- or Early Wisconsinan, consist of scattered crystalline boulders and a patchy veneer of sediments that cover parts of the counties adjacent to, and mainly southwest of, the Missouri River. These deposits mark the known limit of Pleistocene glaciations in North Dakota (fig. 4). Ice-margin positions in northern and eastern North Dakota indicate multiple readvances of Late Wisconsinan glaciers across the state. The general lithology of the deposits associated with each of these episodes is largely influenced by the direction from which the advancing ice came and the nature of the subglacial bedrock. Sediments deposited by glaciers that advanced over the Canadian Shield and southwestwards into North Dakota therefore consist of predominantly crystalline and shale lithologies, whereas those from ice that entered the state from the north tend to be sandier and rich in carbonates derived from Paleozoic limestones and dolomites in central Manitoba.

The Oahe Formation consists of the generally organic-rich, postglacial deposits that overlie the Coleharbor Group. It consists mainly of clay, silt, and sand, and includes modern pond and fluvial sediments, and windblown silt (loess) and sand. Loess is common throughout much of North Dakota but the deposits are typically thin (< 6 feet/2 m) and are therefore not usually mapped. More extensive loess deposits occur in parts of Burleigh, Emmons, McLean, Mercer, and Oliver Counties, where the silt may be up to 20 feet (6 m) thick. Sand deposited as density-current fans in proglacial lakes was later reworked by the wind into dunes and sand plains. The largest areas of windblown sand are associated with glacial Lake Souris in north-central North Dakota and the Sheyenne and Pembina Deltas on the western edge of the Agassiz Lake plain. Small areas of dunes derived from Paleocene bedrock occur in parts of southwestern North Dakota.

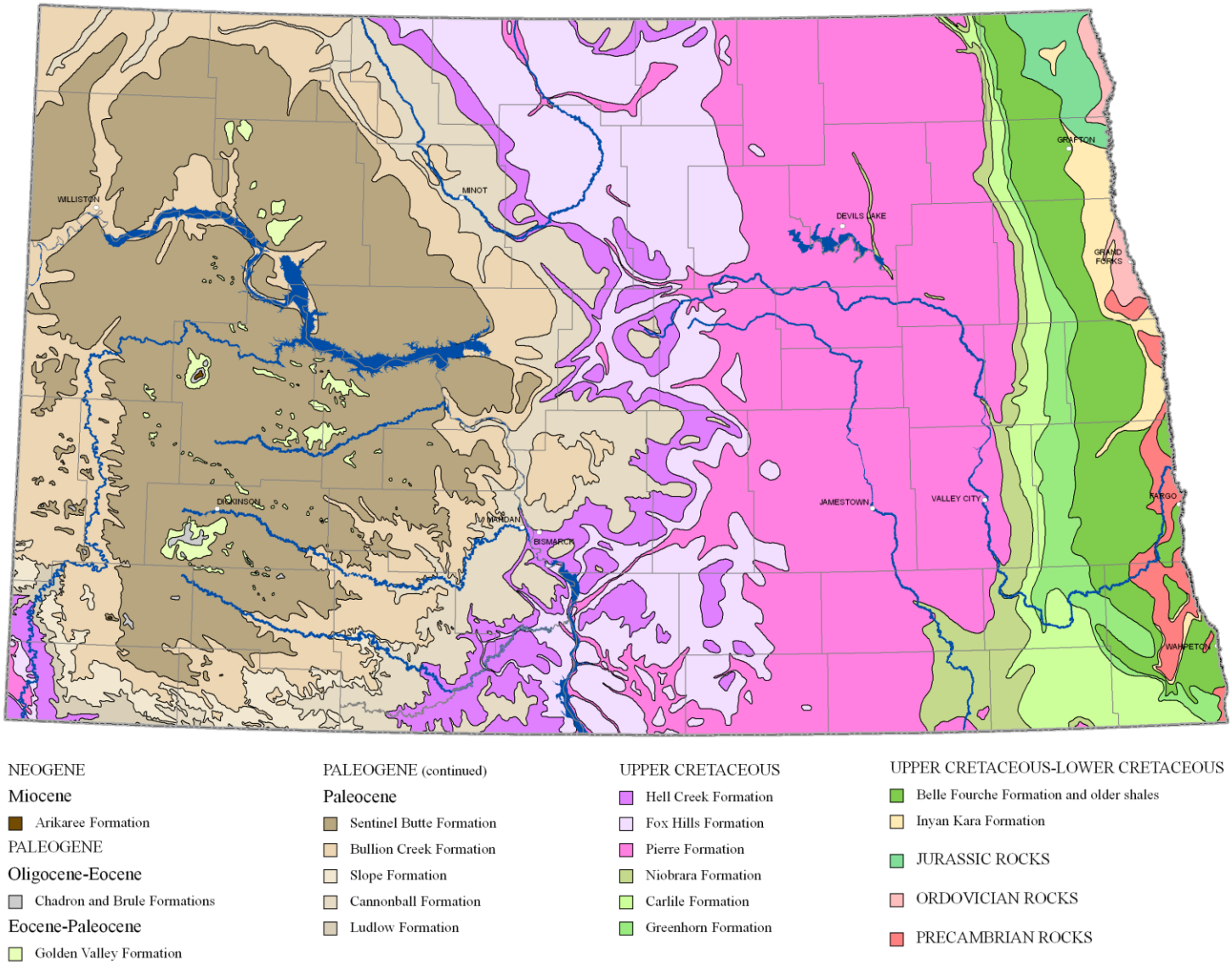


Figure 1. *General bedrock geology of North Dakota. Modified from Bluemle, 1983.*

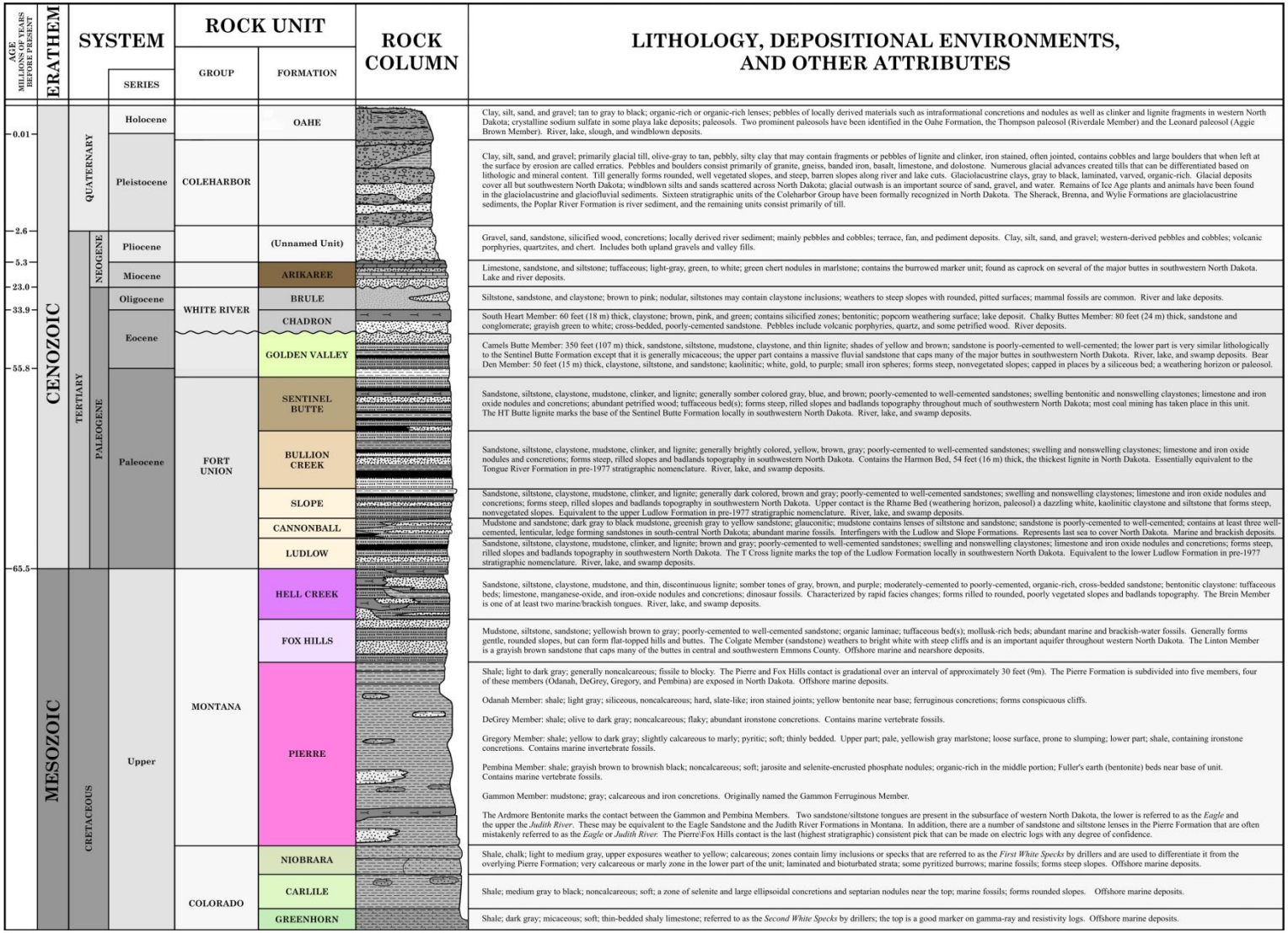


Figure 2. *Upper Cretaceous and Cenozoic bedrock stratigraphy for North Dakota. This column only shows rocks that are exposed at the surface. Older Mesozoic, Paleozoic, and Precambrian basement rocks that subcrop beneath glacial sediments in the Red River Valley are thus omitted. Colors have the same meanings as in figure 1. Modified from Murphy and others, 2009.*

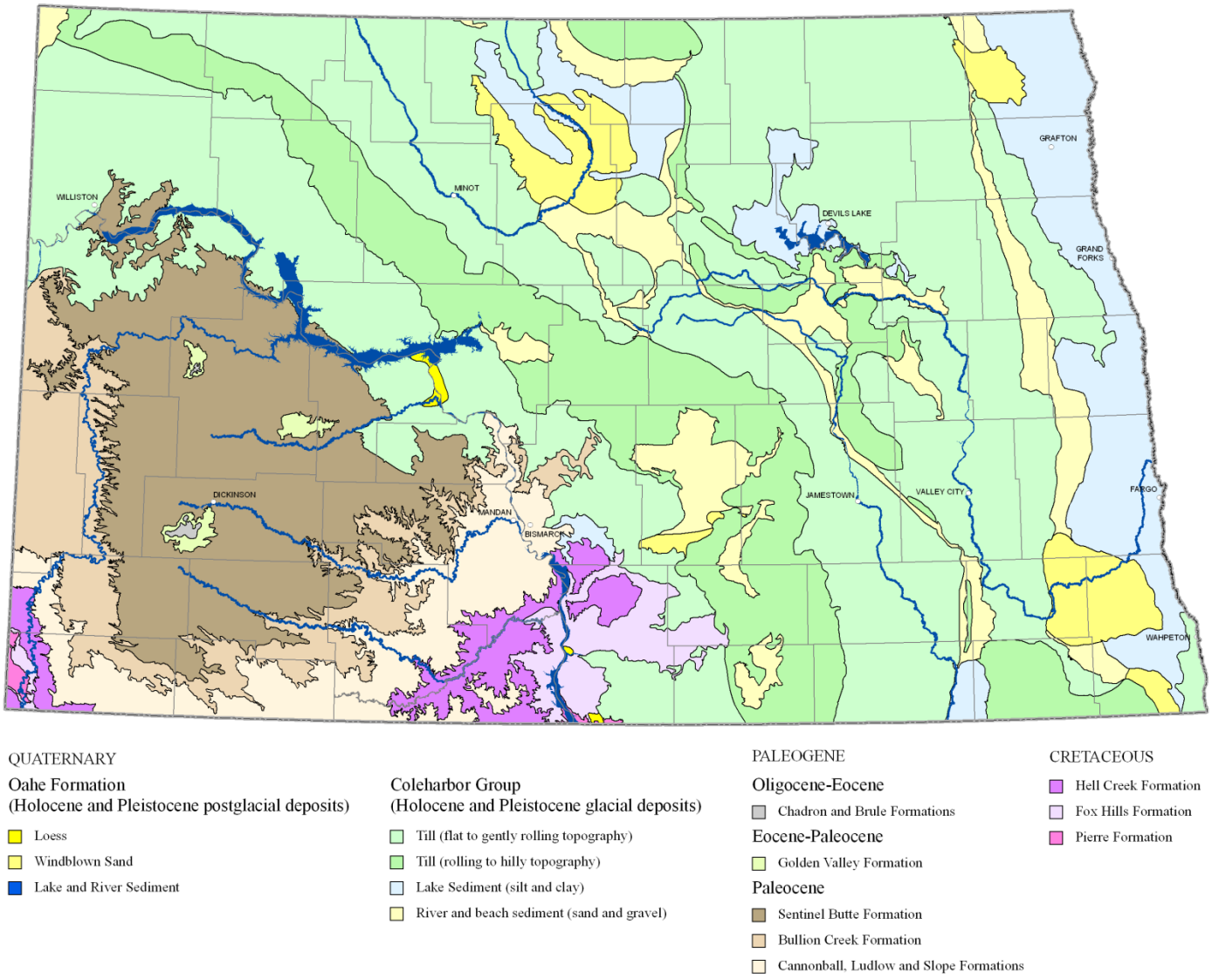


Figure 3. *Generalized surface geology of North Dakota. Areas in the north-central and eastern parts of the statewhere bedrock is exposed along river valleys and the Pembina Escarpment are not visible at this scale. The Arikaree Formationand Late Neogene/Quaternary unconsolidated sand and gravel in western North Dakota are likewise omitted. Modified from Clayton, Moran, Bluemle, and Carlson, 1980.*

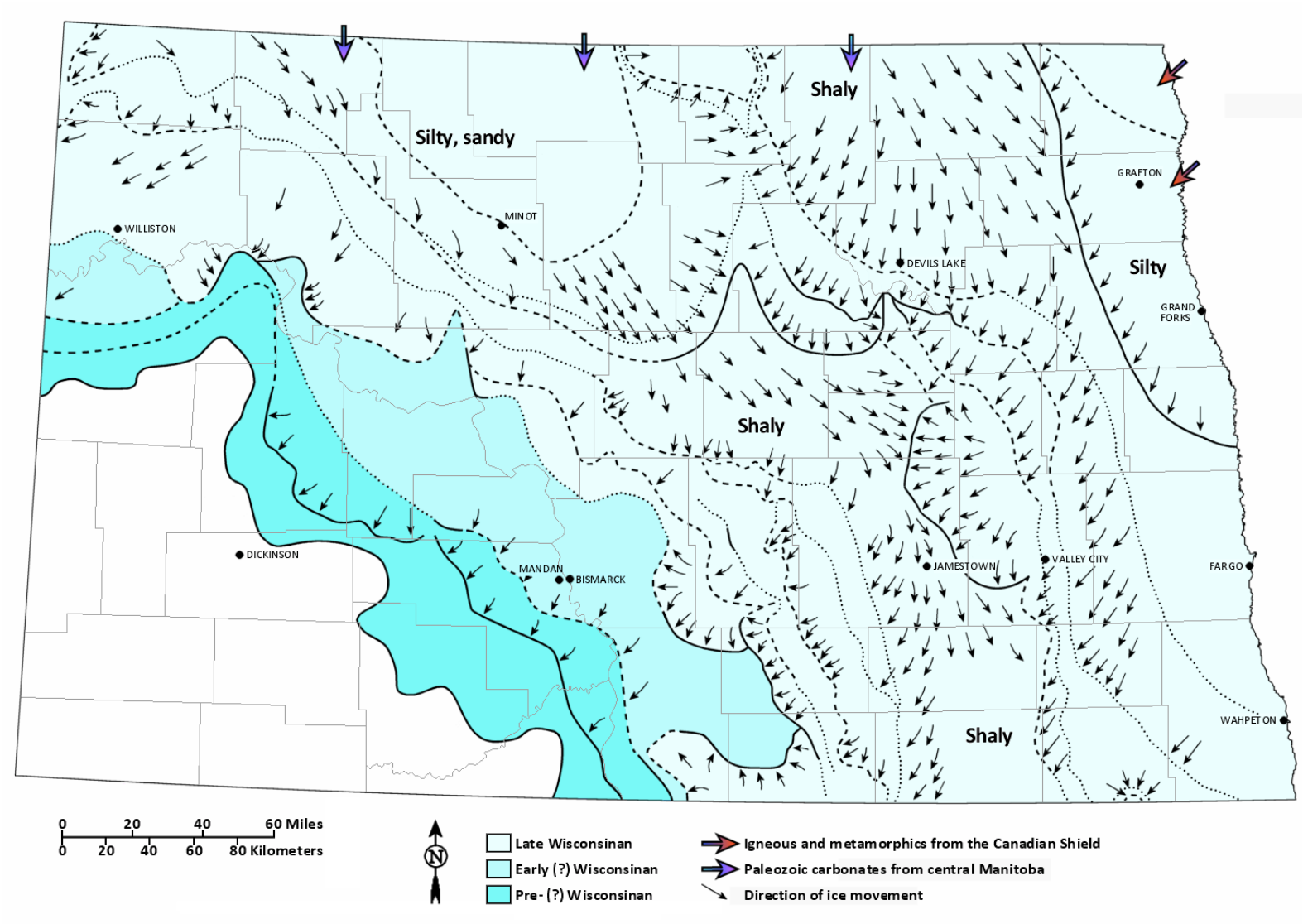


Figure 4. *Ice-movement and outer margins of glacial advances. Till lithologies generally reflect the direction of ice-movement and the character of the subglacial bedrock or sediment. Colored arrows indicate the sources of exotic rock types. Adapted from Clayton, Moran, and Bluemle, 1980.*

4.0 Methods

4.1 Site selection and sampling procedure

The sample grid was derived from the USGS 1° x 2° series (1:250,000-scale) map set by dividing each quadrangle into cells approximately 10 x 10 miles in size (fig. 5). With the exception of the northernmost tier of quadrangles, this produced a 63-cell grid consisting of nine columns and seven-rows, designated A to I (west-east) and 1 to 7 (south-north) respectively. The smaller areal extent of the quadrangles covering the northern one-third of the state meant that they divided into only eight columns, reducing the number of cells to 56.

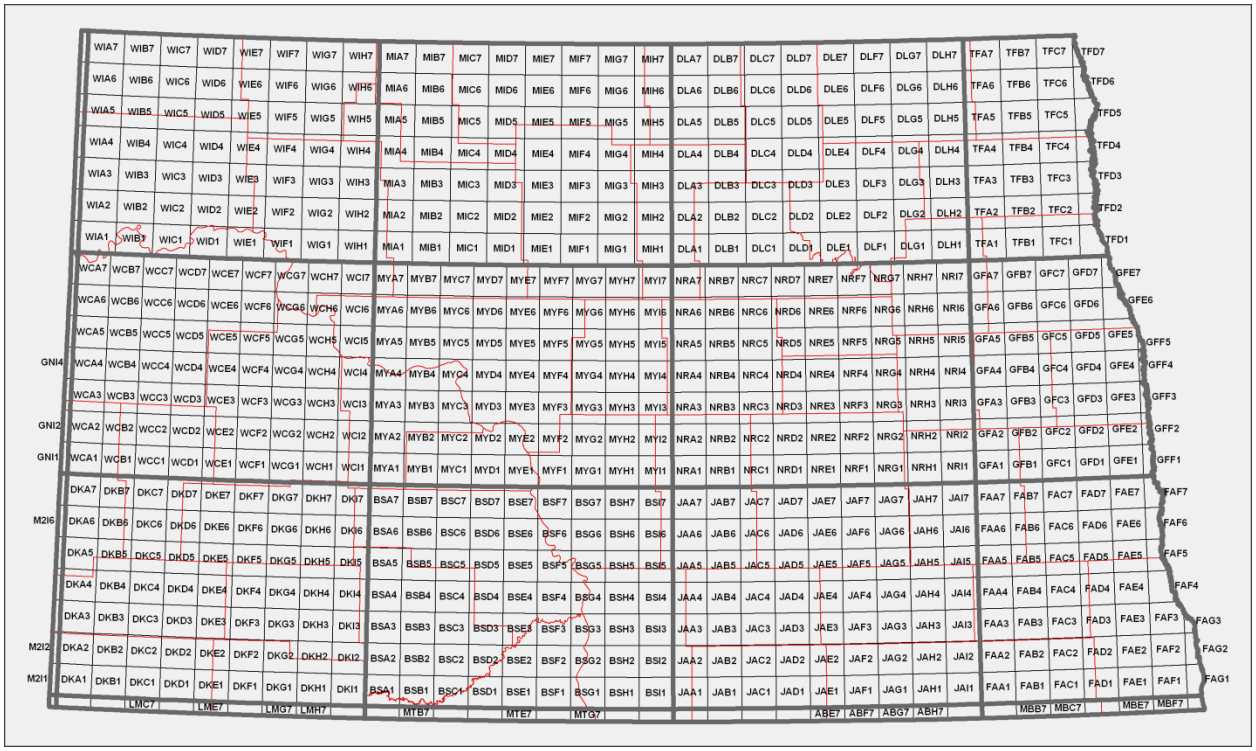


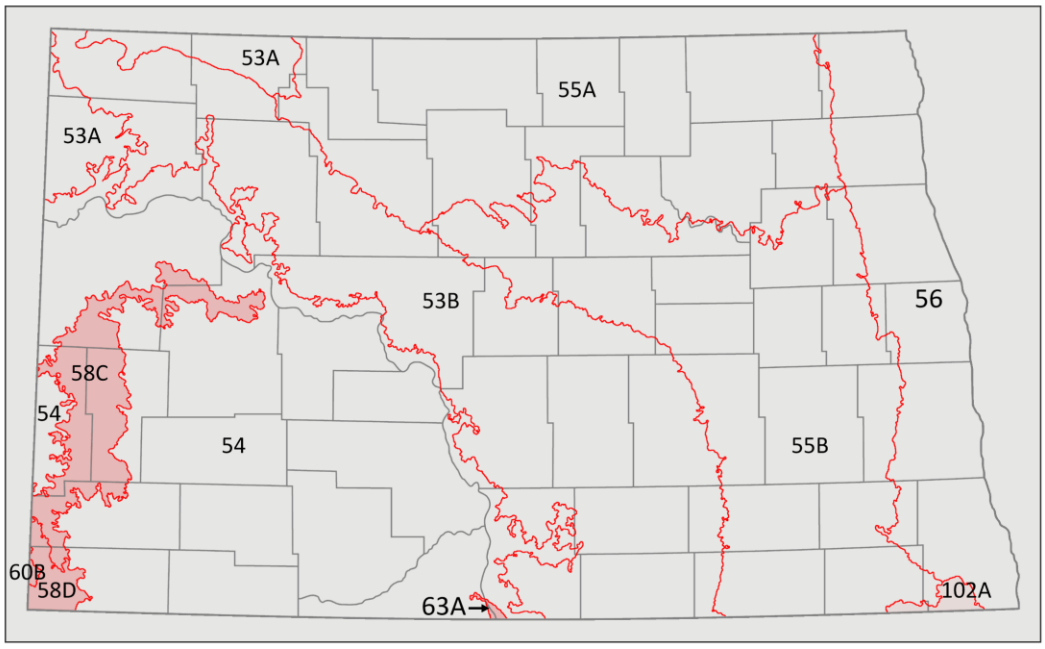
Figure 5. *Geochemical survey sample grid for North Dakota. Each black square on the grid represents an area of approximately 100 square miles (280 km^2). Areas bordered by the heavy gray lines depict USGS 1 x 2 degree series (1:250,000 scale) map coverages. County boundaries are shown in red. Blank cells were sampled by, and in, neighboring states.*

Site locations were randomly pre-selected by the USGS to maximize the statistical reliability of the project. Each 10- x 10-mile (17- x 17-km) grid cell contained one sample site plus, in 33 randomly designated cells, one analysis of variance (ANOVA) site. NRCS field crews were permitted to choose the specific soil and site to sample within the pre-selected cell quadrants (approximately 25 square miles [72 km^2]). Wherever possible, only major, extensive soils within the Major Land Resource Area (MLRA) (USDA, NRCS, 2006) were to be sampled (fig. 6).

Where possible, the risk of contamination from anthropogenic sources was minimized by selecting sample sites according to an additional set of visual criteria. Sample sites were required to be at least:

- 160 feet (50 m) from end rows or other areas where large amounts of fertilizer may have been deposited
- 325 feet (100 m) from buildings, including abandoned ones
- 325 feet (100 m) from rural roads
- 650 feet (200 m) from U.S. or State highways
- 5 miles (8 km) downwind from power plants

Atypical or unusual landscapes and landforms such as eroded knolls and wetlands were also avoided.



NORTHERN GREAT PLAINS SPRING WHEAT REGION

53A Northern Dark Brown Glaciated Plains
53B Central Dark Brown Glaciated Plains
54 Rolling Soft Shale Plain
55A Northern Black Glaciated Plains
55B Central Black Glaciated Plains
56 Red River Valley of the North

WESTERN GREAT PLAINS RANGE AND IRRIGATED REGION

58C Northern Rolling High Plains, Northeastern Part
58D Northern Rolling High Plains, Eastern Part
60B Pierre Shale Plains, Northern Part
63A Northern Rolling Pierre Shale Plains

CENTRAL FEED GRAINS AND LIVESTOCK REGION

102A Rolling Till Prairie

Figure 6. *Major Land Resource Areas (MLRAs) in North Dakota.*

Samples were collected by standard soil survey procedures (Soil Survey Division Staff, 1993) using only stainless steel and polycarbonate plastic tools in order to minimize the risk of contamination by other metals. Gold rings were removed. Portions of the sample that may have contacted any metal during excavation were discarded. Both native and cultivated sites were sampled. At most sites, samples were collected from zones at 0-8 inches (0-20 cm) (surface or plow zone) and 12-20 inches (30-50 cm) (dominant subsoil horizon). At every 10th site (excluding ANOVA sites) surface subsamples (0-2 and 2-8 inches [0-5 and 5-20 cm]) and a C horizon (geologic material) sample were also collected. Samples comprised a roughly 2 lb (~1 kg) analytical sample and a 10 lb (~5 kg) archival sample.

In ANOVA cells all samples were collected from the same or a similar soil series, but in different quadrants. After collecting the primary sample a second cell quadrant was selected at random and a suitable ANOVA site located within it by the field crew. Here, two ANOVA sample sets (identified as AOV1 and AOV2) were collected from the same soil at points approximately 10 feet (3 m) apart. A third ANOVA sample (AOV3) was later split from about half of the AOV2 samples in the laboratory.

Samples were allowed to air dry at ambient temperature prior to shipment to a USGS archive facility at the Denver Federal Center in Denver, Colorado.

The sample grid (fig. 5) consists of 715 cells – 636 full, and 79 partial that overlap into neighboring states. Of these, 682 were sampled at least once, 32 partial cells in which the sample quadrant was outside the state were not sampled at all, and one ANOVA site (MYG1) was omitted in error. Excluding the remaining ANOVAs, nine cells were sampled twice and one three times, either by accident or intentionally for soil characterization purposes by the NRCS. A total of 1,725 analytical samples were collected, and 30 AOV3 samples generated as described above.

Nine samples (full set of five from BSE6*, BSI2U, MIA5U, MIE2U, and MIE5U) were damaged or lost prior to shipping.

4.2 Sample analysis (XRAL Laboratories)

All samples were sieved through a -100 mesh (<150 µm) screen prior to submission for analysis by XRAL laboratories of Toronto, Canada.

Each sample was analyzed for a suite of forty major, minor, and trace elements by inductively coupled plasma atomic emission spectrometry (ICP-AES)/acid dissolution (ICP-40 method). Single-element analyses by atomic absorption spectrometry (AAS) were also carried out for arsenic, mercury and selenium. Gold and platinum group metals (Pd and Pt) were determined by fire assay-atomic absorption spectrometry (FAAS). The brief descriptions of these methods that follow are reproduced essentially verbatim from the NGS web site (USGS, 2004) where additional analytical information and links to full documentation are also available.

Table 1. *Detection limits for 40 elements measured by ICP-AES (ICP-40) at XRAL laboratories*

Element	Units	Lower limit	Upper limit	Element	Units	Lower limit	Upper limit
Aluminum	%	0.005	50	Holmium[2]	ppm	4	5,000
Calcium	%	0.005	50	Lanthanum	ppm	2	50,000
Iron	%	0.02	25	Lead	ppm	4	50,000
Potassium	%	0.01	50	Lithium	ppm	2	50,000
Magnesium	%	0.005	5	Manganese	ppm	4	50,000
Sodium	%	0.005	50	Molybdenum[2]	ppm	2	50,000
Phosphorus	%	0.005	50	Niobium	ppm	4	50,000
Titanium	%	0.005	25	Neodymium	ppm	9	50,000
Arsenic[1]	ppm	10	50,000	Nickel	ppm	3	50,000
Barium	ppm	1	35,000	Scandium	ppm	2	50,000
Beryllium	ppm	1	5,000	Silver[2]	ppm	2	10,000
Bismuth[2]	ppm	10	50,000	Strontium	ppm	2	15,000
Cadmium[2]	ppm	2	25,000	Tantalum[2]	ppm	40	50,000
Cerium	ppm	5	50,000	Tin[2]	ppm	5	50,000
Cobalt	ppm	2	25,000	Thorium	ppm	6	50,000
Chromium	ppm	2	25,000	Uranium[2]	ppm	100	100,000
Copper	ppm	2	15,000	Vanadium	ppm	2	30,000
Europium[2]	ppm	2	5,000	Yttrium	ppm	2	25,000
Gallium	ppm	4	50,000	Ytterbium[2]	ppm	1	5,000
Gold[3]	ppm	8	50,000	Zinc	ppm	2	15,000

[1] Inadequate detection limit. As measured by HG-AAS

[2] The principal advantage of the ICP-40 method over similar analytical procedures is its ability to simultaneously determine a large number of elements from a single sample. However, except where they occur as large enrichments , the normal background concentrations of these elements fall below ICP-40 reporting limits and therefore cannot be accurately determined by this method. Other than As and Au, which were determined by other methods, data for these elements are consequently not included in this report.

[3] Inadequate detection limit. Au measured by FA-AAS

* Two identical sample sets (one representing BSF6) were collected from the same site in this cell. Only the BSF6 set was shipped.

4.2.1 ICP-AES (ICP-40)

Sample aliquots of 200 mg are decomposed using a mixture of hydrochloric, nitric, perchloric, and hydrofluoric acids at low temperature. The digested samples are aspirated into the ICP-AES discharge where the elemental emission signal is measured simultaneously for the forty elements. Calibration is performed by standardizing with digested rock reference materials and a series of multi-element solution standards. Analytical data for an experimental run are deemed acceptable based on results determined for two in-house quality-control standards: recovery for all elements present at >5 times the detection limit must be within 15% of the certified value, and the calculated relative standard deviation of duplicate samples no greater than 15%.

Detection limits for the full suite of 40 elements are shown in table 1.

4.2.2 Analysis of arsenic by Hydride-generation Atomic Absorption Spectrometry (HG-AAS)

100-mg sample aliquots are weighed into zirconium crucibles. Approximately 0.75 g of sodium peroxide is added and mixed. The mixture is heated in a muffle furnace set at 750°C for four minutes. The sample is cooled, and 15 ml of water and 5 ml of concentrated HCl are added. The mixture is shaken and 0.25 ml of an ascorbic acid-potassium iodide solution is added, then diluted with 20% HCl and let to stand overnight. Arsenic is then measured using hydride generation atomic absorption spectrometry. Commercially available standards are used to calibrate the instrument. The optimum concentration range without sample dilution in various solid phase sample media is 0.6 ppm to 20 ppm. Analytical data for an experimental run are deemed acceptable based on results determined for two in-house quality-control standards: recovery for all elements present at >5 times the detection limit must be within 20% of the certified value, and the calculated relative standard deviation of duplicate samples no greater than 20%.

4.2.3 Analysis of selenium by Hydride-generation Atomic Absorption Spectrometry (HG-AAS)

250-mg sample aliquots are weighed into test tubes. A mixture of nitric, hydrofluoric and perchloric acids is added, and the sample is heated. After the solution is cooled, hydrochloric and nitric acids are added, and the sample is heated again. The samples are diluted and analyzed for selenium using hydride generation atomic absorption spectrometry. Commercially available standards are used to calibrate the instrument. The optimum concentration range without sample dilution in various solid phase sample media is 0.2 ppm to 4 ppm. Analytical data for an experimental run are deemed acceptable based on results determined for two in-house quality-control standards: recovery for all elements present at >5 times the detection limit must be within 20% of the certified value, and the calculated relative standard deviation of duplicate samples no greater than 20%.

4.2.4 Analysis of mercury by Cold Vapor Atomic Absorption Spectrometry (CVAAS)

100-mg sample aliquots are digested with a mixture of sulfuric acid, nitric acid, 5% potassium permanganate, and 5% potassium peroxydisuflate in a water bath for one hour. Excess potassium permanganate is reduced with hydroxylamine sulfate solution. Hg (II) is then reduced with stannous chloride. The Hg vapor is separated and measured using a LEEMAN PS200 automated mercury analyzer. Solutions derived from NIST* standard reference material 1641c are used for calibration. Samples exceeding 1.8 ppm mercury require dilution. Analytical data for an experimental run are deemed acceptable based on results determined for two in-house quality-control standards: recovery for all elements present at >5 times the detection limit must be within 20% of the certified value, and the calculated relative standard deviation for duplicate samples no greater than 20%.

4.2.5 Analysis of Au, Pd, and Pt by Fire Assay-Atomic Absorption Spectrometry (FA-AAS)

Gold, Pd, and Pt are determined by atomic absorption spectrophotometry after collection by fire assay. An assay fusion consists of heating a mixture of the finely pulverized sample with about three parts of a flux until the product is molten. One of the ingredients of the flux is a lead compound which is reduced by other constituents of the flux or sample to metallic lead. The latter collects all the gold, together with silver, platinum metals, and small quantities of certain base metals present in the sample and falls to the bottom of the crucible to form a lead button. The gangue of the ore is converted by the flux into a slag sufficiently fluid that all particles of lead may fall

*National Institute of Standards and Technology

readily through the molten mass. The choice of a suitable flux depends on the character of the ore. The lead button is cupelled to oxidize the lead leaving behind a doré bead containing the precious metals. The doré bead is then transferred to a test tube, dissolved with aqua regia, diluted to a specific volume and determined by atomic absorption spectrophotometry.

The lower reporting levels for Au, Pd, and Pt are 5, 1, and 10 ppb respectively for a 15 g sample charge. The upper reporting limit is 10,000 ppb.

Full analyses were performed on 1,733 of the 1,751 submitted samples. Three (GFA1U, WCC4M, and WIA4U2) were only partially analyzed and the remaining 15 (mostly AOV3s) lost, damaged, or not analyzed for other reasons.

5.0 Results and discussion

5.1 Data handling

Field data, including site and sample descriptions, are presented in Appendix 1 (tables A1.1 and A1.2). Sample descriptions conform to National Cooperative Soil Survey conventions (Schoeneberger and others, 2002).

The mean concentrations of 34 elements (see note 4 under table 1) were calculated for 753 individual sample sites (each ANOVA sample set was treated as a separate data point) (table 2). For the sake of consistency, elemental concentrations are expressed as the mean of the surface (excluding subsamples) and subsoil concentrations only. (*Note:* Other than the basic statistical information reported in table 2 no statistical analysis, including ANOVA, has been conducted on this data.)

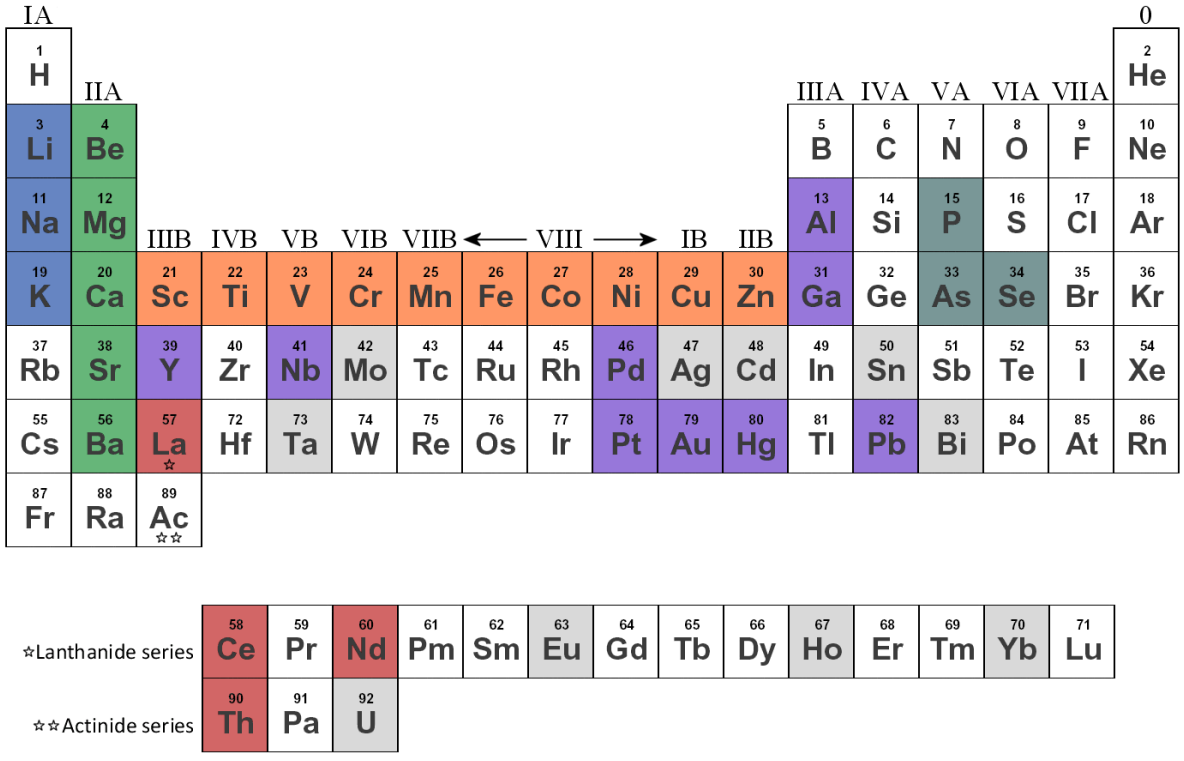


Figure 7. *Color codes for geochemical maps depicted in figures 8-41. Group IA and IIA elements are shown in blue and green respectively. First-row transition elements are colored orange, lanthanides and actinides red, and all other metallic elements violet. Non-metals and metalloids (P, As, and Se) are blue-gray. Light gray fields indicate elements that were analyzed but whose data is not included in this report because concentrations were consistently below the limits of detection for ICP-40.*

The spatial distribution of each of the 34 elements is shown on the series of maps in figures 8-41. Numerical values are listed in Appendix 2 (tables A2.1 and A2.2). Elements are color-coded according to their position in the periodic table (fig. 7). Below each map is a box-and-whisker plot in which the maximum and minimum concentrations for North Dakota extend as lines (whiskers) from a box formed by the 25th and 75th percentile values. The median is represented by a colored vertical line in the box. A second (whiskerless) box depicts values for the entire NGS database.

The maps (and the values in tables A2.1 and A2.2) are arranged in the same order as the corresponding analytical data fields in the NGS primary repository.

5.2 Discussion

Irrespective of the paucity of statistical data, it is beyond the scope of this study to make anything but the most general observations about North Dakota's surface geochemistry. Moreover, attempts to identify possible correlations between elemental distributions and the underlying geology were difficult and unrewarding. Given these limitations it is therefore only possible to state the following with a reasonable level of confidence:

- Overall, the geochemical data appear to be typical for the United States, with most of the 44 elemental concentrations falling within, or close to, the 25th and 75th percentiles for the entire NGS database.
- Arsenic (fig. 36) may be an exception, although as a naturally occurring, and problematic contaminant of surface and ground water throughout the state, its apparent above-average range of concentrations is not wholly unexpected.
- The validity of large outliers, such as those reported for barium (fig. 16) and chromium (fig. 20) is uncertain and will require further investigation.
- Lithology is a significant controlling factor in the distribution of aluminum (fig. 8), potassium (fig. 11), barium (fig. 16), niobium, (fig. 26), and possibly iron (fig. 10), titanium (fig. 15), gallium (fig. 22), and scandium (fig. 30). The highest concentrations of these elements are primarily in areas (mostly south and west of the Missouri River) that are dominated by bedrock geology and where glacial sediments are thin or absent altogether.
- Conversely, calcium (fig. 9) and manganese (fig. 25) appear to be more abundant in soils in central and eastern North Dakota that developed on Late Wisconsinan glacial sediments.

Other perceived associations were tentative at best.

The collection of surface subsamples was part of a secondary project to measure the variability of elemental concentrations with depth in the upper part of the solum and thereby determine if such a breakdown would a worthwhile sampling practice in future investigations. Whereas a cursory review of the analytical data from these subsets has revealed no obvious differences between the upper and lower members of each sample pair, a closer examination may prove otherwise.

Table 2. *Summary statistics for total element concentrations (mean of surface and subsoil) in North Dakota soils (n = 753) measured by (a) ICP-AES[1], (b) HG-AAS/CVAAS[2], and (c) FA-AAS[3].*

a.

	Al (wt%)	Ca (wt%)	Fe (wt%)	K (wt%)	Mg (wt%)	Na (wt%)	P (wt%)	Ti (wt%)	Ba (ppm)	Be (ppm)	Ce (ppm)	Co (ppm)	Cr (ppm)	Cu (ppm)
Mean	5.349	2.748	2.26	1.68	0.981	0.943	0.065	0.251	649	1.3	52	9	38	19
σ	0.891	2.256	0.49	0.25	0.454	0.244	0.013	0.050	221	0.5	8	2	31	15
Minimum	2.215	0.187	0.80	0.74	0.186	0.198	0.028	0.092	232	0.5	21	3	6	2
Median	5.305	1.651	2.26	1.67	0.874	0.914	0.064	0.249	625	1.5	52	9	37	18
75th %ile	5.901	4.378	2.50	1.82	1.231	1.080	0.072	0.276	701	1.5	57	10	47	21
90th %ile	6.442	5.955	2.77	1.97	1.558	1.251	0.081	0.308	798	2.0	62	11	56	27
95th %ile	6.844	6.816	2.96	2.09	1.749	1.378	0.086	0.328	880	2.0	66	12	64	32
99th %ile	7.590	9.073	3.60	2.31	2.495	1.621	0.102	0.413	1394	2.0	76	18	78	45
Maximum	11.349	15.650	5.87	3.61	3.255	1.867	0.176	0.566	3380	3.0	103	27	785	255
Detection limit	0.005	0.005	0.02	0.01	0.005	0.005	0.005	0.005	1	1.0	59	2	2	2

a. *(contd.)*

	Ga (ppm)	La (ppm)	Li (ppm)	Mn (ppm)	Nb (ppm)	Nd (ppm)	Ni (ppm)	Pb (ppm)	Sc (ppm)	Sr (ppm)	Th (ppm)	V (ppm)	Y (ppm)	Zn (ppm)
Mean	14	28	23	653	13	23.6	26	13	8	179	10	88	16.2	69
σ	3	4	6	352	3	4.0	8	4	2	58	3	23	2.2	18
Minimum	7	11	8	178	4	4.5	6	3	3	42	3	25	7.0	20
Median	15	28	23	572	13	23.5	26	12	8	170	10	87	16.0	67
75th %ile	16	31	26	735	15	26.0	29	14	9	203	12	101	17.5	78
90th %ile	18	33	30	973	17	28.0	33	16	10	240	13	111	18.5	87
95th %ile	19	35	34	1215	18	29.7	36	17	11	283	14	122	19.0	94
99th %ile	21	40	41	1998	20	34.2	46	26	13	383	16	166	21.0	121
Maximum	35	51	53	4770	25	47.0	133	48	20	576	20	238	36.0	238
Detection limit	4	2	2	4	4	9.0	3	4	2	2	6	2	2.0	2

[1]Inductively Coupled Plasma-Atomic Emission Spectrometry
[2]Hydride generation-Atomic Absorption Spectrometry (As and Se)/Cold Vapor Atomic Absorption Spectrometry (Hg)
[3]Fire Assay-Atomic Absorption Spectrometry

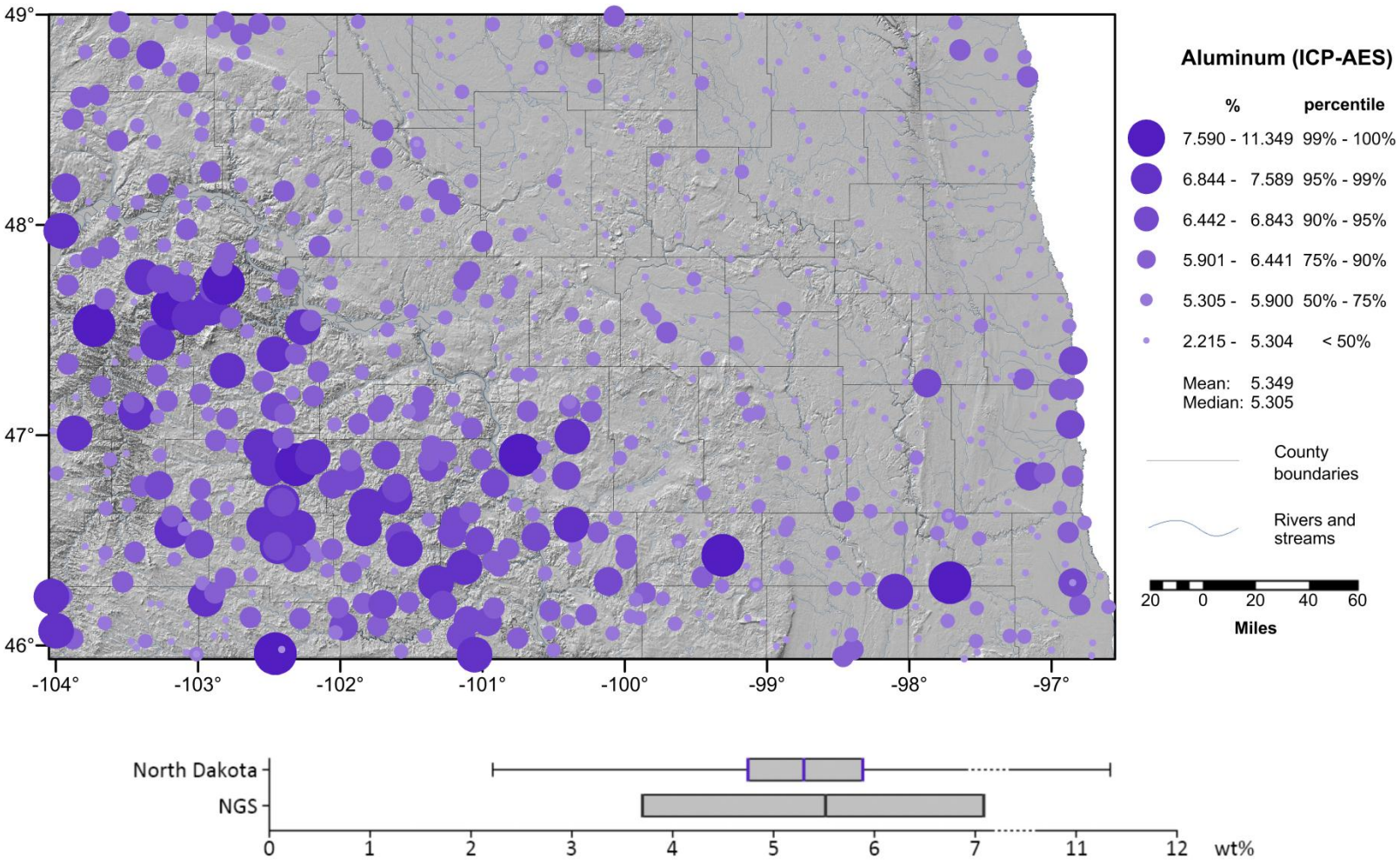
Table 2. *(contd.)*

b.

	As (ppm)	Se (ppm)	Hg (ppm)
Mean	8.0	0.5	0.035
σ	2.6	0.2	0.014
Minimum	2.4	0.1	0.010
Median	7.9	0.5	0.035
75th %ile	9.3	0.6	0.045
90th %ile	10.5	0.7	0.050
95th %ile	11.3	0.9	0.055
99th %ile	14.4	1.3	0.070
Maximum	39.3	2.0	0.115
Detection limit	0.6	0.2	0.020

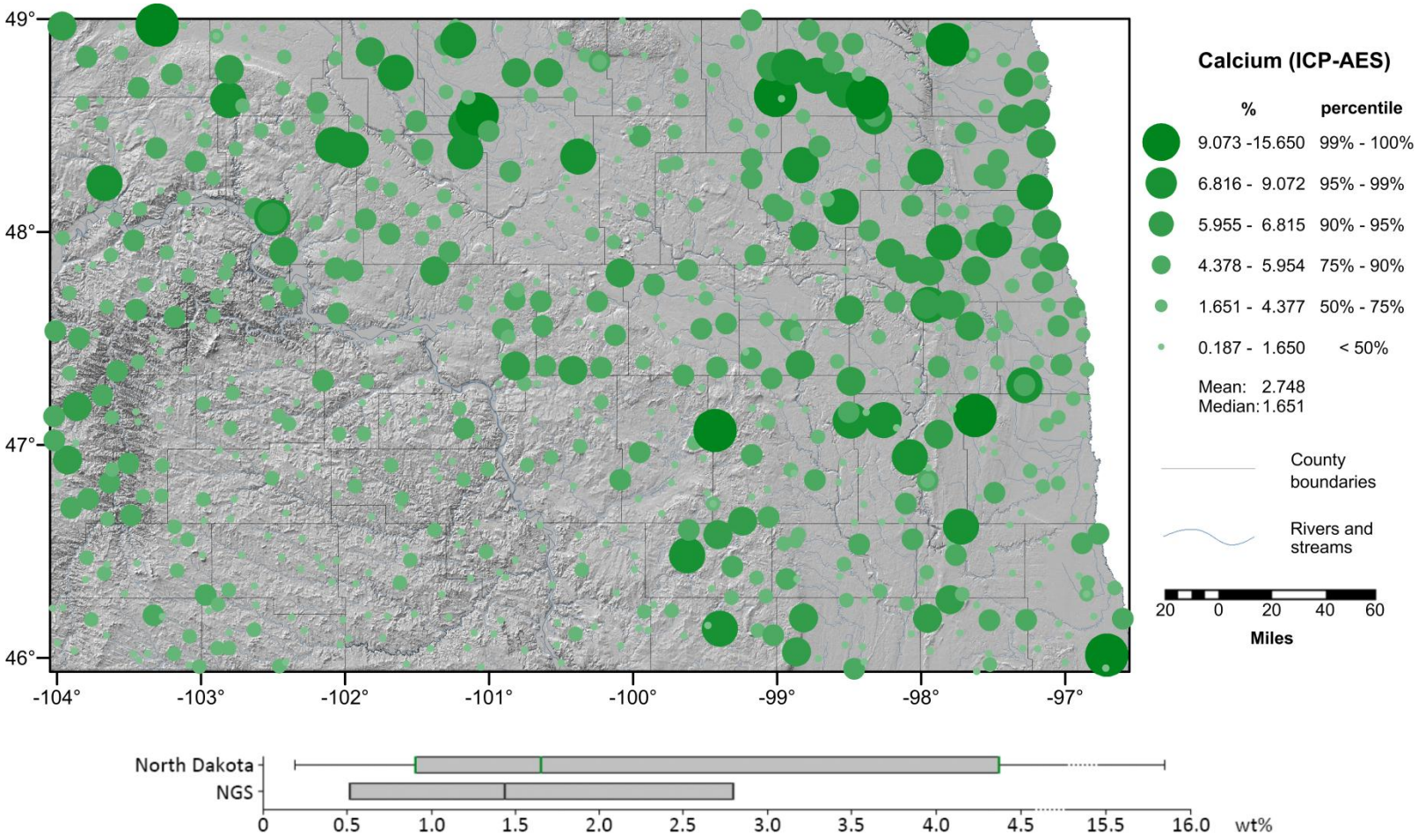
c.

	Au (ppb)	Pd (ppb)	Pt (ppb)
Mean	3.8	0.76	0.67
σ	8.5	0.45	0.63
Minimum	0.5	0.50	0.25
Median	2.5	0.50	0.55
75th %ile	3.5	0.75	0.80
90th %ile	5.0	1.25	1.07
95th %ile	7.5	1.50	1.36
99th %ile	31.5	2.00	31.00
Maximum	167.0	6.75	7.63
Detection limit	5.0	1.00	10.00



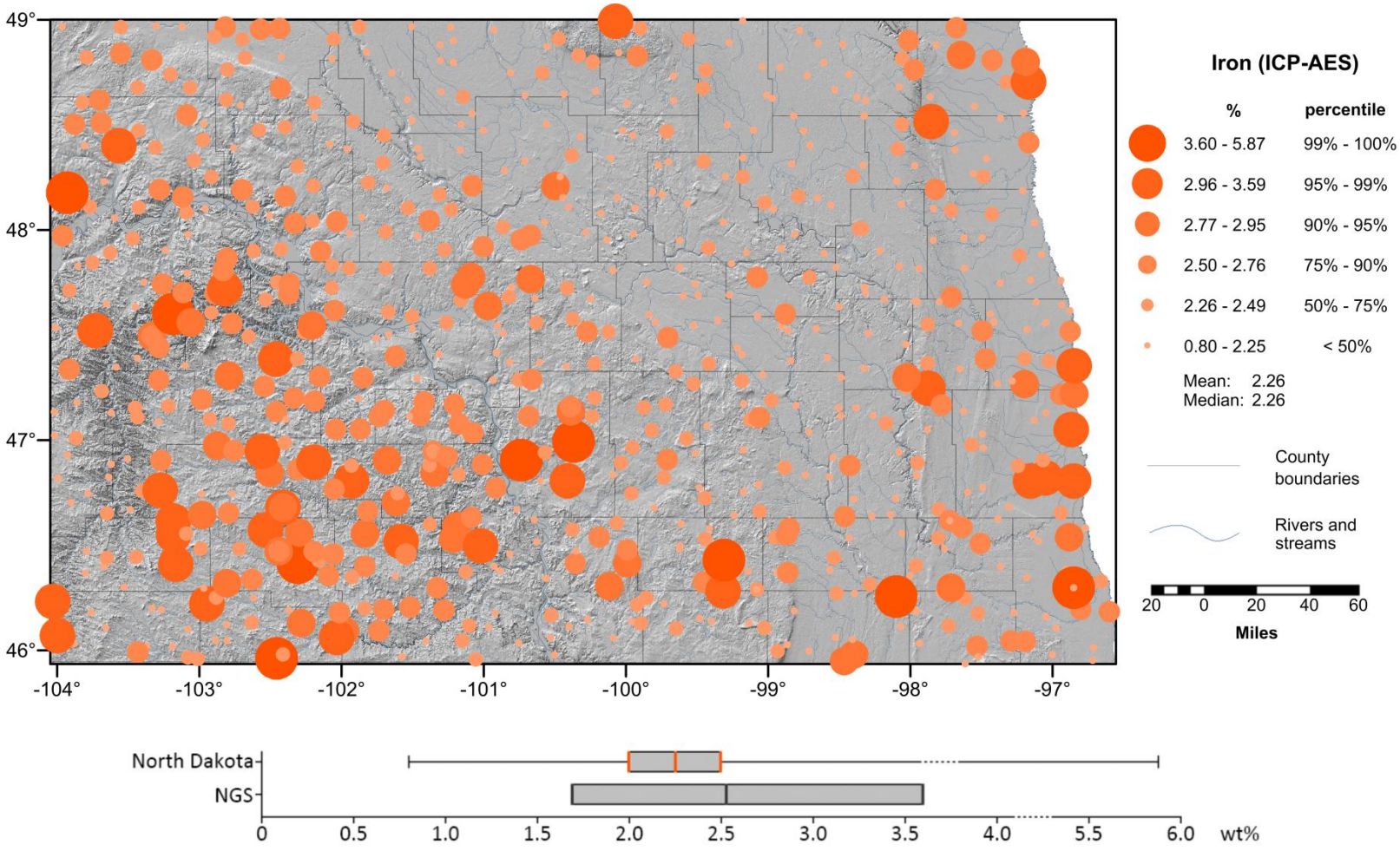
NGS Database	n	Minimum	25th %	Median	75th %	Maximum
	71562	0.005	3.7	5.53	7.094	60.3

Figure 8. *Mean total aluminum (Al) in surface and principal horizons of North Dakota soils*



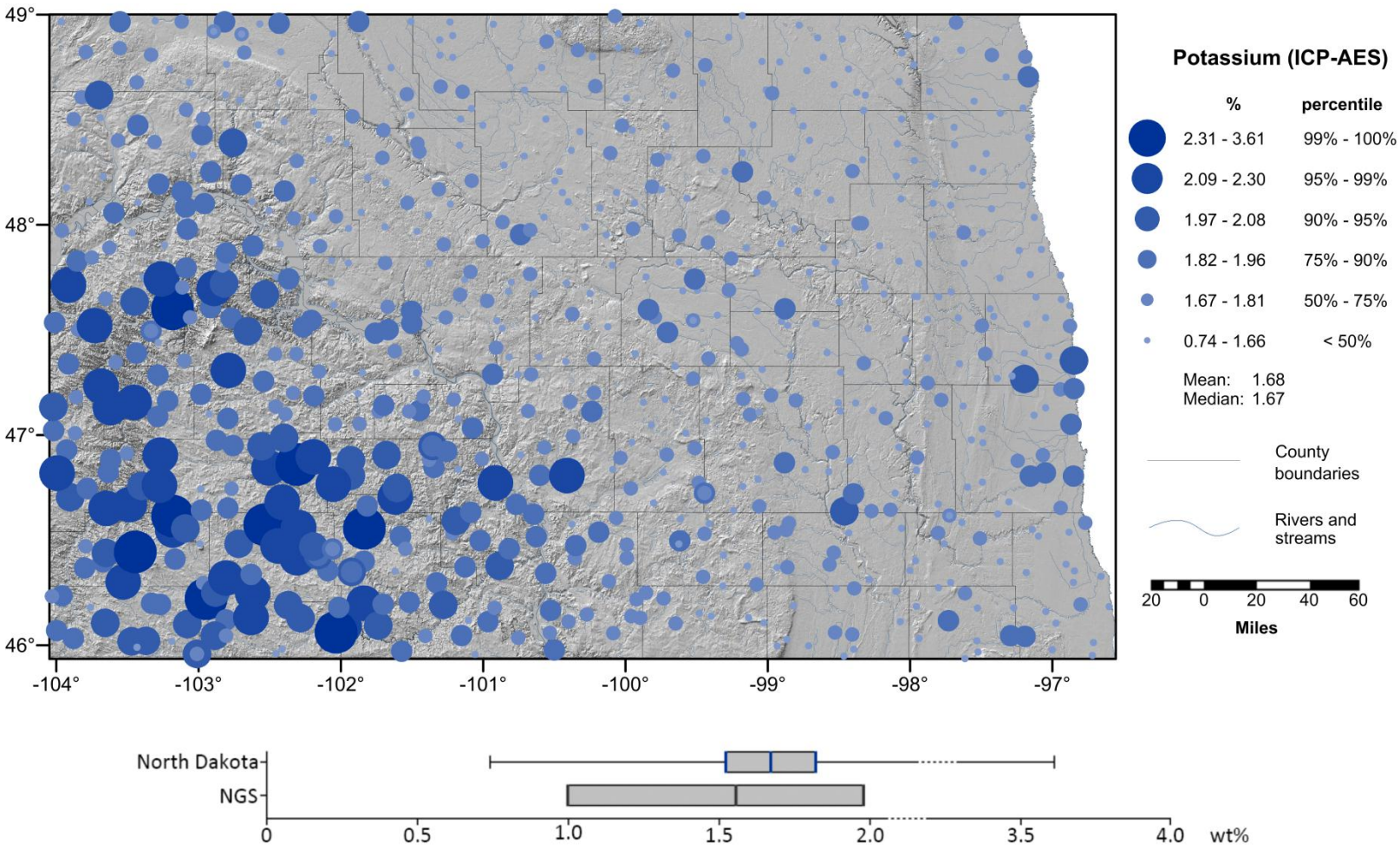
NGS Database	n	Minimum	25th %	Median	75th %	Maximum
	71562	0.005	0.519	1.44	2.8	39.6

Figure 9. *Mean total calcium (Ca) in surface and principal horizons of North Dakota soils*



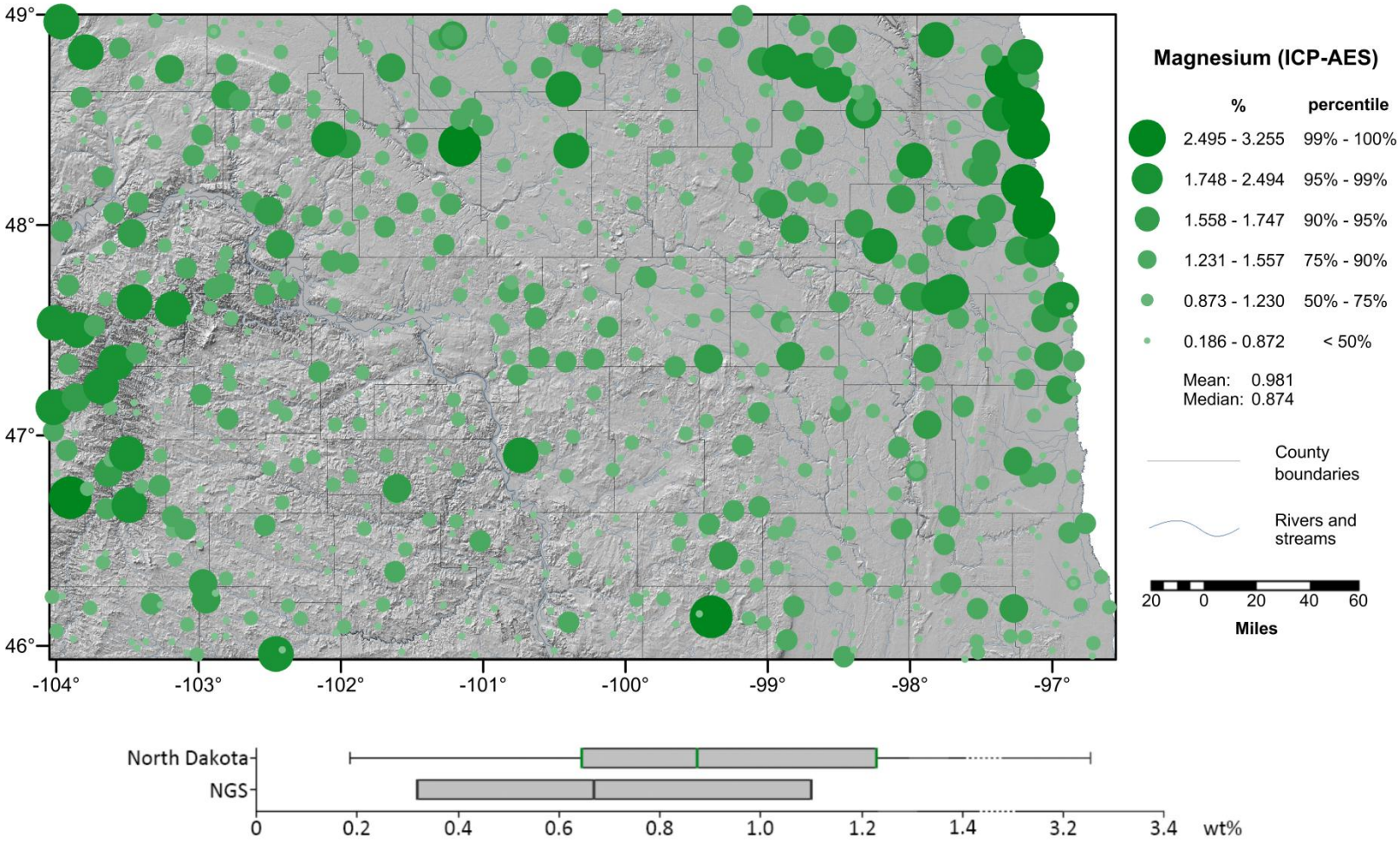
NGS Database	n	Minimum	25th %	Median	75th %	Maximum
	71562	0.005	1.69	2.53	3.6	64.4

Figure 10. *Mean total iron (Fe) in surface and principal horizons of North Dakota soils*



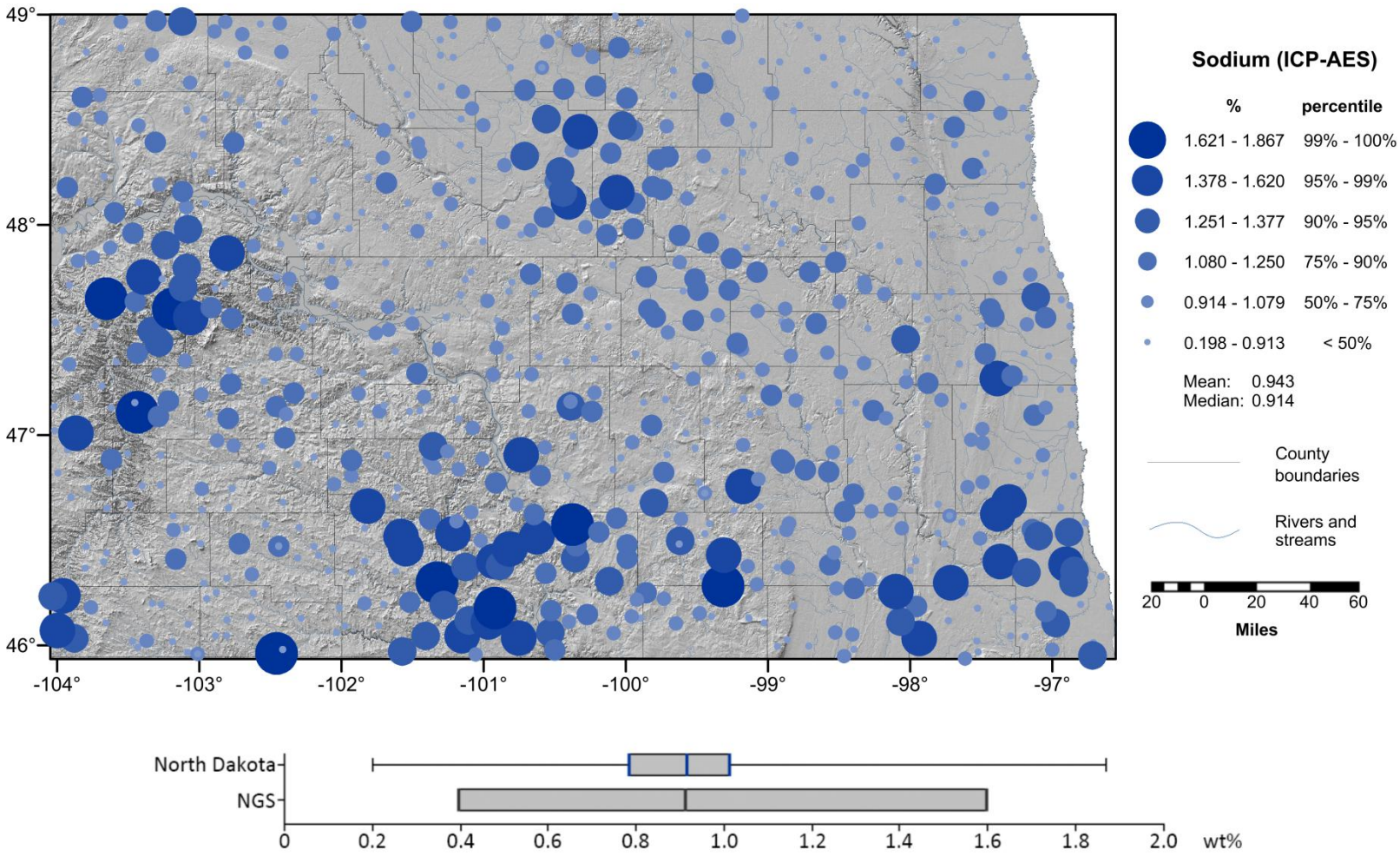
NGS Database	n	Minimum	25th %	Median	75th %	Maximum
	71562	0.005	1	1.56	1.98	17

Figure 11. *Mean total potassium (K) in surface and principal horizons of North Dakota soils*



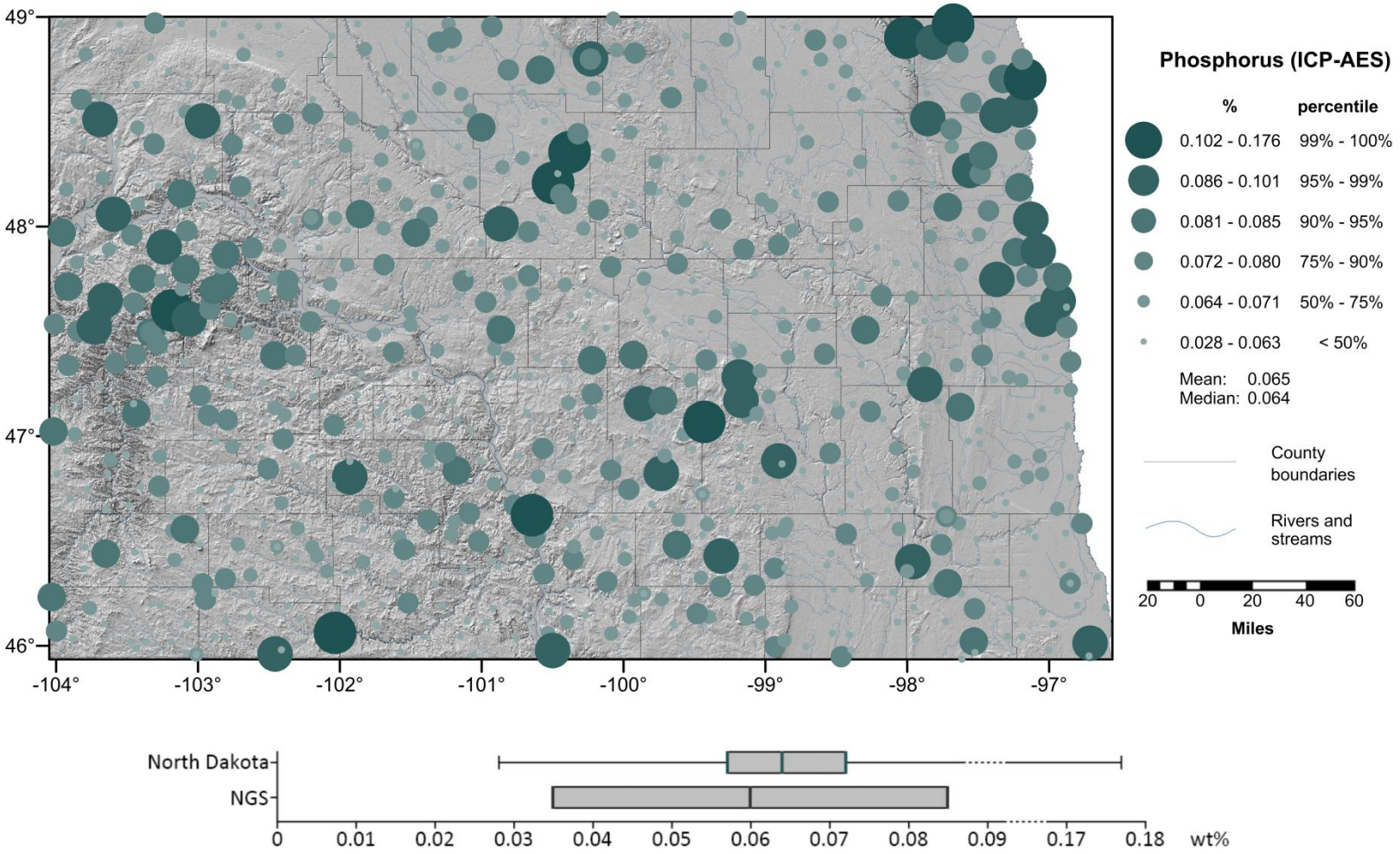
NGS Database	n	Minimum	25th %	Median	75th %	Maximum
	71550	0.005	0.32	0.67	1.1	24.8

Figure 12. *Mean total magnesium (Mg) in surface and principal horizons of North Dakota soils*



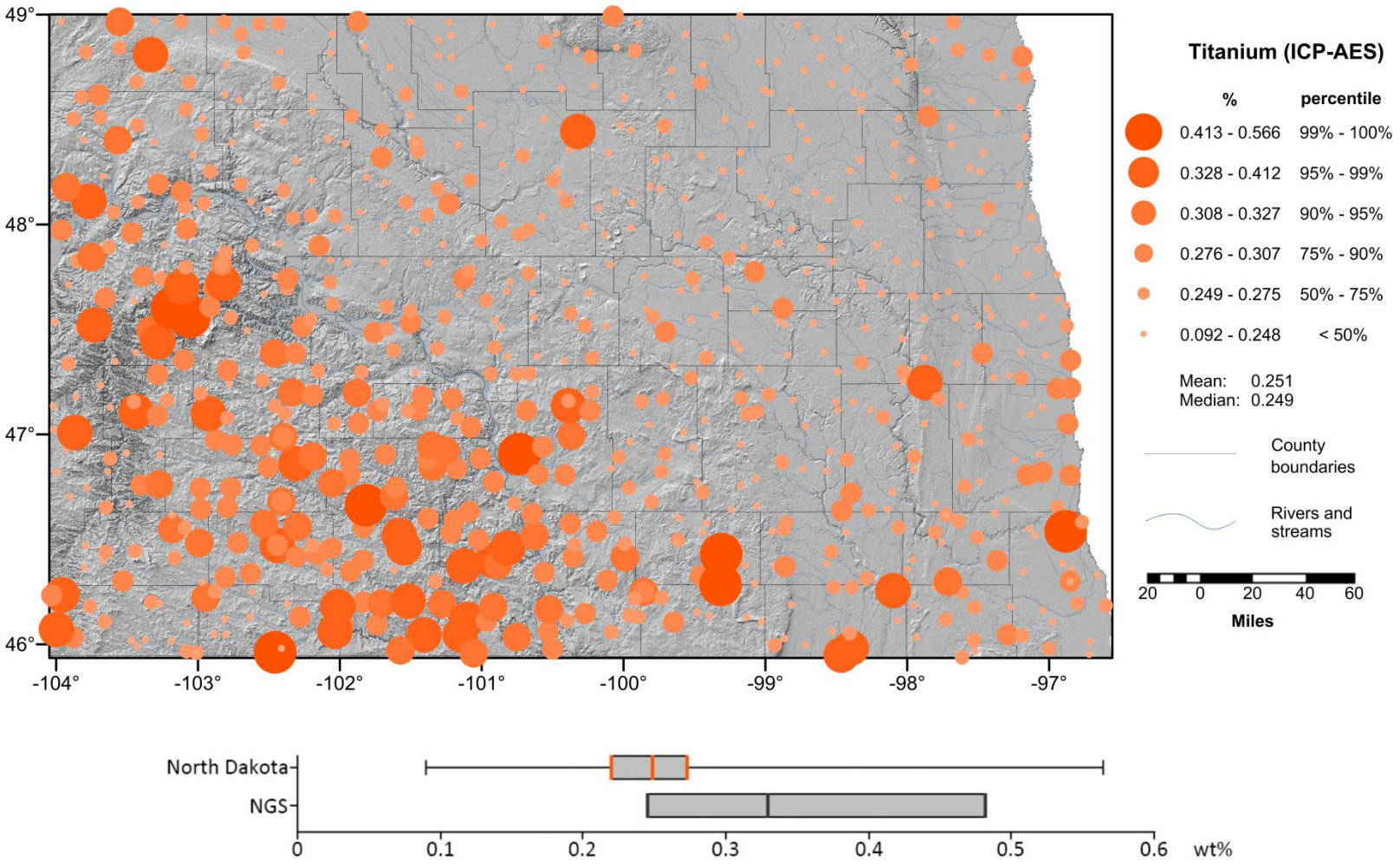
NGS Database	n	Minimum	25th %	Median	75th %	Maximum
	71562	0.005	0.399	0.915	1.599	8.4

Figure 13. *Mean total sodium (Na) in surface and principal horizons of North Dakota soils*



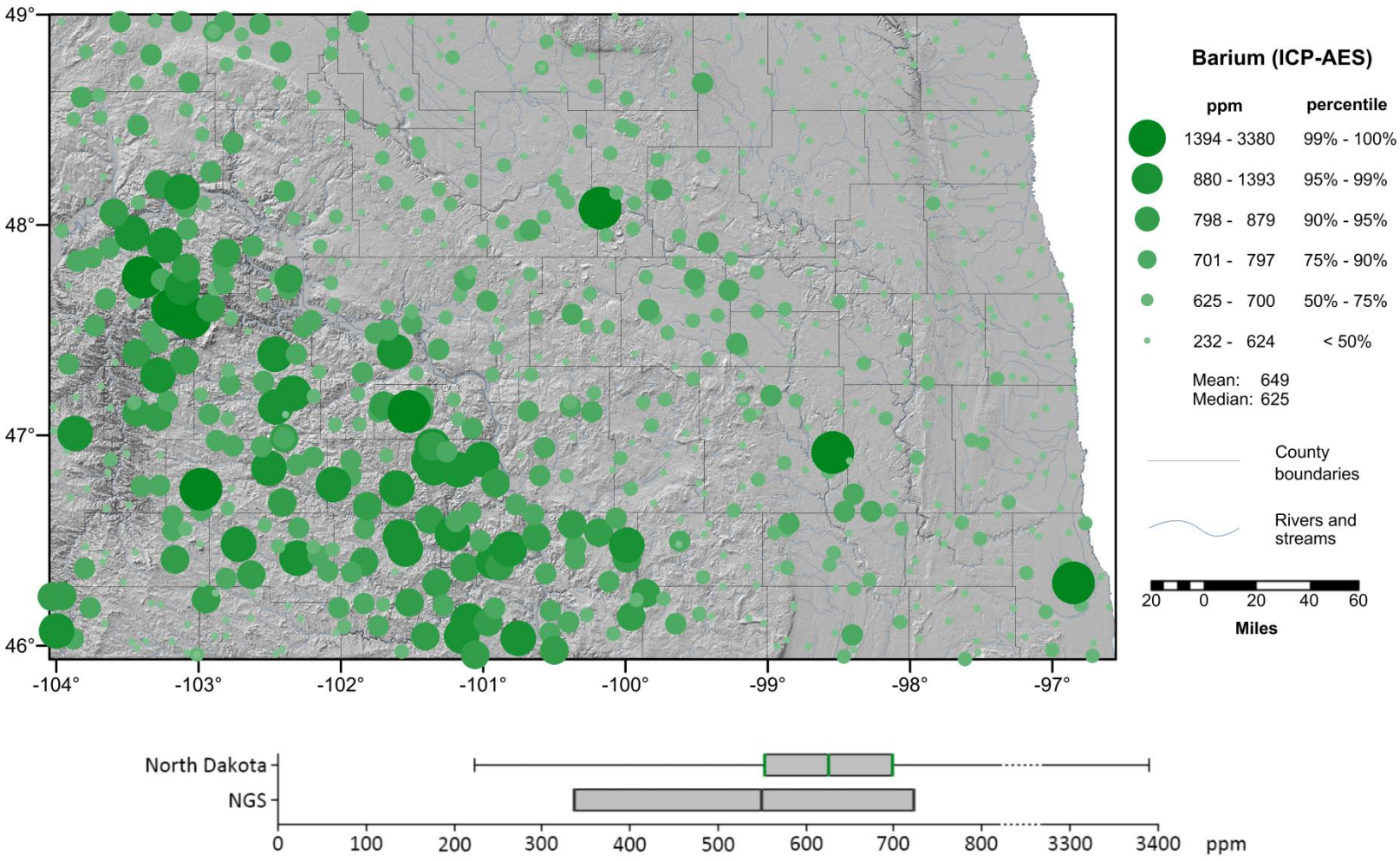
NGS Database	n	Minimum	25th %	Median	75th %	Maximum
	71518	0.005	0.035	0.06	0.085	9

Figure 14. *Mean total phosphorus (P) in surface and principal horizons of North Dakota soils*



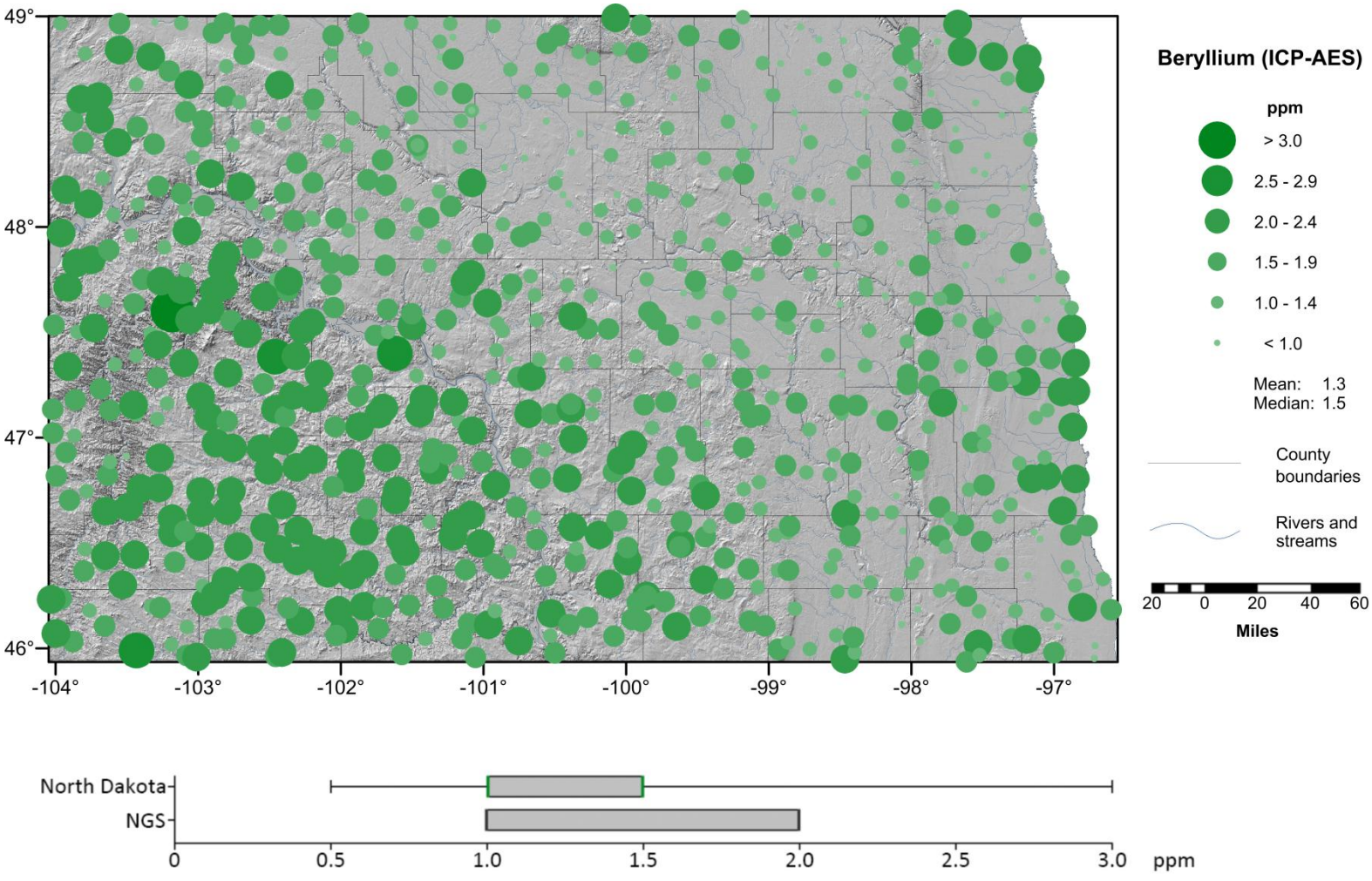
NGS Database	n	Minimum	25th %	Median	75th %	Maximum
	71562	0.005	0.246	0.33	0.482	9.595

Figure 15. *Mean total titanium (Ti) in surface and principal horizons of North Dakota soils*



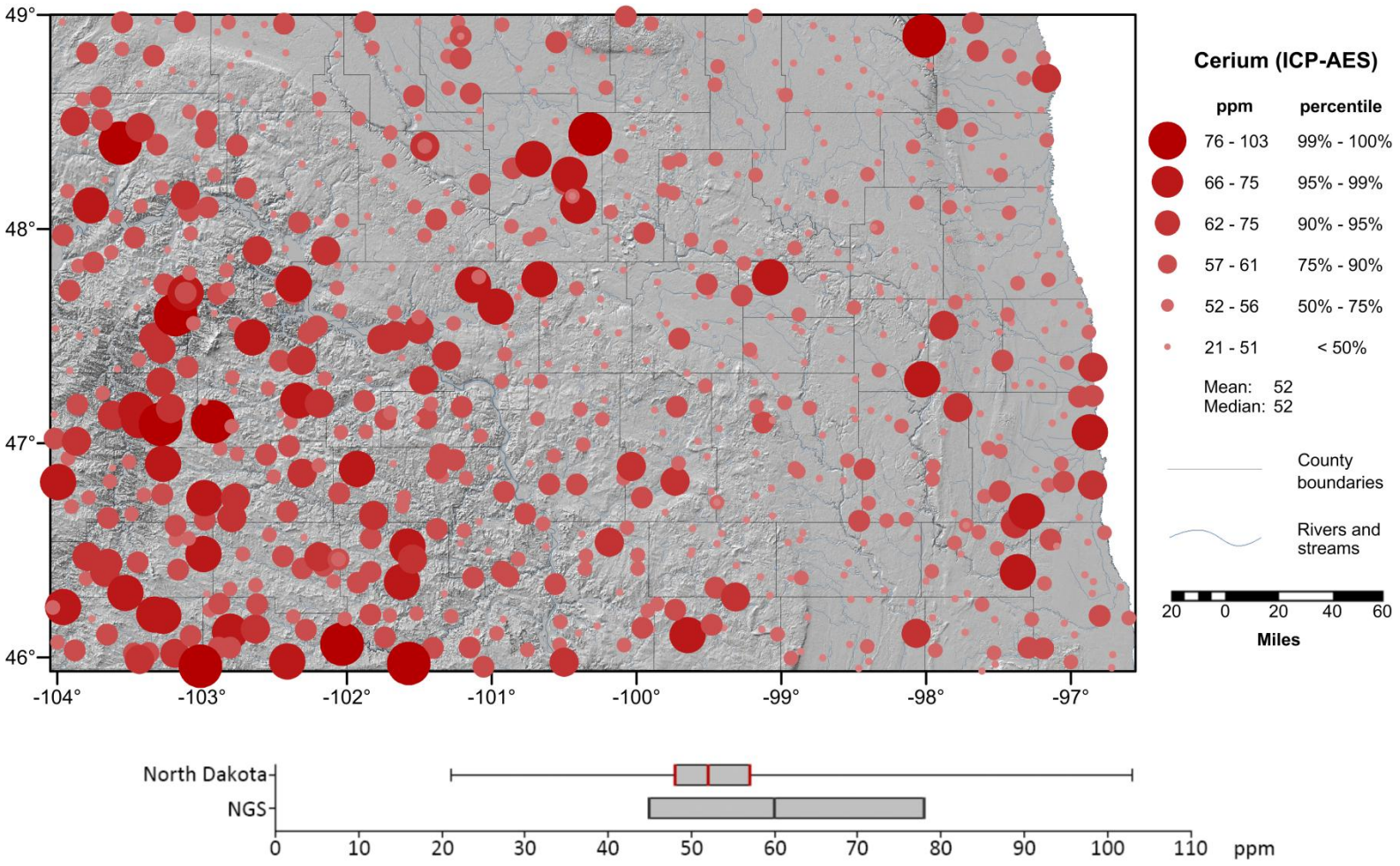
NGS Database	n	Minimum	25th %	Median	75th %	Maximum
	71554	1	337	550	724	16000

Figure 16. *Mean total barium (Ba) in surface and principal horizons of North Dakota soils*



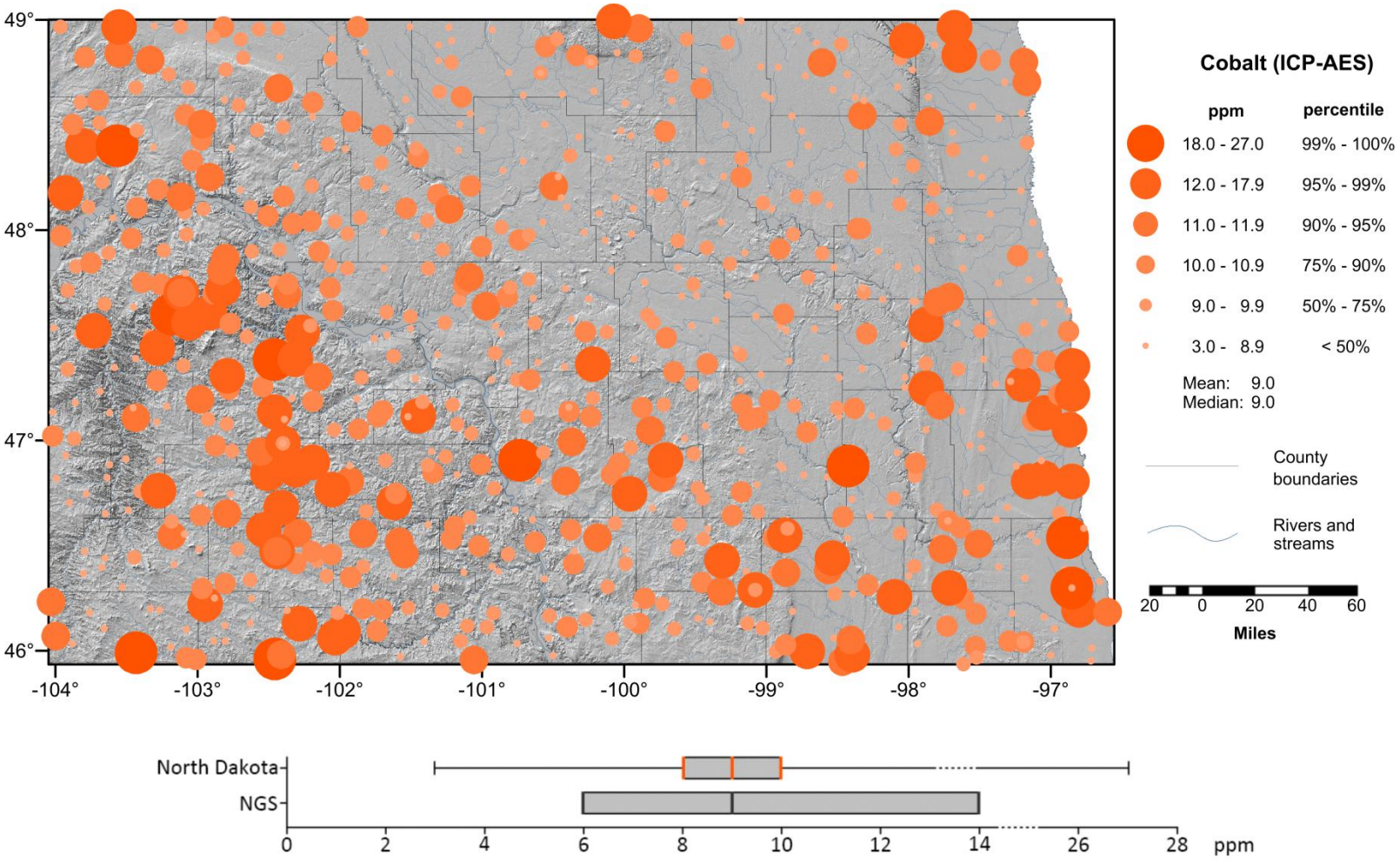
NGS Database	n	Minimum	25th %	Median	75th %	Maximum
	71562	1	1	1	2	53

Figure 17. *Mean total beryllium (Be) in surface and principal horizons of North Dakota soils*



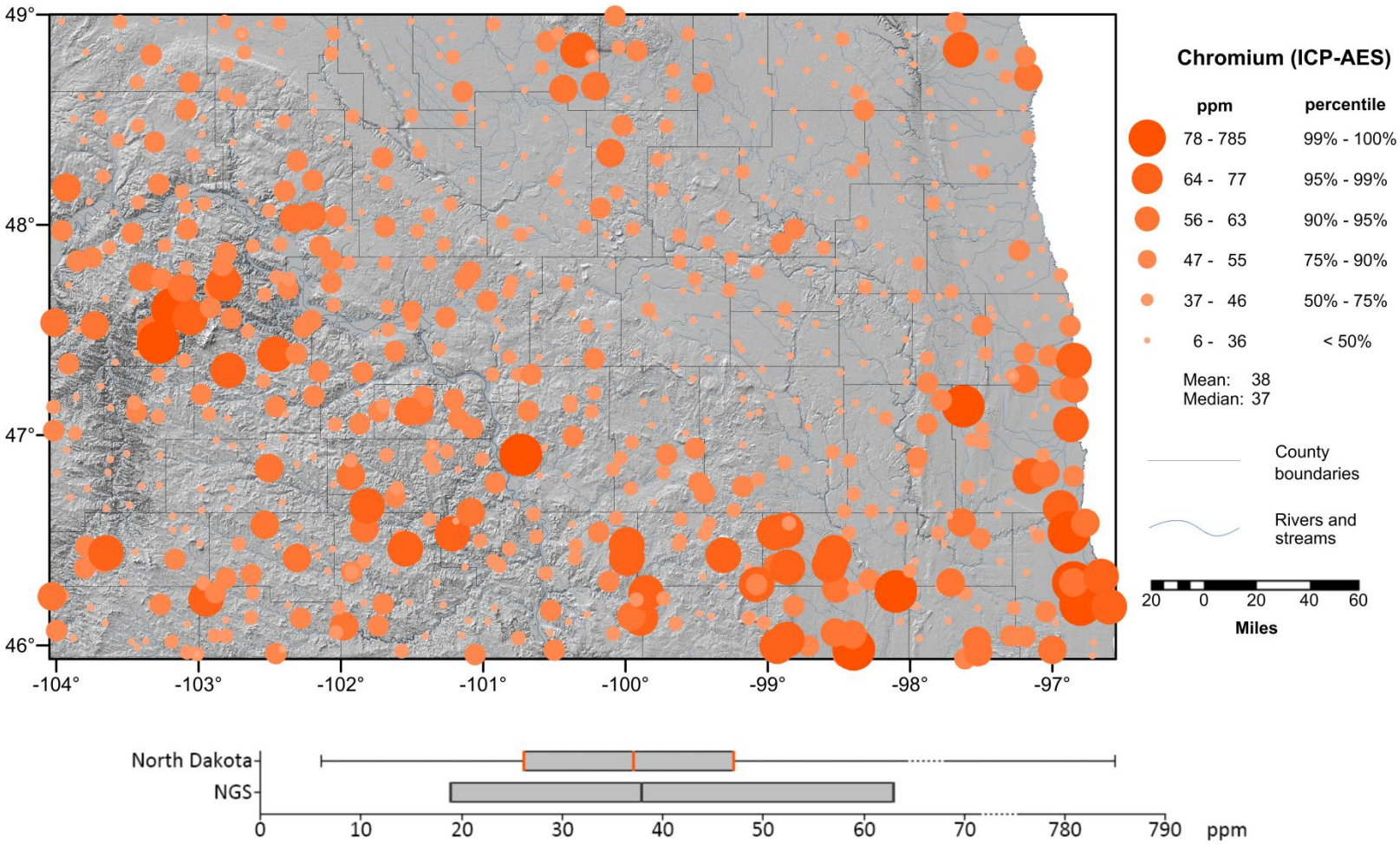
NGS Database	n	Minimum	25th %	Median	75th %	Maximum
	71562	4	45	60	78	12000

Figure 18. *Mean total cerium (Ce) in surface and principal horizons of North Dakota soils*



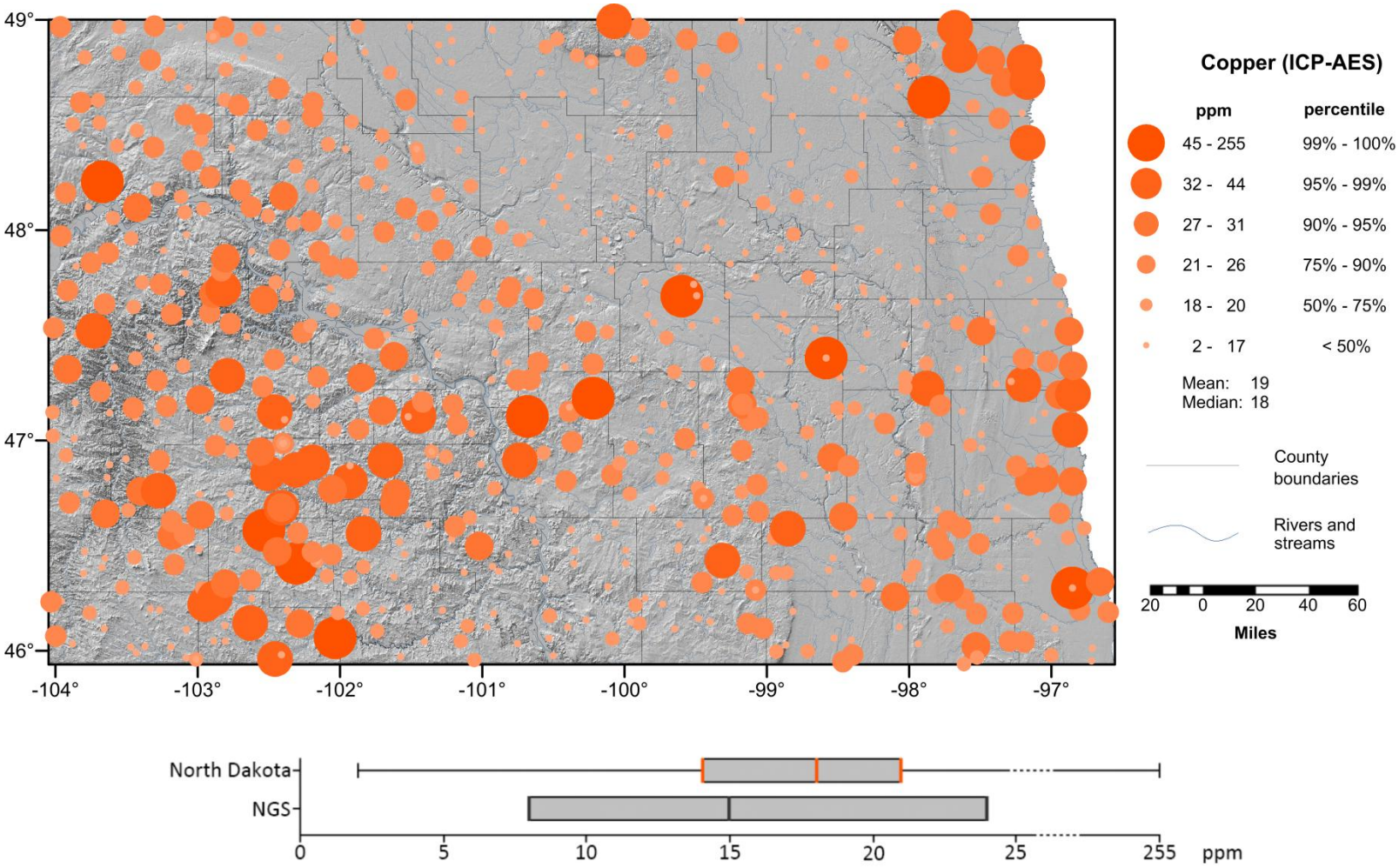
NGS Database	n	Minimum	25th %	Median	75th %	Maximum
	71562	1	6	9	14	695

Figure 19. *Mean total cobalt (Co) in surface and principal horizons of North Dakota soils*



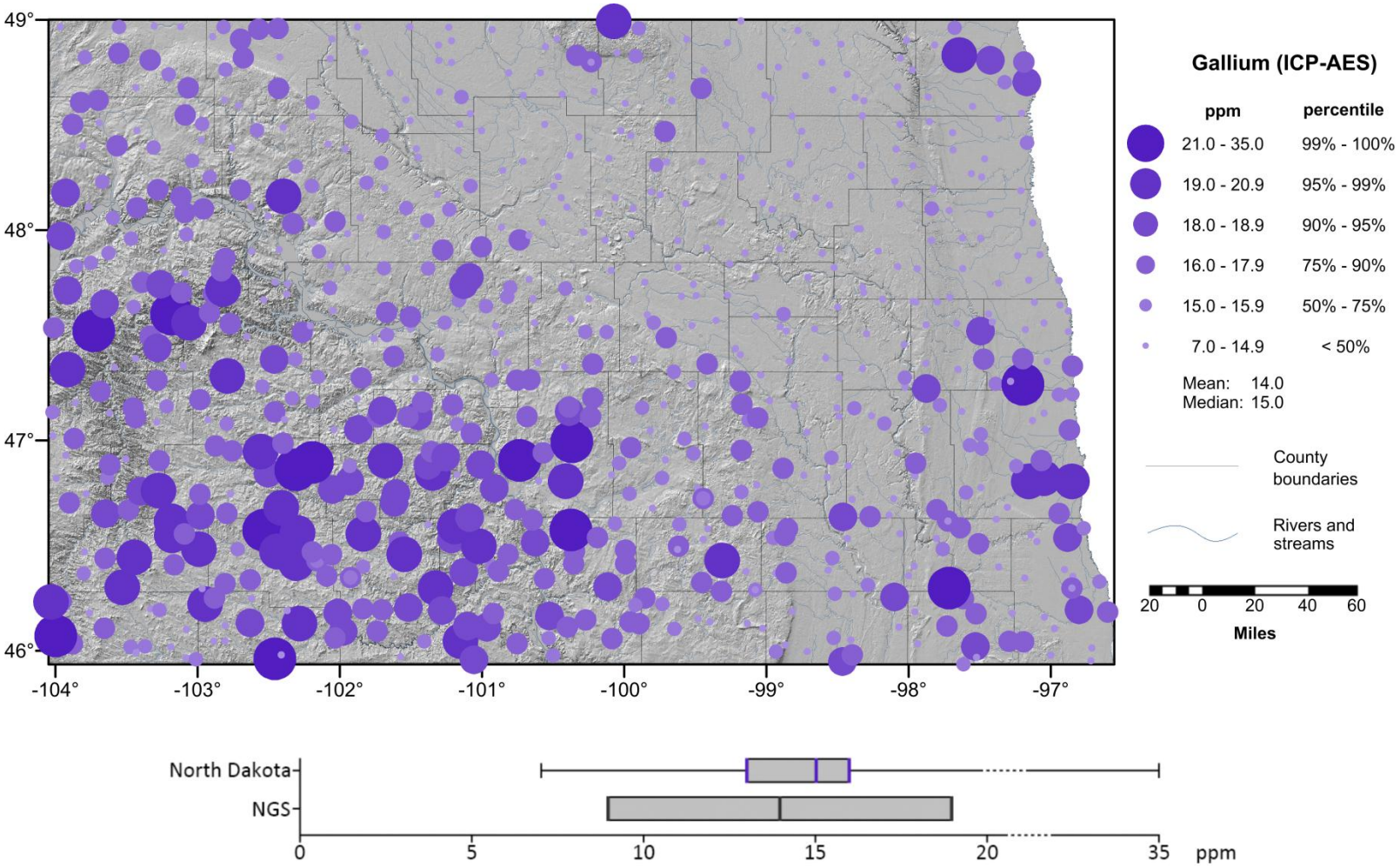
NGS Database	n	Minimum	25th %	Median	75th %	Maximum
	71562	1	19	38	63	12000

Figure 20. *Mean total chromium (Cr) in surface and principal horizons of North Dakota soils*



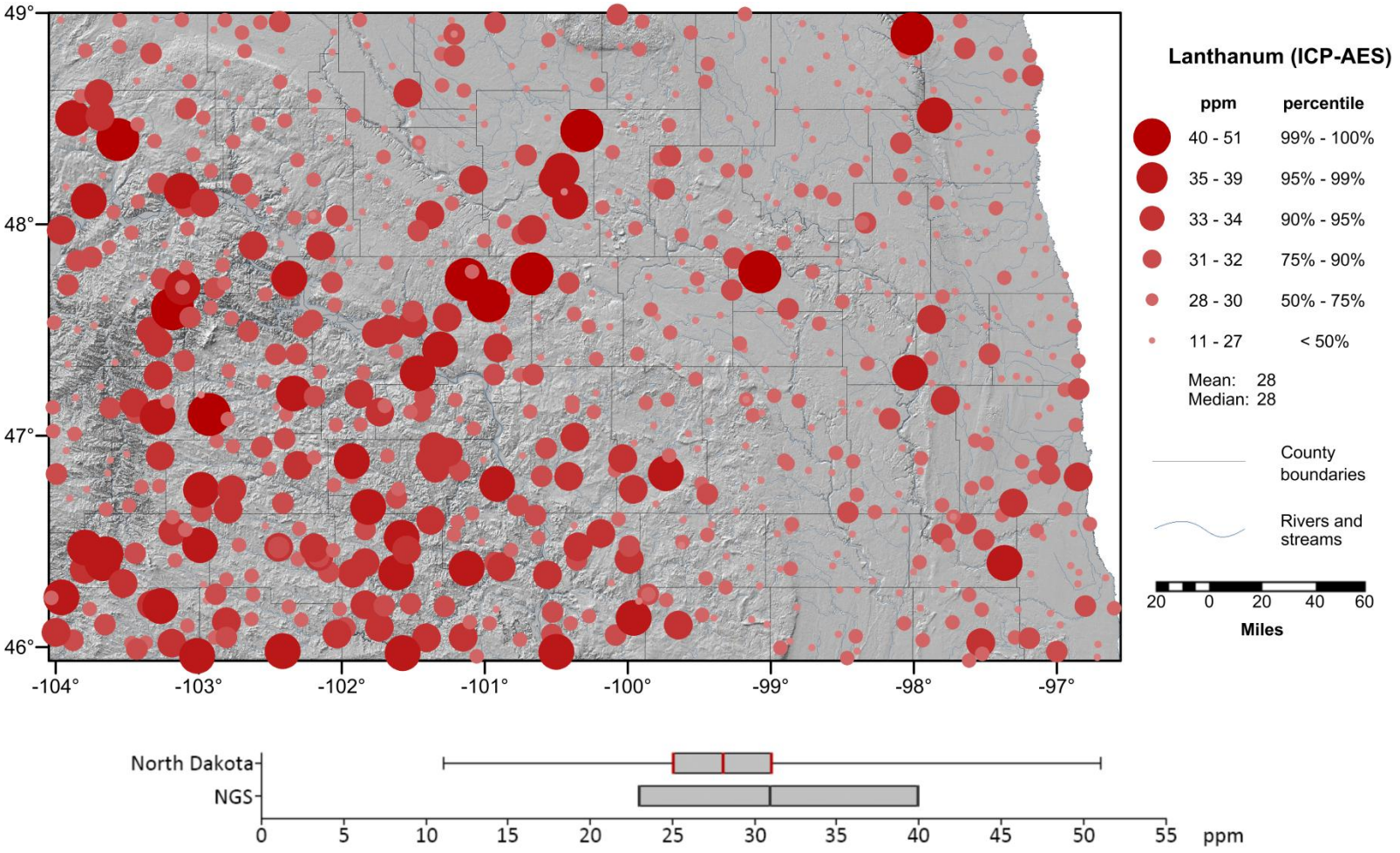
NGS Database	n	Minimum	25th %	Median	75th %	Maximum
	71562	0.5	8	15	24	11080

Figure 21. *Mean total copper (Cu) in surface and principal horizons of North Dakota soils*



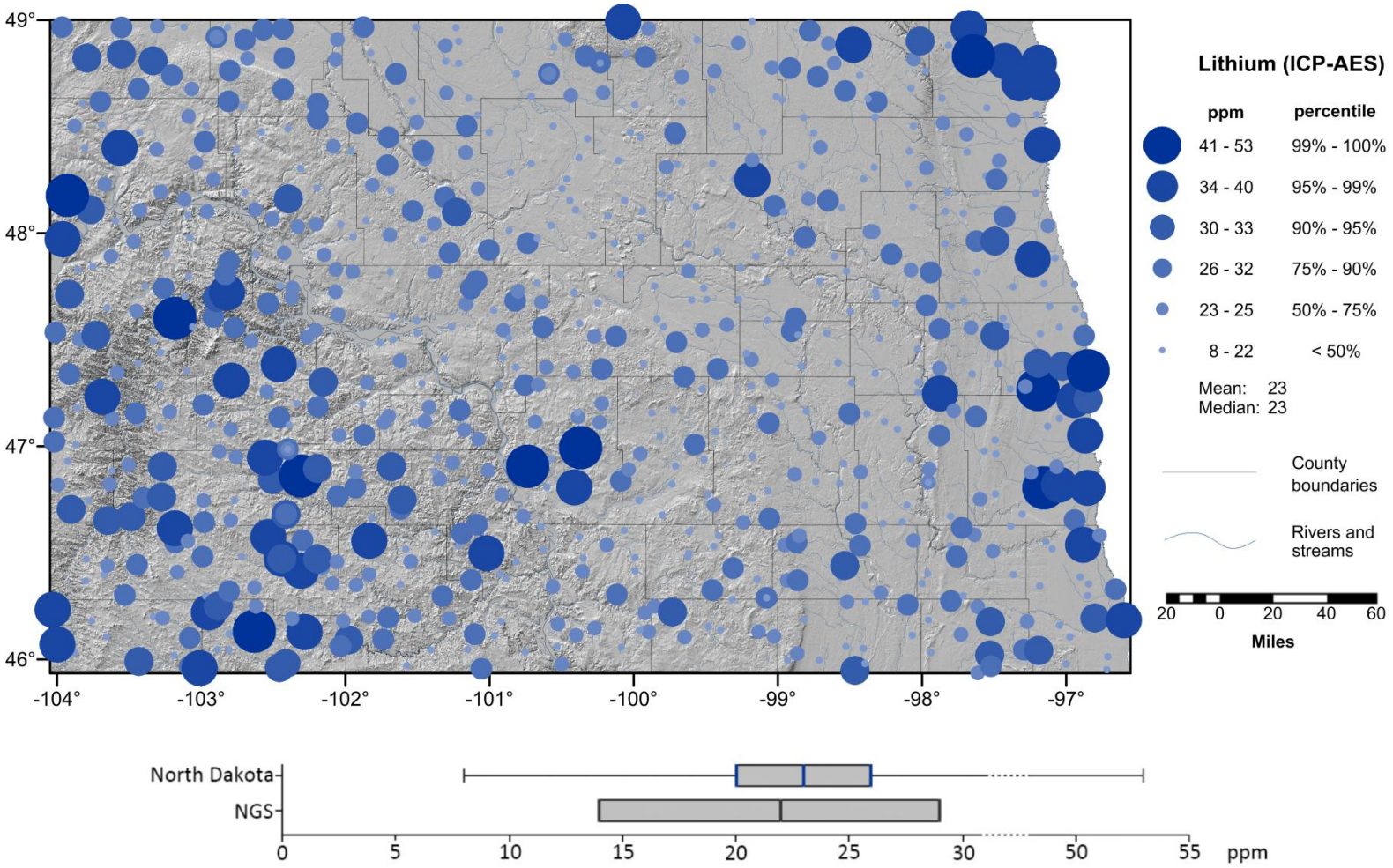
NGS Database	n	Minimum	25th %	Median	75th %	Maximum
	71562	1	9	14	19	67

Figure 22. *Mean total gallium (Ga) in surface and principal horizons of North Dakota soils*



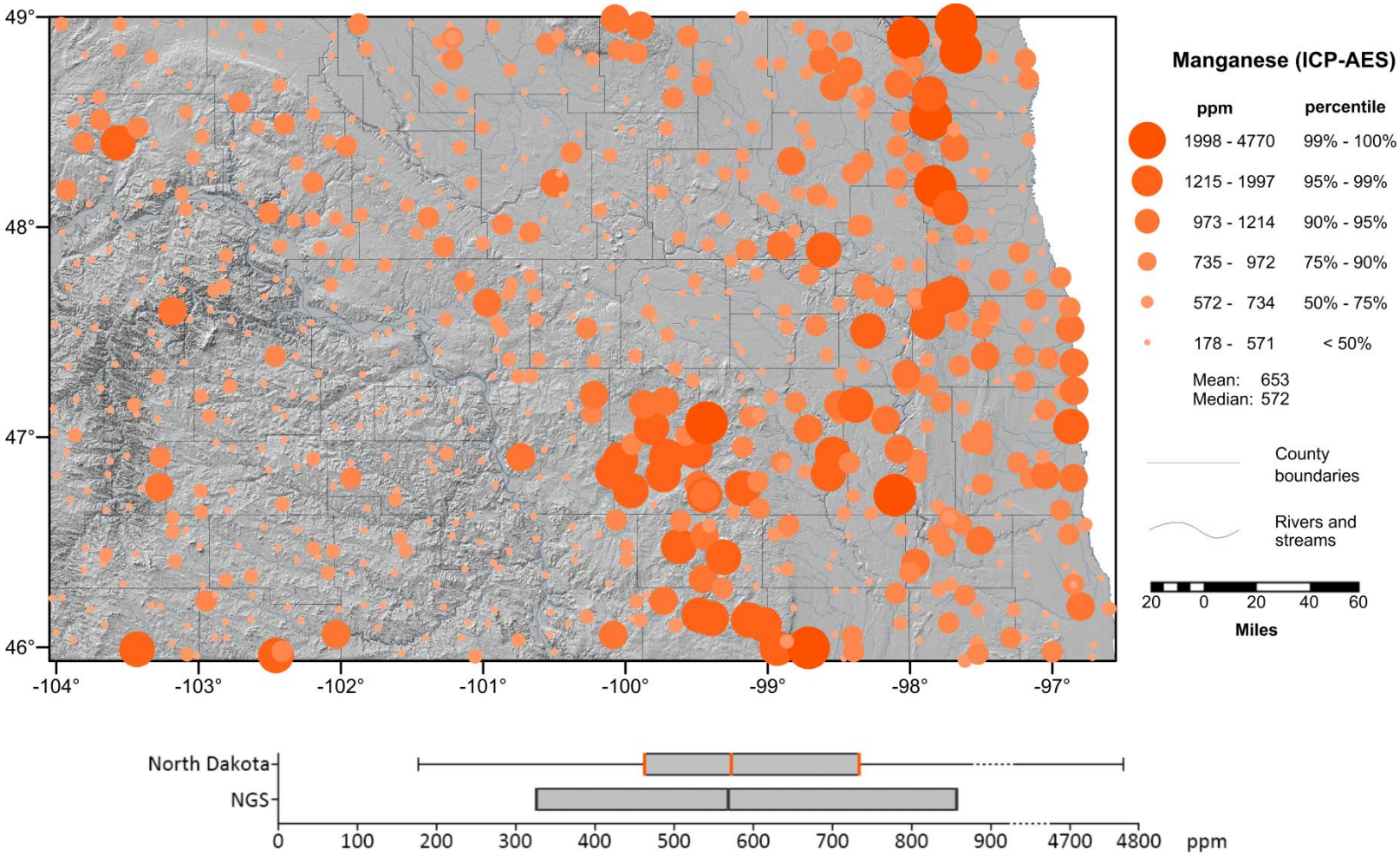
NGS Database	n	Minimum	25th %	Median	75th %	Maximum
	71562	2	23	31	40	8700

Figure 23. *Mean total lanthanum (La) in surface and principal horizons of North Dakota soils*



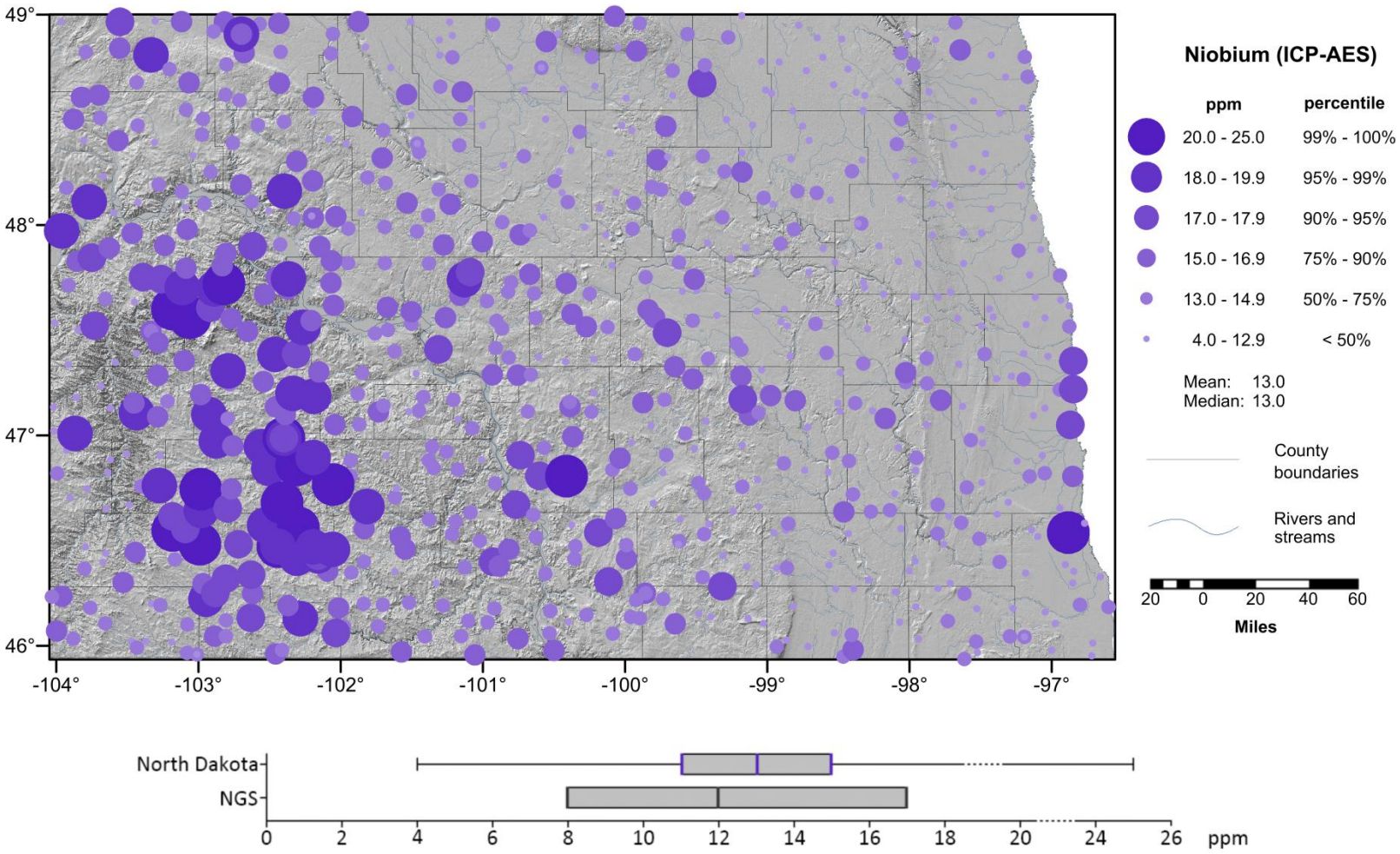
NGS Database	n	Minimum	25th %	Median	75th %	Maximum
	0	2	14	22	29	910

Figure 24. *Mean total lithium (Li) in surface and principal horizons of North Dakota soils*



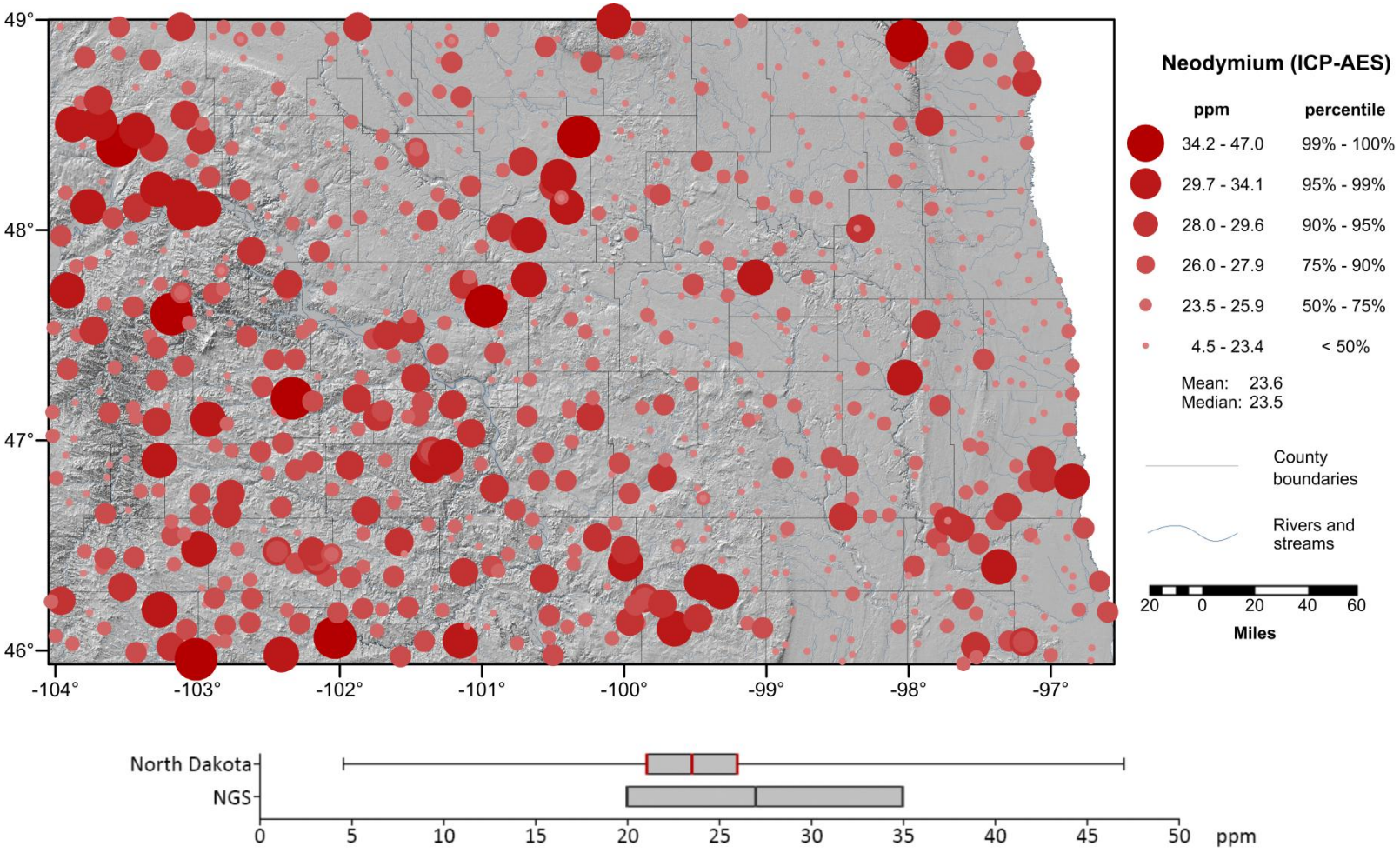
NGS Database	n	Minimum	25th %	Median	75th %	Maximum
	71544	4	327	569	857	44390

Figure 25. *Mean total manganese (Mn) in surface and principal horizons of North Dakota soils*



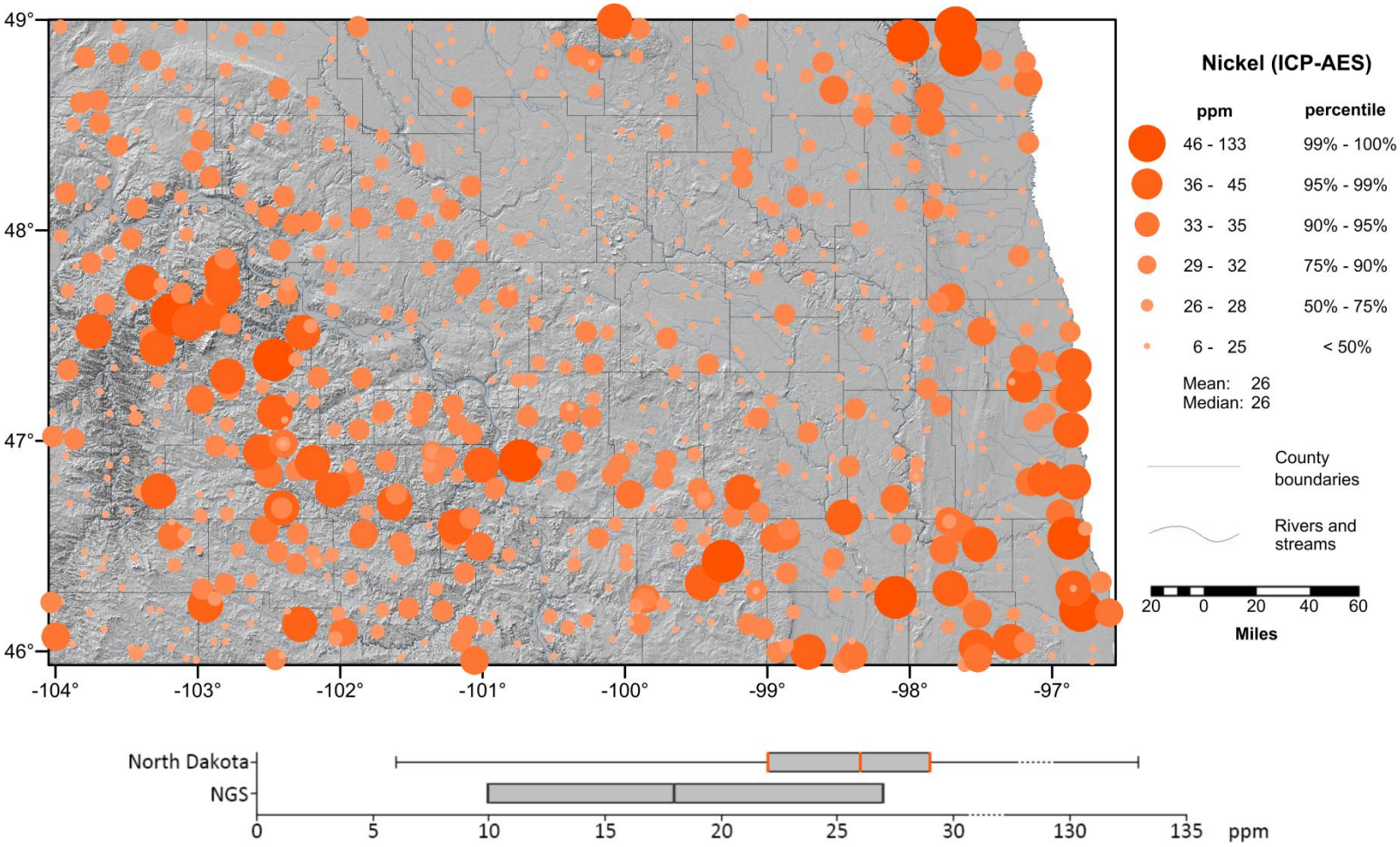
NGS Database	n	Minimum	25th %	Median	75th %	Maximum
	71302	2	8	12	17	468

Figure 26. *Mean total niobium (Nb) in surface and principal horizons of North Dakota soils*



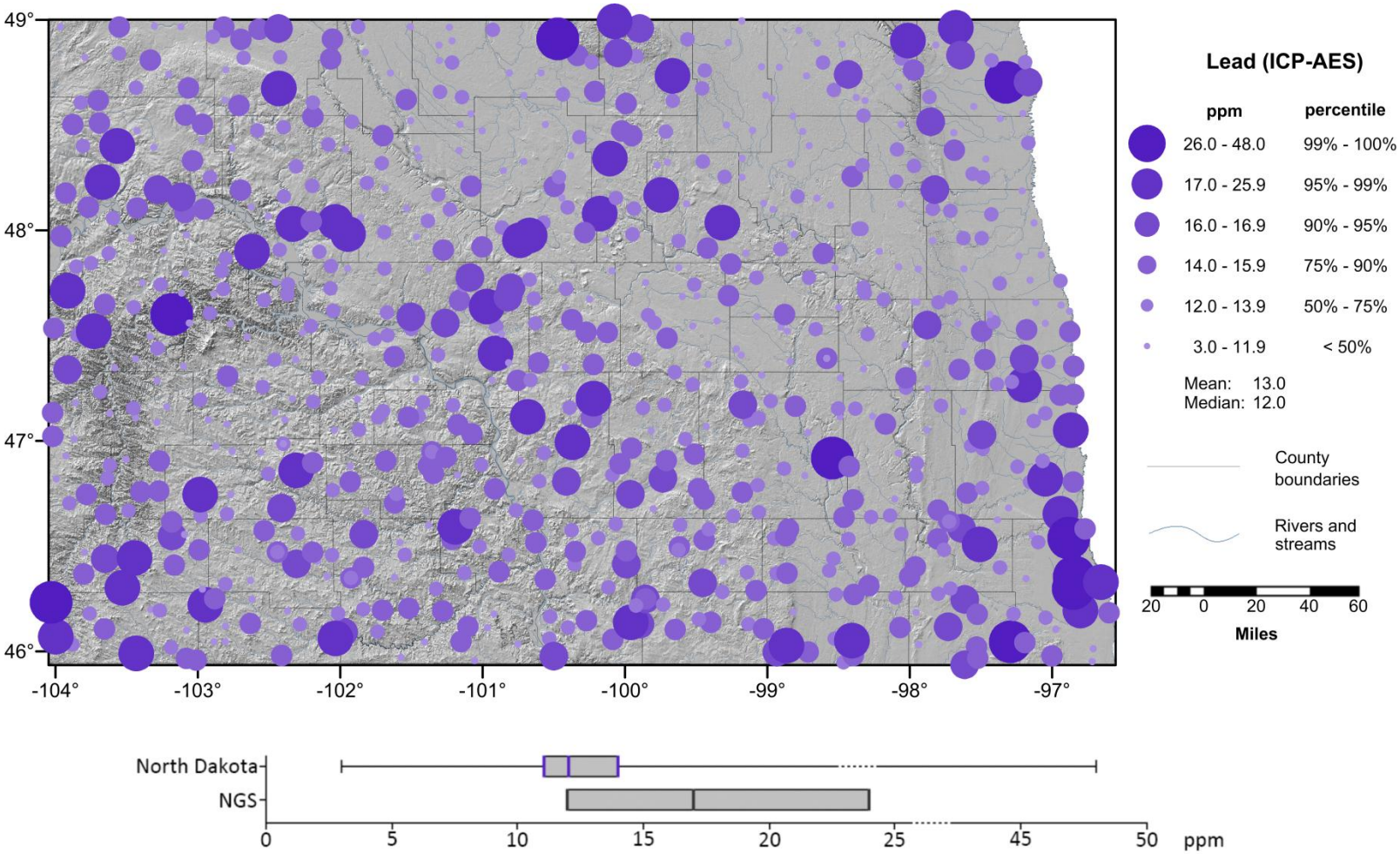
NGS Database	n	Minimum	25th %	Median	75th %	Maximum
	67850	4	20	27	35	3200

Figure 27. *Mean total neodymium (Nd) in surface and principal horizons of North Dakota soils*



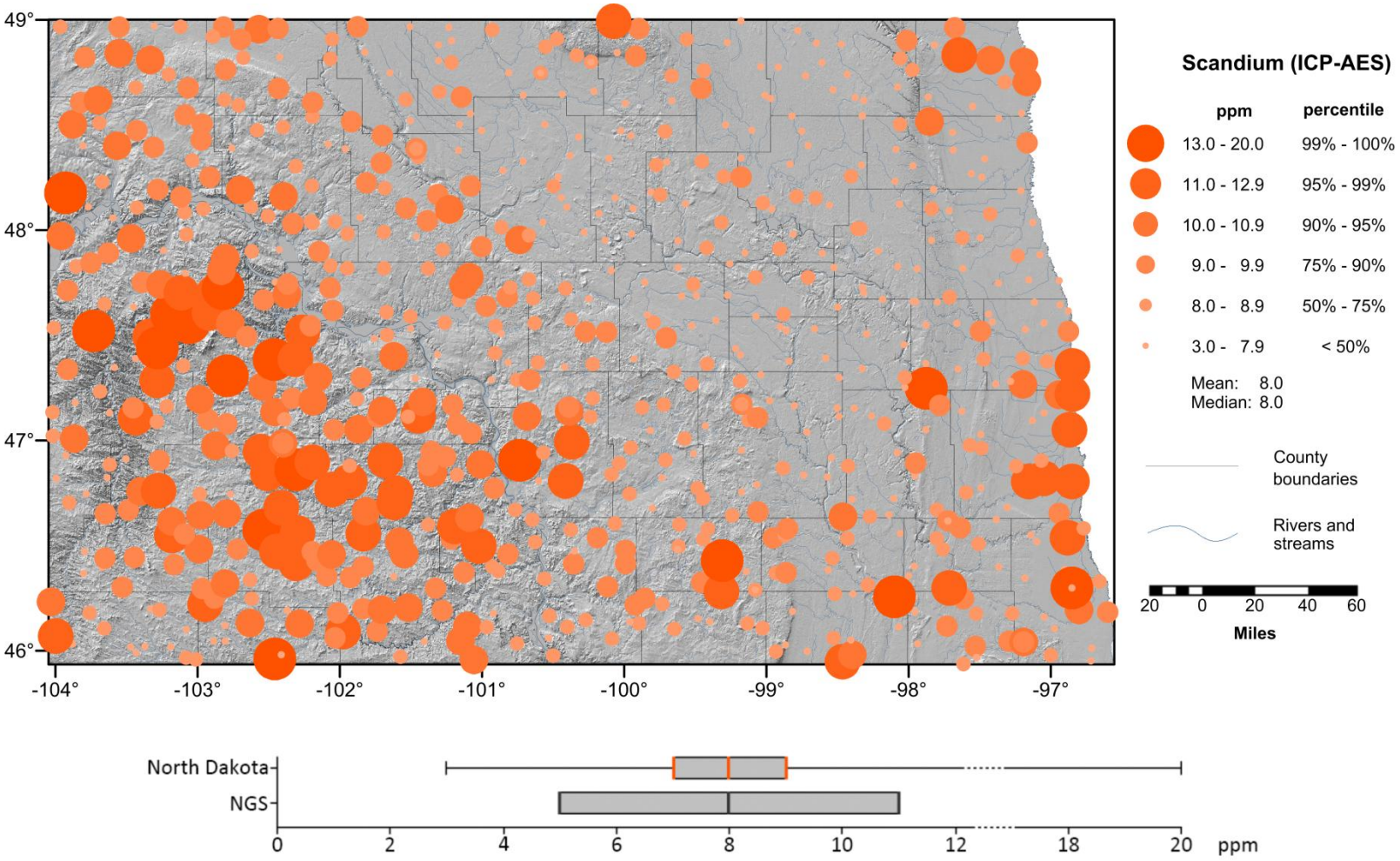
NGS Database	n	Minimum	25th %	Median	75th %	Maximum
	71562	2	10	18	27	15800

Figure 28. *Mean total nickel (Ni) in surface and principal horizons of North Dakota soils*



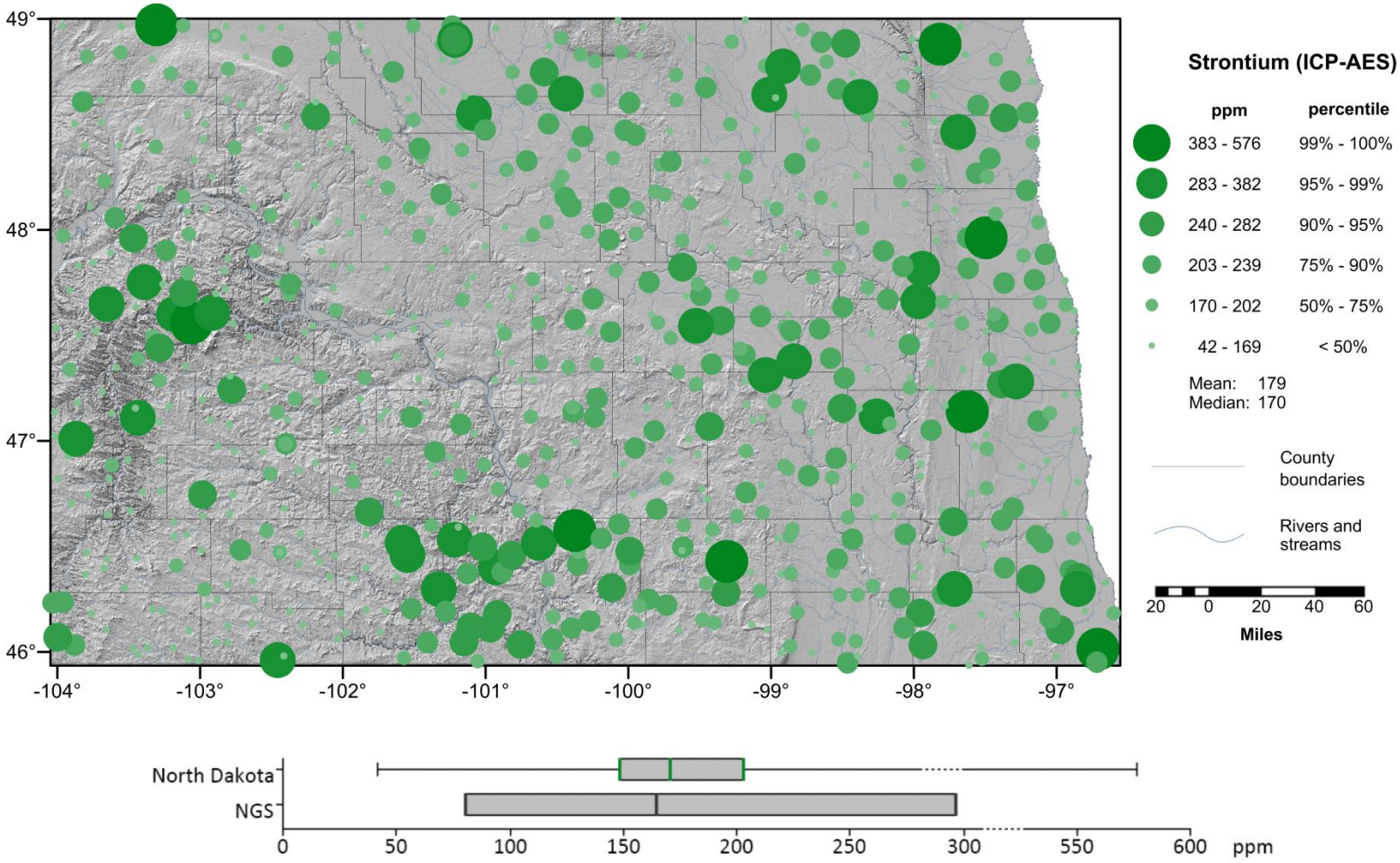
NGS Database	n	Minimum	25th %	Median	75th %	Maximum
	71562	4	12	17	24	33410

Figure 29. *Mean total lead (Pb) in surface and principal horizons of North Dakota soils*



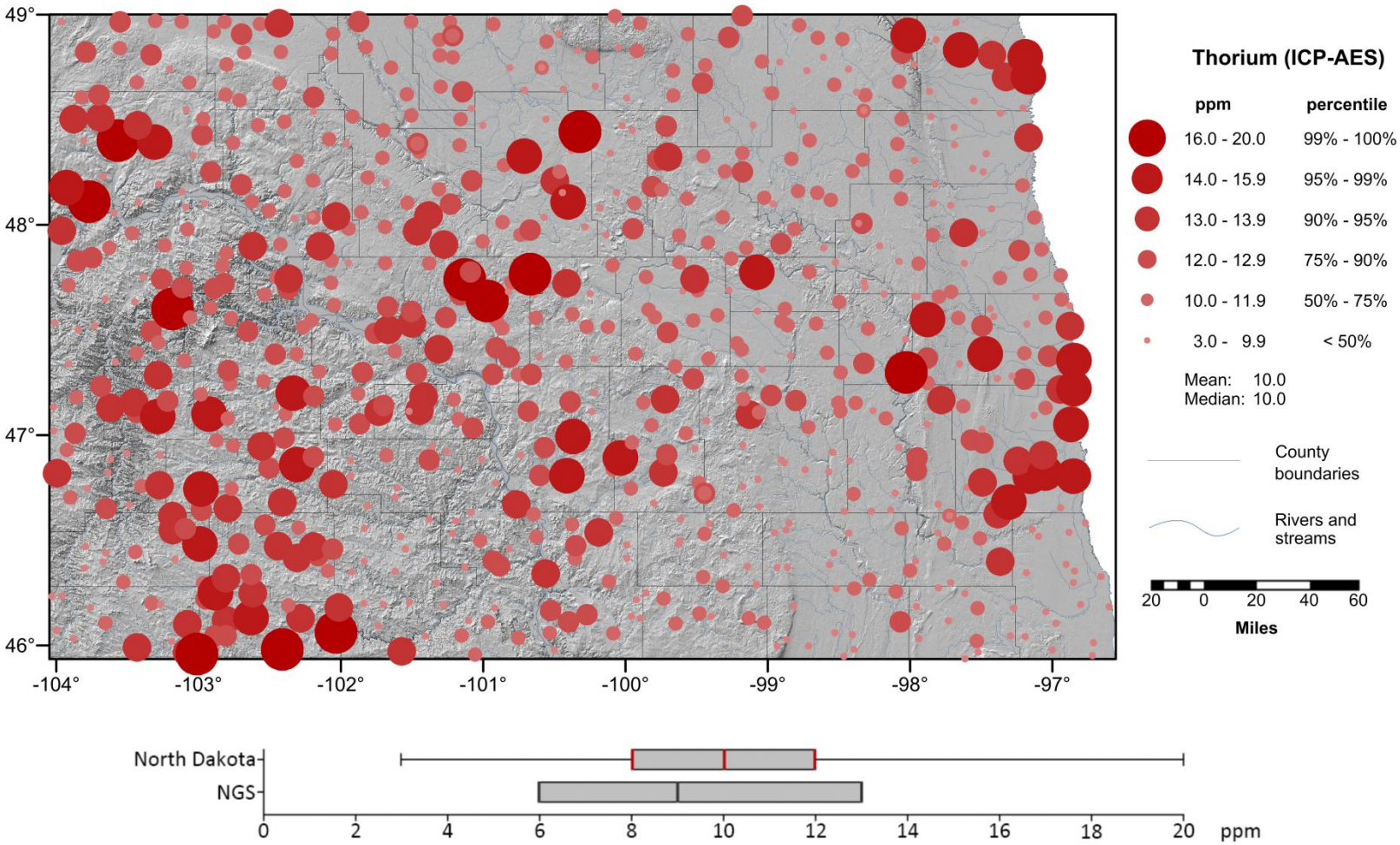
NGS Database	n	Minimum	25th %	Median	75th %	Maximum
	71562	1	5	8	11	100

Figure 30. *Mean total scandium (Sc) in surface and principal horizons of North Dakota soils*



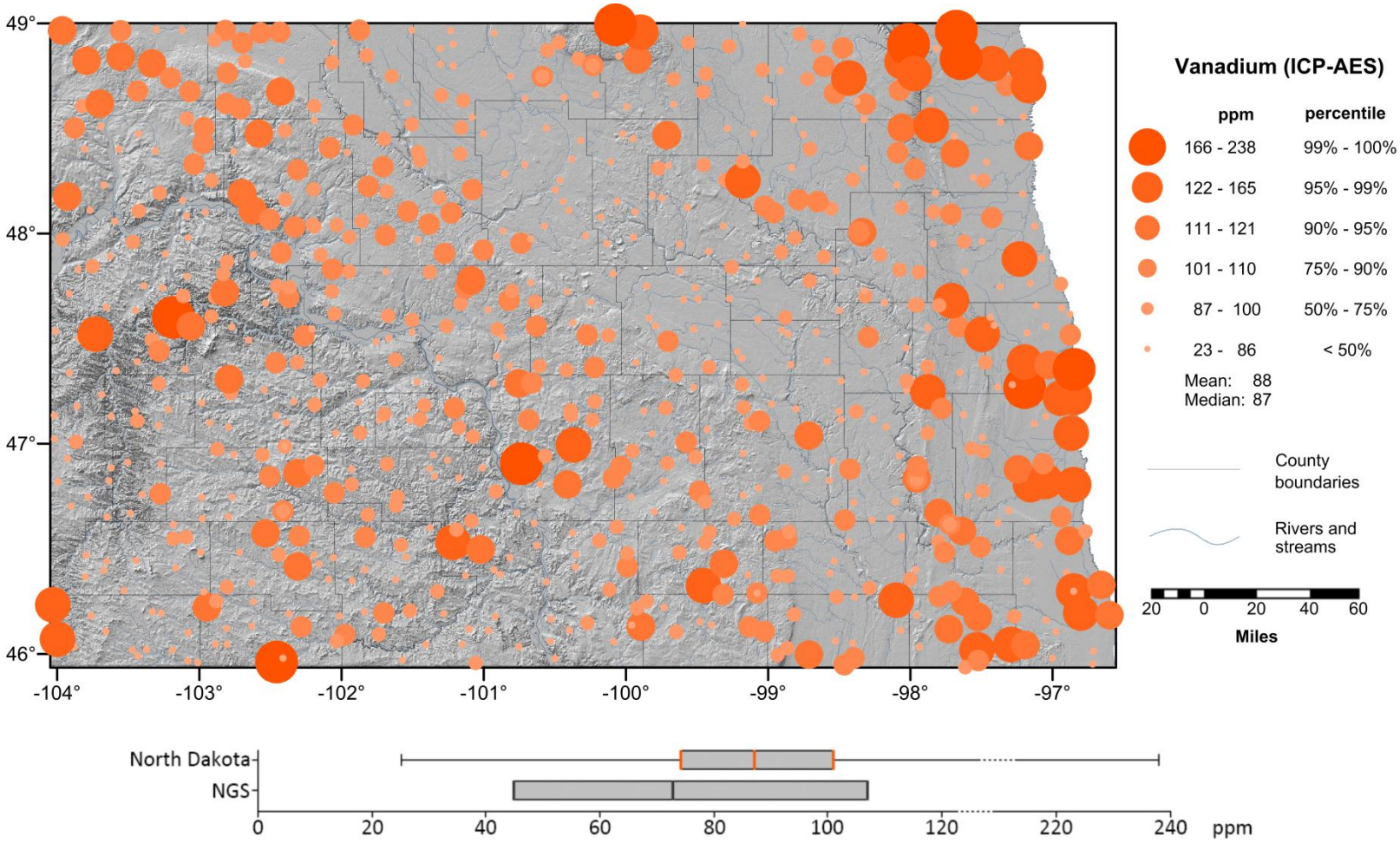
NGS Database	n	Minimum	25th %	Median	75th %	Maximum
	71548	2	81	165	297	7500

Figure 31. *Mean total strontium (Sr) in surface and principal horizons of North Dakota soils*



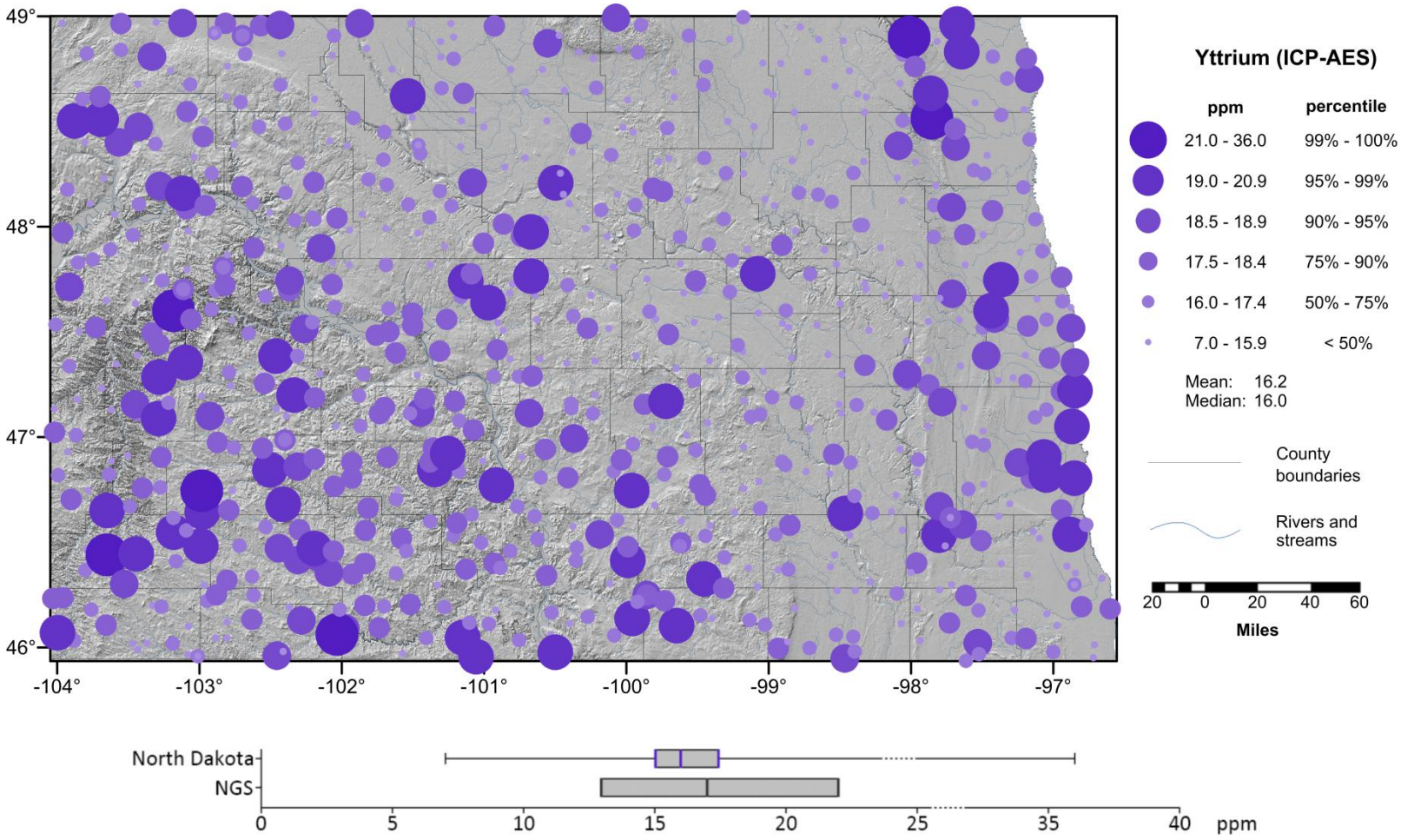
NGS Database	n	Minimum	25th %	Median	75th %	Maximum
	71562	2	6	9	13	1180

Figure 32. *Mean total thorium (Th) in surface and principal horizons of North Dakota soils*



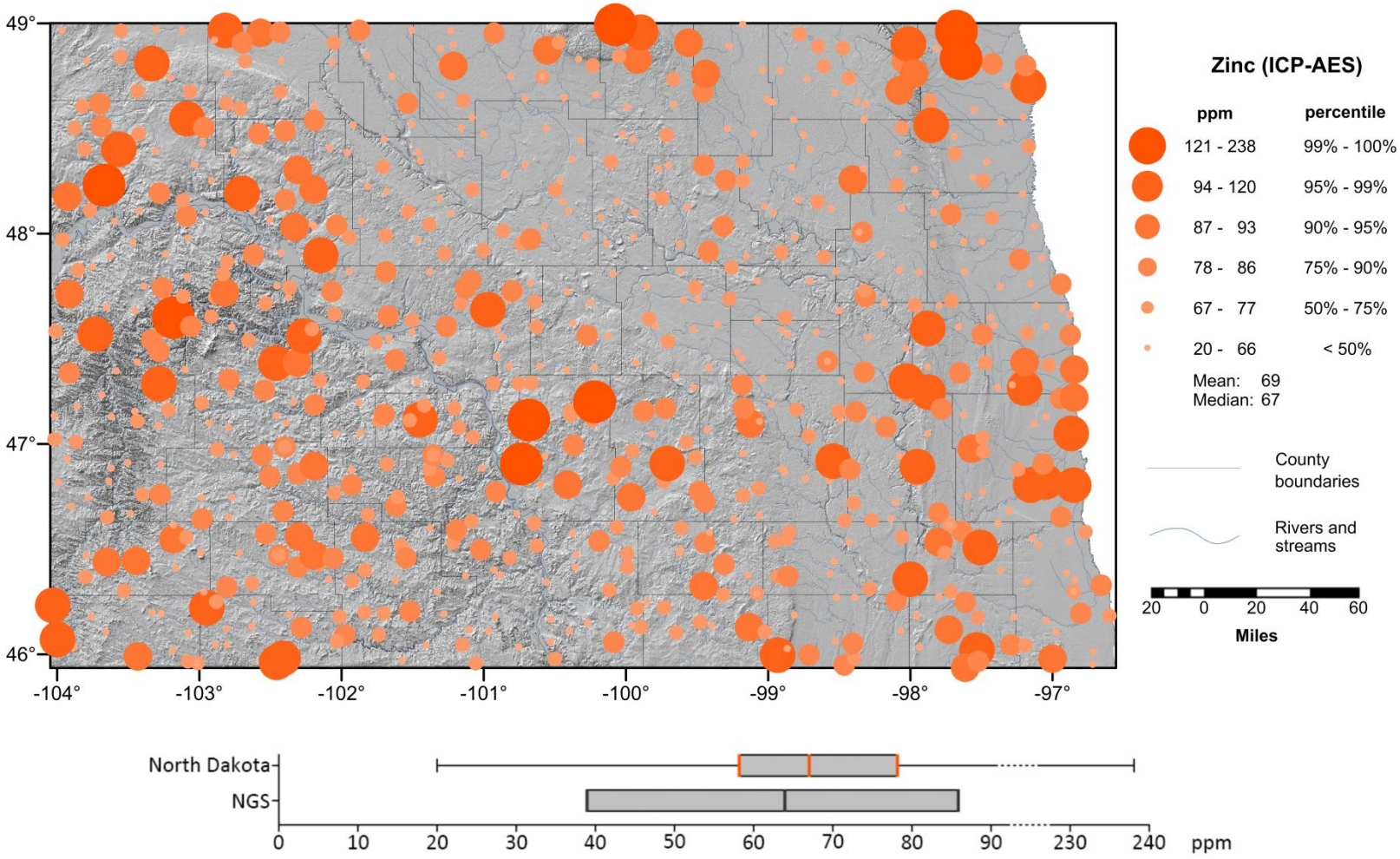
NGS Database	n	Minimum	25th %	Median	75th %	Maximum
	71560	2	45	73	107	3440

Figure 33. *Mean total vanadium (V) in surface and principal horizons of North Dakota soils*



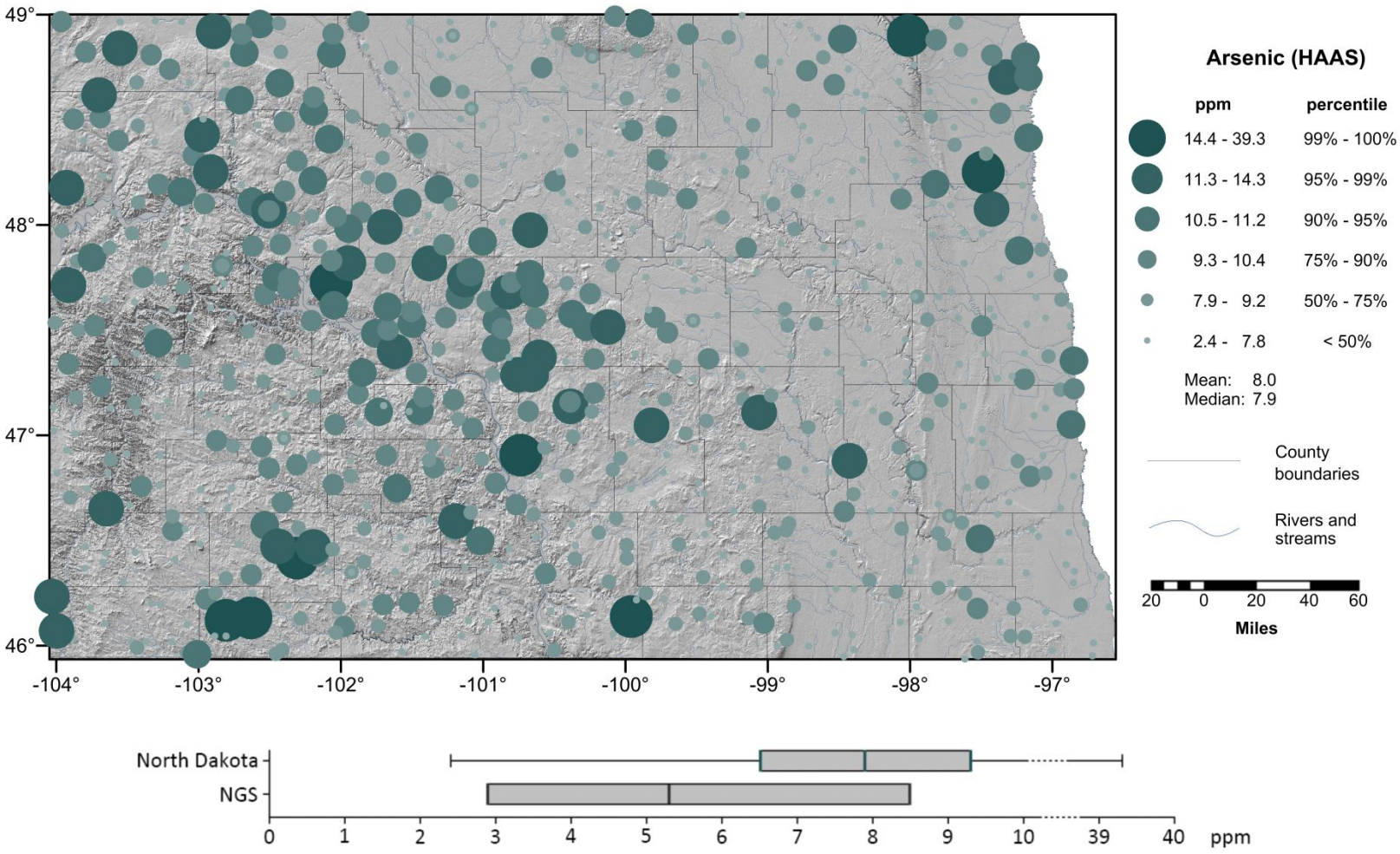
NGS Database	n	Minimum	25th %	Median	75th %	Maximum
	71560	2	13	17	22	816

Figure 34. *Mean total Yttrium (Y) in surface and principal horizons of North Dakota soils*



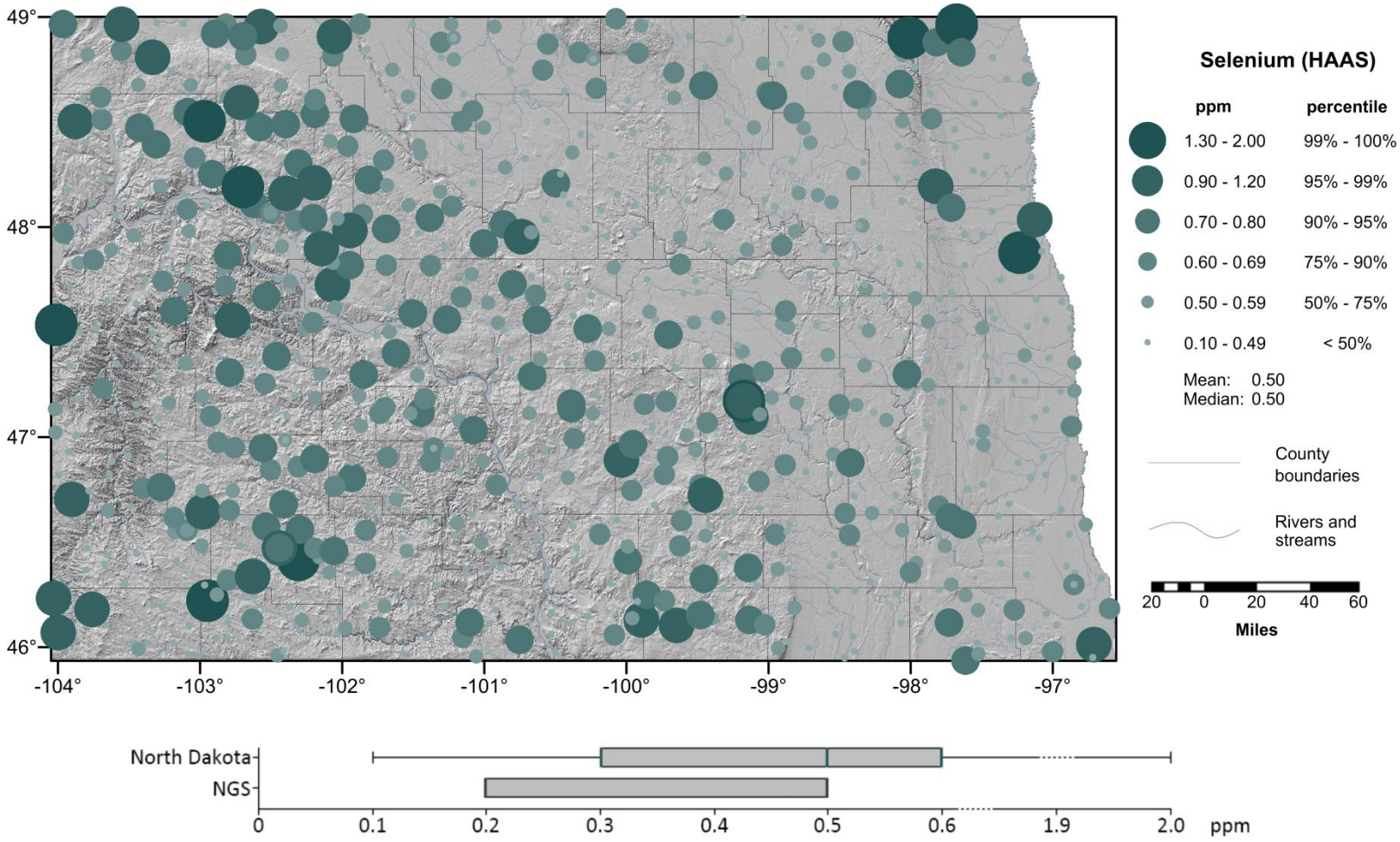
NGS Database	n	Minimum	25th %	Median	75th %	Maximum
	71558	2	39	64	86	27040

Figure 35. *Mean total zinc (Zn) in surface and principal horizons of North Dakota soils*



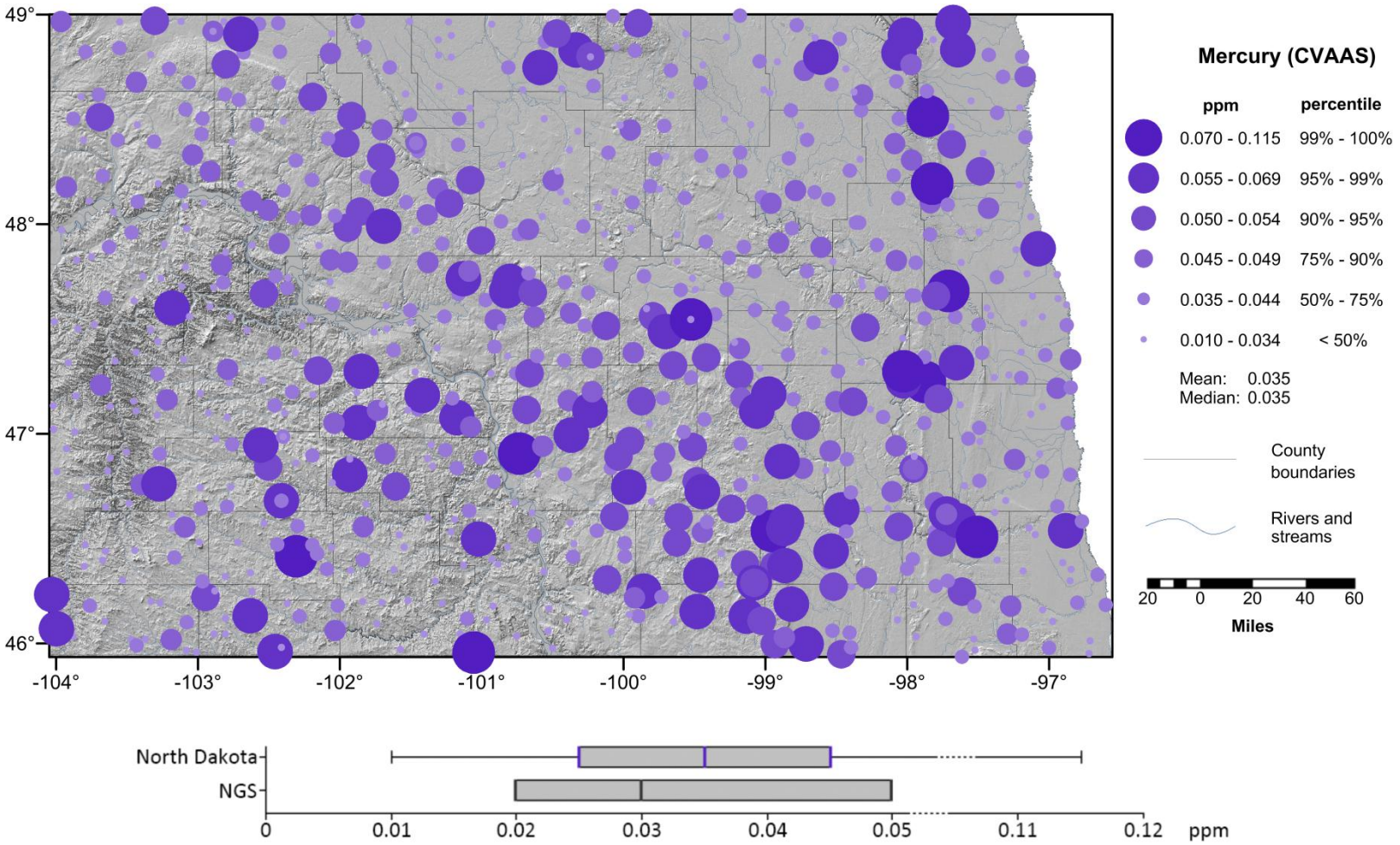
NGS Database	n	Minimum	25th %	Median	75th %	Maximum
	58981	0.6	2.9	5.3	8.5	4910

Figure 36. *Mean total arsenic (As) in surface and principal horizons of North Dakota soils*



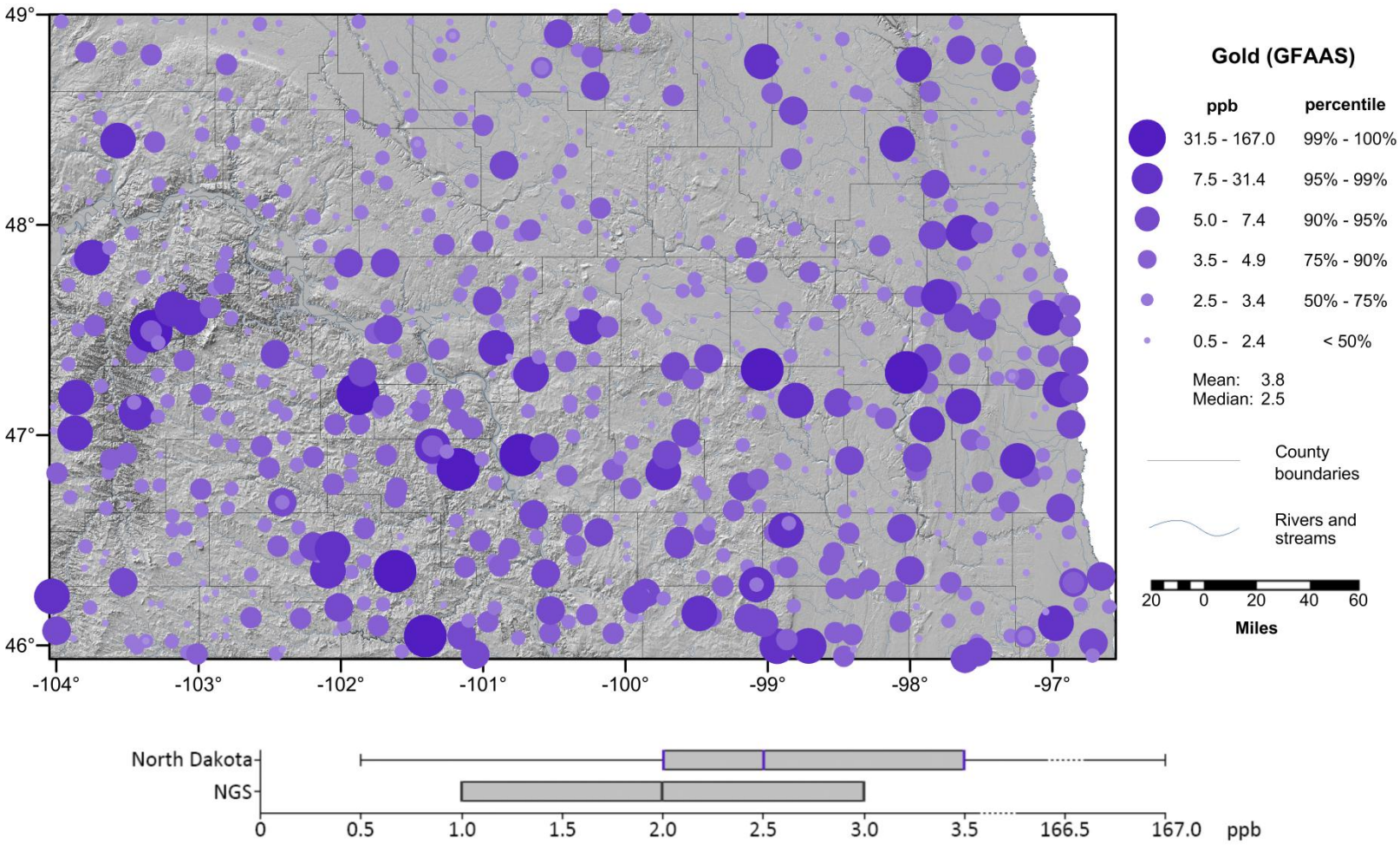
NGS Database	n	Minimum	25th %	Median	75th %	Maximum
	53049	0.1	0.2	0.2	0.5	223

Figure 37. *Mean total selenium (Se) in surface and principal horizons of North Dakota soils*



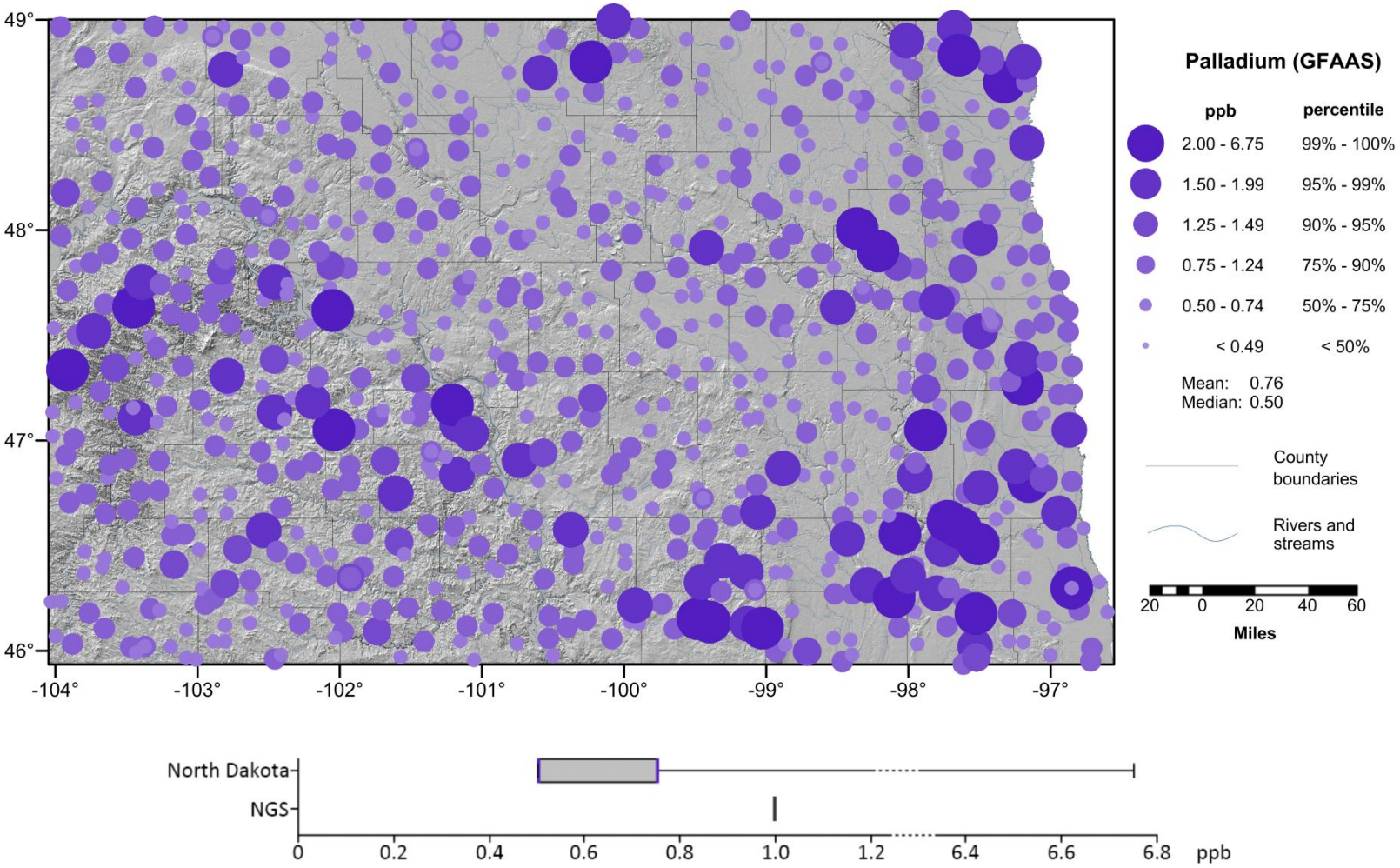
NGS Database	n	Minimum	25th %	Median	75th %	Maximum
	54302	0.01	0.02	0.03	0.05	199

Figure 38. *Mean total mercury (Hg) in surface and principal horizons of North Dakota soils*



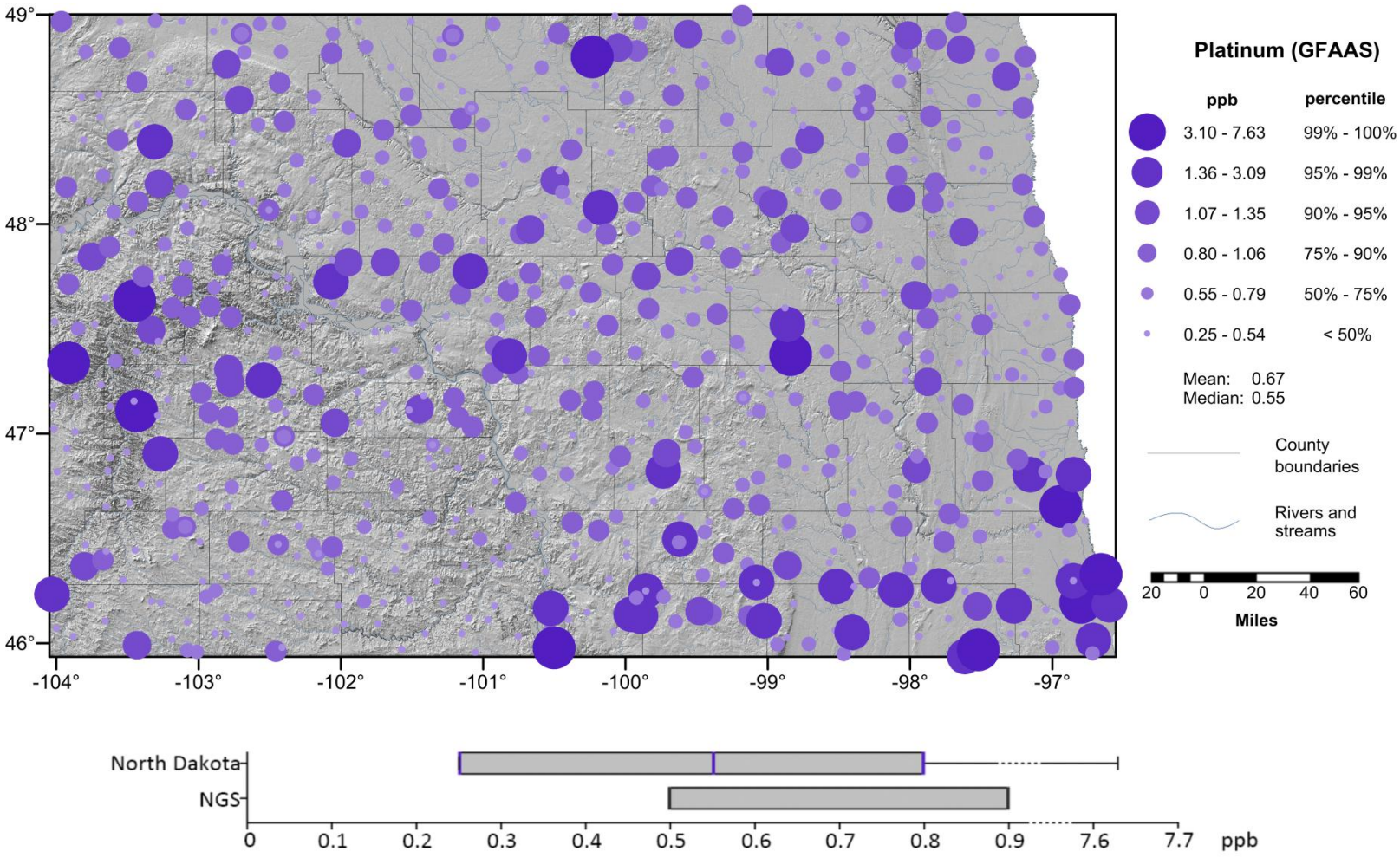
NGS Database	n	Minimum	25th %	Median	75th %	Maximum
	31514	0.002	1	2	3	46000

Figure 39. *Mean total gold (Au) in surface and principal horizons of North Dakota soils*



NGS Database	n	Minimum	25th %	Median	75th %	Maximum
	13792	1	1	1	1	34

Figure 40. *Mean total palladium (Pd) in surface and principal horizons of North Dakota soils*



NGS Database	n	Minimum	25th %	Median	75th %	Maximum
	12398	0.5	0.5	0.5	0.9	249

Figure 41. *Mean total platinum (Pt) in surface and principal horizons of North Dakota soils*

References

Bluemle, J.P., 1983, Geologic and topographic bedrock map of North Dakota: North Dakota Geological Survey Miscellaneous Map 25.

Bluemle, J.P. 1989, Geology of Renville and Ward Counties, North Dakota: North Dakota Geological Survey Bulletin 50, pt. 1, and North Dakota State Water Commission County Groundwater Studies 11, pt. 1, 62 p., 1 pl.

Boerngen, J.G., and Shacklette, H.T., 1981, Chemical analysis of soils and other surficial materials of the conterminous United States: United States Geological Survey Open-File Report 81-197, 143 p.

Burt, R., Wilson, M.A., Mays, M.D., and Lee, C.W., 2003, Major and trace elements of selected pedons in the USA: Journal of Environmental Quality, v. 32, p. 2109-2121.

Clayton, Lee, Moran, S.R., Bluemle, J.P., 1980, Explanatory text to accompany the Geologic Map of North Dakota: North Dakota Geological Survey Report of Investigation 69, 93 p.

Clayton, Lee, assisted by Moran, S.R., Bluemle, J.P., and Carlson, C.G., 1980, Geologic map of North Dakota: U.S. Geological Survey.

Franzen, D.W., Nanna, T., and Norvell, W.A., 2006, A survey of soil attributes in North Dakota by landscape position: Agronomy Journal, v. 98, no. 4, p. 1015-1022.

Garrett, R.G., 1994, The distribution of cadmium in A horizon soils in the prairies of Canada and adjoining United States, *in* Current Research 1994-B: Calgary, Alberta, Canada Geological Survey, p. 73-82.

Gough, L.P., 1984, Regional investigations of soil and overburden analysis and plant uptake of metals: Environmental Geochemistry and Health, v. 6, no. 3, p. 105-110.

Gustavson, N., Bølviken, B., Smith, D.B., and Severson, R.C., 2001, Geochemical landscapes of the conterminous United States – new map presentations for 22 elements: United States Geological Survey Professional Paper 1648, 38p.

Haluschak, P.W., Eilers, R.G., Mills, G.F., and Grift, S., 1998, Status of selected trace elements in agricultural soils of southern Manitoba: Technical Report 1998-6E, Land Resource Unit, Brandon Research Center, Research Branch, Agriculture and Agri-Food Canada, 71 p.

Holmgren, G.G.S., Meyer, M.W., Chaney, R.L., and Daniels, R.B., 1993, Cadmium, lead, zinc, copper, and nickel in agricultural soils of the United States of America: Journal of Environmental Quality, v. 22, p. 335-348.

Hopkins, D.G., and Norvell, W.A., 2000, Geochemical evaluation of the Dahlen and Hansboro Formations in northeastern North Dakota: Geological Society of America Abstracts with Programs, v. 32, no. 7, pp. 222, 2000.

Klassen, R.A., 2009, Geological controls on soil parent material geochemistry along a northern Manitoba–North Dakota transect: Applied Geochemistry, v. 24, no. 8, p. 1382-1393.

L. Lee, M.B. Goldhaber, D.B. Smith, The Geochemical Landscapes Project, *http://minerals.cr.usgs.gov/projects/geochemical_landscapes/index.html*: United States Geological Survey, Denver, Colo. (Version 11 February 2010, retrieved 16 August 2010).

Manz, L.A., 2005, Surface geochemical study of North Dakota - final report for Cooperative Agreement #02ERAG0063: Bismarck, N. Dak., North Dakota Geological Survey.

Martin, D.B. and Hartman, W.A., 1984, Arsenic, cadmium, lead, mercury, and selenium in sediments of riverine and pothole wetlands of the north-central United States: Journal of the Association of Official Analytical Chemists, v. 67, p. 1141-1146.

Murphy, E.C., Nordeng, S.H., Juenker, B.J., and Hoganson, J.W., 2009, North Dakota stratigraphic column: North Dakota Geological Survey Miscellaneous Series 91.

Schoeneberger, P.J. and Wysocki, D.A., Benham, E.C., and Broderson, W.D., eds., 2002, Field Book for Describing and sampling Soils (ver. 2.0): [Lincoln, Neb.], Natural Resources Conservation Service, National Soil Survey Center, [212] p.

Severson, R.C. and Wilson, S.A., 1990, Assessment of geochemical variability and a listing of geochemical data for surface soils of eastern North Dakota and parts of northeastern South Dakota and northwestern Minnesota: United States Geological Survey Open File Report 90-310, 58 p.

Shacklette, H.T., and Boerngen, J.G., 1984, Element concentrations in soils and other surficial materials of the conterminous United States: United States Geological Survey Professional Paper 1270, 105 p.

Smith, D.B., Goldhaber, M.B., Wilson, M.A., Burt, R., and Helmke, P.A., 2003, A proposed continental-scale soil geochemical survey of North America: Annual Meetings Abstracts, American Society of Agronomy, Crop Science Society of America, Soil Science Society of America, 2003 Annual Meetings (CD-ROM).

Smith, D.B., ed., 2009, Geochemical Studies of North American Soils: Results from the Pilot Study Phase of the North American Soil Geochemical Landscapes Project: Applied Geochemistry, v. 24, no. 8, p. 1355-1616.

Smith, S.M., 2001, National Geochemical Database, Reformatted data from the National Uranium Resource Evaluation (NURE) Hydrogeochemical and Stream Sediment Reconnaissance (HSSR): United States Geological Survey Open-File Report 97-492.

Soil Survey Division Staff, 1993, Soil Survey Manual: U.S.D.A., Soil Conservation Service, Agricultural Handbook No. 18: Washington, D.C., U.S. Government Printing Office.

Thien, S.J., 1979, A flow diagram for teaching texture by feel analysis: Journal of Agronomic Education, v. 8, p. 54-55.

Wilson, M.A., Burt, R., Indorante, S.J., Jenkins, A.B., Chiaretti, J.V., Ulmer, M.G., and Scheyer, J.M., 2008, Geochemistry in the modern soil survey program: Environmental Monitoring and Assessment, v. 139, p. 151-171.

Wu, J., Norvell, W.A., Hopkins, D.G., and Welch, R.M., 2002, Spatial variability of grain cadmium and soil characteristics in a durum wheat field: Soil Science Society of America Journal, v. 66, p. 268-275.

Wu, J., Norvell, W.A., Hopkins, D.G., Smith, D.B., Ulmer, M.G., and Welch, R.M., 2003, Improved prediction and mapping of soil copper by kriging with auxiliary data for cation-exchange capacity: Soil Society of America Journal, v. 67, p. 919-927.

United States Department of Agriculture-Natural Resources Conservation Service, 2006, Land Resource Regions and Major Land Resource Areas of the United States, the Caribbean, and the Pacific Basin: United States Department of Agriculture Handbook 296, Washington, D.C., United States Government Printing Office.

United States Department of Agriculture-Natural Resources Conservation Service, 2009, Soil Geochemistry Spatial Database, *http://soils.usda.gov/survey/geochemistry/index.html* (Version August 2009, retrieved 16 August 2010).

United States Environmental Protection Agency Regions 3, 6, and 9, 2010, Regional Screening Levels for Chemical Contaminants at Superfund Sites, *http://www.epa.gov/reg3hwmd/risk/human/rb-concentration_table/index.htm* (Version May 17, 2010, retrieved September 15, 2010).

United States Geological Survey, 2004, The National Geochemical Survey - database and documentation: U.S. Geological Survey Open-File Report 2004-1001, United States Geological Survey, Reston Va. *http://tin.er.usgs.gov/geochem/* (Version 5.0, 30 September 2008, retrieved 9 July 2009).

Appendix 1
Field data

Key to abbreviations

Refer to table footnotes for sources.

Slope shape

L	Linear
C	Concave
V	Convex

Drainage

P	Poorly drained
SP	Somewhat poorly drained
MW	Moderately well drained
W	Well drained
SE	Somewhat excessively drained
E	Excessively drained

Texture

vgrcos	Very gravelly coarse sand
grcos	Gravelly coarse sand
grs	Gravelly sand
s	Sand
fs	Fine sand
lvcos	Loamy very coarse sand
vgrlcos	Very gravelly loamy coarse sand
lcos	Loamy coarse sand
vgrls	Very gravelly loamy sand
grls	Gravelly loamy sand
ls	Loamy sand
lfs	Loamy fine sand
cosl	Coarse sandy loam
grsl	Gravelly sandy loam
sl	Sandy loam
fsl	Fine sandy loam
vfsl	Very fine sandy loam
vgrl	Very gravelly loam
grl	Gravelly loam
Cnl	Channery loam
l	Loam
sil	Silt loam
vgrscl	Very gravelly sandy clay loam
grscl	Gravelly sandy clay loam
scl	Sandy clay loam
vfscl	Very fine sandy clay loam
grcl	Gravelly clay loam
cl	Clay loam
sicl	Silty clay loam
sic	Silty clay
c	Clay

Table A1.1a. Site description: location and earth cover

Site no.[1]	Collection date	QD250 name[2]	County	Latitude	Longitude	Datum	Land use/Land cover	Contamination	Comments
ABE7	08/18/2004	Aberdeen	Dickey	45.99595	-98.93315	83	WPA[3]/unsp.[4] grasses	Possible - livestock	
ABF7	08/18/2004	Aberdeen	Dickey	45.99683	-98.71333	83	CRP[5]/unsp. grasses, alfalfa	Probable - farming	
ABG7	08/20/2004	Aberdeen	Dickey	45.94829	-98.46569	83	CRP unsp. /grasses, clover	Probable - farming	
ABH7	08/20/2004	Aberdeen	Dickey	45.98084	-98.39644	83	CRP/unsp. grasses, alfalfa	Probable - farming	
BSA1	09/19/2003	Bismarck	Grant	46.09133	-101.97671	83	CRP/tame grasses	Possible - farming	
BSA2	09/04/2003	Bismarck	Grant	46.19982	-101.83729	83	Cropland/small grains	Possible - farming	
BSA3	09/04/2003	Bismarck	Grant	46.39920	-101.83655	83	Hayland/unsp. grasses	Possible - farming, livestock	
BSA3 AOV1	09/04/2003	Bismarck	Grant	46.34843	-101.92475	83	Cropland/small grains	Possible - farming	
BSA3 AOV2	09/04/2003	Bismarck	Grant	46.34840	-101.92477	83	Cropland/small grains	Possible - farming	
BSA4	10/28/2003	Bismarck	Grant	46.55614	-101.83545	83	Cropland/small grains	Possible - farming, livestock	
BSA5	10/28/2003	Bismarck	Grant	46.66260	-101.81476	83	CRP/unsp. grasses, alfalfa	Possible - farming	
BSA6	07/29/2003	Bismarck	Morton	46.80597	-101.92978	83	Pasture/mixed grasses	Possible - livestock	
BSA7	11/19/2003	Bismarck	Morton	46.87952	-101.93037	83	Cropland/row crops	Possible - farming	
BSB1	10/02/2003	Bismarck	Grant	46.09296	-101.73708	83	Cropland/small grains	Possible - farming	
BSB2	09/04/2003	Bismarck	Grant	46.19494	-101.70311	83	Hayland/alfalfa	Possible - farming	
BSB3	09/04/2003	Bismarck	Grant	46.35235	-101.61915	83	Cropland/small grains	Possible - farming	
BSB4	10/28/2003	Bismarck	Grant	46.51754	-101.58218	83	Pasture/mixed grasses	Possible - livestock	
BSB5	10/28/2003	Bismarck	Morton	46.70507	-101.61810	83	CRP/unsp. grasses, alfalfa	Possible - farming	
BSB6	10/28/2003	Bismarck	Morton	46.74816	-101.60623	83	Cropland/small grains	Possible - farming, livestock	
BSB7	11/19/2003	Bismarck	Morton	46.90384	-101.68098	83	CRP/unsp. grasses	Possible - farming	
BSC1	10/03/2003	Bismarck	Sioux	46.04445	-101.40731	83	Rangeland/native grasses and forbs	Possible - livestock	
BSC2	10/02/2003	Bismarck	Grant	46.20469	-101.51878	83	Pasture/tame grasses	Possible - farming, livestock	
BSC3	10/02/2003	Bismarck	Grant	46.29729	-101.32756	83	CRP/tame grasses	Possible - farming	
BSC4	04/28/2004	Bismarck	Grant	46.45889	-101.54624	83	Rangeland/native grasses and forbs	Possible - livestock	
BSC5	04/28/2004	Bismarck	Grant	46.60001	-101.37796	83	Cropland/row crops	Possible - farming	
BSC6	09/18/2003	Bismarck	Morton	46.84536	-101.34624	83	Hayland/mixed grasses	Possible - farming	
BSC7	09/18/2003	Bismarck	Morton	46.88181	-101.38129	83	Hayland/mixed grasses	Possible - farming	
BSC7 AOV1	09/18/2003	Bismarck	Morton	46.94724	-101.35614	83	Cropland/small grains	Possible - farming	
BSC7 AOV2	09/18/2003	Bismarck	Morton	46.94725	-101.35612	83	Cropland/small grains	Possible - farming	
BSD1	10/03/2003	Bismarck	Sioux	46.04634	-101.15113	83	Hayland/alfalfa	Possible - farming, livestock	
BSD2	10/02/2003	Bismarck	Grant	46.19132	-101.28068	83	Hayland/alfalfa	Possible - farming, livestock	
BSD3	10/02/2003	Bismarck	Morton	46.37261	-101.12749	83	CRP/tame grasses	Possible - farming, livestock	
BSD4	04/28/2004	Bismarck	Morton	46.53128	-101.21505	83	Rangeland/native grasses, forbs, sedges	Possible - livestock	
BSD5	11/19/2003	Bismarck	Morton	46.59106	-101.19080	83	CRP/mixed grasses, alfalfa	Possible - farming	
BSD6	09/18/2003	Bismarck	Morton	46.83639	-101.17611	83	Cropland/small grains	Possible - farming, livestock	
BSD7	11/19/2003	Bismarck	Morton	46.92169	-101.25555	83	CRP/mixed grasses	Possible - farming	
BSE1	10/03/2003	Bismarck	Sioux	46.11788	-101.10396	83	Rangeland/native grasses and forbs	Possible - livestock	
BSE2	04/21/2004	Bismarck	Sioux	46.11194	-100.96667	83	Pasture/tame grasses	Possible - farming	
BSE3	04/22/2004	Bismarck	Morton	46.40016	-100.92860	83	CRP/tame grasses	Possible - farming	
BSE4	04/22/2004	Bismarck	Morton	46.49750	-101.02186	83	Rangeland/native grasses and forbs	Possible - farming, livestock	
BSE5	04/28/2004	Bismarck	Morton	46.63237	-101.08690	83	Cropland/row crops	Possible - farming	
BSE7	09/18/2003	Bismarck	Morton	46.88528	-101.00972	83	Rangeland/native grasses and forbs	Possible - livestock	
BSF1	04/21/2004	Bismarck	Sioux	46.03460	-100.75309	83	Rangeland/native grasses	Possible - livestock	
BSF2	04/21/2004	Bismarck	Sioux	46.17750	-100.91889	83	Rangeland/native grasses	Possible - farming, livestock	
BSF3	04/22/2004	Bismarck	Sioux	46.37857	-100.88400	83	Hayland/alfalfa	Possible - farming	
BSF4	04/22/2004	Bismarck	Morton	46.45875	-100.81702	83	Rangeland/native grasses and forbs	Possible - farming, livestock	
BSF5	04/03/2003	Bismarck	Morton	46.66997	-100.76785	83	Hayland/sudangrass	Possible - farming	Loc. outside sample quadrant
BSF6	07/10/2003	Bismarck	Morton	46.77220	-100.91413	83	Rangeland/unsp.	Possible - farming, livestock	Loc. outside sample quadrant
BSF7	07/09/2003	Bismarck	Burleigh	46.90528	-100.73500	83	Cropland/fallow	Possible - farming	
BSG1	04/13/2004	Bismarck	Emmons	46.05993	-100.53152	83	Cropland/row crops	Possible - farming	
BSG2	04/13/2004	Bismarck	Emmons	46.16563	-100.52622	83	CRP/unsp.	Possible - farming	
BSG3	04/21/2004	Bismarck	Sioux	46.34220	-100.56155	83	Rangeland/native grasses	Possible - farming, livestock	
BSG4	04/20/2004	Bismarck	Morton	46.51607	-100.62676	83	Rangeland/native grasses	Possible - livestock	
BSG5	04/20/2004	Bismarck	Morton	46.62286	-100.64561	83	Pasture/unsp. grasses	Possible - livestock, historic site	
BSG6	06/04/2003	Bismarck	Burleigh	46.80785	-100.60208	83	Cropland/tame grasses	Possible - farming, hunting	

Table A1.1a. Site description: location and earth cover (continued)

Site no.[1]	Collection date	QD250 name[2]	County	Latitude	Longitude	Datum	Land use/Land cover	Contamination	Comments
BSG7	04/29/2004	Bismarck	Burleigh	46.94127	-100.57006	83	Rangeland/native grasses	Possible - farming, livestock	
BSH1	04/13/2004	Bismarck	Emmons	46.11265	-100.39988	83	Cropland/small grains	Possible - farming	
BSH2	04/13/2004	Bismarck	Emmons	46.14630	-100.27072	83	CRP/unsp.	Possible - farming	
BSH3	04/14/2004	Bismarck	Emmons	46.41338	-100.35683	83	Rangeland/unsp.	Possible - livestock	
BSH4	04/14/2004	Bismarck	Emmons	46.47390	-100.34912	83	Cropland/small grains	Possible - farming	
BSH5	04/14/2004	Bismarck	Emmons	46.57473	-100.37513	83	Cropland/small grains	Possible - farming	Loc. outside sample quadrant
BSH6	06/04/2003	Bismarck	Burleigh	46.80679	-100.41250	83	Cropland/tame grasses	Possible - farming, hunting	
BSH7	04/29/2004	Bismarck	Burleigh	46.99350	-100.36913	83	Rangeland/native grasses	Possible - farming, livestock	
BSI1	04/13/2004	Bismarck	Emmons	46.05745	-100.08508	83	Cropland/small grains	Possible - farming	
BSI2	04/13/2004	Bismarck	Emmons	46.18800	-100.16998	83	CRP/unsp.	Possible - farming	
BSI3	04/13/2004	Bismarck	Emmons	46.30472	-100.11637	83	Rangeland/unsp.	Possible - livestock	
BSI4	04/14/2004	Bismarck	Emmons	46.53777	-100.18878	83	Cropland/small grains	Possible - farming	
BSI5	04/14/2004	Bismarck	Emmons	46.60525	-100.06437	83	CRP/unsp.	Possible - farming	
BSI6	04/14/2004	Bismarck	Burleigh	46.83692	-100.08888	83	Cropland/small grains	Possible - farming	
BSI7	04/14/2004	Bismarck	Kidder	46.89167	-100.03567	83	CRP/unsp.	Possible - farming	
DKA1	09/17/2003	Dickinson	Bowman	46.03241	-103.88054	83	Rangeland/native grasses and forbs	Possible - livestock	
DKA2	06/16/2004	Dickinson	Bowman	46.23579	-103.95872	83	Rangeland/native grasses, forbs, sedges	Possible - livestock	
DKA3	05/19/2004	Dickinson	Slope	46.36733	-103.80217	83	Rangeland/native grasses	Possible - livestock	U.S. Forest Service land
DKA4	05/19/2004	Dickinson	Slope	46.47039	-103.79444	83	Rangeland/native grasses, club moss	Possible - livestock	U.S. Forest Service land
DKA5	07/16/2003	Dickinson	Golden Valley	46.70366	-103.90297	83	Cropland/small grains	Possible - farming	
DKA6	07/16/2003	Dickinson	Golden Valley	46.74622	-103.78351	83	Hayland/native grasses and forbs	Possible - farming	
DKA7	07/16/2003	Dickinson	Golden Valley	46.92937	-103.92620	83	Cropland/small grains	Possible - farming	
DKB1	09/17/2003	Dickinson	Bowman	46.10630	-103.65553	83	Cropland/small grains	Possible - farming	
DKB2	06/16/2004	Dickinson	Bowman	46.18003	-103.76110	83	Pasture/mixed grasses and forbs	Possible - livestock	
DKB3	05/19/2004	Dickinson	Slope	46.39689	-103.67208	83	Rangeland/native grasses	Possible - livestock	U.S. Forest Service land
DKB4	05/19/2004	Dickinson	Slope	46.43964	-103.65031	83	Hayland/tame grasses	Possible - livestock	U.S. Forest Service land
DKB5	07/16/2003	Dickinson	Golden Valley	46.65121	-103.64998	83	Rangeland/native grasses and forbs	Possible - livestock	U.S. Forest Service land
DKB6	07/16/2003	Dickinson	Golden Valley	46.82222	-103.63611	83	Rangeland/native grasses and forbs	None	U.S. Forest Service land
DKB7	08/05/2003	Dickinson	Golden Valley	46.88485	-103.61869	83	Rangeland/native grasses	Possible - livestock	U.S. Forest Service land
DKC1	09/16/2003	Dickinson	Bowman	46.01840	-103.47156	83	Cropland/small grains	Possible - farming	
DKC1 AOV1	09/16/2003	Dickinson	Bowman	46.02077	-103.37064	83	Cropland/row crops	Possible - farming, oil field	
DKC1 AOV2	09/16/2003	Dickinson	Bowman	46.02076	-103.37070	83	Cropland/row crops	Possible - farming, oil field	
DKC2	08/05/2003	Dickinson	Bowman	46.20006	-103.33010	83	Hayland/alfalfa	Possible - farming	
DKC3	08/05/2003	Dickinson	Slope	46.30133	-103.53012	83	Pasture/tame grasses	Possible - livestock	U.S. Forest Service land
DKC4	07/09/2003	Dickinson	Slope	46.44425	-103.44502	83	Rangeland/native grasses and forbs	Possible - livestock	U.S. Forest Service land
DKC5	07/09/2003	Dickinson	Billings	46.66920	-103.48686	83	Rangeland/native grasses	Possible - livestock	U.S. Forest Service land
DKC6	08/05/2003	Dickinson	Billings	46.75801	-103.40213	83	Hayland/tame grasses	Possible - farming	U.S. Forest Service land
DKC7	08/05/2003	Dickinson	Billings	46.91226	-103.50326	83	Rangeland/native grasses	Possible - farming	
DKD1	09/17/2003	Dickinson	Bowman	46.01826	-103.18839	83	Rangeland/native grasses and forbs	Possible - farming	
DKD2	08/05/2003	Dickinson	Bowman	46.19375	-103.26743	83	Cropland/fallow	Possible - farming	
DKD3	07/09/2003	Dickinson	Slope	46.40963	-103.16628	83	Cropland/small grains	Possible - farming	
DKD4	05/27/2003	Dickinson	Slope	46.54818	-103.18093	83	Rangeland/native grasses	Possible - livestock	
DKD5	06/03/2003	Dickinson	Slope	46.61531	-103.18250	83	Rangeland/native grasses	Possible - livestock	
DKD6	06/03/2003	Dickinson	Billings	46.76134	-103.27570	83	Rangeland/native grasses	Possible - livestock	
DKD7	08/05/2003	Dickinson	Billings	46.90386	-103.27010	83	Rangeland/native grasses	Possible - livestock	U.S. Forest Service land
DKE1	09/17/2003	Dickinson	Bowman	46.10083	-103.07889	83	Cropland/small grains	Possible - farming	
DKE2	08/05/2003	Dickinson	Adams	46.22120	-102.94787	83	Hayland/tame grasses	Possible - farming	
DKE3	08/05/2003	Dickinson	Slope	46.29580	-102.96884	83	Wildlife habitat/mixed grasses	None	Cedar Lake WMA
DKE4	06/03/2003	Dickinson	Slope	46.48284	-102.99108	83	Rangeland/native grasses	Possible - livestock	
DKE4 AOV1	06/03/2003	Dickinson	Slope	46.55552	-103.09365	83	Rangeland/native grasses	Possible - livestock	
DKE4 AOV2	06/03/2003	Dickinson	Slope	46.55559	-103.09369	83	Rangeland/native grasses	Possible - livestock	
DKE5	05/21/2003	Dickinson	Stark	46.64360	-102.98005	83	Rangeland/native grasses	Possible - livestock	
DKE6	05/21/2003	Dickinson	Stark	46.74437	-102.98295	83	CRP/tame grasses, alfalfa	Possible - farming	
DKE7	05/21/2003	Dickinson	Stark	46.97438	-102.87463	83	Hayland/tame grasses, alfalfa	Possible - farming	
DKF1	09/18/2003	Dickinson	Adams	46.12080	-102.80727	83	Cropland/small grains	Possible - farming, livestock	
DKF1 AOV1	09/18/2003	Dickinson	Adams	46.04543	-102.88590	83	Rangeland/native grasses and forbs	Possible - livestock	
DKF1 AOV2	09/18/2003	Dickinson	Adams	46.04541	-102.80727	83	Rangeland/native grasses and forbs	Possible - livestock	

Table A1.1a. Site description: location and earth cover (continued)

Site no.[1]	Collection date	QD250 name[2]	County	Latitude	Longitude	Datum	Land use/Land cover	Contamination	Comments
DKF2	07/09/2003	Dickinson	Adams	46.25056	-102.88171	83	Rangeland/native grasses	Possible - livestock	
DKF3	07/09/2003	Dickinson	Hettinger	46.31919	-102.80746	83	Cropland/fallow	Possible - farming	
DKF4	07/01/2003	Dickinson	Hettinger	46.48291	-102.71821	83	Pasture/tame grasses	Possible - livestock	
DKF5	05/21/2003	Dickinson	Stark	46.65265	-102.79535	83	CRP/native grasses, alfalfa, clover	Possible - farming	
DKF6	05/21/2003	Dickinson	Stark	46.74515	-102.76832	83	Rangeland/native grasses	Possible - livestock	
DKF7	05/01/2003	Dickinson	Stark	46.95024	-102.75921	83	Cropland/small grains	Possible - farming	
DKG1	09/18/2003	Dickinson	Adams	46.13255	-102.63167	83	Rangeland/unsp. grasses	Possible - livestock	
DKG2	07/09/2003	Dickinson	Adams	46.24807	-102.61916	83	Pasture/mixed grasses	Possible - livestock	
DKG3	08/05/2003	Dickinson	Hettinger	46.33706	-102.62968	83	Wildlife habitat/native grasses and forbs	None	Indian Creek WMA
DKG4	06/02/2003	Dickinson	Hettinger	46.47166	-102.44135	83	Rangeland/native grasses	Possible - livestock	
DKG5	07/01/2003	Dickinson	Hettinger	46.57324	-102.53514	83	Cropland/fallow	Possible - farming	
DKG6	07/01/2003	Dickinson	Stark	46.84386	-102.50623	83	Hayland/tame grasses, alfalfa	Possible - farming	
DKG7	05/01/2003	Dickinson	Stark	46.94699	-102.55816	83	Rangeland/native grasses	Possible - livestock	
DKH1	09/18/2003	Dickinson	Adams	46.12851	-102.28289	83	Cropland/small grains	Possible - farming, livestock	
DKH2	08/20/2021	Dickinson	Adams	46.19127	-102.36970	83	CRP/mixed grasses, alfalfa	Possible - farming	
DKH3	07/01/2003	Dickinson	Hettinger	46.41578	-102.30739	83	Cropland/row crops	Possible - farming	
DKH4	06/02/2003	Dickinson	Hettinger	46.55975	-102.29764	83	Rangeland/native grasses	Possible - livestock	
DKH4 AOV1	06/02/2003	Dickinson	Hettinger	46.47157	-102.44128	83	Rangeland/native grasses	Possible - livestock	
DKH4 AOV2	06/02/2003	Dickinson	Hettinger	46.47185	-102.44135	83	Rangeland/native grasses	Possible - livestock	
DKH5	06/02/2003	Dickinson	Stark	46.68024	-102.41190	83	Rangeland/native grasses	Possible - livestock	
DKH6	05/07/2003	Dickinson	Stark	46.85972	-102.30917	83	Cropland/small grains	Possible - farming	
DKH7	05/07/2003	Dickinson	Stark	46.98646	-102.39970	83	Rangeland/native grasses	Possible - livestock	
DKI1	09/19/2003	Dickinson	Adams	46.06159	-102.03390	83	CRP/tame grasses	Possible - farming	
DKI2	07/09/2003	Dickinson	Adams	46.17963	-102.01455	83	Pasture/mixed grasses	Possible - livestock	
DKI3	05/22/2003	Dickinson	Hettinger	46.35533	-102.09119	83	Rangeland/native grasses	Possible - livestock	
DKI3 AOV1	05/22/2003	Dickinson	Hettinger	46.42802	-102.16023	83	Rangeland/native grasses	Possible - livestock	
DKI3 AOV2	05/22/2003	Dickinson	Hettinger	46.42794	-102.16019	83	Rangeland/native grasses	Possible - livestock	
DKI4	05/22/2003	Dickinson	Hettinger	46.47014	-102.19402	83	Rangeland/native grasses	Possible - livestock	
DKI4 AOV1	05/22/2003	Dickinson	Hettinger	46.45770	-102.05903	83	Rangeland/native grasses	Possible - livestock	
DKI4 AOV2	05/22/2003	Dickinson	Hettinger	46.45773	-102.05894	83	Rangeland/native grasses	Possible - livestock	
DKI5	06/02/2003	Dickinson	Stark	46.68010	-102.41153	83	Rangeland/native grasses	Possible - livestock	
DKI6	05/07/2003	Dickinson	Morton	46.76631	-102.05375	83	Rangeland/native grasses	Possible - livestock	
DKI7	05/07/2003	Dickinson	Stark	46.89569	-102.19329	83	CRP/tame grasses, alfalfa	Possible - farming	
DKI7 AOV1	05/07/2003	Dickinson	Stark	46.98631	-102.39982	83	Cropland/small grains	Possible - farming, livestock	
DKI7 AOV2	05/07/2003	Dickinson	Stark	46.98631	-102.39982	83	Cropland/small grains	Possible - farming, livestock	
DLA1	05/21/2003	Devils Lake	Pierce	48.10315	-99.93639	83	Cropland/small grains	Possible - farming	
DLA2	05/21/2003	Devils Lake	Benson	48.18201	-99.81119	83	Cropland/small grains	Possible - farming	
DLA3	05/21/2003	Devils Lake	Benson	48.30964	-99.77353	83	Cropland/small grains	Possible - farming	
DLA4	05/29/2003	Devils Lake	Pierce	48.45000	-99.95167	83	Cropland/small grains	Possible - farming	
DLA5	05/29/2003	Devils Lake	Rolette	48.60233	-99.99158	83	Cropland/row crops	Possible - farming	
DLA6	05/21/2003	Devils Lake	Rolette	48.82776	-99.91865	83	Trees/aspen woods	Possible - livestock	
DLA7	05/21/2003	Devils Lake	Rolette	48.95849	-99.89738	83	Trees/aspen woods	Possible - hunting	
DLB1	05/20/2003	Devils Lake	Benson	48.12521	-99.56827	83	Pasture/native grasses and forbs	Possible - farming	
DLB2	05/21/2003	Devils Lake	Benson	48.16767	-99.74550	83	Cropland/small grains	Possible - farming	
DLB3	05/21/2003	Devils Lake	Benson	48.32404	-99.70187	83	Cropland/fallow	Possible - farming	
DLB4	05/23/2003	Devils Lake	Pierce	48.46842	-99.71332	83	Cropland/row crops	Possible - farming	
DLB5	05/27/2003	Devils Lake	Rolette	48.61511	-99.66505	83	Cropland/small grains	Possible - farming	
DLB6	05/27/2003	Devils Lake	Rolette	48.73405	-99.66684	83	Cropland/small grains	Possible - farming	
DLB7	05/21/2003	Devils Lake	Rolette	48.90746	-99.56020	83	Cropland/fallow	Possible - farming	
DLC1	05/16/2003	Devils Lake	Benson	48.03601	-99.31691	83	Wildlife habitat/native grasses	Possible - hunting?	
DLC2	05/20/2003	Devils Lake	Benson	48.25412	-99.30155	83	Cropland/small grains	Possible - farming	
DLC3	05/20/2003	Devils Lake	Benson	48.32655	-99.45267	83	Cropland/row crops	Possible - farming	
DLC4	05/14/2003	Devils Lake	Towner	48.49998	-99.28613	83	Cropland/small grains	Possible - farming	
DLC5	05/27/2003	Devils Lake	Towner	48.67363	-99.45863	83	Cropland/small grains	Possible - farming	
DLC6	05/27/2003	Devils Lake	Towner	48.75991	-99.44012	83	Cropland/small grains	Possible - farming	
DLC7	05/23/2003	Devils Lake	Towner	48.89132	-99.27544	83	Cropland/small grains	Possible - farming	
DLD1	05/01/2003	Devils Lake	Ramsey	48.12928	-99.02553	83	Cropland/small grains	Possible - farming	

Table A1.1a. Site description: location and earth cover (continued)

Site no.[1]	Collection date	QD250 name[2]	County	Latitude	Longitude	Datum	Land use/Land cover	Contamination	Comments
DLD2	05/20/2003	Devils Lake	Ramsey	48.25183	-99.17700	83	Cropland/fallow	Possible - farming	
DLD3	05/20/2003	Devils Lake	Ramsey	48.34255	-99.17775	83	Cropland/small grains	Possible - farming	
DLD4	05/22/2003	Devils Lake	Towner	48.47491	-99.10325	83	Cropland/small grains	Possible - farming	
DLD5	05/22/2003	Devils Lake	Towner	48.64084	-99.01183	83	Cropland/row crops	Possible - farming, livestock	
DLD6	05/22/2003	Devils Lake	Towner	48.77737	-99.04130	83	Cropland/small grains	Possible - farming	
DLD7	05/23/2003	Devils Lake	Towner	48.99518	-99.18011	83	Cropland/small grains	Possible - farming	
DLE1	05/01/2003	Devils Lake	Ramsey	48.09910	-98.96034	83	Cropland/fallow	Possible - farming	
DLE2	05/01/2003	Devils Lake	Ramsey	48.16108	-98.78755	83	Cropland/small grains	Possible - farming	
DLE3	04/16/2003	Devils Lake	Ramsey	48.31394	-98.83395	83	Cropland/small grains	Possible - farming	
DLE4	04/16/2003	Devils Lake	Ramsey	48.54228	-98.81976	83	Cropland/small grains	Possible - farming	
DLE5	10/14/2003	Devils Lake	Cavalier	48.62563	-98.96907	83	Wildlife habitat/native grasses and forbs	None	
DLE6	05/22/2003	Devils Lake	Cavalier	48.77485	-98.91653	83	Cropland/unsp.	Possible - farming	
DLE7	05/22/2003	Devils Lake	Cavalier	48.94878	-98.77861	83	Cropland/small grains	Possible - farming	
DLF1	04/29/2003	Devils Lake	Ramsey	48.11852	-98.55652	83	Hayland/unsp.	Possible - farming	
DLF2	04/29/2003	Devils Lake	Ramsey	48.15219	-98.65264	83	Cropland/row crops	Possible - farming	
DLF3	05/01/2003	Devils Lake	Ramsey	48.40198	-98.70682	83	Cropland/unsp.	Possible - farming	
DLF4	05/14/2003	Devils Lake	Ramsey	48.47042	-98.75190	83	Wildlife habitat/native grasses	None	
DLF5	05/13/2003	Devils Lake	Cavalier	48.66742	-98.53215	83	Wildlife habitat/native grasses	Possible - hunting?	
DLF6	05/28/2003	Devils Lake	Cavalier	48.73404	-98.72463	83	Wildlife habitat/native grasses	Possible - hunting?	
DLF6 AOV1	05/28/2003	Devils Lake	Cavalier	48.79679	-98.60991	83	Wildlife habitat/native grasses	Possible - hunting?	
DLF6 AOV2	05/28/2003	Devils Lake	Cavalier	48.79675	-98.60986	83	Wildlife habitat/native grasses	Possible - hunting?	
DLF7	05/22/2003	Devils Lake	Cavalier	48.88955	-98.64867	83	Cropland/small grains	Possible - farming	
DLG1	05/13/2003	Devils Lake	Nelson	48.00669	-98.33873	83	Cropland/unsp.	Possible - farming	
DLG2	05/13/2003	Devils Lake	Ramsey	48.25558	-98.40494	83	Wildlife habitat/native grasses	None	
DLG3	05/13/2003	Devils Lake	Ramsey	48.30894	-98.33167	83	Cropland/unsp.	Possible - farming	
DLG4	05/13/2003	Devils Lake	Ramsey	48.54210	-98.32666	83	Cropland/unsp.	Possible - farming	
DLG4*	04/19/2004	Devils Lake	Cavalier	48.54448	-98.32466	83	CRP/tame grasses	Possible - farming	
DLG5	05/13/2003	Devils Lake	Cavalier	48.61590	-98.31408	83	Cropland/row crops	Possible - farming	
DLG5*	04/19/2004	Devils Lake	Cavalier	48.63005	-98.37524	83	Wildlife habitat/tame grasses	Possible - farming	
DLG6	05/14/2003	Devils Lake	Cavalier	48.74043	-98.43249	83	Cropland/small grains	Possible - farming	
DLG7	05/22/2003	Devils Lake	Cavalier	48.88353	-98.47637	83	Cropland/small grains	Possible - farming	
DLH1	05/15/2003	Devils Lake	Nelson	48.12263	-98.06339	83	Cropland/small grains	Possible - farming	
DLH2	05/15/2003	Devils Lake	Walsh	48.23170	-98.09603	83	Hayland/unsp.	Possible - livestock	
DLH3	05/15/2003	Devils Lake	Walsh	48.38430	-98.08956	83	Cropland/small grains	Possible - farming, gravel pit	
DLH4	05/15/2003	Devils Lake	Walsh	48.50309	-98.05983	83	Cropland/small grains and row crops	Possible - farming	
DLH5	05/03/2003	Devils Lake	Cavalier	48.68104	-98.07709	83	Cropland/small grains	Possible - farming	
DLH6	05/15/2003	Devils Lake	Cavalier	48.81724	-98.05854	83	Cropland/row crops	Possible - farming	
DLH7	05/15/2003	Devils Lake	Cavalier	48.90091	-98.01248	83	Cropland/small grains	Possible - farming	
FAA1	10/02/2004	Fargo	Sargent	46.03261	-97.93710	83	Hayland/sudangrass	Possible - farming	
FAA2	10/02/2004	Fargo	Sargent	46.18484	-97.95568	83	Pasture/unsp.	Possible - farming	
FAA3	09/09/2004	Fargo	Ransom	46.40151	-97.96037	83	WPA/native grasses and forbs	None	
FAA4	09/02/2004	Fargo	Ransom	46.53364	-97.80378	83	Cropland/small grains	Possible - farming	
FAA5	09/02/2004	Fargo	Barnes	46.67078	-97.80233	83	Pasture/unsp.	Probable - livestock	
FAA6	05/23/2003	Fargo	Barnes	46.83415	-97.95579	83	Cropland/small grains	Possible - farming	
FAA6 AOV1	05/23/2003	Fargo	Barnes	46.83145	-97.95579	83	Cropland/row crops	Possible - farming	
FAA6 AOV2	05/23/2003	Fargo	Barnes	46.83145	-97.95579	83	Cropland/row crops	Possible - farming	
FAA7	04/30/2003	Fargo	Barnes	46.89237	-97.95055	83	Cropland/row crops	Possible - burn	
FAB1	10/02/2004	Fargo	Sargent	46.11694	-97.73019	83	Cropland/row crops	Possible - farming	
FAB2	10/02/2004	Fargo	Sargent	46.24719	-97.61388	83	Cropland/small grains	Possible - farming	
FAB2**	10/14/2004	Fargo	Sargent	46.27349	-97.79978	83	Cropland/small grains	Definite - farming	
FAB3	10/02/2004	Fargo	Ransom	46.29828	-97.71441	83	Cropland/small grains	Possible - farming	
FAB4	09/02/2004	Fargo	Ransom	46.48240	-97.76007	83	Cropland/small grains	Possible - farming	
FAB5	08/26/2004	Fargo	Ransom	46.58448	-97.63686	83	Cropland/small grains	Possible - farming	
FAB5 AOV1	09/09/2004	Fargo	Ransom	46.61668	-97.72356	83	Cropland/small grains	Possible - farming	
FAB5 AOV2	09/09/2004	Fargo	Ransom	46.61667	-97.72354	83	Cropland/small grains	Possible - farming	
FAB6	09/02/2004	Fargo	Cass	46.75238	-97.59611	83	Cropland/small grains	Possible - farming, paved road	
FAB7	05/23/2003	Fargo	Cass	46.97720	-97.56990	83	Cropland/small grains	Possible - farming	

Table A1.1a. Site description: location and earth cover (continued)

Site no.[1]	Collection date	QD250 name[2]	County	Latitude	Longitude	Datum	Land use/Land cover	Contamination	Comments
FAC1	10/02/2004	Fargo	Sargent	46.02032	-97.53145	83	Rangeland/native grasses	Possible - farming	Teewaukon NWR
FAC2	10/02/2004	Fargo	Sargent	46.17635	-97.52583	83	Pasture/native grasses and forbs	None	
FAC3	10/07/2004	Fargo	Richland	46.39847	-97.36636	83	Rangeland/native grasses and sedges	None	
FAC4	08/26/2004	Fargo	Ransom	46.50824	-97.50876	83	Cropland/small grains	Possible - farming	
FAC5	05/21/2003	Fargo	Ransom	46.62450	-97.38340	83	Cropland/row crops	Possible - farming, paved road	
FAC6	05/20/2003	Fargo	Tri-County	46.77550	-97.49060	83	Cropland/row crops	Possible - farming	
FAC7	05/15/2003	Fargo	Cass	46.96310	-97.48840	83	Cropland/small grains	Possible - farming	
FAD1	10/07/2004	Fargo	Richland	46.04498	-97.29375	83	Cropland/row crops	Possible - farming	
FAD1 AOV1	10/07/2004	Fargo	Richland	46.04231	-97.19166	83	Cropland/row crops	Possible - farming	
FAD1 AOV2	10/07/2004	Fargo	Richland	46.04227	-97.19165	83	Cropland/row crops	Possible - farming	
FAD2	09/18/2004	Fargo	Sargent	46.17790	-97.27043	83	Cropland/small grains	Possible - farming	
FAD3	10/07/2004	Fargo	Richland	46.34542	-97.18198	83	Rangeland/unsp.	None	Sheyenne National Grasslands
FAD4	08/26/2004	Fargo	Richland	46.55074	-97.14045	83	Pasture/mixed grasses	Possible - paved road	
FAD5	05/21/2003	Fargo	Tri-County	46.68210	-97.30550	83	Cropland/row crops	Possible - farming	
FAD6	05/20/2003	Fargo	Cass	46.80470	-97.15550	83	Cropland/row crops	Possible - farming, railroad	
FAD7	05/15/2003	Fargo	Cass	46.87780	-97.24320	83	Shelter belt/unsp.	Possible - paved road	
FAE1	09/18/2004	Fargo	Richland	46.10522	-96.97548	83	Rangeland/mixed grasses	Possible - livestock	
FAE2	09/18/2004	Fargo	Richland	46.16008	-97.04511	83	Cropland/small grains	Possible - farming	
FAE3	09/18/2004	Fargo	Richland	46.38576	-96.90303	83	Cropland/row crops	Possible - farming	
FAE4	08/26/2004	Fargo	Richland	46.51876	-97.09748	83	CRP/unsp.	Possible - farming	
FAE5	08/24/2004	Fargo	Cass	46.65340	-96.94201	83	Cropland/small grains	Possible - farming	
FAE6	05/20/2003	Fargo	Cass	46.81990	-97.04960	83	Cropland/row crops	Possible - farming, farmhouse	
FAE7	05/15/2003	Fargo	Cass	46.90480	-97.06680	83	Cropland/row crops	Possible - farming, paved road	
FAF1	09/18/2004	Fargo	Richland	46.01250	-96.71162	83	Rangeland/native grasses and forbs	None	
FAF2	09/11/2004	Fargo	Richland	46.19453	-96.80127	83	Cropland/small grains	Possible - farming	
FAF3	09/11/2004	Fargo	Richland	46.35391	-96.84487	83	Cropland/small grains	Possible - farming	
FAF3 AOV1	09/11/2004	Fargo	Richland	46.29834	-96.85199	83	Cropland/row crops	Possible - farming	
FAF3 AOV2	09/11/2004	Fargo	Richland	46.29827	-96.85204	83	Cropland/row crops	Possible - farming	
FAF4	08/24/2004	Fargo	Richland	46.53768	-96.88253	83	Cropland/small grains	Possible - farming	
FAF5	08/24/2004	Fargo	Richland	46.58258	-96.76863	83	Cropland/small grains	Possible - farming	
FAF6	05/20/2003	Fargo	Cass	46.80480	-96.85130	83	Cropland/small grains	Possible - paved road	
FAG2	09/11/2004	Fargo	Richland	46.18359	-96.59988	83	Cropland/small grains	Possible - farming	
FAG3	09/11/2004	Fargo	Richland	46.32830	-96.65767	83	Cropland/small grains	Possible - farming	
GFA1	04/16/2004	Grand Forks	Barnes	47.05038	-97.87978	83	Wildlife habitat/unsp. grasses	Possible - farming	
GFA2	08/11/2002	Grand Forks	Steele	47.24722	-97.87559	83	Hayland/unsp. grasses and forbs	None	
GFA3	04/21/2004	Grand Forks	Steele	47.36614	-97.88012	83	Cropland/unsp.	None	
GFA4	08/11/2003	Grand Forks	Steele	47.55003	-97.87779	83	Idle/unsp. grasses, forbs, brush	None	
GFA5	06/08/2004	Grand Forks	Steele	47.65850	-97.94854	83	Cropland/small grains	Possible - farming	
GFA5*	04/21/2004	Grand Forks	Steele	47.66072	-97.96810	83	Cropland/unsp.	None	
GFA6	06/16/2004	Grand Forks	Nelson	47.81642	-97.94077	83	Rangeland/unsp. grasses and forbs	Possible - livestock	
GFA7	06/16/2004	Grand Forks	Grand Forks	47.95077	-97.84037	83	CRP/unsp. grasses	None	
GFB1	04/16/2004	Grand Forks	Cass	47.13809	-97.62666	83	CRP/unsp. grasses	None	
GFB2	04/16/2004	Grand Forks	Barnes	47.16695	-97.78049	83	Cropland/fallow	None	
GFB3	08/11/2003	Grand Forks	Steele	47.33861	-97.65316	83	Idle/ unsp. grasses	None	
GFB4	08/11/2003	Grand Forks	Steele	47.55670	-97.66183	83	Idle/unsp. grasses and forbs	None	
GFB5	06/08/2004	Grand Forks	Grand Forks	47.95077	-97.71149	83	Rangeland/unsp. grasses, alfalfa	Possible - farming, livestock	
GFB5*	04/21/2004	Grand Forks	Steele	47.65825	-97.79865	83	Cropland/unsp.	None	
GFB6	06/16/2004	Grand Forks	Grand Forks	47.81767	-97.61948	83	Cropland/row crops	Possible - farming	
GFB7	06/16/2004	Grand Forks	Grand Forks	47.96230	-97.62220	83	Cropland/row crops	Possible - farming	
GFC1	04/14/2004	Grand Forks	Cass	47.02872	-97.49323	83	Cropland/unsp.	None	
GFC2	04/16/2004	Grand Forks	Traill	47.26884	-97.38760	83	Cropland/unsp.	None	
GFC3	04/19/2004	Grand Forks	Traill	47.38630	-97.47165	83	Wildlife habitat/unsp. grasses	None	
GFC4	04/28/2004	Grand Forks	Steele	47.51978	-97.49548	83	Cropland/unsp.	None	
GFC4 AOV1	04/28/2004	Grand Forks	Traill	47.56356	-97.41145	83	Cropland/unsp.	None	
GFC4 AOV2	04/28/2004	Grand Forks	Traill	47.56357	-97.41150	83	Cropland/unsp.	None	
GFC5	06/04/2004	Grand Forks	Traill	47.60055	-97.43735	83	Shelter belt/unsp. grasses	Possible - farming	
GFC6	06/17/2004	Grand Forks	Grand Forks	47.74750	-97.36778	83	Cropland/row crops	Possible - farming	

Table A1.1a. Site description: location and earth cover (continued)

Site no.[1]	Collection date	QD250 name[2]	County	Latitude	Longitude	Datum	Land use/Land cover	Contamination	Comments
GFC7	06/17/2004	Grand Forks	Grand Forks	47.96218	-97.49507	83	Cropland/row crops	Possible - farming	
GFD1	04/14/2004	Grand Forks	Cass	47.09431	-97.12823	83	Cropland/unsp.	None	
GFD2	04/19/2004	Grand Forks	Traill	47.26646	-97.19610	83	Cropland/fallow	Possible - farming	
GFD2 AOV1	04/19/2004	Grand Forks	Traill	47.28106	-97.28309	83	CRP/unsp. grasses	Possible - farming	
GFD2 AOV2	04/19/2004	Grand Forks	Traill	47.28104	-97.28313	83	CRP/unsp. grasses	Possible - farming	
GFD3	04/19/2004	Grand Forks	Traill	47.38895	-97.19727	83	Cropland/unsp.	None	
GFD4	04/28/2004	Grand Forks	Traill	47.52727	-97.17873	83	Cropland/unsp.	None	
GFD5	06/04/2004	Grand Forks	Traill	47.65637	-97.11598	83	Gravel pit/unsp. grasses and forbs	Possible - gravel pit	
GFD6	06/17/2004	Grand Forks	Grand Forks	47.76288	-97.15483	83	Cropland/row crops	Possible - farming	
GFD7	06/16/2004	Grand Forks	Grand Forks	47.87812	-97.23254	83	CRP/unsp. grasses	None	
GFE1	04/14/2004	Grand Forks	Cass	47.12990	-97.04746	83	Cropland/unsp.	None	
GFE2	04/14/2004	Grand Forks	Cass	47.21708	-96.94387	83	Cropland/unsp.	None	
GFE3	04/19/2004	Grand Forks	Traill	47.37520	-97.02692	83	Cropland/unsp.	None	
GFE4	04/28/2004	Grand Forks	Traill	47.55846	-97.04778	83	Cropland/unsp.	None	
GFE5	06/17/2004	Grand Forks	Traill	47.64444	-96.93694	83	Cropland/row crops	None	
GFE6	06/17/2004	Grand Forks	Grand Forks	47.76008	-96.94104	83	Cropland/row crops	None	
GFE7	06/16/2004	Grand Forks	Grand Forks	47.88343	-97.07757	83	Cropland/row crops	Possible - urban area	
GFF1	04/14/2004	Grand Forks	Cass	47.05028	-96.86860	83	Cropland/unsp.	None	
GFF2	04/14/2004	Grand Forks	Cass	47.22029	-96.84816	83	Cropland/unsp.	None	
GFF3	04/19/2004	Grand Forks	Traill	47.35397	-96.84883	83	Cropland/fallow	None	
GFF4	06/17/2004	Grand Forks	Traill	47.51788	-96.87606	83	Cropland/row crops	None	
GFF5	06/17/2004	Grand Forks	Traill	47.61562	-96.87732	83	Idle/unsp. grasses	None	
GNI1	09/25/2003	Glendive	Golden Valley	47.02190	-104.01801	83	Hayland/tame grasses	Possible - farming	
GNI2	06/23/2004	Glendive	Golden Valley	47.13425	-104.02061	83	Rangeland/mixed grasses and forbs	Possible - livestock	
GNI4	06/23/2004	Glendive	McKenzie	47.53495	-104.01099	83	Rangeland/native grasses	Possible - livestock	U.S. Forest Service land
JAA1	09/21/2004	Jamestown	Emmons	46.12964	-99.89478	83	CRP/native grasses, alfalfa	Possible - farming, livestock	
JAA2	09/22/2004	Jamestown	Emmons	46.13773	-99.95921	83	Hayland/tame grasses	Possible - farming	
JAA2 AOV1	09/22/2004	Jamestown	Emmons	46.24921	-99.85620	83	Pasture/tame grasses	Possible - farming, livestock	
JAA2 AOV2	09/22/2004	Jamestown	Emmons	46.24924	-99.85617	83	Pasture/tame grasses	Possible - farming, livestock	
JAA3	09/22/2004	Jamestown	Emmons	46.41430	-99.99089	83	Cropland/small grains	Possible - farming	
JAA4	09/22/2004	Jamestown	Emmons	46.47820	-99.99047	83	Cropland/small grains	Possible - farming	
JAA5	04/15/2004	Jamestown	Kidder	46.67731	-99.80214	83	Pasture/native grasses, alfalfa	Possible - farming, livestock	
JAA6	06/02/2004	Jamestown	Kidder	46.74646	-99.96242	83	Cropland/row crops	Possible - farming, livestock	
JAA7	04/15/2004	Jamestown	Kidder	46.96578	-99.95461	83	CRP/native grasses	Possible - farming	
JAB1	09/21/2004	Jamestown	McIntosh	46.10400	-99.64713	83	Cropland/small grains	Possible - farming	
JAB2	09/22/2004	Jamestown	McIntosh	46.22200	-99.73160	83	Cropland/small grains	Possible - farming	
JAB3	04/15/2004	Jamestown	Logan	46.49694	-99.61750	83	CRP/native grasses and forbs	Possible - farming	
JAB4	04/16/2004	Jamestown	Logan	46.48156	-99.62412	83	Cropland/row crops	Possible - farming	
JAB5	06/02/2004	Jamestown	Logan	46.60121	-99.61223	83	Hayland/unsp. grasses	Possible - farming, livestock	
JAB6	06/02/2004	Jamestown	Kidder	46.82209	-99.73327	83	Wildlife habitat/unsp. grasses	Possible - farming, livestock	
JAB7	06/03/2004	Jamestown	Kidder	46.90696	-99.71027	83	Rangeland/unsp. grasses	Possible - farming, livestock	
JAC1	09/21/2004	Jamestown	McIntosh	46.13748	-99.39803	83	CRP/tame grasses, alfalfa	Possible - farming, hunting	
JAC2	09/21/2004	Jamestown	McIntosh	46.15260	-99.48087	83	Hayland/tame grasses, alfalfa	Possible - farming, hunting	
JAC3	09/22/2004	Jamestown	Logan	46.32528	-99.45494	83	Rangeland/native grasses & forbs	Possible - livestock	
JAC4	04/16/2004	Jamestown	Logan	46.53033	-99.44433	83	Pasture/unsp.	Possible - farming	
JAC5	04/16/2004	Jamestown	Logan	46.57914	-99.41211	83	Pasture/alfalfa	Possible - farming	
JAC6	05/19/2004	Jamestown	Kidder	46.77330	-99.48450	83	Rangeland/unsp.	Probable - livestock	Streeter range station[6]
JAC6 AOV1	05/19/2004	Jamestown	Stutsman	46.72419	-99.44389	83	Rangeland/unsp.	Probable - livestock	
JAC6 AOV2	05/19/2004	Jamestown	Stutsman	46.72421	-99.44389	83	Rangeland/unsp.	Probable - livestock	
JAC7	06/03/2004	Jamestown	Kidder	46.93714	-99.51202	83	Rangeland/unsp. grasses	Possible - farming, livestock	
JAD1	08/05/2004	Jamestown	McIntosh	46.12920	-99.13413	83	Rangeland/unsp.	Possible - livestock	
JAD2	08/05/2004	Jamestown	McIntosh	46.28223	-99.31602	83	Rangeland/unsp. grasses	Possible - livestock	
JAD3	05/18/2004	Jamestown	Logan	46.37633	-99.14259	83	Rangeland/unsp. grasses	Definite - livestock	
JAD4	05/18/2004	Jamestown	Logan	46.42844	-99.31046	83	WPA/unsp.	Possible - livestock	
JAD5	05/26/2004	Jamestown	Stutsman	46.64245	-99.24039	83	CRP/unsp. grasses, alfalfa	Possible - farming	
JAD6	05/26/2004	Jamestown	Stutsman	46.75531	-99.17630	83	CRP/unsp. grasses	Possible - farming	
JAD7	06/03/2004	Jamestown	Stutsman	46.95271	-99.17515	83	WPA/unsp. grasses	Possible - farming, oil pipeline	

Table A1.1a. Site description: location and earth cover (continued)

Site no.[1]	Collection date	QD250 name[2]	County	Latitude	Longitude	Datum	Land use/Land cover	Contamination	Comments
JAE1	08/05/2004	Jamestown	McIntosh	46.10708	-99.02672	83	Hayland/unsp. grasses, alfalfa	Possible - farming	
JAE2	08/05/2004	Jamestown	Dickey	46.21717	-99.92233	83	CRP/alfalfa	Probable - farming	
JAE3	05/10/2004	Jamestown	LaMoure	46.36985	-98.93469	83	WPA/unsp.	Possible - livestock	
JAE3 AOV1	05/18/2004	Jamestown	Logan	46.28925	-99.07818	83	Rangeland/unsp.	Possible - livestock	
JAE3 AOV2	05/18/2004	Jamestown	Logan	46.28923	-99.07820	83	Rangeland/unsp.	Possible - livestock	
JAE4	05/10/2004	Jamestown	LaMoure	46.53688	-98.95315	83	Rangeland/unsp.	Possible - livestock	
JAE5	05/26/2004	Jamestown	Stutsman	46.66058	-99.05908	83	Cropland/small grains and row crops	Possible - farming	
JAE6	05/26/2004	Jamestown	Stutsman	46.78929	-99.06776	83	WPA/unsp. grasses	Possible - farming	
JAE7	05/21/2004	Jamestown	Stutsman	46.88224	-98.90540	83	WPA/unsp. grasses	Possible - farming	
JAF1	08/18/2004	Jamestown	Dickey	46.02760	-98.86507	83	Rangeland/native grasses and forbs	Possible - livestock	
JAF2	08/20/2004	Jamestown	Dickey	46.18730	-98.81736	83	Rangeland/native grasses	Probable - livestock	
JAF3	05/18/2004	Jamestown	LaMoure	46.37083	-98.86144	83	CRP/native grasses, dandelions	Definite - farming	
JAF4	05/10/2004	Jamestown	LaMoure	46.54861	-98.87006	83	Cropland/row crops	Definite - farming	
JAF5	05/28/2004	Jamestown	LaMoure	46.58036	-98.85222	83	WPA/unsp. grasses	Possible - farming	
JAF6	05/21/2004	Jamestown	Stutsman	46.83487	-98.73693	83	Cropland/small grains	Possible - farming	
JAF7	05/21/2004	Jamestown	Stutsman	46.86749	-98.88316	83	WPA/unsp. grasses	Possible - farming	
JAG1	08/20/2004	Jamestown	Dickey	46.06092	-98.52750	83	CRP/mixed grasses	Possible - farming	
JAG2	10/07/2004	Jamestown	Dickey	46.27044	-98.51839	83	CRP/unsp. grasses	Probable - farming	
JAG3	10/04/2004	Jamestown	LaMoure	46.38369	-98.56626	83	CRP/tame grasses	Probable - farming	
JAG4	10/04/2004	Jamestown	LaMoure	46.44049	-98.53550	83	CRP/tame grasses, alfalfa	Definite - farming	
JAG5	05/27/2004	Jamestown	Stutsman	46.63660	-98.46163	83	CRP/unsp. grasses, alfalfa	Possible - farming	
JAG6	04/22/2004	Jamestown	Stutsman	46.82540	-98.57181	83	CRP/tame grasses, alfalfa	Possible - farming	
JAG7	04/22/2004	Jamestown	Stutsman	46.91790	-98.54385	83	Rangeland/unsp. grasses	Possible - farming, livestock	
JAH1	10/07/2004	Jamestown	Dickey	46.05145	-98.40604	83	CRP/unsp. grasses	Probable - farming	
JAH2	10/07/2004	Jamestown	Dickey	46.27028	-98.39326	83	Cropland/small grains	Probable - farming	
JAH3	10/04/2004	Jamestown	LaMoure	46.31247	-98.28680	83	Wildlife habitat/row crops	Probable - farming	
JAH4	10/12/2004	Jamestown	LaMoure	46.53360	-98.43048	83	Cropland/small grains	Probable - farming	
JAH5	05/27/2004	Jamestown	Barnes	46.63792	-98.27201	83	Cropland/small grains	Possible - farming	
JAH6	05/27/2004	Jamestown	Barnes	46.71994	-98.39834	83	CRP/unsp. grasses	Possible - farming, livestock	
JAH7	04/22/2004	Jamestown	Barnes	46.87885	-98.42534	83	Cropland/small grains	Possible - farming	
JAI1	10/07/2004	Jamestown	Dickey	46.11274	-98.06773	83	Cropland/row crops	Probable - farming	
JAI2	10/12/2004	Jamestown	Dickey	46.25578	-98.10017	83	Cropland/row crops	Probable - farming	
JAI3	10/12/2004	Jamestown	Ransom	46.35609	-98.00110	83	WPA/unsp. grasses	Possible - farming	
JAI4	10/12/2004	Jamestown	LaMoure	46.55688	-98.05980	83	Cropland/row crops	Probable - farming	
JAI5	05/27/2004	Jamestown	Barnes	46.64477	-98.13703	83	CRP/wetland	Possible - farming	
JAI6	05/27/2004	Jamestown	Barnes	46.72352	-98.10561	83	Wildlife habitat/unsp. grasses	Possible - farming	
JAI7	05/27/2004	Jamestown	Barnes	46.94217	-98.07920	83	CRP/unsp. grasses	Possible - farming	
LMC7	09/17/2003	Lemmon	Bowman	45.99029	-103.43205	83	Rangeland/native grasses and forbs	Possible - livestock	
LME7	09/16/2003	Lemmon	Bowman	45.96638	-103.08022	83	Cropland/small grains	Possible - farming	
LME7 AOV1	09/16/2003	Lemmon	Bowman	45.95872	-103.01170	83	Rangeland/native grasses and forbs	Possible - livestock	
LME7 AOV2	09/16/2003	Lemmon	Bowman	45.95873	-103.01165	83	Rangeland/native grasses and forbs	Possible - livestock	
LMG7	09/18/2003	Lemmon	Adams	45.96132	-102.45702	83	Rangeland/native grasses and forbs	Possible - livestock	
LMH7	09/18/2003	Lemmon	Adams	45.98061	-102.41262	83	Hayland/unsp. grasses, alfalfa	Possible - farming, livestock	
M2I1	06/16/2004	Miles City	Bowman	46.07023	-103.99832	83	Rangeland/barren	Possible - livestock	
M2I2	06/16/2004	Miles City	Bowman	46.23271	-104.03060	83	Hayland/tame grasses, alfalfa	Possible - farming, livestock	
M2I6	07/16/2003	Miles City	Golden Valley	46.81886	-103.99368	83	Cropland/row crops	Possible - farming	
MBB7	10/13/2004	Milbank	Sargent	45.93628	-97.61438	83	CRP/unsp. grasses	Probable - farming	
MBC7	10/02/2004	Milbank	Richland	45.96805	-97.52164	83	Cropland/small grains	Possible - farming	
MBE7	10/07/2004	Milbank	Richland	45.97884	-97.00011	83	Cropland/row crops	Possible - farming	
MBF7	10/07/2004	Milbank	Richland	45.95195	-96.71768	83	Cropland/row crops	Possible - farming	
MIA1	06/10/2003	Minot	Ward	48.05944	-101.85657	83	Wildlife habitat/native grasses	Possible - hunting	
MIA2	06/10/2003	Minot	Ward	48.22488	-101.81268	83	WPA/native grasses	Possible - hunting	
MIA3	06/11/2003	Minot	Ward	48.38572	-101.96030	83	Wildlife habitat/tame grasses, alfalfa	Possible - farming, hunting	
MIA4	06/11/2003	Minot	Ward	48.51593	-101.91810	83	Cropland/small grains	Possible - farming	
MIA5	05/30/2003	Minot	Ward	48.67511	-101.92871	83	Cropland/small grains	Possible - farming	
MIA6	05/28/2003	Minot	Renville	48.84654	-101.82354	83	Cropland/small grains	Possible - farming	
MIA7	05/28/2003	Minot	Renville	48.96680	-101.87402	83	Cropland/small grains	Possible - farming	

Table A1.1a. Site description: location and earth cover (continued)

Site no.[1]	Collection date	QD250 name[2]	County	Latitude	Longitude	Datum	Land use/Land cover	Contamination	Comments
MIB1	06/10/2003	Minot	Ward	48.10463	-101.53238	83	Cropland/small grains	Possible - farming	
MIB2	06/10/2003	Minot	Ward	48.19935	-101.68301	83	Rangeland/native grasses	Possible - livestock	
MIB3	06/11/2003	Minot	Ward	48.31869	-101.70763	83	Cropland/row crops	Possible - farming	
MIB4	06/11/2003	Minot	Renville	48.45001	-101.70203	83	Cropland/row crops	Possible - farming	
MIB5	05/30/2003	Minot	Renville	48.62058	-101.53722	83	Cropland/small grains	Possible - farming	
MIB6	05/28/2003	Minot	Renville	48.74820	-101.64780	83	CRP/unsp.	Possible - farming	
MIB7	05/28/2003	Minot	Renville	48.96700	-101.50700	83	Hayland/unsp.	Possible - farming	
MIC1	06/10/2003	Minot	Ward	48.04450	-101.38364	83	Cropland/row crops	Possible - farming	
MIC2	06/10/2003	Minot	Ward	48.16883	-101.31060	83	Cropland/small grains	Possible - farming	
MIC3	07/16/2003	Minot	Ward	48.34754	-101.44808	83	Cropland/row crops	Possible - farming	
MIC3 AOV1	07/16/2003	Minot	Ward	48.38711	-101.46125	83	Cropland/row crops	Possible - farming	
MIC3 AOV2	07/16/2003	Minot	Ward	48.38708	-101.46132	83	Cropland/row crops	Possible - farming	
MIC4	06/11/2003	Minot	Renville	48.51991	-101.50566	83	CRP/tame grasses, alfalfa	Possible - farming	
MIC5	05/28/2003	Minot	Bottineau	48.65797	-101.29884	83	Cropland/small grains	Possible - farming	
MIC6	05/28/2003	Minot	Bottineau	48.80599	-101.30401	83	CRP/unsp.	Possible - farming	
MIC7	05/28/2003	Minot	Bottineau	48.87989	-101.30529	83	Cropland/small grains	Possible - farming	
MID1	06/10/2003	Minot	Ward	48.09809	-101.22995	83	Cropland/small grains	Possible - farming	
MID2	07/15/2003	Minot	Ward	48.20947	-101.08065	83	Cropland/small grains	Possible - farming	
MID3	07/16/2003	Minot	Ward	48.37889	-101.16489	83	Cropland/fallow	Possible - farming	
MID4	07/16/2003	Minot	Renville	48.50295	-101.15838	83	Cropland/fallow	Possible - farming	
MID4 AOV1	07/16/2003	Minot	Bottineau	48.55291	-101.08286	83	CRP/mixed grasses	Possible - farming	
MID4 AOV2	07/16/2003	Minot	Bottineau	48.55294	-101.08287	83	CRP/mixed grasses	Possible - farming	
MID5	05/30/2003	Minot	Bottineau	48.63314	-101.14555	83	CRP/unsp.	Possible - farming	
MID6M	05/30/2003	Minot	Bottineau	48.79747	-101.21382	83	CRP/unsp.	Possible - farming	
MID7	05/30/2003	Minot	Bottineau	48.96499	-101.23251	83	Cropland/small grains	Possible - farming	
MID7 AOV1	05/30/2003	Minot	Bottineau	48.90034	-101.21370	83	Cropland/small grains	Possible - farming	
MID7 AOV2	05/30/2003	Minot	Bottineau	48.90034	-101.21370	83	Cropland/small grains	Possible - farming	
MIE1	06/12/2003	Minot	McHenry	48.01268	-100.86379	83	Cropland/small grains	Possible - farming	
MIE2	06/12/2003	Minot	McHenry	48.22439	-100.84090	83	Wildlife habitat/tame grasses	Possible - farming, hunting	
MIE3	05/29/2003	Minot	McHenry	48.28361	-100.85417	83	CRP/unsp.	Possible - farming	
MIE4	07/06/2003	Minot	McHenry	48.47365	-101.00297	83	CRP/tame grasses, alfalfa	Possible - farming	
MIE5	05/29/2003	Minot	McHenry	48.61178	-100.82102	83	Cropland/small grains	Possible - farming	
MIE6	05/29/2003	Minot	McHenry	48.74768	-100.81253	83	Cropland/small grains	Possible - farming	
MIE7	05/29/2003	Minot	Bottineau	48.95339	-100.92832	83	CRP/unsp.	Possible - farming	
MIF1	06/12/2003	Minot	McHenry	48.03610	-100.57246	83	Cropland/small grains	Possible - farming, hunting	
MIF2	07/15/2003	Minot	McHenry	48.20844	-100.49710	83	Pasture/native grasses	Possible - farming, livestock	
MIF3	06/12/2003	Minot	McHenry	48.32696	-100.71169	83	Rangeland/native grasses	Possible - livestock	
MIF4	05/29/2003	Minot	McHenry	48.50255	-100.55959	83	Cropland/native grasses	Possible - livestock	
MIF5	05/29/2003	Minot	Bottineau	48.64117	-100.70975	83	Rangeland/native grasses	Possible - livestock	
MIF6	05/29/2003	Minot	Bottineau	48.74759	-100.58924	83	Cropland/small grains	Possible - farming	
MIF6*	08/05/2004	Minot	Bottineau	48.74759	-100.58924	83	Cropland/small grains	Possible - farming	
MIF7	05/28/2003	Minot	Bottineau	48.87165	-100.55426	83	Rangeland/native grasses	Possible - livestock	
MIG1	07/26/2004	Minot	McHenry	48.10952	-100.40273	83	Pasture/unsp. grasses	Possible - livestock	
MIG2	06/08/2004	Minot	McHenry	48.25343	-100.46393	83	Hayland/unsp.	Possible - farming, livestock	
MIG2 AOV1	06/08/2004	Minot	McHenry	48.15318	-100.44337	83	Hayland/unsp.	Possible - farming, livestock	
MIG2 AOV2	06/08/2004	Minot	McHenry	48.15318	-100.44337	83	Hayland/unsp.	Possible - farming, livestock	
MIG3	06/07/2004	Minot	McHenry	48.35430	-100.38104	83	Hayland/unsp.	Possible - livestock, railroad	
MIG4	07/26/2004	Minot	McHenry	48.44292	-100.32065	83	Hayland/tame grasses	Possible - livestock	
MIG5	07/20/2004	Minot	Bottineau	48.64616	-100.43671	83	Cropland/fallow	Possible - farming	
MIG6	07/09/2004	Minot	Bottineau	48.83103	-100.33374	83	Cropland/unsp.	Possible - farming	
MIG7	06/30/2004	Minot	Bottineau	48.90922	-100.47248	83	Pasture/unsp.	Possible - livestock	
MIH1	08/09/2004	Minot	Pierce	48.07941	-100.17725	83	Hayland/unsp. grasses	Possible - farming	
MIH2	07/09/2004	Minot	Pierce	48.15319	-100.06323	83	CRP/unsp. grasses, alfalfa	Possible - farming	
MIH3	06/07/2004	Minot	Pierce	48.34118	-100.10577	83	Hayland/unsp.	Possible - farming	
MIH4	07/26/2004	Minot	Pierce	48.47226	-100.02276	83	Rangeland/unsp.	Possible - livestock	
MIH5	07/20/2004	Minot	Bottineau	48.66035	-100.21202	83	Cropland/fallow	Possible - farming	
MIH6	08/06/2004	Minot	Bottineau	48.80019	-100.23346	83	Cropland/unsp. grasses	Possible - farming	

Table A1.1a. Site description: location and earth cover (continued)

Site no.[1]	Collection date	QD250 name[2]	County	Latitude	Longitude	Datum	Land use/Land cover	Contamination	Comments
MIH6*	07/09/2004	Minot	Rolette	48.84284	-100.04916	83	Rangeland/unsp	Possible - livestock	
MIH6**	08/06/2004	Minot	Bottineau	48.79856	-100.23338	83	CRP/unsp. grasses	Possible - farming	
MIH7	07/16/2004	Minot	Rolette	48.99261	-100.07381	83	Trees/aspen woods	Possible - tourists, hikers	International Peace Garden
MTB7	10/03/2003	McIntosh	Sioux	45.97099	-101.57355	83	Rangeland/tame grasses	Possible - farming, livestock	
MTE7	10/03/2003	McIntosh	Sioux	45.95648	-101.05576	83	Cropland/small grains	Possible - farming	
MTG7	09/21/2004	McIntosh	Emmons	45.97758	-100.50043	83	Cropland/small grains	Possible - farming, livestock	
MYA1	06/07/2004	McClusky	Mercer	47.05268	-101.86913	83	CRP/unsp. grasses, alfalfa	None	
MYA2	06/07/2004	McClusky	Mercer	47.19744	-101.88025	83	CRP/unsp. grasses, alfalfa	None	
MYA3	06/08/2004	McClusky	Mercer	47.29767	-101.84851	83	Rangeland/native grasses	None	
MYA4	06/08/2004	McClusky	Mercer	47.48462	-101.75808	83	Wildlife habitat/unsp. grasses	None	
MYA5	06/09/2003	McClusky	McLean	47.72506	-102.06918	83	Rangeland/native grasses	Possible - oil field	
MYA6	06/09/2003	McClusky	McLean	47.81865	-101.94781	83	Rangeland/native grasses	None	
MYA7	06/09/2003	McClusky	Mountrail	47.98285	-101.94589	83	Rangeland/native grasses	Possible - oil field	
MYB1	06/07/2004	McClusky	Oliver	47.11210	-101.73372	83	CRP/unsp. grasses, alfalfa	None	
MYB2	06/07/2004	McClusky	Oliver	47.14112	-101.69902	83	CRP/unsp. grasses	None	
MYB3	06/08/2004	McClusky	Mercer	47.39948	-101.62070	83	CRP/unsp. grasses	None	
MYB4	06/08/2004	McClusky	Mercer	47.50108	-101.66833	83	CRP/unsp. grasses	None	
MYB5	06/09/2003	McClusky	McLean	47.60944	-101.67255	83	Cropland/tame grasses	None	
MYB6	06/09/2003	McClusky	McLean	47.81828	-101.68872	83	Rangeland/native grasses	None	
MYB7	06/10/2003	McClusky	Ward	47.99111	-101.69083	83	Rangeland/native grasses	None	
MYC1	06/07/2004	McClusky	Oliver	47.11628	-101.44783	83	Rangeland/native grasses and forbs	None	
MYC2	06/07/2004	McClusky	Oliver	47.18290	-101.41869	83	CRP/unsp. grasses, alfalfa	None	
MYC3	06/08/2004	McClusky	Mercer	47.29417	-101.46825	83	Rangeland/native grasses	None	
MYC4	06/08/2004	McClusky	Mercer	47.53077	-101.50121	83	Wildlife habitat/tame grasses	None	
MYC5	06/10/2003	McClusky	McLean	47.58833	-101.50359	83	Wildlife habitat/tame grasses	None	
MYC6	06/10/2003	McClusky	McLean	47.81694	-101.37898	83	CRP/unsp. grasses, alfalfa	None	
MYC7	06/10/2003	McClusky	McLean	47.96990	-101.46458	83	CRP/tame grasses	None	
MYD1	10/18/2004	McClusky	Oliver	47.07706	-101.17348	83	Wildlife habitat/native grasses	Possible - power plant	
MYD2	10/18/2004	McClusky	Oliver	47.16967	-101.20663	83	CRP/tame grasses	None	
MYD3	07/24/2003	McClusky	McLean	47.40803	-101.31231	83	CRP/tame grasses	None	
MYD4	07/24/2003	McClusky	McLean	47.55942	-101.26261	83	Wildlife habitat/tame grasses	None	
MYD5	06/11/2003	McClusky	McLean	47.66677	-101.16158	83	Wildlife habitat/tame grasses	None	
MYD6	06/11/2003	McClusky	McLean	47.74022	-101.12893	83	CRP/tame grasses	None	
MYD7	06/10/2003	McClusky	Ward	47.90577	-101.27701	83	CRP/tame grasses	None	
MYE1	10/18/2005	McClusky	Oliver	47.03328	-101.07635	83	Rangeland/native grasses and forbs	None	
MYE2	07/24/2003	McClusky	McLean	47.28822	-100.93422	83	CRP/tame grasses	None	
MYE3	07/23/2003	McClusky	McLean	47.41539	-100.90914	83	CRP/tame grasses	None	
MYE4	07/23/2003	McClusky	McLean	47.54425	-100.90411	83	Wildlife habitat/tame grasses	None	
MYE5	06/11/2003	McClusky	McLean	47.63840	-100.97231	83	CRP/tame grasses	None	
MYE6	06/11/2003	McClusky	McLean	47.77633	-101.08907	83	CRP/tame grasses	None	
MYE7	06/11/2003	McClusky	Ward	47.92111	-101.00372	83	Wildlife habitat/tame grasses	None	
MYF1	06/09/2004	McClusky	Burleigh	47.11380	-100.68335	83	CRP/unsp. grasses, alfalfa	None	
MYF2	07/24/2003	McClusky	McLean	47.28719	-100.75506	83	CRP/tame grasses	None	
MYF3	07/23/2003	McClusky	McLean	47.37031	-100.81664	83	Wildlife habitat/tame grasses	None	
MYF4	07/23/2003	McClusky	McLean	47.50758	-100.86614	83	CRP/tame grasses	None	
MYF5	06/11/2003	McClusky	McLean	47.68292	-100.82231	83	Cropland/fallow	None	
MYF6	06/12/2003	McClusky	McLean	47.72735	-100.80140	83	CRP/tame grasses	None	
MYF7	06/12/2003	McClusky	McHenry	47.95349	-100.73698	83	Cropland/unsp.	None	
MYG1	10/18/2004	McClusky	Burleigh	47.11249	-101.52107	83	Cropland/small grains	None	
MYG2	06/10/2004	McClusky	Burleigh	47.28920	-100.66290	83	Wildlife habitat/unsp. grasses, alfalfa	None	
MYG3	07/23/2003	McClusky	Sheridan	47.37047	-100.60836	83	CRP/tame grasses	None	
MYG4	07/23/2003	McClusky	Sheridan	47.55828	-100.62961	83	Rangeland/native grasses	None	
MYG5	07/22/2003	McClusky	McLean	47.67486	-100.64094	83	Wildlife habitat/tame grasses	None	
MYG6	06/12/2003	McClusky	McLean	47.76585	-100.67004	83	Wildlife habitat/tame grasses	None	
MYG7	06/12/2003	McClusky	McHenry	47.97493	-100.67037	83	CRP/tame grasses	None	
MYH1	06/09/2004	McClusky	Burleigh	47.13717	-100.38783	83	CRP/unsp. grasses, alfalfa	None	
MYH2	06/09/2004	McClusky	Burleigh	47.15897	-100.38829	83	Rangeland/native grasses	None	

Table A1.1a. Site description: location and earth cover (continued)

Site no.[1]	Collection date	QD250 name[2]	County	Latitude	Longitude	Datum	Land use/Land cover	Contamination	Comments
MYH3	04/09/2004	McClusky	Sheridan	47.35001	-100.41857	83	CRP/unsp. grasses, alfalfa	None	
MYH4	07/22/2003	McClusky	Sheridan	47.51656	-100.27328	83	CRP/tame grasses	None	
MYH5	07/22/2003	McClusky	Sheridan	47.57589	-100.37431	83	Wildlife habitat/tame grasses	None	
MYH6	07/22/2003	McClusky	Sheridan	47.72242	-100.41300	83	Rangeland/native grasses	None	
MYH7	07/21/2003	McClusky	McHenry	47.99000	-100.28358	83	WPA/tame grasses	None	
MYI1	06/09/2004	McClusky	Burleigh	47.11177	-100.23743	83	Wildlife habitat/native grasses	None	
MYI2	06/09/2004	McClusky	Burleigh	47.20062	-100.22102	83	Wildlife habitat/native grasses	None	
MYI3	06/09/2004	McClusky	Sheridan	47.36244	-100.22099	83	Wildlife habitat/native grasses	None	
MYI4	07/22/2003	McClusky	Sheridan	47.51536	-100.12444	83	CRP/tame grasses	None	
MYI5	07/22/2003	McClusky	Sheridan	47.67342	-100.24825	83	CRP/tame grasses	None	
MYI6	07/21/2003	McClusky	Sheridan	47.80789	-100.09036	83	CRP/tame grasses	None	
MYI7	07/21/2003	McClusky	Pierce	47.95253	-100.13461	83	CRP/tame grasses	None	
NRA1	06/27/2003	New Rockford	Kidder	47.04678	-99.81792	83	Wildlife habitat/tame grasses, alfalfa	Possible - farming	
NRA2	06/27/2003	New Rockford	Kidder	47.15570	-99.87476	83	Rangeland/native grasses	None	
NRA3	07/14/2003	New Rockford	Wells	47.38670	-99.93206	83	WPA/mixed grasses, alfalfa, clover	Possible - farming	
NRA4	07/14/2003	New Rockford	Wells	47.56029	-99.79269	83	Cropland/row crops	Possible - farming	
NRA5	04/14/2004	New Rockford	Wells	47.59672	-99.83858	83	Cropland/small grains	Possible - farming	
NRA6	04/14/2004	New Rockford	Wells	47.75135	-99.85450	83	Cropland/row crops	Possible - farming	
NRA7	04/13/2004	New Rockford	Pierce	47.98120	-99.94733	83	Hayland/tame grasses	Possible - farming	
NRB1	06/23/2003	New Rockford	Kidder	47.00839	-99.57698	83	WPA/mixed grasses	Possible - farming	
NRB2	06/27/2003	New Rockford	Kidder	47.16994	-99.72165	83	CRP/tame grasses	Possible - farming	
NRB3	07/15/2003	New Rockford	Kidder	47.32618	-99.65005	83	CRP/tame grasses and forbs, alfalfa, clover	Possible - farming	
NRB4	07/15/2003	New Rockford	Wells	47.48775	-99.70425	83	CRP/tame grasses	Possible - farming	
NRB5	04/22/2004	New Rockford	Wells	47.68557	-99.59695	83	Cropland/small grains	Possible - farming	
NRB6	04/13/2004	New Rockford	Wells	47.82240	-99.62053	83	CRP/unsp. grasses	Possible - farming	
NRB7	04/09/2004	New Rockford	Benson	47.94994	-99.62337	83	Cropland/row crops	Possible - farming	
NRC1	06/20/2003	New Rockford	Stutsman	47.06789	-99.43044	83	WPA/mixed grasses	Possible - farming	
NRC2	07/09/2003	New Rockford	Kidder	47.26800	-99.52500	83	Cropland/fallow	Possible - farming	
NRC3	07/15/2003	New Rockford	Wells	47.36392	-99.41653	83	Cropland/row crops	Possible - farming	
NRC4	07/16/2003	New Rockford	Wells	47.56974	-99.35402	83	Cropland/row crops	Possible - farming	
NRC4 AOV1	01/03/2000	New Rockford	Wells	47.54550	-99.52508	83	Cropland/row crops	Possible - farming	
NRC4 AOV2	07/16/2003	New Rockford	Wells	47.54553	-99.52511	83	Cropland/row crops	Possible - farming	
NRC5	04/22/2004	New Rockford	Wells	47.68882	-99.49242	83	Cropland/row crops	Possible - farming	
NRC6	04/22/2004	New Rockford	Wells	47.74250	-99.51427	83	Cropland/small grains	Possible - farming	
NRC7	04/15/2004	New Rockford	Benson	47.91520	-99.42052	83	Cropland/small grains	Possible - farming	
NRD1	06/20/2003	New Rockford	Stutsman	47.09683	-99.12479	83	WPA/mixed grasses and forbs	Possible - farming	
NRD2	07/02/2003	New Rockford	Stutsman	47.28209	-99.18388	83	WPA/wetland	None	
NRD2 AOV1	07/02/2003	New Rockford	Stutsman	47.17156	-99.17260	83	WPA/wetland	Possible - farming	
NRD2 AOV2	07/02/2003	New Rockford	Stutsman	47.17157	-99.17255	83	WPA/wetland	Possible - farming	
NRD3	07/15/2003	New Rockford	Foster	47.40698	-99.18324	83	Cropland/row crops	Possible - farming	
NRD4	07/15/2003	New Rockford	Foster	47.43686	-99.21756	83	CRP/tame grasses	Possible - farming	
NRD5	04/22/2004	New Rockford	Eddy	47.68982	-99.27328	83	Cropland/small grains	Possible - farming	
NRD6	04/22/2004	New Rockford	Eddy	47.83940	-99.25739	83	Cropland/row crops	Possible - farming	
NRD7	04/09/2004	New Rockford	Benson	47.89152	-99.15173	83	Pasture/unsp. grasses	Possible - farming, livestock	
NRE1	06/20/2003	New Rockford	Stutsman	47.10783	-99.06072	83	WPA/mixed grasses	Possible - farming	
NRE2	07/09/2003	New Rockford	Stutsman	47.18897	-98.97577	83	WPA/mixed grasses, alfalfa	Possible - farming	
NRE3	07/09/2003	New Rockford	Stutsman	47.31172	-99.03915	83	CRP/tame grasses, alfalfa	Possible - farming	
NRE4	07/24/2003	New Rockford	Foster	47.54074	-98.90338	83	CRP/tame grasses, alfalfa	Possible - farming	
NRE5	04/23/2004	New Rockford	Eddy	47.58980	-99.07359	83	CRP/unsp. grasses	Possible - farming	
NRE6	04/23/2004	New Rockford	Eddy	47.77533	-99.07743	83	Cropland/small grains	Possible - farming	
NRE7	04/08/2004	New Rockford	Benson	47.91139	-98.90778	83	Cropland/small grains	Possible - farming	
NRF1	06/20/2003	New Rockford	Stutsman	47.03851	-98.71570	83	CRP/tame grasses, alfalfa	Possible - farming	
NRF2	07/02/2003	New Rockford	Stutsman	47.16451	-98.80406	83	Wildlife habitat/tame grasses, alfalfa	Possible - farming	
NRF3	07/24/2003	New Rockford	Foster	47.37638	-98.83917	83	Rangeland/native grasses and forbs	Possible - farming, livestock	
NRF4	07/24/2003	New Rockford	Foster	47.52142	-98.86131	83	Hayland/alfalfa	Possible - farming	
NRF5	04/22/2004	New Rockford	Eddy	47.60086	-98.87979	83	Cropland/small grains	Possible - farming	
NRF6	04/22/2004	New Rockford	Eddy	47.77486	-98.70810	83	CRP/unsp. grasses	Possible - farming	

Table A1.1a. Site description: location and earth cover (continued)

Site no.[1]	Collection date	QD250 name[2]	County	Latitude	Longitude	Datum	Land use/Land cover	Contamination	Comments
NRF7	04/08/2004	New Rockford	Benson	47.97964	-98.81116	83	Cropland/row crops	Possible - farming	
NRG1	06/19/2003	New Rockford	Stutsman	47.11438	-98.48901	83	Cropland/row crops	Possible - farming	
NRG2	07/11/2003	New Rockford	Stutsman	47.15439	-98.50299	83	CRP/tame grasses	Possible - farming	
NRG3	07/17/2003	New Rockford	Stutsman	47.29791	-98.48716	83	Cropland/row crops	Possible - farming	
NRG3 AOV1	07/17/2003	New Rockford	Foster	47.39196	-98.58357	83	Cropland/row crops	Possible - farming	
NRG3 AOV2	07/17/2003	New Rockford	Foster	47.39196	-98.58353	83	Cropland/row crops	Possible - farming	
NRG4	07/24/2003	New Rockford	Foster	47.53057	-98.66148	83	WPA/tame grasses	Possible - farming	
NRG5	04/22/2004	New Rockford	Griggs	47.63330	-98.49861	83	Cropland/row crops	Possible - farming	
NRG6	04/15/2004	New Rockford	Nelson	47.82183	-98.52412	83	Pasture/unsp. grasses	Possible - farming	
NRG7	04/19/2004	New Rockford	Benson	47.88934	-98.60706	83	CRP/unsp. grasses	Possible - farming	
NRH1	06/19/2003	New Rockford	Barnes	47.11683	-98.26083	83	WPA/ wetland	Possible - farming	
NRH2	07/11/2003	New Rockford	Barnes	47.15297	-98.38147	83	Cropland/row crops	Possible - farming	
NRH3	07/17/2003	New Rockford	Griggs	47.34177	-98.32423	83	Cropland/row crops	Possible - farming	
NRH4	07/30/2003	New Rockford	Griggs	47.50699	-98.29613	83	CRP/tame grasses	Possible - farming	
NRH5	04/16/2004	New Rockford	Nelson	47.70239	-98.31648	83	Cropland/row crops	Possible - farming	
NRH6	04/16/2004	New Rockford	Nelson	47.72833	-98.32278	83	Cropland/row crops	Possible - farming	
NRH7	04/19/2004	New Rockford	Nelson	48.00722	-98.36083	83	Cropland/row crops	Possible - farming	
NRI1	06/09/2003	New Rockford	Barnes	47.08059	-98.17032	83	Cropland/row crops	Possible - farming	
NRI2	07/11/2003	New Rockford	Griggs	47.25282	-98.02749	83	Cropland/row crops	Possible - farming	
NRI3	07/11/2003	New Rockford	Griggs	47.29867	-98.02630	83	Rangeland/native grasses, forbs, sedges	Possible - livestock	
NRI4	07/30/2003	New Rockford	Griggs	47.45564	-98.03149	83	CRP/tame grasses	Possible - farming	
NRI5	04/19/2004	New Rockford	Griggs	47.67099	-98.18195	83	Cropland/row crops	Possible - farming	
NRI6	04/12/2004	New Rockford	Nelson	47.82692	-98.07727	83	Hayland/unsp. grasses	Possible - farming	
NRI7	04/16/2004	New Rockford	Nelson	47.90020	-98.21419	83	CRP/unsp. grasses	Possible - farming	
TFA1	06/16/2004	Thief River	Grand Forks	48.10207	-97.83859	83	Hayland/unsp.	None	
TFA2	04/21/2004	Thief River	Grand Forks	48.19377	-97.82325	83	Cropland/small grains	Possible - farming	
TFA3	04/21/2004	Thief River	Walsh	48.30644	-97.96980	83	Cropland/small grains	Possible - farming	
TFA4	04/20/2004	Thief River	Walsh	48.51522	-97.85430	83	CRP/unsp.	Possible - farming	
TFA5	04/19/2004	Thief River	Pembina	48.63346	-97.86134	83	CRP/tame grasses	Possible - farming	
TFA6	04/19/2004	Thief River	Cavalier	48.76157	-97.97343	83	CRP/tame grasses	Possible - livestock	
TFA7	04/19/2004	Thief River	Pembina	48.88004	-97.81725	83	Hayland/alfalfa	Possible - farming	
TFB1	06/16/2004	Thief River	Grand Forks	48.09247	-97.71517	83	Wildlife habitat/unsp. grasses	None	
TFB2	04/20/2004	Thief River	Walsh	48.26830	-97.55959	83	Cropland/row crops	Possible - farming	
TFB3	04/20/2004	Thief River	Walsh	48.38089	-97.68661	83	Cropland/row crops	Possible - farming	
TFB4	04/20/2004	Thief River	Walsh	48.46363	-97.69066	83	CRP/mixed grasses	Possible - farming	
TFB5	04/20/2004	Thief River	Pembina	48.58889	-97.54944	83	Cropland/small grains	Possible - farming	
TFB6	04/19/2004	Thief River	Pembina	48.83000	-97.63833	83	Cropland/small grains	Possible - farming	
TFB7	04/19/2004	Thief River	Pembina	48.96248	-97.67674	83	Cropland/small grains	Possible - farming	
TFC1	06/16/2004	Thief River	Grand Forks	48.07582	-97.42723	83	CRP/mixed grasses	None	
TFC2	04/20/2004	Thief River	Walsh	48.25177	-97.48594	83	Cropland/row crops	Possible - farming	
TFC3	04/20/2004	Thief River	Walsh	48.33873	-97.46590	83	Cropland/row crops	Possible - farming	
TFC4	04/21/2004	Thief River	Walsh	48.53061	-97.36619	83	Cropland/small grains	Possible - farming	
TFC5	04/20/2004	Thief River	Pembina	48.70365	-97.32516	83	Cropland/small grains	Possible - farming	
TFC6	04/20/2004	Thief River	Pembina	48.80769	-97.42474	83	Cropland/row crops	Possible - farming	
TFC7	04/20/2004	Thief River	Pembina	48.83176	-97.64337	83	Cropland/row crops	Possible - farming	
TFD1	06/16/2004	Thief River	Grand Forks	48.03469	-97.12811	83	CRP/mixed grasses	None	
TFD2	04/21/2004	Thief River	Grand Forks	48.18762	-97.20967	83	Cropland/row crops	Possible - farming	
TFD3	04/21/2004	Thief River	Walsh	48.41481	-97.16718	83	Cropland/row crops	Possible - farming	
TFD4	04/21/2004	Thief River	Pembina	48.55588	-97.20554	83	Cropland/row crops	Possible - farming	
TFD5	04/20/2004	Thief River	Pembina	48.70404	-97.16847	83	Cropland/small grains	Possible - farming	
TFD6	04/20/2004	Thief River	Pembina	48.79917	-97.18944	83	Cropland/row crops	Possible - farming	
WCA1	09/25/2003	Watford City	Golden Valley	47.00911	-103.86742	83	Rangeland/native grasses and forbs	None	
WCA2	09/25/2003	Watford City	Golden Valley	47.17944	-103.86103	83	Rangeland/native grasses and forbs	Possible - livestock	
WCA3	06/23/2004	Watford City	McKenzie	47.33741	-103.91376	83	Rangeland/mixed grasses	Possible - livestock	
WCA4	06/23/2004	Watford City	McKenzie	47.50140	-103.84720	83	Rangeland /mixed grasses	Possible - livestock	
WCA5	07/15/2004	Watford City	McKenzie	47.71339	-103.91412	83	Rangeland/mixed grasses and forbs	Possible - livestock	
WCA6	04/01/2004	Watford City	McKenzie	47.82830	-103.85399	83	Rangeland/native grasses	Possible - livestock	

Table A1.1a. Site description: location and earth cover (continued)

Site no.[1]	Collection date	QD250 name[2]	County	Latitude	Longitude	Datum	Land use/Land cover	Contamination	Comments
WCA7	04/01/2004	Watford City	McKenzie	47.97171	-103.96092	83	Cropland/row crops	Possible - farming	
WCB1	09/25/2003	Watford City	Billings	47.13008	-103.62022	83	Rangeland/native grasses and forbs	Possible - livestock	
WCB2	09/25/2003	Watford City	Golden Valley	47.23260	-103.68539	83	Rangeland/native grasses and forbs	Possible - livestock	
WCB3	07/14/2004	Watford City	McKenzie	47.34637	-103.58395	83	Rangeland/native grasses and forbs	Possible - livestock	
WCB4	06/23/2004	Watford City	McKenzie	47.52086	-103.73039	83	Pasture/tame grass	Possible - livestock	
WCB5	07/15/2004	Watford City	McKenzie	47.64863	-103.65369	83	Rangeland/native grasses, forbs, cacti	Possible - livestock	
WCB6	04/01/2004	Watford City	McKenzie	47.84412	-103.74976	83	Rangeland/tame grasses	Possible - farming	
WCB7	04/20/2004	Watford City	McKenzie	47.89135	-103.62596	83	Rangeland/tame grasses	Possible - farming, livestock	
WCC1	09/16/2003	Watford City	Billings	47.10871	-103.43612	83	Rangeland/native grasses	Possible - livestock	
WCC2	09/16/2003	Watford City	Billings	47.15479	-103.45321	83	Rangeland/native grasses	Possible - livestock	
WCC3	11/14/2003	Watford City	McKenzie	47.38958	-103.43581	83	Rangeland/native grasses	Possible - livestock	
WCC4	11/14/2003	Watford City	McKenzie	47.58667	-103.56472	83	Rangeland/native grasses	Possible - livestock	
WCC4 AOV1	11/14/2003	Watford City	McKenzie	47.49472	-103.33440	83	Rangeland/mixed grasses	Possible - livestock	
WCC4 AOV2	11/14/2003	Watford City	McKenzie	47.49472	-103.33440	83	Rangeland/mixed grasses	Possible - livestock	
WCC5	07/15/2004	Watford City	McKenzie	47.63482	-103.45012	83	Rangeland/native grasses and forbs	Possible - livestock	
WCC6	04/22/2004	Watford City	McKenzie	47.75134	-103.38943	83	Cropland/small grains	Possible - farming	
WCC7	04/20/2004	Watford City	McKenzie	47.95983	-103.46812	83	Cropland/small grains	Possible - farming	
WCD1	08/05/2003	Watford City	Billings	47.08809	-103.28730	83	Rangeland/native grasses	Possible - livestock	
WCD2	08/13/2003	Watford City	Billings	47.16264	-103.21722	83	Rangeland/native grasses	Possible - livestock	
WCD3	08/13/2003	Watford City	Billings	47.28527	-103.28472	83	Rangeland/native grasses	Possible - livestock	
WCD4	08/13/2003	Watford City	McKenzie	47.44043	-103.28317	83	Rangeland/native grasses	Possible - livestock	
WCD5	08/13/2003	Watford City	McKenzie	47.60058	-103.18252	83	Rangeland/native grasses	Possible - livestock	
WCD6	04/20/2004	Watford City	McKenzie	47.74252	-103.26051	83	Cropland/small grains	Possible - farming	
WCD7	03/31/2004	Watford City	McKenzie	47.90309	-103.23925	83	Rangeland/native grasses	None	
WCE1	07/23/2003	Watford City	Dunn	47.09963	-102.92633	83	Hayland/tame grasses	Possible - farming	
WCE2	07/23/2003	Watford City	Dunn	47.19436	-102.98370	83	Rangeland/native grasses, clover	Possible - livestock	
WCE3	08/22/2003	Watford City	McKenzie	47.35426	-103.10064	83	Rangeland/mixed grasses	Possible - livestock	
WCE4	08/22/2003	Watford City	Dunn	47.55930	-103.06014	83	Rangeland/native grasses and forbs	Possible - livestock	
WCE5	08/22/2003	Watford City	Dunn	47.60611	-102.91611	83	Pasture/kochia	Possible - livestock	
WCE5 AOV1	08/27/2003	Watford City	McKenzie	47.70234	-103.11420	83	Rangeland/mixed grasses	Possible - livestock	
WCE5 AOV2	08/27/2003	Watford City	McKenzie	47.70234	-103.11414	83	Rangeland/mixed grasses	Possible - livestock	
WCE6	08/27/2003	Watford City	McKenzie	47.79529	-103.08762	83	Hayland/tame grass, alfalfa	Possible - farming	
WCE7	10/23/2003	Watford City	McKenzie	47.97944	-103.07899	83	Rangeland/mixed grasses and forbs	Possible - livestock	
WCF1	05/15/2003	Watford City	Dunn	47.07897	-102.79566	83	Rangeland/native grasses	Possible - livestock	
WCF2	05/15/2003	Watford City	Dunn	47.24279	-102.77869	83	Rangeland/native grasses	Possible - livestock	
WCF3	07/23/2003	Watford City	Dunn	47.30705	-102.79074	83	Hayland/tame grasses, alfalfa	Possible - farming	
WCF4	08/27/2003	Watford City	Dunn	47.55551	-102.77020	83	Hayland/tame grasses, alfalfa	Possible - farming	
WCF5	08/27/2003	Watford City	McKenzie	47.69722	-102.89000	83	Rangeland/native grasses and forbs	Possible - livestock	
WCF6	10/23/2003	Watford City	McKenzie	47.72065	-102.82019	83	Cropland/small grains	Possible - farming	
WCF6 AOV1	10/23/2003	Watford City	McKenzie	47.80678	-102.83289	83	Cropland/small grains, alfalfa	Possible - farming, livestock	
WCF6 AOV2	10/23/2003	Watford City	McKenzie	47.80680	-102.83288	83	Cropland/small grains, alfalfa	Possible - farming, livestock	
WCF7	10/23/2003	Watford City	McKenzie	47.86594	-102.80556	83	Rangeland/native grasses, forbs, cacti	Possible - livestock	
WCG1	07/29/2003	Watford City	Dunn	47.13521	-102.45805	83	Rangeland/native grasses and forbs	Possible - livestock	
WCG2	05/15/2003	Watford City	Dunn	47.25595	-102.54294	83	Rangeland/native grasses	Possible - livestock	
WCG3	07/23/2003	Watford City	Dunn	47.38486	-102.46230	83	Rangeland/mixed grasses	Possible - livestock	
WCG4	10/23/2003	Watford City	Dunn	47.49352	-102.65449	83	Pasture/mixed grasses	Possible - livestock	
WCG5	09/16/2003	Watford City	Dunn	47.66851	-102.53470	83	Rangeland/native grasses and forbs	Possible - livestock	
WCG6	09/16/2003	Watford City	Dunn	47.75143	-102.45309	83	Rangeland/native grasses and forbs	Possible - livestock	
WCG7	06/23/2003	Watford City	Mountrail	47.89941	-102.62044	83	Wildlife habitat/tame grasses	Possible - farming	
WCH1	07/23/2003	Watford City	Dunn	47.09945	-102.38905	83	Rangeland/native grasses and forbs	Possible - livestock	
WCH2	05/15/2003	Watford City	Dunn	47.19982	-102.33549	83	Rangeland/native grasses	Possible - livestock	
WCH3	07/23/2003	Watford City	Dunn	47.38621	-102.31378	83	Cropland/fallow	Possible - farming	
WCH4	09/16/2003	Watford City	Dunn	47.51357	-102.26521	83	Hayland/tame grasses, alfalfa	Possible - farming	
WCH5	09/16/2003	Watford City	Dunn	47.69558	-102.37269	83	Rangeland/native grasses and forbs	Possible - livestock	
WCH6	09/16/2003	Watford City	Dunn	47.74330	-102.36707	83	Rangeland/native grasses and forbs	Possible - livestock	
WCH7	06/23/2003	Watford City	Mountrail	47.90783	-102.42651	83	Wildlife habitat/mixed grasses	None	
WCI1	07/29/2003	Watford City	Mercer	47.05124	-102.04090	83	Rangeland/native grasses and forbs	Possible - livestock	

Table A1.1a. Site description: location and earth cover (continued)

Site no.[1]	Collection date	QD250 name[2]	County	Latitude	Longitude	Datum	Land use/Land cover	Contamination	Comments
WCI2	07/29/2003	Watford City	Dunn	47.18606	-102.18967	83	Cropland/row crops	Possible - farming	
WCI3	07/29/2003	Watford City	Dunn	47.30180	-102.15347	83	Rangeland/mixed grasses	Possible - livestock	
WCI4	09/16/2003	Watford City	Dunn	47.54558	-102.20778	83	Rangeland/native grasses and forbs	Possible - livestock	
WCI5	06/24/2003	Watford City	McLean	47.61770	-102.04965	83	Cropland/fallow	Possible - farming	
WCI6	06/24/2003	Watford City	McLean	47.83015	-102.06441	83	Idle/mixed grasses	Probable - oil field	
WCI7	03/31/2004	Watford City	Mountrail	47.89788	-102.14735	83	Cropland/small grains	Possible - farming	
WIA1	05/30/2003	Williston	Williams	48.11030	-103.76808	83	Cropland/small grains	Possible - farming, oil field	
WIA2	05/30/2003	Williston	Williams	48.17681	-103.92875	83	Cropland/small grains	Possible - farming	
WIA3	05/30/2003	Williston	Williams	48.40125	-103.80737	83	Cropland/small grains	Possible - farming	
WIA4	05/30/2003	Williston	Williams	48.50256	-103.87854	83	Cropland/small grains	Possible - farming	
WIA5	05/29/2003	Williston	Williams	48.60674	-103.82189	83	Cropland/small grains	Possible - farming	
WIA6	05/29/2003	Williston	Divide	48.82175	-103.79340	83	Cropland/small grains	Possible - farming	
WIA7	05/29/2003	Williston	Divide	48.96650	-103.96432	83	Rangeland/unsp. grasses and forbs	None recorded	
WIB1	04/28/2004	Williston	McKenzie	48.05784	-103.59537	83	Rangeland/native grasses, brush, shrubs	Possible - livestock	
WIB2	04/22/2004	Williston	Williams	48.23027	-103.67078	83	Cropland/small grains	Possible - farming	
WIB3	05/30/2003	Williston	Williams	48.40083	-103.56605	83	Rangeland/unsp. grasses	Possible - farming	
WIB4	06/03/2003	Williston	Williams	48.51013	-103.69151	83	Cropland/alfalfa	Possible - farming	
WIB5	05/29/2003	Williston	Williams	48.61804	-103.69991	83	Cropland/small grains	Possible - farming	
WIB6	05/29/2003	Williston	Divide	48.84036	-103.55338	83	Cropland/row crops	Possible - farming	
WIB7	05/29/2003	Williston	Divide	48.96551	-103.55166	83	Cropland/small grains	Possible - farming	
WIC1	04/28/2004	Williston	Williams	48.10678	-103.42590	83	Cropland/small grains	Possible - farming	
WIC2	05/19/2004	Williston	Williams	48.19291	-103.28053	83	Cropland/small grains	Possible - farming	
WIC3	05/30/2003	Williston	Williams	48.39328	-103.30964	83	Cropland/small grains	Possible - farming	
WIC4	05/30/2003	Williston	Williams	48.47372	-103.42784	83	Rangeland/unsp. grasses and forbs	None recorded	
WIC5	05/29/2003	Williston	Divide	48.67742	-103.43447	83	Cropland/small grains	Possible - farming	
WIC6	05/06/2003	Williston	Divide	48.80875	-103.33438	83	Rangeland/unsp. grasses and forbs	None recorded	
WIC7	05/29/2003	Williston	Divide	48.97086	-103.30374	83	Wildlife habitat/unsp. grasses	None recorded	
WID1	04/27/2004	Williston	McKenzie	48.08395	-103.09188	83	Rangeland/native grasses and forbs	Possible - livestock	
WID2	05/19/2004	Williston	Williams	48.15782	-103.11806	83	Cropland/row crops	Possible - farming	
WID3	05/17/2004	Williston	Williams	48.33005	-103.03674	83	Cropland/small grains	Possible - farming	
WID4	05/17/2004	Williston	Williams	48.54706	-103.08817	83	Rangeland/native grasses	Possible - livestock	
WID5	05/28/2003	Williston	Divide	48.67614	-103.06542	83	CRP/unsp.	Possible - farming	
WID6	05/28/2003	Williston	Divide	48.74071	-103.20327	83	CRP/unsp.	Possible - farming	
WID7	05/06/2003	Williston	Divide	48.96736	-103.11845	83	CRP/unsp.	Possible - farming	
WIE1	04/27/2004	Williston	McKenzie	48.10094	-102.95927	83	Rangeland/native grasses	Possible - livestock	
WIE2	07/30/2003	Williston	Williams	48.25225	-102.91396	83	Rangeland/native grasses	None	
WIE3	07/30/2003	Williston	Williams	48.42851	-102.97485	83	CRP/tame grasses, alfalfa	Possible - farming	
WIE4	07/30/2003	Williston	Williams	48.50415	-102.96751	83	Rangeland/native grasses	None	
WIE5	05/28/2003	Williston	Burke	48.61939	-102.81049	83	Cropland/small grains	Possible - farming	
WIE6	05/05/2003	Williston	Burke	48.76298	-102.80339	83	Cropland/small grains	Possible - farming	
WIE7	05/06/2003	Williston	Burke	48.96607	-102.81700	83	Cropland/row crops	Possible - farming	
WIE7 AOV1	05/06/2003	Williston	Burke	48.92015	-102.89411	83	CRP/unsp.	Possible - farming, coal mine	
WIE7 AOV2	05/06/2003	Williston	Burke	48.92042	-102.89395	83	CRP/unsp.	Possible - farming, coal mine	
WIF1	07/29/2003	Williston	Mountrail	48.11065	-102.62418	83	Rangeland/native grasses	None	
WIF1 AOV1	07/29/2003	Williston	Mountrail	48.06752	-102.50477	83	Rangeland/native grasses	None	
WIF1 AOV2	07/29/2003	Williston	Mountrail	48.06734	-102.50527	83	Rangeland/native grasses	Possible - farming	
WIF2	07/29/2003	Williston	Mountrail	48.19107	-102.69945	83	Wildlife habitat/wetland	None	
WIF3	07/30/2003	Williston	Mountrail	48.39003	-102.75802	83	CRP/native grasses	None recorded	
WIF4	07/30/2003	Williston	Mountrail	48.47522	-102.58229	83	Wildlife habitat/tame grasses	Possible - farming	
WIF5	05/28/2003	Williston	Burke	48.59301	-102.71188	83	Rangeland/unsp. grasses and forbs	None recorded	
WIF6	05/05/2003	Williston	Burke	48.81969	-102.67885	83	Rangeland/native grasses and forbs	None recorded	
WIF7	05/05/2003	Williston	Burke	48.95473	-102.56869	83	Cropland/small grains	Possible - farming	
WIF7 AOV1	05/05/2003	Williston	Burke	48.90760	-102.69848	83	Cropland/row crops	Possible - farming	
WIF7 AOV2	05/05/2003	Williston	Burke	48.90759	-102.69814	83	Cropland/row crops	Possible - farming	
WIG1	07/29/2003	Williston	Mountrail	48.04027	-102.03378	83	Cropland/fallow	Possible - farming	
WIG1*	06/23/2003	Williston	Mountrail	48.03063	-102.33079	83	Cropland/small grains	Possible - farming	
WIG2	07/29/2003	Williston	Mountrail	48.16088	-102.39571	83	Wildlife habitat/tame grasses	Probable - Al from bucket auger	

Table A1.1a. Site description: location and earth cover (continued)

Site no.[1]	Collection date	QD250 name[2]	County	Latitude	Longitude	Datum	Land use/Land cover	Contamination	Comments
WIG3	07/31/2003	Williston	Mountrail	48.30302	-102.30909	83	CRP/tame grasses and alfalfa	Possible - farming	
WIG4	07/30/2003	Williston	Mountrail	48.48943	-102.39744	83	Wildlife habitat/native grasses	Possible - livestock	
WIG5	05/28/2003	Williston	Burke	48.67399	-102.43105	83	Rangeland/unsp. grasses and forbs	None recorded	
WIG6	05/05/2003	Williston	Burke	48.82231	-102.42209	83	Cropland/small grains	Possible - farming	
WIG7	05/05/2003	Williston	Burke	48.95828	-102.43406	83	Cropland/small grains	Probable - farming, oil field	
WIH1	07/28/2003	Williston	Mountrail	48.03371	-102.19212	83	Hayland/native grasses	Possible - gravel road	
WIH1*	06/23/2003	Williston	Mountrail	48.04249	-102.20301	83	Cropland/small grains	Possible - farming	
WIH2	07/28/2003	Williston	Mountrail	48.21048	-102.19712	83	Rangeland/native grasses	None recorded	
WIH3	07/31/2003	Williston	Mountrail	48.40800	-102.08308	83	CRP/tame grasses and alfalfa	None recorded	
WIH4	05/28/2003	Williston	Mountrail	48.53880	-102.19182	83	Cropland/row crops	Possible - farming	
WIH5	05/28/2003	Williston	Ward	48.60696	-102.19141	83	Cropland/small grains	Possible - farming	
WIH6	05/05/2003	Williston	Burke	48.81426	-102.06665	83	Cropland/small grains	Possible - farming	
WIH7	05/05/2003	Williston	Burke	48.90778	-102.05541	83	Wildlife habitat/unsp.	None	

[1] Site names consist of a three-letter, single digit code in the format QQXn; where QQ is the two-letter code for the 1:250,000-scale quadrangle in which the sample was collected, and Xn is a letter-digit code that identifies a 10 x 10 mile grid cell within that quadrangle. Sites marked with an asterisk (*) indicate a second (inadvertent) sampling of the same cell. Double asterisks (**) indicates sites where samples were collected for full characterization at the NRCS Soil Survey Laboratory in Lincoln, NE.

[2] USGS 1° x 2° series (1:250,000-scale) map set.

[3] Wildfowl production Area

[4] Not specified

[5] Land in Conservation Reserve Program

[6] Sample collected from Jay Volk Ph.D. project pit 504ND043-001.

Table A1.1b. Site description: geology

Site no.[1]	Landscape	Landform	Slope shape[2]	Slope gradient (%)	Drainage[3]	Parent material
ABE7	Till plain	Moraine	CC	4	W	Till
ABF7	Till plain	Rise	LL	5	W	Till over weathered shale
ABG7	Till plain	Ground moraine	LL	5	W	Till
ABH7	Till plain	Ground moraine	CL	1	MW	Till
BSA1	Upland	Swale	CL	2	W	Silty alluvium
BSA2	Upland	Alluvial flat	CL	1	W	Loamy alluvium
BSA3	Upland	Terrace	LL	1	W	Loamy alluvium
BSA3 AOV1	Upland	Alluvial fan	LL	2	W	Loamy alluvium
BSA3 AOV2	Upland	Alluvial fan	LL	2	W	Loamy alluvium
BSA4	Upland	Alluvial flat	LL	3	W	Silty alluvium
BSA5	Upland	Alluvial fan	CL	3	W	Loamy alluvium
BSA6	Upland	Ridge	LV	5	W	Silty residuum
BSA7	Upland	Alluvial fan	CC	3	W	Sandy alluvium
BSB1	Upland	Flat	LL	1	W	Alluvial silt & clay
BSB2	Upland	Alluvial fan	LL	2	W	Silty alluvium
BSB3	Upland	Alluvial fan	VV	5	W	Sandy alluvium
BSB4	Upland	Flat	CL	4	W	Sandy alluvium
BSB5	Upland	Alluvial fan	LL	6	W	Silty alluvium
BSB6	Upland	Ridge	VL	7	W	Silty residuum
BSB7	Upland	Ridge	VL	10	W	Silty residuum
BSC1	Upland	Ridge	LV	9	SE	Sandy residuum
BSC2	Upland	Plain	LC	2	W	Loamy alluvium
BSC3	Upland	Ridge	VV	14	W	Sandy residuum
BSC4	Upland	Drainageway	LC	2	MW	Loamy alluvium
BSC5	Upland	Stream terrace	LL	1	W	Recent alluvium
BSC6	Upland	Alluvial fan	LL	2	W	Loamy alluvium
BSC7	Upland	Ridge	VV	7	W	Silty alluvium
BSC7 AOV1	Upland	Ridge	VV	5	W	Sandy alluvium
BSC7 AOV2	Upland	Ridge	VV	5	W	Sandy alluvium
BSD1	Upland	Plain	LL	5	W	Loamy alluvium
BSD2	Upland	Ridge	LV	4	W	Loamy residuum
BSD3	Upland	Ridge	LC	6	W	Sandy alluvium
BSD4	Upland	Ridge	VL	18	W	Sandy residuum
BSD5	Upland	Alluvial fan	LL	3	W	Clayey alluvium
BSD6	River valley	Ridge	VV	7	W	Glaciofluvial sand & gravel
BSD7	Upland	Alluvial flat	LL	2	W	Till
BSE1	Upland	Ridge	LL	20	W	Shaly residuum
BSE2	Upland	Hillslope	VL	9	W	Sandy residuum
BSE3	Upland	Ridge	VV	8	SE	Sandy residuum
BSE4	Upland	Ridge	VL	5	W	Loamy residuum
BSE5	Upland	Stream terrace	LL	1	W	Silty alluvium
BSE7	Upland	Ridge	LV	8	W	Till
BSF1	Upland	Ridge	LL	12	W	Residual silt & clay
BSF2	Upland	Fan	LV	2	W	Sandy alluvium
BSF3	Upland	Ridge	CC	5	W	Loamy residuum
BSF4	Upland	Alluvial fan	VL	2	W	Sandy residuum
BSF5	Upland	Terrace	LV	1	W	Loamy alluvium over sand & gravel
BSF6	Upland	Rise	LL	< 1	W	Loess over till
BSF7	Upland	Knoll	LC	4	MW	Loamy alluvium over till
BSG1	Upland	Rise	LL	4	W	Sandy alluvium
BSG2	Upland	Swale	LC	2	W	Silty alluvium
BSG3	Upland	Terrace	LV	5	W	Loess
BSG4	Upland	Fan	LV	2	W	Silty alluvium
BSG5	Upland	Terrace	LL	1	W	Loess
BSG6	Upland	Rise	CC	2	W	Sandy lacustrine
BSG7	Upland	Hillslope	VL	5	W	Till
BSH1	Upland	Knoll	VV	2	W	Loess
BSH2	Upland	Rise	LC	3	W	Loamy alluvium
BSH3	Upland	Rise	LL	12	W	Loamy alluvium over till
BSH4	Upland	Swale	CL	2	MW	Silty alluvium
BSH5	Upland	Rise	LV	7	W	Residual silt & clay
BSH6	Upland	Rise	LL	2	W	Silty alluvium
BSH7	Upland	Ridge	VV	2	W	Till
BSI1	Upland	Swale	CC	9	W	Loamy alluvium
BSI2	Upland	Rise	VL	2	W	Loamy alluvium over till

Table A1.1b. Site description: geology (continued)

Site no.[1]	Landscape	Landform	Slope shape[2]	Slope gradient (%)	Drainage[3]	Parent material
BSI3	Upland	Rise	LL	9	W	Silty residuum
BSI4	Upland	Knoll	VL	2	W	Loess over till
BSI5	Upland	Rise	LC	1	MW	Loess over till
BSI6	Upland	Knoll	VL	2	W	Till
BSI7	Upland	Knoll	VV	1	W	Till
DKA1	Upland	Plain	VL	4	SE	Sandstone residuum
DKA2	Upland	Ridge	VV	9	W	Sandy residuum
DKA3	Upland	Alluvial fan	LV	2	W	Loamy alluvium over sand & gravel
DKA4	Upland	Rise	LL	7	W	Sandy residuum
DKA5	Upland	Rise	VV	8	W	Silty residuum
DKA6	Upland	Ridge	VV	10	W	Silty residuum
DKA7	Upland	Rise	LV	4	W	Silty residuum
DKB1	Upland	Ridge	LL	8	W	Shaly residuum
DKB2	Upland	Flat	CL	2	W	Clayey residuum
DKB3	Upland	Pediment	LL	4	W	Sandy residuum
DKB4	Upland	Flat	CL	1	W	Loamy alluvium
DKB5	Upland	Drainageway	LC	3	W	Silty alluvium
DKB6	Upland	Alluvial fan	LL	14	W	Silty alluvium
DKB7	Upland	Alluvial fan	LL	5	W	Clayey alluvium
DKC1	Upland	Plain	LL	3	W	Loamy residuum
DKC1 AOV1	Upland	Ridge	LL	10	W	Loamy residuum
DKC1 AOV2	Upland	Ridge	LL	10	W	Loamy residuum
DKC2	Upland	Ridge	VL	4	W	Sandy residuum
DKC3	Upland	Alluvial fan	LL	2	W	Loamy alluvium
DKC4	Upland	Alluvial flat	LL	1.5	W	Silty alluvium
DKC5	Upland	Alluvial fan	LL	5	W	Silty alluvium
DKC6	Upland	Alluvial flat	LL	2	W	Clayey alluvium
DKC7	Upland	Alluvial fan	LC	9	W	Loamy alluvium
DKD1	Upland	Ridge	LV	13	W	Silty residuum
DKD2	Upland	Swale	CC	1	W	Loamy alluvium
DKD3	Upland	Alluvial fan	LL	2	W	Clayey alluvium
DKD4	Upland	Alluvial flat	LL	1	W	Clayey alluvium
DKD5	Upland	Plain	LL	1	W	Silty alluvium
DKD6	Upland	Flat	LL	2	W	Residual silt & clay
DKD7	Upland	Alluvial flat	LL	3	W	Silty residuum
DKE1	Upland	Ridge	VL	7	W	Loamy residuum
DKE2	Upland	Alluvial fan	LL	5	W	Clayey alluvium
DKE3	Upland	Ridge	VL	10	W	Silty residuum
DKE4	Upland	Ridge	VV	15	W	Loamy residuum
DKE4 AOV1	Upland	Fan	VL	3	W	Silty residuum
DKE4 AOV2	Upland	Fan	VL	3	W	Silty residuum
DKE5	Upland	Swale	CC	2	W	Silty alluvium
DKE6	Upland	Rise	VL	4	W	Shaly residuum
DKE7	Upland	Rise	VV	4	W	Loamy alluvium
DKF1	Upland	Plain	VL	3	W	Sandstone
DKF1 AOV1	Upland	Plain	LL	5	W	Sandstone
DKF1 AOV2	Upland	Plain	LL	5	W	Sandstone
DKF2	Upland	Ridge	VL	7	W	Residual silt & clay
DKF3	Upland	Alluvial flat	LC	2	MW	Clayey alluvium
DKF4	Upland	Stream terrace	LL	3	W	Loamy alluvium over sand & gravel
DKF5	Upland	Alluvial flat	LL	1	MW	Loamy alluvium
DKF6	Upland	Ridge	VL	10	W	Sandy residuum
DKF7	Upland	Rise	CC	2	W	Sandy residuum
DKG1	Upland	Plain	VL	5	W	Shaly residuum
DKG2	Upland	Ridge	LL	4	W	Sandy residuum
DKG3	Upland	Ridge	CL	11	W	Loamy residuum
DKG4	Upland	Ridge	VV	7	W	Sandy residuum
DKG5	Upland	Rise	VL	8	MW	Residual silt & clay
DKG6	Upland	Rise	VL	5	W	Silty residuum
DKG7	Upland	Ridge	LL	8	W	Weathered lignite
DKH1	Upland	Flat	LL	1	W	Clayey alluvium
DKH2	Upland	Ridge	VV	12	W	Sandy residuum
DKH3	Upland	Fan	LL	2	W	Residual silt & clay
DKH4	Upland	Alluvial fan	CL	5	W	Silty alluvium
DKH4 AOV1	Upland	Alluvial fan	VL	4	W	Silty alluvium

Table A1.1b. Site description: geology (continued)

Site no.[1]	Landscape	Landform	Slope shape[2]	Slope gradient (%)	Drainage[3]	Parent material
DKH4 AOV2	Upland	Alluvial fan	VL	4	W	Silty alluvium
DKH5	Upland	Alluvial flat	CL	2	W	Residual silt & clay
DKH6	Upland	Alluvial flat	LL	1	W	Clayey alluvium
DKH7	Upland	Ridge	LV	8	W	Shale
DKI1	Upland	Ridge	VL	7	W	Siltstone
DKI2	Upland	Alluvial flat	LL	2	W	Loamy alluvium
DKI3	Upland	Stream terrace	LL	1	W	Loamy alluvium over sand & gravel
DKI3 AOV1	Upland	Stream terrace	LL	1	W	Loamy alluvium over sand & gravel
DKI3 AOV2	Upland	Stream terrace	LL	1	W	Loamy alluvium over sand & gravel
DKI4	Upland	Alluvial flat	CL	1	W	Silty alluvium
DKI4 AOV1	Upland	Ridge	CC	3	W	Clayey alluvium
DKI4 AOV2	Upland	Ridge	CC	3	W	Clayey alluvium
DKI5	Upland	Alluvial fan	VL	4	W	Silty alluvium
DKI6	Upland	Alluvial fan	CL	3	MW	Clayey alluvium
DKI7	Upland	Alluvial fan	LL	4	W	Silty alluvium
DKI7 AOV1	Upland	Alluvial fan	CL	5	W	Sandy alluvium
DKI7 AOV2	Upland	Alluvial fan	CL	6	W	Sandy alluvium
DLA1	Till plain	Rise	CL	3	W	Till
DLA2	Till plain	Knoll	VV	1	W	Till
DLA3	Till plain	Rise	CC	6	W	Till
DLA4	Till plain	Ridge	LL	5	W	Till
DLA5	Sand plain	Rise	LL	5	W	Sandy glaciofluvial
DLA6	Till plain	Ridge	LL	2	W	Till
DLA7	Till plain	Ridge	LL	10	W	Till
DLB1	Till plain	Rise	VV	5	W	Till
DLB2	Till plain	Rise	CC	3	W	Till
DLB3	Till plain	Knoll	LL	9	W	Till
DLB4	Till plain	Rise	LV	5	W	Till
DLB5	Till plain	Rise	VV	1	W	Till
DLB6	Till plain	Rise	LL	3	W	Till
DLB7	Till plain	Ridge	LC	3	MW	Till
DLC1	Till plain	Rise	CV	3	W	Till
DLC2	Till plain	Plain	CC	1	MW	Till
DLC3	Till plain	Rise	LC	1	MW	Till
DLC4	Lake plain	Rise	LL	< 1	SP	Sandy glaciolacustrine
DLC5	Till plain	Rise	LL	3	MW	Till
DLC6	Till plain	Plain	VC	1	MW	Till
DLC7	Till plain	Ridge	VV	9	W	Till
DLD1	Till plain	Rise	VL	2	MW	Till
DLD2	Lake plain	Plain	-	0	P	Glaciolacustrine silt & clay
DLD3	Till plain	Rise	LV	2	SP	Till
DLD4	Lake plain	Plain	-	-	SP	Silty glaciolacustrine
DLD5	Till plain	Drainageway	CV	1	SP	Till
DLD6	Till plain	Rise	VL	4	W	Till
DLD7	Till plain	Rise	LL	2	W	Till
DLE1	Till plain	Knoll	VV	1	W	Till
DLE2	Till plain	Rise	VL	2	W	Till
DLE3	Lake plain	Plain	LL	< 1	SP	Silty glaciolacustrine
DLE4	Till plain	Rise	VL	2	W	Till
DLE5	Till plain	Depression	-	0	P	Till
DLE6	Till plain	Rise	LV	1	SP	Till
DLE7	Till plain	Plain	LL	1	MW/SP	Till
DLF1	Till plain	Knoll	VV	4	W	Till
DLF2	Till plain	Plain	VL	< 1	MW	Till
DLF3	Till plain	Rise	VV	1	W	Till
DLF4	Till plain	Depression	CL	2	SP	Till
DLF5	Till plain	Rise	VC	4	W	Till
DLF6	Till plain	Rise	VV	4	W	Till
DLF6 AOV1	Till plain	Rise	VV	1	W	Till
DLF6 AOV2	Till plain	Rise	LV	2	W	Till
DLF7	Till plain	Rise	VL	2	SP	Till
DLG1	Till plain	Rise	CL	3	MW	Till
DLG2	Till plain	Plain	LV	1	MW	Till
DLG3	Till plain	Rise	LL	9	MW	Till
DLG4	Till plain	Rise	VV	5	W	Till

Table A1.1b. Site description: geology (continued)

Site no.[1]	Landscape	Landform	Slope shape[2]	Slope gradient (%)	Drainage[3]	Parent material
DLG4*	Till plain	Rise	VV	3	W	Till
DLG5	Till plain	Rise	LV	4	W	Till
DLG5*	Till plain	Depression	VC	1	P	Till
DLG6	Till plain	Knoll	LV	6	W	Till
DLG7	Till plain	Rise	VL	1	SP	Till
DLH1	Till plain	Knoll	VV	4	W	Till
DLH2	Till plain	Plain	-	1	SP	Till
DLH3	Till plain	Knoll	VV	1	W	Till
DLH4	Till plain	Rise	LV	4	W	Till
DLH5	Till plain	Rise	VL	1	SP	Till
DLH6	Till plain	Plain	LL	1	MW	Till
DLH7	Alluvial plain	Floodplain	LL	< 1	MW	Alluvial silt & clay
FAA1	Lake plain	Flat	LV	0-1	P	Sandy glaciolacustrine
FAA2	Lake plain	Flat	LL	0-1	SP	Silty glaciolacustrine
FAA3	Outwash plain	Terrace	LV	1	W	Loamy alluvium over sand & gravel
FAA4	Till plain	Flat	CC	1	P	Till
FAA5	Till plain	Hillslope	LC	3	W	Till
FAA6	Upland	Rise	CL	5	W	Till
FAA6 AOV1	Till plain	End moraine	CL	1	W	Till
FAA6 AOV2	Till plain	End moraine	CL	1	W	Till
FAA7	Lake plain	Plain	LL	1	W	Alluvial silt & clay
FAB1	Till plain	Flat	LC	2	W	Till
FAB2	Till plain	Rise	LV	3	W	Till
FAB2**	Till plain	Flat	LL	1	SP	Loamy alluvium over till
FAB3	Till plain	Rise	LV	4	W	Till
FAB4	Till plain	Hillslope	CC	4	W	Till
FAB5	Till plain	Hillslope	LV	2	W	Till
FAB5 AOV1	Till plain	Rise	LC	2	W	Till
FAB5 AOV2	Till plain	Rise	LC	2	W	Till
FAB6	Till plain	Depression	LV	3	P	Till
FAB7	Till plain	Ground moraine	CL	2	MW	Till
FAC1	Till plain	Rise	LV	3	W	Till
FAC2	Till plain	Hillslope	LV	4	W	Till
FAC3	Delta plain	Flat	LL	0-1	P	Deltaic sand
FAC4	Till plain	Flat	VV	2	W	Silty glaciolacustrine
FAC5	Delta plain	Plain	LL	0-1	SP	Sandy alluvium
FAC6	Till plain	Hillslope	CL	3	W	Till
FAC7	Till plain	Rise	CL	4	W	Till
FAD1	Till plain	Ground moraine	LV	2	W	Till
FAD1 AOV1	Till plain	Rise	LC	2	W	Till
FAD1 AOV2	Till plain	Rise	LC	2	W	Till
FAD2	Delta plain	Hillslope	LV	4	W	Silty glaciolacustrine
FAD3	Delta plain	Knoll	VV	1	P	Deltaic sand
FAD4	Alluvial plain	Terrace	LL	1	MW	Eolian sand
FAD5	Delta plain	Plain	LL	0	W	Sandy alluvium
FAD6	Lake plain	Plain	LL	0	P	Glaciolacustrine silt & clay
FAD7	Lake plain	Flat	LL	0	P	Silty glaciolacustrine
FAE1	Sandhills	Hillslope	LC	4	SP	Eolian sand
FAE2	Delta plain	Flat	LL	0-1	MW	Loam over sand & gravel
FAE3	Delta plain	Flat	LL	0-1	MW	Deltaic sand
FAE4	Delta plain	Plain	CV	0-2	P	Eolian sand
FAE5	Alluvial plain	Terrace	LL	0-1	SP	Silty alluvium
FAE6	Lake plain	Plain	LL	0-1	P	Glaciolacustrine silt & clay
FAE7	Lake plain	Plain	LL	0	P	Clayey glaciolacustrine
FAF1	Lake plain	Flat	LC	0-1	P	Silty glaciolacustrine
FAF2	Lake plain	Flat	LV	0	P	Clayey glaciolacustrine
FAF3	Delta plain	Flat	CC	1	SP	Deltaic sand
FAF3 AOV1	Delta plain	Flat	LL	0-1	SP	Deltaic sand
FAF3 AOV2	Delta plain	Flat	LL	0-1	SP	Deltaic sand
FAF4	Lake plain	Plain	LL	0	P	Silty clayey glaciolacustrine
FAF5	Lake plain	Plain	LV	2	W	Lacustrine
FAF6	Lake plain	Plain	LL	0	P	Clayey glaciolacustrine
FAG2	Lake plain	Flat	CC	1	P	Clayey glaciolacustrine
FAG3	Lake plain	Flat	LL	2	SP	Clayey alluvium
GFA1	Till plain	Rise	-	2	SP	Till

Table A1.1b. Site description: geology (continued)

Site no.[1]	Landscape	Landform	Slope shape[2]	Slope gradient (%)	Drainage[3]	Parent material
GFA2	Till plain	Swale	LC	4	MW	Till
GFA3	Till plain	Rise	LC	1	W	Till
GFA4	Till plain	Depression	LC	10	MW	Till
GFA5	Till plain	Hillslope	VV	3-6	MW	Till
GFA5*	Till plain	Swale	CC	1	SP	Till
GFA6	Till plain	Hillslope	VV	3-6	W	Till
GFA7	Till plain	Hillslope	VV	2-6	W	Till
GFB1	Delta plain	Flat	LL	1	P	Silty glaciolacustrine
GFB2	Till plain	Hillslope	LC	2	MW	Till
GFB3	Outwash plain	Rise	VV	4	E	Glaciofluvial sand & gravel
GFB4	Till plain	Hillslope	LL	4	W	Till
GFB5	Outwash plain	Hillslope	VV	2-3	SE	Sandy glaciofluvial
GFB5*	Till plain	Ridge	VL	8	SE	Sandy glaciofluvial
GFB6	Lake plain	Flat	LL	0-1	SP	Silty glaciolacustrine
GFB7	Outwash plain	Flat	LL	0-2	MW	Sandy glaciofluvial
GFC1	Till plain	Rise	VV	2	SP	Till
GFC2	Till plain	Flat	LL	1	MW	Eolian sand
GFC3	Till plain	Interbeach	LL	2	MW	Till
GFC4	Alluvial plain	Terrace	VC	6	W	Silty glaciolacustrine
GFC4 AOV1	Lake plain	Flat	VV	0	SP	Silty glaciolacustrine
GFC4 AOV2	Lake plain	Flat	VV	0	SP	Silty glaciolacustrine
GFC5	Delta plain	Flat	LL	0	SP	Silty glaciolacustrine
GFC6	Lake plain	Flat	LL	0-2	SP	Silty glaciolacustrine
GFC7	Till plain	Interbeach	LL	0-2	SP	Silty glaciolacustrine
GFD1	Delta plain	Flat	LL	0	SP	Silty glaciolacustrine
GFD2	Lake plain	Flat	LL	0	P	Clayey glaciolacustrine
GFD2 AOV1	Lake plain	Interbeach	LV	1	P	Till over silty glaciolacustrine
GFD2 AOV2	Lake plain	Interbeach	LV	1	P	Till over silty glaciolacustrine
GFD3	Lake plain	Flat	LL	0	P	Clayey glaciolacustrine
GFD4	Delta plain	Flat	LL	0	SP	Silty glaciolacustrine
GFD5	Lake plain	Beach ridge	LC	3	SE	Sandy glaciofluvial
GFD6	Lake plain	Flat	LL	0-2	SP	Sandy glaciolacustrine
GFD7	Delta plain	Flat	LL	0	P	Silty glaciolacustrine
GFE1	Delta plain	Flat	LL	0	SP	Silty glaciolacustrine
GFE2	Lake plain	Flat	LL	0	P	Clayey glaciolacustrine
GFE3	Lake plain	Depression	LL	0	SP	Silty glaciolacustrine
GFE4	Till plain	Flat	CC	1	SP	Till
GFE5	Delta plain	Flat	LL	0	SP	Silty glaciolacustrine
GFE6	Delta plain	Flat	LL	0	MW	Silty glaciolacustrine
GFE7	Delta plain	Flat	LL	0	SP	Silty glaciolacustrine
GFF1	Lake plain	Flat	LL	0	P	Clayey glaciolacustrine
GFF2	Lake plain	Flat	LL	0	P	Clayey glaciolacustrine
GFF3	Lake plain	Terrace	LL	0	W	Clayey glaciolacustrine
GFF4	Lake plain	Flat	LL	0	P	Clayey glaciolacustrine
GFF5	Lake plain	Depression	CL	2	SP	Silty glaciolacustrine
GNI1	Upland	Alluvial fan	LL	2	W	Silty alluvium
GNI2	Upland	Alluvial fan	LL	6	W	Silty alluvium
GNI4	Upland	Alluvial fan	VV	7	W	Silty Alluvium
JAA1	Till plain	Knoll	VL	4	W	Till
JAA2	Outwash plain	Knoll	LL	5	SE	Sandy glaciofluvial
JAA2 AOV1	Outwash plain	Knoll	CL	5	W	Loamy alluvium over sand & gravel
JAA2 AOV2	Outwash plain	Knoll	CL	5	W	Loamy alluvium over sand & gravel
JAA3	Upland	Ridge	LL	9	W	Sandy residuum
JAA4	Upland	Ridge	VV	2	W	Loamy residuum
JAA5	Till plain	Rise	LV	4	W	Eolian over till
JAA6	Plains	Outwash plain	LL	1	W	Loam over sand & gravel
JAA7	Till plain	Rise	VL	9	W	Till
JAB1	Till plain	Rise	LC	4	W	Till
JAB2	Upland	Ridge	VV	3	W	Loamy alluvium
JAB3	Till plain	Flat	LL	1	W	Till
JAB4	Till plain	Rise	VV	10	W	Till
JAB5	Till plain	Moraine	LC	4	W	Till
JAB6	Plains	Outwash plain	LL	7	SE	Sandy glaciofluvial
JAB7	Plains	Outwash plain	LL	1	W	Sandy glaciofluvial
JAC1	Lake plain	Beach	LC	10	E	Glaciofluvial sand & gravel

Table A1.1b. Site description: geology (continued)

Site no.[1]	Landscape	Landform	Slope shape[2]	Slope gradient (%)	Drainage[3]	Parent material
JAC2	Outwash plain	Rise	LC	2	SE	Sandy glaciofluvial
JAC3	Till plain	Ridge	LL	18	W	Till
JAC4	Till plain	Rise	VL	3	W	Till
JAC5	Till plain	Rise	VV	6	W	Till
JAC6	Upland	Rise	VL	4	MW	Till
JAC6 AOV1	Upland	Rise	LL	4	W	Till
JAC6 AOV2	Upland	Rise	LL	4	W	Till
JAC7	Upland	Moraine	LC	2	SP	Till
JAD1	Till plain	Moraine	CL	5	W	Till
JAD2	Till plain	Moraine	LL	15	SE	Sandy glaciofluvial
JAD3	Till plain	Rise	LV	7	W	Till
JAD4	Till plain	Moraine	CL	2	SP	Till
JAD5	Till plain	Moraine	CL	9	W	Till
JAD6	Upland	Moraine	LL	8	W	Till
JAD7	Till plain	Moraine	CC	12	W	Till
JAE1	Till plain	Moraine	LL	3	W	Till
JAE2	Till plain	Moraine	LL	6	W	Till
JAE3	Till plain	Moraine	LC	2	W	Till
JAE3 AOV1	Till plain	Ridge	VV	4	W	Till
JAE3 AOV2	Till plain	Ridge	VV	7	W	Till
JAE4	Till plain	Knoll	LV	3	W	Till
JAE5	Till plain	Ridge	CC	5	W	Till
JAE6	Till plain	Swale	CL	5	MW	Loamy alluvium
JAE7	Plains	Outwash plain	LL	1	W	Loamy alluvium over sand & gravel
JAF1	Till plain	Ridge	VV	25	W	Till
JAF2	Till plain	Moraine	VL	9	W	Till
JAF3	Till plain	Moraine	LL	4	W	Till
JAF4	Till plain	Ground moraine	LV	3	W	Till
JAF5	Till plain	Rise	CC	2	W	Till
JAF6	Till plain	Rise	LL	6	W	Till
JAF7	Till plain	Ridge	LL	1	W	Till
JAG1	Till plain	Rise	CL	1	MW	Till
JAG2	Till plain	Moraine	VV	5	W	Till
JAG3	Till plain	Moraine	LL	4	W	Till
JAG4	Till plain	Rise	VL	6	W	Till
JAG5	Till plain	Rise	CL	2	MW	Till
JAG6	Till plain	Alluvial flat	LL	1	W	Loamy alluvium
JAG7	Till plain	Outwash plain	CC	1	W	Loam over sand & gravel
JAH1	Till plain	Swale	CL	2	MW	Till
JAH2	Till plain	Moraine	LL	2	MW	Eolian sand over till
JAH3	Till plain	Ridge	VL	8	W	Till
JAH4	Till plain	Moraine	LC	2	SP	Till
JAH5	Till plain	Flat	LL	1	MW	Till
JAH6	Till plain	Swale	CL	2	W	Till
JAH7	Till plain	Rise	LC	2	W	Till
JAI1	Delta plain	Flat	CL	1	SP	Deltaic sand
JAI2	Till plain	Ground moraine	VV	2	W	Till
JAI3	Till plain	Ground moraine	LC	2	MW	Till
JAI4	Till plain	Ground moraine	LL	3	W	Till
JAI5	Till plain	Depression	CC	1	P	Loamy alluvium over till
JAI6	Till plain	Flat	CC	4	W	Till
JAI7	Till plain	Moraine	LC	12	W	Till
LMC7	Upland	Plain	LV	4	W	Loamy residuum
LME7	Upland	Ridge	LL	7	W	Silty residuum
LME7 AOV1	Upland	Plain	LL	5	W	Silty residuum
LME7 AOV2	Upland	Plain	LL	5	W	Silty residuum
LMG7	Upland	Ridge	CL	21	SE	Sandstone
LMH7	Upland	Swale	LC	2	W	Loamy alluvium
M2I1	Upland	Ridge	VV	5	W	Shaly residuum
M2I2	Upland	Floodplain	LL	1	W	Loamy alluvium
M2I6	Upland	Alluvial fan	LC	1	W	Silty alluvium
MBB7	Upland	Flat	CL	1	MW	Clayey lacustrine over till
MBC7	Till plain	Rise	LV	3	W	Till
MBE7	Till plain	Hillslope	CC	1	-	Till
MBF7	Lake plain	Flat	LL	1	SP	Sandy glaciolacustrine

Table A1.1b. Site description: geology (continued)

Site no.[1]	Landscape	Landform	Slope shape[2]	Slope gradient (%)	Drainage[3]	Parent material
MIA1	Upland	Ridge	VL	3	W	Till
MIA2	Upland	Rise	LV	12	W	Till
MIA3	Upland	Knoll	VV	5	SE	Glaciofluvial sand & gravel
MIA4	Breaks	Interfluve	LL	1	W	Till
MIA5	Upland	Rise	LL	3	W	Till
MIA6	Upland	Rise	VL	< 1	SP	Till
MIA7	Upland	Rise	VL	1	MW	Till
MIB1	Upland	Rise	VL	3	W	Till
MIB2	Upland	Hill	VL	15	W	Till
MIB3	Till plain	Rise	LC	2	MW	Till
MIB4	Till plain	Rise	LC	3	W	Till
MIB5	Upland	Depression	CC	< 1	P	Loamy alluvium over till
MIB6	Upland	Rise	LV	2	SP	Till
MIB7	Upland	Outwash plain	LL	< 1	P	Sandy glaciofluvial
MIC1	Upland	Rise	VL	5	W	Till
MIC2	Till plain	Rise	LV	1	W	Till
MIC3	Till plain	Rise	VL	2	W	Till
MIC3 AOV1	Till plain	Knoll	VL	3	W	Till
MIC3 AOV2	Till plain	Knoll	VL	3	W	Till
MIC4	Till plain	Rise	LV	1	W	Till
MIC5	Upland	Plain	CL	1	SP	Till
MIC6	Upland	Rise	VV	3	W	Glaciofluvial sand & gravel over till
MIC7	Upland	Rise	VL	3	MW	Till
MID1	Till plain	Rise	LV	2	SP	Till
MID2	Till plain	Flat	LC	2	W	Till
MID3	Till plain	Knoll	VL	2	MW	Till
MID4	Till plain	Rise	LV	1	SP	Till
MID4 AOV1	Till plain	Depression	LL	2	SP	Till
MID4 AOV2	Till plain	Depression	LL	2	SP	Till
MID5	Upland	Plain	VL	3	MW	Deltaic sand
MID6M	Upland	Plain	LL	< 1	MW	Till
MID7	Upland	Rise	VL	< 1	SP	Till
MID7 AOV1	Upland	Rise	VL	< 1	SP	Sandy glaciofluvial
MID7 AOV2	Upland	Rise	VL	< 1	SP	Sandy glaciofluvial
MIE1	River valley	Terrace	LV	1	MW	Alluvial silt & clay
MIE2	Outwash plain	Plain	LV	< 1	SP	Sandy glaciofluvial
MIE3	Upland	Plain	LL	< 1	MW	Till
MIE4	Outwash plain	Rise	LV	2	SP	Sandy glaciofluvial
MIE5	Upland	Plain	LL	< 1	SP	Silty glaciolacustrine
MIE6	Upland	Plain	LL	< 1	SP	Till
MIE7	Upland	Plain	LL	< 1	W	Loamy alluvium over sand & gravel
MIF1	Outwash plain	Rise	LV	1	MW	Sandy glaciofluvial
MIF2	Outwash plain	Knoll	LV	1	SE	Sandy glaciofluvial
MIF3	Delta plain	Dunes	VV	3	E	Eolian sand
MIF4	Upland	Microhigh	LV	< 1	MW	Eolian sand
MIF5	Basin	Plain	LC	1	SP	Sandy glaciolacustrine
MIF6	Upland	Rise	LC	2	MW	Silty glaciolacustrine
MIF6*	Till plain	Rise	LV	6	MW	Till
MIF7	Upland	Plain	LL	< 1	W	Till
MIG1	Outwash plain	Delta	CV	0 - 6	MW	Eolian sand
MIG2	Upland	Plain	CC	1	W	Sandy glaciofluvial
MIG2 AOV1	Upland	Plain	CC	1	W	Sandy glaciofluvial
MIG2 AOV2	Upland	Plain	CC	1	W	Sandy glaciofluvial
MIG3	Upland	Plain	LC	< 1	SP	Sandy glaciofluvial
MIG4	Outwash plain	Delta	CV	0 - 6	MW	Eolian sand
MIG5	Lake plain	Rise	CV	2	SP	Glaciolacustrine silt & sand
MIG6	Upland	Moraine	CV	0 - 3	W	Till
MIG7	Upland	Moraine	CV	6 - 9	W	Till
MIH1	Lake plain	Outwash plain	CV	0 - 3	MW	Sandy glaciolacustrine
MIH2	Lake plain	Outwash plain	CV	3 - 6	W	Sandy glaciolacustrine
MIH3	Upland	Plain	LL	1	MW	Silty glaciolacustrine
MIH4	Upland	Till Plain	CV	3	MW	Till
MIH5	Lake plain	Rise	VC	1 -2	MW	Silty glaciolacustrine
MIH6	Outwash plain	Rise	CL	4	MW	Sandy alluvium
MIH6*	Upland	Moraine	CV	9 - 15	W	Till

Table A1.1b. Site description: geology (continued)

Site no.[1]	Landscape	Landform	Slope shape[2]	Slope gradient (%)	Drainage[3]	Parent material
MIH6**	Outwash plain	Flat	LL	< 1	MW	Sandy glaciofluvial
MIH7	Lake plain	Rise	CC	1 - 3	MW	Clayey glaciolacustrine
MTB7	Upland	Ridge	LC	9	W	Loamy alluvium
MTE7	Upland	Flat	LV	2	W	Clayey residuum
MTG7	Upland	Flat	LC	1	W	Loess
MYA1	Till plain	Rise	LV	3	W	Till
MYA2	Upland	Flat	LC	2	W	Till
MYA3	Till plain	Knoll	LV	17	W	Till
MYA4	Till plain	Flat	LL	2	W	Loess over till
MYA5	Upland	Till Plain	CL	< 2	MW	Till
MYA6	Upland	Till Plain	CL	3	W	Till
MYA7	Upland	Moraine	CC	< 2	W	Till
MYB1	Till plain	Flat	LL	2	W	Till
MYB2	Upland	Swale	LL	9	W	Loamy alluvium
MYB3	Till plain	Depression	LV	3	W	Till
MYB4	Till plain	Rise	LV	2	W	Loess over till
MYB5	Upland	Till Plain	LL	< 2	W	Till
MYB6	Upland	Till Plain	CC	< 2	W	Till
MYB7	Upland	Moraine	CC	5	W	Till
MYC1	Alluvial plain	Fan	LL	5	W	Loamy residuum
MYC2	Till plain	Rise	VV	6	W	Till
MYC3	Upland	Flat	LV	2	W	Eolian sand
MYC4	Upland	Flat	LL	1	W	Loess
MYC5	Upland	Till Plain	LC	< 2	W	Till
MYC6	Upland	Moraine	CC	10	W	Till
MYC7	Upland	Outwash plain	LV	3	SE	Loamy alluvium over sand & gravel
MYD1	Upland	Microhigh	CL	5	W	Loamy residuum
MYD2	Upland	Till Plain	VL	8	W	Till
MYD3	Upland	Till Plain	LV	< 2	W	Loess over till
MYD4	Upland	Till Plain	VV	< 2	W	Till
MYD5	Upland	Moraine	LC	< 2	W	Till
MYD6	Upland	Outwash plain	LC	2	W	Loamy alluvium over sand & gravel
MYD7	Upland	Moraine	CC	3	W	Till
MYE1	Upland	Till Plain	LV	3	W	Till
MYE2	Upland	Lake plain	LL	< 2	W	Loamy glaciolacustrine
MYE3	Upland	Till Plain	LV	< 2	W	Till
MYE4	Upland	Till Plain	LV	3	W	Till
MYE5	Upland	Outwash plain	LV	< 2	W	Loamy alluvium
MYE6	Upland	Moraine	LV	3	W	Till
MYE7	Upland	Moraine	CC	5	W	Till
MYF1	Till plain	Flat	LV	2	W	Till
MYF2	Upland	Till Plain	LL	< 2	W	Till
MYF3	Upland	Till Plain	LV	4	W	Till
MYF4	Upland	Outwash plain	LV	< 2	W	Loamy alluvium over sand & gravel
MYF5	Upland	Till Plain	CC	4	W	Till
MYF6	Upland	Moraine	CL	3	W	Till
MYF7	Upland	Till Plain	LC	< 2	W	Till
MYG1	Upland	Till Plain	LC	3	W	Till
MYG2	Till plain	Flat	LL	3	W	Till
MYG3	Upland	Moraine	LV	8	W	Till
MYG4	Upland	Moraine	VL	8	W	Till
MYG5	Upland	Moraine	VL	3	W	Till
MYG6	Upland	Outwash plain	LC	2	W	Loamy alluvium
MYG7	Upland	Plain	LC	< 2	W	Sandy glaciolacustrine
MYH1	Till plain	Flat	LV	3	W	Till
MYH2	Till plain	Rise	LV	3	W	Till
MYH3	Till plain	Knoll	LV	10	W	Till
MYH4	Upland	Moraine	VC	5	W	Till
MYH5	Upland	Till Plain	LL	6	W	Till
MYH6	Upland	Till Plain	LV	5	W	Till
MYH7	Upland	Moraine	VV	9	W	Till
MYI1	Till plain	Flat	LL	3	W	Till
MYI2	Till plain	Flat	LL	5	W	Till
MYI3	Till plain	Knoll	VV	9	W	Till
MYI4	Upland	Till Plain	LV	< 2	SP	Till

Table A1.1b. Site description: geology (continued)

Site no.[1]	Landscape	Landform	Slope shape[2]	Slope gradient (%)	Drainage[3]	Parent material
MYI5	Upland	Till Plain	LV	< 2	W	Till
MYI6	Upland	Till Plain	LV	2	W	Till
MYI7	Upland	Till Plain	LV	6	W	Eolian sand over silty glaciolacustrine
NRA1	Outwash plain	Plain	LL	4	SE	Sandy glaciofluvial
NRA2	Outwash plain	Plain	LL	3	SE	Loamy alluvium over sand & gravel
NRA3	Till plain	Plain	VL	2	W	Till
NRA4	Till plain	Plain	LL	3	W	Till
NRA5	Till plain	Flat	LL	2	W	Till
NRA6	Till plain	Knoll	LV	4	W	Till
NRA7	Till plain	Ridge	LL	7	W	Till
NRB1	Till plain	Plain	LL	2	W	Till
NRB2	Outwash plain	Plain	VL	2	SE	Loamy alluvium over sand & gravel
NRB3	Till plain	Plain	VL	6	W	Till
NRB4	Till plain	Plain	LV	2	W	Till
NRB5	Till plain	Flat	LL	2	W	Till
NRB6	Till plain	Knoll	LV	2	W	Till
NRB7	Till plain	Ridge	LL	8	W	Till
NRC1	Outwash plain	Plain	LL	4	W	Sandy glaciofluvial
NRC2	Till plain	Plain	LC	7	W	Till
NRC3	Till plain	Plain	VV	10	W	Till
NRC4	Till plain	Plain	LV	2	SP	Till
NRC4 AOV1	Till plain	Plain	LV	2	SP	Till
NRC4 AOV2	Till plain	Plain	LV	2	SP	Till
NRC5	Till plain	Ridge	LV	7	W	Till
NRC6	Till plain	Flat	LL	1	MW	Till
NRC7	Till plain	Knoll	LV	5	W	Till
NRD1	Till plain	Moraine	CL	3	MW	Till
NRD2	Till plain	Depression	CC	0	SP	Till
NRD2 AOV1	Till plain	Depression	CC	1	SP	Till
NRD2 AOV2	Till plain	Depression	CC	1	SP	Till
NRD3	Till plain	Plain	LL	1	W	Till
NRD4	Outwash plain	Flat	LL	1	W	Till
NRD5	Till plain	Flat	LC	1	MW	Till
NRD6	Till plain	Knoll	LL	3	W	Till
NRD7	Till plain	Ridge	LL	10	W	Till
NRE1	Till plain	Moraine	LL	27	W	Till
NRE2	Outwash plain	Flat	LL	1	W	Loam over sand & gravel
NRE3	Till plain	Plain	LL	1	SP	Till
NRE4	Till plain	Plain	LV	5	W	Till
NRE5	Till plain	Rise	LL	2	MW	Till
NRE6	Outwash plain	Knoll	LC	5	W	Sandy glaciofluvial
NRE7	Outwash plain	Ridge	LL	6	W	Shaly glaciofluvial
NRF1	Till plain	Rise	VL	14	W	Till
NRF2	Till plain	Flat	LL	1	MW	Till
NRF3	Till plain	Plain	VV	5	W	Till
NRF4	Till plain	Plain	VL	6	W	Till
NRF5	Till plain	Rise	LL	2	W	Till
NRF6	Till plain	Knoll	LL	6	W	Till
NRF7	Till plain	Ridge	LV	9	W	Till
NRG1	Till plain	Plain	VL	1	SP	Till
NRG2	Till plain	Plain	LL	1	SP	Till
NRG3	Till plain	Plain	LL	2	W	Till
NRG3 AOV1	Till plain	Plain	LL	5	W	Till
NRG3 AOV2	Till plain	Plain	LV	5	W	Till
NRG4	Outwash plain	Plain	CL	3	SP	Sandy glaciofluvial
NRG5	Till plain	Ridge	VL	7	W	Till
NRG6	Sand plain	Rise	VV	2	MW	Eolian sand
NRG7	Outwash plain	Flat	LL	1	W	Shaly glaciofluvial
NRH1	Till plain	Depression	CC	< 1	P	Till
NRH2	Till plain	Plain	LC	2	MW	Till
NRH3	Till plain	Plain	LC	1	MW	Till
NRH4	Outwash plain	Plain	LL	6	SE	Sandy glaciofluvial
NRH5	Till plain	Flat	LL	1	W	Till
NRH6	Till plain	Flat	LL	1-2	W	Till
NRH7	Till plain	Knoll	LL	5	W	Till

Table A1.1b. Site description: geology (continued)

Site no.[1]	Landscape	Landform	Slope shape[2]	Slope gradient (%)	Drainage[3]	Parent material
NRI1	Till plain	Flat	LL	1	SP	Till
NRI2	Till plain	Plain	LC	1	SP	Till
NRI3	Till plain	Plain	-	1	P	Till
NRI4	Outwash plain	Plain	LC	3	MW	Sandy glaciofluvial
NRI5	Till plain	Rise	LV	3	MW	Till
NRI6	Till plain	Rise	LL	2	MW	Till
NRI7	Till plain	Knoll	LV	3	SP	Till
TFA1	Till plain	Summit	CL	3	W	Till
TFA2	Outwash plain	Flat	-	< 1	MW	Loamy alluvium over sand & gravel
TFA3	Till plain	Knoll	VL	3	W	Till
TFA4	Outwash plain	Rise	VV	3	E	Sandy glaciofluvial
TFA5	Lake plain	Plain	LC	1	MW	Eolian sand
TFA6	Till plain	Flat	LL	1	W	Till
TFA7	Lake plain	Flat	LL	0-1	P	Silty glaciolacustrine
TFB1	Lake plain	Beach	CC	3	MW	Sandy glaciofluvial
TFB2	Lake plain	Flat	-	< 1	SP	Glaciolacustrine silt & sand
TFB3	Lake plain	Flat	-	< 1	SP	Sandy glaciolacustrine
TFB4	Lake plain	Rise	VL	1	P/SP	Silty glaciolacustrine
TFB5	Lake plain	Rise	VL	1	SP	Silty glaciolacustrine
TFB6	Lake plain	Flat	LV	1	SP	Glaciolacustrine silt & sand
TFB7	Alluvial plain	Flat	LV	1	W	Alluvial silt & clay
TFC1	Delta plain	Flat	LL	0	SP	Silty glaciolacustrine
TFC2	Lake plain	Flat	-	< 1	SP	Glaciolacustrine silt & clay
TFC3	Lake plain	Flat	-	< 1	SP	Silty glaciolacustrine
TFC4	Lake plain	Flat	-	< 1	SP	Silty glaciolacustrine
TFC5	Lake plain	Rise	VL	1	SP	Silty glaciolacustrine
TFC6	Lake plain	Flat	LL	1	SP	Silty glaciolacustrine
TFC7	Lake plain	Flat	LC	1	P	Clayey glaciolacustrine
TFD1	Delta plain	Flat	LV	2	SP	Silty glaciolacustrine
TFD2	Lake plain	Flat	-	< 1	SP	Silty glaciolacustrine
TFD3	Lake plain	Flat	-	< 1	P/SP	Glaciolacustrine silt & clay
TFD4	Lake plain	Flat	-	< 1	SP	Silty glaciolacustrine
TFD5	Lake plain	Rise	VL	1	P	Glaciolacustrine silt & clay
TFD6	Lake plain	Flat	VL	1	P	Glaciolacustrine silt & clay
WCA1	Upland	Ridge	VV	12	W	Sandy alluvium
WCA2	Upland	Ridge	VL	10	W	Sandy residuum
WCA3	Upland	Flat	CL	1	W	Clayey alluvium
WCA4	Upland	Alluvial fan	VL	4	W	Silty alluvium
WCA5	Upland	Alluvial fan	LL	3	W	Silty Alluvium
WCA6	Till plain	Plain	LC	2	W	Till
WCA7	Alluvial plain	Floodplain	LL	< 1	MW	Clayey alluvium
WCB1	Upland	Ridge	VL	6	W	Loamy residuum
WCB2	Upland	Ridge	CL	15	W	Silty alluvium
WCB3	Badlands	Alluvial fan	LL	3	W	Loamy alluvium
WCB4	Upland	Alluvial flat	LC	2	W	Clayey alluvium
WCB5	Upland	Flat	CC	1	W	Shale
WCB6	Alluvial plain	Hill	LV	9	W	Loamy alluvium
WCB7	Till plain	Hill	LC	8	W	Till
WCC1	Upland	Ridge	LV	25	W	Sandy residuum
WCC2	Upland	Plain	LV	2	W	Sandstone
WCC3	Upland	Alluvial fan	LL	3	W	Clayey alluvim
WCC4	Upland	Rise	LL	9	W	Sandy residuum
WCC4 AOV1	Upland	Rise	LC	11	W	Sandy residuum
WCC4 AOV2	Upland	Rise	LC	11	W	Sandy residuum
WCC5	Upland	Rise	VV	11	W	Silty residuum
WCC6	Plains	Hill	LV	4	W	Sandstone
WCC7	Till plain	Hill	VV	8	W	Till
WCD1	Upland	Terrace	LV	2	W	Loamy alluvium
WCD2	Upland	Terrace	LV	3	W	Clayey alluvium
WCD3	Upland	Ridge	VL	3	W	Sandy residuum
WCD4	Upland	Ridge	VV	7	W	Sandy residuum
WCD5	Upland	Fan	LL	4	W	Shale
WCD6	Alluvial plain	Terrace	LL	2	W	Loamy alluvium
WCD7	Alluvial plain	Floodplain	LL	1	W	Loamy alluvium
WCE1	Upland	Ridge	VV	7	W	Loamy residuum

Table A1.1b. Site description: geology (continued)

Site no.[1]	Landscape	Landform	Slope shape[2]	Slope gradient (%)	Drainage[3]	Parent material
WCE2	Upland	Ridge	VL	10	W	Silty residuum
WCE3	Upland	Rise	CC	4	W	Clayey residuum
WCE4	Upland	Rise	VL	5	W	Sandy residuum
WCE5	Upland	Alluvial fan	LL	7	W	Loamy alluvium
WCE5 AOV1	Upland	Ridge	VV	8	W	Loamy residuum
WCE5 AOV2	Upland	Ridge	VV	8	W	Loamy residuum
WCE6	Upland	Rise	LL	7	W	Residual silt & sand
WCE7	Upland	Ridge	VV	10	W	Sandy residuum
WCF1	Upland	Ridge	VV	16	W	Silty residuum
WCF2	Upland	Ridge	VV	12	W	Sandy residuum
WCF3	Upland	Rise	VV	4	W	Silty residuum
WCF4	Upland	Plain	LC	3	W	Shale
WCF5	Upland	Alluvial fan	LL	8	W	Silty alluvium
WCF6	Upland	Alluvial fan	VL	3	W	Clayey alluvium
WCF6 AOV1	Upland	Ridge	VL	8	W	Till
WCF6 AOV2	Upland	Ridge	VL	8	W	Till
WCF7	Upland	Alluvial fan	CC	2	W	Loamy alluvium
WCG1	Upland	Ridge	VV	8	W	Silty residuum
WCG2	Upland	Drainageway	CL	1	W	Loamy alluvium
WCG3	Upland	Drainageway	CL	3	W	Loamy alluvium
WCG4	Upland	Alluvial flat	LL	2	W	Loamy alluvium
WCG5	Upland	Alluvial fan	LV	6	W	Clayey alluvium
WCG6	Upland	Ridge	LL	5	W	Till
WCG7	Alluvial plain	Terrace	CC	1	W	Loamy alluvium
WCH1	Upland	Ridge	VL	4	W	Till
WCH2	Upland	Ridge	VV	8	W	Sandy alluvium
WCH3	Upland	Drainageway	CC	2	W	Loamy alluvium
WCH4	Upland	Rise	LL	4	W	Silty residuum
WCH5	Upland	Ridge	VV	10	W	Till
WCH6	Upland	Ridge	LL	3	W	Till
WCH7	Till plain	Knoll	VC	9	W	Till
WCI1	Upland	Ridge	VL	7	W	Till
WCI2	Upland	Ridge	CL	7	W	Till
WCI3	Upland	Ridge	VV	5	W	Till
WCI4	Upland	Ridge	VL	4	W	Till
WCI5	Upland	Rise	LC	2	W	Till
WCI6	Till plain	Ridge	VL	6	W	Till
WCI7	Till plain	Plain	CL	2	W	Till
WIA1	Till plain	Plain	LC	1	W	Till
WIA2	Till plain	Plain	LC	2	W	Till
WIA3	Till plain	Plain	LC	2	W	Till
WIA4	Till plain	Rise	CL	3	W	Till
WIA5	Upland	Alluvial fan	LV	4	W	Alluvial silt & clay
WIA6	Till plain	Knoll	VV	4	W	Till
WIA7	Till plain	Ridge	LV	14	W	Till
WIB1	Alluvial plain	Terrace	LL	1	W	Loamy alluvium
WIB2	Till plain	Plain	VL	4	W	Till
WIB3	Till plain	Ridge	CC	6	W	Till
WIB4	Outwash plain	Plain	LL	1	E	Sandy glaciofluvial
WIB5	Till plain	Rise	LC	2	W	Till
WIB6	Till plain	Ridge	LV	10	W	Till
WIB7	Till plain	Depression	CC	< 1	P	Loamy alluvium over till
WIC1	Till plain	Plain	LC	4	W	Till
WIC2	Till plain	Plain	LC	2	W	Till
WIC3	Till plain	Ridge	CV	7	W	Till
WIC4	Till plain	Plain	LV	< 1	W	Till
WIC5	Till plain	Rise	LV	2	W	Till
WIC6	Upland	Alluvial flat	VL	1	MW	Silty alluvium
WIC7	Till plain	Plain	LC	< 1	P	Till
WID1	Till plain	Plain	LC	4	W	Till
WID2	Alluvial plain	Terrace	LL	1	W	Loamy alluvium over sand & gravel
WID3	Till plain	Plain	LV	6	W	Till
WID4	Till plain	Plain	LC	5	W	Till
WID5	Till plain	Knoll	VL	4	W	Till
WID6	Till plain	Knoll	VV	13	W	Till

Table A1.1b. Site description: geology (continued)

Site no.[1]	Landscape	Landform	Slope shape[2]	Slope gradient (%)	Drainage[3]	Parent material
WID7	Sand plain	Rise	VL	4	W	Eolian sand over till
WIE1	Till plain	Plain	LV	2	W	Loess over till
WIE2	Till plain	Rise	VL	4	W	Till
WIE3	Till plain	Lake plain	LC	2	W	Silty alluvium
WIE4	Till plain	Depression	CC	0	P	Loamy alluvium over till
WIE5	Till plain	Depression	LV	< 1	MW	Loamy alluvium over till
WIE6	Till plain	Knoll	VL	12	W	Till
WIE7	Till plain	Plain	LC	1	W	Loamy alluvium
WIE7 AOV1	Till plain	Plain	LC	1	MW	Till
WIE7 AOV2	Till plain	Rise	LC	2	MW	Till
WIF1	Till plain	Ridge	LV	8	W	Till
WIF1 AOV1	Till plain	Ridge	VV	18	W	Till
WIF1 AOV2	Till plain	Ridge	VV	12	W	Till
WIF2	Till plain	Depression	CC	0	P	Loamy alluvium over till
WIF3	River valley	Floodplain	LL	1	E	Sandy alluvium
WIF4	Till plain	Hill	LV	7	W	Till
WIF5	Till plain	Rise	LC	4	W	Till
WIF6	Till plain	Knoll	VV	4	W	Till
WIF7	Till plain	Plain	LV	1	MW	Till
WIF7 AOV1	Till plain	Plain	CL	2	MW	Till
WIF7 AOV2	Till plain	Plain	CL	2	MW	Till
WIG1	Till plain	Rise	VV	3	W	Till
WIG1*	Lake plain	Plain	LC	1	W	Clayey glaciolacustrine
WIG2	Upland	Alluvial fan	LV	3	MW	Silty alluvium
WIG3	Till plain	Rise	LV	3	MW	Till
WIG4	Till plain	Swale	LC	2	W	Till
WIG5	Till plain	Knoll	VV	4	W	Till
WIG6	Till plain	Rise	LV	3	W	Till
WIG7	Till plain	Plain	LL	< 1	MW	Till
WIH1	Till plain	Ridge	LV	5	W	Till
WIH1*	Till plain	Ridge	VC	7	W	Till
WIH2	Till plain	Swale	LC	2	W/MW	Till
WIH3	Till plain	Ridge	LV	22	W	Till
WIH4	Till plain	Plain	LC	1	SP	Till
WIH5	Till plain	Rise	VV	2	W	Till
WIH6	Till plain	Knoll	VV	2	W	Till
WIH7	Till plain	Rise	VV	3	W	Till

[1] See note 1 for table A1.1a.

[2] Schoeneberger and others (2002, p. 3.38).

[3] National criteria for Natural Soil Drainage Classes (Soil Survey Staff, 1993).

Table A1.2 Sample data

Site no.[1]	Soil series	Taxadjunct (reason)	Taxonomic class
ABE7	Bowbells		Fine-loamy, mixed, superactive, frigid Pachic Argiustolls
ABF7	Edgeley		Fine-loamy, mixed, superactive, frigid Typic Hapludolls
ABG7	Barnes		Fine-loamy, mixed, superactive, frigid Calcic Hapludolls
ABH7	Svea		Fine-loamy, mixed, superactive, frigid Pachic Hapludolls
BSA1	Grail		Fine, smectitic, frigid Pachic Vertic Argiustolls
BSA2	Arnegard		Fine-loamy, mixed, superactive, frigid Pachic Haplustolls
BSA3	Ruso		Coarse-loamy, mixed, superactive, frigid Pachic Haplustolls
BSA3 AOV1	Arnegard		Fine-loamy, mixed, superactive, frigid Pachic Haplustolls
BSA3 AOV2	Arnegard		Fine-loamy, mixed, superactive, frigid Pachic Haplustolls
BSA4	Savage		Fine, smectitic, frigid Vertic Argiustolls
BSA5	Arnegard	Fine sandy loam surface	Fine-loamy, mixed, superactive, frigid Pachic Haplustolls
BSA6	Morton		Fine-silty, mixed, superactive, frigid Typic Argiustolls
BSA7	Parshall		Coarse-loamy, mixed, superactive, frigid Pachic Haplustolls
BSB1	Belfield		Fine, smectitic, frigid Glossic Natrustolls
BSB2	Savage		Fine, smectitic, frigid Vertic Argiustolls
BSB3	Tally	Carbonates within 10 in. of soil surface	Coarse-loamy, mixed, superactive, frigid Typic Haplustolls
BSB4	Parshall		Coarse-loamy, mixed, superactive, frigid Pachic Haplustolls
BSB5	Savage		Fine, smectitic, frigid Vertic Argiustolls
BSB6	Chama		Fine-silty, mixed, superactive, frigid Typic Calciustolls
BSB7	Janesburg		Fine, smectitic, frigid Typic Natrustolls
BSC1	Telfer		Sandy, mixed, frigid Entic Haplustolls
BSC2	Shambo		Fine-loamy, mixed, superactive, frigid Typic Haplustolls
BSC3	Vebar		Coarse-loamy, mixed, superactive, frigid Typic Haplustolls
BSC4	Arnegard	Surface horizon is sandy loam deposited by erosion of surrounding sandy soils	Fine-loamy, mixed, superactive, frigid Pachic Haplustolls
BSC5	Velva		Coarse-loamy, mixed, superactive, frigid Fluventic Haplustolls

Table A1.2 Sample data (continued)

Site no.[1]	Depth of mollic (in.)	Depth to CO_3 (in.)	Horizons sampled	Interval sampled (in.)	Texture[2]	% clay[3]	Munsell color[4]	Comments
ABE7	24	33	A Bt1 BCk	0-8[5] 15-20 39-40	l l l	18 20 24	10YR 2/1 10YR 3/1 2.5Y 4/2	
ABF7	11	> 20	Ap 2Bw	0-6 12-20	l Cnl	19 20	10YR 3/1 10YR 4/2	
ABG7	8	11	Ap Bk1	0-5 13-20	l l	20 20	10YR 3/1 2.5Y 5/3	
ABH7	21	> 21	Ap Bw1	0-7 12-20	l l	18 20	10YR 3/1 10YR 3/1	
BSA1	21	21	Ap Bt	0-6 12-18	sicl sic	36 50	10YR 2/2 2.5Y 3/2	
BSA2	20	> 20	Ap Bw	0-7 12-17	l l	18 20	10YR 2/2 10YR 3/2	
BSA3	18	> 20	Ap Bw	0-5 12-18	l l	18 22	10YR 2/2 10YR 3/3	
BSA3 AOV1	19	26	Ap Bw	0-6 12-19	l l	22 26	10YR 3/2 10YR 3/3	
BSA3 AOV2	20	24	Ap Bw	0-7 12-20	l l	22 26	10YR 3/2 10YR 3/3	
BSA4	12	17	Ap Bt2 Bk1	0-7[5] 12-17 17-30+	sicl sic sicl	35 42 34	10YR 2/2 2.5Y 4/3 2.5Y 5/3	
BSA5	28	> 20	Ap Bw2 Bw	0-8[5] 13-20 28-40	fsl l l	16 19 20	10YR 2/2 10YR 3/3 10YR 4/3	
BSA6	10	14	A & Bt Bk	0-8 16-20	sil sil	22 24	10YR 3/2 10YR 4/4	
BSA7	26	32	Ap Bw	0-6 12-20	fsl fsl	14 14	10YR 3/2 10YR 3/3	
BSB1	23	> 30	Ap Btn	0-7 12-20	l cl	27 38	10YR 2/2 10YR 3/2	
BSB2	16	16	Ap Bt	0-6 12-16	sicl sic	30 41	10YR 2/2 10YR 3/3	
BSB3	6	6	Ap Bk	0-6 12-20	fsl fsl	14 11	10YR 3/3 2.5Y 5/4	
BSB4	20	35	A Bw	0-8 12-20	fsl fsl	14 15	10YR 3/2 10YR 3/3	
BSB5	12	19	Ap Bt2	0-7 12-19	sicl sic	38 42	10YR 3/2 10YR 4/3	
BSB6	8	Surface	Ap Bk C	0-8[5] 12-19 19-31	sicl sicl sicl	35 35 33	2.5Y 3/3 2.5Y 5/3 2.5Y 6/3	
BSB7	7	7	Ap Bk	0-7 13-20	sil sicl	24 34	10YR 3/2 2.5Y 5/3	
BSC1	7	> 32	A Bw	0-8 12-18	fsl lfs	11 5	10YR 2/2 10YR 4/3	
BSC2	23	> 32	Ap Bw	0-7 12-20	l l	22 22	10YR 2/2 10YR 3/2	
BSC3	15	22	Ap Bw2	0-6 15-20	l fsl	16 12	10YR 3/2 10YR 4/4	
BSC4	20	> 20	A Bw1	0-8 14-20	sl l	11 24	10YR 2/2 10YR 3/2	
BSC5	15	Surface	Ap C1	0-7 15-20	l fsl	23 15	10YR 3/2 2.5Y 5/2	

Table A1.2 Sample data (continued)

Site no.[1]	Soil series	Taxadjunct (reason)	Taxonomic class
BSC6	Arnegard		Fine-loamy, mixed, superactive, frigid Pachic Haplustolls
BSC7	Grassna		Fine-silty, mixed, superactive, frigid Pachic Haplustolls
BSC7 AOV1	Parshall		Coarse-loamy, mixed, superactive, frigid Pachic Haplustolls
BSC7 AOV2	Parshall		Coarse-loamy, mixed, superactive, frigid Pachic Haplustolls
BSD1	Belfield		Fine, smectitic, frigid Glossic Natrustolls
BSD2	Reeder		Fine-loamy, mixed, superactive, frigid Typic Argiustolls
BSD3	Parshall		Coarse-loamy, mixed, superactive, frigid Pachic Haplustolls
BSD4	Vebar		Coarse-loamy, mixed, superactive, frigid Typic Haplustolls
BSD5	Savage		Fine, smectitic, frigid Vertic Argiustolls
BSD6	Wabek		Sandy-skeletal, mixed, frigid Entic Haplustolls
BSD7	Max		Fine-loamy, mixed, superactive, frigid Typic Haplustolls
BSE1	Janesburg		Fine, smectitic, frigid Typic Natrustolls
BSE2	Shambo		Fine-loamy, mixed, superactive, frigid Typic Haplustolls
BSE3	Beisigl		Mixed, frigid Typic Ustipsamments
BSE4	Cabba		Loamy, mixed, superactive, calcareous, frigid, shallow Typic Ustorthents
BSE5	Savage	Buried profile under recent alluvium. A and Bw horizons over buried A and Bt horizons at 18 in.	Fine, smectitic, frigid Vertic Argiustolls
BSE7	Zahl		Fine-loamy, mixed, superactive, frigid Typic Calciustolls
BSF1	Shambo	sicl substratum (almost fine)	Fine-loamy, mixed, superactive, frigid Typic Haplustolls
BSF2	Sham		Coarse-loamy, mixed, superactive, calcareous, frigid Aridic Ustorthents
BSF3	Arnegard		Fine-loamy, mixed, superactive, frigid Pachic Haplustolls
BSF4	Ekalaka		Coarse-loamy, mixed, superactive, frigid Typic Natrustolls
BSF5	Stady		Fine-loamy over sandy or sandy-skeletal, mixed, superactive, frigid Typic Haplustolls
BSF6	Wilton		Fine-silty, mixed, superactive, frigid Pachic Haplustolls
BSF7	Falkirk		Fine-loamy, mixed, superactive, frigid Pachic Haplustolls

Table A1.2 Sample data (continued)

Site no.[1]	Depth of mollic (in.)	Depth to CO_3 (in.)	Horizons sampled	Interval sampled (in.)	Texture[2]	% clay[3]	Munsell color[4]	Comments
BSC6	18	> 20	Ap Bw	0-8 12-18	l l	20 22	10YR 2/2 10YR 3/3	
BSC7	> 20	> 20	Ap Bw	0-6 12-20	sil sil	20 21	10YR 2/2 10YR 3/2	
BSC7 AOV1	> 20	> 20	Ap Bw	0-7 12-20	fsl fsl	16 14	10YR 2/2 10YR 3/3	
BSC7 AOV2	> 20	> 20	Ap Bw	0-7 12-20	fsl fsl	16 14	10YR 2/2 10YR 3/3	
BSD1	22	> 25	Ap A/E	0-6 12-18	l l	18 16	10YR 2/2 10YR 3/2	
BSD2	15	> 32	Ap Bt	0-7 12-18	l cl	14 30	10YR 3/2 10YR 3/3	
BSD3	18	> 32	Ap Bw	0-5 12-18	fsl fsl	14 14	10YR 3/2 10YR 3/3	
BSD4	8	> 20	A & Bw1 Bw2	0-8 15-20	l fsl	20 13	10YR 3/2 2.5Y 5/3	
BSD5	15	21	Ap Bt2 Btk1	0-7[5] 15-20 21-36	sicl sic sic	32 43 41	10YR 2/2 2.5Y 4/3 2.5Y 4/3	
BSD6	4	1	A & Bk 2C	0-8 12-19	grl vgrls	15 4	10YR 3/1 2.5Y 4/2	
BSD7	17	17	Ap Bw	0-7 12-17	l l	22 22	10YR 2/2 10YR 3/3	
BSE1	18	> 20	A Btn	0-8 12-18	l sic	16 50	10YR 2/2 2.5Y 3/2	
BSE2	15	> 20	Ap Bw	0-8 12-20	l scl	23 19	10YR 2/2 10YR 4/3	
BSE3	8	> 20	Ap Bw	0-8 12-20	lfs lfs	7 10	10YR 3/3 10YR 4/3	
BSE4	4	Surface	Ap C	0-8 12-18	sicl sicl	32 34	2.5Y 3/2 2.5Y 4/3	
BSE5	12	> 20	Ap Bw	0-7 12-18	sic sicl	37 32	10YR 2/1 2.5Y 5/2	
BSE7	5	5	A & Bk Bk	0-8 12-20	l l	21 18	10YR 3/2 2.5Y 5/3	A & Bk may be contaminated with Decon
BSF1	18	34	A Bw Bk	0-8[5] 12-20 36-53	l l sicl	20 22 34	10YR 3/2 10YR 3/3 2.5Y 4/3	
BSF2	4	> 20	A C	0-8 12-20	fsl fsl	10 15	10YR 3/2 10YR 4/2	
BSF3	20	> 22	Ap Bw	0-8 12-20	l l	20 20	10YR 2/2 10YR 3/2	
BSF4	12	> 22	A E/Bt	0-8 12-20	l fsl/sl	17 15/17	10YR 3/3 10YR 4/2	
BSF5	15	12	Ap Bk1 Bk2	0-8[5] 12-20 28-36	l l l	24 22 18	10YR 2/2 10YR 4/3 2.5Y 4/3	
BSF6	22	29	A Bw 2C	0-8[5] 12-20 35-60	sil sil cl	23 26 30	10YR 2/1 10YR 2/2 2.5Y 4/2	
BSF7	20	20	Ap Bw C1	0-7[5] 12-20 48-60	l scl cl	24 25 32	10YR 2/2 10YR 3/2 2.5Y 4/4	

Table A1.2 Sample data (continued)

Site no.[1]	Soil series	Taxadjunct (reason)	Taxonomic class
BSG1	Tally		Coarse-loamy, mixed, superactive, frigid Typic Haplustolls
BSG2	Savage		Fine, smectitic, frigid Vertic Argiustolls
BSG3	Mandan		Coarse-silty, mixed, superactive, frigid Pachic Haplustolls
BSG4	Golva	Coarse silty	Fine-silty, mixed, superactive, frigid Typic Haplustolls
BSG5	Mandan		Coarse-silty, mixed, superactive, frigid Pachic Haplustolls
BSG6	Parshall		Coarse-loamy, mixed, superactive, frigid Pachic Haplustolls
BSG7	Vida		Fine-loamy, mixed, superactive, frigid Typic Argiustolls
BSH1	Sutley		Coarse-silty, mixed, superactive, frigid Typic Calciustolls
BSH2	Arnegard	Bear Paw Till at 38 in.	Fine-loamy, mixed, superactive, frigid Pachic Haplustolls
BSH3	Falkirk		Fine-loamy, mixed, superactive, frigid Pachic Haplustolls
BSH4	Grassna		Fine-silty, mixed, superactive, frigid Pachic Haplustolls
BSH5	Vebar		Coarse-loamy, mixed, superactive, frigid Typic Haplustolls
BSH6	Grail		Fine, smectitic, frigid Pachic Vertic Argiustolls
BSH7	Williams		Fine-loamy, mixed, superactive, frigid Typic Argiustolls
BSI1	Arnegard		Fine-loamy, mixed, superactive, frigid Pachic Haplustolls
BSI2	Falkirk		Fine-loamy, mixed, superactive, frigid Pachic Haplustolls
BSI3	Reeder		Fine-loamy, mixed, superactive, frigid Typic Argiustolls
BSI4	Farland	Formed on loess not alluvium	Fine-silty, mixed, superactive, frigid Typic Argiustolls
BSI5	Flaxton		Fine-loamy, mixed, superactive, frigid Pachic Argiustolls
BSI6	Williams		Fine-loamy, mixed, superactive, frigid Typic Argiustolls
BSI7	Williams		Fine-loamy, mixed, superactive, frigid Typic Argiustolls
DKA1	Desart		Coarse-loamy, mixed, superactive, frigid Typic Natrustolls
DKA2	Chinook	Pachic soil	Coarse-loamy, mixed, superactive, frigid Aridic Haplustolls
DKA3	Bowdle	Soil has argillic horizon	Fine-loamy over sandy or sandy-skeletal, mixed, superactive, frigid Pachic Haplustolls
DKA4	Chinook		Coarse-loamy, mixed, superactive, frigid Aridic Haplustolls

Table A1.2 Sample data (continued)

Site no.[1]	Depth of mollic (in.)	Depth to CO_3 (in.)	Horizons sampled	Interval sampled (in.)	Texture[2]	% clay[3]	Munsell color[4]	Comments
BSG1	10	> 20	Ap Bw	0-7 15-20	l sl	20 15	10YR 3/2 10YR 4/3	
BSG2	12	> 20	Ap Bt	0-7 15-20	sicl sicl	28 38	10YR 2/2 10YR 4/3	
BSG3	> 20	18	A Bw	0-8 12-18	sil sil	20 20	10YR 2/2 10YR 3/2	
BSG4	15	> 22	A Bw	0-8 12-18	sil sil	18 17	10YR 2/2 10YR 3/2	
BSG5	> 20	18	Ap Bw	0-8 12-20	sil sil	18 20	10YR 2/2 10YR 3/2	
BSG6	> 20	> 20	Ap Bw	0-8 12-20	fsl fsl	16 14	10YR 2/2 10YR 3/2	
BSG7	8	10	A/Bt Bk	0-8 12-18	l/cl cl	23/28 28	10YR 3/2 2.5Y 5/2	
BSH1	10	Surface	Ap Bk	0-7 15-20	sil sil	22 18	2.5Y 3/2 2.5Y 4/3	
BSH2	24	34	Ap Bw BCk	0-6[5] 15-20 36-60	cl cl cl	29 30 37	10YR 2/2 10YR 3/2 2.5Y 4/2	
BSH3	12	20	Ap 2Bw 2C	0-6[5] 14-20 36-60	l vgrl vfsl	18 20 12	10YR 2/2 10YR 4/2 2.5Y 4/4	
BSH4	> 20	> 25	Ap Bw	0-7 15-20	sil sil	23 22	10YR 2/1 10YR 2/2	
BSH5	9	> 20	Ap Bw	0-6 15-20	scl sl	20 14	10YR 3/2 2.5Y 4/3	
BSH6	> 20	28	Ap Bt Bk	0-8[5] 12-18 30-60	sicl sicl sicl	36 40 38	10YR 2/1 10YR 2/1 2.5Y 4/4	
BSH7	12	14	A Bk	0-8 14-20	l cl	25 28	10YR 3/2 2.5Y 5/2	
BSI1	> 20	> 20	Ap AB	0-7 14-20	l l	22 23	10YR 2/2 10YR 3/2	
BSI2	12	14	Ap 2Bk	0-6 15-20	sl vgrscl	16 20	10YR 2/2 2.5Y 4/3	
BSI3	12	20	A Bt	0-8 14-19	l cl	24 32	10YR 2/2 10YR 4/2	
BSI4	14	> 20	Ap Bt	0-7 14-20	sil sicl	25 33	10YR 2/2 2.5Y 4/3	
BSI5	> 20	> 20	Ap 2Bt	0-7 15-20	fsl cl	14 32	10YR 2/2 10YR 3/3	
BSI6	10	15	Ap Bk	0-7 16-20	l cl	24 32	10YR 2/2 2.5Y 4/3	
BSI7	12	19	Ap Bt	0-6 13-19	l cl	24 32	10YR 2/2 2.5Y 4/2	
DKA1	26	>30	A A	0-8 12-20	fsl fsl	12 12	10YR 3/2 10YR 3/2	
DKA2	> 20	> 20	A & Bw Bw2	0-8 12-20	fsl fsl	13 11	2.5Y 3/3 2.5Y 3/3	
DKA3	36	> 36	A Bt	0-5 12-20	sil sil	21 26	10YR 3/2 10YR 3/2	
DKA4	13	13	A Bk	0-4 13-20	fsl fsl	15 14	10YR 3/3 2.5Y 4/3	

Table A1.2 Sample data (continued)

Site no.[1]	Soil series	Taxadjunct (reason)	Taxonomic class
DKA5	Cabba		Loamy, mixed, superactive, calcareous, frigid, shallow Typic Ustorthents
DKA6	Chama		Fine-silty, mixed, superactive, frigid Typic Calciustolls
DKA7	Sen		Fine-silty, mixed, superactive, frigid Typic Haplustolls
DKB1	Regent		Fine, smectitic, frigid Vertic Argiustolls
DKB2	Gerda		Fine, smectitic, frigid Leptic Torrertic Natrustolls
DKB3	Vebar		Coarse-loamy, mixed, superactive, frigid Typic Haplustolls
DKB4	Arnegard		Fine-loamy, mixed, superactive, frigid Pachic Haplustolls
DKB5	Floweree		Fine-silty, mixed, superactive, frigid Aridic Haplustolls
DKB6	Lonna		Fine-silty, mixed, superactive, frigid Aridic Haplustepts
DKB7	Ethridge		Fine, smectitic, frigid Torrertic Argiustolls
DKC1	Amor		Fine-loamy, mixed, superactive, frigid Typic Haplustolls
DKC1 AOV1	Amor		Fine-loamy, mixed, superactive, frigid Typic Haplustolls
DKC1 AOV2	Amor		Fine-loamy, mixed, superactive, frigid Typic Haplustolls
DKC2	Beisigl		Mixed, frigid Typic Ustipsamments
DKC3	Arnegard		Fine-loamy, mixed, superactive, frigid Pachic Haplustolls
DKC4	Golva		Fine-silty, mixed, superactive, frigid Typic Haplustolls
DKC5	Lonna		Fine-silty, mixed, superactive, frigid Aridic Haplustepts
DKC6	Maltese		Fine, smectitic, frigid Torrertic Natrustolls
DKC7	Patent		Fine-loamy, mixed, superactive, calcareous, frigid Aridic Ustorthents
DKD1	Chama	May be fine family with sic at 20 in. Wayden upslope	Fine-silty, mixed, superactive, frigid Typic Calciustolls
DKD2	Arnegard		Fine-loamy, mixed, superactive, frigid Pachic Haplustolls
DKD3	Daglum		Fine, smectitic, frigid Vertic Natrustolls
DKD4	Daglum		Fine, smectitic, frigid Vertic Natrustolls
DKD5	Sen		Fine-silty, mixed, superactive, frigid Typic Haplustolls
DKD6	Janesburg		Fine, smectitic, frigid Typic Natrustolls
DKD7	Sen		Fine-silty, mixed, superactive, frigid Typic Haplustolls

Table A1.2 Sample data (continued)

Site no.[1]	Depth of mollic (in.)	Depth to CO_3 (in.)	Horizons sampled	Interval sampled (in.)	Texture[2]	% clay[3]	Munsell color[4]	Comments
DKA5	Non-mollic	Surface	Ap Bk2	0-6 12-19	sil sil	20 22	2.5Y 4/2 2.5Y 5/4	
DKA6	7	3	A & Bw Bk2	0-8 12-20	sil sil	18 17	10YR 3/3 2.5Y 5/4	
DKA7	8	11	Ap Bk	0-8 12-20	sil sil	18 19	10YR 3/3 2.5Y 5/3	
DKB1	15	18	A Bt2	0-5 12-18	sicl sic	30 40	10YR 3/2 10YR 3/3	
DKB2	8	8	Ap Btnk	0-4 12-20	l cl	22 38	10YR 3/3 2.5Y 5/3	
DKB3	12	12	A Bk	0-5 12-20	fsl fsl	15 14	10YR 3/3 2.5Y 4/3	Cr at 35 in.
DKB4	30	> 40	A Bw	0-6 12-20	l l	20 20	10YR 3/2 10YR 3/3	
DKB5	12	12	A Bk	0-7 12-20	sil sil	22 24	10YR 3/2 2.5Y 4/3	
DKB6	Non-mollic	1	A & Bw Bk	0-8 12-20	sil sil	22 20	10YR 4/3 2.5Y 4/2	Large krotovina (filled animal burrow) at about 13 in.
DKB7	9.5	9.5	A Btk	0-8 12-20	sil sicl	20 38	10YR 3/2 2.5Y 5/3	
DKC1	14	18	Ap Bw3	0-7 14-18	l l	18 20	10YR 3/2 10YR 4/3	
DKC1 AOV1	12	16	Ap Bw2	0-7 12-18	l l	16 18	10YR 3/2 10YR 4/3	
DKC1 AOV2	13	17	Ap Bw2	0-7 13-18	l l	16 18	10YR 3/2 10YR 4/3	
DKC2	Non-mollic	Surface	Ap Bk	0-6 12-20	lfs lfs	7 6	10YR 4/2 2.5Y 5/3	
DKC3	19	19	Ap Bw	0-5 12-19	lfs l	21 20	10YR 3/2 10YR 3/3	
DKC4	7	18	A Bw2	0-7 12-18	sil sil	22 22	10YR 3/2 10YR 4/3	
DKC5	1.5	1.5	Bw1 Bk1	1.5-8 13-20	sil sil	21 21	2.5Y 4/3 10YR 4/3	
DKC6	7.5	7.5	Ap Btnk	0-8 12-20	sil sicl	23 28	2.5Y 3/2 5Y 4/3	
DKC7	Non-mollic	Surface	A & C1 C2	0-8 12-20	sil l	22 20	2.5Y 4/3 5Y 4/3	Soft bedrock (Cr) at about 30 in.
DKD1	8	Surface	A Bw	0-8 12-16	sil sil	24 24	10YR 3/2 10YR 4/2	
DKD2	> 20	> 20	Ap Bw	0-7 14-20	lfs l	22 24	10YR 2/2 10YR 3/3	
DKD3	14	14	Ap Btnk	0-6 14-20	sicl sic	36 45	10YR 3/2 2.5Y 4/3	
DKD4	17	19	A Btn	0-8 12-19	sil sic	25 48	10YR 3/2 10YR 3/2	
DKD5	12	12	A Bk	0-8 12-20	sil sil	24 26	2.5Y 3/2 2.5Y 5/4	
DKD6	12	12	A & Btn Btnk	0-8 12-18	sicl sic	35 43	10YR 2/2 2.5Y 4/3	
DKD7	15	15	A Bk	0-8 15-20	sil sil	19 20	2.5Y 3/2 5Y 5/4	

Table A1.2 Sample data (continued)

Site no.[1]	Soil series	Taxadjunct (reason)	Taxonomic class
DKE1	Cabba		Loamy, mixed, superactive, calcareous, frigid, shallow Typic Ustorthents
DKE2	Daglum		Fine, smectitic, frigid Vertic Natrustolls
DKE3	Cabba		Loamy, mixed, superactive, calcareous, frigid, shallow Typic Ustorthents
DKE4	Amor		Fine-loamy, mixed, superactive, frigid Typic Haplustolls
DKE4 AOV1	Sen		Fine-silty, mixed, superactive, frigid Typic Haplustolls
DKE4 AOV2	Sen		Fine-silty, mixed, superactive, frigid Typic Haplustolls
DKE5	Savage		Fine, smectitic, frigid Vertic Argiustolls
DKE6	Moreau		Fine, smectitic, frigid Vertic Haplustolls
DKE7	Amor		Fine-loamy, mixed, superactive, frigid Typic Haplustolls
DKF1	Vebar		Coarse-loamy, mixed, superactive, frigid Typic Haplustolls
DKF1 AOV1	Vebar		Coarse-loamy, mixed, superactive, frigid Typic Haplustolls
DKF1 AOV2	Vebar		Coarse-loamy, mixed, superactive, frigid Typic Haplustolls
DKF2	Janesburg		Fine, smectitic, frigid Typic Natrustolls
DKF3	Daglum	Saline phase - salts at 16 in.	Fine, smectitic, frigid Vertic Natrustolls
DKF4	Manning		Coarse-loamy over sandy or sandy-skeletal, mixed, superactive, frigid Typic Haplustolls
DKF5	Farnuf		Fine-loamy, mixed, superactive, frigid Typic Argiustolls
DKF6	Vebar		Coarse-loamy, mixed, superactive, frigid Typic Haplustolls
DKF7	Vebar	Pachic	Coarse-loamy, mixed, superactive, frigid Typic Haplustolls
DKG1	Moreau		Fine, smectitic, frigid Vertic Haplustolls
DKG2	Tally		Coarse-loamy, mixed, superactive, frigid Typic Haplustolls
DKG3	Shambo		Fine-loamy, mixed, superactive, frigid Typic Haplustolls
DKG4	Vebar		Coarse-loamy, mixed, superactive, frigid Typic Haplustolls
DKG5	Regent	Saline phase - salts to surface	Fine, smectitic, frigid Vertic Argiustolls
DKG6	Morton		Fine-silty, mixed, superactive, frigid Typic Argiustolls
DKG7	Sen		Fine-silty, mixed, superactive, frigid Typic Haplustolls

Table A1.2 Sample data (continued)

Site no.[1]	Depth of mollic (in.)	Depth to CO_3 (in.)	Horizons sampled	Interval sampled (in.)	Texture[2]	% clay[3]	Munsell color[4]	Comments
DKE1	0	Surface	A Bk	0-6 12-17	l l	18 18	10YR 4/2 10YR 5/2	
DKE2	9	9	Ap & Btn Btk	0-8 12-19	sicl sic	41 47	10YR 3/2 2.5Y 4/3	
DKE3	Non-mollic	Surface	A & Bk Cr	0-8 14-20	sil sil	22 21	2.5Y 4/3 2.5Y 5/2	
DKE4	4	> 20	A Bw	0-8 12-20	cl cl	32 32	10YR 3/2 10YR 3/2	
DKE4 AOV1	15	15	A Bk	0-8 15-20	sil sil	20 22	10YR 2/2 2.5Y 5/2	
DKE4 AOV2	15	15	A Bk	0-8 15-20	sil sil	20 21	10YR 2/2 2.5Y 5/3	
DKE5	6	> 20	A Bt	0-6 12-20	sil sic	25 46	10YR 3/2 10YR 3/4	
DKE6	4	Surface	Ap Bk	0-8 12-20	sic sic	45 50	10YR 3/2 10YR 5/1	
DKE7	8	> 20	Ap Bw	0-8 12-18	cl cl	30 30	10YR 3/3 10YR 3/4	
DKF1	10	16	Ap Bk	0-5 16-20	fsl fsl	8 16	10YR 3/3 10YR 4/4	
DKF1 AOV1	8	8	A Bk	0-8 14-20	fsl fsl	10 10	10YR 3/2 10YR 4/3	
DKF1 AOV2	12	12	A Bk	0-8 14-20	fsl fsl	10 10	10YR 3/2 10YR 4/3	
DKF2	11	11	A, E, & Btn Btnk	0-8 12-20	sicl sic	38 50	2.5Y 3/2 2.5Y 5/4	
DKF3	12	12	Ap, E, & Bt Btnkz	0-7 12-20	sil sic	24 43	2.5Y 3/2 2.5Y 4/4	
DKF4	> 20	> 20	Ap Bw	0-6 12-20	sl sl	16 11	10YR 2/2 10YR 3/3	
DKF5	6	> 20	Ap Bw	0-6 12-19	l l	25 25	10YR 3/3 10YR 3/4	
DKF6	9	> 20	A Bw	0-8 12-20	fsl fsl	15 11	10YR 3/3 10YR 3/4	
DKF7	18	> 20	Ap Bw	0-6 12-20	sl sl	16 16	10YR 3/2 10YR 3/3	
DKG1	11	Surface	A Bw	0-8 12-16	sicl sic	30 40	2.5Y 3/2 2.5Y 4/3	
DKG2	15	31	A Bw Bk	0-8[5] 12-20 31-44	fsl fsl l	16 17 22	10YR 2/2 10YR 3/3 10YR 4/3	
DKG3	15	> 20	A & Bw Bw	0-8 12-20	l l	23 23	10YR 3/2 10YR 3/3	
DKG4	7	> 20	A Bw	0-8 12-20	fsl fsl	18 17	10YR 3/3 2.5Y 4/4	
DKG5	8	11	Ap & Bt Bkz	0-7 12-20	sicl sic	35 42	2.5Y 3/2 2.5Y 4/2	
DKG6	14	14	Ap & Bt Bk	0-7 14-20	sil sicl	27 32	10YR 3/3 2.5Y 5/3	
DKG7	12	24	A Bw Cr	0-7[5] 12-20 31-50	l sil sil	22 24 23	10YR 2/2 10YR 4/2 5YR 4/3	

Table A1.2 Sample data (continued)

Site no.[1]	Soil series	Taxadjunct (reason)	Taxonomic class
DKH1	Daglum		Fine, smectitic, frigid Vertic Natrustolls
DKH2	Lihen		Sandy, mixed, frigid Entic Haplustolls
DKH3	Janesburg		Fine, smectitic, frigid Typic Natrustolls
DKH4	Grail		Fine, smectitic, frigid Pachic Vertic Argiustolls
DKH4 AOV1	Savage		Fine, smectitic, frigid Vertic Argiustolls
DKH4 AOV2	Savage		Fine, smectitic, frigid Vertic Argiustolls
DKH5	Regent		Fine, smectitic, frigid Vertic Argiustolls
DKH6	Daglum		Fine, smectitic, frigid Vertic Natrustolls
DKH7	Dogtooth		Fine, smectitic, frigid Leptic Natrustolls
DKI1	Chama		Fine-silty, mixed, superactive, frigid Typic Calciustolls
DKI2	Shambo		Fine-loamy, mixed, superactive, frigid Typic Haplustolls
DKI3	Stady		Fine-loamy over sandy or sandy-skeletal, mixed, superactive, frigid Typic Haplustolls
DKI3 AOV1	Bowdle		Fine-loamy over sandy or sandy-skeletal, mixed, superactive, frigid Pachic Haplustolls
DKI3 AOV2	Bowdle		Fine-loamy over sandy or sandy-skeletal, mixed, superactive, frigid Pachic Haplustolls
DKI4	Belfield		Fine, smectitic, frigid Glossic Natrustolls
DKI4 AOV1	Daglum		Fine, smectitic, frigid Vertic Natrustolls
DKI4 AOV2	Daglum		Fine, smectitic, frigid Vertic Natrustolls
DKI5	Savage		Fine, smectitic, frigid Vertic Argiustolls
DKI6	Daglum		Fine, smectitic, frigid Vertic Natrustolls
DKI7	Savage		Fine, smectitic, frigid Vertic Argiustolls
DKI7 AOV1	Parshall		Coarse-loamy, mixed, superactive, frigid Pachic Haplustolls
DKI7 AOV2	Parshall		Coarse-loamy, mixed, superactive, frigid Pachic Haplustolls
DLA1	Esmond		Coarse-loamy, mixed, superactive, frigid Typic Calciudolls
DLA2	Heimdal		Coarse-loamy, mixed, superactive, frigid Calcic Hapludolls
DLA3	Barnes	Fine loamy in coarse loamy unit	Fine-loamy, mixed, superactive, frigid Calcic Hapludolls
DLA4	Heimdal		Coarse-loamy, mixed, superactive, frigid Calcic Hapludolls

Table A1.2 Sample data (continued)

Site no.[1]	Depth of mollic (in.)	Depth to CO_3 (in.)	Horizons sampled	Interval sampled (in.)	Texture[2]	% clay[3]	Munsell color[4]	Comments
DKH1	17	17	Ap Btn	0-5 12-17	sicl sic	28 50	10YR 2/2 2.5Y 3/2	
DKH2	5	14	Ap Bk	0-8 14-20	lfs lfs	10 8	10YR 3/3 10YR 4/3	
DKH3	> 20	30	Ap Btn	0-7 12-20	sicl sic	32 46	10YR 2/2 7.5YR 3/2	
DKH4	> 20	> 20	A Bt	0-8 12-20	sicl sic	30 42	10YR 2/2 10YR 3/2	
DKH4 AOV1	12	> 20	A Bt	0-8 12-20	sicl sic	30 45	10YR 3/2 2.5Y 4/3	
DKH4 AOV2	12	> 20	A Bt	0-8 12-20	sil sicl	22 37	2.5Y 3/2 2.5Y 4/3	
DKH5	10	> 20	A Bt	0-8 12-20	sicl sic	29 42	10YR 3/2 10YR 4/4	
DKH6	11	15	Ap Btnk	0-8 12-20	sic sic	45 50	2.5Y 3/2 2.5Y 4/4	
DKH7	12	12	A, E, & Btn Btnky	0-8 12-20	sic sic	42 47	10YR 4/2 2.5Y 4/2	
DKI1	5	Surface	Ap Bk Cr	0-5[5] 13-20 37-52	sil sil sil	22 20 15	10YR 3/2 2.5Y 4/3 2.5Y 4/4	
DKI2	7	> 20	A & Bw Bw	0-8 12-20	l l	26 27	10YR 3/3 10YR 4/3	
DKI3	9	> 20	A Bw	0-8 12-16	l l	17 20	2.5Y 3/2 2.5Y 3/3	
DKI3 AOV1	> 20	> 20	A Bw	0-8 12-20	l sl	20 18	2.5Y 3/3 10YR 3/3	
DKI3 AOV2	> 20	> 20	A Bw	0-8 12-20	l sl	20 18	2.5Y 3/2 10YR 3/3	
DKI4	> 20	> 20	A BE	0-8 12-20	sil sil	23 25	10YR 2/2 10YR 3/2	
DKI4 AOV1	14	> 20	A Btn	0-8 12-20	sil sic	20 48	10YR 2/2 10YR 3/3	
DKI4 AOV2	> 20	> 20	A Btn	0-7 12-20	sil sic	20 50	10YR 2/2 10YR 3/3	
DKI5	15	17	A Bt	0-8 12-17	sicl sic	34 45	10YR 3/2 2.5Y 4/3	
DKI6	> 20	> 20	A Btn	0-8 12-20	sicl sic	38 50	2.5Y 3/2 2.5Y 3/3	
DKI7	11	> 20	Ap Bt	0-8 12-20	sicl sic	32 40	10YR 2/2 10YR 4/3	
DKI7 AOV1	> 20	> 20	Ap Bw	0-8 12-20	fsl l	15 22	10YR 3/2 10YR 2/2	Manure spread on soil surface, then worked before seeding
DKI7 AOV2	21	> 21	Ap Bw	0-8 12-17	fsl l	15 21	10YR 3/2 10YR 3/2	Manure spread on soil surface, then worked before seeding
DLA1	5	5	Ap Bk2	0-5 12-18	l l	14 17	10YR 3/2 2.5Y 6/4	
DLA2	7	17	Ap Bw	0-7 12-17	fsl fsl	15 13	2.5Y 3/1 2.5Y 4/4	
DLA3	8	14	Ap Bk	0-8 14-20	l cl	25 29	10YR 2/1 5Y 5/4	
DLA4	7	14	Ap Bk	0-7 14-20	l l	14 14	10YR 3/3 2.5Y 5/4	

Table A1.2 Sample data (continued)

Site no.[1]	Soil series	Taxadjunct (reason)	Taxonomic class
DLA5	Egeland	Coarse fragments on surface in places	Coarse-loamy, mixed, superactive, frigid Calcic Hapludolls
DLA6	Bottineau	Mollic deeper than Range in Characteristics (RIC) for series	Fine-loamy, mixed, superactive, frigid Alfic Argiudolls
DLA7	Kelvin		Fine, smectitic, frigid Chromic Vertic Hapludalfs
DLB1	Barnes		Fine-loamy, mixed, superactive, frigid Calcic Hapludolls
DLB2	Emrick		Coarse-loamy, mixed, superactive, frigid Pachic Hapludolls
DLB3	Sisseton		Coarse-loamy, mixed, superactive, frigid Typic Eutrudepts
DLB4	Barnes		Fine-loamy, mixed, superactive, frigid Calcic Hapludolls
DLB5	Buse		Fine-loamy, mixed, superactive, frigid Typic Calciudolls
DLB6	Barnes		Fine-loamy, mixed, superactive, frigid Calcic Hapludolls
DLB7	Svea		Fine-loamy, mixed, superactive, frigid Pachic Hapludolls
DLC1	Barnes		Fine-loamy, mixed, superactive, frigid Calcic Hapludolls
DLC2	Svea		Fine-loamy, mixed, superactive, frigid Pachic Hapludolls
DLC3	Svea		Fine-loamy, mixed, superactive, frigid Pachic Hapludolls
DLC4	Wyndmere		Coarse-loamy, mixed, superactive, frigid Aeric Calciaquolls
DLC5	Barnes		Fine-loamy, mixed, superactive, frigid Calcic Hapludolls
DLC6	Svea		Fine-loamy, mixed, superactive, frigid Pachic Hapludolls
DLC7	Langhei		Fine-loamy, mixed, superactive, frigid Typic Eutrudepts
DLD1	Balaton		Fine-loamy, mixed, superactive, frigid Aquic Calciudolls
DLD2	Hegne		Fine, smectitic, frigid Typic Calciaquerts
DLD3	Hamerly		Fine-loamy, mixed, superactive, frigid Aeric Calciaquolls
DLD4	Bearden		Fine-silty, mixed, superactive, frigid Aeric Calciaquolls
DLD5	Hamerly, saline		Fine-loamy, mixed, superactive, frigid Aeric Calciaquolls
DLD6	Buse (shaly)		Fine-loamy, mixed, superactive, frigid Typic Calciudolls
DLD7	Barnes		Fine-loamy, mixed, superactive, frigid Calcic Hapludolls

Table A1.2 Sample data (continued)

Site no.[1]	Depth of mollic (in.)	Depth to CO_3 (in.)	Horizons sampled	Interval sampled (in.)	Texture[2]	% clay[3]	Munsell color[4]	Comments
DLA5	15	15	Ap Bk	0-8 15-20	fsl fsl	12 12	10YR 2/1 2.5Y 5/3	
DLA6	26	28	A Bt	2-8 12-20	l cl	20 38	10YR 2/1 2.5Y 3/2	2 in. Oi (slightly decomposed organic matter) on surface
DLA7	5	18	E Bt	1-5 12-18	l cl	20 45	10YR 2/2 10YR 4/3	1 in. Oi (slightly decomposed organic matter) on surface.
DLB1	7	14	Ap Bk	0-7 14-20	l l	20 20	10YR 2/1 5Y 5/4	
DLB2	21	28	Ap Bw	0-8 13-20	l l	19 17	10YR 2/1 2.5Y 3/2	Well drained
DLB3	4	Surface	Ap Bk2	0-4 12-20	sl sl	13 10	2.5Y 2/2 5Y 5/3	
DLB4	7	14	Ap Bk	0-7 14-20	l l	23 20	10YR 2/1 5Y 5/4	
DLB5	10	Surface	Ap Bk	0-8 12-20	l l	21 23	2.5Y 2.5/1 2.5Y 4/2	
DLB6	9	13	Ap Bk	0-8 13-20	l cl	26 28	10YR 2/1 5Y 6/4	
DLB7	23	24	Ap Bw C	0-8[5] 12-20 40-60	cl cl l	29 31 25	10YR 2/1 10YR 3/2 10YR 5/3	
DLC1	13	30	A Bw	0-8 13-20	l l	23 25	10YR 2/1 2.5Y 4/3	
DLC2	18	24	Ap Bw1	0-8 12-18	cl cl	28 27	10YR 2/1 2.5Y 3/2	
DLC3	19	24	Ap Bw1	0-8 14-19	l sil	26 24	10YR 2/1 2.5Y 3/2	
DLC4	18	Surface	Ap Bk	0-8 12-18	l l	14 14	10YR 2/1 2.5Y 3/2	
DLC5	8	20	Ap Bw C	0-8[5] 12-20 40-60	l l c	25 25 35/25	10YR 2/1 2.5Y 4/2 10YR 5/3	
DLC6	18	18	Ap Bw	0-8 12-18	cl cl	29 32	10YR 2/2 10YR 3/1	
DLC7	5	Surface	Ap Bk	0-5 12-20	l l	26 26	10YR 3/2 2.5Y 5/3	
DLD1	8	Surface	Ap Bk	0-8 12-20	l l	25 25	10YR 2/1 2.5Y 5/4	
DLD2	7	Surface	Ap Bk	0-7 12-20	sic sic	45 45	10YR 2/2 2.5Y 4/5-5/2	
DLD3	10	Surface	Ap Bk C	0-8[5] 12-20 40-60	cl cl l	29 29 26	10YR 2/1 2.5Y 4/2 2.5Y 5/4	
DLD4	18	Surface	Ap Bk	0-7 12-18	sil sil	25 25	10YR 2/1 2.5Y 3/2	
DLD5	14	Surface	Ap Bk	0-8 14-20	l l	26 20	10YR 2/1 2.5Y 8/4	
DLD6	7	Surface	Ap Bk	0-7 12-20	l cl	26 29	10YR 2/1 2.5Y 6/4	
DLD7	10	15	Ap Bk	0-8 15-20	l l	21 21	10YR 2/1 2.5Y 5/4	

Table A1.2 Sample data (continued)

Site no.[1]	Soil series	Taxadjunct (reason)	Taxonomic class
DLE1	Langhei		Fine-loamy, mixed, superactive, frigid Typic Eutrudepts
DLE2	Barnes		Fine-loamy, mixed, superactive, frigid Calcic Hapludolls
DLE3	Bearden		Fine-silty, mixed, superactive, frigid Aeric Calciaquolls
DLE4	Buse		Fine-loamy, mixed, superactive, frigid Typic Calciudolls
DLE5	Tonka		Fine, smectitic, frigid Argiaquic Argialbolls
DLE6	Hamerly	Sodium effected	Fine-loamy, mixed, superactive, frigid Aeric Calciaquolls
DLE7	Cresbard		Fine, smectitic, frigid Glossic Natrudolls
DLF1	Buse		Fine-loamy, mixed, superactive, frigid Typic Calciudolls
DLF2	Cresbard		Fine, smectitic, frigid Glossic Natrudolls
DLF3	Buse		Fine-loamy, mixed, superactive, frigid Typic Calciudolls
DLF4	Hamerly		Fine-loamy, mixed, superactive, frigid Aeric Calciaquolls
DLF5	Buse		Fine-loamy, mixed, superactive, frigid Typic Calciudolls
DLF6	Buse		Fine-loamy, mixed, superactive, frigid Typic Calciudolls
DLF6 AOV1	Buse		Fine-loamy, mixed, superactive, frigid Typic Calciudolls
DLF6 AOV2	Buse	Appearance of 1 in. Bw in some areas	Fine-loamy, mixed, superactive, frigid Typic Calciudolls
DLF7	Hamerly		Fine-loamy, mixed, superactive, frigid Aeric Calciaquolls
DLG1	Barnes	Depth of mollic	Fine-loamy, mixed, superactive, frigid Calcic Hapludolls
DLG2	Svea		Fine-loamy, mixed, superactive, frigid Pachic Hapludolls
DLG3	Balaton	Slope?	Fine-loamy, mixed, superactive, frigid Aquic Calciudolls
DLG4	Langhei		Fine-loamy, mixed, superactive, frigid Typic Eutrudepts
DLG4*	Barnes		Fine-loamy, mixed, superactive, frigid Calcic Hapludolls
DLG5	Buse (shaly)		Fine-loamy, mixed, superactive, frigid Typic Calciudolls
DLG5*	Vallers		Fine-loamy, mixed, superactive, frigid Typic Calciaquolls
DLG6	Barnes		Fine-loamy, mixed, superactive, frigid Calcic Hapludolls
DLG7	Hamerly		Fine-loamy, mixed, superactive, frigid Aeric Calciaquolls

Table A1.2 Sample data (continued)

Site no.[1]	Depth of mollic (in.)	Depth to CO_3 (in.)	Horizons sampled	Interval sampled (in.)	Texture[2]	% clay[3]	Munsell color[4]	Comments
DLE1	4	Surface	Ap Bk C	0-4[5] 12-20 40-60	sl l l	14 24 20	10YR 3/2 2.5Y 5/4 2.5Y 5/4	
DLE2	8	11	Ap Bk	0-8 12-20	l l	24 26	10YR 3/1 2.5Y 6/4	
DLE3	8	Surface	Ap Bk	0-8 12-20	l sil-l	25 23	10YR 2/1 2.5Y 5/3	
DLE4	7	Surface	Ap Bk	0-7 12-20	l l	26 26	10YR 2/1 2.5Y 6/4	
DLE5	16	No carbonates	A1 E	1-8 16-20	sicl sil	30 20	10YR 2/1 5Y 5/1	1 in. Oi on surface
DLE6	14	Surface	Ap Bk	0-8 14-20	cl cl	32 40	10YR 2/1 2.5Y 5/2-6/1	
DLE7	14	14	Ap Bk	0-8 14-20	cl cl	29 31	10YR 2/1 2.5Y 5/2	
DLF1	8	Surface	Ap Bk	0-8 16-20	l scl	26 26	10YR 2/1 2.5Y 5/3	
DLF2	7	12	Ap Bk	0-7 15-20	l cl	25 28	10YR 2/1 2.5Y 5/4	
DLF3	11	Surface	Ap Bk	0-8 12-20	l l	20 23	10YR 3/1 2.5Y 5/3	
DLF4	13	Surface	A Bk	0-8 13-20	cl cl	28 28	10YR 2/1 2.5Y 4/2	
DLF5	6	Surface	A Bk	0-6 12-20	l l	22 25	2.5Y 3/2 2.5Y 5/4	
DLF6	7	Surface	A Bk	0-7 12-20	l l	21 23	10YR 3/1 2.5Y 5/4	
DLF6 AOV1	8	Surface, then at 6	A Bk2	0-8 12-20	l sil	24 24	10YR 2/1 5Y 6/4	
DLF6 AOV2	11	Surface (slight)	A Bk	0-8 12-20	l sil	24 24	10YR 2/1 5Y 6/4	
DLF7	12	Surface	Ap Bk	0-8 12-20	l l	26 26	10YR 2/1 2.5Y 4/2	
DLG1	15	17	Ap Bw	0-8 12-16	l l	25 26	10YR 2/1 2.5Y 3/2	
DLG2	23 (8 of A1)	22	A1 A2	0-8 12-20	l sil	24 22	10YR 2/1 10YR 3/2	
DLG3	11	11	Ap Bk	0-8 12-20	l l	20 20	10YR 2/1 2.5Y 4/2	
DLG4	4	Surface	Ap Bk	0-4 12-20	l l	18 22	2.5Y 3/2 2.5Y 5/3	
DLG4*	14	14	Ap Bk	0-7 14-20	l l	24 25	10YR 2/1 2.5Y 5/2	
DLG5	9	Surface	Ap Bk C	0-8[5] 12-20 40-60	l l grscl	24 20 20	10YR 3/1 5Y 5/3 5Y 4/4	
DLG5*	6	Surface	A Bk2	0-5 12-20	l cl	25 29	10YR 2/1 5Y 5/1	
DLG6	8	14	Ap Bk	0-8 14-20	grscl scl	21 21	10YR 2/1 2.5Y 4/3	
DLG7	12	Surface	Ap Bk	0-8 12-20	cl cl	29 32	10YR 2/1 2.5Y 4/2	

Table A1.2 Sample data (continued)

Site no.[1]	Soil series	Taxadjunct (reason)	Taxonomic class
DLH1	Langhei		Fine-loamy, mixed, superactive, frigid Typic Eutrudepts
DLH2	Wyard		Fine-loamy, mixed, superactive, frigid Typic Endoaquolls
DLH3	Barnes		Fine-loamy, mixed, superactive, frigid Calcic Hapludolls
DLH4	Barnes		Fine-loamy, mixed, superactive, frigid Calcic Hapludolls
DLH5	Wyard		Fine-loamy, mixed, superactive, frigid Typic Endoaquolls
DLH6	Cresbard		Fine, smectitic, frigid Glossic Natrudolls
DLH7	Fairdale		Fine-loamy, mixed, superactive, calcareous, frigid Mollic Udifluvents
FAA1	Hecla		Sandy, mixed, frigid Oxyaquic Hapludolls
FAA2	Glyndon		Coarse-silty, mixed, superactive, frigid Aeric Calciaquolls
FAA3	Renshaw		Fine-loamy over sandy or sandy-skeletal, mixed, superactive, frigid Calcic Hapludolls
FAA4	Tonka		Fine, smectitic, frigid Argiaquic Argialbolls
FAA5	Forman		Fine-loamy, mixed, superactive, frigid Calcic Argiudolls
FAA6	Buse		Fine-loamy, mixed, superactive, frigid Typic Calciudolls
FAA6 AOV1	Buse	Forman variant; distinct Bt; continuous, moderately thick clay films on ped faces; calcic arguidoll?	Fine-loamy, mixed, superactive, frigid Typic Calciudolls
FAA6 AOV2	Buse	Forman variant; distinct Bt; continuous, moderately thick clay films on ped faces; calcic arguidoll?	Fine-loamy, mixed, superactive, frigid Typic Calciudolls
FAA7	Overly		Fine-silty, mixed, superactive, frigid Pachic Hapludolls
FAB1	Forman		Fine-loamy, mixed, superactive, frigid Calcic Argiudolls
FAB2	Forman		Fine-loamy, mixed, superactive, frigid Calcic Argiudolls
FAB2**	Hamerly		Fine-loamy, mixed, superactive, frigid Aeric Calciaquolls
FAB3	Barnes		Fine-loamy, mixed, superactive, frigid Calcic Hapludolls
FAB4	Buse		Fine-loamy, mixed, superactive, frigid Typic Calciudolls
FAB5	Forman variant	Sodium impacted	
FAB5 AOV1	Forman		Fine-loamy, mixed, superactive, frigid Calcic Argiudolls
FAB5 AOV2	Forman		Fine-loamy, mixed, superactive, frigid Calcic Argiudolls
FAB6	Tonka		Fine, smectitic, frigid Argiaquic Argialbolls

Table A1.2 Sample data (continued)

Site no.[1]	Depth of mollic (in.)	Depth to CO_3 (in.)	Horizons sampled	Interval sampled (in.)	Texture[2]	% clay[3]	Munsell color[4]	Comments
DLH1	5	Surface	Ap Bk C	0-5[5] 12-20 40-47	l l cl	24 24 27	10YR 2/1 2.5Y 5/4 5Y 5/4	
DLH2	17	16	A Bw	0-8 12-26	l l	24 25	2.5Y 2.5/1 2.5Y 3/1	
DLH3	8	16	Ap Bw	0-8 12-16	l l	22 20	10YR 3/1 5Y 4/4	
DLH4	12	22	Ap Bw	0-8 12-20	l l	25 27	10YR 2/1 2.5Y 5/3	
DLH5	16	15	Ap Bkg	0-8 15-20	l cl	27 32	10YR 2/1 2.5Y 4/1	
DLH6	9	21	Ap Btn	0-8 12-20	l c	24 42	10YR 2/1 2.5Y 4/3	
DLH7	26	9	Ap C	0-8 12-20	l l	24 19	10YR 2/2 2.5Y 3/2	
FAA1	14	24	Ap Bw	0-8 14-20	lfs fs	8 ~5	10YR 3/1 10YR 3/2	
FAA2	10	Surface	Ak Bk	0-8 12-17	vfscl sil	30 26	10YR 3/1 10YR 5/1.5	
FAA3	13	13	A Bw	0-8 12-17	l l	23-24 25-26	10YR 2/1 10YR 3/2	Bit thin to gravel, but not Sioux. Substratum texture: l, % clay 25-26; 2C horizon at ~17-19 in.
FAA4	> 30	> 30	A E	0-8 12-20	sil sicl	26-28 28	10YR 2.5/1 10YR 2/2	Tonka Bt at 30 in. Bt is > 40% clay. Well-developed E horizons, prismatic parting to platy mottles in E.
FAA5	12	30.5	A Bt C	0-8[5] 12-20 37-48	cl-sicl cl cl	~30 33-35 27-28	10YR 3/1 2.5Y 4/2.5 2.5Y 5/3	Abundant shale in parent material; color is 5Y 3/2. Excellent Bt - great thick skins
FAA6	7	7	Ap Bw	0-7 12-20	l l	27-29 27	10YR 2/2 2.5Y 4/3	Silty for Buse
FAA6 AOV1	5	8	Ap Bk2	0-5 14-20	sicl sicl	28 35-36	10YR 2/1 2.5Y 6/4	
FAA6 AOV2	5	8	Ap Bk1	0-5 13-18	sicl sicl	28 34	10YR 2/1 2.5Y 6/4	
FAA7	16	18	Ap Bw	0-8 12-18	sil sicl	26 32	10YR 2/1 10YR 2/1	
FAB1	11	18	Ap Bt	0-8 12-18	cl c	32 44	10YR 3/1 2.5Y 4/2	
FAB2	13	18	Ap Bt	0-8 12-18	sicl cl	20 35	10YR 3/1 10YR 4/2	Great clay skins
FAB2**	10	Surface	Akp Bk1 2C1	0-5[5] 15-20 54-66	sicl sicl cl	29 28 38	10YR 2/1 2.5Y 5/2 2.5Y 5/4	
FAB3	9	12	Ap Bk	0-8 13-20	cl cl	30-32 30	10YR 3/2 2.5Y 5/3	A thin one-cambic is leached, but only 9-12 inches thick
FAB4	10	11	Ap Bk	0-7 12-20	cl l	29 25-27	10YR 3/1 2.5Y 5/4	No gravel. Till past 40 in.
FAB5	9	23.5	Ap Bt	0-8 12-18	sicl cl	28-30 38-42	10YR 2/1 10YR 4/2.5	Possibly natric - abundant salt efflorescences on surface clods
FAB5 AOV1	12	17	Ap Bt	0-8 12-15.5	cl scl	32 28-30	10YR 3/1 10YR 4/2	Variable depth to carbonates. Lots of bioturbation in lower Bt; 2-in. Btk above true Bk
FAB5 AOV2	7	11	Ap Bk	0-8 12-18	cl sil	32 25	10YR 3/1 2.5Y 5/4	Very well-expressed Bky horizon at 17 in.
FAB6	0-13	> 25	Ap E	0-8 13-19	cl sil	38-40 27-28	10YR 3/1 10YR 3/1	

Table A1.2 Sample data (continued)

Site no.[1]	Soil series	Taxadjunct (reason)	Taxonomic class
FAB7	Svea		Fine-loamy, mixed, superactive, frigid Pachic Hapludolls
FAC1	Forman		Fine-loamy, mixed, superactive, frigid Calcic Argiudolls
FAC2	Buse	Lime too high for Forman or Aastad	Fine-loamy, mixed, superactive, frigid Typic Calciudolls
FAC3	Hecla		Sandy, mixed, frigid Oxyaquic Hapludolls
FAC4	Eckman		Coarse-silty, mixed, superactive, frigid Calcic Hapludolls
FAC5	Hecla		Sandy, mixed, frigid Oxyaquic Hapludolls
FAC6	Barnes		Fine-loamy, mixed, superactive, frigid Calcic Hapludolls
FAC7	Barnes		Fine-loamy, mixed, superactive, frigid Calcic Hapludolls
FAD1	Forman		Fine-loamy, mixed, superactive, frigid Calcic Argiudolls
FAD1 AOV1	Forman		Fine-loamy, mixed, superactive, frigid Calcic Argiudolls
FAD1 AOV2	Forman		Fine-loamy, mixed, superactive, frigid Calcic Argiudolls
FAD2	Aastad		Fine-loamy, mixed, superactive, frigid Pachic Argiudolls
FAD3	Hecla		Sandy, mixed, frigid Oxyaquic Hapludolls
FAD4	Hecla		Sandy, mixed, frigid Oxyaquic Hapludolls
FAD5	Embden		Coarse-loamy, mixed, superactive, frigid Pachic Hapludolls
FAD6	Hegne sicl		Fine, smectitic, frigid Typic Calciaquerts
FAD7	Bearden		Fine-silty, mixed, superactive, frigid Aeric Calciaquolls
FAE1	Hecla		Sandy, mixed, frigid Oxyaquic Hapludolls
FAE2	Fordville		Fine-loamy over sandy or sandy-skeletal, mixed, superactive, frigid Pachic Hapludolls
FAE3	Tiffany		Coarse-loamy, mixed, superactive, frigid Typic Endoaquolls
FAE4	Hamar		Sandy, mixed, frigid Typic Endoaquolls
FAE5	LaDelle		Fine-silty, mixed, superactive, frigid Cumulic Hapludolls
FAE6	Hegne variant		Fine, smectitic, frigid Typic Calciaquerts
FAE7	Fargo		Fine, smectitic, frigid Typic Epiaquerts
FAF1	Borup		Coarse-silty, mixed, superactive, frigid Typic Calciaquolls

Table A1.2 Sample data (continued)

Site no.[1]	Depth of mollic (in.)	Depth to CO_3 (in.)	Horizons sampled	Interval sampled (in.)	Texture[2]	% clay[3]	Munsell color[4]	Comments
FAB7	19	24	Ap Bw	0-8 12-19	cl sicl	28-30 30	10YR 2/1 10YR 2/1	Free of rocks and gravels; silty
FAC1	14	14	A Btk	0-8 14-20	cl cl	33-35 35-39	10YR 3/1 10yr 4/2	Lots of biotic activity - good clay skins. Pachic Forman map unit but more Aastad-like
FAC2	11	8	A Bk	0-8 15-20	cl sicl	32-35 33	10YR 2/1 2.5Y 5/3	High biotic activity
FAC3	9	> 25	A Bw	0-83 12-17	fsl fs	8-10 5	10YR 2.5/1 10YR 4/3	Faint mottles at 18-20 in.
FAC4	12	19	Ap Bw	0-8 12-18.5	sicl sil	27-28 26-28	10YR 3/1 2.5Y 4/3	
FAC5	15	46	Ap Bw	0-8 12-20	lfs lfs	5 5	10YR 3/1 10YR 3/2	Redox deeper than normal Hecla. Hecla-Hamar map unit but no Hamar in some adjacent depressions
FAC6	13	15	Ap Bk	0-8 16-20	l sil-l	25 25	10YR 3/1 2.5Y 5/3	
FAC7	13.5	17	Ap Bw	0-8 13.5-17	l sil-l	23 25	10YR 2.5/1 10YR 3.5/2	
FAD1	10	16	Ap Bt	0-8 12-16	cl cl	35 35-40	10YR 3/2 10YR 4/2	Forman-Aastad loams, eroded, undulating
FAD1 AOV1	9	20	Ap Bt	0-8 12-18	cl cl	33-35 35-38	10YR 2/1 10YR 4/3	Lots of biotic activity. Tongues of Ap in Bt horizon
FAD1 AOV2	9	18	Ap Bt	0-8 12-18	cl cl	33-35 35-38	10YR 2/1 10YR 4/3	Lots of biotic activity. Tongues of Ap in Bt horizon
FAD2	9	Surface (plowed) 9 (undisturbed)	Ap Bk	0-8 14-20	sicl sicl	30-32 27-28	10YR 4/2 2.5Y 5/4	
FAD3	8	Surface	A Bw	0-8 8-20	lfs lfs	5-6 3	10YR 3/1 10YR 5/2	
FAD4	18	> 40	A Bw	0-8 12-18	fsl fsl	8-10 8	10YR 3/4 10YR 3/1	Sandy Hecla fsl
FAD5	15	> 40	Ap Bw C	0-8[5] 12-20 36-40	lfs lfs fs	8 8 <1	10YR 2/1 10YR 3/2 10YR 4/3.5	Probably a sandy family rather than coarse-loamy
FAD6	9	Surface	Apk Bk	0-8 12-19	sicl sic	38-42 55	2.5Y 5/1 2.5Y 4/2	Fargo map unit but most holes examined are Hegne. Probably strong effervescence to HCl in Apk when dry
FAD7	13	15	A Bk	0-8 15-20	sic sic	48 45	2.5Y 2.5/1 2.5Y 5/2	Perella-like: distinct mottles below mollic
FAE1	13	Surface	A C	0-8 15-20	lfs fs	6 2-3	10YR 3/1 10YR 5/3	
FAE2	21	26	Ap Bt 2C	0-8[5] 12-18 31-50	scl cl lfs	23-25 30 2	10YR 3/1.5 10YR - 2.5Y 5/3	Strong Bt. 2Bt in clay loam at 18 in. 3C horizon at 31 in.
FAE3	10	10	Ap Bg	0-8 12-20	fsl fs	6-8 1-3	10YR 3/1.5 10YR 4/3	C is effervescent - possible weak BCk horizon
FAE4	16	No carbonates	A Bwg	0-8 12-20	fsl lfs	10-12 5	10YR 2/1 10YR 3/2	
FAE5	17	17	Ap Bw	0-8 12-17	sic sic	45-50 45-50	10YR 3/1 10YR 3/1	
FAE6	13-19	19 (to strong effervescence)	Ap Bw	0-8 13-19	sic sic	45 50	10YR 3/1 2.5Y 2.5/1	Audible effervescence only in Ap; Bw effervescent in parts. True Bk is deeper than 20 in.
FAE7	14	18	Ap Bw1	0-8 14-19	sicl sicl	36-38 32-34	10YR 2/1 10YR 2.5/1	
FAF1	8	Surface	A Bk	0-8 12-20	sil sil	25 24	10YR 3/1 10YR 4/1	

Table A1.2 Sample data (continued)

Site no.[1]	Soil series	Taxadjunct (reason)	Taxonomic class
FAF2	Ryan		Fine, smectitic, frigid Typic Natraquerts
FAF3	Ulen fsl		Sandy, mixed, frigid Aeric Calciaquolls
FAF3 AOV1	Ulen variant		Sandy, mixed, frigid Aeric Calciaquolls
FAF3 AOV2	Hamar		Sandy, mixed, frigid Typic Endoaquolls
FAF4	Hegne		Fine, smectitic, frigid Typic Calciaquerts
FAF5	Overly		Fine-silty, mixed, superactive, frigid Pachic Hapludolls
FAF6	Fargo		Fine, smectitic, frigid Typic Epiaquerts
FAG2	Fargo		Fine, smectitic, frigid Typic Epiaquerts
FAG3	Doran		Fine, smectitic, frigid Aquertic Argiudolls
GFA1	Hamerly		Fine-loamy, mixed, superactive, frigid Aeric Calciaquolls
GFA2	Svea		Fine-loamy, mixed, superactive, frigid Pachic Hapludolls
GFA3	Barnes		Fine-loamy, mixed, superactive, frigid Calcic Hapludolls
GFA4	Svea		Fine-loamy, mixed, superactive, frigid Pachic Hapludolls
GFA5	Buse		Fine-loamy, mixed, superactive, frigid Typic Calciudolls
GFA5*	Hamerly		Fine-loamy, mixed, superactive, frigid Aeric Calciaquolls
GFA6	Buse		Fine-loamy, mixed, superactive, frigid Typic Calciudolls
GFA7	Buse		Fine-loamy, mixed, superactive, frigid Typic Calciudolls
GFB1	Colvin		Fine-silty, mixed, superactive, frigid Typic Calciaquolls
GFB2	Barnes		Fine-loamy, mixed, superactive, frigid Calcic Hapludolls
GFB3	Coe		Sandy-skeletal, mixed, frigid Entic Hapludolls
GFB4	Buse		Fine-loamy, mixed, superactive, frigid Typic Calciudolls
GFB5	Arvilla sandy loam		Sandy, mixed, frigid Calcic Hapludolls
GFB5*	Binford		Sandy, mixed, frigid Typic Hapludolls
GFB6	Bearden		Fine-silty, mixed, superactive, frigid Aeric Calciaquolls
GFB7	Inkster		Coarse-loamy, mixed, superactive, frigid Pachic Hapludolls

Table A1.2 Sample data (continued)

Site no.[1]	Depth of mollic (in.)	Depth to CO_3 (in.)	Horizons sampled	Interval sampled (in.)	Texture[2]	% clay[3]	Munsell color[4]	Comments
FAF2	14	24	Ap Btn	0-8 12-20	sic sic	50 55-60	10YR 2/1 10YR 3/1	
FAF3	12	Surface	Apk Bk1	0-8 12-20	fsl lfs	8-10 5-7	10YR 3/1.5 10YR 4/2	Not a coarse-loamy family
FAF3 AOV1	11	Surface	Ap Bk	0-8 12-20	fsl fsl	12-13 9-11	10YR 3/1 10YR 3/2	Low total $CaCO_3$
FAF3 AOV2	12	Surface	Ap Bk	0-8 12-20	fsl fsl	12-13 9-11	10YR 3/1 10YR 3/2	Distinct redox features below mollic epipedon
FAF4	9	11	Ap Bkg	0-8 14-20	sic sic	40-44 45-47	10YR 3/1 2.5Y 4/2	Strong mottling below mollic-vsf+ silts at 26 in. 2-in. Bwg horizon
FAF5	12-14	14	Ap Bk	0-7 14-20	sicl sicl	38 30	10YR 3/1 10YR 5/2	
FAF6	16.5	23 (slight)	Ap Bw	0-8 12-20	sic sic	48 53	10YR 2/1 2.5Y 3/1	Good Fargo sic
FAG2	20	20	A Bwg	0-8 12-20	sic sic	55 55	10YR 3/1 2.5Y 3/1	
FAG3	12	Surface (slight)	Ap Bw1	0-8 12-20	sic sic	45-47 45	10YR 3/1 10YR 3.5/1	
GFA1	9	Surface	A Bk C	0-8[5] 12-20 30-50	l l l	25 20 20	2.5Y 2.5/1 2.5Y 5/4 2.5Y 4/4	
GFA2	> 24	> 60	A1 A2	0-8 12-20	l fsl	20 16	10YR 2/1 10YR 2/1	Mollic too thick, no calcareous loamy till within 60 in.
GFA3	8	8	Ap Bk	0-8 10-20	l l	28 28	2.5Y 2.5/1 2.5Y 5/4	
GFA4	24	24	A1 A2	0-8 12-20	sil sil	20 20	10YR 2/2 10YR 3/1	
GFA5	8	Surface	Ap Bk	0-8 8-20	l l	28 28	2.5Y 3/2 2.5Y 4/4	Identified in field as Svea-Buse
GFA5*	9	Surface	Ap Bk	0-8 10-20	l l	25 25	2.5Y 2.5/1 2.5Y 4/2	
GFA6	13	Surface	A Bk C	0-13[5] 13-20 28-40	l l cl	16 23 30	10YR 2/1 2.5Y 5/3 2.5Y 4/3	Identified in field as Svea-Buse
GFA7	8	Surface	A Bk	0-8 8-18	l l	15 10	2.5Y 3/2 2.5Y 5/4	
GFB1	12	Surface	Ap Bk	0-8 14-20	sil sil	20 20	2.5Y 2.5/1 2.5Y 5/2	
GFB2	10	18	Ap Bw	0-6 10-16	l l	22 22	2.5Y 2.5/1 2.5Y 3/2	
GFB3	5	5	Ap Bk2	0-5 12-18	ls sl	15 8	10YR 3/1 10YR 4/2	
GFB4	11	Surface	A Bk	0-8 12-20	l ls	20 20	10YR 2/1 10YR 5/3	
GFB5	10	14	A Bk	0-10 14-32	sl s	8 3	2.5Y 3/2 10YR 4/3	
GFB5*	6	Surface	Ap 2Bk2	0-6 11-20	sl grsl	15 10	10YR 3/2 10YR 5/4	
GFB6	11	Surface	Ap Bk	0-11 17-25	sicl sicl	30 20	2.5Y 2.5/1 2.5Y 6/4	
GFB7	12	> 20	Ap Bw	0-8 12-20	sl sl	10 10	10YR 3/2 2.5Y 4/4	

Table A1.2 Sample data (continued)

Site no.[1]	Soil series	Taxadjunct (reason)	Taxonomic class
GFC1	Wyard		Fine-loamy, mixed, superactive, frigid Typic Endoaquolls
GFC2	Hecla		Sandy, mixed, frigid Oxyaquic Hapludolls
GFC3	Emrick		Coarse-loamy, mixed, superactive, frigid Pachic Hapludolls
GFC4	Zell		Coarse-silty, mixed, superactive, frigid Typic Calciudolls
GFC4 AOV1	Glyndon		Coarse-silty, mixed, superactive, frigid Aeric Calciaquolls
GFC4 AOV2	Glyndon		Coarse-silty, mixed, superactive, frigid Aeric Calciaquolls
GFC5	Mantador		Coarse-loamy, mixed, superactive, frigid Aquic Pachic Hapludolls
GFC6	Antler		Fine-loamy, mixed, superactive, frigid Aeric Calciaquolls
GFC7	Antler		Fine-loamy, mixed, superactive, frigid Aeric Calciaquolls
GFD1	Bearden		Fine-silty, mixed, superactive, frigid Aeric Calciaquolls
GFD2	Fargo		Fine, smectitic, frigid Typic Epiaquerts
GFD2 AOV1	Bohnsack		Coarse-silty, mixed, superactive, frigid Aeric Calciaquolls
GFD2 AOV2	Bohnsack		Coarse-silty, mixed, superactive, frigid Aeric Calciaquolls
GFD3	Fargo	Bk horizon	Fine, smectitic, frigid Typic Epiaquerts
GFD4	Mantador		Coarse-loamy, mixed, superactive, frigid Aquic Pachic Hapludolls
GFD5	Arvilla		Sandy, mixed, frigid Calcic Hapludolls
GFD6	Wyndmere		Coarse-loamy, mixed, superactive, frigid Aeric Calciaquolls
GFD7	Ojata		Fine-silty, mixed, superactive, frigid Typic Calciaquolls
GFE1	Bearden		Fine-silty, mixed, superactive, frigid Aeric Calciaquolls
GFE2	Hegne		Fine, smectitic, frigid Typic Calciaquerts
GFE3	Bearden		Fine-silty, mixed, superactive, frigid Aeric Calciaquolls
GFE4	Hamerly		Fine-loamy, mixed, superactive, frigid Aeric Calciaquolls
GFE5	Bearden		Fine-silty, mixed, superactive, frigid Aeric Calciaquolls
GFE6	Overly		Fine-silty, mixed, superactive, frigid Pachic Hapludolls
GFE7	Bearden		Fine-silty, mixed, superactive, frigid Aeric Calciaquolls

Table A1.2 Sample data (continued)

Site no.[1]	Depth of mollic (in.)	Depth to CO_3 (in.)	Horizons sampled	Interval sampled (in.)	Texture[2]	% clay[3]	Munsell color[4]	Comments
GFC1	> 20	> 20	Ap A	0-8 8-20	l l	20 20	2.5Y 2.5/1 2.5Y 2.5/1	
GFC2	10	> 20	Ap Bw	0-8 10-20	lfs lfs	3 3	10YR 2/1 10YR 3/3	
GFC3	10	> 20	A Bw	0-8 14-20	l l	20 20	2.5Y 2.5/1 10YR 3/2	
GFC4	8	Surface	Ap Bk	0-8 10-20	sil sil	20 20	2.5Y 2.5/1 5Y 5/3	
GFC4 AOV1	> 20	Surface	Ap Bk	0-8 10-20	vfsl vfsl	15 15	2.5Y 2.5/1 2.5Y 3/1	Slightly sandier and wetter than Glyndon
GFC4 AOV2	> 20	Surface	Ap Bk	0-8 10-20	vfsl vfsl	15 15	2.5Y 2.5/1 2.5Y 3/1	Slightly sandier and wetter than Glyndon
GFC5	> 20	Surface	A Bk	0-8 10-20	sil-vfsl vfsl	14 16	5Y 2.5/1 2.5Y 3/2	
GFC6	15	9	Ap Bk	0-8 15-20	l l	24 18	2.5Y 2.5/1 2.5Y 3/2	
GFC7	9	Surface	Ap Bk	0-8 12-20	sicl sil	30 21	2.5Y 2.5/1 2.5Y 4/2	
GFD1	13	13	Ap Bk	0-8 13-20	sil sil	23 20	2.5Y 2.5/1 2.5Y 4/2	No carbonates at surface
GFD2	14	18	A Bg	0-8 14-20	c c	50 50	2.5Y 2.5/1 2.5Y 4/2	
GFD2 AOV1	10	Surface	A Bk	0-8 10-20	l l	25 25	2.5Y 2.5/1 2.5Y 4/1	
GFD2 AOV2	10	Surface	A Bk	0-8 10-20	l l	2 25	2.5Y 2.5/1 2.5Y 4/1	
GFD3	10	10	A Bk	0-8 10-20	sic sic	50 50	2.5Y 2.5/1 2.5Y 3/2	
GFD4	12	Surface	Ap Bw C	0-8[5] 10-18 30-55	sil sil lfs	15 15 5	2.5Y 2.5/1 2.5Y 3/2 7.5 YR 3/4 & 5Y 5/3	
GFD5	16	16	A Bk C	0-16[5] 16-20 20-45	sl s s	10 2 1	7.5 YR 2.5/1 10YR 4/3 2.5Y 5/3	
GFD6	9	Surface	Ap Bk	0-9 10-18	sl sl	15 15	2.5Y 2.5/1 10YR 5/1	
GFD7	12	Surface	A Bk	0-8 12-20	sil sil	23 25	2.5Y 2.5/1 2.5Y 4/2	
GFE1	10	10	Ap Bk	0-10 10-20	sil sil	22 20	2.5Y 2.5/1 2.5Y 4/2	Not calcareous to surface
GFE2	10	10	Ap Bk	0-8 10-20	sic sic	50 45	2.5Y 2.5/1 2.5Y 4/2	
GFE3	10	Surface	A Bk	0-8 10-20	sicl sicl	40 40	2.5Y 2.5/1 2.5Y 4/1	
GFE4	8	Surface	Ap Bk2	0-8 13-20	l vfsl	20 14	2.5Y 2.5/1 2.5Y 5/4	
GFE5	10	Surface	Ap Bk2	0-7 12-20	sicl sil	28 24	2.5Y 2.5/1 2.5Y 5/3	
GFE6	16	20	Ap A2	0-8 8-16	sil sil	25 23	2.5Y 2.5/1 2.5Y 2.5/1	
GFE7	9	Surface	Ap Bk	0-8 12-20	sicl sil	30 25	2.5Y 2.5/1 2.5Y 5/3	

Table A1.2 Sample data (continued)

Site no.[1]	Soil series	Taxadjunct (reason)	Taxonomic class
GFF1	Fargo		Fine, smectitic, frigid Typic Epiaquerts
GFF2	Fargo		Fine, smectitic, frigid Typic Epiaquerts
GFF3	Nutley		Fine, smectitic, frigid Chromic Hapluderts
GFF4	Hegne		Fine, smectitic, frigid Typic Calciaquerts
GFF5	Bearden		Fine-silty, mixed, superactive, frigid Aeric Calciaquolls
GNI1	Golva		Fine-silty, mixed, superactive, frigid Typic Haplustolls
GNI2	Lonna		Fine-silty, mixed, superactive, frigid Aridic Haplustepts
GNI4	Maschetah		Fine-silty, mixed, superactive, frigid Typic Calciustolls
JAA1	Zahl		Fine-loamy, mixed, superactive, frigid Typic Calciustolls
JAA2	Appam		Sandy, mixed, frigid Typic Haplustolls
JAA2 AOV1	Lehr		Fine-loamy over sandy or sandy-skeletal, mixed, superactive, frigid Typic Haplustolls
JAA2 AOV2	Lehr		Fine-loamy over sandy or sandy-skeletal, mixed, superactive, frigid Typic Haplustolls
JAA3	Vebar		Coarse-loamy, mixed, superactive, frigid Typic Haplustolls
JAA4	Amor		Fine-loamy, mixed, superactive, frigid Typic Haplustolls
JAA5	Livona		Fine-loamy, mixed, superactive, frigid Typic Argiustolls
JAA6	Fordville		Fine-loamy over sandy or sandy-skeletal, mixed, superactive, frigid Pachic Hapludolls
JAA7	Williams		Fine-loamy, mixed, superactive, frigid Typic Argiustolls
JAB1	Bowbells		Fine-loamy, mixed, superactive, frigid Pachic Argiustolls
JAB2	Farnuf		Fine-loamy, mixed, superactive, frigid Typic Argiustolls
JAB3	Livona		Fine-loamy, mixed, superactive, frigid Typic Argiustolls
JAB4	Zahl		Fine-loamy, mixed, superactive, frigid Typic Calciustolls
JAB5	Williams		Fine-loamy, mixed, superactive, frigid Typic Argiustolls
JAB6	Arvilla		Sandy, mixed, frigid Calcic Hapludolls
JAB7	Arvilla		Sandy, mixed, frigid Calcic Hapludolls
JAC1	Wabek		Sandy-skeletal, mixed, frigid Entic Haplustolls

Table A1.2 Sample data (continued)

Site no.[1]	Depth of mollic (in.)	Depth to CO_3 (in.)	Horizons sampled	Interval sampled (in.)	Texture[2]	% clay[3]	Munsell color[4]	Comments
GFF1	> 20	> 20	Ap Bg	0-8 8-20	sic sic	50 50	2.5Y 2.5/1 2.5Y 2.5/1	
GFF2	> 20	> 20	Ap Bg	0-8 8-20	sic sic	50 50	2.5Y 2.5/1 2.5Y 2.5/1	
GFF3	10	10	A Bss	0-8 12-20	sic sic	40 40	2.5Y 2.5/1 2.5Y 4/2	
GFF4	16	Surface	Ap Ak	0-8 8-16	sic sicl	50 50	2.5Y 2.5/1 2.5Y 2.5/1	
GFF5	16	Surface	A Ak	0-8 8-16	sil sil	20 20	2.5Y 2.5/1 2.5Y 3/1	
GNI1	11	11	Ap Bk	0-6 12-20	sil sil	22 23	10YR 3/2 10YR 4/3	Possible Decon contamination
GNI2	Non-mollic	Surface	Ap & Bw Bk1 C1	0-8[5] 12-20 30-48	sil sil sil	24 22 22	2.5Y 4/3 2.5Y 4/4 2.5Y 5/4	
GNI4	9	4	A & Bw Bk	0-8 9-20+	sicl sicl	29 30	2.5Y 3/3 2.5Y 4/4	
JAA1	9	Surface	Ap Bk	0-8 12-20	cl cl	28 28	10YR 3/2 2.5Y 4/3	
JAA2	10	18	Ap Bw1	0-7 12-18	sl sl	15 12	10YR 2/2 10YR 4/3	
JAA2 AOV1	8	18	Ap 2Bw	0-7 12-18	l l	20 20	10YR 2/2 10YR 4/3	
JAA2 AOV2	8	18	Ap Bw	0-7 12-18	l l	20 22	10YR 2/2 10YR 2/2	
JAA3	12	> 20	Ap Bw	0-7 12-18	fsl fsl	15 18	10YR 2/2 10YR 4/3	
JAA4	10	18	Ap Bw	0-7 12-17	l l	15 23	10YR 2/2 10YR 4/3	
JAA5	6	No carbonates	A Bw	0-6 12-20	fsl fsl	8 9	2.5Y 3/2 2.5Y 4/2	No argillic found
JAA6	18	> 28	A Bw	0-8 12-18	sl sl	15 19	10YR 2/1 10YR 2/2	
JAA7	11	11	A Btk2	0-6 14-20	cl cl	28 32	10YR 2/1 2.5Y 5/3	
JAB1	> 20	> 20	Ap Bt1	0-7 12-16	l cl	23 28	10YR 2/2 10YR 3/2	
JAB2	10	> 20	Ap Bt1	0-7 12-20	sil sicl	24 30	10YR 2/2 10YR 4/3	
JAB3	11	No carbonates	A Bw	0-8 12-20	l fsl	21 14	10YR 2/1 2.5Y 5/4	Coarse-loamy, non-argillic
JAB4	6	Surface	Ap Bk2	0-6 14-19	l cl	26 28	10YR 2/1 2.5Y 5/2	50% carbonate masses in Bk2
JAB5	11	11	A Bk	0-5 12-20	l cl	26 32	10YR 2/1 2.5Y 5/3	
JAB6	16	> 25	Ap Bw	0-7 12-16	sl sl	10 8	10YR 2/2 10YR 3/2	
JAB7	22	> 26	A Bw	0-8 12-20	l l	18 16	10YR 2/1 10YR 2/2	
JAC1	7 (after mixing)	Surface	Ap 2BCk 2C	0-6[5] 14-20 20-40	l vgrcos grcos	20 5 2	10YR 2/2 10YR 4/2 10YR 5/3	

Table A1.2 Sample data (continued)

Site no.[1]	Soil series	Taxadjunct (reason)	Taxonomic class
JAC2	Appam		Sandy, mixed, frigid Typic Haplustolls
JAC3	Bowbells		Fine-loamy, mixed, superactive, frigid Pachic Argiustolls
JAC4	Williams		Fine-loamy, mixed, superactive, frigid Typic Argiustolls
JAC5	Buse		Fine-loamy, mixed, superactive, frigid Typic Calciudolls
JAC6	Bowbells		Fine-loamy, mixed, superactive, frigid Pachic Argiustolls
JAC6 AOV1	Bowbells		Fine-loamy, mixed, superactive, frigid Pachic Argiustolls
JAC6 AOV2	Bowbells		Fine-loamy, mixed, superactive, frigid Pachic Argiustolls
JAC7	Divide		Fine-loamy over sandy or sandy-skeletal, mixed, superactive, frigid Aeric Calciaquolls
JAD1	Williams		Fine-loamy, mixed, superactive, frigid Typic Argiustolls
JAD2	Appam		Sandy, mixed, frigid Typic Haplustolls
JAD3	Max		Fine-loamy, mixed, superactive, frigid Typic Haplustolls
JAD4	Hamerly		Fine-loamy, mixed, superactive, frigid Aeric Calciaquolls
JAD5	Zahl		Fine-loamy, mixed, superactive, frigid Typic Calciustolls
JAD6	Ustic Heimdal		Coarse-loamy, mixed, superactive, frigid Calcic Hapludolls
JAD7	Buse		Fine-loamy, mixed, superactive, frigid Typic Calciudolls
JAE1	Williams		Fine-loamy, mixed, superactive, frigid Typic Argiustolls
JAE2	Williams		Fine-loamy, mixed, superactive, frigid Typic Argiustolls
JAE3	Barnes		Fine-loamy, mixed, superactive, frigid Calcic Hapludolls
JAE3 AOV1	Zahl		Fine-loamy, mixed, superactive, frigid Typic Calciustolls
JAE3 AOV2	Zahl		Fine-loamy, mixed, superactive, frigid Typic Calciustolls
JAE4	Barnes		Fine-loamy, mixed, superactive, frigid Calcic Hapludolls
JAE5	Zahl		Fine-loamy, mixed, superactive, frigid Typic Calciustolls
JAE6	Svea		Fine-loamy, mixed, superactive, frigid Pachic Hapludolls
JAE7	Renshaw		Fine-loamy over sandy or sandy-skeletal, mixed, superactive, frigid Calcic Hapludolls
JAF1	Zahl		Fine-loamy, mixed, superactive, frigid Typic Calciustolls
JAF2	Zahl		Fine-loamy, mixed, superactive, frigid Typic Calciustolls

Table A1.2 Sample data (continued)

Site no.[1]	Depth of mollic (in.)	Depth to CO_3 (in.)	Horizons sampled	Interval sampled (in.)	Texture[2]	% clay[3]	Munsell color[4]	Comments
JAC2	14	14	Ap 2Bk	0-7 14-20	sl grsl	15 10	10YR 2/2 10YR 5/2	
JAC3	> 20	> 20	A Bt1	0-8 12-28	l cl	24 30	10YR 2/2 2.5Y 3/2	
JAC4	9	20	A2 Bt2	2-8 12-20	cl cl	27 32	10YR 2/1 10YR 5/3	Highly compacted relict plow layer. May have slight sodium effect (some prismatic-like structure), but not natric
JAC5	7	Surface	Ap Bk2	1-7 12-20	l cl	26 28	10YR 2/1 2.5Y 5/3	
JAC6	22	22	A Bt	0-8 14-20	l cl	24 27	10YR 2/1 10YR 3/2	
JAC6 AOV1	20	20	A Bt	0-8 14-20	l cl	24 27	10YR 2/1 10YR 3/2	
JAC6 AOV2	20	20	A Bt	0-8 14-20	l cl	27 27	10YR 2/1 10YR 3/2	
JAC7	17	Surface	Ap ABk	0-5 12-17	l cl	22 30	10YR 2/1 10YR 2/2	
JAD1	7	14	A & Bt Bk	0-8 14-20	l cl	26 32	10YR 3/2 2.5Y 5/3	
JAD2	12	17 (variable)	A Bw	0-8 12-19	sl sl	16 13	10YR 3/2 10YR 5/3	
JAD3	5	11	A & Bw Bk	0-8 12-20	l l	20 22	10YR 3/2 2.5Y 5/3	
JAD4	10	Surface	A & ABk Bk1	0-8 12-19	l l	20 22	10YR 3/1 10YR 4/2	
JAD5	8	Surface	A Bk	0-8 12-20	l cl	26 30	2.5Y 3/2 2.5Y 5/3	
JAD6	19	26	Ap Bw	0-8 12-19	l l	15 15	10YR 2/1 10YR 4/2	
JAD7	6	Surface	A Bk C	0-6[5] 12-20 25-48	l cl cl	27 34 34	10YR 3/1 2.5Y 5/3 5Y 4/3	
JAE1	1	11	Ap Btk	0-7 12-20	l cl	24 30	10YR 3/1 2.5Y 5/3	
JAE2	7	14	Ap Bk	0-7 14-20	l l	21 26	10YR 3/1 2.5Y 5/3	
JAE3	11	14	A Bk	0-8 15-20	l l	20 20	10YR 2/1 2.5Y 5/3	
JAE3 AOV1	7	5	A & ABk Bk	0-8 12-20	l l	21 23	10YR 3/2 2.5Y 4/3	
JAE3 AOV2	7	7	A & ABk Bk2	0-8 14-20	l l	20 22	10YR 3/1 2.5Y 5/3	10YR 3/1 chroma not allowed for Zahl
JAE4	7	10	A & B Bk	0-8 13-20	l l	20 22	10YR 2/1 2.5Y 5/3	
JAE5	6	Surface	Ap Bk	0-6 12-20	l cl	27 32	10YR 3/1 2.5Y 4/3	
JAE6	24	> 30	Ap A2	0-8 12-17	sil sil	23 25	10YR 2/1 10YR 2/1	
JAE7	15	10	A Bk	0-8 12-20	l l	20 20	10YR 2/1 10YR 3/2	
JAF1	5	2	A & Bk1 Bk2	0-8 12-20	l l	21 24	10YR 3/2 2.5Y 5/3	
JAF2	5	2	A & Bk1 Bk2	0-8 12-20	l l	21 25	10YR 3/2 2.5Y 5/3	

Table A1.2 Sample data (continued)

Site no.[1]	Soil series	Taxadjunct (reason)	Taxonomic class
JAF3	Barnes		Fine-loamy, mixed, superactive, frigid Calcic Hapludolls
JAF4	Buse		Fine-loamy, mixed, superactive, frigid Typic Calciudolls
JAF5	Barnes		Fine-loamy, mixed, superactive, frigid Calcic Hapludolls
JAF6	Barnes		Fine-loamy, mixed, superactive, frigid Calcic Hapludolls
JAF7	Barnes		Fine-loamy, mixed, superactive, frigid Calcic Hapludolls
JAG1	Cavour		Fine, smectitic, frigid Calcic Natrudolls
JAG2	Buse		Fine-loamy, mixed, superactive, frigid Typic Calciudolls
JAG3	Svea		Fine-loamy, mixed, superactive, frigid Pachic Hapludolls
JAG4	Barnes		Fine-loamy, mixed, superactive, frigid Calcic Hapludolls
JAG5	Barnes		Fine-loamy, mixed, superactive, frigid Calcic Hapludolls
JAG6	La Prairie		Fine-loamy, mixed, superactive, frigid Cumulic Hapludolls
JAG7	Fordville		Fine-loamy over sandy or sandy-skeletal, mixed, superactive, frigid Pachic Hapludolls
JAH1	Svea		Fine-loamy, mixed, superactive, frigid Pachic Hapludolls
JAH2	Swenoda		Coarse-loamy, mixed, superactive, frigid Pachic Hapludolls
JAH3	Barnes		Fine-loamy, mixed, superactive, frigid Calcic Hapludolls
JAH4	Hamerly		Fine-loamy, mixed, superactive, frigid Aeric Calciaquolls
JAH5	Svea		Fine-loamy, mixed, superactive, frigid Pachic Hapludolls
JAH6	Svea		Fine-loamy, mixed, superactive, frigid Pachic Hapludolls
JAH7	Barnes		Fine-loamy, mixed, superactive, frigid Calcic Hapludolls
JAI1	Tiffany		Coarse-loamy, mixed, superactive, frigid Typic Endoaquolls
JAI2	Barnes		Fine-loamy, mixed, superactive, frigid Calcic Hapludolls
JAI3	Svea		Fine-loamy, mixed, superactive, frigid Pachic Hapludolls
JAI4	Barnes		Fine-loamy, mixed, superactive, frigid Calcic Hapludolls
JAI5	Tonka		Fine, smectitic, frigid Argiaquic Argialbolls
JAI6	Buse		Fine-loamy, mixed, superactive, frigid Typic Calciudolls

Table A1.2 Sample data (continued)

Site no.[1]	Depth of mollic (in.)	Depth to CO_3 (in.)	Horizons sampled	Interval sampled (in.)	Texture[2]	% clay[3]	Munsell color[4]	Comments
JAF3	9	19	Ap Bw	0-7 12-18	l cl	25 29	10YR 2/1 10YR 4/2	
JAF4	6	8	Ap Bk2	0-5 12-20	l cl	25 27	10YR 3/1 2.5Y 5/3	
JAF5	11	15	Ap Bk	0-7 15-20	l cl	26 32	10YR 2/1 2.5Y 4/3	
JAF6	15	15	A Bk	0-6 15-20	l l	25 25	10YR 2/1 2.5Y 4/3	
JAF7	15	15	Ap Bw	0-8 12-16	l cl	23 28	10YR 2/1 10YR 2/2	
JAG1	17	> 20	Ap Btn	0-6 12-17	cl c	29 41	10YR 2/1 2.5Y 3/2	
JAG2	7	5	Ap Bk1	0-7 12-20	l cl	25 27	10YR 3/1 2.5Y 5/3	
JAG3	17	17	Ap Bw	0-7 12-17	l l	23 25	10YR 2/1 10YR 3/2	
JAG4	8	14	Ap Bk	0-6 14-20	l cl	25 28	10YR 3/1 2.5Y 5/3	
JAG5	12	18	Ap Bw2	0-8 12-18	l cl	27 35	10YR 2/1 2.5Y 4/3	
JAG6	29	> 36	Ap Bw	0-8 16-20	l l	23 21	10YR 2/1 10YR 2/2	
JAG7	21	> 25	A Bw	0-8 12-18	l l	22 26	10YR 2/1 10YR 2/2	
JAH1	> 20	> 20	A Bw	0-8 12-20	l l	22 22	10YR 2/1 10YR 3/2	
JAH2	22	37	Ap Bw	0-7 12-20	l sl	18 16	10YR 2/1 10YR 3/2	
JAH3	7	11	Ap Bk	0-7 12-20	cl cl	28 29	10YR 3/1 2.5Y 5/3	
JAH4	8	Surface	Ap Bk1 BCk	0-7[5] 12-20 32-39	l l l	21 24 22	10YR 2/1 2.5Y 5/3 2.5Y 4/4	
JAH5	19	25	A Bw2	0-8 15-19	l l	24 27	10YR 2/1 10YR 2/2	
JAH6	23	30	Ap Bw1	0-8 12-19	l l	22 24	10YR 2/1 10YR 3/1	
JAH7	12	12	A Bk	0-8 13-20	l l	26 26	10YR 2/1 2.5Y 6/3	
JAI1	22	> 22	Ap A	0-8 15-20	fsl fsl	16 14	10YR 2/1 10YR 3/2	
JAI2	9	13	Ap Bk1	0-7 13-20	cl cl	30 32	10YR 3/1 2.5Y 5/4	
JAI3	22	24	A Bw	0-8 14-20	l cl	26 29	10YR 2/1 10YR 3/2	
JAI4	9	15	Ap Bk1 BCk	0-7[5] 15-20 37-51	l l l	22 21 22	10YR 3/1 2.5Y 5/3 2.5Y 5/4	
JAI5	13	> 24	Ap E	0-8 13-18	sil sil	20 20	10YR 2/1 2.5Y 3/2	
JAI6	10	Surface	Ap Bk C	0-8[5] 14-20 36-56	l l l	22 26 27	10YR 2/1 2.5Y 5/3 2.5Y 4/3	

Table A1.2 Sample data (continued)

Site no.[1]	Soil series	Taxadjunct (reason)	Taxonomic class
JAI7	Buse		Fine-loamy, mixed, superactive, frigid Typic Calciudolls
LMC7	Amor		Fine-loamy, mixed, superactive, frigid Typic Haplustolls
LME7	Chama		Fine-silty, mixed, superactive, frigid Typic Calciustolls
LME7 AOV1	Sen		Fine-silty, mixed, superactive, frigid Typic Haplustolls
LME7 AOV2	Sen		Fine-silty, mixed, superactive, frigid Typic Haplustolls
LMG7	Beisigl		Mixed, frigid Typic Ustipsamments
LMH7	Arnegard		Fine-loamy, mixed, superactive, frigid Pachic Haplustolls
M2I1	Dilts		Clayey, smectitic, acid, frigid, shallow Aridic Ustorthents
M2I2	Korchea		Fine-loamy, mixed, superactive, calcareous, frigid Mollic Ustifluvents
M2I6	Grassna		Fine-silty, mixed, superactive, frigid Pachic Haplustolls
MBB7	Peever		Fine, smectitic, frigid Vertic Argiudolls
MBC7	Forman		Fine-loamy, mixed, superactive, frigid Calcic Argiudolls
MBE7	Aastad		Fine-loamy, mixed, superactive, frigid Pachic Argiudolls
MBF7	Embden	Slightly sandy from 30-40 in.	Coarse-loamy, mixed, superactive, frigid Pachic Hapludolls
MIA1	Williams		Fine-loamy, mixed, superactive, frigid Typic Argiustolls
MIA2	Williams		Fine-loamy, mixed, superactive, frigid Typic Argiustolls
MIA3	Wabek		Sandy-skeletal, mixed, frigid Entic Haplustolls
MIA4	Williams		Fine-loamy, mixed, superactive, frigid Typic Argiustolls
MIA5	Barnes		Fine-loamy, mixed, superactive, frigid Calcic Hapludolls
MIA6	Hamerly		Fine-loamy, mixed, superactive, frigid Aeric Calciaquolls
MIA7	Cresbard		Fine, smectitic, frigid Glossic Natrudolls
MIB1	Zahl		Fine-loamy, mixed, superactive, frigid Typic Calciustolls
MIB2	Max		Fine-loamy, mixed, superactive, frigid Typic Haplustolls
MIB3	Bowbells	Calcareous Bt	Fine-loamy, mixed, superactive, frigid Pachic Argiustolls

Table A1.2 Sample data (continued)

Site no.[1]	Depth of mollic (in.)	Depth to CO_3 (in.)	Horizons sampled	Interval sampled (in.)	Texture[2]	% clay[3]	Munsell color[4]	Comments
JAI7	10	Surface	Ap Bk	0-10 12-20	l l	26 26	10YR 3/1 2.5Y 5/3	
LMC7	15	17	Ap Bw	0-8 12-16	l l	15 17	10YR 3/2 10YR 3/3	
LME7	10	Surface	Ap Bw2	0-6 13-20	sil sil	18 22	10YR 3/2 2.5Y 4/3	
LME7 AOV1	14	16	Ap Bk	0-8 16-20	sil sil	18 23	10YR 3/2 2.5Y 4/4	
LME7 AOV2	14	16	Ap Bw	0-8 16-20	sil sil	18 23	10YR 3/2 2.5Y 4/4	
LMG7	1	Surface	Ap B	0-8 12-20	lfs lfs	4 4	10YR 4/3 10YR 4/3	
LMH7	18	21	Ap Bw1	0-7 12-18	l l	26 26	10YR 2/2 10YR 3/2	
M2I1	7	> 20	A & C Cr	0-7 12-20	sic sic	42 48	10YR 3/2 10YR 3/2	Mollic colors and less than 50% clay
M2I2	17	7	Ap C1 C3	0-7[5] 12-17 26-40	sicl sicl cl	38 38 33	2.5Y 3/2 2.5Y 3/3 2.5Y 4/2	
M2I6	19	19	Ap Bw2	0-6 12-19	sil sil	20 22	10YR 3/2 2.5Y 3/3	
MBB7	16	22	Ap Bt1 2Bky	0-4[5] 9-16 56-67	sicl c cl	32 42 38	10YR 2/1 10YR 2/1 10YR 5/3	Sampled with S04ND081001 (Peever) NSSL characterization
MBC7	13	13	Ap Bk	0-8 13-20	cl sicl	35 30	10YR 3/1 10YR 4/2	Not an Overly. Good Bt above Bk
MBE7	> 20	> 33	Ap Bw	0-8 12-20	sil sil	26 26-28	10YR 2/1 10YR 3/2	Bt gets better below 20 in. Clay skin at 30 in.
MBF7	19	Surface	Ap Bw C	0-8[5] 12-18 30-40	fsl fsl fs	8-10 6-8 2	10YR 2.5/1 10YR 3/2 10YR 4/3	
MIA1	11	11	A Bk	0-8 12-18	l cl	25 28	10YR 2/2 10YR 5/2	
MIA2	13	13	A Bk BCk	0-8[5] 13-20 30-60	l cl cl	26 30 30	10YR 2/2 2.5Y 5/2 2.5Y 6/2	
MIA3	7	Surface	Ap Bk 2C	0-65 12-18 24-48	l l grsl	20 25 15	10YR 3/2 10YR 3/2 10YR 5/4	Parent is more likely glaciofluvial sand and gravel (esker) according to Ward County geologic map (Bluemle, 1989)
MIA4	7	12	Ap Bk	0-6 12-20	cl cl	28 30	10YR 2/2 2.5Y 4/3	
MIA5	8	> 20	Ap Bt	0-8 12-17	l cl	24 29	10YR 2/2 10YR 4/3	Has good argillic - not sodic (Williams-like)
MIA6	14	Surface	Ap Bk2	0-7 15-20	l l	24 24	10YR 2/2 2.5Y 5/3	
MIA7	16	22	Ap Bt	0-7 16-20	l cl	25 35	10YR 2/1 2.5Y 4/2	
MIB1	7	Surface	Ap Bk	0-7 12-20	cl cl	28 30	2.5Y 3/2 2.5Y 5/3	
MIB2	10	10	A Bk	0-8 12-20	l l	22 26	10YR 2/2 2.5Y 4/4	
MIB3	18	10	Ap Btk	0-7 12-18	l cl	24 29	10YR 2/2 2.5Y 3/3	

Table A1.2 Sample data (continued)

Site no.[1]	Soil series	Taxadjunct (reason)	Taxonomic class
MIB4	Williams		Fine-loamy, mixed, superactive, frigid Typic Argiustolls
MIB5	Tonka		Fine, smectitic, frigid Argiaquic Argialbolls
MIB6	Hamerly		Fine-loamy, mixed, superactive, frigid Aeric Calciaquolls
MIB7	Tiffany		Coarse-loamy, mixed, superactive, frigid Typic Endoaquolls
MIC1	Williams		Fine-loamy, mixed, superactive, frigid Typic Argiustolls
MIC2	Williams		Fine-loamy, mixed, superactive, frigid Typic Argiustolls
MIC3	Barnes		Fine-loamy, mixed, superactive, frigid Calcic Hapludolls
MIC3 AOV1	Barnes		Fine-loamy, mixed, superactive, frigid Calcic Hapludolls
MIC3 AOV2	Barnes		Fine-loamy, mixed, superactive, frigid Calcic Hapludolls
MIC4	Barnes		Fine-loamy, mixed, superactive, frigid Calcic Hapludolls
MIC5	Wyard		Fine-loamy, mixed, superactive, frigid Typic Endoaquolls
MIC6	Sioux	Over till at 24 in.	Sandy-skeletal, mixed, frigid Entic Hapludolls
MIC7	Balaton		Fine-loamy, mixed, superactive, frigid Aquic Calciudolls
MID1	Hamerly		Fine-loamy, mixed, superactive, frigid Aeric Calciaquolls
MID2	Barnes		Fine-loamy, mixed, superactive, frigid Calcic Hapludolls
MID3	Balaton		Fine-loamy, mixed, superactive, frigid Aquic Calciudolls
MID4	Hamerly		Fine-loamy, mixed, superactive, frigid Aeric Calciaquolls
MID4 AOV1	Hamerly		Fine-loamy, mixed, superactive, frigid Aeric Calciaquolls
MID4 AOV2	Hamerly		Fine-loamy, mixed, superactive, frigid Aeric Calciaquolls
MID5	Hecla		Sandy, mixed, frigid Oxyaquic Hapludolls
MID6M	Svea		Fine-loamy, mixed, superactive, frigid Pachic Hapludolls
MID7	Hamerly		Fine-loamy, mixed, superactive, frigid Aeric Calciaquolls
MID7 AOV1	Wyndmere		Coarse-loamy, mixed, superactive, frigid Aeric Calciaquolls
MID7 AOV2	Wyndmere		Coarse-loamy, mixed, superactive, frigid Aeric Calciaquolls
MIE1	Overly		Fine-silty, mixed, superactive, frigid Pachic Hapludolls
MIE2	Karlsruhe		Sandy, mixed, frigid Aeric Calciaquolls

Table A1.2 Sample data (continued)

Site no.[1]	Depth of mollic (in.)	Depth to CO_3 (in.)	Horizons sampled	Interval sampled (in.)	Texture[2]	% clay[3]	Munsell color[4]	Comments
MIB4	10	10	Ap Bk	0-7 12-20	cl cl	27 30	10YR 2/2 2.5Y 4/4	
MIB5	> 20	> 20	Ap E	0-7 12-18	l sil	26 23	10YR 2/1 10YR 3/2	
MIB6	5	Surface	Ap Bk2	0-5 12-20	cl cl	30 30	10YR 2/2 2.5Y 5/3	
MIB7	> 20	> 20	Ap Bw	0-8 16-20	fsl fsl	15 12	10YR 2/1 10YR 3/2	
MIC1	13	13	Ap Bk	0-6 13-20	l cl	24 28	10YR 2/2 2.5Y 4/4	
MIC2	13	13	Ap Bk	0-7 13-20	l cl	26 29	10YR 2/2 2.5Y 4/3	
MIC3	14	14	Ap Bk	0-6 14-20	l l	23 25	10YR 2/2 2.5Y 4/2	Argillic
MIC3 AOV1	12	12	Ap Bk	0-6 12-20	l l	23 25	10YR 2/2 2.5Y 4/2	
MIC3 AOV2	14	14	Ap Bk	0-6 14-20	l l	23 25	10YR 2/2 2.5Y 4/2	
MIC4	10	10	Ap Bk	0-7 12-20	l cl	24 27	10YR 2/1 2.5Y 4/3	
MIC5	14	14	Ap Bk1	0-6 14-20	l cl	24 28	10YR 2/1 2.5Y 4/3	Not Hamerly. Distinct Bw
MIC6	5	12	Ap C1	0-5 12-20	l grls	23 5	10YR 2/2 10YR 4/4	
MIC7	5	Surface	Ap Bk1	0-5 12-20	l cl	25 28	10YR 2/2 2.5Y 4/3	
MID1	7	7	Ap Bk	0-7 12-20	l cl	23 28	10YR 3/2 2.5Y 4/3	
MID2	14	18	A Bt	0-8 12-18	l cl	24 28	10YR 2/1 10YR 3/2	Argillic horizon
MID3	7	Surface	Ap Bk	0-7 12-20	l cl	24 27	10YR 3/2 2.5Y 5/2	
MID4	7	Surface	Ap Bk	0-6 12-20	l cl	24 27	10YR 2/2 2.5Y 4/3	
MID4 AOV1	12	Surface	Ap ABk	0-7 12-20	l l	24 22	10YR 2/1 2.5Y 3/3	
MID4 AOV2	10	Surface	Ap Bk	0-7 12-20	l l	24 22	10YR 2/1 2.5Y 3/2	
MID5	> 20	> 20	Ap Bw	0-8 16-20	fsl lfs	15 10	10YR 2/1 10YR 3/2	
MID6M	> 20	> 20	Ap Bw	0-7 16-20	l l	25 27	10YR 2/1 10YR 2/2	
MID7	13	6	Ap Bk2	0-6 14-20	l l	22 22	10YR 2/2 2.5Y 4/3	
MID7 AOV1	8	Surface	Ap Bk	0-6 12-20	scl scl	22 22	10YR 2/1 2.5Y 4/3	Over till
MID7 AOV2	10	Surface	Ap Bk	0-6 12-20	scl scl	22 22	10YR 2/1 2.5Y 4/3	Over till
MIE1	> 20	> 20	Ap Bw	0-7 12-20	sicl sicl	27 30	10YR 2/3 10YR 3/3	
MIE2	7	13	Ap Bk	0-7 13-20	cosl lvcos	15 3	10YR 2/1 10YR 5/3	

Table A1.2 Sample data (continued)

Site no.[1]	Soil series	Taxadjunct (reason)	Taxonomic class
MIE3	Emrick		Coarse-loamy, mixed, superactive, frigid Pachic Hapludolls
MIE4	Karlsruhe		Sandy, mixed, frigid Aeric Calciaquolls
MIE5	Glyndon		Coarse-silty, mixed, superactive, frigid Aeric Calciaquolls
MIE6	Hamerly		Fine-loamy, mixed, superactive, frigid Aeric Calciaquolls
MIE7	Renshaw		Fine-loamy over sandy or sandy-skeletal, mixed, superactive, frigid Calcic Hapludolls
MIF1	Letcher		Coarse-loamy, mixed, superactive, frigid Calcic Natrudolls
MIF2	Lohnes		Sandy, mixed, frigid Entic Hapludolls
MIF3	Serden		Mixed, frigid Typic Udipsamments
MIF4	Aylmer		Mixed, frigid Aquic Udipsamments
MIF5	Wyndmere		Coarse-loamy, mixed, superactive, frigid Aeric Calciaquolls
MIF6	Overly		Fine-silty, mixed, superactive, frigid Pachic Hapludolls
MIF6*	Barnes		Fine-loamy, mixed, superactive, frigid Calcic Hapludolls
MIF7	Svea		Fine-loamy, mixed, superactive, frigid Pachic Hapludolls
MIG1	Aylmer		Mixed, frigid Aquic Udipsamments
MIG2	Lohnes		Sandy, mixed, frigid Entic Hapludolls
MIG2 AOV1	Lohnes		Sandy, mixed, frigid Entic Hapludolls
MIG2 AOV2	Lohnes		Sandy, mixed, frigid Entic Hapludolls
MIG3	Karlsruhe		Sandy, mixed, frigid Aeric Calciaquolls
MIG4	Alymer		Mixed, frigid Aquic Udipsamments
MIG5	Glyndon		Coarse-silty, mixed, superactive, frigid Aeric Calciaquolls
MIG6	Barnes		Fine-loamy, mixed, superactive, frigid Calcic Hapludolls
MIG7	Bottineau		Fine-loamy, mixed, superactive, frigid Alfic Argiudolls
MIH1	Hecla		Sandy, mixed, frigid Oxyaquic Hapludolls
MIH2	Maddock		Sandy, mixed, frigid Entic Hapludolls

Table A1.2 Sample data (continued)

Site no.[1]	Depth of mollic (in.)	Depth to CO_3 (in.)	Horizons sampled	Interval sampled (in.)	Texture[2]	% clay[3]	Munsell color[4]	Comments
MIE3	16	16	Ap Bk	0-7 16-20	l fsl	22 17	10YR 2/1 2.5Y 4/3	
MIE4	7	Surface	Ap Bk	0-7 12-20	cosl cosl	15 12	10YR 2/2 10YR 5/2	
MIE5	14	14	Ap Bk1	0-7 14-20	sil sil	18 18	10YR 2/1 2.5Y 5/3	
MIE6	14	14	Ap Bk	0-7 14-20	l grcl	23 28	10YR 2/1 2.5Y 4/3	Many shale fragments
MIE7	6	14	Ap B	0-6 8-14	l l	23 23	10YR 2/1 10YR 3/3	
MIF1	18	> 20	Ap Btn	0-7 12-18	fsl fsl	15 18	10YR 2/1 10YR 2/2	
MIF2	10	> 55	A AC C	0-8[5] 12-18 24-55	lcos lcos cosl	5 3 2	10YR 2/2 10YR 3/2 10YR 5/3	
MIF3	Non mollic	> 20	A/AC C	0-8 12-20	lfs fs	3 1	10YR 4/2 10YR 5/3	3 in. mollic colors
MIF4	11	> 20	A C1	0-8 12-20	lfs lfs	8 7	10YR 2/1 10YR 4/3	
MIF5	16	12	A Bk C	0-8[5] 16-20 36-60	fsl fsl sl	17 15 20	10YR 2/2 2.5Y 4/3 2.5Y 5/3	
MIF6	17	17	Ap Bk	0-6 17-20	sicl sicl	30 30	10YR 2/1 2.5Y 4/2	
MIF6*	12	12	Ap Bk 2C	0-6[5] 16-20 36-48	l l cl	25 27 33	10YR 2/1 2.5Y 5/3 2.5Y 4/2	May be moderately well-drained, similar to Hokans series. 1-in. layer on surface is calcareous
MIF7	24	36	A Bw C	0-8[5] 14-20 36-60	l l cl	22 22 30	10YR 2/1 10YR 2/2 2.5Y 5/3	
MIG1	6	> 20	A C	2-6 15-20	ls s	2 0	10YR 3/1 10YR 4/2	
MIG2	12	> 20	A Bw	0-6 15-20	lcos lcos	5 4	10YR 3/2 10YR 3/3	
MIG2 AOV1	10	> 20	A Bw	2-6 14-18	lcos lcos	5 4	10YR 2/2 10YR 3/2	
MIG2 AOV2	10	> 20	A Bw	2-6 14-18	lcos lcos	5 4	10YR 2/2 10YR 3/2	
MIG3	10	Surface	A Bk	0-8 14-20	cosl lcos	15 5	10YR 3/1 10YR 3/3	
MIG4	6	> 20	A C	2-6 12-20	lfs fs	2 0	10YR 3/1 10YR 5/3	
MIG5	7	Surface	Ap Bk	2-8 14-20	vfsl vfsl	17 17	10YR 2/1 10YR 5/2	
MIG6	8	18	Ap Bw	0-8 12-20	l cl	20 20	10YR 2/1 10YR 4/3	
MIG7	8	14	A Bk	2-6 14-20	l l	25 25	10YR 2/1 2.5Y 4/2	
MIH1	14	> 20	Ap Bw	4-8 15-20	lfs lfs	5 5	10YR 2/1 10YR 4/3	
MIH2	13	> 20	Ap Bw	4-8 15-20	lfs lfs	5 5	10YR 2/2 10YR 3/3	

Table A1.2 Sample data (continued)

Site no.[1]	Soil series	Taxadjunct (reason)	Taxonomic class
MIH3	Gardena		Coarse-silty, mixed, superactive, frigid Pachic Hapludolls
MIH4	Emrick		Coarse-loamy, mixed, superactive, frigid Pachic Hapludolls
MIH5	Overly		Fine-silty, mixed, superactive, frigid Pachic Hapludolls
MIH6	Embden		Coarse-loamy, mixed, superactive, frigid Pachic Hapludolls
MIH6*	Buse		Fine-loamy, mixed, superactive, frigid Typic Calciudolls
MIH6**	Letcher		Coarse-loamy, mixed, superactive, frigid Calcic Natrudolls
MIH7	Rolla		Very-fine, smectitic, frigid Vertic Hapludalfs
MTB7	Parshall		Coarse-loamy, mixed, superactive, frigid Pachic Haplustolls
MTE7	Belfield (moderately deep)		Fine, smectitic, frigid Glossic Natrustolls
MTG7	Wilton		Fine-silty, mixed, superactive, frigid Pachic Haplustolls
MYA1	Zahl		Fine-loamy, mixed, superactive, frigid Typic Calciustolls
MYA2	Williams		Fine-loamy, mixed, superactive, frigid Typic Argiustolls
MYA3	Zahl		Fine-loamy, mixed, superactive, frigid Typic Calciustolls
MYA4	Temvik		Fine-silty, mixed, superactive, frigid Typic Haplustolls
MYA5	Bowbells		Fine-loamy, mixed, superactive, frigid Pachic Argiustolls
MYA6	Williams		Fine-loamy, mixed, superactive, frigid Typic Argiustolls
MYA7	Williams		Fine-loamy, mixed, superactive, frigid Typic Argiustolls
MYB1	Williams		Fine-loamy, mixed, superactive, frigid Typic Argiustolls
MYB2	Shambo		Fine-loamy, mixed, superactive, frigid Typic Haplustolls
MYB3	Tonka		Fine, smectitic, frigid Argiaquic Argialbolls
MYB4	Temvik		Fine-silty, mixed, superactive, frigid Typic Haplustolls
MYB5	Bowbells		Fine-loamy, mixed, superactive, frigid Pachic Argiustolls
MYB6	Bowbells		Fine-loamy, mixed, superactive, frigid Pachic Argiustolls
MYB7	Vida		Fine-loamy, mixed, superactive, frigid Typic Argiustolls
MYC1	Arnegard		Fine-loamy, mixed, superactive, frigid Pachic Haplustolls

Table A1.2 Sample data (continued)

Site no.[1]	Depth of mollic (in.)	Depth to CO_3 (in.)	Horizons sampled	Interval sampled (in.)	Texture[2]	% clay[3]	Munsell color[4]	Comments
MIH3	20	20	Ap Bw 2BCk	0-6[5] 14-20 36-48	sil sil sicl	17 17 28	10YR 2/1 10YR 3/2 2.5Y 4/2	Substratum sicl
MIH4	18	> 20	A ABk	4-8 14-18	fsl fsl	14 14	10YR 2/1 10YR 3/2	Texture class is coarse-loamy but soil contains high concentration of fine sand. Thick mollic
MIH5	16	20	Ap Bw	0-8 12-18	sicl sicl	25 27	10YR 2/1 10YR 3/2-4/2	Thin mollic; < 16 in. in places. Some Bearden also present
MIH6	48	34	Ap Bw2	0-5 14-20	sl sl	14 12	2.5Y 2.5/1 10YR 3/1	Cumulic
MIH6*	7	8	A Bk	2-8 12-20	l l	20 20	10YR 2/2 2.5Y 4/2	
MIH6**	14	14	Ap Bk 2C	0-5[5] 14-20 20-55	cl scl vgrlcos	30 32 5	10YR 2/1 2.5Y 7/2 2.5Y 5/3	
MIH7	4	20	A Bt	2-8 12-20	sil sic	24 40	10YR 2/1 2.5Y 4/3	sil surface
MTB7	17	> 40	Ap Bw	0-8 12-17	fsl fsl	10 10	10YR 3/2 10YR 3/3	
MTE7	19	19	Ap Bt	0-6 12-19	l cl	24 36	10YR 2/2 10YR 3/2	
MTG7	20	18	Ap Bw	0-7 12-18	sil sil	20 22	10YR 2/2 10YR 3/2	
MYA1	6	Surface	Ap Bk	0-7 12-20	l l	24 27	10YR 4/1 2.5Y 5/3	
MYA2	16	18	A Bt C	0-8[5] 12-17 36-50	fsl l c	17 28 25	10YR 2/2 10YR 3/2 10YR 4/3	
MYA3	6	Surface	A Bk	0-5 12-16	l l	25 25	10YR 4/1 2.5Y 5/3	
MYA4	12	19	Ap Bw	0-7 12-19	sil sil	23 23	10YR 2/2 10YR 4/3	
MYA5	18	18	A Bt	0-8 12-17	l cl	25 30	10YR 2/2 10YR 3/2	
MYA6	12	13	A Bk	0-8 14-20	l l	24 26	10YR 2/2 2.5Y 4/4	
MYA7	12	13	A Bk	0-8 13-20	l l	24 27	10YR 2/2 2.5Y 4/3	
MYB1	9	18	Ap Bt	0-7 12-17	l cl	24 29	10YR 2/1 10YR 4/3	
MYB2	12	17	Ap Bw	0-7 12-17	l l	23 24	10YR 2/3 10YR 4/4	
MYB3	24	> 28	Ap A	0-7 16-20	l sicl	24 26	10YR 2/1 10YR 2/1	
MYB4	6	20	Ap Bw	0-6 12-17	sil sil	24 24	10YR 2/2 10YR 4/4	
MYB5	17	20	Ap Bt	0-8 12-17	l cl	25 30	10YR 2/2 10YR 3/2	
MYB6	18	16	A Bt	0-8 12-15	l cl	24 28	10YR 2/2 10YR 2/2	
MYB7	6	9	Bt Bk	2-8 12-20	l l	28 25	10YR 3/2 2.5Y 4/4	
MYC1	22	25	A Bw1	0-8 12-20	l l	26 27	10YR 2/1 10YR 2/2	

Table A1.2 Sample data (continued)

Site no.[1]	Soil series	Taxadjunct (reason)	Taxonomic class
MYC2	Williams		Fine-loamy, mixed, superactive, frigid Typic Argiustolls
MYC3	Towner		Sandy over loamy, mixed, superactive, frigid Calcic Hapludolls
MYC4	Mandan		Coarse-silty, mixed, superactive, frigid Pachic Haplustolls
MYC5	Bowbells		Fine-loamy, mixed, superactive, frigid Pachic Argiustolls
MYC6	Zahl		Fine-loamy, mixed, superactive, frigid Typic Calciustolls
MYC7	Manning		Coarse-loamy over sandy or sandy-skeletal, mixed, superactive, frigid Typic Haplustolls
MYD1	Cabba		Loamy, mixed, superactive, calcareous, frigid, shallow Typic Ustorthents
MYD2	Zahl		Fine-loamy, mixed, superactive, frigid Typic Calciustolls
MYD3	Wilton		Fine-silty, mixed, superactive, frigid Pachic Haplustolls
MYD4	Bowbells		Fine-loamy, mixed, superactive, frigid Pachic Argiustolls
MYD5	Max		Fine-loamy, mixed, superactive, frigid Typic Haplustolls
MYD6	Lehr		Fine-loamy over sandy or sandy-skeletal, mixed, superactive, frigid Typic Haplustolls
MYD7	Zahl		Fine-loamy, mixed, superactive, frigid Typic Calciustolls
MYE1	Bowbells		Fine-loamy, mixed, superactive, frigid Pachic Argiustolls
MYE2	Roseglen		Fine-loamy, mixed, superactive, frigid Pachic Haplustolls
MYE3	Bowbells		Fine-loamy, mixed, superactive, frigid Pachic Argiustolls
MYE4	Zahl		Fine-loamy, mixed, superactive, frigid Typic Calciustolls
MYE5	Ruso		Coarse-loamy, mixed, superactive, frigid Pachic Haplustolls
MYE6	Bowbells		Fine-loamy, mixed, superactive, frigid Pachic Argiustolls
MYE7	Bowbells		Fine-loamy, mixed, superactive, frigid Pachic Argiustolls
MYF1	Bowbells		Fine-loamy, mixed, superactive, frigid Pachic Argiustolls
MYF2	Williams		Fine-loamy, mixed, superactive, frigid Typic Argiustolls
MYF3	Bowbells		Fine-loamy, mixed, superactive, frigid Pachic Argiustolls
MYF4	Manning		Coarse-loamy over sandy or sandy-skeletal, mixed, superactive, frigid Typic Haplustolls
MYF5	Zahl		Fine-loamy, mixed, superactive, frigid Typic Calciustolls
MYF6	Williams		Fine-loamy, mixed, superactive, frigid Typic Argiustolls

Table A1.2 Sample data (continued)

Site no.[1]	Depth of mollic (in.)	Depth to CO_3 (in.)	Horizons sampled	Interval sampled (in.)	Texture[2]	% clay[3]	Munsell color[4]	Comments
MYC2	7	18	Ap Bt	0-7 12-16	l cl	24 29	10YR 2/1 10YR 4/3	
MYC3	17	25	A 2Bt1	0-8 17-20	lfs l	8 23	10YR 3/2 10YR 4/4	
MYC4	23	24	Ap Bw	0-7 12-18	sil sil	23 23	10YR 2/1 10YR 3/2	
MYC5	16	18	Ap Bt	0-8 12-16	l cl	25 30	10YR 2/2 10YR 3/2	
MYC6	7	Surface	Ap Bk C	0-7[5] 12-20 30-60	l l l	25 25 25	10YR 2/2 2.5Y 4/3 2.5Y 4/4 & 5/3	
MYC7	9	12	Ap Bk	0-8 12-20	sl sl	17 14	10YR 2/2 2.5Y 4/2	
MYD1	8	8	A Bk	0-6 12-15	l l	25 25	10YR 2/2 2.5Y 5/3	
MYD2	7	Surface	Ap Bk	0-6 12-18	l cl	25 25	10YR 2/2 2.5Y 5/3	
MYD3	18	20	Ap Bw	0-6 12-18	sil sil	23 23	10YR 2/1 10YR 3/1	
MYD4	20	20	Ap Bt	0-6 12-18	l cl	25 29	10YR 2/1 10YR 3/1	
MYD5	12	13	Ap Bk	0-4 12-20	l l	25 26	10YR 2/2 2.5Y 4/3	
MYD6	9	17	Ap Bw	0-8 12-16	l l	26 28	10YR 2/1 10YR 3/4	
MYD7	6	Surface	Ak Bk	0-6 12-20	l l	26 26	10YR 2/2 2.5YR 5/3	
MYE1	18	22	A Bt	0-8 12-16	l cl	24 30	10YR 2/2 10YR 2/2	Possible glossic features (Niobell?)
MYE2	19	19	Ap Bw	0-8 12-20	sil sil	23 23	10YR 2/2 10YR 3/2	
MYE3	15	15	Ap Bt	0-8 12-15	l l	25 26	10YR 2/2 10YR 3/2	
MYE4	9	9	Ap Bk	0-8 12-18	l l	25 25	10YR 2/2 2.5Y 5/2	
MYE5	20	22	Ap Bw	0-8 12-20	l sl	24 17	10YR 2/2 10YR 3/2	
MYE6	19	23	Ap Bt	0-8 12-20	l cl	25 32	10YR 2/2 10YR 3/3	
MYE7	18	21	Ap Bt	0-8 12-20	l cl	25 30	10YR 2/1 10YR 3/3	
MYF1	18	22	Ap Bt	0-7 12-18	l cl	25 30	10YR 2/1 10YR 3/2	
MYF2	11	11	Ap Bk	0-6 12-20	l l	24 25	10YR 2/1 2.5Y 4/3	
MYF3	10	10	Ap Bk	0-8 12-18	l l	25 25	10YR 2/2 2.5Y6/2	
MYF4	20	16	Ap Bk	0-6 12-18	sl vgrlcos	17 5	10YR 2/2 10YR 3/1	
MYF5	6	Surface	Ap Bk	0-7 12-20	l l	26 26	10YR 3/2 2.5Y 4/3	
MYF6	14	16	Ap Bk	0-8 12-20	l l	25 27	10YR 2/2 2.5Y 4/4	

Table A1.2 Sample data (continued)

Site no.[1]	Soil series	Taxadjunct (reason)	Taxonomic class
MYF7	Barnes		Fine-loamy, mixed, superactive, frigid Calcic Hapludolls
MYG1	Bowbells		Fine-loamy, mixed, superactive, frigid Pachic Argiustolls
MYG2	Williams		Fine-loamy, mixed, superactive, frigid Typic Argiustolls
MYG3	Zahl		Fine-loamy, mixed, superactive, frigid Typic Calciustolls
MYG4	Zahl		Fine-loamy, mixed, superactive, frigid Typic Calciustolls
MYG5	Max		Fine-loamy, mixed, superactive, frigid Typic Haplustolls
MYG6	Ruso		Coarse-loamy, mixed, superactive, frigid Pachic Haplustolls
MYG7	Lohnes		Sandy, mixed, frigid Entic Hapludolls
MYH1	Bowbells		Fine-loamy, mixed, superactive, frigid Pachic Argiustolls
MYH2	Williams		Fine-loamy, mixed, superactive, frigid Typic Argiustolls
MYH3	Zahl		Fine-loamy, mixed, superactive, frigid Typic Calciustolls
MYH4	Svea		Fine-loamy, mixed, superactive, frigid Pachic Hapludolls
MYH5	Heimdal		Coarse-loamy, mixed, superactive, frigid Calcic Hapludolls
MYH6	Heimdal		Coarse-loamy, mixed, superactive, frigid Calcic Hapludolls
MYH7	Barnes		Fine-loamy, mixed, superactive, frigid Calcic Hapludolls
MYI1	Williams		Fine-loamy, mixed, superactive, frigid Typic Argiustolls
MYI2	Williams		Fine-loamy, mixed, superactive, frigid Typic Argiustolls
MYI3	Zahl		Fine-loamy, mixed, superactive, frigid Typic Calciustolls
MYI4	Hamerly		Fine-loamy, mixed, superactive, frigid Aeric Calciaquolls
MYI5	Esmond		Coarse-loamy, mixed, superactive, frigid Typic Calciudolls
MYI6	Heimdal		Coarse-loamy, mixed, superactive, frigid Calcic Hapludolls
MYI7	Swenoda		Coarse-loamy, mixed, superactive, frigid Pachic Hapludolls
NRA1	Arvilla		Sandy, mixed, frigid Calcic Hapludolls
NRA2	Renshaw		Fine-loamy over sandy or sandy-skeletal, mixed, superactive, frigid Calcic Hapludolls

Table A1.2 Sample data (continued)

Site no.[1]	Depth of mollic (in.)	Depth to CO_3 (in.)	Horizons sampled	Interval sampled (in.)	Texture[2]	% clay[3]	Munsell color[4]	Comments
MYF7	8	18	Ap Bt	0-8 12-17	l cl	25 33	10YR 2/1 10YR 4/4	Argillic B horizon
MYG1	23	23	Ap Bt	0-8 12-18	l cl	24 29	10YR 2/1 10YR 2/2	
MYG2	7	17	Ap Bt	0-7 12-16	l cl	25 29	10YR 2/1 10YR 4/4	
MYG3	6	Surface	Ap Bk	0-5 12-18	l l	25 26	10YR 2/2 2.5Y 4/3	
MYG4	7	Surface	A Bk C	0-6[5] 12-18 40-60	l l l	25 27 28	10YR 2/2 2.5Y 4/2 2.5Y 5/3	
MYG5	10	10	Ap Bk	0-5 12-18	l l	25 26	10YR 2/2 2.5Y 4/3	
MYG6	24	26	Ap Bw C	0-8[5] 12-20 30-60	sl sl lcos	15 13 7	10YR 2/2 10YR 3/2 10YR 4/3	
MYG7	24	24	Ap Bw	0-8 12-20	cosl lcos	15 8	10YR 2/1 10YR 3/2	
MYH1	19	20	Ap Bt	1-6 12-19	l cl	24 29	10YR 2/1 10YR 3/2	
MYH2	7	20	A Bt	0-7 12-18	l cl	26 30	10YR 2/1 10YR 4/4	
MYH3	Non-mollic	Surface	Ap Bk C	0-4[5] 12-16 30-55	l l cl	25 28 29	10YR 4/1 2.5Y 5/3 2.5Y 6/4	
MYH4	19	18	Ap Bt	0-6 12-18	l l	25 30	10YR 2/1 10YR 3/1	Argillic
MYH5	10	20	Ap Bw2	0-6 12-18	l l	24 25	10YR 2/1 10YR 4/3	
MYH6	15	18	A Bw	0-6 12-16	l l	20 20	10YR 2/1 10YR 3/3	
MYH7	11	11	Ap Bk	0-6 12-20	l l	26 27	10YR 2/1 2.5Y 3/3	
MYI1	12	12	A Bk	0-6 12-20	l l	25 27	10YR 2/1 2.5Y 3/2	
MYI2	7	14	A Bk	0-6 14-20	l cl	25 30	10YR 2/1 2.5Y 5/3	
MYI3	7	7	A Bk	0-6 12-20	l l	24 25	10YR 2/1 2.5Y 5/3	
MYI4	8	Surface	Ap Bk	0-8 12-18	l l	27 28	10YR 2/1 2.5Y 4/3	
MYI5	10	10	Ap Bk	0-8 12-18	l l	24 25	10YR 3/1 2.5Y 5/2	Area mapped as Arvilla but dominated by coarse, loamy till
MYI6	13	13	Ap Bk	0-8 14-20	l l	22 24	10YR 2/1 2.5Y 4/3	
MYI7	20	Surface	Ap Bk	0-8 12-20	fsl sl	14 17	10YR 3/1 10YR 3/2	
NRA1	16	> 28	Ap Bw1	0-8 12-16	sl sl	12 8	10YR 2/2 10YR 3/3	
NRA2	16	16	A Bw1	0-8 12-16	l l	21 18	10YR 2/1 10YR 3/2	

Table A1.2 Sample data (continued)

Site no.[1]	Soil series	Taxadjunct (reason)	Taxonomic class
NRA3	Barnes		Fine-loamy, mixed, superactive, frigid Calcic Hapludolls
NRA4	Barnes		Fine-loamy, mixed, superactive, frigid Calcic Hapludolls
NRA5	Emrick		Coarse-loamy, mixed, superactive, frigid Pachic Hapludolls
NRA6	Esmond		Coarse-loamy, mixed, superactive, frigid Typic Calciudolls
NRA7	Heimdal		Coarse-loamy, mixed, superactive, frigid Calcic Hapludolls
NRB1	Williams		Fine-loamy, mixed, superactive, frigid Typic Argiustolls
NRB2	Renshaw		Fine-loamy over sandy or sandy-skeletal, mixed, superactive, frigid Calcic Hapludolls
NRB3	Buse		Fine-loamy, mixed, superactive, frigid Typic Calciudolls
NRB4	Forman		Fine-loamy, mixed, superactive, frigid Calcic Argiudolls
NRB5	Heimdal		Coarse-loamy, mixed, superactive, frigid Calcic Hapludolls
NRB6	Buse		Fine-loamy, mixed, superactive, frigid Typic Calciudolls
NRB7	Heimdal		Coarse-loamy, mixed, superactive, frigid Calcic Hapludolls
NRC1	Arvilla		Sandy, mixed, frigid Calcic Hapludolls
NRC2	Emrick		Coarse-loamy, mixed, superactive, frigid Pachic Hapludolls
NRC3	Buse		Fine-loamy, mixed, superactive, frigid Typic Calciudolls
NRC4	Fram		Coarse-loamy, mixed, superactive, frigid Aeric Calciaquolls
NRC4 AOV1	Fram		Coarse-loamy, mixed, superactive, frigid Aeric Calciaquolls
NRC4 AOV2	Fram		Coarse-loamy, mixed, superactive, frigid Aeric Calciaquolls
NRC5	Sisseton		Coarse-loamy, mixed, superactive, frigid Typic Eutrudepts
NRC6	Emrick		Coarse-loamy, mixed, superactive, frigid Pachic Hapludolls
NRC7	Heimdal		Coarse-loamy, mixed, superactive, frigid Calcic Hapludolls
NRD1	Svea		Fine-loamy, mixed, superactive, frigid Pachic Hapludolls
NRD2	Tonka		Fine, smectitic, frigid Argiaquic Argialbolls
NRD2 AOV1	Tonka		Fine, smectitic, frigid Argiaquic Argialbolls
NRD2 AOV2	Tonka		Fine, smectitic, frigid Argiaquic Argialbolls

Table A1.2 Sample data (continued)

Site no.[1]	Depth of mollic (in.)	Depth to CO_3 (in.)	Horizons sampled	Interval sampled (in.)	Texture[2]	% clay[3]	Munsell color[4]	Comments
NRA3	15	15	Ap Bk C	0-7[5] 15-20 41-60	l l l	22 27 27	10YR 2/1 2.5Y 4/3 10YR 4/4	
NRA4	12	20	Ap Bw2	0-6 12-20	l cl	18 30	10YR 3/1 10YR 4/3	
NRA5	22	41	Ap Bw	0-8 12-20	l sl	14 13	10YR 2/1 10YR 3/1	
NRA6	7	Surface	Ap Bk	0-7 12-20	sl l	12 15	10YR 2/1 2.5Y 5/4	Frozen at 35 in. No mottles.
NRA7	13	20	Ap Bw	0-11 14-19	l l	15 15	10YR 2/2 2.5Y 4/4	
NRB1	11	11	Ap Bk C	0-6[5] 14-20 38-60	l cl cl	24 28 34	10YR 2/1 2.5Y 4/3 5Y 4/3	Argillic 2/1 surface
NRB2	16	16	A Bw1	0-8 12-16	l l	20 22	10YR 2/1 10YR 3/2	
NRB3	5	Surface	Ap Bk	0-5 12-20	l cl	26 33	10YR 3/1 2.5Y 5/3	
NRB4	15	22	Ap Bt3	0-7 16-20	l cl	26 35	10YR 2/1 10YR 4/4	
NRB5	9	20	Ap Bw	0-8 12-19	l l	10 12	10YR 2/1 10YR 4/2	
NRB6	8	Surface	Ap Bk	0-8 12-19	l l	20 20	10YR 2/1 2.5Y 5/3	
NRB7	9	22	Ap Bw	0-7 14-20	l l	15 15	10YR 2/1 10YR 4/3	
NRC1	12	7	Ap Bw	0-8 12-20	l sl	15 14	10YR 2/2 10YR 4/3	Slight effervescence in Bw
NRC2	17	25	A Bw1	0-5 12-17	l l	15 15	10YR 3/1 10YR 3/2	
NRC3	5	Surface	A Bk	0-5 12-20	l cl	25 33	10YR 3/1 2.5Y 4/4	
NRC4	11	Surface	Ap Bk	0-8 12-20	l l	20 17	10YR 2/1 2.5Y 4/4	
NRC4 AOV1	12	Surface	Ap Bk	0-9 12-20	l l	22 19	10YR 2/1 2.5Y 5/2	
NRC4 AOV2	13	Surface	Ap Bk	0-9 12-20	l l	22 19	10YR 2/1 2.5Y 5/2	
NRC5	5	Surface	Ap Bk	0-5 12-20	fsl fsl	10 10	10YR 3/2 2.5Y 5/4	
NRC6	18	19	Ap Bw	0-7 12-18	l l	15 15	10YR 2/1 2.5Y 3/1	
NRC7	14	38	Ap Bw C	0-8[5] 15-20 45-60	l l l	12 10 10	10YR 2/1 2.5Y 4/3 2.5Y 6/3	
NRD1	26	35	A Bw	0-7 12-20	l cl	23 30	10YR 2/2 10YR 3/1	
NRD2	> 30	> 30	A Bt	0-5 12-20	sic sic	15 50	N 2/0 2.5Y 3/2	
NRD2 AOV1	> 30	>30	A Bt	0-8 16-20	sil sicl	15 40	N 2/0 2.5Y 3/2	
NRD2 AOV2	> 30	> 30	A Bt	0-8 16-20	sil cl	20 40	N 2/0 2.5Y 3/2	

Table A1.2 Sample data (continued)

Site no.[1]	Soil series	Taxadjunct (reason)	Taxonomic class
NRD3	Heimdal		Coarse-loamy, mixed, superactive, frigid Calcic Hapludolls
NRD4	Emrick		Coarse-loamy, mixed, superactive, frigid Pachic Hapludolls
NRD5	Emrick		Coarse-loamy, mixed, superactive, frigid Pachic Hapludolls
NRD6	Heimdal		Coarse-loamy, mixed, superactive, frigid Calcic Hapludolls
NRD7	Buse		Fine-loamy, mixed, superactive, frigid Typic Calciudolls
NRE1	Barnes		Fine-loamy, mixed, superactive, frigid Calcic Hapludolls
NRE2	Fordville		Fine-loamy over sandy or sandy-skeletal, mixed, superactive, frigid Pachic Hapludolls
NRE3	Hamerly		Fine-loamy, mixed, superactive, frigid Aeric Calciaquolls
NRE4	Barnes		Fine-loamy, mixed, superactive, frigid Calcic Hapludolls
NRE5	Ortonville		Coarse-loamy, mixed, superactive, frigid Aquic Calciudolls
NRE6	Arvilla		Sandy, mixed, frigid Calcic Hapludolls
NRE7	Brantford		Fine-loamy over sandy or sandy-skeletal, mixed, superactive, frigid Typic Hapludolls
NRF1	Buse		Fine-loamy, mixed, superactive, frigid Typic Calciudolls
NRF2	Svea		Fine-loamy, mixed, superactive, frigid Pachic Hapludolls
NRF3	Esmond		Coarse-loamy, mixed, superactive, frigid Typic Calciudolls
NRF4	Heimdal		Coarse-loamy, mixed, superactive, frigid Calcic Hapludolls
NRF5	Heimdal		Coarse-loamy, mixed, superactive, frigid Calcic Hapludolls
NRF6	Heimdal		Coarse-loamy, mixed, superactive, frigid Calcic Hapludolls
NRF7	Buse		Fine-loamy, mixed, superactive, frigid Typic Calciudolls
NRG1	Hamerly		Fine-loamy, mixed, superactive, frigid Aeric Calciaquolls
NRG2	Hamerly		Fine-loamy, mixed, superactive, frigid Aeric Calciaquolls
NRG3	Barnes		Fine-loamy, mixed, superactive, frigid Calcic Hapludolls
NRG3 AOV1	Barnes		Fine-loamy, mixed, superactive, frigid Calcic Hapludolls
NRG3 AOV2	Barnes		Fine-loamy, mixed, superactive, frigid Calcic Hapludolls
NRG4	Hamar		Sandy, mixed, frigid Typic Endoaquolls

Table A1.2 Sample data (continued)

Site no.[1]	Depth of mollic (in.)	Depth to CO_3 (in.)	Horizons sampled	Interval sampled (in.)	Texture[2]	% clay[3]	Munsell color[4]	Comments
NRD3	14	14	Ap Bk	0-7 14-20	l l	17 17	10YR 2/1 2.5Y 4/4	
NRD4	25	> 40	Ap Bw2	0-8 12-20	l l	16 16	10YR 2/1 10YR 2/2	Map unit is Heimdal-Emrick series (till)
NRD5	21	22	Ap Bw	0-8 12-20	l l	15 15	10YR 2/1 10YR 3/2	
NRD6	7	21	Ap Bw	0-7 12-20	l l	15 15	10YR 2/1 10YR 4/2	
NRD7	7	Surface	A Bk	0-7 12-20	l l	18 18	10YR 2/1 2.5Y 5/4	
NRE1	14	14	A Bk1	0-8 14-19	l l	24 24	10YR 2/1 10YR 4/3	
NRE2	14	21	A Bw2	0-8 14-20	l l	22 18	10YR 2/1 10YR 3/4	Pachic to 14 in. Depth to gravel 30 in.
NRE3	17	Surface	Ap ABk	0-8 12-17	l l	22 22	10YR 2/1 2.5Y 4/2	
NRE4	8	11	Ap Bk1	0-8 12-20	l l	22 22	10YR 3/1 2.5Y 5/3	
NRE5	10	14	Ap Bk	0-8 14-20	l l	13 14	10YR 2/1 2.5Y 5/3	
NRE6	9	20	Ap Bw	0-8 12-18	fsl sl	8 12	10YR 2/1 10YR 4/4	
NRE7	17	20	Ap Bw	0-8 12-17	l l	22 25	10YR 2/1 10YR 3/3	
NRF1	7	7	Ap Bk	0-7 12-20	l l	23 24	10YR 2/1 2.5Y 4/3	
NRF2	17	23	A Bw	0-8 12-17	sil l	20 26	10YR 2/1 10YR 3/2	
NRF3	7	Surface	Ap Bk	0-7 12-20	l l	14 14	10YR 2/1 2.5Y 4/4	
NRF4	11	13	Ap Bk	0-8 13-20	l l	18 17	10YR 3/1 2.5Y 5/3	
NRF5	10	18	Ap Bw	0-8 12-18	l l	16 16	10YR 2/1 2.5Y 4/3	
NRF6	11	22	Ap Bw C	0-9[5] 12-20 36-54	l l l	17 16 16	10YR 2/1 2.5Y 4/4 2.5Y 5/3	
NRF7	7	Surface	Ap Bk	0-7 12-18	cl cl	31 28	10YR 2/1 2.5Y 5/4	Frozen at 20 in.
NRG1	12	Surface	Ap Bk1	0-8 12-17	l l	22 22	10YR 2/1 2.5Y 4/2	
NRG2	20	8	Ap Bk	0-8 12-20	l l	24 27	10YR 2/1 2.5Y 3/2	
NRG3	14	14	Ap Bk	0-7 16-20	l l	21 24	10YR 2/1 2.5Y 4/3	
NRG3 AOV1	16	10	A Bk	0-7 12-20	l l	22 24	10YR 2/1 10YR 3/2 & 2.5Y 4/4	Slight effervescence in Bw
NRG3 AOV2	16	9	Ap Bk	0-7 12-20	l l	22 24	10YR 2/1 10YR 3/2 & 2.5Y 4/4	Slight effervescence in Bw
NRG4	22	22	Ap Bw Cg	0-8[5] 12-20 40-60	sl ls s	8 4 2	10YR 2/1 10YR 3/1 5Y 5/2	

Table A1.2 Sample data (continued)

Site no.[1]	Soil series	Taxadjunct (reason)	Taxonomic class
NRG5	Esmond		Coarse-loamy, mixed, superactive, frigid Typic Calciudolls
NRG6	Aylmer		Mixed, frigid Aquic Udipsamments
NRG7	Brantford		Fine-loamy over sandy or sandy-skeletal, mixed, superactive, frigid Typic Hapludolls
NRH1	Vallers		Fine-loamy, mixed, superactive, frigid Typic Calciaquolls
NRH2	Svea		Fine-loamy, mixed, superactive, frigid Pachic Hapludolls
NRH3	Svea		Fine-loamy, mixed, superactive, frigid Pachic Hapludolls
NRH4	Binford		Sandy, mixed, frigid Typic Hapludolls
NRH5	Svea		Fine-loamy, mixed, superactive, frigid Pachic Hapludolls
NRH6	Svea		Fine-loamy, mixed, superactive, frigid Pachic Hapludolls
NRH7	Buse		Fine-loamy, mixed, superactive, frigid Typic Calciudolls
NRI1	Wyard		Fine-loamy, mixed, superactive, frigid Typic Endoaquolls
NRI2	Wyard		Fine-loamy, mixed, superactive, frigid Typic Endoaquolls
NRI3	Parnell		Fine, smectitic, frigid Vertic Argiaquolls
NRI4	Hecla		Sandy, mixed, frigid Oxyaquic Hapludolls
NRI5	Balaton		Fine-loamy, mixed, superactive, frigid Aquic Calciudolls
NRI6	Balaton		Fine-loamy, mixed, superactive, frigid Aquic Calciudolls
NRI7	Hamerly		Fine-loamy, mixed, superactive, frigid Aeric Calciaquolls
TFA1	Buse		Fine-loamy, mixed, superactive, frigid Typic Calciudolls
TFA2	Warsing		Fine-loamy over sandy or sandy-skeletal, mixed, superactive, frigid Oxyaquic Hapludolls
TFA3	Buse		Fine-loamy, mixed, superactive, frigid Typic Calciudolls
TFA4	Arvilla		Sandy, mixed, frigid Calcic Hapludolls
TFA5	Hecla		Sandy, mixed, frigid Oxyaquic Hapludolls
TFA6	Waukon		Fine-loamy, mixed, superactive, frigid Mollic Hapludalfs
TFA7	Borup		Coarse-silty, mixed, superactive, frigid Typic Calciaquolls
TFB1	Inkster	Pachic colors	Coarse-loamy, mixed, superactive, frigid Pachic Hapludolls

Table A1.2 Sample data (continued)

Site no.[1]	Depth of mollic (in.)	Depth to CO_3 (in.)	Horizons sampled	Interval sampled (in.)	Texture[2]	% clay[3]	Munsell color[4]	Comments
NRG5	7	Surface	Ap Bk	0-7 12-20	l l	12 12	10YR 3/2 2.5Y 5/3	
NRG6	3	42 (very slight)	A C	0-8 12-20	fsl fsl	1 <1	10YR 3/3 10YR 4/2	0-3 in. is 10YR 3/2. After mixing to 8 in. color is 10 YR 3/3
NRG7	8	19	Ap Bw	0-8 12-16	l l	25 25	10YR 2/1 2,5Y 4/3	
NRH1	10	Surface	Ap Bk	0-8 12-20	sil l	15 25	10YR 2/1 5Y 4/1	
NRH2	22	22	A Bw1	0-7 12-17	l l	27 30	10YR 2/1 10YR 3/1	
NRH3	27	> 40	Ap Bw2	0-6 16-20	l l	25 27	10YR 2/1 10YR 2/2	
NRH4	15	15	Ap C	0-8 15-20	sl grs	10 2	10YR 3/1 10YR 5/3	
NRH5	21	36	Ap Bw	0-8 12-20	l l	23 25	10YR 2/1 10YR 3/1	Bw almost a 2/1 color
NRH6	17	30	Ap Bw	0-8 12-17	l l	21 24	10YR 2/1 2.5Y 3/2	
NRH7	10	Surface	Ap Bk C	0-8[5] 12-20 45-60	l cl cl	25 27 27	10YR 2/1 2.5Y 5/3 2.5Y 5/4	
NRI1	17	21	Ap Bw	0-8 8-17	l l	24 24	10YR 2/1 10YR 3/1	
NRI2	19	19	A Bw	0-5 12-17	l cl	24 34	10YR 2/1 10YR 3/1	
NRI3	18	27	A Bt	0-8 12-18	sil cl	14 40	N 2/0 5Y 3/2	
NRI4	22	> 40	Ap A	0-8 12-20	lfs lfs	5 3	10YR 3/1 10YR 2/2	
NRI5	13	Surface	Ap Bk	0-8 14-20	l l	20 20	10YR 2/1 2.5Y 5/3	
NRI6	8	9	Ap Bk	0-8 12-18	cl cl	28 30	10YR 2/1 2.5Y 6/3	
NRI7	6	Surface	Ap Bk	0-6 12-20	l l	18 18	10YR 2/1 2.5Y 6/3	
TFA1	5	Surface	Ap Bk	0-5 10-20	l l	20 22	10YR 3/1 2.5Y 4/3	
TFA2	11	24	Ap Bw	0-8 12-17	cl cl	28 29	10YR 2/1 2.5Y 4/3	Some shale in upper part of profile
TFA3	7	Surface	Ap Bk	0-7 12-20	l l	26 26	10YR 3/1 2.5Y 5/3	
TFA4	13	25 (slight)	Ap Bw 2C1	0-8[5] 13-17 25-40	sl sl grs	15 12 2	10YR 2/1 10YR 3/3 2.5Y 5/4	
TFA5	> 20	> 20	Ap A2	0-8 12-20	fsl lfs	14 10	10YR 2/1 10YR 3/2	
TFA6	> 22	22	Ap Bt	0-8 14-20	l cl	24 28	10YR 2/1 10YR 3/3	
TFA7	13	Surface	Ap Bk	0-8 13-20	vfsl sil	21 24	10YR 2/1 5Y 5/1	
TFB1	24	18	A1 A2	0-8 8-18	sl sl	15 15	10YR 2/1 10YR 2/1	

Table A1.2 Sample data (continued)

Site no.[1]	Soil series	Taxadjunct (reason)	Taxonomic class
TFB2	Glyndon		Coarse-silty, mixed, superactive, frigid Aeric Calciaquolls
TFB3	Delamere		Coarse-loamy, mixed, superactive, frigid Typic Endoaquolls
TFB4	Colvin saline		Fine-silty, mixed, superactive, frigid Typic Calciaquolls
TFB5	Glyndon		Coarse-silty, mixed, superactive, frigid Aeric Calciaquolls
TFB6	Glyndon		Coarse-silty, mixed, superactive, frigid Aeric Calciaquolls
TFB7	Fairdale		Fine-loamy, mixed, superactive, calcareous, frigid Mollic Udifluvents
TFC1	Bearden		Fine-silty, mixed, superactive, frigid Aeric Calciaquolls
TFC2	Kindred		Fine-silty, mixed, superactive, frigid Typic Endoaquolls
TFC3	Bearden		Fine-silty, mixed, superactive, frigid Aeric Calciaquolls
TFC4	Glyndon		Coarse-silty, mixed, superactive, frigid Aeric Calciaquolls
TFC5	Bearden		Fine-silty, mixed, superactive, frigid Aeric Calciaquolls
TFC6	Bearden		Fine-silty, mixed, superactive, frigid Aeric Calciaquolls
TFC7	Fargo		Fine, smectitic, frigid Typic Epiaquerts
TFD1	Bearden		Fine-silty, mixed, superactive, frigid Aeric Calciaquolls
TFD2	Glyndon		Coarse-silty, mixed, superactive, frigid Aeric Calciaquolls
TFD3	Hegne		Fine, smectitic, frigid Typic Calciaquerts
TFD4	Glyndon		Coarse-silty, mixed, superactive, frigid Aeric Calciaquolls
TFD5	Hegne		Fine, smectitic, frigid Typic Calciaquerts
TFD6	Hegne		Fine, smectitic, frigid Typic Calciaquerts
WCA1	Tally		Coarse-loamy, mixed, superactive, frigid Typic Haplustolls
WCA2	Fleak		Mixed, frigid, shallow Aridic Ustipsamments
WCA3	Daglum		Fine, smectitic, frigid Vertic Natrustolls
WCA4	Cherry		Fine-silty, mixed, superactive, frigid Typic Haplustepts
WCA5	Maschetah		Fine-silty, mixed, superactive, frigid Typic Calciustolls
WCA6	Williams		Fine-loamy, mixed, superactive, frigid Typic Argiustolls

Table A1.2 Sample data (continued)

Site no.[1]	Depth of mollic (in.)	Depth to CO_3 (in.)	Horizons sampled	Interval sampled (in.)	Texture[2]	% clay[3]	Munsell color[4]	Comments
TFB2	11	Surface	Ap Bk	0-8 12-20	vfsl vfsl	13 13	10YR 2/1 2.5Y 4/2 & 4/4	Frozen at 24 in.
TFB3	10	20	Ap Bw	0-8 12-20	fsl fsl	15 13	10YR 2/1 2.5Y 4/3	
TFB4	12	Surface	Ap Bk1	0-8 12-18	sicl sicl	30 33	10YR 2/1 5Y 4/1	
TFB5	> 20	Surface	Ap Bk	0-8 13-20	sil sil	18 18	2.5Y 2/1 2.5Y 3/2	
TFB6	10	> 20	Ap Bk	0-8 14-20	vfsl sil	20 24	10YR 2/1 2.5Y 4/4	
TFB7	> 20	> 20	Ap Bw	0-8 15-20	l l	24 25	10YR 2/1 10YR 3/2	
TFC1	12	Surface	Ap Bk	0-8 14-20	sicl sil	32 24	2.5Y 2.5/1 2.5Y 6/4	
TFC2	12	15	Ap Bk	0-9 15-20	sicl sicl	30 30	10YR 2/1 2.5Y 5/3	Frozen at 25 in. CO_3 1 in. too shallow
TFC3	9	Surface	Ap Bk	0-9 12-18	sicl sil	32 24	10YR 2/1 2.5Y 2/1	Many gypsum and salt crystals in Bk
TFC4	8	Surface	Ap Bk C	0-8[5] 12-20 40-60	sil sil sil	14 14 23	10YR 2/1 2.5Y 4/3 2.5Y 5/2 & 5/4	Few salts in Ap and right below Ap. Percent clay too high in C
TFC5	13	Surface	Ap Bk	0-8 13-20	sicl sicl	29 30	10YR 2/1 2.5Y 3/2	
TFC6	14	Surface	Ap Bk	0-8 14-20	sicl sicl	34 32	10YR 2/1 5Y 4/3	
TFC7	> 20	Surface	Ap Bk	0-8 12-20	sic sic	40 45	10YR 2/1 5Y 3/1	
TFD1	12	Surface	Ap Bk C	0-8[5] 12-20 35-43	sicl sil sil	30 20 20	2.5Y 2.5/1 2.5Y 5/4 2.5Y 4/4	
TFD2	8	Surface	Ap Bk	0-8 12-20	sicl sil	28 16	10YR 2/1 2.5Y 5/3	
TFD3	8	Surface	Ap Bk	0-8 12-20	sicl sicl	46 41	10YR 2/1 2.5Y 4/3	
TFD4	11	Surface	Ap Bk	0-8 12-20	sil sil	16 16	10YR 2/1 2.5Y 4/2 & 4/4	
TFD5	12	Surface	Ap Bk C	0-8[5] 12-17 38-52	sic sic c	45 40 45	10YR 2/1 5Y 4/2 5Y 5/3	
TFD6	10	Surface	Ap Bk	0-8 12-20	sic sic	40 40	2.5Y 2/1 2.5Y 4/2 & 4/4	
WCA1	11	16	A & Bw Bw	0-8 12-16	fsl fsl	15 15	10YR 3/2 10YR 4/3	
WCA2	Non-mollic	Surface	A & Bk Bk	0-8 12-18	lfs lfs	9 7	10YR 4/3 2.5Y 5/3	
WCA3	11	5	AE & Btnk1 Btnk2	0-8 12-17	sicl sic	38 48	2.5Y 3/2 2.5Y 4/2	
WCA4	2	2	A & Bw Bk	0-8 13-20	sil sl	23 12	2.5Y 4/3 2.5Y 5/3	Loamy-skeletal at depth with 35-50% porcelanite fragments
WCA5	6	6	Ap Bk1	0-6 12-20	sicl sicl	32 30	2.5Y 3/2 2.5Y 4/2	
WCA6	13	17	A Bt	0-5 8-15	l cl	22 30	10YR 2/2 10YR 4/2	

Table A1.2 Sample data (continued)

Site no.[1]	Soil series	Taxadjunct (reason)	Taxonomic class
WCA7	Lohler		Fine, smectitic, calcareous, frigid Vertic Ustifluvents
WCB1	Boxwell		Fine-loamy, mixed, superactive, frigid Aridic Haplustolls
WCB2	Maltese		Fine, smectitic, frigid Torrertic Natrustolls
WCB3	Patent	Particle size control section is coarse-loamy	Fine-loamy, mixed, superactive, calcareous, frigid Aridic Ustorthents
WCB4	Daglum		Fine, smectitic, frigid Vertic Natrustolls
WCB5	Dogtooth		Fine, smectitic, frigid Leptic Natrustolls
WCB6	Shambo		Fine-loamy, mixed, superactive, frigid Typic Haplustolls
WCB7	Williams		Fine-loamy, mixed, superactive, frigid Typic Argiustolls
WCC1	Rhame		Coarse-loamy, mixed, superactive, frigid Aridic Haplustolls
WCC2	Sen		Fine-silty, mixed, superactive, frigid Typic Haplustolls
WCC3	Gerda		Fine, smectitic, frigid Leptic Torrertic Natrustolls
WCC4	Rhame		Coarse-loamy, mixed, superactive, frigid Aridic Haplustolls
WCC4 AOV1	Rhame		Coarse-loamy, mixed, superactive, frigid Aridic Haplustolls
WCC4 AOV2	Rhame		Coarse-loamy, mixed, superactive, frigid Aridic Haplustolls
WCC5	Chama	Non-mollic; platy E horizon at surface	Fine-silty, mixed, superactive, frigid Typic Calciustolls
WCC6	Chama		Fine-silty, mixed, superactive, frigid Typic Calciustolls
WCC7	Zahl		Fine-loamy, mixed, superactive, frigid Typic Calciustolls
WCD1	Ruso		Coarse-loamy, mixed, superactive, frigid Pachic Haplustolls
WCD2	Rhoades		Fine, smectitic, frigid Leptic Vertic Natrustolls
WCD3	Kremlin		Fine-loamy, mixed, superactive, frigid Aridic Haplustolls
WCD4	Vebar		Coarse-loamy, mixed, superactive, frigid Typic Haplustolls
WCD5	Dogtooth		Fine, smectitic, frigid Leptic Natrustolls
WCD6	Farnuf		Fine-loamy, mixed, superactive, frigid Typic Argiustolls
WCD7	Korell		Fine-loamy, mixed, superactive, frigid Fluventic Haplustolls

Table A1.2 Sample data (continued)

Site no.[1]	Depth of mollic (in.)	Depth to CO_3 (in.)	Horizons sampled	Interval sampled (in.)	Texture[2]	% clay[3]	Munsell color[4]	Comments
WCA7	8	Surface	Ap C1 C2	0-8[5] 12-20 22-35	sicl sic sic	30 35 36	10YR 3/2 10YR 4/2 10YR 4/2	A horizon has mollic colors
WCB1	14	14	A & Bw Bk	0-8 15-20	l l	21 25	10YR 3/2 2.5Y 5/3	
WCB2	4	Surface	A & E Btnk	0-8 12-16	sil sic	25 45	10YR 4/3 10YR 4/3	Calcareous to surface. A & E may be contaminated with Decon
WCB3	Non-mollic	Surface	A & AC C1 C3	0-8[5] 12-20 24-44	sil fsl l	22 15 16	2.5Y 4/3 2.5Y 4/3 5Y 5/3	
WCB4	> 20	8	Ap Btnk	0-8 8-20	sic sic	42 48	2.5Y 3/2 2.5Y 3/3	
WCB5	Non-mollic	14	E & Btny Btnky	0-8 14-20	sic sic	42 47	2.5Y 4/2 2.5Y 4/3	No mollic A horizon. E horizon at surface. Cr at 22 in. Salts and $CaSO_4$ crystals at 6 in.
WCB6	5	15	A Bw	0-5 8-15	l l	19 19	10YR 3/2 10YR 3/3	
WCB7	6	13	Ap Bk	0-6 13-21	l cl	22 26	10YR 2/2 10YR 5/3	
WCC1	12	12	A & Bw Bw2	0-8 12-20	fsl fsl	16 10	10YR 3/2 2.5Y 4/3	
WCC2	10	16	A & Bw1 Bw2	0-8 12-16	sil sil	20 21	10YR 3/2 2.5Y 4/3	
WCC3	11	5	E & Btn Bk	0-8 12-20	l cl	20 31	10YR 3/2 10YR 4/3	
WCC4	11	> 22	A Bw	0-8 12-20	l fsl	16 14	10YR 3/2 10YR 4/3	
WCC4 AOV1	12	> 21	A Bw	0-8 12-20	fsl fsl	15 14	10YR 3/2 10YR 4/2	
WCC4 AOV2	10	> 22	A Bw	0-8 12-20	fsl fsl	16 15	10YR 3/2 10YR 4/3	
WCC5	Non-mollic	2	E & Bk1 Bk2 Cr	0-8[5] 12-17 25-42	sil sil sic	25 25 41	2.5Y 4/3 5Y 5/4 5Y 5/2	Salts and $CaSO_4$ crystals in the Cr horizon. Sampled in the transition area between natric soils at the base of the ridge and fine silty soils on the ridge
WCC6	6	Surface	Ap Bk	0-5 9-14	l l	22 20	10YR 3/2 2.5Y 5/3	Sandstone beds
WCC7	6	Surface	Ap Bk	0-6 10-14	l l	22 26	10YR 3/2 10YR 4/2	
WCD1	> 20	> 20	A Bw	0-8 12-20	fsl sl	15 12	10YR 3/2 10YR 3/3	Mollic colors at 16 in.
WCD2	6	9	A, E, & Btn Btnky	0-8 15-20	grl c	20 40	10YR 3/3 2.5Y 5/3	
WCD3	> 28	28	A Bw2 Bk1	0-8[5] 12-20 28-41	l l l	21 22 22	10YR 2/2 10YR 3/2 10YR 3/3	Pachic with mollic colors below 28 in.
WCD4	11	> 20	A &Bw1 Bw2	0-8 12-17	fsl fsl	16 13	10YR 3/2 10YR 5/3	
WCD5	Non-mollic	4	E, Btn, & B Btnky	0-8 12-18	sic sicl	42 38	10YR 4/2 2.5Y 5/3	Non-mollic
WCD6	8	23	Ap Bt	0-7 12-19	l cl	23 30	10YR 2/2 10YR 3/2	
WCD7	11	8	A C1	0-8 12-20	l l	19 21	10YR 2/2 10YR 4/2	

Table A1.2 Sample data (continued)

Site no.[1]	Soil series	Taxadjunct (reason)	Taxonomic class
WCE1	Vebar		Coarse-loamy, mixed, superactive, frigid Typic Haplustolls
WCE2	Chama		Fine-silty, mixed, superactive, frigid Typic Calciustolls
WCE3	Janesburg		Fine, smectitic, frigid Typic Natrustolls
WCE4	Vebar		Coarse-loamy, mixed, superactive, frigid Typic Haplustolls
WCE5	Patent		Fine-loamy, mixed, superactive, calcareous, frigid Aridic Ustorthents
WCE5 AOV1	Boxwell		Fine-loamy, mixed, superactive, frigid Aridic Haplustolls
WCE5 AOV2	Boxwell		Fine-loamy, mixed, superactive, frigid Aridic Haplustolls
WCE6	Chama		Fine-silty, mixed, superactive, frigid Typic Calciustolls
WCE7	Tally		Coarse-loamy, mixed, superactive, frigid Typic Haplustolls
WCF1	Cabba		Loamy, mixed, superactive, calcareous, frigid, shallow Typic Ustorthents
WCF2	Tally		Coarse-loamy, mixed, superactive, frigid Typic Haplustolls
WCF3	Janesburg		Fine, smectitic, frigid Typic Natrustolls
WCF4	Dogtooth		Fine, smectitic, frigid Leptic Natrustolls
WCF5	Savage		Fine, smectitic, frigid Vertic Argiustolls
WCF6	Daglum		Fine, smectitic, frigid Vertic Natrustolls
WCF6 AOV1	Williams		Fine-loamy, mixed, superactive, frigid Typic Argiustolls
WCF6 AOV2	Williams		Fine-loamy, mixed, superactive, frigid Typic Argiustolls
WCF7	Rhoades		Fine, smectitic, frigid Leptic Vertic Natrustolls
WCG1	Cabba		Loamy, mixed, superactive, calcareous, frigid, shallow Typic Ustorthents
WCG2	Arnegard		Fine-loamy, mixed, superactive, frigid Pachic Haplustolls
WCG3	Belfield		Fine, smectitic, frigid Glossic Natrustolls
WCG4	Arnegard		Fine-loamy, mixed, superactive, frigid Pachic Haplustolls
WCG5	Vanda		Fine, smectitic, calcareous, frigid Torrertic Ustorthents
WCG6	Max		Fine-loamy, mixed, superactive, frigid Typic Haplustolls
WCG7	Arnegard		Fine-loamy, mixed, superactive, frigid Pachic Haplustolls
WCH1	Max		Fine-loamy, mixed, superactive, frigid Typic Haplustolls

Table A1.2 Sample data (continued)

Site no.[1]	Depth of mollic (in.)	Depth to CO_3 (in.)	Horizons sampled	Interval sampled (in.)	Texture[2]	% clay[3]	Munsell color[4]	Comments
WCE1	8	> 20	Ap Bw	0-8 12-20	l l	17 16	10YR 3/3 10YR 4/4	
WCE2	5	4	A & Bk Bk	0-8 12-20	l sil	21 26	10YR 3/3 10YR 5/3	
WCE3	12	>20	Ap E	0-8 12-16	sil sil	18 16	10YR 3/2 2.5Y 4/3	
WCE4	5	17	A & Bw Bw	0-8 12-17	fsl fsl	14 10	10YR 3/2 2.5Y 4/3	
WCE5	Non-mollic	Surface	Ap C	0-6 12-20	l l	25 24	2.5Y 4/3 2.5Y 4/3	Ap may be contaminated with Decon
WCE5 AOV1	> 20	> 20	Ap Bw	0-6 12-20	l l	18 18	10YR 3/2 10YR 3/3	Mollic epipedon thicker than 16 in.
WCE5 AOV2	22	22	Ap Bw	0-5 12-20	l l	19 18	10YR 3/2 10YR 3/3	Mollic epipedon thicker than 16 in.
WCE6	7	Surface	Ap Bk	0-7 12-20	vfsl vfsl	16 16	10YR 3/3 10YR 5/3	Coarse-silty texture, not fine-silty
WCE7	11	> 20	A & Bw Bw	0-8 12-20	fsl fsl	16 14	10YR 3/2 10YR 4/3	
WCF1	2	Surface	A Bk	0-8 12-18	sil sil	25 25	2.5Y 3/2 2.5Y 4/4	
WCF2	12	20	A Bw Bk2	0-8[5] 12-20 36-45	fsl fsl fsl	16 12 14	10YR 3/2 10YR 4/2 2.5Y 5/3	
WCF3	16	16	Ap & Btn Btn	0-7 12-16	sil sic	26 44	10YR 3/2 10YR 3/2	
WCF4	13	16	Ap Btnky	0-5.5 13-16	sil sicl	18 32	10YR 3/3 2.5Y 4/4	$CaSO_4$ crystals at 13 in.
WCF5	14	6	A & Bt Bk	0-8 14-20	sicl sil	35 25	10YR 3/2 10YR 5/3	
WCF6	12	5	Ap Btnk	0-6 12-17	sicl sic	38 50	2.5Y 3/2 2.5Y 4/2	
WCF6 AOV1	12	> 20	Ap Bt	0-7 12-20	l cl	26 33	10YR 2/2 10YR 4/4	
WCF6 AOV2	8	15	Ap Btk	0-6 15-20	l cl	26 34	10YR 2/2 2.5Y 4/2	
WCF7	4	6	E & Btn Btnky	0-8 12-18	l sic	25 47	10YR 3/2 2.5Y 4/2	No A horizon. Surface E horizon is 5 in. thick. Visible salts at 12 in.
WCG1	2	6	A & Bk Bk	0-8 12-17	sil sil	20 20	10YR 3/3 10YR 5/3	
WCG2	> 20	> 20	A Bw	0-8 12-20	l l	24 26	10YR 2/1 10YR 3/2	
WCG3	16	> 20	A & B/E Btn	0-8 12-18	l cl	18 39	10YR 2/2 10YR 3/3	
WCG4	> 20	> 20	A Bw	0-8 12-20	l l	19 21	10YR 2/2 10YR 3/2	
WCG5	4	5	A & Bk Bk	0-8 12-16	cl cl	33 40	10YR 3/2 10YR 4/2	$CaSO_4$ crystals at 16 in.
WCG6	7	10	A & Bw Bk	0-8 12-20	l l	20 26	10YR 3/2 10YR 4/3	
WCG7	24	29	Ap Bw	0-7 7-26	l l	20 23	10YR 2/2 10YR 3/2	Arnegard sand substratum; 44 in. to sand
WCH1	8	8	A Bk	0-8 12-20	sil l	23 22	10YR 3/2 2.5Y 5/3	

Table A1.2 Sample data (continued)

Site no.[1]	Soil series	Taxadjunct (reason)	Taxonomic class
WCH2	Tally		Coarse-loamy, mixed, superactive, frigid Typic Haplustolls
WCH3	Arnegard		Fine-loamy, mixed, superactive, frigid Pachic Haplustolls
WCH4	Morton		Fine-silty, mixed, superactive, frigid Typic Argiustolls
WCH5	Zahl		Fine-loamy, mixed, superactive, frigid Typic Calciustolls
WCH6	Bowbells		Fine-loamy, mixed, superactive, frigid Pachic Argiustolls
WCH7	Zahill		Fine-loamy, mixed, superactive, frigid Typic Calciustepts
WCI1	Williams		Fine-loamy, mixed, superactive, frigid Typic Argiustolls
WCI2	Bowbells		Fine-loamy, mixed, superactive, frigid Pachic Argiustolls
WCI3	Zahl		Fine-loamy, mixed, superactive, frigid Typic Calciustolls
WCI4	Williams		Fine-loamy, mixed, superactive, frigid Typic Argiustolls
WCI5	Williams		Fine-loamy, mixed, superactive, frigid Typic Argiustolls
WCI6	Zahl		Fine-loamy, mixed, superactive, frigid Typic Calciustolls
WCI7	Niobell		Fine, smectitic, frigid Glossic Natrustolls
WIA1	Williams		Fine-loamy, mixed, superactive, frigid Typic Argiustolls
WIA2	Williams		Fine-loamy, mixed, superactive, frigid Typic Argiustolls
WIA3	Williams		Fine-loamy, mixed, superactive, frigid Typic Argiustolls
WIA4	Williams		Fine-loamy, mixed, superactive, frigid Typic Argiustolls
WIA5	Farland		Fine-silty, mixed, superactive, frigid Typic Argiustolls
WIA6	Zahl		Fine-loamy, mixed, superactive, frigid Typic Calciustolls
WIA7	Zahl		Fine-loamy, mixed, superactive, frigid Typic Calciustolls
WIB1	Havrelon		Fine-loamy, mixed, superactive, calcareous, frigid Typic Ustifluvents
WIB2	Zahl		Fine-loamy, mixed, superactive, frigid Typic Calciustolls
WIB3	Bowbells		Fine-loamy, mixed, superactive, frigid Pachic Argiustolls
WIB4	Appam		Sandy, mixed, frigid Typic Haplustolls
WIB5	Williams		Fine-loamy, mixed, superactive, frigid Typic Argiustolls

Table A1.2 Sample data (continued)

Site no.[1]	Depth of mollic (in.)	Depth to CO_3 (in.)	Horizons sampled	Interval sampled (in.)	Texture[2]	% clay[3]	Munsell color[4]	Comments
WCH2	14	41	A Bw	0-8 12-20	fsl fsl	15 12	2.5Y 3/2 10YR 4/3	
WCH3	> 20	> 20	Ap Bw	0-7 14-20	l l	22 18	10YR 2/2 10YR 3/2	
WCH4	12	> 20	Ap Bt	0-7 12-20	sil sicl	22 38	10YR 2/2 10YR 4/3	
WCH5	6	6	A & Bk Bk	0-8 12-20	l l	17 23	10YR 2/2 10YR 4/2	
WCH6	20	20	A Bt	0-8 12-20	l l	18 25	10YR 2/2 10YR 3/2	
WCH7	4	4	A Bk	0-8 12-20	l cl	20 30	10YR 2/2 2.5Y 5/2	
WCI1	6	9	A & Bt Bk	0-8 12-20	l l	21 23	10YR 3/3 10YR 4/3	
WCI2	18	> 20	Ap Bt1	0-7 12-18	l cl	25 33	10YR 2/2 10YR 3/2	
WCI3	2	6	A & Bk Bk1 Bk2	0-8[5] 12-20 34-44	l cl cl	24 32 32	10YR 3/2 2.5Y 4/3 2.5Y 4/4	
WCI4	11	>20	A & Bt Bt	0-8 12-20	l cl	20 28	10YR 2/2 10YR 4/2	
WCI5	10	14	Ap Bk	0-7 14-20	l l	20 22	10YR 2/2 2.5Y 5/2	
WCI6	7	7	A Bk	0-6 10-18	l l	20 27	10YR 2/2 2.5Y 5/2	
WCI7	21	26	Ap Bt	0-7 10-17	l cl	26 34	10YR 2/2 10YR 2/2	
WIA1	9	11	Ap Bk	0-6 12-20	l cl	21 28	10YR 2/2 2.5Y 6/3	
WIA2	14	23	Ap Bt C	0-6[5,6] 8-16 27-40	l cl cl	19 30 26	10YR 2/2 10YR 3/3-3/2 2.5Y 5/3	
WIA3	11	16	Ap Bt	0-5 5-16	l cl	24 30	10YR 2/2 10YR 3/2	
WIA4	17	17	Ap Bt C1	0-7[5] 12-17 28-41	l cl cl	24 29 30	10YR 3/2 10YR 4/3 2.5Y 5/2	
WIA5	9	18	Ap Bt	0-8 12-18	sil sicl	26 32	10YR 3/2 10YR 4/3	
WIA6	7	Surface	Ap Bk2	0-7 13-20	l cl	25 30	2.5Y 4/2 2.5Y 5/3	
WIA7	6	3	A Bk2	0-8 13-20	l l	23 25	2/5Y/3/2 2.5Y 4/3	
WIB1	3	Surface	A C	0-8 13-20	sil sil	18 16	10YR 3/3 2.5Y 5/2	
WIB2	6	Surface	Ap Bk	0-6 9-16	l l	22 25	10YR 2/2 10YR 5/4	
WIB3	20	24	A1 Bt	0-8 9-20	l cl	20 25	10YR 2/1 10YR 3/2	
WIB4	15	23	Ap Bw1	0-8 12-15	sl cosl	15 13	10YR 2/2 10YR 3/3	
WIB5	17	17	Ap Bt1	0-8 12-17	l cl	25 30	10YR 2/2 10YR 3/3	

Table A1.2 Sample data (continued)

Site no.[1]	Soil series	Taxadjunct (reason)	Taxonomic class
WIB6	Max		Fine-loamy, mixed, superactive, frigid Typic Haplustolls
WIB7	Tonka		Fine, smectitic, frigid Argiaquic Argialbolls
WIC1	Williams		Fine-loamy, mixed, superactive, frigid Typic Argiustolls
WIC2	Bowbells		Fine-loamy, mixed, superactive, frigid Pachic Argiustolls
WIC3	Vida		Fine-loamy, mixed, superactive, frigid Typic Argiustolls
WIC4	Arnegard		Fine-loamy, mixed, superactive, frigid Pachic Haplustolls
WIC5	Williams		Fine-loamy, mixed, superactive, frigid Typic Argiustolls
WIC6	Savage		Fine, smectitic, frigid Vertic Argiustolls
WIC7	Vallers		Fine-loamy, mixed, superactive, frigid Typic Calciaquolls
WID1	Williams	Buried A horizon at 25 in.	Fine-loamy, mixed, superactive, frigid Typic Argiustolls
WID2	Bowdle	Lower part of mollic is calcareous	Fine-loamy over sandy or sandy-skeletal, mixed, superactive, frigid Pachic Haplustolls
WID3	Zahl		Fine-loamy, mixed, superactive, frigid Typic Calciustolls
WID4	Bowbells		Fine-loamy, mixed, superactive, frigid Pachic Argiustolls
WID5	Williams		Fine-loamy, mixed, superactive, frigid Typic Argiustolls
WID6	Zahl		Fine-loamy, mixed, superactive, frigid Typic Calciustolls
WID7	Dooley		Fine-loamy, mixed, superactive, frigid Typic Argiustolls
WIE1	Temvik		Fine-silty, mixed, superactive, frigid Typic Haplustolls
WIE2	Williams		Fine-loamy, mixed, superactive, frigid Typic Argiustolls
WIE3	Farnuf		Fine-loamy, mixed, superactive, frigid Typic Argiustolls
WIE4	Tonka		Fine, smectitic, frigid Argiaquic Argialbolls
WIE5	Bowbells		Fine-loamy, mixed, superactive, frigid Pachic Argiustolls
WIE6	Zahl		Fine-loamy, mixed, superactive, frigid Typic Calciustolls
WIE7	Arnegard		Fine-loamy, mixed, superactive, frigid Pachic Haplustolls
WIE7 AOV1	Noonan		Fine, smectitic, frigid Typic Natrustolls
WIE7 AOV2	Niobell		Fine, smectitic, frigid Glossic Natrustolls

Table A1.2 Sample data (continued)

Site no.[1]	Depth of mollic (in.)	Depth to CO_3 (in.)	Horizons sampled	Interval sampled (in.)	Texture[2]	% clay[3]	Munsell color[4]	Comments
WIB6	17	11	Ap Bk1	0-7 12-17	l l	26 27	10YR 3/2 2.5Y 5/3	
WIB7	> 26	> 26	Ap Bt1	0-8 14-20	sil sic	26 42	10YR 2/1 10YR 3/1	
WIC1	6	11	Ap Bk	0-6 13-20	l cl	20 26	10YR 2/2 2.5Y 4/2	
WIC2	26	26	Ap Bk	0-6 10-18	l cl	21 30	10YR 2/2 10YR 3/2	
WIC3	6	5	Ap Bk	0-4 6-20	l l	20 25	10YR 3/2 2.5Y 6/2	
WIC4	> 25	> 25	A Bw	0-8 12-17	l l	21 21	10YR 2/2 10YR 3/2	
WIC5	19	11	Ap Bk1	0-7 12-19	l cl	26 30	10YR 3/2 2.5Y 5/3	
WIC6	11	26	A Bt2	0-8 13-20	sicl sic	33 40	10YR 2/2 2.5Y 4/2	
WIC7	13	6	A Bk2 C1	0-8[5] 13-20 31-60	l cl cl	26 30 30	10YR 2/1 2.5Y 5/3 2.5Y 5/2	
WID1	15	38	A Bt	0-8 12-20	l cl	23 29	10YR 2/2 10YR 4/2	
WID2	18	13	Ap Bk	0-6 13-20	l l	21 20	10YR 2/1 10YR 3/2	
WID3	5	Surface	Ap Bk C	0-5[5] 8-13 20-40	l cl cl	23 31 32	10YR 2/2 2.5Y 5/2 2.5Y 4/4	
WID4	20	24	A Bt	0-6 9-19	l cl	20 30	10YR 2/2 10YR 3/2	Buried A horizon at 16 in., 10YR 2/3
WID5	17	17	Ap Bt2	0-7 12-17	l cl	26 32	10YR 2/2 10YR 4/3	
WID6	6	Surface	Ap Bk1	0-6 12-18	l l	23 25	2.5Y 3/2 2.5Y 5/3	
WID7	8	31	Ap Bw (E?)	0-8 12-19	fsl fsl	15 19	10YR 3/2 10YR 5/3	
WIE1	9	13	A Bk	0-8 14-21	sil l	21 25	10YR 2/2 10YR 4/2	
WIE2	11	11	A Bk	0-7 12-20	l cl	23 29	10YR 3/1 10YR 5/3	
WIE3	11	11	Ap Bk	0-8 12-20	sil sil	23 25	10YR 2/1 2.5Y 4/3	
WIE4	> 20	> 20	A Bt	0-7 14-20	sil sic	22 40	10YR 2/1 10YR 3/1	
WIE5	23	29	Ap Bt2	0-8 13-20	cl cl	29 35	10YR 2/1 10YR 3/2	
WIE6	4	Surface	Ap Bk	0-8 11-20	l l	24 24	10YR 3/2 2.5Y 5/2	
WIE7	27	27	Ap Bw2	0-7 12-18	l l	21 23	10YR 2/1 10YR 3/2	
WIE7 AOV1	14	14	Ap Btkn	0-7 14-20	cl cl	29 33	10YR 2/1 10YR 4/3	
WIE7 AOV2	18	26	Ap Btnz1	0-8 12-18	l cl	26 37	10YR 2/2 10YR 4/3	

Table A1.2 Sample data (continued)

Site no.[1]	Soil series	Taxadjunct (reason)	Taxonomic class
WIF1	Zahl		Fine-loamy, mixed, superactive, frigid Typic Calciustolls
WIF1 AOV1	Zahl		Fine-loamy, mixed, superactive, frigid Typic Calciustolls
WIF1 AOV2	Zahl		Fine-loamy, mixed, superactive, frigid Typic Calciustolls
WIF2	Tonka		Fine, smectitic, frigid Argiaquic Argialbolls
WIF3	Banks		Sandy, mixed, frigid Typic Ustifluvents
WIF4	Max		Fine-loamy, mixed, superactive, frigid Typic Haplustolls
WIF5	Max		Fine-loamy, mixed, superactive, frigid Typic Haplustolls
WIF6	Max		Fine-loamy, mixed, superactive, frigid Typic Haplustolls
WIF7	Niobell		Fine, smectitic, frigid Glossic Natrustolls
WIF7 AOV1	Niobell		Fine, smectitic, frigid Glossic Natrustolls
WIF7 AOV2	Niobell		Fine, smectitic, frigid Glossic Natrustolls
WIG1	Max		Fine-loamy, mixed, superactive, frigid Typic Haplustolls
WIG1*	Mondamin		Fine, smectitic, frigid Vertic Argiustolls
WIG2	Savage		Fine, smectitic, frigid Vertic Argiustolls
WIG3	Bowbells		Fine-loamy, mixed, superactive, frigid Pachic Argiustolls
WIG4	Bowbells		Fine-loamy, mixed, superactive, frigid Pachic Argiustolls
WIG5	Williams		Fine-loamy, mixed, superactive, frigid Typic Argiustolls
WIG6	Williams		Fine-loamy, mixed, superactive, frigid Typic Argiustolls
WIG7	Bowbells		Fine-loamy, mixed, superactive, frigid Pachic Argiustolls
WIH1	Williams		Fine-loamy, mixed, superactive, frigid Typic Argiustolls
WIH1*	Zahl		Fine-loamy, mixed, superactive, frigid Typic Calciustolls
WIH2	Bowbells		Fine-loamy, mixed, superactive, frigid Pachic Argiustolls
WIH3	Zahill		Fine-loamy, mixed, superactive, frigid Typic Calciustepts
WIH4	Hamerly		Fine-loamy, mixed, superactive, frigid Aeric Calciaquolls
WIH5	Max		Fine-loamy, mixed, superactive, frigid Typic Haplustolls

Table A1.2 Sample data (continued)

Site no.[1]	Depth of mollic (in.)	Depth to CO_3 (in.)	Horizons sampled	Interval sampled (in.)	Texture[2]	% clay[3]	Munsell color[4]	Comments
WIF1	7	Surface	Ak Bk	0-7 12-18	l l	24 25	10YR 3/2 2.5Y 4/3	
WIF1 AOV1	6	Surface	A Bk	0-6 12-20	l l	23 23	10YR 3/2 2.5Y 4/3	
WIF1 AOV2	7	Surface	Ak Bk2	0-7 12-18	l l	21 23	10YR 3/3 2.5Y 5/3	
WIF2	> 26	> 26	A Bt1	0-8 14-20	sil sic	23 42	10YR 2/1 10YR 2/1	
WIF3	Surface	Surface	AC C	0-8 12-20	fsl lfs	16 10	10YR 4/2 2.5Y 4/2	
WIF4	10	10	Ap Bk	0-8 12-20	l l	23 25	10YR 3/1 10YR 4/2	
WIF5	11	17	A Bk1	0-8 11-17	l l	24 27	10YR 2/2 2.5Y 4/2	
WIF6	16	16	A Bw	0-8 12-16	l l	21 23	10YR 3/3 (Dry) 10YR 4/3 (Dry)	
WIF7	> 20	> 20	Ap Bt2	0-7 13-20	cl cl	28 34	10YR 2/1 10YR 3/3	
WIF7 AOV1	> 20	> 20	Ap Bt	0-8 12-20	l cl	25 36	10YR 2/1 10YR 3/2	
WIF7 AOV2	17	17	Ap Bt	0-8 12-17	cl cl	29 37	10YR 2/1 10YR 3/3	May have stronger Btn horizon than typical for Niobell
WIG1	16	16	Ap Bw	0-8 12-16	l l	24 26	10YR 3/1 10YR 3/2	
WIG1*	8	25	Ap Bw	0-7 10-20	l c	22 45	10YR 3/1 10YR 4/1	
WIG2	11	11	Ap Btkn C2	0-7[5] 12-20 37-60	sil sic sicl	24 40 35	10YR 3/1 10YR 3/3 2.5Y 5/3	
WIG3	23	23	Ap Bt2	0-6 14-20	l cl	25 35	10YR 3/1 10YR 3/3	
WIG4	28	14	A Bk BCk	0-7[5] 14-20 37-53	l l l	25 23 20	10YR 2/1 10YR 3/2 2.5Y 5/3	
WIG5	13	13	Ap Bk C2	0-8[5] 13-20 38-60	l cl cl	25 30 32	10YR 2/2 2.5Y 4/2 2.5Y 6/3	
WIG6	9	13	Ap Bk	0-7 13-20	l cl	23 30	10YR 3/2 2.5Y 5/3	
WIG7	18	18	Ap Bt	0-7 12-18	l cl	26 33	10YR 2/1 10YR 3/2	
WIH1	15	15	A Bt	0-8 12-15	l cl	23 29	10YR 3/1 10YR 4/3	
WIH1*	8	9	Ap Bk	0-7 11-19	l cl	22 30	10YR 2/2 2.5Y 4/2	
WIH2	27	27	A1 Bt1	0-7 12-18	cl cl	28 33	10YR 2/1 10YR 3/1	
WIH3	Surface	Surface	Apk BCk	0-5 14-20	l l	23 25	2.5Y 4/2 2.5Y 5/3	
WIH4	17	Surface (slight) 9 (strong)	Ap Bk1	0-8 12-16	l l	26 24	10YR 2/1 10YR 2/2	
WIH5	12	12	Ap Bk1	0-6 12-20	l cl	26 29	10YR 3/2 2.5Y 5/3	

Table A1.2 Sample data (continued)

Site no.[1]	Soil series	Taxadjunct (reason)	Taxonomic class
WIH6	Barnes		Fine-loamy, mixed, superactive, frigid Calcic Hapludolls
WIH7	Barnes		Fine-loamy, mixed, superactive, frigid Calcic Hapludolls

Table A1.2 Sample data (continued)

Site no.[1]	Depth of mollic (in.)	Depth to CO_3 (in.)	Horizons sampled	Interval sampled (in.)	Texture[2]	% clay[3]	Munsell color[4]	Comments
WIH6	8	13	Ap Bk	0-8 13-20	l l	21 25	10YR 2/2 2.5Y 4/2	
WIH7	9	18	A Bw C	0-8[5] 12-18 35-60	l l cl	23 26 30	10YR 2/1 10YR 4/3 2.5Y 6/3	

[1] See note 1 for Table A1.1

[2] Apparent field texture. Shorthand notation according to Schoeneberger and others (2002, p. 2.29-2.31)

[3] Clay content was estimated in the field using the feel method (Thien, 1979).

[4] Moist sample

[5] Surface subsamples also collected but not included in this dataset.

[6] Surface subsamples collected at 0-2 and 2-8 inches.

Appendix 2
Analytical data

Table A2.1 ICP-AES analytical data

Site No.[1]	Al (wt%)	Ca (wt%)	Fe (wt%)	K (wt%)	Mg (wt%)	Na (wt%)	P (wt%)	Ti (wt%)	Ba (ppm)	Be (ppm)	Ce (ppm)	Co (ppm)	Cr (ppm)	Cu (ppm)
ABE7	5.180	1.073	2.47	1.53	0.616	0.775	0.072	0.250	614	1.5	52	9	66	20
ABF7	4.210	1.222	1.93	1.17	0.601	0.584	0.061	0.201	420	1.0	37	13	47	19
ABG7	6.190	4.415	2.85	1.59	1.310	1.052	0.073	0.337	637	2.0	50	11	48	24
ABH7	6.040	0.782	2.92	1.44	0.465	0.845	0.055	0.370	613	1.0	46	12	79	21
BSA1	6.597	0.557	2.95	2.19	1.054	0.781	0.060	0.304	676	2.0	58	12	56	26
BSA2	6.144	0.617	2.33	2.17	0.614	0.917	0.063	0.279	705	2.0	60	10	36	18
BSA3	5.843	0.677	2.57	1.87	0.606	0.885	0.070	0.294	862	2.0	57	9	46	18
BSA3 AOV1	6.064	0.545	2.40	1.99	0.647	0.879	0.063	0.293	696	2.0	58	9	50	19
BSA3 AOV2	5.916	0.534	2.33	1.95	0.655	0.869	0.062	0.287	706	2.0	60	10	42	18
BSA4	7.129	0.532	2.93	2.37	0.947	0.710	0.062	0.304	731	2.0	58	11	63	32
BSA5	6.914	1.086	2.61	1.86	0.630	1.514	0.070	0.423	830	1.5	65	9	65	15
BSA6	6.699	2.471	3.23	2.07	1.120	1.001	0.086	0.286	739	2.0	48	11	61	36
BSA7	6.127	0.619	2.27	2.05	0.673	1.180	0.061	0.300	741	2.0	66	8	39	17
BSB1	6.211	0.559	2.52	1.97	0.785	0.886	0.057	0.289	702	1.5	59	10	50	20
BSB2	6.464	0.589	2.66	1.90	0.874	0.898	0.058	0.309	670	1.5	55	10	47	15
BSB3	4.778	3.586	1.75	1.59	1.296	0.788	0.050	0.238	452	1.5	66	6	30	8
BSB4	6.771	1.126	2.96	1.91	0.635	1.473	0.064	0.387	886	2.0	66	11	38	11
BSB5	6.884	0.676	2.93	2.11	0.907	0.901	0.078	0.311	701	2.0	55	12	55	29
BSB6	6.605	3.779	2.46	2.08	1.634	0.748	0.056	0.277	933	2.0	52	10	42	31
BSB7	6.484	3.751	2.85	2.03	1.226	0.907	0.070	0.286	680	2.0	49	9	37	32
BSC1	5.780	0.798	1.77	1.77	0.418	1.372	0.051	0.332	827	1.0	58	7	22	7
BSC2	6.385	0.950	2.61	1.96	0.656	1.218	0.073	0.328	819	1.5	55	9	36	16
BSC3	7.350	1.436	2.67	1.84	0.857	1.743	0.045	0.267	837	1.5	45	8	25	5
BSC4	6.850	2.015	2.52	1.81	0.891	1.620	0.074	0.340	901	2.0	62	11	71	10
BSC5	5.310	2.185	2.43	1.66	1.135	1.155	0.073	0.304	852	1.0	58	8	46	12
BSC6	6.464	0.777	2.79	1.95	0.721	1.051	0.063	0.312	901	2.0	56	10	45	20
BSC7	5.983	0.773	2.43	1.78	0.578	1.062	0.066	0.300	893	1.5	60	9	41	17
BSC7 AOV1	6.402	0.857	2.58	1.99	0.596	1.192	0.070	0.316	932	1.5	59	8	37	18
BSC7 AOV2	6.218	0.830	2.37	1.89	0.547	1.258	0.071	0.316	834	1.5	57	8	32	14
BSD1	6.798	0.846	2.34	1.84	0.540	1.528	0.056	0.375	885	1.5	57	9	24	18
BSD2	6.620	0.852	2.73	1.98	0.690	1.256	0.054	0.313	769	1.5	54	9	26	16
BSD3	6.845	0.924	2.46	1.89	0.606	1.321	0.055	0.334	800	1.5	60	8	33	16
BSD4	6.545	1.330	2.84	1.73	0.676	1.430	0.068	0.288	1355	2.0	50	10	65	11
BSD5	6.731	0.813	2.95	2.06	1.035	1.019	0.068	0.300	712	2.0	53	10	31	25
BSD6	5.047	4.097	2.32	1.64	0.968	1.016	0.082	0.304	1048	1.0	54	8	23	13
BSD7	6.034	1.412	2.52	1.93	0.747	0.991	0.078	0.317	776	1.5	57	9	37	19
BSE1	6.568	1.304	2.32	1.65	0.598	1.313	0.048	0.339	1090	1.5	51	9	26	19
BSE2	6.514	0.945	1.91	1.82	0.462	1.556	0.048	0.286	834	2.0	54	9	30	15

Table A2.1 ICP-AES analytical data (continued)

Site No.[1]	Ga (ppm)	La (ppm)	Li (ppm)	Mn (ppm)	Nb (ppm)	Nd (ppm)	Ni (ppm)	Pb (ppm)	Sc (ppm)	Sr (ppm)	Th (ppm)	V (ppm)	Y (ppm)	Zn (ppm)
ABE7	15	30	21	1515	13	21.5	29	16	8	135	5	97	17.5	101
ABF7	12	20	20	4770	9	14.5	36	14	7	116	5	113	16.0	81
ABG7	18	29	30	564	14	21.5	31	13	11	209	5	106	18.5	80
ABH7	17	27	19	762	15	18.5	35	15	10	144	5	107	16.5	77
BSA1	18	31	33	566	14	24.5	33	16	11	120	9	109	18.5	81
BSA2	16	34	25	531	14	26.5	24	13	9	144	8	75	17.5	72
BSA3	15	34	24	566	14	25.5	25	15	9	143	8	75	18.0	76
BSA3 AOV1	16	33	25	509	14	25.5	25	14	9	126	8	79	18.0	73
BSA3 AOV2	15	33	25	505	14	26.5	26	13	9	125	9	79	17.5	69
BSA4	20	32	37	558	15	25.5	34	16	12	102	9	105	18.0	91
BSA5	17	39	20	523	18	29.0	28	10	10	260	8	89	18.0	74
BSA6	18	30	27	752	13	21.5	33	14	11	188	9	96	17.5	84
BSA7	15	37	24	449	14	28.0	26	11	8	158	8	70	17.5	66
BSB1	16	34	26	482	14	25.5	27	13	9	139	8	89	17.5	70
BSB2	16	31	26	300	14	23.5	28	14	10	151	8	105	17.0	72
BSB3	12	36	22	282	12	26.0	16	9	6	85	7	53	16.0	46
BSB4	17	39	22	660	15	28.5	30	11	10	301	8	88	18.0	71
BSB5	18	31	29	669	14	24.0	37	14	11	130	8	99	17.0	81
BSB6	18	29	33	396	12	22.5	31	13	11	162	8	96	15.5	74
BSB7	20	28	32	558	11	25.5	32	14	11	144	10	90	17.5	71
BSC1	15	33	20	308	14	26.0	23	10	7	230	3	66	16.0	53
BSC2	18	31	23	499	14	26.5	30	14	10	234	8	87	18.0	78
BSC3	19	26	29	212	12	21.5	27	12	9	338	7	90	14.5	58
BSC4	19	34	24	619	15	22.5	31	13	10	323	3	85	16.5	82
BSC5	14	33	22	391	13	23.5	25	11	8	200	3	74	16.0	62
BSC6	19	34	24	538	14	27.5	32	14	10	166	8	84	19.5	78
BSC7	18	34	21	554	13	33.5	27	14	9	166	12	77	17.5	70
BSC7 AOV1	17	33	22	542	14	28.5	30	14	9	196	8	81	18.0	78
BSC7 AOV2	17	33	22	464	14	26.5	27	13	9	203	7	79	17.5	77
BSD1	19	33	22	566	14	33.0	30	15	10	253	11	82	19.5	70
BSD2	18	31	24	441	13	25.0	32	15	9	212	7	85	17.0	66
BSD3	18	35	26	373	13	28.0	29	12	9	229	8	86	18.0	64
BSD4	18	29	22	397	14	21.5	29	15	9	365	5	126	16.5	75
BSD5	19	30	27	488	14	25.0	36	17	11	161	8	97	18.0	80
BSD6	14	31	21	537	13	24.5	28	11	8	170	7	64	16.0	63
BSD7	18	34	23	593	13	31.5	30	14	9	161	9	82	19.5	75
BSE1	18	29	28	428	14	23.0	32	14	10	263	5	85	16.5	66
BSE2	18	28	20	363	13	23.0	26	9	8	273	10	79	16.0	66

Table A2.1 ICP-AES analytical data (continued)

Site No.[1]	Al (wt%)	Ca (wt%)	Fe (wt%)	K (wt%)	Mg (wt%)	Na (wt%)	P (wt%)	Ti (wt%)	Ba (ppm)	Be (ppm)	Ce (ppm)	Co (ppm)	Cr (ppm)	Cu (ppm)
BSE3	6.247	1.072	1.90	1.66	0.462	1.535	0.057	0.331	880	1.5	59	8	46	10
BSE4	6.573	3.842	3.09	1.88	1.270	0.940	0.075	0.281	743	2.0	47	10	46	27
BSE5	6.235	0.742	2.64	1.89	0.796	1.012	0.074	0.299	746	2.0	50	9	57	19
BSE7	6.374	2.651	2.53	1.74	0.716	1.072	0.062	0.291	1210	1.5	47	10	43	15
BSF1	6.151	1.063	2.19	1.73	0.531	1.434	0.062	0.310	933	2.0	53	7	43	12
BSF2	6.114	1.002	1.55	1.72	0.455	1.623	0.043	0.310	783	1.0	47	9	31	9
BSF3	6.145	0.892	2.17	2.03	0.609	1.309	0.060	0.314	810	1.5	58	8	44	14
BSF4	6.420	0.963	1.92	1.85	0.532	1.479	0.062	0.333	904	1.0	52	9	37	14
BSF5	5.581	1.017	2.25	1.86	0.689	1.024	0.079	0.275	774	1.5	61	8	19	14
BSF6	6.444	0.786	2.58	2.16	0.662	1.119	0.069	0.307	864	2.0	61	9	47	18
BSF7	8.463	1.835	5.87	1.42	2.167	1.389	0.060	0.564	549	1.5	34	27	785	39
BSG1	5.444	1.019	2.03	1.74	0.575	1.345	0.066	0.301	746	1.0	54	7	29	10
BSG2	6.237	0.842	2.31	1.92	0.745	1.203	0.057	0.310	763	2.0	53	9	48	18
BSG3	5.590	0.835	2.24	1.95	0.689	1.089	0.073	0.291	739	1.5	59	8	42	14
BSG4	6.628	1.282	2.09	1.96	0.591	1.613	0.077	0.316	872	1.5	51	10	43	17
BSG5	5.495	1.351	2.17	1.93	0.837	1.112	0.104	0.276	763	1.0	54	8	37	17
BSG6	5.379	0.806	2.06	1.84	0.550	1.118	0.068	0.284	774	1.5	60	8	16	12
BSG7	5.545	3.169	2.41	1.70	0.918	1.017	0.080	0.292	716	1.0	52	9	36	18
BSH1	5.464	4.294	2.20	1.71	1.313	1.057	0.067	0.273	730	1.5	51	10	14	16
BSH2	5.955	1.084	2.23	1.80	0.715	1.179	0.054	0.291	700	1.5	50	9	35	15
BSH3	5.875	2.861	2.57	1.70	0.890	1.251	0.076	0.299	749	1.5	52	10	37	13
BSH4	5.519	0.804	2.12	1.87	0.567	1.106	0.065	0.272	756	1.0	55	8	41	16
BSH5	7.465	1.645	2.46	1.66	0.693	1.867	0.059	0.289	837	2.0	42	10	25	10
BSH6	6.831	0.994	3.00	2.20	1.026	0.697	0.067	0.292	626	2.0	61	11	26	25
BSH7	7.574	3.900	3.64	1.76	1.218	0.621	0.044	0.320	609	2.0	56	11	54	23
BSI1	5.333	0.853	2.11	1.72	0.592	0.964	0.067	0.254	679	1.5	55	9	42	18
BSI3	6.574	1.286	2.83	1.67	0.868	1.345	0.079	0.284	727	2.0	45	9	50	16
BSI4	6.335	0.849	2.59	1.96	0.717	1.156	0.069	0.297	798	2.0	63	11	51	17
BSI5	5.554	0.940	2.26	1.80	0.617	1.184	0.057	0.267	721	1.5	56	9	43	14
BSI6	5.017	4.511	2.25	1.62	1.025	0.738	0.072	0.234	545	1.5	55	10	46	21
BSI7	5.398	0.831	2.39	1.69	0.698	0.864	0.063	0.262	630	2.0	65	10	46	19
DKA1	5.924	0.762	1.86	1.84	0.435	1.271	0.046	0.287	757	1.5	61	7	21	11
DKA2	6.105	0.910	1.68	1.89	0.451	1.475	0.048	0.332	807	1.5	72	7	45	7
DKA3	5.285	0.534	2.02	1.85	0.432	0.758	0.063	0.246	765	1.5	56	8	48	17
DKA4	4.630	3.350	1.65	1.72	0.754	0.750	0.056	0.229	540	1.0	65	5	49	9
DKA5	5.300	5.688	2.16	2.06	2.827	0.270	0.056	0.233	449	1.5	54	8	10	22
DKA6	4.790	4.697	1.71	1.89	1.132	0.604	0.043	0.200	470	1.0	53	6	11	16
DKA7	4.652	6.188	1.77	1.89	1.255	0.623	0.050	0.201	475	1.5	52	6	12	20

Table A2.1 ICP-AES analytical data (continued)

Site No.[1]	Ga (ppm)	La (ppm)	Li (ppm)	Mn (ppm)	Nb (ppm)	Nd (ppm)	Ni (ppm)	Pb (ppm)	Sc (ppm)	Sr (ppm)	Th (ppm)	V (ppm)	Y (ppm)	Zn (ppm)
BSE3	15	31	19	400	17	26.5	24	10	8	283	12	69	17.5	54
BSE4	20	25	34	287	13	22.5	33	12	11	254	11	118	17.0	84
BSE5	18	30	27	386	14	22.0	30	15	10	158	6	98	17.0	77
BSE7	18	27	24	496	12	25.0	36	13	10	171	9	82	15.5	60
BSF1	17	28	19	594	15	23.5	20	9	8	278	11	73	16.0	57
BSF2	17	27	19	201	14	18.0	24	11	7	278	8	69	13.5	54
BSF3	17	33	22	413	15	25.0	23	14	8	213	12	78	17.0	66
BSF4	17	30	20	335	15	23.5	26	13	9	266	9	80	16.5	74
BSF5	16	32	23	369	17	27.0	23	13	8	189	13	76	17.0	62
BSF6	18	35	25	506	14	29.0	29	15	9	185	8	90	19.0	80
BSF7	23	18	42	997	17	17.0	133	7	20	192	9	198	12.5	126
BSG1	15	32	19	373	14	24.5	19	12	7	224	11	68	15.0	54
BSG2	18	32	24	383	14	26.0	27	12	8	200	12	82	16.5	64
BSG3	16	34	23	325	14	28.0	22	14	8	170	13	81	17.5	64
BSG4	18	30	20	466	14	24.5	24	14	8	306	11	75	16.5	72
BSG5	16	31	22	314	13	24.0	22	14	8	191	11	78	16.0	72
BSG6	14	31	20	401	17	26.0	22	12	7	191	12	74	16.0	63
BSG7	16	32	21	463	14	27.0	26	12	8	174	12	88	17.5	64
BSH1	16	29	24	434	12	23.5	26	12	8	206	12	77	15.5	53
BSH2	17	30	24	636	13	24.0	26	14	8	211	12	90	16.0	64
BSH3	17	31	24	470	13	25.5	26	12	9	236	11	80	17.0	60
BSH4	16	33	21	424	13	25.5	21	14	7	172	12	73	16.5	66
BSH5	21	25	21	450	12	19.5	24	13	8	423	10	76	14.5	61
BSH6	20	34	34	563	22	26.5	30	16	11	129	14	111	18.0	87
BSH7	24	33	45	382	15	25.5	32	18	12	167	15	124	18.5	83
BSI1	16	31	19	1165	13	24.5	25	14	8	172	11	84	16.5	84
BSI3	18	26	27	433	17	20.5	25	12	9	266	10	89	15.5	75
BSI4	17	34	24	524	17	28.0	29	13	9	206	13	92	18.5	78
BSI5	15	30	20	792	16	23.5	26	12	8	208	11	87	16.0	68
BSI6	14	28	26	1900	14	22.0	31	13	8	165	11	110	16.0	74
BSI7	15	34	25	1310	15	27.0	30	14	8	157	14	106	17.5	85
DKA1	16	31	20	285	13	24.0	21	12	7	209	9	65	16.5	59
DKA2	16	39	20	302	16	28.0	18	12	7	227	3	64	17.5	59
DKA3	15	33	20	442	13	21.5	19	15	7	139	3	63	17.0	72
DKA4	13	36	20	346	12	23.5	15	11	6	108	3	51	15.0	49
DKA5	16	27	33	367	11	22.5	19	13	8	128	10	68	17.5	63
DKA6	14	26	21	296	9	20.5	16	14	7	89	9	54	14.5	47
DKA7	14	26	22	340	10	21.0	15	11	6	112	10	49	14.5	50

Table A2.1 ICP-AES analytical data (continued)

Site No.[1]	Al (wt%)	Ca (wt%)	Fe (wt%)	K (wt%)	Mg (wt%)	Na (wt%)	P (wt%)	Ti (wt%)	Ba (ppm)	Be (ppm)	Ce (ppm)	Co (ppm)	Cr (ppm)	Cu (ppm)
DKB1	5.865	0.391	2.25	1.99	0.600	0.440	0.043	0.274	590	1.5	60	8	10	14
DKB2	5.210	2.548	2.06	1.61	0.913	1.025	0.064	0.275	791	1.0	51	7	36	19
DKB3	4.460	2.560	1.52	1.82	1.083	0.796	0.051	0.228	422	1.0	65	5	47	6
DKB4	5.695	0.575	2.49	2.00	0.650	0.690	0.081	0.265	592	2.0	64	8	65	15
DKB5	5.890	2.956	2.33	2.20	1.244	0.426	0.057	0.253	526	2.0	60	8	34	29
DKB6	5.011	4.415	1.79	1.82	1.711	0.565	0.050	0.214	469	1.5	54	7	16	16
DKB7	5.888	2.703	2.13	1.89	1.079	1.211	0.064	0.257	673	1.0	50	7	15	17
DKC1	5.285	0.447	1.81	2.07	0.500	0.789	0.051	0.227	605	1.0	57	7	33	15
DKC1 AOV1	5.313	1.370	1.66	1.96	0.652	0.997	0.047	0.229	578	1.0	52	6	20	17
DKC1 AOV2	5.458	1.091	1.75	2.01	0.666	1.016	0.050	0.242	608	1.0	57	7	10	12
DKC2	4.776	4.969	1.62	1.92	1.397	0.853	0.051	0.250	409	1.0	67	6	13	10
DKC3	5.984	0.487	2.15	2.24	0.701	0.728	0.053	0.283	579	2.0	70	7	15	18
DKC4	6.313	0.507	2.44	2.44	0.846	0.636	0.057	0.273	582	2.0	61	9	24	19
DKC5	5.417	4.995	2.08	2.21	1.972	0.543	0.050	0.218	480	2.0	55	7	25	19
DKC6	6.153	2.021	2.39	2.00	1.125	0.865	0.058	0.279	731	2.0	55	9	21	27
DKC7	4.622	5.937	1.78	1.75	2.335	0.567	0.059	0.221	541	0.8	52	7	11	16
DKD1	4.095	2.715	1.29	1.51	0.699	0.198	0.033	0.215	452	1.0	65	5	40	15
DKD2	5.230	0.667	2.21	1.90	0.731	0.802	0.058	0.238	541	1.5	71	6	49	10
DKD3	5.590	2.364	2.96	1.82	0.905	1.135	0.071	0.254	799	1.5	58	8	51	21
DKD4	7.120	0.520	3.30	2.18	0.961	1.011	0.068	0.323	734	2.0	56	11	26	28
DKD5	6.409	3.221	3.26	2.81	1.545	0.591	0.056	0.242	701	2.0	59	9	23	26
DKD6	6.825	2.597	3.19	2.14	1.314	0.903	0.072	0.317	743	2.0	57	13	29	34
DKD7	5.800	3.111	2.59	2.18	1.152	0.800	0.064	0.248	579	2.0	72	8	36	22
DKE1	4.754	3.048	1.44	2.01	1.032	0.260	0.039	0.210	585	1.0	61	5	29	10
DKE2	7.183	1.481	3.45	2.40	1.593	0.729	0.080	0.313	860	2.0	53	12	65	39
DKE3	5.305	4.894	1.84	1.76	1.739	0.733	0.074	0.238	530	1.0	49	10	44	19
DKE4	6.475	0.754	2.36	1.44	0.569	0.597	0.049	0.323	610	2.0	75	8	15	16
DKE4 AOV1	5.390	3.110	2.12	1.77	1.110	0.826	0.074	0.239	678	1.5	48	8	18	21
DKE4 AOV2	5.863	3.202	2.39	2.04	1.265	0.902	0.081	0.268	663	1.5	56	8	21	22
DKE5	6.277	0.466	2.94	1.93	0.660	0.671	0.052	0.289	766	2.0	57	10	21	27
DKE6	6.026	2.923	2.07	1.47	0.851	0.958	0.056	0.296	1620	2.0	67	7	12	16
DKE7	6.237	0.502	2.86	1.92	0.695	1.013	0.057	0.298	736	2.0	55	10	19	22
DKF1	4.512	1.498	1.72	1.84	0.504	0.602	0.043	0.227	461	1.0	66	7	32	8
DKF1 AOV1	4.835	2.387	1.82	1.98	0.731	0.797	0.056	0.226	476	1.5	60	6	41	8
DKF1 AOV2	4.770	3.088	1.87	1.78	0.690	0.766	0.051	0.230	470	1.5	60	6	42	10
DKF2	6.142	1.827	2.38	2.06	0.868	0.458	0.058	0.262	584	2.0	59	8	51	36
DKF3	6.262	2.091	2.79	2.12	1.064	0.856	0.079	0.279	720	2.0	56	10	52	29
DKF4	5.825	0.784	2.38	2.01	0.602	1.181	0.069	0.297	893	2.0	54	9	44	14

Table A2.1 ICP-AES analytical data (continued)

Site No.[1]	Ga (ppm)	La (ppm)	Li (ppm)	Mn (ppm)	Nb (ppm)	Nd (ppm)	Ni (ppm)	Pb (ppm)	Sc (ppm)	Sr (ppm)	Th (ppm)	V (ppm)	Y (ppm)	Zn (ppm)
DKB1	17	31	22	382	14	24.5	19	15	8	97	10	76	17.5	66
DKB2	14	29	22	508	13	20.5	24	13	8	161	3	74	16.0	63
DKB3	13	35	21	350	10	24.0	12	10	6	67	3	47	16.5	47
DKB4	17	36	25	617	10	27.0	22	16	9	90	7	75	21.5	93
DKB5	18	30	31	384	12	26.0	20	15	9	77	12	74	19.0	68
DKB6	15	27	25	320	9	21.0	18	12	7	88	8	64	16.0	60
DKB7	16	26	22	408	11	21.0	24	12	8	179	9	72	15.0	65
DKC1	15	28	18	488	12	22.0	16	14	7	96	9	55	15.5	56
DKC1 AOV1	15	27	19	305	12	21.5	15	12	7	135	8	58	14.0	47
DKC1 AOV2	15	28	19	304	12	22.0	18	13	7	138	8	62	14.5	52
DKC2	14	33	22	286	11	25.0	15	10	7	90	10	47	15.0	52
DKC3	19	34	27	372	15	29.0	19	17	9	84	11	65	18.5	70
DKC4	19	32	29	518	15	27.5	21	17	9	81	11	73	19.0	91
DKC5	17	28	31	372	11	21.0	17	13	9	95	9	58	16.5	53
DKC6	18	29	27	411	13	24.5	26	15	10	129	11	83	17.5	72
DKC7	14	26	23	340	9	19.5	18	11	7	111	8	60	15.5	53
DKD1	12	34	21	178	12	28.0	16	12	6	75	8	56	16.0	41
DKD2	15	37	24	401	13	31.0	17	13	8	84	8	66	17.0	59
DKD3	16	29	23	653	13	25.0	26	14	9	179	7	83	16.0	61
DKD4	20	33	28	645	21	26.5	33	16	11	152	13	99	19.0	92
DKD5	19	30	36	716	17	25.0	22	15	10	84	13	75	16.5	63
DKD6	19	29	32	1002	18	24.5	39	14	11	153	13	105	17.0	84
DKD7	16	34	31	767	11	30.5	20	14	9	95	9	74	18.0	57
DKE1	13	30	27	212	14	26.5	13	8	6	147	13	44	14.5	39
DKE2	20	26	34	857	19	23.0	38	17	12	138	12	117	16.5	97
DKE3	14	24	22	322	15	21.0	31	8	9	173	11	76	15.0	62
DKE4	19	39	26	348	22	32.0	17	14	10	141	15	78	21.0	61
DKE4 AOV1	15	26	20	398	15	21.0	23	10	8	136	10	73	14.5	64
DKE4 AOV2	16	28	23	380	17	23.5	27	11	9	157	12	87	16.0	70
DKE5	18	32	26	629	18	27.5	26	13	10	127	12	83	19.5	80
DKE6	17	35	24	694	20	26.5	14	17	8	263	15	77	23.5	58
DKE7	17	30	25	544	18	25.0	30	11	10	164	11	87	18.0	67
DKF1	12	33	18	183	14	27.5	17	9	6	82	13	52	14.5	46
DKF1 AOV1	13	30	22	475	15	25.0	15	8	7	90	12	53	14.0	45
DKF1 AOV2	13	31	22	505	14	25.5	16	8	7	87	12	54	15.0	45
DKF2	17	31	32	377	17	27.0	26	15	9	132	14	93	17.5	77
DKF3	17	28	28	691	17	24.5	31	13	10	121	13	92	17.5	83
DKF4	15	28	21	506	17	24.0	28	9	9	230	12	74	16.5	65

Table A2.1 ICP-AES analytical data (continued)

Site No.[1]	Al (wt%)	Ca (wt%)	Fe (wt%)	K (wt%)	Mg (wt%)	Na (wt%)	P (wt%)	Ti (wt%)	Ba (ppm)	Be (ppm)	Ce (ppm)	Co (ppm)	Cr (ppm)	Cu (ppm)
DKF5	5.757	0.372	2.51	1.85	0.618	0.795	0.054	0.304	656	2.0	64	11	17	19
DKF6	4.585	0.383	2.02	1.69	0.454	0.735	0.038	0.306	517	2.0	63	8	9	9
DKF7	5.726	0.517	2.55	1.87	0.596	1.035	0.064	0.280	724	2.0	55	9	15	18
DKG1	6.110	2.010	2.36	2.29	1.023	0.360	0.050	0.237	603	2.0	63	7	44	32
DKG2	5.260	0.446	1.95	2.11	0.623	0.762	0.052	0.225	568	1.5	60	7	41	14
DKG3	5.667	0.648	2.70	1.96	0.633	0.935	0.067	0.279	810	2.0	53	9	47	25
DKG4	6.491	0.751	2.91	1.78	0.744	1.191	0.065	0.373	628	1.5	61	9	27	11
DKG5	7.553	1.480	3.36	2.38	1.446	0.634	0.052	0.312	630	2.0	52	16	63	45
DKG6	6.972	1.913	2.92	2.11	0.994	0.922	0.073	0.307	892	2.0	55	12	58	34
DKG7	6.881	0.510	3.15	1.97	0.856	0.835	0.055	0.298	728	2.0	59	11	29	31
DKH1	6.366	1.076	2.92	2.08	0.955	0.461	0.049	0.300	600	2.0	59	12	54	31
DKH2	4.674	1.551	1.52	2.04	1.029	0.796	0.056	0.243	447	1.5	56	5	32	9
DKH3	6.664	0.420	4.09	2.18	0.814	0.610	0.062	0.285	916	2.0	60	10	59	45
DKH4	6.844	0.607	2.92	2.09	0.759	0.837	0.064	0.314	702	2.0	51	11	25	26
DKH4 AOV1	6.880	0.409	2.78	2.07	0.747	0.610	0.059	0.285	665	2.0	60	12	28	30
DKH4 AOV2	6.563	0.401	2.71	2.12	0.712	0.631	0.058	0.284	668	2.0	60	11	22	31
DKH5	6.870	0.576	3.14	2.11	0.834	0.842	0.061	0.325	746	2.0	56	12	20	33
DKH6	7.714	0.668	2.56	2.33	0.937	0.614	0.050	0.346	780	2.0	65	12	21	37
DKH7	6.398	0.678	2.49	1.97	0.805	1.247	0.066	0.324	851	2.0	53	12	25	25
DKI1	5.840	1.548	3.42	2.42	0.864	0.767	0.176	0.332	580	1.5	80	17	40	46
DKI2	6.212	0.706	2.61	1.92	0.734	0.906	0.056	0.333	758	2.0	56	9	39	19
DKI3	5.620	0.675	2.53	1.90	0.673	0.848	0.066	0.269	728	2.0	56	9	20	18
DKI3 AOV1	5.695	0.589	2.47	1.99	0.589	0.905	0.068	0.299	756	2.0	61	8	17	18
DKI3 AOV2	5.661	0.563	2.43	1.92	0.579	0.880	0.065	0.291	752	2.0	57	9	18	16
DKI4	5.865	0.634	2.50	2.04	0.737	0.612	0.065	0.260	682	2.0	62	10	21	25
DKI4 AOV1	5.914	0.427	2.50	1.85	0.641	0.910	0.052	0.279	681	2.0	57	10	24	20
DKI4 AOV2	6.018	0.413	2.64	1.81	0.678	0.870	0.050	0.278	644	2.0	56	10	16	23
DKI5	6.565	0.612	2.90	2.09	0.912	0.699	0.067	0.296	800	2.0	61	12	29	27
DKI6	6.462	0.633	2.69	2.11	0.874	0.952	0.063	0.314	886	1.5	58	12	16	29
DKI7	7.053	0.538	3.20	2.13	0.901	0.828	0.062	0.312	730	2.0	54	13	29	36
DKI7 AOV1	6.164	0.704	2.38	2.06	0.642	1.119	0.080	0.279	775	1.5	58	9	19	20
DKI7 AOV2	6.082	0.668	2.33	1.97	0.594	1.166	0.072	0.299	769	2.0	61	8	14	17
DLA1	4.820	4.166	1.88	1.57	1.130	1.103	0.060	0.222	679	1.0	49	8	17	12
DLA2	5.113	1.595	2.14	1.70	0.673	1.118	0.064	0.240	660	1.0	53	8	31	12
DLA3	5.414	3.126	2.19	1.77	1.101	1.098	0.068	0.243	640	1.0	54	8	42	17
DLA4	4.587	4.981	1.83	1.61	0.910	1.137	0.068	0.208	669	0.8	43	8	22	11
DLA5	4.440	3.808	1.57	1.61	0.728	1.221	0.070	0.188	667	1.0	39	7	24	9
DLA6	5.796	1.128	2.67	1.64	0.855	0.760	0.073	0.251	576	1.5	45	9	53	22

Table A2.1 ICP-AES analytical data (continued)

Site No.[1]	Ga (ppm)	La (ppm)	Li (ppm)	Mn (ppm)	Nb (ppm)	Nd (ppm)	Ni (ppm)	Pb (ppm)	Sc (ppm)	Sr (ppm)	Th (ppm)	V (ppm)	Y (ppm)	Zn (ppm)
DKF5	16	33	25	445	17	28.0	28	12	10	128	13	83	18.0	66
DKF6	13	33	20	340	16	28.5	17	10	6	98	11	84	13.0	47
DKF7	16	29	23	427	16	25.0	27	10	8	166	11	75	17.0	63
DKG1	18	30	46	325	17	27.5	21	15	10	77	15	78	18.0	62
DKG2	14	30	24	465	15	26.5	19	11	8	89	13	62	16.5	58
DKG3	16	28	23	609	17	24.5	26	11	8	149	12	81	16.5	72
DKG4	18	33	23	428	20	28.0	29	7	10	201	12	95	16.0	64
DKG5	21	25	38	335	19	23.0	35	14	13	192	12	117	16.5	86
DKG6	18	28	31	386	18	25.0	33	12	12	180	12	102	19.0	80
DKG7	19	31	40	505	18	26.5	36	11	12	137	13	100	18.0	84
DKH1	19	29	36	371	18	26.5	36	13	10	111	13	108	18.5	83
DKH2	12	28	23	287	15	24.0	13	8	7	78	11	49	15.0	42
DKH3	20	29	36	445	18	27.0	31	16	11	140	13	112	18.5	85
DKH4	19	29	28	490	20	22.0	32	12	12	162	11	107	18.0	91
DKH4 AOV1	20	32	34	485	18	27.0	31	14	11	122	12	96	18.5	79
DKH4 AOV2	19	31	31	427	19	27.5	31	13	11	130	13	93	18.5	75
DKH5	20	31	30	557	20	25.0	36	13	12	149	12	109	19.0	86
DKH6	23	33	53	418	23	27.5	32	19	13	133	14	112	18.5	84
DKH7	17	28	27	487	20	23.5	33	12	10	172	11	93	17.5	74
DKI1	16	34	28	1175	17	35.0	26	19	9	138	16	87	24.0	67
DKI2	18	30	23	502	16	27.0	28	12	9	147	13	86	17.0	67
DKI3	16	31	23	572	16	26.0	24	11	9	123	11	67	18.5	66
DKI3 AOV1	16	33	25	469	18	28.0	27	11	9	137	12	74	18.5	72
DKI3 AOV2	15	32	23	481	17	26.5	25	11	9	131	12	74	18.5	69
DKI4	17	33	31	582	18	28.0	27	15	9	108	13	83	21.0	92
DKI4 AOV1	17	30	24	682	16	26.0	26	12	9	125	12	81	17.5	75
DKI4 AOV2	17	29	24	606	19	25.0	28	13	10	127	12	83	17.5	79
DKI5	19	32	28	688	20	27.0	32	16	11	124	13	96	19.0	86
DKI6	18	29	29	505	20	24.5	36	13	11	167	13	105	17.5	77
DKI7	21	30	32	670	19	26.0	36	14	12	136	12	103	18.0	91
DKI7 AOV1	16	28	23	464	18	24.0	27	10	9	203	11	82	15.5	79
DKI7 AOV2	17	31	22	423	17	27.0	25	10	9	199	12	78	16.0	75
DLA1	13	27	19	430	14	20.5	21	12	6	193	11	69	16.0	50
DLA2	14	30	20	501	14	24.0	24	12	7	172	12	81	17.5	55
DLA3	15	30	25	460	16	20.5	23	11	8	195	12	88	15.5	65
DLA4	12	24	17	446	12	18.5	22	14	6	205	9	63	14.5	46
DLA5	12	22	14	420	11	18.5	18	15	6	211	8	57	13.5	49
DLA6	15	28	26	775	15	23.0	28	13	9	150	10	119	16.0	90

Table A2.1 ICP-AES analytical data (continued)

Site No.[1]	Al (wt%)	Ca (wt%)	Fe (wt%)	K (wt%)	Mg (wt%)	Na (wt%)	P (wt%)	Ti (wt%)	Ba (ppm)	Be (ppm)	Ce (ppm)	Co (ppm)	Cr (ppm)	Cu (ppm)
DLA7	5.288	1.086	2.43	1.56	0.736	0.724	0.058	0.236	515	1.5	53	11	34	23
DLB1	4.727	3.858	2.12	1.62	1.054	1.022	0.068	0.224	589	1.0	47	8	29	14
DLB2	5.159	0.973	2.13	1.45	0.584	1.120	0.059	0.246	703	1.0	56	9	45	13
DLB3	4.538	3.736	1.47	1.56	0.874	1.240	0.062	0.205	614	1.0	55	6	21	8
DLB4	5.529	2.624	2.44	1.58	1.215	0.922	0.058	0.249	601	1.0	50	10	45	19
DLB5	4.203	3.792	1.92	1.30	0.930	0.754	0.074	0.190	513	0.8	44	8	38	16
DLB6	4.910	3.871	2.19	1.69	1.224	0.894	0.061	0.232	568	1.0	50	9	46	19
DLB7	5.154	1.056	2.31	1.44	0.641	0.895	0.055	0.232	593	1.5	50	9	45	21
DLC1	4.740	1.491	2.09	1.74	0.707	0.904	0.076	0.230	614	1.0	50	7	37	17
DLC2	5.153	0.885	2.18	1.58	0.611	0.877	0.050	0.240	607	1.0	51	8	23	23
DLC3	5.346	0.963	2.29	1.78	0.601	1.051	0.051	0.247	652	1.0	54	8	33	14
DLC4	4.302	1.700	1.62	1.54	0.640	1.063	0.055	0.178	573	1.0	45	6	14	12
DLC5	5.860	0.998	2.44	1.66	0.630	1.215	0.066	0.269	795	1.0	54	10	50	16
DLC6	5.191	1.780	2.32	1.69	0.944	0.878	0.055	0.233	563	1.0	52	8	35	18
DLC7	4.854	4.166	2.08	1.58	1.464	1.004	0.064	0.226	531	1.5	49	9	22	23
DLD1	5.236	5.068	2.38	1.67	1.315	0.862	0.065	0.230	546	1.0	51	9	34	20
DLD2	5.434	5.855	2.48	1.91	1.434	0.666	0.062	0.248	536	1.5	52	10	39	18
DLD3	4.518	5.538	1.99	1.55	1.282	0.835	0.059	0.203	524	1.0	46	9	28	20
DLD4	3.696	2.179	1.65	1.32	0.875	0.642	0.060	0.168	420	0.8	37	7	21	14
DLD5	2.824	11.038	1.28	1.01	0.980	0.559	0.052	0.122	319	0.8	28	4	26	14
DLD6	4.660	5.957	2.13	1.56	1.635	0.811	0.064	0.203	479	1.0	48	8	20	17
DLD7	4.514	5.339	2.06	1.57	1.445	0.974	0.067	0.203	517	1.0	54	8	17	16
DLE1	4.310	5.704	2.08	1.40	1.608	0.792	0.064	0.205	548	0.8	45	8	17	14
DLE2	4.926	3.959	2.26	1.61	1.291	0.855	0.052	0.218	525	1.0	49	9	18	18
DLE3	3.853	6.982	1.59	1.40	1.493	0.952	0.057	0.178	492	0.8	47	4	19	14
DLE4	3.211	3.548	1.43	1.15	1.288	0.675	0.050	0.142	378	0.8	35	6	13	11
DLE5	4.718	1.025	1.52	1.71	0.518	0.969	0.053	0.239	611	1.0	55	5	31	17
DLE6	3.757	7.139	1.61	1.33	2.482	0.711	0.063	0.165	445	0.8	39	6	29	15
DLE7	4.310	4.581	1.94	1.42	1.336	0.843	0.053	0.195	470	0.8	46	7	19	16
DLF1	4.026	8.387	2.00	1.42	1.179	0.693	0.075	0.183	446	0.8	47	8	35	15
DLF2	4.927	3.746	2.25	1.59	1.285	0.953	0.061	0.226	531	1.0	54	9	24	16
DLF3	4.649	5.306	2.10	1.55	1.606	0.864	0.066	0.210	500	1.0	48	8	19	16
DLF4	3.397	1.576	1.48	1.06	0.637	0.712	0.043	0.150	408	0.8	40	6	28	11
DLF5	4.088	7.112	1.89	1.42	2.087	0.765	0.056	0.177	435	1.0	44	8	33	17
DLF6	3.909	7.456	1.77	1.35	2.086	0.741	0.058	0.168	452	0.8	43	8	15	14
DLF6 AOV1	4.127	4.700	1.84	1.48	1.336	0.693	0.054	0.178	494	0.8	41	8	27	16
DLF6 AOV2	4.097	5.226	1.88	1.50	1.295	0.702	0.064	0.176	507	1.0	43	11	25	19
DLF7	4.087	5.126	1.84	1.41	1.017	0.752	0.078	0.185	451	0.8	45	8	25	15

Table A2.1 ICP-AES analytical data (continued)

Site No.[1]	Ga (ppm)	La (ppm)	Li (ppm)	Mn (ppm)	Nb (ppm)	Nd (ppm)	Ni (ppm)	Pb (ppm)	Sc (ppm)	Sr (ppm)	Th (ppm)	V (ppm)	Y (ppm)	Zn (ppm)
DLA7	15	29	25	1196	14	24.5	32	16	9	124	11	130	16.0	104
DLB1	13	26	19	562	14	18.0	23	10	7	176	11	82	15.0	56
DLB2	14	31	19	681	13	26.5	21	17	8	176	11	79	17.5	69
DLB3	12	31	16	357	12	20.5	18	9	5	215	13	63	13.5	40
DLB4	16	28	27	652	16	20.5	27	12	8	163	12	112	16.0	75
DLB5	12	25	22	805	11	19.0	26	12	6	170	10	86	13.5	61
DLB6	14	27	25	715	14	23.0	24	18	8	200	11	96	15.5	67
DLB7	14	28	21	796	14	21.5	23	13	8	146	11	98	16.5	88
DLC1	13	28	18	680	13	23.0	20	19	8	157	10	83	16.0	82
DLC2	13	29	20	724	13	24.5	22	13	8	148	11	92	16.5	81
DLC3	13	29	20	653	14	26.0	22	12	8	166	11	90	17.0	83
DLC4	11	23	16	557	10	21.0	20	10	6	171	9	69	14.5	54
DLC5	16	30	21	759	17	24.0	27	12	9	237	12	92	16.5	83
DLC6	14	29	24	688	14	22.5	24	12	8	164	11	97	16.5	89
DLC7	13	27	23	559	13	21.5	26	10	7	181	12	89	15.5	62
DLD1	14	27	27	648	13	23.5	28	10	8	166	11	109	15.5	66
DLD2	14	28	34	603	16	24.5	30	11	9	195	12	133	15.5	76
DLD3	12	24	25	614	12	20.5	29	11	7	199	10	92	14.5	69
DLD4	10	20	19	573	9	17.0	19	9	6	118	7	76	12.0	61
DLD5	9	16	17	397	9	12.8	16	8	4	314	7	54	9.0	51
DLD6	12	26	25	683	12	21.5	28	11	7	193	10	99	14.0	63
DLD7	12	29	19	659	11	25.0	26	11	7	167	12	85	16.0	57
DLE1	12	23	22	699	11	21.0	27	10	7	176	9	101	15.0	57
DLE2	13	28	25	719	13	24.0	29	12	8	165	11	110	16.0	64
DLE3	10	24	19	1090	10	19.5	28	11	5	228	10	63	13.5	50
DLE4	9	19	19	524	8	16.0	20	9	5	142	6	61	11.0	46
DLE5	12	26	17	437	12	18.0	15	11	6	139	11	67	13.0	64
DLE6	10	21	26	615	10	17.5	22	9	6	327	9	73	11.5	62
DLE7	11	24	26	731	12	21.5	24	11	7	199	10	92	14.5	67
DLF1	11	28	21	675	9	21.5	25	9	6	158	11	90	16.0	64
DLF2	13	28	27	848	14	24.5	28	11	8	182	11	108	16.0	69
DLF3	12	25	25	712	11	22.0	26	10	7	177	10	95	15.0	59
DLF4	9	21	15	700	8	18.0	18	10	5	131	8	54	11.0	58
DLF5	11	22	28	1163	11	18.0	33	13	6	203	10	103	13.0	58
DLF6	11	22	28	636	10	19.0	26	10	6	232	9	91	12.5	50
DLF6 AOV1	11	22	24	861	12	17.5	25	10	6	201	9	103	13.5	64
DLF6 AOV2	11	24	25	1005	12	18.0	32	12	6	196	9	104	13.5	69
DLF7	11	24	23	887	11	18.0	25	9	6	206	10	90	13.5	67

Table A2.1 ICP-AES analytical data (continued)

Site No.[1]	Al (wt%)	Ca (wt%)	Fe (wt%)	K (wt%)	Mg (wt%)	Na (wt%)	P (wt%)	Ti (wt%)	Ba (ppm)	Be (ppm)	Ce (ppm)	Co (ppm)	Cr (ppm)	Cu (ppm)
DLG1	5.217	1.058	2.47	1.72	0.759	0.879	0.051	0.232	530	1.5	55	10	38	15
DLG2	5.131	1.068	2.29	1.70	0.688	0.948	0.050	0.230	573	1.0	52	9	45	19
DLG3	4.528	3.132	1.99	1.51	0.867	1.002	0.066	0.208	510	1.0	49	8	39	14
DLG4	4.080	7.450	1.78	1.30	1.898	0.854	0.058	0.182	455	0.8	43	7	23	15
DLG4*	3.785	5.380	1.75	1.29	1.466	0.837	0.060	0.184	478	0.8	47	11	53	13
DLG5	4.187	4.745	1.90	1.38	1.517	0.688	0.049	0.188	460	0.8	47	8	27	17
DLG5*	3.090	9.720	1.44	1.00	1.015	0.523	0.071	0.153	343	0.8	38	6	45	13
DLG6	3.793	3.145	1.79	1.15	0.926	0.463	0.068	0.168	347	1.0	40	8	28	15
DLG7	4.526	4.999	2.20	1.51	1.727	0.735	0.068	0.207	494	0.8	49	9	39	19
DLH1	4.675	5.347	2.11	1.57	1.571	0.882	0.072	0.208	474	1.0	53	9	31	15
DLH2	4.494	3.091	2.13	1.50	1.172	0.861	0.056	0.200	497	1.0	51	8	27	15
DLH3	4.936	1.271	2.28	1.57	0.805	0.983	0.045	0.212	500	1.0	53	9	32	10
DLH4	4.771	0.908	2.26	1.45	0.754	0.804	0.043	0.216	516	1.5	48	9	29	15
DLH5	4.554	1.366	2.15	1.41	0.733	0.749	0.056	0.206	494	1.0	49	8	21	17
DLH6	4.980	0.861	2.33	1.53	0.690	0.743	0.036	0.223	528	1.5	51	9	23	16
DLH7	5.036	1.760	2.68	1.56	0.844	0.453	0.138	0.223	597	1.5	78	15	27	31
FAA1	4.710	1.490	1.28	1.47	0.326	1.555	0.052	0.247	612	0.8	55	4	24	4
FAA2	4.365	6.275	1.45	1.44	0.732	1.170	0.062	0.177	610	0.8	40	6	21	10
FAA3	4.960	2.035	2.33	1.60	0.821	0.903	0.087	0.246	522	1.0	52	9	36	18
FAA4	5.310	0.941	2.26	1.76	0.614	0.860	0.056	0.261	603	1.5	54	8	37	21
FAA5	5.290	0.792	2.26	1.65	0.642	0.804	0.061	0.243	566	1.5	45	9	33	15
FAA6	4.648	4.599	2.25	1.44	1.225	0.661	0.062	0.232	535	1.0	47	9	45	22
FAA6 AOV1	4.844	4.691	2.20	1.54	1.250	0.782	0.061	0.234	581	1.0	50	9	30	20
FAA6 AOV2	4.876	4.005	2.20	1.57	1.219	0.816	0.064	0.233	585	1.0	52	9	31	20
FAA7	5.403	1.020	2.46	1.77	0.661	0.827	0.060	0.266	661	1.5	55	10	49	23
FAB1	5.640	0.836	2.43	1.82	0.674	0.909	0.058	0.258	603	1.5	50	10	34	20
FAB2	5.535	0.830	2.45	1.72	0.706	0.845	0.054	0.259	574	1.5	52	10	44	21
FAB2**	4.635	6.710	1.97	1.51	1.205	0.755	0.065	0.207	517	1.0	40	7	30	21
FAB3	7.642	1.730	2.87	1.29	1.234	1.494	0.084	0.324	475	1.0	42	12	61	30
FAB4	4.920	5.069	2.20	1.42	1.293	0.784	0.079	0.233	574	1.0	49	11	25	21
FAB5	5.486	0.890	2.57	1.57	0.658	0.867	0.069	0.273	642	1.5	53	10	58	23
FAB5 AOV1	5.507	2.275	2.52	1.69	1.347	0.953	0.076	0.259	562	1.0	52	10	36	18
FAB5 AOV2	4.455	7.016	2.00	1.33	1.430	0.794	0.070	0.211	552	1.3	45	8	31	21
FAB6	5.125	1.340	1.85	1.57	0.596	0.970	0.048	0.255	624	1.0	52	6	42	17
FAB7	5.190	1.007	2.37	1.60	0.646	0.968	0.051	0.251	657	1.5	55	8	45	18
FAC1	5.761	1.590	2.67	1.64	0.920	0.741	0.083	0.256	534	2.0	55	10	61	28
FAC2	5.427	5.228	2.46	1.57	1.539	0.697	0.075	0.251	543	1.0	50	10	26	26
FAC3	4.465	1.614	1.63	1.29	0.431	1.383	0.056	0.299	604	1.0	68	7	23	5

Table A2.1 ICP-AES analytical data (continued)

Site No.[1]	Ga (ppm)	La (ppm)	Li (ppm)	Mn (ppm)	Nb (ppm)	Nd (ppm)	Ni (ppm)	Pb (ppm)	Sc (ppm)	Sr (ppm)	Th (ppm)	V (ppm)	Y (ppm)	Zn (ppm)
DLG1	14	31	25	857	13	28.0	27	13	8	157	12	111	17.0	82
DLG2	13	29	22	933	14	25.0	27	15	8	153	11	91	16.5	93
DLG3	12	27	19	738	12	22.5	23	12	7	162	10	82	15.0	60
DLG4	11	23	21	643	11	17.5	23	8	6	194	10	86	13.5	49
DLG4*	10	23	22	719	9	18.5	31	12	6	181	3	78	13.5	56
DLG5	12	25	26	911	12	19.5	28	10	7	189	10	108	14.0	61
DLG5*	8	19	22	690	8	15.0	21	9	5	284	3	73	11.0	59
DLG6	11	22	19	993	9	19.5	23	16	7	101	8	122	14.0	67
DLG7	13	27	36	899	12	20.5	25	10	7	244	11	104	14.0	70
DLH1	12	28	22	706	11	22.0	26	10	7	163	11	94	15.5	58
DLH2	12	28	21	767	11	24.0	23	12	7	182	10	78	15.5	74
DLH3	13	31	21	799	13	25.5	26	12	7	155	11	109	18.5	57
DLH4	13	27	22	967	13	24.5	29	11	8	146	11	114	16.0	72
DLH5	12	26	21	1017	11	23.0	27	11	7	171	10	106	15.0	89
DLH6	14	29	24	847	14	26.0	28	12	8	130	12	133	17.0	80
DLH7	14	42	33	2430	12	42.0	56	17	9	149	15	199	36.0	117
FAA1	12	29	11	433	11	21.5	10	11	5	261	5	40	12.0	31
FAA2	12	22	18	505	9	15.5	16	11	5	268	3	56	12.5	46
FAA3	14	30	19	1198	12	27.0	22	14	7	152	9	76	17.5	77
FAA4	14	31	21	846	14	26.0	24	15	8	139	8	93	19.0	87
FAA5	16	28	22	714	13	24.0	22	15	8	128	8	117	18.5	79
FAA6	14	25	23	922	11	22.0	27	12	7	144	10	120	15.5	75
FAA6 AOV1	14	27	23	733	11	22.5	24	11	7	155	11	103	15.0	66
FAA6 AOV2	14	27	22	793	11	23.0	25	12	7	147	12	100	15.5	64
FAA7	16	29	23	940	14	25.5	28	12	9	150	12	107	17.0	99
FAB1	16	29	25	838	13	24.0	27	16	9	150	8	113	17.5	89
FAB2	16	29	25	857	14	26.0	30	16	9	141	9	119	17.5	78
FAB2**	13	22	28	641	11	17.5	25	13	7	221	7	102	14.0	59
FAB3	22	23	21	710	12	21.0	39	12	11	306	6	108	15.0	71
FAB4	15	28	26	783	11	25.0	35	13	8	157	10	109	15.0	71
FAB5	16	32	23	850	14	29.0	33	16	9	144	10	111	18.5	86
FAB5 AOV1	16	30	27	759	11	28.0	34	15	9	170	10	104	17.5	68
FAB5 AOV2	13	25	28	694	10	20.5	27	13	7	271	9	91	14.5	63
FAB6	15	29	23	368	13	24.0	22	15	8	161	8	82	16.0	61
FAB7	15	29	20	832	13	25.0	23	13	8	165	12	92	17.0	89
FAC1	18	34	30	726	14	28.5	38	15	9	133	11	124	18.5	97
FAC2	16	28	31	689	11	25.0	35	14	8	139	10	115	16.0	75
FAC3	12	36	13	445	13	30.5	18	13	6	226	13	48	15.0	37

Table A2.1 ICP-AES analytical data (continued)

Site No.[1]	Al (wt%)	Ca (wt%)	Fe (wt%)	K (wt%)	Mg (wt%)	Na (wt%)	P (wt%)	Ti (wt%)	Ba (ppm)	Be (ppm)	Ce (ppm)	Co (ppm)	Cr (ppm)	Cu (ppm)
FAC4	5.476	1.329	2.56	1.67	0.775	1.001	0.062	0.263	688	1.5	54	11	55	23
FAC5	4.281	1.102	1.32	1.40	0.310	1.409	0.052	0.233	616	1.0	63	4	18	5
FAC6	4.767	5.295	2.14	1.51	1.142	1.002	0.068	0.225	605	1.5	57	8	33	16
FAC7	5.142	1.090	2.25	1.66	0.655	1.061	0.054	0.239	655	1.0	56	8	45	16
FAD1	5.675	1.340	2.71	1.85	0.914	0.784	0.048	0.282	579	1.5	60	10	53	22
FAD1 AOV1	5.840	0.891	2.70	1.91	0.811	0.787	0.052	0.275	559	2.0	61	10	50	22
FAD1 AOV2	5.830	1.425	2.73	1.86	1.020	0.810	0.063	0.271	550	2.0	60	9	51	21
FAD2	4.825	5.765	2.20	1.55	1.618	0.776	0.062	0.235	560	1.0	53	8	40	21
FAD3	4.300	1.400	1.16	1.47	0.506	1.295	0.042	0.197	632	0.5	53	4	18	4
FAD4	4.205	1.145	1.53	1.46	0.344	1.245	0.062	0.238	610	0.5	59	5	31	6
FAD5	4.494	0.940	1.43	1.53	0.311	1.380	0.054	0.214	673	1.0	70	5	23	6
FAD6	6.508	3.546	3.13	1.84	1.368	0.634	0.065	0.283	574	2.0	56	12	65	27
FAD7	4.890	3.877	2.44	1.67	1.560	0.744	0.065	0.225	520	1.0	51	8	33	25
FAE1	4.405	1.105	1.31	1.37	0.331	1.325	0.054	0.225	610	0.8	50	4	24	4
FAE2	5.000	0.974	1.73	1.55	0.415	1.215	0.042	0.215	640	1.0	48	6	53	9
FAE3	4.585	1.110	1.18	1.45	0.342	1.405	0.042	0.142	644	1.0	38	5	16	5
FAE4	4.190	1.270	1.20	1.38	0.356	1.290	0.053	0.194	621	0.8	48	7	42	5
FAE5	5.765	1.074	2.34	1.80	0.796	0.847	0.066	0.249	572	2.0	47	9	74	22
FAE6	6.433	1.763	3.16	1.86	1.266	0.644	0.070	0.295	563	2.0	61	13	58	31
FAE7	5.253	1.254	2.34	1.80	0.847	0.935	0.064	0.221	561	1.0	54	8	40	18
FAF1	2.215	15.650	0.80	0.74	1.176	0.582	0.096	0.092	336	0.5	21	4	26	7
FAF2	6.235	0.874	2.75	1.73	0.951	0.865	0.046	0.270	689	2.0	59	14	85	24
FAF3	4.390	2.125	1.32	1.51	0.454	1.280	0.058	0.188	610	0.5	51	9	38	6
FAF3 AOV1	6.710	2.280	3.70	1.29	1.128	1.245	0.078	0.283	571	1.0	41	18	78	73
FAF3 AOV2	4.635	1.270	1.18	1.60	0.366	1.325	0.045	0.148	2954	1.0	35	5	56	6
FAF4	6.385	4.910	2.85	1.55	1.338	1.315	0.059	0.566	580	1.5	41	19	99	20
FAF5	5.320	4.640	2.19	1.73	1.420	0.880	0.079	0.264	635	1.5	52	8	56	19
FAF6	6.271	0.870	3.02	1.90	1.123	0.749	0.052	0.290	589	2.0	65	12	50	27
FAG2	5.525	5.371	2.50	1.60	1.195	0.743	0.060	0.255	598	1.5	53	11	69	21
FAG3	5.170	2.515	2.31	1.66	1.057	0.785	0.063	0.248	555	1.0	48	8	67	27
GFA1	4.466	6.002	2.04	1.45	1.597	0.695	0.062	0.206	504	1.0	50	8	53	19
GFA2	6.825	0.917	3.55	1.75	0.964	1.223	0.090	0.330	690	1.5	45	12	52	32
GFA3	4.751	5.437	2.31	1.65	1.671	0.855	0.065	0.211	457	1.5	50	9	45	18
GFA4	4.187	0.692	2.29	1.30	0.424	0.490	0.061	0.223	366	2.0	64	14	35	14
GFA5	3.678	7.924	1.87	1.32	1.722	0.636	0.063	0.177	455	1.0	42	8	33	15
GFA5*	4.094	6.757	1.99	1.41	1.631	0.713	0.065	0.196	509	1.0	46	8	38	17
GFA6	4.449	6.767	2.04	1.51	1.495	0.820	0.059	0.196	511	1.5	45	7	40	17
GFA7	4.089	6.906	1.75	1.45	1.452	0.907	0.064	0.195	478	1.0	50	8	34	13

Table A2.1 ICP-AES analytical data (continued)

Site No.[1]	Ga (ppm)	La (ppm)	Li (ppm)	Mn (ppm)	Nb (ppm)	Nd (ppm)	Ni (ppm)	Pb (ppm)	Sc (ppm)	Sr (ppm)	Th (ppm)	V (ppm)	Y (ppm)	Zn (ppm)
FAC4	16	31	23	984	13	27.0	38	17	8	162	10	110	18.0	97
FAC5	11	30	9	414	11	26.0	10	8	5	230	13	44	12.5	34
FAC6	14	29	20	802	11	25.5	24	12	7	186	13	91	15.5	61
FAC7	15	28	22	845	12	25.5	23	12	8	184	12	92	16.5	77
FAD1	17	30	27	764	14	27.0	36	36	9	154	7	128	17.0	79
FAD1 AOV1	17	31	30	541	13	28.0	32	15	10	158	7	116	18.0	66
FAD1 AOV2	16	31	31	570	12	27.5	32	14	9	153	7	111	18.0	67
FAD2	13	26	24	647	10	22.0	28	13	8	169	6	99	15.5	62
FAD3	11	25	11	222	7	21.0	12	11	5	263	5	44	12.0	31
FAD4	10	28	10	458	9	24.0	14	11	5	224	5	53	13.5	43
FAD5	12	34	11	444	9	29.0	13	9	5	220	14	53	14.5	43
FAD6	20	30	41	857	14	26.0	35	13	11	152	14	162	17.5	94
FAD7	15	28	25	738	12	25.5	25	13	8	148	13	119	18.5	72
FAE1	11	24	10	300	9	20.5	12	10	5	240	3	49	13.5	35
FAE2	13	24	15	385	10	19.5	16	12	6	225	3	64	14.0	52
FAE3	11	20	12	324	6	15.5	14	12	4	233	3	38	11.0	33
FAE4	10	25	13	332	8	21.5	19	12	4	226	5	42	13.0	40
FAE5	16	29	28	887	12	21.5	33	18	9	161	5	109	17.5	84
FAE6	19	31	37	1066	14	28.0	41	20	11	140	14	159	19.5	99
FAE7	16	31	23	628	11	28.5	25	12	8	154	13	106	19.5	81
FAF1	7	11	17	475	4	4.5	12	3	3	562	3	29	7.0	38
FAF2	18	31	33	1071	13	25.0	46	21	10	155	6	122	18.0	80
FAF3	11	27	15	409	9	19.5	23	33	5	250	3	46	13.0	62
FAF3 AOV1	17	22	22	778	9	20.5	39	12	18	258	3	138	16.5	72
FAF3 AOV2	11	19	15	301	7	16.0	21	41	4	318	3	43	11.0	45
FAF4	18	24	34	836	21	20.0	53	28	11	201	5	115	19.5	62
FAF5	15	29	23	624	11	26.0	26	15	8	167	7	97	16.5	71
FAF6	20	33	36	1020	16	30.0	36	15	11	143	15	144	20.0	101
FAG2	17	30	35	731	13	26.0	35	15	9	174	8	121	17.5	77
FAG3	15	26	26	571	12	27.0	29	22	8	153	5	111	15.5	84
GFA1	12	26	27	601	11	20.0	25	11	7	211	8	99	14.0	63
GFA2	18	24	40	924	14	22.5	31	11	13	129	11	146	18.0	104
GFA3	13	28	25	727	13	22.5	26	10	7	167	12	92	15.5	59
GFA4	12	33	28	1344	12	29.0	28	16	7	89	14	74	14.5	114
GFA5	10	22	23	811	10	17.5	23	9	6	218	9	89	13.0	55
GFA5*	11	23	28	662	12	18.5	22	10	6	287	9	95	14.0	72
GFA6	12	25	28	656	12	19.5	21	11	7	311	10	90	15.0	64
GFA7	11	26	17	661	11	21.5	24	11	6	160	11	77	16.0	45

Table A2.1 ICP-AES analytical data (continued)

Site No.[1]	Al (wt%)	Ca (wt%)	Fe (wt%)	K (wt%)	Mg (wt%)	Na (wt%)	P (wt%)	Ti (wt%)	Ba (ppm)	Be (ppm)	Ce (ppm)	Co (ppm)	Cr (ppm)	Cu (ppm)
GFB1	3.331	10.286	1.51	1.21	1.306	0.906	0.081	0.176	439	0.8	43	6	87	10
GFB2	5.244	1.275	2.56	1.74	0.846	0.930	0.061	0.263	578	2.0	62	11	48	21
GFB3	3.008	3.023	1.90	0.91	0.536	0.365	0.071	0.160	259	1.0	43	9	27	16
GFB4	4.452	6.503	1.93	1.41	1.324	0.714	0.058	0.192	442	1.0	47	8	36	18
GFB5	4.052	4.226	2.57	1.24	1.956	0.462	0.055	0.200	392	1.5	47	11	45	15
GFB5*	3.877	6.483	2.03	1.40	2.107	0.705	0.062	0.193	453	1.0	52	11	36	14
GFB6	3.431	6.716	1.61	1.10	0.790	0.750	0.071	0.143	316	0.8	37	5	23	13
GFB7	4.702	5.950	2.23	1.69	2.378	0.732	0.061	0.220	417	1.5	51	8	19	16
GFC1	4.936	1.176	2.09	1.53	0.573	0.991	0.059	0.228	600	1.0	49	8	38	17
GFC2	5.121	1.232	1.57	1.61	0.380	1.579	0.061	0.228	663	1.5	49	6	25	8
GFC3	5.261	1.783	2.64	1.68	0.938	1.095	0.080	0.304	588	1.5	58	8	45	16
GFC4	5.655	3.045	2.55	1.67	1.137	0.683	0.064	0.246	513	1.5	48	9	53	27
GFC4 AOV1	4.075	2.100	1.46	1.38	0.581	1.162	0.071	0.166	531	0.5	48	5	24	9
GFC4 AOV2	4.076	2.270	1.50	1.40	0.613	1.139	0.075	0.175	518	1.3	50	5	24	9
GFC5	4.048	2.343	1.57	1.35	0.707	1.121	0.063	0.180	551	0.8	53	5	25	8
GFC6	4.030	4.065	1.75	1.34	0.695	1.000	0.091	0.176	467	0.8	52	6	30	14
GFC7	3.525	8.713	1.77	1.26	1.641	0.681	0.071	0.154	340	0.8	36	6	27	17
GFD1	4.696	3.988	1.65	1.55	0.910	1.157	0.059	0.168	582	1.0	42	10	21	14
GFD2	6.269	3.448	2.93	1.99	1.295	0.538	0.066	0.271	494	2.0	48	12	63	33
GFD2 AOV1	4.234	7.174	1.46	1.43	0.847	1.140	0.066	0.194	553	1.0	43	6	37	10
GFD2 AOV2	4.556	5.790	1.57	1.53	0.869	1.238	0.069	0.211	587	1.0	48	6	27	12
GFD3	5.016	1.769	2.43	1.54	0.893	0.342	0.054	0.219	383	1.5	43	10	47	26
GFD4	4.598	1.316	1.89	1.46	0.774	1.075	0.050	0.190	508	1.0	50	9	34	11
GFD5	4.183	3.140	1.44	1.40	1.214	1.281	0.060	0.144	468	0.8	45	8	25	9
GFD6	3.851	5.458	1.47	1.34	1.082	1.040	0.078	0.175	455	0.8	53	7	31	6
GFD7	4.766	4.990	2.32	1.49	1.645	0.815	0.085	0.204	323	1.5	49	10	47	22
GFE1	4.267	3.087	1.60	1.46	0.787	1.059	0.055	0.175	520	1.0	50	12	33	12
GFE2	5.953	3.096	2.72	1.78	1.580	0.598	0.056	0.288	497	2.0	57	10	49	29
GFE3	4.974	4.637	2.31	1.65	1.577	0.645	0.061	0.232	478	1.5	54	10	49	26
GFE4	3.932	5.198	1.41	1.34	1.601	1.133	0.086	0.185	432	0.8	51	6	20	11
GFE5	4.037	5.941	1.71	1.41	2.081	0.875	0.088	0.188	484	0.8	49	7	28	14
GFE6	5.043	1.269	2.08	1.58	0.720	0.847	0.081	0.231	568	1.0	51	8	44	20
GFE7	4.037	6.772	1.73	1.46	2.348	0.832	0.090	0.175	496	0.8	44	6	21	15
GFF1	6.549	1.115	3.10	1.94	1.054	0.574	0.055	0.281	575	2.0	66	14	65	32
GFF2	6.049	1.084	2.90	1.87	1.093	0.632	0.066	0.280	553	2.0	61	12	62	34
GFF3	6.645	2.719	3.20	2.00	1.522	0.567	0.079	0.287	531	2.0	64	14	68	30
GFF4	5.391	2.092	2.51	1.72	1.195	0.710	0.076	0.257	539	2.0	55	10	49	28
GFF5	3.927	1.322	1.81	1.36	0.730	0.652	0.063	0.179	437	1.3	43	8	35	17

Table A2.1 ICP-AES analytical data (continued)

Site No.[1]	Ga (ppm)	La (ppm)	Li (ppm)	Mn (ppm)	Nb (ppm)	Nd (ppm)	Ni (ppm)	Pb (ppm)	Sc (ppm)	Sr (ppm)	Th (ppm)	V (ppm)	Y (ppm)	Zn (ppm)
GFB1	9	22	28	662	10	16.0	22	7	5	404	10	56	12.0	46
GFB2	15	33	25	827	16	27.0	31	13	9	158	13	104	18.5	78
GFB3	8	22	19	788	8	19.0	22	15	5	82	9	61	11.0	81
GFB4	12	24	24	816	10	20.5	25	10	7	196	11	104	14.0	56
GFB5	12	26	21	1900	11	23.0	34	13	8	108	11	134	18.5	71
GFB5*	11	28	22	1280	11	20.5	30	12	6	172	11	87	15.0	53
GFB6	11	21	16	674	7	15.5	20	9	5	237	8	81	15.0	52
GFB7	14	27	26	779	9	22.0	28	12	8	239	13	89	17.5	54
GFC1	15	25	17	881	11	20.0	23	16	7	169	9	76	15.5	71
GFC2	15	25	12	565	11	20.0	19	13	6	259	8	56	14.5	46
GFC3	16	31	19	1020	14	26.5	24	15	8	182	14	89	18.5	75
GFC4	18	26	31	784	12	22.0	33	15	9	136	12	143	16.5	86
GFC4 AOV1	12	24	12	685	7	20.0	23	13	5	201	8	49	17.0	44
GFC4 AOV2	12	27	13	695	8	22.0	17	12	6	209	8	51	18.5	43
GFC5	12	27	12	738	8	22.5	16	10	6	202	8	56	19.0	44
GFC6	12	28	16	786	8	22.0	20	12	6	236	10	73	19.5	56
GFC7	12	19	30	625	8	13.5	21	12	5	419	8	72	12.0	56
GFD1	13	22	16	532	7	18.0	29	13	6	211	7	69	16.0	54
GFD2	21	26	43	937	14	22.0	39	19	10	132	12	181	16.0	107
GFD2 AOV1	12	22	23	384	9	17.0	17	10	5	284	8	55	14.0	49
GFD2 AOV2	13	24	25	397	10	19.0	18	12	6	302	9	63	14.0	53
GFD3	17	22	31	847	11	18.0	33	16	8	83	10	149	13.5	89
GFD4	14	25	19	729	9	21.5	26	14	7	177	9	70	17.5	68
GFD5	9	22	12	911	9	18.0	19	10	5	198	8	43	12.0	46
GFD6	9	26	15	574	10	21.5	18	10	6	211	11	52	17.0	43
GFD7	12	24	39	899	14	20.0	29	11	8	181	12	124	14.5	80
GFE1	10	24	17	806	10	20.5	30	12	6	188	10	67	16.0	54
GFE2	15	29	39	698	14	23.0	32	14	10	127	13	141	18.0	80
GFE3	13	26	32	816	11	21.5	30	13	8	147	12	118	18.0	71
GFE4	9	26	15	530	9	22.0	17	10	6	220	11	52	17.0	42
GFE5	9	25	22	557	9	21.0	19	11	6	178	11	72	17.0	60
GFE6	12	27	21	877	13	22.5	24	13	7	141	11	90	17.5	78
GFE7	9	22	22	486	10	19.0	19	9	6	203	10	68	16.5	62
GFF1	16	30	36	1805	17	25.5	43	17	11	122	14	162	19.5	98
GFF2	15	31	33	1110	17	25.0	37	15	11	118	14	140	19.5	91
GFF3	17	30	44	1012	17	24.5	41	15	11	117	14	166	18.5	90
GFF4	13	29	28	1030	13	25.0	30	14	9	136	13	108	18.5	85
GFF5	10	21	18	756	10	18.5	22	10	6	104	8	76	14.0	62

Table A2.1 ICP-AES analytical data (continued)

Site No.[1]	Al (wt%)	Ca (wt%)	Fe (wt%)	K (wt%)	Mg (wt%)	Na (wt%)	P (wt%)	Ti (wt%)	Ba (ppm)	Be (ppm)	Ce (ppm)	Co (ppm)	Cr (ppm)	Cu (ppm)
GNI1	4.745	4.810	2.15	1.86	1.345	0.397	0.083	0.216	538	1.5	58	10	47	18
GNI2	4.785	5.050	1.88	2.05	2.225	0.435	0.059	0.185	490	1.5	51	7	43	20
GNI4	5.265	5.675	2.06	1.94	1.845	0.594	0.072	0.219	552	1.5	51	7	57	22
JAA1	5.535	1.593	2.34	1.68	0.845	0.811	0.057	0.272	609	1.5	49	10	67	19
JAA2	5.440	0.896	2.11	1.68	0.503	1.065	0.070	0.273	806	1.5	60	9	60	15
JAA2 AOV1	6.245	1.188	2.45	1.69	0.674	1.125	0.065	0.314	770	2.0	55	10	57	16
JAA2 AOV2	6.135	0.965	2.45	1.72	0.655	1.180	0.058	0.303	808	1.5	54	10	70	14
JAA3	6.210	0.938	2.90	1.79	0.612	1.150	0.064	0.316	812	2.0	54	9	74	14
JAA4	6.190	1.020	2.50	1.74	0.557	1.240	0.063	0.271	901	1.5	53	8	67	11
JAA5	4.577	1.043	1.61	1.54	0.372	1.338	0.044	0.265	608	1.0	49	5	35	10
JAA6	5.116	1.077	2.40	1.79	0.638	0.890	0.074	0.268	669	2.0	57	15	45	19
JAA7	5.452	4.548	2.28	1.59	0.944	0.944	0.060	0.237	611	2.0	44	9	45	20
JAB1	5.751	0.803	2.39	1.72	0.525	0.940	0.054	0.290	701	2.0	66	9	43	17
JAB2	5.618	3.268	2.20	1.68	1.181	1.008	0.071	0.264	641	1.5	57	9	45	15
JAB3	5.748	0.975	2.08	1.84	0.497	1.286	0.056	0.267	727	2.0	50	9	43	14
JAB4	4.807	7.004	2.15	1.48	0.941	0.813	0.083	0.227	585	1.5	45	9	40	17
JAB5	5.044	5.140	2.07	1.62	0.878	0.927	0.068	0.238	595	1.5	44	9	42	17
JAB6	4.847	1.335	2.31	1.65	0.681	1.112	0.089	0.249	600	1.5	63	11	40	19
JAB7	4.906	1.014	2.59	1.76	0.675	0.836	0.069	0.250	610	1.5	54	12	47	20
JAC1	3.862	8.505	1.78	1.37	2.855	0.788	0.066	0.198	407	0.8	46	7	23	17
JAC2	4.685	1.387	2.06	1.48	0.643	1.029	0.079	0.240	630	1.5	58	8	36	15
JAC3	5.901	1.011	2.53	1.67	0.748	0.832	0.065	0.276	696	2.0	58	10	34	25
JAC4	5.249	0.832	2.28	1.75	0.603	0.893	0.056	0.235	593	1.5	48	9	40	17
JAC5	4.787	6.435	2.07	1.55	1.393	0.850	0.064	0.229	573	1.0	46	8	43	17
JAC6	5.191	0.888	2.23	1.67	0.622	0.809	0.058	0.246	575	1.5	51	9	49	20
JAC6 AOV1	5.391	2.121	2.37	1.86	0.748	0.956	0.071	0.227	618	1.5	54	9	49	21
JAC6 AOV2	5.412	0.851	2.46	1.74	0.574	0.899	0.063	0.273	577	2.0	50	9	51	16
JAC7	5.020	1.015	2.20	1.67	0.657	0.868	0.062	0.212	573	1.5	43	9	49	17
JAD1	4.923	3.237	2.23	1.60	1.198	0.746	0.066	0.228	516	1.5	51	9	45	23
JAD2	5.860	1.996	3.11	1.62	0.877	1.627	0.073	0.450	591	1.5	63	11	27	13
JAD3	4.450	2.727	2.01	1.49	0.953	0.953	0.058	0.220	480	1.5	43	7	32	18
JAD4	7.630	5.802	3.88	1.07	1.639	1.434	0.099	0.426	468	1.5	36	15	65	42
JAD5	5.279	6.388	2.24	1.62	1.532	0.870	0.058	0.235	625	1.5	46	10	41	22
JAD6	5.232	1.366	2.03	1.64	0.617	1.382	0.061	0.213	536	1.0	44	10	47	18
JAD7	4.939	5.406	1.88	1.62	1.254	1.074	0.048	0.184	526	1.5	35	8	24	24
JAE1	5.196	4.590	2.33	1.45	1.070	0.805	0.064	0.237	539	1.5	55	9	42	23
JAE2	5.422	3.868	2.27	1.72	1.052	0.957	0.066	0.259	655	1.5	52	8	42	19
JAE3	5.040	4.758	2.20	1.61	1.001	0.821	0.078	0.234	621	1.0	48	9	57	19

Table A2.1 ICP-AES analytical data (continued)

Site No.[1]	Ga (ppm)	La (ppm)	Li (ppm)	Mn (ppm)	Nb (ppm)	Nd (ppm)	Ni (ppm)	Pb (ppm)	Sc (ppm)	Sr (ppm)	Th (ppm)	V (ppm)	Y (ppm)	Zn (ppm)
GNI1	14	29	26	441	12	25.0	29	14	8	85	5	76	18.0	77
GNI2	15	28	27	354	7	24.5	18	14	8	82	7	61	15.5	52
GNI4	16	28	27	391	11	25.0	23	15	8	134	7	77	16.0	68
JAA1	16	29	25	654	14	25.5	29	16	8	152	7	111	16.5	70
JAA2	16	36	19	458	14	29.0	23	17	7	196	8	82	19.0	61
JAA2 AOV1	17	31	22	462	15	28.5	33	16	9	203	8	93	18.5	61
JAA2 AOV2	17	30	23	499	14	27.0	31	15	9	207	7	92	17.5	58
JAA3	17	33	22	626	15	30.0	27	16	9	211	8	103	19.0	76
JAA4	17	32	22	621	14	29.5	27	14	9	246	6	94	18.0	72
JAA5	12	27	12	561	12	20.0	14	10	6	221	9	55	12.5	43
JAA6	15	34	21	1515	14	26.0	33	16	8	153	11	82	20.0	91
JAA7	16	26	24	837	12	21.5	27	14	8	203	10	100	16.0	71
JAB1	15	33	24	598	15	32.0	25	14	8	168	11	93	19.0	74
JAB2	15	29	31	1029	13	29.5	28	13	8	232	11	85	18.0	72
JAB3	16	29	20	670	14	24.5	24	14	8	215	9	76	18.0	59
JAB4	14	25	20	1815	10	20.5	27	13	7	166	9	93	16.0	60
JAB5	15	24	21	896	12	18.5	26	13	8	187	9	85	14.5	67
JAB6	15	37	17	1630	11	29.0	32	16	7	178	13	70	17.0	68
JAB7	13	30	20	1710	13	24.0	32	15	8	147	12	89	18.0	96
JAC1	10	22	17	1429	9	22.0	19	15	6	195	7	61	15.5	66
JAC2	13	28	16	1974	11	28.0	23	13	7	179	10	72	17.0	70
JAC3	16	30	26	1080	13	30.5	36	16	9	173	11	126	19.0	89
JAC4	14	28	20	1010	14	22.5	27	14	8	147	10	89	17.0	79
JAC5	13	25	22	589	11	19.0	25	12	8	178	9	87	15.5	57
JAC6	14	29	21	1125	13	23.0	29	15	8	139	11	101	17.5	85
JAC6 AOV1	16	31	21	1315	11	25.0	30	14	7	164	12	91	17.0	82
JAC6 AOV2	15	31	23	1155	14	23.0	26	15	8	150	11	100	18.0	81
JAC7	15	25	21	1290	11	20.5	28	15	7	146	9	90	16.0	77
JAD1	14	26	24	1300	11	25.5	29	13	8	148	10	102	16.5	87
JAD2	16	30	18	919	17	32.0	22	13	11	280	11	106	18.0	67
JAD3	12	21	17	510	10	21.5	21	12	7	164	8	68	14.0	63
JAD4	19	20	28	1280	12	22.0	46	9	13	402	8	117	16.0	81
JAD5	17	25	25	699	11	20.5	31	12	8	190	10	96	15.5	61
JAD6	15	24	15	1895	13	20.0	42	14	7	223	9	79	14.0	67
JAD7	16	20	22	779	8	15.5	25	12	7	188	7	82	12.5	53
JAE1	14	27	25	1295	11	26.0	32	14	8	165	10	103	17.0	73
JAE2	15	26	24	650	13	26.0	28	13	9	179	9	90	16.0	70
JAE3	14	24	23	498	9	18.5	24	13	8	168	5	92	14.0	67

Table A2.1 ICP-AES analytical data (continued)

Site No.[1]	Al (wt%)	Ca (wt%)	Fe (wt%)	K (wt%)	Mg (wt%)	Na (wt%)	P (wt%)	Ti (wt%)	Ba (ppm)	Be (ppm)	Ce (ppm)	Co (ppm)	Cr (ppm)	Cu (ppm)
JAE3 AOV1	5.440	4.310	2.49	1.74	1.148	0.900	0.071	0.237	594	1.0	45	12	64	21
JAE3 AOV2	5.005	3.545	1.97	1.68	1.088	0.998	0.077	0.229	585	1.0	51	9	55	16
JAE4	5.300	4.095	2.48	1.67	1.140	0.830	0.071	0.239	625	1.0	50	10	72	19
JAE5	5.585	4.812	2.27	1.71	1.269	0.838	0.061	0.248	598	1.0	48	9	26	23
JAE6	5.047	0.844	1.96	1.64	0.512	0.996	0.059	0.233	693	1.0	48	7	39	22
JAE7	4.450	3.418	1.94	1.50	0.603	1.103	0.086	0.225	603	1.0	54	7	30	12
JAF1	4.635	6.145	2.08	1.53	1.390	0.829	0.070	0.210	516	1.0	41	10	68	17
JAF2	4.495	6.630	2.09	1.43	1.299	0.728	0.064	0.211	544	1.0	44	8	47	17
JAF3	5.790	0.944	2.57	1.78	0.761	0.986	0.062	0.276	685	1.5	53	11	68	19
JAF4	5.485	4.168	2.50	1.74	1.161	0.943	0.065	0.258	662	1.0	50	14	65	20
JAF5	5.733	3.571	2.54	1.76	1.123	1.073	0.066	0.253	712	1.5	51	9	43	39
JAF6	4.928	4.584	1.86	1.57	1.035	1.090	0.062	0.219	610	1.0	47	8	32	15
JAF7	5.839	1.457	2.36	1.91	0.717	1.190	0.061	0.272	697	1.5	55	8	41	16
JAG1	5.285	0.923	2.13	1.79	0.524	1.040	0.044	0.245	621	1.0	47	7	57	14
JAG2	5.395	3.925	2.31	1.66	1.125	1.001	0.056	0.249	617	1.0	48	9	58	17
JAG3	5.235	1.036	2.13	1.70	0.573	1.135	0.063	0.240	639	1.0	45	11	77	14
JAG4	5.380	3.671	2.31	1.69	1.133	1.043	0.057	0.251	675	1.0	51	13	69	17
JAG5	6.436	0.824	2.72	1.98	0.706	1.129	0.059	0.303	720	2.0	59	10	40	30
JAG6	4.482	0.879	1.57	1.47	0.469	1.214	0.051	0.197	627	1.0	44	6	31	9
JAG7	5.324	0.896	2.13	1.73	0.526	1.034	0.076	0.248	3380	1.0	54	7	39	28
JAH1	5.355	0.810	2.18	1.81	0.516	1.060	0.059	0.260	702	1.5	55	11	62	16
JAH2	5.362	0.814	2.15	1.71	0.492	1.080	0.062	0.257	665	1.0	49	8	44	17
JAH3	5.766	3.458	2.41	1.64	1.009	0.967	0.064	0.256	668	1.0	47	10	47	19
JAH4	5.064	5.217	2.01	1.58	1.102	0.986	0.076	0.235	593	1.5	44	8	43	16
JAH5	5.481	0.720	2.13	1.77	0.520	1.079	0.057	0.256	747	1.0	52	8	42	16
JAH6	5.563	0.848	2.19	1.86	0.517	1.139	0.061	0.276	724	1.0	54	8	44	16
JAH7	4.602	0.556	2.55	1.59	0.492	0.588	0.053	0.267	454	1.5	60	18	40	21
JAI1	4.884	1.091	1.58	1.53	0.417	1.350	0.054	0.233	669	0.8	63	6	33	9
JAI2	7.210	1.651	3.56	1.39	1.077	1.381	0.059	0.352	583	1.0	37	16	88	31
JAI3	5.100	0.950	2.21	1.66	0.583	0.859	0.064	0.221	611	1.0	49	8	46	19
JAI4	5.374	4.936	2.21	1.66	1.395	1.051	0.070	0.264	663	0.8	47	9	45	19
JAI5	4.962	0.948	1.90	1.70	0.528	1.050	0.053	0.243	699	1.0	52	6	36	14
JAI6	4.378	4.615	1.79	1.50	0.967	1.016	0.067	0.198	555	0.8	45	9	27	16
JAI7	3.883	8.234	1.68	1.29	1.293	0.892	0.064	0.189	515	0.8	44	7	24	13
LMC7	5.026	0.964	2.65	1.56	0.417	0.373	0.052	0.244	414	2.5	64	23	33	16
LME7	4.681	0.466	2.40	1.53	0.402	0.702	0.040	0.261	447	1.5	60	10	37	14
LME7 AOV1	5.820	0.822	2.27	2.06	0.646	1.035	0.066	0.249	653	1.5	57	8	44	18
LME7 AOV2	5.031	2.772	2.46	1.77	1.012	0.490	0.062	0.245	422	2.0	77	10	35	16

Table A2.1 ICP-AES analytical data (continued)

Site No.[1]	Ga (ppm)	La (ppm)	Li (ppm)	Mn (ppm)	Nb (ppm)	Nd (ppm)	Ni (ppm)	Pb (ppm)	Sc (ppm)	Sr (ppm)	Th (ppm)	V (ppm)	Y (ppm)	Zn (ppm)
JAE3 AOV1	15	24	27	544	10	19.0	32	13	8	173	5	103	14.5	69
JAE3 AOV2	13	24	21	559	10	19.0	25	14	7	184	3	85	14.5	59
JAE4	15	26	25	585	9	21.0	33	13	9	159	5	105	16.0	72
JAE5	16	25	29	782	11	23.0	32	12	9	173	8	104	16.0	62
JAE6	14	25	18	786	12	22.0	22	12	7	162	7	75	15.0	75
JAE7	13	29	15	865	11	25.0	21	10	6	183	8	64	16.0	56
JAF1	13	22	24	600	10	14.5	27	25	7	170	3	88	13.5	60
JAF2	13	23	22	539	10	16.0	26	11	7	177	3	100	14.0	60
JAF3	16	28	26	661	14	23.0	31	15	9	173	7	94	17.0	82
JAF4	16	26	28	618	12	21.0	33	14	8	184	5	102	15.5	67
JAF5	17	28	23	751	14	24.5	31	15	9	172	9	97	17.5	67
JAF6	14	24	22	651	10	21.5	24	10	6	211	7	75	14.5	52
JAF7	16	30	25	633	14	26.0	28	12	8	201	9	90	16.5	63
JAG1	15	26	19	471	12	21.0	21	13	8	174	3	85	16.0	55
JAG2	15	25	25	520	11	20.0	28	13	8	199	5	95	14.5	65
JAG3	14	25	22	486	11	18.0	26	13	7	184	3	78	15.0	62
JAG4	15	27	30	494	12	19.5	30	13	8	208	3	80	15.0	59
JAG5	18	32	29	669	15	29.0	39	14	10	179	9	106	20.5	68
JAG6	12	23	15	1320	10	20.5	21	10	6	186	5	68	13.5	50
JAG7	15	30	18	1246	14	26.5	24	29	7	205	8	77	18.0	95
JAH1	14	28	21	761	13	21.5	24	18	7	174	5	76	16.5	81
JAH2	14	25	21	551	12	23.5	22	14	7	174	11	74	15.0	65
JAH3	15	24	25	547	12	22.0	27	15	8	186	11	95	15.5	68
JAH4	12	22	26	494	11	18.5	25	12	8	234	9	79	14.5	66
JAH5	16	28	20	687	14	24.5	22	13	8	161	8	81	17.0	75
JAH6	14	29	22	660	14	25.0	24	14	7	172	10	79	16.5	72
JAH7	14	28	23	970	14	26.0	30	15	8	107	9	104	17.0	81
JAI1	12	30	14	693	10	24.5	18	14	5	231	12	58	14.5	59
JAI2	18	19	26	739	12	19.5	54	12	15	217	11	132	17.0	83
JAI3	13	26	19	875	11	22.5	25	15	7	150	10	92	15.5	101
JAI4	13	24	24	673	12	21.0	30	13	7	214	10	85	15.5	69
JAI5	14	27	18	375	14	24.0	18	13	7	157	8	71	15.0	63
JAI6	12	23	17	2310	10	20.5	33	11	6	193	7	74	14.5	60
JAI7	11	22	17	1041	8	18.5	28	10	5	178	7	68	13.5	44
LMC7	13	32	32	1844	13	27.5	28	18	7	71	13	64	15.5	91
LME7	12	30	27	598	13	26.5	24	15	8	107	13	71	14.5	72
LME7 AOV1	15	30	21	514	13	26.0	20	13	8	155	13	77	16.5	69
LME7 AOV2	15	39	38	567	12	35.5	22	15	8	85	17	68	14.5	61

Table A2.1 ICP-AES analytical data (continued)

Site No.[1]	Al (wt%)	Ca (wt%)	Fe (wt%)	K (wt%)	Mg (wt%)	Na (wt%)	P (wt%)	Ti (wt%)	Ba (ppm)	Be (ppm)	Ce (ppm)	Co (ppm)	Cr (ppm)	Cu (ppm)
LMG7	7.629	2.917	5.33	1.48	2.205	1.808	0.088	0.518	476	1.5	27	20	49	32
LMH7	4.345	1.565	2.35	1.52	0.553	0.443	0.043	0.246	355	2.0	72	11	24	9
M2I1	7.180	0.953	3.51	1.87	1.016	1.435	0.074	0.330	991	2.0	56	11	47	24
M2I2	6.880	0.945	3.22	1.80	0.895	1.315	0.083	0.300	848	2.0	52	11	56	26
M2I6	5.440	0.461	1.95	2.09	0.648	0.615	0.046	0.212	598	1.5	69	6	32	15
MBB7	5.155	0.852	2.15	1.62	0.677	0.936	0.053	0.258	640	1.5	48	9	51	19
MBC7	5.020	2.961	2.19	1.55	1.114	0.836	0.056	0.240	573	1.0	50	9	62	20
MBE7	5.085	0.924	2.11	1.63	0.534	0.926	0.062	0.250	640	1.5	54	8	59	19
MBF7	4.505	1.008	1.28	1.38	0.312	1.348	0.051	0.217	649	0.8	48	5	24	5
MIA1	4.857	5.585	2.04	1.58	1.206	0.818	0.082	0.226	537	1.0	47	9	31	17
MIA2	5.722	3.801	2.29	1.55	0.989	0.845	0.061	0.247	624	1.5	48	9	35	19
MIA3	4.357	8.608	1.91	1.12	1.587	0.781	0.070	0.203	503	1.0	44	8	30	15
MIA4	5.891	3.423	2.39	1.70	1.102	0.877	0.067	0.267	700	1.0	54	10	37	20
MIA6	4.762	6.297	1.84	1.55	1.227	0.841	0.066	0.216	561	1.0	53	8	36	16
MIA7	5.775	0.995	2.37	1.85	0.791	0.949	0.063	0.276	732	1.5	59	10	28	20
MIB1	5.693	4.144	2.29	1.79	1.280	0.839	0.067	0.261	666	1.0	52	10	29	21
MIB2	5.431	3.011	2.15	1.45	0.861	1.080	0.065	0.236	641	1.5	46	8	38	16
MIB3	6.142	1.575	2.48	1.73	0.916	0.939	0.066	0.282	677	1.5	53	9	49	19
MIB4	5.991	4.030	2.29	1.74	1.140	0.922	0.064	0.265	698	1.0	54	10	36	20
MIB5	5.279	0.779	1.95	1.71	0.533	0.891	0.046	0.260	660	1.5	58	7	33	24
MIB6	5.109	7.647	2.09	1.59	1.732	0.785	0.064	0.215	556	1.0	48	8	28	19
MIB7	4.558	1.054	1.55	1.46	0.436	1.145	0.053	0.199	561	1.0	49	6	31	9
MIC1	5.673	3.412	2.60	1.58	1.037	0.786	0.078	0.264	655	1.5	57	9	46	21
MIC2	5.982	3.899	2.30	1.79	1.131	0.970	0.068	0.272	696	1.0	51	10	34	19
MIC3	5.735	3.134	2.13	1.74	1.021	0.966	0.069	0.266	649	1.0	54	10	39	18
MIC3 AOV1	5.578	5.048	2.18	1.80	1.250	0.964	0.070	0.257	629	1.5	63	9	18	18
MIC3 AOV2	5.232	5.508	2.04	1.67	1.392	0.936	0.063	0.240	662	1.0	52	9	26	16
MIC4	5.280	4.378	2.06	1.42	1.052	0.882	0.067	0.224	561	1.0	51	8	40	17
MIC5	5.168	3.817	2.12	1.68	1.356	0.905	0.069	0.240	624	1.0	55	9	34	17
MIC6	4.071	0.806	1.75	1.15	0.503	0.768	0.048	0.195	437	0.8	53	7	26	11
MIC7	4.725	5.073	1.92	1.61	1.329	0.863	0.075	0.225	559	1.0	51	8	34	17
MID1	6.164	3.637	2.41	1.66	1.246	0.938	0.062	0.281	693	1.5	54	11	42	20
MID2	5.869	0.906	2.54	1.75	0.748	0.872	0.065	0.265	649	2.0	59	10	23	19
MID3	4.752	7.282	1.99	1.47	2.600	0.845	0.061	0.211	507	1.0	50	8	36	17
MID4	5.019	7.322	2.07	1.49	1.523	0.764	0.062	0.222	549	1.0	47	8	42	18
MID4 AOV1	4.413	5.176	1.69	1.60	1.135	1.055	0.066	0.192	571	1.0	48	7	15	12
MID4 AOV2	3.756	9.464	1.25	1.41	1.290	0.976	0.069	0.177	549	0.5	45	6	20	11
MID5	5.558	1.870	2.42	1.67	0.862	0.927	0.066	0.264	609	1.5	57	10	48	18

Table A2.1 ICP-AES analytical data (continued)

Site No.[1]	Ga (ppm)	La (ppm)	Li (ppm)	Mn (ppm)	Nb (ppm)	Nd (ppm)	Ni (ppm)	Pb (ppm)	Sc (ppm)	Sr (ppm)	Th (ppm)	V (ppm)	Y (ppm)	Zn (ppm)
LMG7	21	13	32	1579	16	15.0	32	6	18	286	7	176	18.5	94
LMH7	13	37	30	767	13	30.5	22	14	7	57	16	58	15.0	98
M2I1	21	34	39	279	15	25.0	33	25	11	269	9	157	19.0	104
M2I2	19	30	36	273	13	25.5	32	26	10	223	9	147	18.0	116
M2I6	14	32	25	301	14	25.5	15	11	7	67	13	56	16.0	55
MBB7	15	28	23	669	13	23.5	28	16	8	163	7	95	17.0	89
MBC7	14	29	28	804	10	25.0	33	15	7	179	7	106	16.5	82
MBE7	14	32	19	751	12	24.5	25	15	8	157	8	86	17.0	87
MBF7	12	24	11	399	10	20.5	14	11	5	227	6	47	12.5	42
MIA1	12	25	21	604	12	23.5	30	10	7	148	10	90	15.0	56
MIA2	15	26	24	544	14	22.5	27	12	9	158	10	106	16.0	65
MIA3	11	24	19	928	9	18.5	22	11	7	168	9	81	14.0	46
MIA4	15	29	26	493	15	25.5	28	13	9	163	11	101	16.5	66
MIA6	12	26	22	728	11	23.0	24	10	7	160	10	88	15.0	60
MIA7	14	29	27	766	16	28.0	31	12	9	150	12	102	18.5	79
MIB1	15	26	28	584	15	24.5	30	11	9	170	11	102	16.5	68
MIB2	14	25	20	322	13	21.0	25	11	8	183	9	88	16.0	51
MIB3	15	29	27	550	15	24.5	27	13	9	172	11	107	16.5	76
MIB4	15	26	27	503	14	23.5	28	14	9	172	10	100	16.5	66
MIB5	14	33	18	551	15	25.5	18	14	8	142	11	86	19.0	80
MIB6	13	25	28	543	11	19.5	25	11	7	233	10	98	14.5	58
MIB7	11	25	12	568	11	21.5	15	11	6	175	10	55	13.5	47
MIC1	15	33	24	738	14	26.0	26	13	9	147	13	104	17.0	74
MIC2	14	26	29	511	14	23.5	27	12	9	213	11	98	16.5	66
MIC3	14	26	25	529	14	26.0	27	11	8	172	11	88	16.0	60
MIC3 AOV1	14	30	29	410	13	27.5	28	11	9	218	12	93	16.5	58
MIC3 AOV2	13	25	29	450	12	24.5	27	10	8	236	11	89	15.5	53
MIC4	13	27	23	555	12	21.5	23	11	7	171	10	90	14.5	60
MIC5	13	28	23	679	13	25.0	25	12	8	154	11	93	16.0	66
MIC6	11	30	18	470	11	22.5	19	11	6	124	11	70	14.5	52
MIC7	12	24	23	590	11	23.0	24	11	7	171	10	85	15.5	58
MID1	15	28	30	488	15	26.5	32	12	10	193	12	105	16.5	66
MID2	15	33	25	600	14	26.5	30	14	9	144	12	109	18.5	76
MID3	12	26	25	587	13	20.5	24	11	7	201	10	89	14.5	48
MID4	13	25	26	566	13	19.0	25	11	7	200	10	96	14.0	59
MID4 AOV1	12	24	22	438	9	21.0	20	10	6	256	9	64	14.0	49
MID4 AOV2	9	20	21	340	10	19.5	18	7	5	344	8	53	12.5	37
MID5	15	29	22	684	15	26.5	30	12	9	152	12	100	17.5	68

Table A2.1 ICP-AES analytical data (continued)

Site No.[1]	Al (wt%)	Ca (wt%)	Fe (wt%)	K (wt%)	Mg (wt%)	Na (wt%)	P (wt%)	Ti (wt%)	Ba (ppm)	Be (ppm)	Ce (ppm)	Co (ppm)	Cr (ppm)	Cu (ppm)
MID6	5.123	1.066	2.24	1.66	0.722	0.889	0.062	0.232	633	1.5	58	9	44	17
MID7	4.886	3.962	1.84	1.58	0.842	0.972	0.065	0.217	597	1.0	52	8	25	14
MID7 AOV1	3.992	7.692	1.87	1.28	1.571	0.898	0.076	0.183	506	0.8	46	8	31	14
MID7 AOV2	4.103	7.430	1.78	1.21	1.353	0.897	0.076	0.195	514	0.8	59	8	30	14
MID7 AOV3	4.047	7.378	1.87	1.42	1.346	0.855	0.076	0.190	511	0.8	49	8	24	14
MIE1	5.272	2.166	2.26	1.69	1.021	0.962	0.096	0.256	666	1.0	56	9	41	18
MIE3	4.574	5.215	1.61	1.61	0.987	1.060	0.066	0.212	626	0.8	57	7	19	13
MIE4	4.000	5.531	1.68	1.38	1.351	0.921	0.081	0.172	559	0.8	46	6	21	12
MIE6	4.710	6.526	1.89	1.42	1.099	0.833	0.072	0.214	591	1.0	49	7	29	16
MIE7	5.354	1.002	2.15	1.36	0.610	0.967	0.072	0.239	622	1.0	54	8	42	16
MIF1	5.258	0.984	1.89	1.40	0.539	1.098	0.059	0.215	684	1.0	49	8	32	13
MIF2	5.433	1.377	2.77	1.33	0.640	1.144	0.119	0.265	650	1.0	61	11	40	14
MIF3	4.780	1.097	1.77	1.36	0.363	1.361	0.070	0.272	565	0.8	67	5	22	2
MIF4	4.422	1.052	1.09	1.28	0.305	1.307	0.057	0.171	609	0.5	44	4	18	3
MIF5	4.625	2.392	1.59	1.57	0.644	1.236	0.062	0.194	619	1.0	46	6	8	7
MIF6	5.533	3.478	2.13	1.64	0.986	0.921	0.063	0.227	653	1.0	49	9	33	17
MIF6*	4.355	6.690	2.43	1.48	1.293	0.889	0.084	0.208	600	1.0	46	8	46	15
MIF7	5.474	1.008	2.20	1.79	0.636	0.932	0.063	0.263	679	1.5	58	10	47	19
MIG1	4.337	1.104	1.88	1.46	0.333	1.444	0.080	0.257	652	0.5	75	5	27	6
MIG2	4.290	1.007	1.84	1.45	0.339	1.377	0.060	0.228	619	0.5	71	6	22	6
MIG2 AOV1	4.155	1.122	1.86	1.38	0.365	1.300	0.069	0.220	631	0.8	54	6	30	6
MIG2 AOV2	4.429	1.189	2.00	1.51	0.401	1.351	0.075	0.241	664	0.8	49	6	22	6
MIG3	3.835	7.170	2.37	1.32	1.788	0.942	0.102	0.181	541	0.8	43	9	24	13
MIG4	4.516	1.137	2.19	1.47	0.379	1.458	0.077	0.367	634	0.5	103	6	19	4
MIG5	4.460	3.575	1.85	1.52	1.895	1.105	0.062	0.197	619	1.0	44	7	56	11
MIG6	5.685	4.055	2.43	1.77	1.227	0.970	0.069	0.236	685	1.0	45	10	64	18
MIG7	5.215	4.195	2.32	1.59	1.315	0.911	0.063	0.235	589	1.5	48	9	39	18
MIH1	4.790	1.080	2.08	1.55	0.457	1.210	0.074	0.224	2002	1.0	54	7	51	10
MIH2	4.645	1.001	1.21	1.60	0.289	1.440	0.045	0.165	663	0.5	37	4	42	5
MIH3	5.280	1.090	2.11	1.79	0.574	1.095	0.066	0.241	682	1.0	55	8	63	14
MIH4	4.955	1.095	1.76	1.67	0.418	1.310	0.063	0.209	691	1.0	50	7	55	9
MIH5	5.380	1.620	2.10	1.73	0.867	1.150	0.069	0.237	651	1.0	52	8	57	13
MIH6	5.092	4.491	2.34	1.53	1.266	0.853	0.087	0.234	566	1.0	44	9	38	20
MIH6*	4.641	1.071	1.93	1.47	0.520	1.087	0.070	0.221	582	1.0	44	7	43	14
MIH6**	4.717	3.944	2.26	1.40	1.303	0.914	0.074	0.254	508	1.3	48	7	21	14
MIH7	6.283	1.168	2.97	1.72	0.900	0.573	0.065	0.292	588	2.0	61	13	49	38
MTB7	5.769	0.847	2.20	1.83	0.527	1.312	0.055	0.327	687	1.5	77	6	40	7
MTE7	6.909	0.765	2.45	1.66	0.641	1.040	0.049	0.319	831	1.5	58	11	53	20

Table A2.1 ICP-AES analytical data (continued)

Site No.[1]	Ga (ppm)	La (ppm)	Li (ppm)	Mn (ppm)	Nb (ppm)	Nd (ppm)	Ni (ppm)	Pb (ppm)	Sc (ppm)	Sr (ppm)	Th (ppm)	V (ppm)	Y (ppm)	Zn (ppm)
MID6	13	31	19	789	14	26.0	23	13	8	145	11	83	17.0	92
MID7	12	26	21	525	12	22.5	20	11	7	211	10	75	15.0	57
MID7 AOV1	11	25	21	776	9	19.5	25	10	6	342	9	69	14.0	58
MID7 AOV2	11	31	19	721	10	25.0	22	10	6	270	12	62	14.5	59
MID7 AOV3	10	26	19	709	10	20.5	23	10	6	266	10	64	14.0	62
MIE1	14	29	22	824	14	28.0	24	12	8	165	11	76	18.0	73
MIE3	11	26	18	461	11	25.0	21	9	6	189	11	65	14.5	46
MIE4	10	24	15	629	9	19.5	18	10	6	211	9	60	13.5	54
MIE6	12	26	20	622	12	20.0	21	10	7	175	9	85	14.5	60
MIE7	13	31	18	645	13	25.0	20	13	8	155	11	82	17.5	81
MIF1	13	26	18	480	12	20.5	20	13	7	185	9	74	15.0	62
MIF2	13	36	16	1027	13	29.5	25	15	8	188	13	74	19.5	68
MIF3	10	32	8	402	13	29.5	11	9	7	218	14	48	15.0	30
MIF4	10	23	9	248	10	19.0	8	10	4	220	8	41	10.5	34
MIF5	12	24	14	330	11	20.5	17	10	5	228	9	60	13.5	43
MIF6	14	26	26	510	13	23.0	26	11	8	172	10	105	15.5	76
MIF6*	12	24	24	560	10	20.0	23	11	7	240	3	93	14.5	62
MIF7	14	30	20	744	15	26.5	25	13	8	149	11	91	18.5	92
MIG1	12	39	11	536	13	32.5	13	12	6	219	14	52	15.0	42
MIG2	12	38	11	539	9	31.0	15	12	6	201	11	51	15.0	40
MIG2 AOV1	12	27	11	452	10	23.5	15	11	6	204	8	50	13.0	47
MIG2 AOV2	12	25	12	508	10	23.0	16	11	6	214	6	52	14.0	46
MIG3	11	23	18	894	8	20.5	24	11	6	181	9	55	14.5	55
MIG4	12	51	12	509	14	47.0	15	12	7	225	18	64	18.0	39
MIG5	12	23	25	512	9	17.5	21	12	6	289	3	60	13.5	57
MIG6	16	25	28	495	10	20.0	32	14	8	195	3	92	15.0	63
MIG7	14	26	23	614	11	19.5	28	36	8	172	5	98	15.5	75
MIH1	12	30	15	637	10	23.5	19	23	6	233	7	55	16.0	61
MIH2	11	20	11	254	6	14.5	12	12	4	228	3	40	11.0	33
MIH3	14	28	20	592	11	22.0	25	20	7	173	5	75	16.5	75
MIH4	13	27	13	465	9	19.5	18	14	6	218	5	57	13.5	56
MIH5	14	29	25	509	11	21.5	27	15	7	200	3	84	16.0	63
MIH6	16	24	26	586	11	25.0	31	13	8	164	9	104	14.5	72
MIH6*	14	25	16	817	12	24.5	22	16	6	171	8	73	15.5	74
MIH6**	14	27	21	608	13	27.5	24	13	7	173	10	92	15.5	76
MIH7	20	32	36	1197	16	31.5	43	19	11	112	10	166	18.5	175
MTB7	14	37	19	384	16	26.0	17	8	8	199	13	69	15.0	56
MTE7	18	28	26	720	15	21.5	35	10	10	182	11	94	19.0	72

Table A2.1 ICP-AES analytical data (continued)

Site No.[1]	Al (wt%)	Ca (wt%)	Fe (wt%)	K (wt%)	Mg (wt%)	Na (wt%)	P (wt%)	Ti (wt%)	Ba (ppm)	Be (ppm)	Ce (ppm)	Co (ppm)	Cr (ppm)	Cu (ppm)
MTG7	5.465	1.015	2.21	1.96	0.695	1.080	0.087	0.300	814	1.5	65	7	51	13
MYA1	6.250	3.780	2.62	1.77	1.060	0.856	0.056	0.295	684	2.0	53	10	50	26
MYA2	5.123	0.722	2.17	1.65	0.520	1.079	0.059	0.310	675	1.5	60	7	31	17
MYA3	5.746	4.101	2.59	1.66	1.155	0.852	0.061	0.266	736	1.5	50	9	50	28
MYA4	5.232	0.790	2.20	1.88	0.620	1.021	0.068	0.278	742	1.5	62	8	34	21
MYA5	5.506	1.373	2.38	1.63	0.773	0.914	0.065	0.257	663	1.5	53	10	49	16
MYA6	5.056	5.365	2.30	1.29	1.522	0.724	0.064	0.222	536	1.5	42	9	46	21
MYA7	4.702	4.129	2.10	1.41	1.126	0.732	0.063	0.215	580	1.0	45	9	32	20
MYB1	5.982	0.629	2.59	1.76	0.656	0.928	0.056	0.295	748	2.0	58	10	50	20
MYB2	6.269	0.648	2.57	1.84	0.690	0.905	0.061	0.271	856	2.0	53	10	46	27
MYB3	5.465	1.115	2.54	1.72	0.653	0.782	0.072	0.270	930	2.5	51	9	52	27
MYB4	5.433	0.751	2.19	1.87	0.606	1.004	0.061	0.273	730	1.0	63	8	44	17
MYB5	5.596	0.796	2.41	1.67	0.693	0.923	0.062	0.259	679	1.5	54	9	37	17
MYB6	5.199	0.913	2.31	1.69	0.666	0.874	0.073	0.228	623	1.5	49	8	44	17
MYB7	5.151	4.607	2.30	1.49	1.231	0.724	0.064	0.223	525	1.5	43	8	47	21
MYC1	6.296	0.589	2.73	1.84	0.826	0.793	0.067	0.294	799	2.0	57	12	61	36
MYC2	6.134	0.775	2.58	1.74	0.717	0.945	0.058	0.297	744	2.0	55	9	51	22
MYC3	5.117	0.726	2.17	1.63	0.512	1.092	0.056	0.247	682	1.0	62	8	34	15
MYC4	5.224	0.753	2.17	1.83	0.607	1.005	0.068	0.281	724	2.0	62	8	41	17
MYC5	5.518	0.809	2.38	1.89	0.735	0.906	0.064	0.260	680	1.5	55	9	49	18
MYC6	5.126	6.529	2.36	1.52	1.204	0.818	0.061	0.226	582	1.0	47	9	42	19
MYC7	4.448	3.603	2.06	1.40	0.813	1.065	0.084	0.245	575	1.0	55	7	39	11
MYD1	5.843	4.726	2.63	1.63	0.979	0.874	0.058	0.256	678	1.0	46	9	52	21
MYD2	5.868	3.394	2.52	1.70	1.150	0.832	0.053	0.280	685	2.0	59	9	47	21
MYD3	5.500	0.774	2.18	1.48	0.606	1.010	0.067	0.269	728	1.0	64	8	45	15
MYD4	5.434	0.744	2.45	1.81	0.634	0.879	0.059	0.254	656	1.5	56	9	49	16
MYD5	5.441	3.031	2.36	1.80	1.049	0.908	0.063	0.242	659	1.5	51	9	32	18
MYD6	6.073	0.991	2.94	1.59	0.781	0.843	0.072	0.286	732	2.0	71	10	51	18
MYD7	5.272	4.596	2.43	1.68	1.414	0.799	0.069	0.234	569	1.0	47	9	45	22
MYE1	5.958	0.775	2.60	1.83	0.699	0.979	0.052	0.290	736	2.0	56	9	53	17
MYE2	5.248	0.807	2.09	1.83	0.578	1.060	0.060	0.249	688	1.0	54	8	40	14
MYE3	5.274	1.072	2.24	1.73	0.709	0.984	0.068	0.261	677	1.0	56	9	36	14
MYE4	5.157	4.867	2.23	1.47	1.203	0.826	0.070	0.227	534	1.0	43	8	29	18
MYE5	5.409	1.052	2.87	1.79	0.758	0.961	0.080	0.267	722	2.0	69	11	49	20
MYE6	6.068	0.921	2.78	1.78	0.807	0.888	0.055	0.262	657	2.0	52	11	48	19
MYE7	5.969	0.841	2.51	1.67	0.678	0.887	0.063	0.273	691	1.5	50	10	34	22
MYF1	6.085	0.810	2.64	1.74	0.744	1.022	0.053	0.282	753	2.0	54	9	50	255
MYF2	5.601	4.125	2.42	1.66	1.251	0.769	0.056	0.250	620	1.5	49	9	45	21

Table A2.1 ICP-AES analytical data (continued)

Site No.[1]	Ga (ppm)	La (ppm)	Li (ppm)	Mn (ppm)	Nb (ppm)	Nd (ppm)	Ni (ppm)	Pb (ppm)	Sc (ppm)	Sr (ppm)	Th (ppm)	V (ppm)	Y (ppm)	Zn (ppm)
MTG7	15	37	23	369	15	27.5	22	16	8	177	7	80	19.5	72
MYA1	18	29	27	459	13	25.0	30	12	10	169	12	94	16.0	65
MYA2	14	34	18	378	14	28.5	20	10	8	162	11	70	16.0	62
MYA3	16	29	25	451	13	25.0	30	12	9	194	12	96	16.0	68
MYA4	14	34	20	422	13	27.5	20	13	7	158	12	76	17.5	67
MYA5	15	31	23	574	16	23.5	27	12	9	156	11	93	17.5	78
MYA6	14	25	23	578	13	21.0	26	11	8	146	9	97	14.5	63
MYA7	14	25	20	647	13	20.5	24	18	8	144	10	92	15.0	68
MYB1	17	33	24	541	15	28.0	27	12	9	145	13	86	18.0	72
MYB2	18	30	24	447	14	26.5	31	12	10	151	12	87	18.0	78
MYB3	16	30	23	528	14	25.0	25	14	10	159	11	90	17.5	79
MYB4	15	34	22	406	14	28.5	23	12	8	154	13	82	17.5	66
MYB5	16	30	21	571	16	21.5	27	12	8	148	12	92	17.0	80
MYB6	15	29	20	733	14	23.0	21	12	8	150	11	83	16.5	82
MYB7	15	26	23	510	14	19.5	28	13	8	140	10	109	15.5	67
MYC1	18	31	25	511	14	27.0	31	13	11	133	13	97	18.5	94
MYC2	17	31	23	469	14	27.0	29	13	10	159	13	94	17.5	72
MYC3	14	35	18	437	12	29.0	24	10	7	166	12	72	15.5	58
MYC4	14	34	21	403	14	28.0	21	13	7	154	13	77	17.5	66
MYC5	16	31	22	558	16	25.0	26	16	8	150	12	95	18.0	70
MYC6	15	26	25	539	14	17.0	27	10	8	167	11	95	15.0	57
MYC7	12	32	15	646	13	22.0	18	10	6	174	13	72	15.5	56
MYD1	15	26	24	417	11	22.5	32	14	9	227	11	91	17.0	72
MYD2	16	29	28	557	14	29.0	32	13	9	166	11	108	17.5	71
MYD3	15	35	22	443	17	27.0	22	12	7	159	13	82	17.5	67
MYD4	15	33	20	626	16	25.5	25	16	8	148	12	93	17.5	83
MYD5	15	29	24	566	15	22.5	25	15	8	185	12	99	16.0	67
MYD6	18	41	26	949	18	29.0	30	13	10	137	16	104	20.0	82
MYD7	16	27	26	777	15	20.0	32	14	8	159	13	105	15.5	68
MYE1	16	29	25	460	14	28.0	31	14	9	168	12	97	17.5	75
MYE2	15	31	20	475	16	22.0	22	11	7	164	12	80	17.0	67
MYE3	14	33	20	571	14	26.5	23	17	8	162	12	79	17.5	62
MYE4	14	25	23	587	14	18.5	25	12	8	158	10	98	14.5	61
MYE5	15	42	19	1111	14	35.0	26	19	9	162	16	85	19.5	99
MYE6	18	30	28	523	17	23.5	31	16	10	148	12	114	18.0	82
MYE7	16	29	26	575	16	25.0	27	14	9	156	11	102	17.5	71
MYF1	17	30	24	455	14	26.5	30	19	10	184	12	102	18.5	238
MYF2	16	28	26	614	16	21.5	28	15	8	160	11	113	16.0	74

Table A2.1 ICP-AES analytical data (continued)

Site No.[1]	Al (wt%)	Ca (wt%)	Fe (wt%)	K (wt%)	Mg (wt%)	Na (wt%)	P (wt%)	Ti (wt%)	Ba (ppm)	Be (ppm)	Ce (ppm)	Co (ppm)	Cr (ppm)	Cu (ppm)
MYF3	4.668	6.155	2.00	1.55	0.886	0.803	0.065	0.215	577	0.8	46	7	39	17
MYF4	4.618	2.081	2.23	1.56	0.989	1.069	0.081	0.214	609	1.0	43	8	36	15
MYF5	5.421	5.720	2.33	1.52	1.483	0.669	0.053	0.246	583	1.0	43	10	38	23
MYF6	5.371	2.913	2.25	1.54	1.149	0.757	0.067	0.237	595	1.5	46	9	46	21
MYF7	5.844	0.594	2.64	1.84	0.691	0.866	0.049	0.257	666	1.5	54	10	44	20
MYG1	5.435	0.678	2.24	1.75	0.578	0.847	0.059	0.267	2702	1.5	50	7	60	16
MYG2	5.620	0.855	2.57	1.73	0.725	0.916	0.052	0.265	653	2.0	53	10	50	23
MYG3	5.138	5.296	2.23	1.44	1.509	0.798	0.059	0.219	579	1.0	42	8	27	22
MYG4	5.157	4.769	2.35	1.54	1.306	0.759	0.062	0.225	659	1.0	42	9	34	20
MYG5	4.974	5.316	2.25	1.40	1.347	0.680	0.070	0.214	514	1.0	42	8	36	22
MYG6	5.116	1.111	2.84	1.71	0.561	1.104	0.080	0.275	629	1.0	73	9	34	14
MYG7	5.269	1.046	2.76	1.75	0.637	1.012	0.079	0.249	728	1.5	52	9	36	17
MYH1	6.199	1.093	2.82	1.60	0.694	1.297	0.060	0.329	728	2.0	49	10	44	21
MYH2	5.840	0.826	2.54	1.68	0.613	0.957	0.065	0.271	696	1.5	52	8	44	17
MYH3	4.886	6.784	2.11	1.48	1.472	0.833	0.052	0.220	575	1.0	46	8	31	17
MYH4	5.847	0.981	2.67	1.61	0.797	0.877	0.062	0.266	630	1.5	51	10	37	21
MYH5	5.535	0.930	2.32	1.78	0.557	1.242	0.052	0.268	728	2.0	51	8	27	11
MYH6	5.234	0.912	2.26	1.50	0.545	1.083	0.064	0.237	600	1.0	55	8	44	13
MYH7	4.783	3.191	1.93	1.51	0.895	0.960	0.071	0.228	603	1.0	45	8	40	16
MYI1	5.913	1.333	2.39	1.83	0.707	1.106	0.070	0.280	734	1.0	52	10	46	17
MYI2	5.540	3.483	2.42	1.68	1.024	0.994	0.074	0.255	678	1.0	47	9	45	227
MYI3	5.604	5.770	2.33	1.72	1.269	0.802	0.083	0.257	612	1.0	50	13	47	23
MYI4	5.440	5.132	2.37	1.65	1.385	0.908	0.059	0.240	655	1.5	44	9	31	19
MYI5	5.026	4.956	1.89	1.37	1.109	1.078	0.053	0.221	648	1.0	44	7	33	12
MYI6	4.372	6.348	1.93	1.53	0.945	0.898	0.077	0.191	554	0.8	43	7	34	15
MYI7	4.855	2.098	1.46	1.56	0.517	1.246	0.063	0.208	655	1.0	45	6	24	8
NRA1	4.699	1.180	2.38	1.62	0.556	1.186	0.057	0.223	681	1.0	51	11	25	10
NRA2	5.210	1.048	2.40	1.49	0.701	0.834	0.086	0.249	665	1.5	51	10	35	16
NRA3	4.755	3.447	2.11	1.55	1.157	0.903	0.082	0.235	580	1.0	49	8	15	15
NRA4	5.427	1.339	2.17	1.76	0.736	1.139	0.057	0.251	679	1.5	50	9	15	16
NRA5	5.485	0.826	2.13	1.82	0.530	1.128	0.060	0.242	718	1.5	51	9	43	15
NRA6	4.696	5.510	1.69	1.50	1.343	1.143	0.071	0.212	696	1.0	47	7	36	12
NRA7	5.150	1.208	1.89	1.72	0.541	1.238	0.071	0.248	693	1.0	58	8	38	11
NRB1	5.140	4.116	2.30	1.66	1.229	0.732	0.065	0.233	526	1.5	48	8	18	21
NRB2	5.036	1.375	2.46	1.62	0.813	0.826	0.084	0.268	630	1.5	58	9	21	15
NRB3	5.152	4.769	2.26	1.63	1.415	0.791	0.063	0.239	597	1.0	50	10	20	19
NRB4	6.028	0.801	2.66	1.82	0.718	0.954	0.061	0.279	696	1.5	57	10	18	19
NRB5	4.020	0.692	1.55	1.33	0.420	0.816	0.046	0.196	535	0.8	43	6	28	59

Table A2.1 ICP-AES analytical data (continued)

Site No.[1]	Ga (ppm)	La (ppm)	Li (ppm)	Mn (ppm)	Nb (ppm)	Nd (ppm)	Ni (ppm)	Pb (ppm)	Sc (ppm)	Sr (ppm)	Th (ppm)	V (ppm)	Y (ppm)	Zn (ppm)
MYF3	13	25	21	573	14	18.0	20	10	6	161	12	77	14.0	61
MYF4	13	25	17	728	13	19.5	20	11	6	180	10	66	15.5	57
MYF5	15	25	27	656	14	20.5	29	16	9	156	9	109	15.0	65
MYF6	15	26	23	659	14	20.5	25	16	8	142	10	100	14.5	80
MYF7	16	31	28	566	15	26.5	27	17	10	144	11	110	18.0	74
MYG1	16	30	22	486	12	25.5	25	15	8	234	7	80	16.5	76
MYG2	16	31	24	661	13	25.5	28	13	9	151	12	102	18.0	74
MYG3	14	25	24	581	12	21.0	27	15	8	192	9	99	15.0	60
MYG4	14	24	26	723	14	18.0	27	13	8	178	10	105	15.0	67
MYG5	14	24	24	674	13	17.5	24	13	8	143	9	95	14.0	72
MYG6	14	41	19	691	16	30.0	24	12	8	177	18	82	20.0	66
MYG7	14	34	19	829	14	30.0	25	18	8	171	12	77	19.5	86
MYH1	18	30	24	403	15	25.5	32	11	10	230	11	93	17.0	73
MYH2	16	30	22	517	13	25.5	24	12	9	172	12	88	16.5	76
MYH3	14	25	24	541	10	21.0	26	10	7	197	10	91	14.5	55
MYH4	15	30	24	777	15	25.5	29	15	9	150	11	107	18.0	78
MYH5	14	30	20	491	15	25.0	25	15	8	226	10	83	16.5	59
MYH6	15	32	22	509	16	23.0	23	13	8	165	13	79	17.0	62
MYH7	13	25	19	510	12	21.0	21	14	7	181	9	74	14.5	56
MYI1	17	30	23	886	13	28.0	29	15	8	210	7	89	17.0	69
MYI2	16	26	23	1175	11	25.0	26	21	8	211	7	89	15.0	178
MYI3	16	29	29	727	12	25.0	32	14	8	170	7	106	15.5	63
MYI4	15	25	27	496	13	21.5	28	15	9	220	10	94	15.0	62
MYI5	14	24	19	408	13	18.0	22	10	6	207	9	76	13.5	50
MYI6	12	24	18	476	11	17.5	20	10	6	175	10	66	14.0	52
MYI7	12	25	16	328	12	18.0	17	9	6	211	9	58	13.0	43
NRA1	13	26	15	1400	12	22.0	25	11	6	212	11	75	15.0	52
NRA2	15	30	20	1153	15	25.0	25	13	8	149	11	84	18.0	80
NRA3	14	28	19	731	13	23.0	21	12	7	158	10	80	15.0	61
NRA4	15	26	22	485	15	21.5	25	12	8	201	10	79	15.5	55
NRA5	14	29	20	629	15	24.0	23	13	7	167	11	76	17.0	74
NRA6	12	26	20	385	13	19.5	21	9	6	225	10	62	13.5	45
NRA7	12	30	18	496	14	25.0	21	12	6	183	12	65	16.5	52
NRB1	15	25	26	877	14	20.5	25	12	8	159	10	102	15.0	69
NRB2	14	30	20	1103	14	26.5	24	13	8	156	13	87	19.0	81
NRB3	15	26	27	683	15	21.5	28	12	8	188	11	94	15.0	63
NRB4	17	30	26	584	17	24.5	30	14	9	172	12	102	17.5	73
NRB5	9	22	16	425	11	19.0	17	10	6	132	8	56	13.5	55

Table A2.1 ICP-AES analytical data (continued)

Site No.[1]	Al (wt%)	Ca (wt%)	Fe (wt%)	K (wt%)	Mg (wt%)	Na (wt%)	P (wt%)	Ti (wt%)	Ba (ppm)	Be (ppm)	Ce (ppm)	Co (ppm)	Cr (ppm)	Cu (ppm)
NRB6	4.784	5.078	1.95	1.66	1.146	1.065	0.073	0.220	628	1.0	49	8	41	16
NRB7	5.134	1.212	1.98	1.69	0.630	1.177	0.064	0.246	691	1.0	53	9	43	14
NRC1	3.412	9.533	1.88	1.23	1.135	0.615	0.103	0.162	443	0.8	34	7	28	15
NRC2	5.184	1.159	2.26	1.67	0.622	1.078	0.068	0.260	644	1.0	53	9	28	13
NRC3	5.579	4.565	2.41	1.78	1.601	0.955	0.077	0.261	663	1.0	50	10	20	18
NRC4	4.820	5.434	1.99	1.66	1.071	0.973	0.069	0.229	665	1.0	48	8	16	14
NRC4 AOV1	4.671	3.959	1.92	1.68	0.925	1.164	0.058	0.217	611	1.0	46	7	9	13
NRC4 AOV2	4.740	4.445	1.81	1.64	1.139	1.120	0.063	0.227	642	1.0	47	7	13	13
NRC5	4.499	4.079	1.51	1.55	1.168	1.182	0.060	0.220	663	1.0	48	6	16	9
NRC6	5.413	1.119	2.20	1.82	0.693	1.106	0.061	0.253	760	1.5	61	9	44	14
NRC7	5.235	0.870	2.27	1.80	0.565	1.103	0.057	0.253	705	1.0	55	9	37	15
NRD1	5.392	0.865	2.36	1.78	0.655	0.830	0.068	0.260	654	1.5	57	10	21	21
NRD2	5.164	0.715	2.29	1.63	0.602	0.697	0.099	0.233	599	1.5	49	7	23	27
NRD2 AOV1	5.675	0.649	2.22	1.71	0.523	0.743	0.092	0.260	645	1.5	51	8	22	25
NRD2 AOV2	5.522	0.680	2.22	1.73	0.528	0.769	0.098	0.254	626	1.5	52	9	19	31
NRD2 AOV3	5.619	0.703	2.25	1.77	0.535	0.792	0.101	0.259	619	1.5	52	10	29	21
NRD3	5.128	4.659	2.18	1.73	1.182	1.075	0.070	0.242	681	1.0	48	9	17	15
NRD4	5.327	0.830	1.98	1.74	0.487	1.167	0.047	0.240	732	1.0	53	8	12	12
NRD5	5.195	1.033	2.11	1.73	0.570	1.149	0.061	0.238	705	1.0	58	8	40	13
NRD6	5.082	1.298	2.19	1.79	0.691	1.144	0.059	0.252	670	1.5	56	9	42	15
NRD7	3.945	5.230	1.73	1.37	1.221	0.840	0.072	0.179	471	0.8	48	8	31	15
NRE1	5.644	4.294	2.58	1.64	1.361	0.759	0.064	0.254	604	1.5	48	10	22	22
NRE2	5.274	0.865	2.27	1.74	0.555	1.100	0.067	0.256	701	1.0	55	10	15	14
NRE3	4.285	5.480	1.86	1.51	1.152	1.067	0.068	0.196	591	1.0	40	6	20	11
NRE4	4.567	4.796	1.94	1.47	1.532	0.781	0.050	0.211	559	1.0	50	8	13	16
NRE5	4.815	3.660	1.94	1.62	0.890	1.018	0.063	0.221	629	1.0	44	8	35	13
NRE6	5.227	1.396	2.54	1.59	0.668	1.118	0.061	0.288	627	1.0	67	8	45	11
NRE7	5.056	1.227	2.24	1.43	0.715	0.866	0.077	0.239	579	1.5	56	10	48	15
NRF1	4.946	3.944	2.22	1.45	1.118	0.758	0.054	0.225	504	1.0	43	10	22	20
NRF2	5.139	0.877	2.17	1.73	0.571	1.067	0.060	0.247	676	1.5	54	9	22	16
NRF3	4.084	6.511	1.54	1.45	1.707	1.012	0.067	0.193	598	0.8	38	6	10	10
NRF4	4.808	4.103	1.91	1.62	1.027	1.001	0.066	0.223	614	1.0	47	8	16	14
NRF5	5.717	0.851	2.55	1.83	0.673	1.057	0.061	0.276	650	1.5	54	10	46	17
NRF6	5.056	1.205	2.39	1.65	0.627	1.138	0.058	0.245	607	1.0	51	9	36	18
NRF7	4.717	6.138	2.05	1.54	1.651	0.782	0.068	0.209	557	1.0	49	9	47	20
NRG1	4.211	6.915	1.88	1.45	1.249	0.747	0.067	0.209	552	1.0	42	7	23	16
NRG2	4.605	4.585	2.08	1.54	1.063	0.837	0.056	0.214	598	1.5	47	9	30	18
NRG3	4.276	6.677	2.02	1.45	1.216	0.938	0.061	0.217	606	0.8	46	7	26	15

Table A2.1 ICP-AES analytical data (continued)

Site No.[1]	Ga (ppm)	La (ppm)	Li (ppm)	Mn (ppm)	Nb (ppm)	Nd (ppm)	Ni (ppm)	Pb (ppm)	Sc (ppm)	Sr (ppm)	Th (ppm)	V (ppm)	Y (ppm)	Zn (ppm)
NRB6	12	27	24	501	13	22.5	22	10	7	243	11	74	15.0	57
NRB7	13	29	19	574	14	23.0	23	12	7	174	11	74	16.5	63
NRC1	10	20	17	3010	8	15.5	17	9	5	253	9	62	11.5	66
NRC2	14	29	21	604	15	24.5	23	12	8	187	12	84	16.5	60
NRC3	16	26	28	554	14	21.0	29	11	8	223	10	96	15.5	63
NRC4	13	25	25	471	12	20.5	22	10	7	267	11	72	14.5	55
NRC4 AOV1	13	26	23	409	13	18.5	18	11	6	303	10	65	14.0	54
NRC4 AOV2	13	24	24	443	13	20.0	20	10	7	301	10	66	14.5	49
NRC5	10	23	17	345	11	19.5	17	10	6	216	10	54	14.0	39
NRC6	12	29	22	596	15	26.0	22	13	8	182	13	77	18.0	74
NRC7	14	30	20	613	12	25.5	24	14	8	165	10	84	17.0	80
NRD1	15	29	22	909	15	25.0	26	13	8	162	13	96	17.0	93
NRD2	16	26	20	456	16	22.0	23	13	8	122	11	87	16.0	86
NRD2 AOV1	16	28	20	325	17	22.0	18	15	9	123	10	94	15.5	82
NRD2 AOV2	16	27	20	458	16	22.0	18	15	9	128	11	95	15.0	81
NRD2 AOV3	16	26	20	463	17	21.0	18	16	8	134	11	94	15.0	80
NRD3	14	26	23	469	14	21.0	25	11	7	236	10	77	15.0	57
NRD4	14	29	17	542	14	23.5	20	11	7	194	11	69	16.0	64
NRD5	14	32	20	563	11	24.5	22	14	7	178	9	75	16.5	69
NRD6	13	32	19	640	11	25.5	24	14	7	176	10	87	17.0	69
NRD7	10	26	16	818	10	21.0	23	10	6	148	10	75	15.0	52
NRE1	16	26	28	669	14	21.0	29	12	9	147	10	107	16.0	65
NRE2	14	30	21	711	15	24.5	26	13	7	183	12	82	17.0	64
NRE3	12	22	23	428	12	16.0	16	11	5	356	9	60	12.5	53
NRE4	13	26	27	448	12	21.0	23	10	7	197	10	67	14.0	46
NRE5	13	24	22	457	10	19.5	21	11	7	210	8	71	14.0	58
NRE6	14	40	19	648	12	31.0	26	13	8	186	14	83	19.5	58
NRE7	13	30	21	1135	13	25.0	28	13	8	136	12	95	18.0	69
NRF1	14	25	24	1205	12	22.5	31	11	7	164	11	115	15.0	74
NRF2	14	28	20	833	15	24.0	23	15	7	181	12	82	16.5	68
NRF3	11	20	20	429	11	16.5	17	9	5	307	8	55	12.0	44
NRF4	13	25	21	574	12	21.0	22	11	7	203	10	75	14.5	54
NRF5	15	31	26	573	12	25.5	30	14	8	167	11	91	17.0	74
NRF6	13	28	19	897	11	23.5	26	13	8	173	10	88	16.0	66
NRF7	13	27	26	621	13	21.0	28	11	7	166	11	100	15.0	56
NRG1	12	23	21	778	12	19.5	21	10	6	192	10	77	13.5	63
NRG2	13	25	27	974	11	20.5	23	12	7	247	10	82	14.5	76
NRG3	12	24	19	704	12	19.0	20	10	6	236	10	73	14.0	54

Table A2.1 ICP-AES analytical data (continued)

Site No.[1]	Al (wt%)	Ca (wt%)	Fe (wt%)	K (wt%)	Mg (wt%)	Na (wt%)	P (wt%)	Ti (wt%)	Ba (ppm)	Be (ppm)	Ce (ppm)	Co (ppm)	Cr (ppm)	Cu (ppm)
NRG3 AOV1	4.516	3.494	1.86	1.51	1.098	0.973	0.076	0.218	617	1.0	47	7	18	16
NRG3 AOV2	4.776	3.430	1.88	1.62	1.094	1.014	0.078	0.227	610	1.0	48	7	30	69
NRG3 AOV3	4.402	3.469	1.88	1.58	1.069	1.006	0.076	0.217	604	1.0	49	7	17	14
NRG4	4.501	1.498	1.84	1.51	0.587	1.153	0.071	0.220	586	1.0	50	8	26	12
NRG5	4.298	6.042	1.70	1.39	1.446	1.058	0.061	0.215	648	0.8	53	8	25	14
NRG6	3.558	0.712	0.87	1.27	0.186	1.182	0.028	0.117	503	0.5	36	3	16	5
NRG7	4.588	0.878	2.12	1.37	0.541	0.830	0.056	0.205	566	1.0	42	9	38	11
NRH1	4.018	7.759	1.30	1.28	1.038	1.096	0.073	0.178	564	0.5	37	5	14	9
NRH2	5.049	1.044	2.19	1.60	0.758	0.868	0.057	0.235	574	1.5	49	10	29	18
NRH3	4.947	0.835	1.99	1.74	0.559	0.953	0.056	0.251	688	1.0	53	6	20	17
NRH4	4.018	3.769	2.06	1.28	0.978	0.612	0.084	0.205	429	1.0	46	10	28	17
NRH5	4.739	0.898	1.99	1.66	0.504	0.956	0.057	0.208	610	1.0	44	9	38	16
NRH6	4.874	0.944	2.02	1.59	0.522	1.073	0.051	0.233	618	1.0	46	8	30	13
NRH7	4.863	5.302	2.27	1.74	1.658	0.960	0.069	0.237	529	1.0	49	10	31	15
NRI1	5.251	1.018	2.49	1.70	0.670	0.994	0.059	0.255	672	1.5	56	9	43	21
NRI2	4.906	1.183	2.36	1.60	0.757	0.921	0.063	0.240	575	1.5	52	8	24	20
NRI3	4.921	0.997	2.85	1.50	0.715	0.837	0.065	0.263	537	1.5	66	7	21	18
NRI4	4.639	0.998	1.48	1.56	0.343	1.356	0.050	0.197	634	1.0	43	6	12	8
NRI5	4.150	4.550	1.86	1.50	1.527	0.944	0.075	0.205	542	0.8	46	8	25	14
NRI6	4.039	6.558	1.99	1.42	1.135	0.692	0.062	0.197	447	0.8	42	8	36	16
NRI7	4.081	6.169	1.81	1.46	1.997	0.754	0.061	0.191	504	1.0	44	7	24	14
TFA1	5.171	2.526	2.17	1.66	0.889	1.041	0.055	0.241	649	1.0	52	9	40	15
TFA2	4.856	0.880	2.62	1.58	0.500	1.090	0.049	0.254	578	0.8	43	9	19	16
TFA3	4.435	6.874	2.07	1.38	1.764	0.759	0.061	0.214	492	0.8	46	9	6	15
TFA4	5.053	1.071	3.24	1.36	0.782	0.613	0.087	0.277	485	1.5	57	11	30	15
TFA5	4.300	1.057	2.09	1.31	0.533	0.939	0.047	0.190	470	0.8	45	6	33	72
TFA6	5.043	0.852	2.50	1.52	0.672	0.725	0.055	0.256	495	1.0	44	7	31	19
TFA7	2.952	11.765	1.21	1.02	2.063	0.869	0.099	0.157	443	0.5	43	4	11	6
TFB1	4.258	1.711	2.28	1.32	0.729	0.722	0.084	0.208	469	1.0	47	8	26	18
TFB2	4.225	5.683	1.58	1.52	1.426	1.148	0.086	0.196	571	0.5	47	6	17	8
TFB3	4.531	0.907	2.17	1.35	0.635	0.786	0.066	0.221	475	1.0	50	9	15	15
TFB4	4.424	5.306	1.83	1.52	1.221	1.153	0.079	0.216	559	0.5	53	6	20	11
TFB5	4.122	4.363	1.51	1.48	1.199	1.093	0.074	0.172	568	0.8	44	7	12	20
TFB6	3.082	2.804	1.16	1.06	0.730	0.846	0.054	0.125	434	0.8	32	5	6	8
TFB7	5.701	0.977	2.60	1.70	0.740	0.386	0.109	0.266	531	2.0	58	12	49	33
TFC1	5.146	4.891	2.49	1.63	1.698	0.916	0.074	0.251	535	1.0	53	8	18	21
TFC2	4.939	5.022	2.46	1.55	1.585	0.785	0.075	0.233	520	0.8	52	8	40	22
TFC3	4.288	5.716	1.84	1.49	1.624	0.901	0.084	0.200	489	0.8	46	6	21	14

Table A2.1 ICP-AES analytical data (continued)

Site No.[1]	Ga (ppm)	La (ppm)	Li (ppm)	Mn (ppm)	Nb (ppm)	Nd (ppm)	Ni (ppm)	Pb (ppm)	Sc (ppm)	Sr (ppm)	Th (ppm)	V (ppm)	Y (ppm)	Zn (ppm)
NRG3 AOV1	12	25	21	718	12	21.0	20	11	6	219	10	75	14.5	61
NRG3 AOV2	13	26	22	697	13	20.5	23	15	6	233	11	79	15.0	81
NRG3 AOV3	12	25	21	672	13	20.5	20	11	6	237	10	72	14.5	61
NRG4	13	29	16	905	13	21.5	18	12	6	214	11	61	14.0	62
NRG5	11	29	18	627	9	21.5	24	11	6	220	10	72	13.5	50
NRG6	8	20	8	259	8	14.0	6	9	3	172	9	25	7.5	20
NRG7	13	25	17	1230	10	21.5	24	14	7	133	9	96	15.5	69
NRH1	11	21	18	647	11	16.0	15	7	4	320	8	49	11.0	41
NRH2	15	27	22	1495	14	23.5	29	13	7	167	11	97	16.0	85
NRH3	14	29	18	613	14	24.0	20	11	7	165	12	84	17.5	78
NRH4	12	24	19	1925	12	22.5	28	12	6	135	11	105	15.0	65
NRH5	13	25	18	928	10	20.5	22	13	7	158	8	90	14.0	83
NRH6	13	27	18	735	10	22.0	21	12	7	176	8	86	15.0	69
NRH7	14	28	23	774	11	22.0	28	12	8	175	9	103	16.0	58
NRI1	15	31	21	1044	15	25.0	24	14	8	178	11	79	17.5	85
NRI2	14	28	22	916	14	23.5	20	12	7	192	11	75	16.0	83
NRI3	15	37	20	1167	15	30.5	22	14	8	162	17	94	18.5	103
NRI4	12	24	13	555	12	18.5	15	10	5	234	9	56	12.5	47
NRI5	11	26	20	849	9	20.5	22	12	6	212	9	77	13.0	60
NRI6	11	24	24	685	9	19.0	25	11	6	222	9	99	13.5	62
NRI7	11	24	26	553	9	18.0	22	11	6	215	8	98	14.0	54
TFA1	15	28	22	758	11	25.5	29	12	8	155	8	93	16.5	62
TFA2	12	22	17	2025	11	17.5	27	16	7	157	5	84	15.0	64
TFA3	12	24	24	735	9	19.5	27	12	7	181	7	110	15.5	59
TFA4	14	35	23	2115	12	29.5	33	16	10	113	9	139	25.0	100
TFA5	11	24	15	1925	8	21.0	35	12	6	153	6	86	19.5	67
TFA6	13	26	22	770	13	22.0	25	15	8	126	7	128	18.0	91
TFA7	7	21	20	487	7	16.5	12	8	4	508	5	44	11.0	41
TFB1	11	25	19	1265	9	21.0	26	13	7	133	5	104	18.5	82
TFB2	9	24	17	501	8	19.5	19	12	5	216	3	63	16.5	55
TFB3	12	26	20	1190	10	21.5	28	14	7	135	7	121	18.5	70
TFB4	11	27	25	582	10	21.5	19	11	6	353	5	69	17.5	57
TFB5	10	23	17	398	5	18.5	20	11	5	209	3	57	15.5	54
TFB6	8	17	12	282	4	13.5	14	8	4	151	3	44	12.0	36
TFB7	15	30	37	2195	14	25.0	46	18	9	109	9	209	21.0	130
TFC1	13	28	29	464	12	23.0	24	13	8	185	8	102	18.0	74
TFC2	13	26	27	665	11	22.0	25	13	7	177	8	99	17.0	71
TFC3	10	24	24	430	8	19.0	20	11	6	208	5	74	15.5	57

Table A2.1 ICP-AES analytical data (continued)

Site No.[1]	Al (wt%)	Ca (wt%)	Fe (wt%)	K (wt%)	Mg (wt%)	Na (wt%)	P (wt%)	Ti (wt%)	Ba (ppm)	Be (ppm)	Ce (ppm)	Co (ppm)	Cr (ppm)	Cu (ppm)
TFC4	3.958	6.762	1.73	1.37	2.083	0.977	0.089	0.191	504	0.5	45	7	16	24
TFC5	4.758	6.478	2.41	1.60	3.171	0.699	0.083	0.231	491	1.0	52	8	44	30
TFC6	5.861	3.861	2.71	1.76	1.530	0.740	0.071	0.256	545	2.0	52	10	42	28
TFC7	6.206	0.867	2.78	1.66	0.868	0.349	0.076	0.267	529	2.0	59	12	67	36
TFD1	4.122	6.678	1.92	1.38	2.831	0.852	0.099	0.191	504	1.0	49	7	35	20
TFD2	3.828	7.656	1.67	1.37	3.255	0.820	0.085	0.176	484	0.5	48	6	23	20
TFD3	5.107	6.265	2.52	1.60	3.215	0.693	0.079	0.242	521	1.0	52	9	37	35
TFD4	3.984	6.648	1.52	1.50	2.509	0.901	0.093	0.173	520	0.8	43	6	30	15
TFD5	5.912	2.111	2.96	1.92	1.386	0.637	0.116	0.272	560	2.0	63	11	56	34
TFD6	5.744	5.470	2.84	1.67	2.176	0.608	0.079	0.295	526	2.0	56	11	51	33
WCA1	6.985	1.142	2.35	1.75	0.691	1.573	0.071	0.379	1075	1.0	63	9	38	13
WCA2	4.163	6.575	1.48	1.73	1.720	0.666	0.052	0.199	387	1.5	59	5	25	8
WCA3	6.233	3.618	2.50	1.87	1.470	1.068	0.079	0.266	761	2.0	48	9	51	29
WCA4	4.523	5.318	1.83	1.72	2.194	0.583	0.078	0.202	603	1.0	48	6	35	16
WCA5	5.959	2.763	2.31	2.14	1.326	0.615	0.084	0.247	619	2.0	58	9	31	23
WCA6	5.701	0.726	2.23	1.90	0.716	0.931	0.065	0.260	706	2.0	56	9	47	17
WCA7	6.887	2.250	2.56	1.81	1.325	0.692	0.085	0.296	698	2.0	61	10	54	25
WCB1	5.344	2.227	1.86	2.13	1.039	0.793	0.059	0.222	507	1.5	65	6	15	14
WCB2	6.064	4.662	2.27	2.26	1.919	0.348	0.050	0.197	532	1.5	55	7	36	22
WCB3	4.410	5.564	1.60	1.77	2.207	0.782	0.072	0.205	623	1.0	47	6	24	13
WCB4	7.608	1.504	3.33	2.17	1.347	0.855	0.093	0.335	710	2.0	51	13	63	35
WCB5	6.089	1.937	2.12	1.67	0.951	1.738	0.089	0.284	738	1.0	48	9	29	22
WCB6	6.050	1.146	2.44	1.73	0.855	1.015	0.062	0.308	713	2.0	57	10	50	23
WCB7	5.915	3.205	2.37	1.79	0.938	0.930	0.067	0.273	753	1.5	55	9	45	21
WCC1	6.925	1.293	2.43	1.65	0.687	1.682	0.082	0.405	873	1.0	66	11	52	9
WCC2	5.958	0.570	2.42	2.17	0.827	0.776	0.059	0.267	681	2.0	70	8	39	22
WCC3	5.317	3.761	1.71	1.83	1.463	1.225	0.072	0.237	801	1.0	53	7	34	19
WCC4 AOV1	6.383	0.822	2.77	1.83	0.653	1.248	0.081	0.313	730	1.0	60	9	60	14
WCC4 AOV2	6.419	0.833	2.75	1.79	0.648	1.280	0.076	0.310	730	1.0	63	9	63	14
WCC5	5.120	4.424	1.87	2.01	1.823	1.166	0.080	0.227	631	1.5	50	6	25	18
WCC6	6.892	3.353	2.17	1.45	1.119	1.610	0.085	0.297	1444	1.5	48	10	59	20
WCC7	5.789	5.537	2.41	1.50	1.593	1.100	0.075	0.288	982	1.0	57	10	51	19
WCD1	5.609	0.615	2.24	1.84	0.517	1.085	0.061	0.302	853	1.0	78	8	40	16
WCD2	5.954	0.985	2.35	1.88	0.781	1.234	0.054	0.271	706	1.0	63	7	24	21
WCD3	6.302	0.820	2.66	1.87	0.653	1.007	0.074	0.302	956	1.5	64	10	46	21
WCD4	6.919	1.184	2.63	1.66	0.683	1.350	0.076	0.394	751	2.0	65	13	79	12
WCD5	11.349	5.335	5.87	3.61	2.156	1.807	0.133	0.503	1436	3.0	77	21	92	23
WCD6	6.496	0.695	2.58	2.17	0.847	0.897	0.070	0.263	746	2.0	57	10	53	21

Table A2.1 ICP-AES analytical data (continued)

Site No.[1]	Ga (ppm)	La (ppm)	Li (ppm)	Mn (ppm)	Nb (ppm)	Nd (ppm)	Ni (ppm)	Pb (ppm)	Sc (ppm)	Sr (ppm)	Th (ppm)	V (ppm)	Y (ppm)	Zn (ppm)
TFC4	10	24	23	443	7	18.5	24	11	5	245	3	67	17.0	56
TFC5	15	28	40	544	8	24.0	26	48	8	220	13	103	16.5	64
TFC6	18	29	35	572	12	24.5	29	13	10	180	13	125	17.0	79
TFC7	20	32	41	2365	15	28.0	50	16	11	119	14	238	20.5	130
TFD1	12	25	25	505	10	21.5	19	10	6	193	11	80	16.5	56
TFD2	11	24	22	520	7	21.0	21	9	5	204	10	71	16.5	46
TFD3	15	28	38	715	8	25.0	30	12	9	173	13	112	17.0	71
TFD4	11	21	21	499	7	18.0	18	9	6	212	9	64	14.0	57
TFD5	18	32	36	767	14	29.5	33	16	10	139	15	133	18.5	102
TFD6	17	30	38	772	14	26.0	32	12	10	165	14	131	17.5	78
WCA1	16	30	19	638	19	23.0	29	8	10	308	12	89	17.0	68
WCA2	10	27	22	286	9	21.0	12	6	6	90	11	51	15.0	37
WCA3	19	26	26	482	12	27.0	32	16	9	186	9	86	16.5	84
WCA4	14	25	25	360	9	25.0	19	12	6	127	8	60	15.0	58
WCA5	18	31	31	416	13	32.0	26	18	9	107	11	82	18.5	87
WCA6	15	31	22	515	16	24.0	24	12	8	145	12	80	17.0	69
WCA7	18	33	34	391	19	27.0	26	14	10	177	13	96	18.0	77
WCB1	14	32	24	330	11	26.0	15	10	7	81	13	55	15.5	54
WCB2	17	26	36	304	11	20.0	18	13	8	106	12	76	14.0	65
WCB3	13	24	23	356	10	25.0	19	11	6	131	8	53	14.0	49
WCB4	24	27	33	527	17	28.0	43	19	13	134	9	123	17.5	117
WCB5	18	25	22	321	14	24.0	29	14	8	292	7	73	15.5	66
WCB6	15	31	22	483	17	24.5	29	12	9	159	12	87	17.0	61
WCB7	15	29	23	509	15	23.0	28	12	9	159	11	82	16.5	65
WCC1	17	31	20	470	19	24.5	28	8	11	310	12	89	17.0	76
WCC2	16	33	27	729	15	25.5	21	12	9	93	13	72	18.5	66
WCC3	13	25	21	424	11	18.5	22	8	7	186	10	63	15.0	53
WCC4 AOV1	16	31	21	558	15	25.0	30	9	11	185	12	90	18.0	83
WCC4 AOV2	16	33	21	536	14	25.5	31	9	11	189	12	90	18.0	82
WCC5	15	26	25	470	9	26.5	20	12	7	160	8	57	15.0	56
WCC6	16	25	21	408	17	20.5	40	9	9	321	9	77	14.5	59
WCC7	15	30	25	474	16	24.0	30	9	10	267	11	94	16.0	58
WCD1	14	38	21	514	15	28.0	22	11	8	154	15	72	19.5	65
WCD2	15	30	25	275	13	23.0	21	9	8	157	12	74	16.5	67
WCD3	16	33	22	634	15	26.0	28	11	11	200	13	87	20.5	94
WCD4	18	34	21	369	15	26.5	39	13	13	267	10	107	18.0	86
WCD5	35	43	53	1141	25	38.0	65	26	19	339	19	168	27.0	137
WCD6	18	31	28	475	17	24.0	28	13	10	134	12	84	17.0	79

Table A2.1 ICP-AES analytical data (continued)

Site No.[1]	Al (wt%)	Ca (wt%)	Fe (wt%)	K (wt%)	Mg (wt%)	Na (wt%)	P (wt%)	Ti (wt%)	Ba (ppm)	Be (ppm)	Ce (ppm)	Co (ppm)	Cr (ppm)	Cu (ppm)
WCD7	5.753	2.177	1.87	1.66	1.082	1.300	0.090	0.248	880	1.0	50	9	42	17
WCE1	5.375	0.590	2.36	1.62	0.566	0.826	0.076	0.363	779	2.0	76	9	45	14
WCE2	6.262	3.648	2.62	1.92	1.317	0.940	0.074	0.261	669	2.0	51	11	52	27
WCE3	5.559	0.465	1.94	1.74	0.547	0.930	0.062	0.282	849	2.0	58	9	42	18
WCE4	7.438	1.553	2.86	1.70	0.861	1.457	0.087	0.457	2495	2.0	56	13	66	10
WCE5	6.904	1.765	2.48	1.84	1.151	1.148	0.078	0.296	872	2.0	51	12	54	23
WCE5 AOV1	6.638	1.174	2.63	1.77	0.782	1.328	0.068	0.349	948	2.0	66	13	52	12
WCE5 AOV2	6.715	1.192	2.68	1.80	0.829	1.322	0.070	0.343	908	2.0	57	11	56	14
WCE6	5.586	3.003	1.80	1.82	1.378	1.272	0.084	0.261	817	1.0	53	7	42	15
WCE7	5.986	0.986	2.21	1.83	0.619	1.281	0.074	0.295	735	2.0	52	9	48	13
WCF1	5.957	3.267	2.36	1.88	1.420	1.145	0.078	0.266	673	1.5	54	9	27	19
WCF2	5.256	4.122	2.21	1.52	1.122	1.158	0.061	0.243	714	0.8	49	10	32	12
WCF3	7.328	0.574	2.89	2.17	1.031	0.745	0.062	0.294	664	2.0	54	12	64	33
WCF4	6.164	1.070	2.69	1.83	1.057	1.213	0.070	0.263	666	1.5	53	10	50	21
WCF5	6.675	1.988	2.65	2.16	1.466	0.835	0.085	0.289	697	2.0	60	10	53	27
WCF6	7.744	1.453	3.21	2.03	1.442	0.910	0.085	0.338	764	2.0	55	13	66	35
WCF6 AOV1	6.267	0.793	2.49	1.81	0.790	1.029	0.064	0.283	781	2.0	55	10	49	20
WCF6 AOV2	6.108	2.724	2.52	1.72	1.130	0.932	0.069	0.262	741	2.0	54	11	54	24
WCF7	6.386	2.066	2.58	1.90	1.176	1.388	0.084	0.257	877	2.0	46	11	53	27
WCG1	6.631	1.823	2.56	1.81	1.064	1.195	0.064	0.255	992	2.0	44	12	51	34
WCG2	5.945	0.587	2.54	1.93	0.646	0.820	0.058	0.258	763	1.5	55	10	41	21
WCG3	6.932	0.555	3.30	1.77	0.781	1.050	0.083	0.324	957	2.5	60	25	72	23
WCG4	5.766	0.563	2.31	1.99	0.713	0.888	0.065	0.245	615	2.0	66	9	38	16
WCG5	5.774	1.962	2.30	1.98	1.310	0.927	0.066	0.243	700	2.0	54	9	43	28
WCG6	5.123	4.198	2.26	1.58	1.161	0.765	0.070	0.232	653	1.0	54	9	44	18
WCG7	5.623	0.902	2.39	1.87	0.644	1.054	0.077	0.258	795	1.5	63	9	44	16
WCH1	5.985	1.869	2.18	1.71	1.182	0.977	0.071	0.253	593	1.5	56	8	33	15
WCH2	5.838	0.690	2.53	1.76	0.538	1.156	0.055	0.327	1006	2.0	71	8	30	16
WCH3	6.334	0.626	2.31	1.79	0.567	1.063	0.075	0.291	741	2.0	64	12	52	14
WCH4	7.034	0.472	2.49	1.92	0.597	0.873	0.051	0.293	759	2.0	58	12	53	24
WCH5	5.890	4.536	2.76	1.63	1.265	0.872	0.075	0.266	761	1.5	60	11	48	19
WCH6	6.045	0.932	2.60	1.91	0.779	1.072	0.078	0.291	814	2.0	67	10	41	16
WCH7	4.715	6.187	2.26	1.46	1.664	0.630	0.064	0.214	512	1.0	49	9	37	23
WCI1	5.693	3.183	2.65	1.73	0.943	0.904	0.075	0.264	684	1.5	55	9	43	19
WCI2	6.392	0.506	2.69	1.87	0.731	0.799	0.053	0.282	695	2.0	62	10	47	20
WCI3	6.193	4.548	2.60	1.77	1.278	0.701	0.060	0.260	645	2.0	54	11	47	25
WCI4	5.969	0.705	2.78	1.85	0.623	0.900	0.073	0.271	761	2.0	58	9	49	19
WCI5	5.654	4.662	2.72	1.64	1.121	0.803	0.071	0.262	664	1.5	54	10	38	19

Table A2.1 ICP-AES analytical data (continued)

Site No.[1]	Ga (ppm)	La (ppm)	Li (ppm)	Mn (ppm)	Nb (ppm)	Nd (ppm)	Ni (ppm)	Pb (ppm)	Sc (ppm)	Sr (ppm)	Th (ppm)	V (ppm)	Y (ppm)	Zn (ppm)
WCD7	14	26	22	464	15	21.5	25	10	7	210	10	67	15.0	58
WCE1	14	41	22	614	18	32.5	23	11	9	120	15	72	18.5	59
WCE2	16	27	28	572	15	21.5	33	12	10	146	11	82	15.5	71
WCE3	14	31	21	383	16	27.0	23	10	8	137	11	68	19.0	56
WCE4	19	32	22	492	22	25.0	37	9	13	576	11	111	17.5	79
WCE5	17	28	26	384	17	22.5	36	12	12	309	11	90	16.0	73
WCE5 AOV1	16	35	22	523	19	27.0	30	11	11	267	12	88	18.0	71
WCE5 AOV2	17	30	21	524	19	23.5	31	11	11	255	12	89	16.5	71
WCE6	13	28	21	423	15	23.0	25	8	7	182	10	65	15.5	51
WCE7	15	29	21	459	16	22.5	28	11	8	200	11	77	15.5	63
WCF1	15	29	25	480	14	25.0	28	9	9	169	11	80	15.5	60
WCF2	14	27	20	660	14	20.5	30	8	8	251	11	92	15.0	58
WCF3	20	29	34	334	18	22.5	39	15	13	125	12	117	16.5	86
WCF4	16	28	27	455	16	22.5	31	9	10	152	11	79	15.5	62
WCF5	17	31	33	638	18	27.5	30	10	11	118	12	89	17.0	73
WCF6	20	28	38	687	20	23.5	38	12	13	147	12	113	17.5	90
WCF6 AOV1	16	29	24	548	16	23.5	30	11	9	154	11	85	17.5	66
WCF6 AOV2	16	28	26	562	16	22.0	36	12	10	147	11	89	16.5	67
WCF7	17	25	27	586	16	19.5	32	12	10	168	10	88	15.0	73
WCG1	17	24	26	368	15	19.0	40	10	10	191	9	85	13.5	66
WCG2	15	30	23	500	16	27.5	28	13	10	126	11	85	17.5	86
WCG3	18	32	38	899	18	26.5	64	12	13	167	12	101	19.5	110
WCG4	14	32	24	330	16	27.0	22	10	9	125	12	75	16.5	68
WCG5	14	28	28	375	16	22.5	28	13	9	166	11	86	17.0	68
WCG6	12	28	22	445	15	22.0	25	11	7	157	11	89	15.5	57
WCG7	13	33	21	417	17	28.0	22	17	8	176	13	78	18.0	83
WCH1	13	28	22	324	16	23.0	21	8	8	158	11	76	14.0	58
WCH2	15	38	22	559	19	36.0	27	11	9	172	14	77	19.0	63
WCH3	15	32	22	353	17	27.5	28	11	11	169	11	95	17.0	87
WCH4	17	31	25	269	19	25.5	36	11	12	141	11	102	18.5	95
WCH5	14	31	25	513	16	25.0	31	12	10	188	12	101	17.5	66
WCH6	14	35	23	430	18	28.0	26	13	9	210	13	95	18.5	74
WCH7	12	25	25	574	14	19.5	30	12	7	148	10	107	14.5	62
WCI1	14	28	23	557	16	23.0	26	11	9	160	11	85	15.5	60
WCI2	15	32	27	487	18	26.0	27	12	10	132	12	92	17.5	79
WCI3	15	28	30	454	16	22.0	31	12	10	171	11	98	15.5	67
WCI4	14	31	23	480	16	25.0	27	12	9	149	11	85	17.0	77
WCI5	13	28	24	464	15	22.5	27	12	9	179	11	92	16.0	70

Table A2.1 ICP-AES analytical data (continued)

Site No.[1]	Al (wt%)	Ca (wt%)	Fe (wt%)	K (wt%)	Mg (wt%)	Na (wt%)	P (wt%)	Ti (wt%)	Ba (ppm)	Be (ppm)	Ce (ppm)	Co (ppm)	Cr (ppm)	Cu (ppm)
WCI6	5.296	5.822	2.42	1.53	1.313	0.733	0.062	0.232	582	1.5	49	9	48	22
WCI7	6.048	0.701	2.58	1.80	0.828	0.881	0.049	0.277	677	1.5	62	10	51	21
WIA1	3.523	0.187	2.34	1.16	0.298	0.340	0.038	0.342	232	2.0	74	9	23	9
WIA2	6.633	0.735	4.43	1.66	0.788	1.168	0.066	0.309	466	2.0	52	17	57	21
WIA3	3.754	0.874	2.14	1.33	0.620	0.508	0.048	0.170	374	1.5	45	12	26	10
WIA4	6.123	0.831	2.72	1.81	0.722	0.922	0.056	0.272	625	1.5	62	10	34	19
WIA5	6.436	2.639	2.42	1.75	1.266	1.184	0.075	0.264	757	2.0	52	9	34	24
WIA6	5.826	4.997	2.35	1.69	1.827	0.858	0.069	0.254	638	1.0	58	10	17	20
WIA7	5.035	6.056	2.17	1.33	1.787	0.681	0.057	0.215	517	1.0	43	9	27	23
WIB1	5.401	3.582	1.79	1.85	1.418	1.240	0.086	0.259	807	1.0	53	7	36	18
WIB2	5.052	6.863	2.14	1.55	1.400	0.881	0.067	0.232	562	1.0	44	9	44	193
WIB3	5.992	0.517	3.44	1.76	0.441	0.686	0.057	0.311	507	2.0	86	26	44	20
WIB4	5.409	1.770	2.65	1.66	1.003	1.008	0.088	0.265	691	2.0	60	9	42	18
WIB5	6.285	0.884	2.66	2.05	0.829	0.945	0.055	0.277	699	2.0	59	10	35	19
WIB6	5.935	4.006	2.60	1.74	1.512	0.894	0.061	0.260	672	2.0	53	11	21	20
WIB7	6.394	0.691	2.41	1.85	0.756	0.994	0.056	0.309	776	1.5	57	12	38	19
WIC1	5.581	4.370	2.35	1.50	1.286	0.809	0.064	0.258	650	1.0	54	10	46	30
WIC2	6.007	0.860	2.54	1.86	0.678	0.930	0.062	0.292	799	1.5	56	10	50	20
WIC3	5.613	5.548	2.36	1.79	1.210	1.139	0.075	0.239	557	1.5	61	8	49	23
WIC4	5.589	0.897	2.28	1.90	0.616	1.076	0.066	0.273	717	1.5	64	9	38	20
WIC5	5.756	4.844	2.31	1.67	1.224	0.876	0.059	0.250	634	1.0	46	9	45	19
WIC6	6.639	0.581	2.74	1.81	0.796	0.915	0.052	0.328	755	2.0	60	11	51	23
WIC7	4.264	9.782	1.86	1.37	1.141	1.091	0.072	0.191	637	0.8	42	7	34	21
WID1	5.581	0.750	2.26	1.84	0.575	0.961	0.058	0.269	787	1.0	58	9	44	18
WID2	5.809	1.678	2.52	1.88	0.873	1.098	0.081	0.290	899	1.5	62	11	44	19
WID3	5.295	4.542	2.31	1.55	1.349	0.731	0.063	0.247	582	1.0	50	10	45	22
WID4	5.839	0.775	2.50	1.81	0.678	0.885	0.066	0.275	693	1.5	55	10	49	23
WID5	6.280	0.886	2.41	1.48	0.681	0.983	0.050	0.266	719	2.0	51	9	48	17
WID6	5.534	5.777	2.41	1.55	1.651	0.842	0.057	0.237	633	1.5	44	9	24	19
WID7	5.794	0.841	2.00	1.71	0.521	1.251	0.051	0.263	766	1.0	58	9	30	10
WIE1	5.474	1.226	2.15	1.82	0.705	0.878	0.058	0.270	679	1.5	59	9	42	20
WIE2	5.930	2.827	2.41	1.83	1.099	0.879	0.068	0.263	701	2.0	53	11	23	22
WIE3	5.693	3.237	2.27	1.84	1.327	0.897	0.062	0.260	651	1.5	58	10	26	19
WIE4	5.648	0.641	2.08	1.74	0.556	0.740	0.086	0.235	601	1.5	57	11	35	21
WIE5	5.208	7.424	2.34	1.60	1.564	0.669	0.064	0.229	576	1.5	45	7	40	20
WIE6	5.603	6.537	2.36	1.38	1.551	0.811	0.063	0.233	638	1.0	49	9	41	20
WIE7	5.931	0.676	2.52	1.83	0.621	0.935	0.056	0.271	790	1.5	54	10	39	21
WIE7 AOV1	5.453	3.574	2.11	1.73	1.047	0.995	0.058	0.247	707	1.0	50	9	21	16

Table A2.1 ICP-AES analytical data (continued)

Site No.[1]	Ga (ppm)	La (ppm)	Li (ppm)	Mn (ppm)	Nb (ppm)	Nd (ppm)	Ni (ppm)	Pb (ppm)	Sc (ppm)	Sr (ppm)	Th (ppm)	V (ppm)	Y (ppm)	Zn (ppm)
WCI6	12	26	24	534	15	20.5	26	12	8	154	10	103	15.0	66
WCI7	15	34	24	692	16	26.5	28	12	9	140	13	99	18.5	94
WIA1	10	37	32	542	18	32.0	19	14	7	42	16	54	15.0	73
WIA2	18	27	44	890	14	24.0	30	15	13	134	14	112	16.0	90
WIA3	10	22	22	755	8	21.0	18	13	5	72	9	45	11.0	70
WIA4	16	35	25	572	16	30.0	28	14	10	150	13	107	19.0	75
WIA5	16	28	21	524	15	23.5	30	12	9	229	11	89	16.0	71
WIA6	15	29	33	516	13	27.0	29	11	9	181	12	112	16.0	62
WIA7	13	24	26	598	11	18.5	27	11	8	156	9	111	14.0	58
WIB1	15	28	21	420	11	26.5	24	12	7	221	5	65	15.0	52
WIB2	15	25	23	460	10	23.0	28	17	8	175	5	84	14.5	138
WIB3	16	45	36	1343	16	38.5	30	25	10	120	20	81	18.5	112
WIB4	14	33	19	805	14	30.0	29	14	8	161	13	76	19.0	80
WIB5	16	33	26	632	16	28.5	29	14	10	157	12	112	17.5	83
WIB6	16	28	30	598	15	25.5	32	12	10	189	11	114	17.0	70
WIB7	15	30	26	665	17	27.0	26	15	9	169	12	106	17.5	76
WIC1	17	30	25	538	12	28.5	30	14	8	159	8	95	16.0	65
WIC2	17	31	23	662	13	30.0	27	16	9	168	8	91	18.5	83
WIC3	15	30	25	472	11	28.0	24	11	9	199	14	81	16.5	53
WIC4	13	30	22	771	14	30.5	25	11	9	157	13	79	18.5	76
WIC5	14	26	27	525	13	21.0	23	12	8	183	10	101	15.0	75
WIC6	17	32	30	604	18	26.5	30	15	10	151	12	120	18.5	102
WIC7	11	24	25	436	10	17.5	23	10	6	413	10	66	12.5	57
WID1	17	32	21	615	12	31.0	23	14	8	168	7	80	17.5	84
WID2	17	35	24	613	14	33.5	28	16	9	197	8	79	20.0	72
WID3	15	28	25	639	12	25.5	30	14	8	148	7	105	15.5	66
WID4	17	31	25	653	13	29.5	26	15	9	152	8	97	17.5	94
WID5	16	29	23	525	15	24.0	24	14	9	175	11	106	16.5	74
WID6	15	25	27	470	14	20.5	28	11	8	184	9	107	15.0	62
WID7	13	29	21	461	15	28.5	27	11	8	199	11	79	18.5	52
WIE1	16	33	23	424	13	31.5	24	14	8	145	8	81	18.0	62
WIE2	15	29	24	488	13	26.0	29	12	9	149	12	92	17.0	64
WIE3	14	27	27	673	13	28.5	31	11	9	148	12	105	17.5	66
WIE4	15	28	21	412	13	25.0	20	14	9	111	11	102	15.5	79
WIE5	14	25	26	500	13	21.5	24	9	8	156	10	102	15.0	70
WIE6	15	27	28	460	13	21.5	27	11	9	188	11	105	15.0	58
WIE7	15	30	22	538	15	24.5	24	14	9	156	11	101	17.5	102
WIE7 AOV1	14	25	27	497	14	22.5	24	12	8	192	10	92	15.5	63

Table A2.1 ICP-AES analytical data (continued)

Site No.[1]	Al (wt%)	Ca (wt%)	Fe (wt%)	K (wt%)	Mg (wt%)	Na (wt%)	P (wt%)	Ti (wt%)	Ba (ppm)	Be (ppm)	Ce (ppm)	Co (ppm)	Cr (ppm)	Cu (ppm)
WIE7 AOV2	5.799	0.732	2.27	1.68	0.601	1.049	0.042	0.240	687	1.5	50	9	34	18
WIE7 AOV3	5.530	0.704	2.28	1.60	0.594	0.954	0.042	0.214	668	1.5	51	9	31	13
WIF1	5.297	4.760	2.31	1.38	1.333	0.692	0.060	0.237	530	1.0	49	9	30	22
WIF1 AOV1	4.521	7.303	1.90	1.38	1.509	0.651	0.054	0.221	525	1.0	47	9	14	20
WIF1 AOV2	4.864	5.906	2.24	1.46	1.675	0.699	0.052	0.203	561	1.0	45	10	23	19
WIF1 AOV3	4.992	6.066	2.12	1.53	1.681	0.737	0.053	0.224	576	1.0	50	10	39	19
WIF2	5.889	0.614	2.55	1.94	0.661	0.683	0.080	0.262	586	2.0	57	8	35	23
WIF3	5.223	2.307	1.78	2.06	1.119	1.178	0.076	0.227	766	1.0	57	7	17	11
WIF4	5.382	4.002	2.31	1.52	1.013	0.738	0.057	0.245	573	1.0	51	9	36	21
WIF5	4.767	4.276	2.24	1.52	1.385	0.698	0.068	0.224	545	1.0	49	9	42	21
WIF6	5.723	0.743	2.37	1.76	0.627	1.016	0.064	0.265	685	1.5	50	9	41	17
WIF7	5.995	0.671	2.62	1.38	0.650	0.856	0.058	0.271	707	1.5	48	9	28	20
WIF7 AOV1	5.646	0.707	2.42	1.78	0.578	0.943	0.053	0.252	691	1.5	50	8	37	17
WIF7 AOV2	5.614	1.163	2.39	1.80	0.796	0.948	0.062	0.254	677	1.5	50	9	25	18
WIF7 AOV3	5.905	1.214	2.42	1.66	0.850	0.978	0.061	0.268	700	1.5	51	9	35	20
WIG1	5.505	1.421	2.64	1.77	0.969	0.871	0.067	0.263	646	1.5	54	9	51	19
WIG1*	5.655	0.731	2.52	1.78	0.739	0.861	0.061	0.272	679	1.5	60	10	60	19
WIG2	6.391	1.463	2.63	1.93	0.882	0.901	0.063	0.272	737	1.5	50	10	54	31
WIG3	5.229	0.739	2.36	1.75	0.635	0.760	0.062	0.239	571	1.5	48	8	48	20
WIG4	4.846	1.868	2.32	1.56	0.921	0.763	0.073	0.219	551	1.0	47	9	44	19
WIG5	5.731	3.773	2.55	1.65	1.335	0.789	0.064	0.252	625	2.0	50	11	24	22
WIG6	5.168	3.687	2.05	1.66	0.998	1.028	0.055	0.242	767	1.0	46	8	25	16
WIG7	5.599	0.778	2.52	1.88	0.627	0.916	0.063	0.250	613	1.5	57	9	38	17
WIH1	5.286	1.310	2.14	1.55	1.011	1.016	0.073	0.243	582	1.0	51	8	37	15
WIH1*	5.195	4.366	2.28	1.48	1.265	0.784	0.065	0.255	587	1.0	49	10	56	21
WIH2	5.358	0.745	2.49	1.65	0.641	0.764	0.056	0.242	598	1.5	49	9	49	19
WIH3	4.644	7.584	2.16	1.37	1.891	0.689	0.058	0.210	503	1.0	44	9	31	20
WIH4	5.019	3.418	2.14	1.28	1.113	0.833	0.077	0.220	615	1.0	45	8	32	22
WIH5	5.472	5.051	2.31	1.61	1.080	0.816	0.057	0.242	636	1.5	53	10	25	22
WIH6	4.995	3.932	2.11	1.53	0.978	0.886	0.060	0.231	627	1.0	48	9	45	18
WIH7	5.224	0.804	2.28	1.45	0.625	0.971	0.059	0.242	658	1.5	44	8	43	15

Table A2.1 ICP-AES analytical data (continued)

Site No.[1]	Ga (ppm)	La (ppm)	Li (ppm)	Mn (ppm)	Nb (ppm)	Nd (ppm)	Ni (ppm)	Pb (ppm)	Sc (ppm)	Sr (ppm)	Th (ppm)	V (ppm)	Y (ppm)	Zn (ppm)
WIE7 AOV2	14	25	24	460	14	23.0	25	12	8	166	10	93	16.0	61
WIE7 AOV3	14	26	23	433	13	22.5	24	13	8	157	10	94	15.5	64
WIF1	14	29	24	514	13	22.5	28	11	8	145	10	115	16.0	59
WIF1 AOV1	12	23	24	533	12	21.0	28	9	7	157	10	99	14.0	53
WIF1 AOV2	13	23	24	747	11	19.5	30	11	8	169	9	104	14.5	55
WIF1 AOV3	13	26	25	795	11	22.5	31	10	8	173	10	103	14.5	53
WIF2	16	31	21	235	15	26.5	26	14	10	109	12	113	18.0	94
WIF3	13	29	19	385	13	24.5	20	9	6	188	10	64	14.0	48
WIF4	15	28	22	666	14	22.5	27	12	8	135	10	111	16.0	79
WIF5	13	26	22	758	13	23.0	25	14	8	145	10	103	16.0	71
WIF6	16	29	23	447	16	22.0	25	13	8	158	11	92	17.0	70
WIF7	16	30	26	608	14	25.0	26	14	10	145	10	103	17.5	88
WIF7 AOV1	16	30	24	473	16	24.0	22	12	9	154	11	99	18.0	81
WIF7 AOV2	16	28	27	473	18	18.5	25	12	9	154	11	103	16.0	76
WIF7 AOV3	16	29	28	524	16	23.0	26	14	9	164	12	106	16.5	78
WIG1	16	32	22	734	16	25.5	28	17	8	140	13	98	18.0	86
WIG1*	16	30	24	672	13	24.5	31	17	9	150	7	104	17.0	92
WIG2	19	27	30	439	18	19.5	32	12	10	163	11	100	16.0	78
WIG3	15	29	21	593	15	22.5	23	12	8	121	11	107	16.5	90
WIG4	14	28	21	828	13	22.0	27	12	8	130	11	96	16.5	81
WIG5	16	29	26	592	15	24.5	29	17	9	161	11	114	16.5	69
WIG6	14	26	26	462	14	19.0	21	12	7	213	10	84	15.0	59
WIG7	16	32	27	552	16	25.0	27	16	9	154	13	101	18.5	80
WIH1	14	28	22	579	15	21.0	24	11	8	150	11	92	16.0	62
WIH1*	14	27	24	658	12	22.5	31	14	8	157	5	98	16.0	66
WIH2	15	30	21	796	15	23.5	24	12	8	126	11	100	17.5	93
WIH3	14	25	24	608	12	18.5	27	13	7	165	11	101	14.5	59
WIH4	14	25	27	668	12	21.0	23	14	8	255	9	82	14.5	78
WIH5	15	30	26	488	15	21.5	27	12	9	167	12	94	15.5	64
WIH6	14	26	23	544	14	20.0	24	14	8	178	10	87	15.0	66
WIH7	14	27	25	568	14	23.5	22	15	8	173	10	86	16.5	70

[1] See note 1 for table A1.1a.

Table A2.2 AA analytical data (a) HG-AAS/CVAAS, (b) FA-AAS

a.

Site No.[1]	As (ppm)	Se (ppm)	Hg (ppm)
ABE7	6.9	0.5	0.050
ABF7	5.8	0.4	0.060
ABG7	6.9	0.3	0.050
ABH7	6.2	0.3	0.040
BSA1	9.9	0.5	0.025
BSA2	7.6	0.4	0.025
BSA3	8.2	0.6	0.040
BSA3 AOV1	8.0	0.4	0.030
BSA3 AOV2	7.7	0.4	0.030
BSA4	8.8	0.6	0.045
BSA5	5.9	0.4	0.010
BSA6	8.6	0.7	0.060
BSA7	6.1	0.3	0.015
BSB1	8.3	0.6	0.020
BSB2	9.5	0.5	0.030
BSB3	5.0	0.1	0.010
BSB4	6.4	0.3	0.015
BSB5	8.5	0.5	0.030
BSB6	10.5	0.4	0.050
BSB7	9.7	0.6	0.045
BSC1	5.6	0.2	0.025
BSC2	9.8	0.4	0.030
BSC3	7.0	0.1	0.010
BSC4	4.5	0.5	0.015
BSC5	7.2	0.1	0.015
BSC6	9.3	0.4	0.030
BSC7	8.6	0.6	0.020
BSC7 AOV1	8.4	0.6	0.020
BSC7 AOV2	7.9	0.4	0.020
BSD1	5.9	0.6	0.020
BSD2	9.3	0.4	0.015
BSD3	7.5	0.4	0.030
BSD4	8.9	0.3	0.020
BSD5	11.3	0.5	0.030
BSD6	7.0	0.4	0.040
BSD7	7.7	0.5	0.040
BSE1	7.4	0.8	0.040
BSE2	5.6	0.2	0.015
BSE3	6.8	0.1	0.020
BSE4	10.5	0.5	0.065
BSE5	9.0	0.4	0.040
BSE7	8.0	0.5	0.035
BSF1	5.4	0.7	0.020
BSF2	5.3	0.1	0.030
BSF3	6.6	0.3	0.030
BSF4	5.3	0.4	0.020
BSF5	10.4	0.4	0.030
BSF6	9.3	0.6	0.035
BSF7	39.3	0.4	0.070
BSG1	6.9	0.2	0.015
BSG2	7.6	0.2	0.030
BSG3	9.9	0.3	0.020

b.

Site No.[1]	Au (ppb)	Pd (ppb)	Pt (ppb)
ABE7	7.5	0.8	0.63
ABF7	8.0	1.3	0.78
ABG7	4.5	0.8	0.58
ABH7	1.0	0.5	0.25
BSA1	2.5	0.8	0.25
BSA2	3.0	0.5	0.78
BSA3	2.5	0.8	0.25
BSA3 AOV1	3.0	1.3	0.43
BSA3 AOV2	3.0	0.8	0.38
BSA4	3.5	1.0	0.63
BSA5	2.3	0.5	0.25
BSA6	2.5	0.8	0.38
BSA7	3.0	0.8	0.73
BSB1	4.0	1.3	0.48
BSB2	2.5	0.8	0.25
BSB3	167.0	0.8	0.25
BSB4	2.0	1.3	0.25
BSB5	3.5	1.0	0.25
BSB6	3.5	1.5	0.63
BSB7	4.5	1.3	0.53
BSC1	45.5	0.8	0.38
BSC2	2.0	0.8	0.25
BSC3	1.0	0.5	0.25
BSC4	1.3	0.5	0.25
BSC5	0.8	0.8	0.63
BSC6	3.0	0.5	0.38
BSC7	2.0	0.5	0.25
BSC7 AOV1	30.5	0.8	0.58
BSC7 AOV2	3.5	0.5	0.25
BSD1	7.0	0.5	0.25
BSD2	2.0	0.8	0.25
BSD3	3.5	0.5	0.25
BSD4	0.8	0.5	0.25
BSD5	2.5	1.0	0.25
BSD6	32.5	1.5	0.25
BSD7	3.0	0.5	0.25
BSE1	3.0	1.0	0.25
BSE2	4.5	0.5	0.53
BSE3	2.5	0.5	0.25
BSE4	4.5	1.0	0.70
BSE5	1.8	0.5	0.25
BSE7	3.0	1.0	0.25
BSF1	2.5	0.5	0.53
BSF2	2.5	0.8	0.25
BSF3	4.0	0.5	0.25
BSF4	4.5	0.8	0.25
BSF5	2.0	0.5	0.80
BSF6	2.5	0.8	0.25
BSF7	75.0	1.5	0.73
BSG1	4.5	0.8	0.73
BSG2	6.5	0.8	2.83
BSG3	6.0	0.8	0.25

Table A2.2 AA analytical data (a) HG-AAS/CVAAS, (b) FA-AAS (continued)

a.

Site No.[1]	As (ppm)	Se (ppm)	Hg (ppm)
BSG4	6.5	0.4	0.035
BSG5	8.4	0.3	0.025
BSG6	7.5	0.4	0.020
BSG7	8.0	0.4	0.045
BSH1	8.2	0.1	0.030
BSH2	7.5	0.2	0.025
BSH3	8.2	0.4	0.035
BSH4	7.3	0.2	0.025
BSH5	5.5	0.1	0.010
BSH6	8.6	0.5	0.035
BSH7	8.5	0.6	0.055
BSI1	6.8	0.6	0.030
BSI3	8.9	0.3	0.050
BSI4	8.0	0.6	0.040
BSI5	8.6	0.4	0.050
BSI6	8.7	0.4	0.040
BSI7	7.9	0.9	0.050
DKA1	6.8	0.2	0.020
DKA2	3.9	0.2	0.015
DKA3	7.0	0.4	0.025
DKA4	5.8	0.3	0.015
DKA5	9.2	1.1	0.025
DKA6	5.8	0.3	0.015
DKA7	6.9	0.3	0.020
DKB1	5.2	0.4	0.020
DKB2	7.3	1.0	0.040
DKB3	6.1	0.2	0.010
DKB4	7.6	0.3	0.025
DKB5	13.2	0.5	0.030
DKB6	7.7	0.3	0.015
DKB7	8.2	0.4	0.025
DKC1	5.9	0.2	0.025
DKC1 AOV1	6.1	0.2	0.015
DKC1 AOV2	6.3	0.3	0.015
DKC2	5.4	0.1	0.010
DKC3	7.0	0.3	0.030
DKC4	7.2	0.3	0.025
DKC5	7.1	0.2	0.020
DKC6	9.4	0.6	0.045
DKC7	7.6	0.3	0.020
DKD1	6.9	0.4	0.045
DKD2	6.0	0.2	0.015
DKD3	7.1	0.4	0.035
DKD4	9.3	0.5	0.025
DKD5	8.1	0.6	0.025
DKD6	7.3	0.7	0.055
DKD7	7.5	0.4	0.035
DKE1	4.7	0.2	0.040
DKE2	10.4	1.4	0.050
DKE3	5.5	0.2	0.040
DKE4	6.3	0.5	0.020
DKE4 AOV1	7.3	0.6	0.045

b.

Site No.[1]	Au (ppb)	Pd (ppb)	Pt (ppb)
BSG4	2.5	0.5	0.25
BSG5	7.0	0.8	0.25
BSG6	2.0	0.5	0.55
BSG7	5.0	1.3	0.25
BSH1	3.0	1.0	0.25
BSH2	4.5	1.0	0.25
BSH3	2.5	1.0	0.25
BSH4	3.5	0.8	0.25
BSH5	3.5	1.5	0.83
BSH6	3.5	0.5	0.65
BSH7	3.0	1.0	0.25
BSI1	3.5	1.0	0.25
BSI3	2.0	0.5	0.25
BSI4	7.0	0.5	0.80
BSI5	2.0	0.5	0.63
BSI6	4.0	0.8	0.58
BSI7	2.5	0.8	1.00
DKA1	1.3	1.0	0.25
DKA2	0.5	0.5	0.25
DKA3	1.8	0.5	1.28
DKA4	3.3	0.5	0.25
DKA5	2.5	0.8	0.25
DKA6	2.0	0.8	0.25
DKA7	1.8	0.8	0.25
DKB1	1.5	0.8	0.25
DKB2	3.0	0.8	0.43
DKB3	0.5	0.5	0.93
DKB4	0.5	0.5	0.25
DKB5	2.5	0.8	0.25
DKB6	2.5	0.5	0.25
DKB7	4.5	1.0	0.25
DKC1	2.5	0.8	0.25
DKC1 AOV1	3.0	0.8	0.25
DKC1 AOV2	1.5	0.5	0.25
DKC2	2.0	0.8	0.25
DKC3	5.0	0.5	0.25
DKC4	2.0	1.0	0.25
DKC5	1.5	0.8	0.25
DKC6	2.5	0.8	0.25
DKC7	3.5	1.0	0.25
DKD1	2.5	0.5	0.25
DKD2	0.5	0.5	0.25
DKD3	3.0	1.3	0.25
DKD4	2.5	0.8	0.80
DKD5	3.0	0.5	0.58
DKD6	3.0	0.8	0.48
DKD7	1.8	1.0	1.38
DKE1	1.3	0.5	0.25
DKE2	2.3	1.0	0.75
DKE3	2.0	0.5	0.25
DKE4	2.0	0.5	0.53
DKE4 AOV1	3.0	0.8	0.85

Table A2.2 AA analytical data (a) HG-AAS/CVAAS, (b) FA-AAS (continued)

a.

Site No.[1]	As (ppm)	Se (ppm)	Hg (ppm)
DKE4 AOV2	6.6	0.5	0.045
DKE5	7.3	0.9	0.035
DKE6	5.8	0.5	0.025
DKE7	9.6	0.6	0.030
DKF1	17.9	0.2	0.020
DKF1 AOV1	5.4	0.2	0.020
DKF1 AOV2	5.4	0.2	0.010
DKF2	8.9	0.5	0.030
DKF3	8.1	0.6	0.015
DKF4	7.7	0.4	0.025
DKF5	6.3	0.6	0.035
DKF6	7.0	0.5	0.020
DKF7	8.2	0.6	0.035
DKG1	17.7	0.6	0.060
DKG2	6.4	0.4	0.015
DKG3	10.3	1.1	0.030
DKG4	7.9	0.6	0.025
DKG5	10.5	0.8	0.010
DKG6	9.6	0.6	0.050
DKG7	9.6	0.7	0.055
DKH1	8.9	0.5	0.040
DKH2	5.7	0.1	0.010
DKH3	20.9	1.7	0.085
DKH4	8.0	0.7	0.035
DKH4 AOV1	12.2	0.9	0.035
DKH4 AOV2	13.0	0.8	0.040
DKH5	9.4	0.5	0.055
DKH6	10.3	0.6	0.015
DKH7	8.7	0.5	0.035
DKI1	8.2	0.4	0.045
DKI2	8.9	0.3	0.040
DKI3	7.0	0.5	0.035
DKI3 AOV1	8.1	0.5	0.035
DKI3 AOV2	9.7	0.5	0.040
DKI4	13.3	0.6	0.035
DKI4 AOV1	8.5	0.8	0.025
DKI4 AOV2	8.0	0.8	0.025
DKI5	10.1	0.7	0.040
DKI6	10.0	0.6	0.030
DKI7	9.1	0.8	0.035
DKI7 AOV1	6.8	0.5	0.020
DKI7 AOV2	7.6	0.3	0.025
DLA1	8.8	0.3	0.040
DLA2	9.1	0.3	0.035
DLA3	9.9	0.4	0.035
DLA4	10.2	0.3	0.045
DLA5	8.9	0.3	0.025
DLA6	8.0	0.6	0.035
DLA7	11.2	0.5	0.050
DLB1	10.3	0.3	0.040
DLB2	8.8	0.3	0.020
DLB3	5.9	0.2	0.025

b.

Site No.[1]	Au (ppb)	Pd (ppb)	Pt (ppb)
DKE4 AOV2	2.5	0.8	0.60
DKE5	3.0	0.5	0.75
DKE6	3.5	0.5	0.25
DKE7	3.0	0.8	1.05
DKF1	0.5	0.5	0.25
DKF1 AOV1	0.8	0.5	0.25
DKF1 AOV2	0.8	0.5	0.25
DKF2	1.8	0.8	0.63
DKF3	2.0	1.3	0.43
DKF4	1.5	1.3	1.05
DKF5	2.5	0.5	0.38
DKF6	2.5	0.5	0.58
DKF7	3.0	0.5	0.90
DKG1	4.0	0.5	0.48
DKG2	1.3	0.5	0.25
DKG3	3.0	1.0	0.43
DKG4	2.0	0.5	0.63
DKG5	3.0	1.5	0.25
DKG6	3.5	1.0	0.25
DKG7	3.5	0.8	0.70
DKH1	3.5	0.8	0.25
DKH2	0.5	0.5	0.48
DKH3	3.0	1.0	0.25
DKH4	3.0	0.5	0.48
DKH4 AOV1	3.5	0.8	1.00
DKH4 AOV2	3.5	0.8	0.25
DKH5	5.0	0.8	0.48
DKH6	3.0	0.8	0.68
DKH7	2.5	0.5	0.90
DKI1	1.3	0.5	0.38
DKI2	5.5	0.8	0.43
DKI3	10.5	0.8	0.58
DKI3 AOV1	2.5	0.5	0.63
DKI3 AOV2	2.5	0.5	0.48
DKI4	5.5	0.5	0.65
DKI4 AOV1	1.5	0.5	0.25
DKI4 AOV2	27.5	0.5	0.80
DKI5	3.0	0.8	1.00
DKI6	3.5	0.8	0.70
DKI7	4.0	0.8	0.63
DKI7 AOV1	2.0	0.5	0.65
DKI7 AOV2	2.5	0.5	0.70
DLA1	1.3	0.5	0.80
DLA2	2.0	0.5	0.85
DLA3	1.3	0.8	0.80
DLA4	1.5	0.5	0.25
DLA5	1.5	0.5	0.65
DLA6	1.0	0.5	0.95
DLA7	3.5	0.8	0.75
DLB1	1.0	0.5	0.80
DLB2	1.5	0.5	0.58
DLB3	0.5	0.5	0.80

Table A2.2 AA analytical data (a) HG-AAS/CVAAS, (b) FA-AAS (continued)

a.

Site No.[1]	As (ppm)	Se (ppm)	Hg (ppm)
DLB4	10.2	0.4	0.040
DLB5	8.5	0.5	0.030
DLB6	8.2	0.6	0.035
DLB7	10.3	0.4	0.025
DLC1	8.5	0.6	0.025
DLC2	6.6	0.5	0.035
DLC3	5.6	0.5	0.035
DLC4	5.2	0.3	0.025
DLC5	7.7	0.7	0.035
DLC6	6.3	0.3	0.030
DLC7	8.0	0.4	0.025
DLD1	7.8	0.4	0.035
DLD2	9.1	0.3	0.035
DLD3	8.3	0.4	0.040
DLD4	9.1	0.5	0.030
DLD5	6.5	0.6	0.020
DLD6	8.6	0.5	0.035
DLD7	7.2	0.1	0.035
DLE1	9.2	0.4	0.045
DLE2	8.5	0.5	0.045
DLE3	6.2	0.3	0.035
DLE4	8.3	0.6	0.040
DLE5	3.5	0.8	0.025
DLE6	5.9	0.4	0.030
DLE7	5.2	0.4	0.035
DLF1	6.3	0.5	0.040
DLF2	5.6	0.5	0.040
DLF3	7.0	0.5	0.040
DLF4	6.4	0.5	0.030
DLF5	9.4	0.4	0.035
DLF6	9.3	0.5	0.045
DLF6 AOV1	6.7	0.4	0.050
DLF6 AOV2	8.2	0.5	0.060
DLF7	6.1	0.5	0.030
DLG1	7.3	0.5	0.040
DLG2	7.4	0.5	0.035
DLG3	7.2	0.4	0.030
DLG4	7.5	0.3	0.035
DLG4*	5.3	0.5	0.035
DLG5	7.3	0.6	0.045
DLG5*	3.2	0.7	0.025
DLG6	3.2	0.5	0.025
DLG7	11.2	0.6	0.040
DLH1	10.3	0.4	0.035
DLH2	2.7	0.3	0.040
DLH3	7.5	0.4	0.045
DLH4	5.6	0.5	0.035
DLH5	5.7	0.7	0.040
DLH6	7.0	0.5	0.055
DLH7	16.0	2.0	0.065
FAA1	3.5	0.1	0.010
FAA2	6.2	0.3	0.030

b.

Site No.[1]	Au (ppb)	Pd (ppb)	Pt (ppb)
DLB4	0.8	0.5	0.75
DLB5	4.5	0.5	0.85
DLB6	1.3	0.8	0.25
DLB7	1.8	0.5	1.30
DLC1	1.3	0.5	0.80
DLC2	0.8	0.5	0.48
DLC3	0.5	0.5	0.48
DLC4	0.8	0.5	0.63
DLC5	0.5	0.5	0.63
DLC6	0.5	0.5	0.25
DLC7	1.5	0.5	0.63
DLD1	1.5	0.8	0.90
DLD2	1.0	0.8	0.75
DLD3	1.3	0.8	0.85
DLD4	0.8	0.5	0.25
DLD5	0.5	0.5	0.43
DLD6	22.3	0.5	0.65
DLD7	1.8	0.8	0.80
DLE1	1.0	0.8	1.10
DLE2	1.5	0.5	0.25
DLE3	3.5	0.8	0.80
DLE4	6.0	0.8	0.43
DLE5	3.5	0.5	0.25
DLE6	0.8	0.5	1.10
DLE7	0.8	0.5	0.25
DLF1	1.5	0.5	1.05
DLF2	1.3	0.5	0.25
DLF3	1.5	0.5	1.10
DLF4	0.5	0.5	0.25
DLF5	1.0	1.0	0.75
DLF6	1.5	0.8	0.63
DLF6 AOV1	2.0	0.8	0.63
DLF6 AOV2	2.0	0.5	0.73
DLF7	1.0	0.5	0.25
DLG1	1.3	0.5	0.85
DLG2	0.8	0.5	0.58
DLG3	0.8	0.5	0.63
DLG4	1.0	0.5	0.90
DLG4*	2.0	0.5	0.25
DLG5	2.5	0.8	0.90
DLG5*	2.5	0.5	0.48
DLG6	0.5	0.5	0.70
DLG7	2.5	0.5	0.70
DLH1	1.5	0.8	1.20
DLH2	1.3	0.5	0.80
DLH3	19.5	0.5	0.90
DLH4	0.5	0.5	0.53
DLH5	0.8	0.5	0.58
DLH6	1.3	0.8	1.00
DLH7	2.0	1.5	1.20
FAA1	2.0	0.5	0.25
FAA2	0.8	0.5	0.25

Table A2.2 AA analytical data (a) HG-AAS/CVAAS, (b) FA-AAS (continued)

a.

Site No.[1]	As (ppm)	Se (ppm)	Hg (ppm)
FAA3	6.7	0.5	0.040
FAA4	8.2	0.4	0.035
FAA5	7.6	0.6	0.045
FAA6	10.3	0.4	0.050
FAA6 AOV1	8.5	0.4	0.035
FAA6 AOV2	8.7	0.3	0.045
FAA7	7.3	0.4	0.030
FAB1	7.5	0.7	0.040
FAB2	8.2	0.5	0.050
FAB2**	8.8	0.4	0.040
FAB3	6.3	0.5	0.035
FAB4	9.0	0.5	0.050
FAB5	8.2	0.7	0.055
FAB5 AOV1	8.4	0.4	0.055
FAB5 AOV2	7.6	0.8	0.045
FAB6	3.8	0.4	0.025
FAB7	6.8	0.3	0.035
FAC1	7.7	0.4	0.030
FAC2	9.3	0.5	0.040
FAC3	3.6	0.3	0.020
FAC4	10.5	0.3	0.070
FAC5	2.7	0.1	0.010
FAC6	9.0	0.3	0.035
FAC7	6.3	0.5	0.025
FAD1	8.6	0.2	0.045
FAD1 AOV1	7.9	0.4	0.035
FAD1 AOV2	7.9	0.5	0.040
FAD2	8.7	0.6	0.045
FAD3	3.4	0.2	0.010
FAD4	3.9	0.2	0.010
FAD5	3.3	0.1	0.010
FAD6	9.4	0.3	0.030
FAD7	8.7	0.2	0.045
FAE1	2.4	0.2	0.010
FAE2	4.8	0.2	0.030
FAE3	3.8	0.1	0.010
FAE4	4.1	0.1	0.010
FAE5	5.4	0.2	0.035
FAE6	8.5	0.4	0.035
FAE7	5.6	0.3	0.030
FAF1	4.2	1.2	0.015
FAF2	8.5	0.4	0.040
FAF3	3.5	0.1	0.015
FAF3 AOV1	2.7	0.6	0.030
FAF3 AOV2	3.3	0.1	0.010
FAF4	5.4	0.1	0.065
FAF5	5.1	0.5	0.040
FAF6	7.2	0.4	0.040
FAG2	6.4	0.6	0.040
FAG3	7.7	0.3	0.035
GFA1	8.3	0.3	0.035
GFA2	9.9	0.5	0.090

b.

Site No.[1]	Au (ppb)	Pd (ppb)	Pt (ppb)
FAA3	1.5	0.8	0.43
FAA4	1.0	0.5	0.53
FAA5	1.5	0.5	0.25
FAA6	4.5	0.8	0.25
FAA6 AOV1	4.0	0.8	0.43
FAA6 AOV2	4.5	1.5	1.20
FAA7	6.0	0.8	0.75
FAB1	2.5	0.8	0.43
FAB2	2.5	0.8	0.25
FAB2**	1.5	1.8	1.63
FAB3	3.5	1.0	0.25
FAB4	2.0	1.5	0.85
FAB5	2.0	2.0	0.63
FAB5 AOV1	2.0	1.5	1.00
FAB5 AOV2	2.0	2.0	1.05
FAB6	1.5	1.0	0.25
FAB7	3.5	0.5	0.73
FAC1	3.0	1.5	0.48
FAC2	3.0	2.0	1.35
FAC3	1.0	0.5	0.43
FAC4	2.5	2.0	0.75
FAC5	2.8	0.5	0.53
FAC6	4.0	1.5	0.90
FAC7	2.5	0.5	0.90
FAD1	3.0	0.5	0.25
FAD1 AOV1	4.5	0.5	0.48
FAD1 AOV2	2.5	0.5	0.25
FAD2	2.0	1.3	1.88
FAD3	0.5	0.5	0.25
FAD4	1.0	0.5	0.25
FAD5	4.0	0.5	0.43
FAD6	4.0	2.0	3.00
FAD7	8.0	1.5	0.85
FAE1	7.5	0.5	0.25
FAE2	0.8	0.5	0.53
FAE3	1.5	0.5	0.48
FAE4	1.3	0.5	0.25
FAE5	5.0	1.5	3.10
FAE6	3.0	1.3	0.75
FAE7	3.0	0.5	0.48
FAF1	6.5	1.0	2.40
FAF2	2.5	1.0	4.80
FAF3	1.5	0.5	0.53
FAF3 AOV1	5.0	4.3	2.83
FAF3 AOV2	3.5	0.5	0.25
FAF4	2.5	0.8	0.75
FAF5	0.8	0.5	0.25
FAF6	2.5	0.8	1.40
FAG2	3.0	0.5	3.05
FAG3	5.0	0.5	3.10
GFA1	23.0	2.0	1.00
GFA2	3.5	1.3	1.25

Table A2.2 AA analytical data (a) HG-AAS/CVAAS, (b) FA-AAS (continued)

a.

Site No.[1]	As (ppm)	Se (ppm)	Hg (ppm)
GFA3	7.3	0.3	0.035
GFA4	8.5	0.5	0.035
GFA5	8.3	0.4	0.040
GFA5*	7.5	0.5	0.035
GFA6	4.8	0.4	0.035
GFA7	7.5	0.2	0.040
GFB1	5.5	0.3	0.025
GFB2	8.6	0.4	0.050
GFB3	7.1	0.4	0.060
GFB4	7.7	0.4	0.035
GFB5	6.5	0.3	0.070
GFB5*	7.7	0.2	0.050
GFB6	6.1	0.1	0.020
GFB7	6.9	0.2	0.010
GFC1	5.9	0.5	0.040
GFC2	3.4	0.1	0.020
GFC3	6.6	0.4	0.035
GFC4	9.8	0.5	0.035
GFC4 AOV1	3.5	0.3	0.015
GFC4 AOV2	3.8	0.3	0.015
GFC5	5.0	0.2	0.010
GFC6	5.3	0.2	0.040
GFC7	5.5	0.4	0.030
GFD1	5.0	0.2	0.030
GFD2	9.5	0.4	0.040
GFD2 AOV1	3.2	0.2	0.020
GFD2 AOV2	3.4	0.2	0.015
GFD3	7.4	0.5	0.025
GFD4	3.3	0.2	0.020
GFD5	3.2	0.3	0.020
GFD6	4.1	0.2	0.020
GFD7	11.2	1.3	0.030
GFE1	4.5	0.2	0.025
GFE2	8.1	0.3	0.045
GFE3	8.1	0.3	0.040
GFE4	4.1	0.2	0.015
GFE5	8.4	0.3	0.030
GFE6	8.7	0.4	0.030
GFE7	8.6	0.3	0.065
GFF1	11.1	0.6	0.040
GFF2	10.0	0.5	0.035
GFF3	11.1	0.5	0.045
GFF4	7.6	0.4	0.040
GFF5	7.4	0.4	0.030
GNI1	7.7	0.5	0.025
GNI2	6.9	0.5	0.025
GNI4	9.0	1.5	0.030
JAA1	7.2	1.0	0.040
JAA2	22.5	0.5	0.030
JAA2 AOV1	8.6	0.8	0.050
JAA2 AOV2	8.7	0.7	0.055
JAA3	8.7	0.7	0.035

b.

Site No.[1]	Au (ppb)	Pd (ppb)	Pt (ppb)
GFA3	5.0	0.8	0.70
GFA4	3.0	0.5	0.98
GFA5	3.5	0.8	1.25
GFA5*	3.5	0.8	1.15
GFA6	2.0	0.8	0.75
GFA7	7.0	0.5	0.48
GFB1	14.0	0.8	1.00
GFB2	2.0	0.5	0.25
GFB3	4.5	0.8	0.25
GFB4	5.0	0.8	0.48
GFB5	4.0	0.8	0.58
GFB5*	10.5	1.5	0.58
GFB6	3.0	1.3	0.25
GFB7	9.5	0.8	1.18
GFC1	2.3	1.3	0.75
GFC2	2.5	0.5	0.43
GFC3	3.0	1.0	0.25
GFC4	5.0	1.5	0.98
GFC4 AOV1	2.0	0.8	0.25
GFC4 AOV2	1.3	0.5	0.25
GFC5	3.8	0.5	0.25
GFC6	1.5	0.5	0.25
GFC7	4.5	1.5	0.25
GFD1	1.5	1.0	0.25
GFD2	4.5	2.0	0.38
GFD2 AOV1	2.5	0.8	0.25
GFD2 AOV2	2.3	0.8	0.58
GFD3	3.0	1.5	0.43
GFD4	1.5	0.8	0.25
GFD5	3.0	0.5	0.48
GFD6	3.0	0.5	0.38
GFD7	3.0	0.8	0.25
GFE1	2.0	0.5	0.63
GFE2	11.5	1.0	0.63
GFE3	4.5	1.0	0.60
GFE4	11.5	0.8	0.25
GFE5	2.5	0.8	0.43
GFE6	2.5	0.8	0.58
GFE7	2.5	0.8	0.58
GFF1	6.5	1.5	0.53
GFF2	6.0	0.8	0.90
GFF3	6.0	1.0	1.05
GFF4	4.0	1.0	0.25
GFF5	3.5	0.8	0.80
GNI1	2.0	0.5	0.25
GNI2	0.5	0.5	0.25
GNI4	0.8	0.5	0.25
JAA1	1.5	0.5	1.58
JAA2	2.5	0.5	1.43
JAA2 AOV1	5.0	0.5	1.53
JAA2 AOV2	1.8	0.5	0.25
JAA3	0.8	0.5	0.25

Table A2.2 AA analytical data (a) HG-AAS/CVAAS, (b) FA-AAS (continued)

a.

Site No.[1]	As (ppm)	Se (ppm)	Hg (ppm)
JAA4	8.4	0.5	0.035
JAA5	2.9	0.3	0.010
JAA6	5.8	0.6	0.055
JAA7	7.8	0.7	0.050
JAB1	7.9	0.9	0.030
JAB2	6.8	0.6	0.040
JAB3	5.9	0.3	0.035
JAB4	8.8	0.6	0.050
JAB5	6.2	0.6	0.050
JAB6	6.0	0.6	0.045
JAB7	7.1	0.6	0.045
JAC1	6.3	0.5	0.040
JAC2	9.0	0.8	0.055
JAC3	8.3	0.8	0.055
JAC4	6.3	0.5	0.045
JAC5	7.1	0.2	0.040
JAC6	7.1	0.6	0.050
JAC6 AOV1	5.2	0.5	0.040
JAC6 AOV2	6.1	0.9	0.055
JAC7	5.3	0.5	0.050
JAD1	8.7	0.7	0.055
JAD2	4.7	0.3	0.015
JAD3	8.2	0.7	0.050
JAD4	5.9	0.4	0.025
JAD5	7.3	0.3	0.050
JAD6	4.2	0.4	0.035
JAD7	5.6	0.2	0.035
JAE1	10.3	0.6	0.050
JAE2	7.3	0.4	0.045
JAE3	7.2	0.5	0.050
JAE3 AOV1	8.7	0.4	0.060
JAE3 AOV2	8.2	0.4	0.050
JAE4	9.2	0.6	0.070
JAE5	8.7	0.3	0.045
JAE6	6.2	0.6	0.025
JAE7	5.2	0.5	0.030
JAF1	8.6	0.4	0.045
JAF2	8.8	0.5	0.055
JAF3	7.4	0.4	0.060
JAF4	8.8	0.3	0.055
JAF5	8.8	0.4	0.055
JAF6	7.6	0.4	0.045
JAF7	8.7	0.6	0.055
JAG1	4.5	0.4	0.040
JAG2	7.3	0.4	0.050
JAG3	6.9	0.3	0.035
JAG4	7.0	0.4	0.065
JAG5	9.6	0.6	0.055
JAG6	4.0	0.2	0.020
JAG7	6.5	0.5	0.045
JAH1	5.3	0.3	0.035
JAH2	6.0	0.3	0.030

b.

Site No.[1]	Au (ppb)	Pd (ppb)	Pt (ppb)
JAA4	1.3	0.5	0.25
JAA5	1.0	0.5	0.25
JAA6	3.5	0.5	0.25
JAA7	2.5	0.8	0.25
JAB1	1.5	1.0	0.60
JAB2	2.5	1.0	0.75
JAB3	5.0	0.5	1.50
JAB4	5.0	1.0	0.63
JAB5	3.0	0.8	0.43
JAB6	16.0	0.8	2.53
JAB7	5.0	0.8	1.08
JAC1	4.0	2.0	0.95
JAC2	11.5	2.0	1.10
JAC3	2.5	1.5	0.78
JAC4	4.0	0.8	0.75
JAC5	3.0	0.8	0.25
JAC6	2.5	0.5	0.25
JAC6 AOV1	3.0	0.8	0.58
JAC6 AOV2	2.5	0.5	0.25
JAC7	3.0	0.5	0.55
JAD1	5.0	1.5	0.80
JAD2	4.0	0.8	0.38
JAD3	3.0	1.5	0.70
JAD4	2.5	1.5	0.90
JAD5	4.5	1.0	0.85
JAD6	6.0	0.5	0.63
JAD7	2.5	0.5	0.48
JAE1	5.5	2.0	1.40
JAE2	5.0	1.5	0.70
JAE3	3.0	0.5	0.25
JAE3 AOV1	10.5	0.8	1.75
JAE3 AOV2	3.0	0.5	0.25
JAE4	4.0	0.5	0.25
JAE5	3.0	1.5	0.93
JAE6	4.5	0.8	0.63
JAE7	2.5	0.5	0.48
JAF1	3.5	0.5	0.25
JAF2	3.0	0.5	0.25
JAF3	4.0	0.5	1.33
JAF4	9.5	0.5	0.43
JAF5	2.5	0.8	0.68
JAF6	1.5	0.5	0.48
JAF7	3.0	1.5	0.58
JAG1	3.5	0.5	0.25
JAG2	3.5	0.8	2.38
JAG3	4.0	0.5	0.25
JAG4	4.0	0.5	0.25
JAG5	2.5	1.0	0.63
JAG6	1.0	0.5	0.58
JAG7	2.0	0.5	0.70
JAH1	3.5	0.5	1.48
JAH2	3.5	0.8	0.48

Table A2.2 AA analytical data (a) HG-AAS/CVAAS, (b) FA-AAS (continued)

a.

Site No.[1]	As (ppm)	Se (ppm)	Hg (ppm)
JAH3	9.1	0.4	0.045
JAH4	7.2	0.6	0.040
JAH5	6.7	0.5	0.030
JAH6	8.2	0.4	0.035
JAH7	14.2	0.7	0.035
JAI1	4.1	0.3	0.015
JAI2	8.5	0.3	0.030
JAI3	6.8	0.6	0.040
JAI4	8.8	0.5	0.050
JAI5	5.7	0.3	0.020
JAI6	7.0	0.4	0.045
JAI7	8.8	0.4	0.045
LMC7	9.2	0.5	0.040
LME7	8.6	0.4	0.020
LME7 AOV1	7.8	0.4	0.025
LME7 AOV2	10.6	0.3	0.020
LMG7	8.8	0.5	0.060
LMH7	8.1	0.3	0.020
M2I1	13.0	1.1	0.055
M2I2	11.5	1.0	0.055
M2I6	7.1	0.1	0.020
MBB7	6.4	0.8	0.035
MBC7	7.9	0.5	0.030
MBE7	6.6	0.6	0.035
MBF7	4.2	0.2	0.010
MIA1	9.3	0.6	0.050
MIA2	8.9	0.7	0.035
MIA3	7.0	0.6	0.050
MIA4	8.8	0.7	0.050
MIA6	7.5	0.3	0.035
MIA7	10.3	0.6	0.035
MIB1	10.6	0.5	0.035
MIB2	9.9	0.5	0.050
MIB3	8.4	0.6	0.050
MIB4	8.0	0.4	0.045
MIB5	5.4	0.5	0.030
MIB6	7.9	0.5	0.035
MIB7	4.5	0.4	0.010
MIC1	7.5	0.8	0.045
MIC2	11.2	0.5	0.045
MIC3	8.6	0.5	0.040
MIC3 AOV1	7.7	0.5	0.045
MIC3 AOV2	10.3	0.5	0.040
MIC4	6.7	0.4	0.040
MIC5	9.3	0.6	0.030
MIC6	5.2	0.3	0.030
MIC7	7.0	0.6	0.030
MID1	8.3	0.6	0.050
MID2	8.3	0.4	0.050
MID3	6.7	0.4	0.035
MID4	7.2	0.6	0.040
MID4 AOV1	8.9	0.6	0.025

b.

Site No.[1]	Au (ppb)	Pd (ppb)	Pt (ppb)
JAH3	4.5	1.5	0.80
JAH4	3.5	1.5	0.63
JAH5	1.3	0.5	0.38
JAH6	1.5	0.5	0.43
JAH7	5.5	0.5	0.38
JAI1	3.5	1.0	0.65
JAI2	3.5	2.5	1.45
JAI3	5.0	1.5	0.75
JAI4	5.0	2.0	0.85
JAI5	1.3	0.5	0.73
JAI6	2.0	0.8	0.63
JAI7	1.8	0.5	0.25
LMC7	2.5	0.5	1.15
LME7	3.0	0.5	0.58
LME7 AOV1	1.5	0.5	0.43
LME7 AOV2	3.5	0.5	0.75
LMG7	2.5	1.0	1.00
LMH7	1.0	0.5	0.25
M2I1	6.5	0.5	0.53
M2I2	7.5	0.5	2.58
M2I6	4.5	0.5	0.25
MBB7	6.5	0.8	1.98
MBC7	7.0	1.3	3.40
MBE7	2.5	0.5	0.63
MBF7	2.8	0.8	0.73
MIA1	2.5	0.5	0.70
MIA2	2.5	0.5	0.65
MIA3	2.0	0.8	1.15
MIA4	2.5	0.8	0.38
MIA6	2.0	0.5	0.55
MIA7	2.5	0.5	0.25
MIB1	2.0	0.8	0.25
MIB2	3.0	0.8	0.38
MIB3	2.5	0.8	0.70
MIB4	2.5	0.8	1.00
MIB5	1.0	0.5	0.63
MIB6	2.5	0.8	0.53
MIB7	1.5	0.5	0.38
MIC1	2.5	0.8	0.25
MIC2	2.5	0.5	0.80
MIC3	2.5	0.8	0.60
MIC3 AOV1	2.5	0.8	0.70
MIC3 AOV2	2.0	0.5	0.65
MIC4	2.5	0.5	1.00
MIC5	2.5	0.5	0.43
MIC6	2.5	0.5	0.65
MIC7	1.5	0.5	0.48
MID1	2.0	0.8	0.63
MID2	2.5	0.8	0.68
MID3	2.0	1.0	0.75
MID4	2.5	0.8	0.80
MID4 AOV1	2.0	0.5	0.55

Table A2.2 AA analytical data (a) HG-AAS/CVAAS, (b) FA-AAS (continued)

a.

Site No.[1]	As (ppm)	Se (ppm)	Hg (ppm)
MID4 AOV2	7.0	0.6	0.020
MID5	8.9	0.4	0.030
MID6	7.3	0.5	0.025
MID7	6.1	0.5	0.020
MID7 AOV1	8.7	0.5	0.025
MID7 AOV2	5.6	0.4	0.025
MID7 AOV3	6.0	0.4	0.020
MIE1	7.1	0.7	0.035
MIE3	6.5	0.5	0.030
MIE4	5.9	0.5	0.030
MIE6	5.9	0.4	0.035
MIE7	4.8	0.5	0.030
MIF1	5.9	0.4	0.030
MIF2	9.7	0.8	0.045
MIF3	4.0	0.1	0.010
MIF4	3.4	0.1	0.010
MIF5	7.0	0.1	0.010
MIF6	8.3	0.4	0.030
MIF6*	9.3	0.6	0.055
MIF7	6.7	0.6	0.035
MIG1	4.5	0.2	0.020
MIG2	4.6	0.2	0.010
MIG2 AOV1	6.0	0.4	0.020
MIG2 AOV2	6.9	0.4	0.020
MIG3	8.4	0.5	0.030
MIG4	5.1	0.1	0.010
MIG5	5.5	0.3	0.025
MIG6	8.2	0.6	0.055
MIG7	9.0	0.3	0.050
MIH1	6.8	0.3	0.025
MIH2	3.7	0.2	0.010
MIH3	6.9	0.4	0.035
MIH4	5.8	0.3	0.020
MIH5	5.4	0.6	0.035
MIH6	8.1	0.5	0.050
MIH6*	5.4	0.2	0.030
MIH6**	4.5	0.1	0.030
MIH7	10.1	0.6	0.040
MTB7	6.1	0.2	0.010
MTE7	6.6	0.5	0.070
MTG7	8.0	0.3	0.025
MYA1	7.6	0.5	0.055
MYA2	10.4	0.5	0.020
MYA3	10.5	0.8	0.055
MYA4	10.5	0.4	0.020
MYA5	14.7	1.0	0.030
MYA6	11.4	0.7	0.045
MYA7	11.0	0.9	0.050
MYB1	10.8	0.6	0.045
MYB2	7.5	0.6	0.030
MYB3	13.5	0.7	0.040
MYB4	10.0	0.5	0.030

b.

Site No.[1]	Au (ppb)	Pd (ppb)	Pt (ppb)
MID4 AOV2	2.0	0.5	0.43
MID5	2.0	0.5	0.25
MID6	1.5	0.5	0.48
MID7	2.0	0.5	0.38
MID7 AOV1	2.5	0.8	0.43
MID7 AOV2	2.0	0.5	0.95
MID7 AOV3	2.0	0.5	0.58
MIE1	2.5	0.5	0.43
MIE3	6.5	0.5	0.48
MIE4	3.5	0.5	0.63
MIE6	1.3	0.5	0.53
MIE7	1.5	0.5	0.65
MIF1	1.5	0.5	0.48
MIF2	2.0	0.5	1.10
MIF3	1.5	0.5	0.65
MIF4	0.5	0.5	0.53
MIF5	2.5	0.5	0.38
MIF6	4.5	0.5	0.63
MIF6*	2.5	1.5	0.68
MIF7	1.5	0.5	0.25
MIG1	3.0	0.8	0.25
MIG2	2.5	0.5	0.25
MIG2 AOV1	2.0	0.8	0.68
MIG2 AOV2	2.0	0.8	0.73
MIG3	2.5	1.0	0.95
MIG4	2.0	0.5	0.43
MIG5	1.0	0.5	0.43
MIG6	2.5	0.5	0.25
MIG7	5.0	0.8	0.93
MIH1	4.0	0.8	1.73
MIH2	0.5	0.5	0.25
MIH3	1.5	0.5	0.25
MIH4	2.0	0.5	0.25
MIH5	7.0	0.8	0.25
MIH6	3.0	2.0	1.15
MIH6*	2.0	0.8	1.10
MIH6**	3.5	2.8	6.30
MIH7	2.5	1.5	0.48
MTB7	2.5	0.5	0.25
MTE7	5.0	0.5	0.25
MTG7	1.3	0.5	7.03
MYA1	3.5	1.0	0.25
MYA2	43.0	0.5	0.25
MYA3	6.0	1.0	0.25
MYA4	4.5	0.5	0.25
MYA5	2.5	0.5	2.45
MYA6	6.0	0.8	1.10
MYA7	1.8	0.5	0.70
MYB1	2.5	0.8	0.25
MYB2	4.0	0.5	0.25
MYB3	3.0	0.5	0.25
MYB4	6.0	0.5	0.25

Table A2.2 AA analytical data (a) HG-AAS/CVAAS, (b) FA-AAS (continued)

a.

Site No.[1]	As (ppm)	Se (ppm)	Hg (ppm)
MYB5	10.7	0.4	0.030
MYB6	10.3	0.6	0.035
MYB7	13.3	0.7	0.060
MYC1	10.7	0.7	0.035
MYC2	9.9	0.6	0.055
MYC3	9.7	0.5	0.030
MYC4	10.8	0.4	0.025
MYC5	10.4	0.8	0.035
MYC6	11.4	0.6	0.045
MYC7	7.8	0.4	0.020
MYD1	8.6	0.5	0.065
MYD2	10.0	0.4	0.035
MYD3	9.0	0.4	0.025
MYD4	10.2	0.7	0.035
MYD5	10.8	0.6	0.035
MYD6	11.9	0.4	0.055
MYD7	10.1	0.3	0.040
MYE1	9.5	0.7	0.045
MYE2	8.9	0.3	0.025
MYE3	11.1	0.4	0.040
MYE4	11.2	0.5	0.045
MYE5	9.6	0.5	0.040
MYE6	10.5	0.5	0.045
MYE7	10.9	0.7	0.050
MYF1	10.3	0.5	0.050
MYF2	11.4	0.4	0.035
MYF3	7.8	0.4	0.030
MYF4	9.3	0.4	0.030
MYF5	11.8	0.5	0.055
MYF6	9.9	0.7	0.055
MYF7	9.2	0.9	0.040
MYG1	7.3	0.5	0.030
MYG2	11.5	0.8	0.050
MYG3	12.1	0.5	0.040
MYG4	9.9	0.7	0.045
MYG5	11.2	0.6	0.050
MYG6	10.5	0.3	0.035
MYG7	11.9	0.5	0.045
MYH1	11.6	0.7	0.030
MYH2	9.3	0.7	0.045
MYH3	7.6	0.2	0.040
MYH4	10.7	0.8	0.040
MYH5	10.6	0.4	0.045
MYH6	9.0	0.3	0.035
MYH7	7.9	0.4	0.040
MYI1	8.7	0.5	0.055
MYI2	9.3	0.4	0.045
MYI3	9.7	0.6	0.045
MYI4	11.6	0.5	0.050
MYI5	10.3	0.3	0.040
MYI6	8.6	0.5	0.040
MYI7	6.3	0.2	0.010

b.

Site No.[1]	Au (ppb)	Pd (ppb)	Pt (ppb)
MYB5	2.5	0.5	0.58
MYB6	5.0	0.5	1.15
MYB7	2.0	0.8	0.65
MYC1	3.5	1.0	1.30
MYC2	3.0	0.8	0.25
MYC3	3.5	1.3	0.70
MYC4	2.0	0.5	0.43
MYC5	2.0	0.5	0.85
MYC6	2.0	0.8	0.80
MYC7	1.5	0.5	0.65
MYD1	4.0	1.5	0.93
MYD2	3.5	2.0	0.95
MYD3	3.5	0.5	0.50
MYD4	1.5	0.5	0.53
MYD5	3.0	0.5	0.80
MYD6	3.0	0.8	0.58
MYD7	3.5	0.5	0.80
MYE1	4.0	1.5	0.85
MYE2	0.8	0.5	0.80
MYE3	24.5	0.5	1.00
MYE4	2.5	0.5	0.75
MYE5	5.0	0.5	0.38
MYE6	3.0	0.5	1.68
MYE7	3.5	0.8	0.48
MYF1	3.0	0.5	0.25
MYF2	2.5	0.8	0.90
MYF3	2.0	0.8	1.70
MYF4	2.0	0.5	0.48
MYF5	3.0	1.0	1.00
MYF6	2.5	0.8	0.43
MYF7	3.0	0.8	0.90
MYG1	2.0	0.5	0.25
MYG2	17.5	0.5	0.25
MYG3	2.5	0.8	1.00
MYG4	2.0	0.5	1.00
MYG5	2.0	0.8	0.63
MYG6	2.5	0.5	0.90
MYG7	3.5	0.5	1.20
MYH1	3.0	0.5	0.25
MYH2	3.0	0.8	0.93
MYH3	4.0	1.0	0.25
MYH4	12.5	0.5	0.48
MYH5	2.5	0.5	0.53
MYH6	2.0	0.5	0.70
MYH7	3.0	0.5	0.58
MYI1	2.5	0.8	0.90
MYI2	2.5	1.3	0.90
MYI3	3.0	0.8	0.70
MYI4	3.5	0.5	0.95
MYI5	2.5	0.5	0.98
MYI6	2.5	0.8	0.85
MYI7	2.0	0.5	0.80

Table A2.2 AA analytical data (a) HG-AAS/CVAAS, (b) FA-AAS (continued)

a.

Site No.[1]	As (ppm)	Se (ppm)	Hg (ppm)
NRA1	13.5	0.3	0.030
NRA2	7.7	0.6	0.050
NRA3	5.9	0.4	0.045
NRA4	9.8	0.3	0.050
NRA5	6.5	0.5	0.025
NRA6	6.2	0.4	0.035
NRA7	6.6	0.4	0.030
NRB1	7.9	0.5	0.040
NRB2	8.3	0.6	0.040
NRB3	9.1	0.4	0.050
NRB4	10.0	0.7	0.065
NRB5	7.5	0.4	0.035
NRB6	7.7	0.6	0.025
NRB7	6.7	0.5	0.025
NRC1	9.0	0.6	0.040
NRC2	7.5	0.4	0.035
NRC3	9.3	0.5	0.050
NRC4	7.1	0.5	0.040
NRC4 AOV1	8.5	0.3	0.115
NRC4 AOV2	6.8	0.5	0.030
NRC5	6.3	0.1	0.030
NRC6	7.6	0.3	0.030
NRC7	6.9	0.3	0.040
NRD1	7.1	1.0	0.040
NRD2	6.9	0.7	0.050
NRD2 AOV1	7.8	1.4	0.035
NRD2 AOV2	6.9	1.2	0.040
NRD2 AOV3	7.9	1.2	0.045
NRD3	8.9	0.5	0.045
NRD4	6.6	0.3	0.030
NRD5	6.5	0.3	0.035
NRD6	6.8	0.4	0.035
NRD7	9.9	0.5	0.040
NRE1	11.8	0.5	0.060
NRE2	8.0	0.5	0.055
NRE3	6.2	0.6	0.030
NRE4	6.3	0.5	0.035
NRE5	4.5	0.4	0.035
NRE6	5.4	0.4	0.040
NRE7	7.5	0.6	0.045
NRF1	7.9	0.4	0.050
NRF2	7.2	0.5	0.040
NRF3	6.7	0.6	0.035
NRF4	7.9	0.5	0.035
NRF5	8.0	0.6	0.040
NRF6	6.2	0.3	0.035
NRF7	8.2	0.5	0.035
NRG1	6.7	0.5	0.025
NRG2	6.5	0.6	0.045
NRG3	5.4	0.4	0.040
NRG3 AOV1	6.1	0.5	0.025
NRG3 AOV2	6.2	0.5	0.025

b.

Site No.[1]	Au (ppb)	Pd (ppb)	Pt (ppb)
NRA1	1.0	0.5	0.48
NRA2	1.3	0.5	0.65
NRA3	2.0	0.5	0.63
NRA4	2.5	0.5	0.43
NRA5	3.0	0.5	0.80
NRA6	2.0	1.0	1.15
NRA7	2.0	0.8	0.73
NRB1	5.0	0.5	0.70
NRB2	3.0	0.5	0.25
NRB3	5.5	0.5	0.38
NRB4	2.0	0.8	0.75
NRB5	3.0	0.5	0.25
NRB6	2.0	0.8	1.35
NRB7	1.0	0.5	0.25
NRC1	1.5	0.5	0.25
NRC2	3.5	0.5	0.80
NRC3	7.0	0.5	0.60
NRC4	1.5	0.5	0.80
NRC4 AOV1	2.0	0.5	0.38
NRC4 AOV2	2.0	0.5	0.58
NRC5	3.0	0.5	0.25
NRC6	3.0	0.5	0.38
NRC7	3.0	1.5	0.70
NRD1	2.0	0.5	0.43
NRD2	2.0	0.5	0.48
NRD2 AOV1	2.0	0.5	0.65
NRD2 AOV2	2.0	0.5	0.25
NRD2 AOV3	1.5	0.5	0.53
NRD3	2.0	0.5	0.53
NRD4	1.5	0.5	0.75
NRD5	1.5	0.8	0.25
NRD6	2.0	0.8	0.98
NRD7	4.5	0.8	0.25
NRE1	2.5	0.5	0.58
NRE2	2.0	0.5	0.48
NRE3	96.5	0.5	0.25
NRE4	3.0	0.8	0.70
NRE5	1.5	1.0	0.53
NRE6	4.0	0.8	0.25
NRE7	2.0	0.8	0.85
NRF1	2.0	0.8	0.25
NRF2	7.5	0.5	0.68
NRF3	3.0	0.5	3.10
NRF4	2.0	0.5	1.40
NRF5	2.5	1.0	0.38
NRF6	4.0	0.8	0.53
NRF7	2.5	1.0	1.20
NRG1	1.5	0.5	0.90
NRG2	5.0	0.5	0.90
NRG3	1.5	0.5	0.95
NRG3 AOV1	2.0	0.5	0.60
NRG3 AOV2	1.0	0.5	0.58

Table A2.2 AA analytical data (a) HG-AAS/CVAAS, (b) FA-AAS (continued)

a.

Site No.[1]	As (ppm)	Se (ppm)	Hg (ppm)
NRG3 AOV3	6.3	0.5	0.025
NRG4	8.1	0.3	0.035
NRG5	5.4	0.3	0.035
NRG6	2.9	0.2	0.010
NRG7	4.8	0.3	0.045
NRH1	4.6	0.4	0.015
NRH2	7.7	0.5	0.050
NRH3	6.3	0.5	0.030
NRH4	5.0	0.5	0.050
NRH5	4.9	0.5	0.030
NRH6	4.8	0.3	0.030
NRH7	6.2	0.3	0.040
NRI1	8.6	0.5	0.035
NRI2	6.1	0.5	0.055
NRI3	5.7	0.7	0.070
NRI4	3.9	0.2	0.010
NRI5	6.2	0.3	0.035
NRI6	5.1	0.4	0.045
NRI7	5.7	0.4	0.035
TFA1	6.8	0.2	0.045
TFA2	10.8	1.1	0.070
TFA3	6.8	0.4	0.045
TFA4	8.8	0.6	0.105
TFA5	5.0	0.4	0.035
TFA6	5.5	0.4	0.045
TFA7	9.4	0.7	0.020
TFB1	6.7	0.7	0.035
TFB2	6.1	0.2	0.010
TFB3	8.0	0.3	0.050
TFB4	6.5	0.2	0.020
TFB5	7.5	0.1	0.010
TFB6	7.5	0.2	0.010
TFB7	9.2	1.4	0.060
TFC1	12.1	0.4	0.045
TFC2	14.7	0.4	0.050
TFC3	9.2	0.4	0.025
TFC4	9.7	0.4	0.040
TFC5	12.4	0.3	0.035
TFC6	9.7	0.3	0.035
TFC7	9.2	0.8	0.060
TFD1	7.3	1.1	0.030
TFD2	7.1	0.3	0.025
TFD3	11.0	0.3	0.040
TFD4	5.7	0.3	0.020
TFD5	10.6	0.5	0.045
TFD6	11.1	0.3	0.035
WCA1	5.9	0.3	0.020
WCA2	8.7	0.2	0.010
WCA3	9.4	0.3	0.020
WCA4	8.1	0.3	0.015
WCA5	12.1	0.4	0.025
WCA6	8.3	0.5	0.020

b.

Site No.[1]	Au (ppb)	Pd (ppb)	Pt (ppb)
NRG3 AOV3	2.0	0.5	0.75
NRG4	2.5	0.5	0.53
NRG5	2.5	1.5	0.25
NRG6	1.3	0.5	0.38
NRG7	1.5	1.0	0.25
NRH1	2.5	0.5	0.70
NRH2	2.5	0.5	0.95
NRH3	1.0	0.5	0.75
NRH4	2.5	0.8	0.58
NRH5	1.0	0.8	0.25
NRH6	1.0	0.5	0.25
NRH7	2.0	2.0	0.68
NRI1	3.5	0.5	0.68
NRI2	2.5	0.5	0.48
NRI3	53.5	0.5	0.43
NRI4	1.0	0.5	0.70
NRI5	2.5	1.0	0.43
NRI6	2.0	1.3	0.25
NRI7	3.5	2.0	0.25
TFA1	2.0	1.0	0.90
TFA2	5.0	0.8	0.85
TFA3	2.0	1.0	0.48
TFA4	2.5	0.8	0.80
TFA5	3.5	0.5	0.43
TFA6	12.5	1.0	0.58
TFA7	0.5	0.5	0.90
TFB1	2.5	0.8	0.53
TFB2	1.0	0.5	0.38
TFB3	2.0	0.8	0.58
TFB4	1.0	0.5	0.63
TFB5	2.0	0.5	0.73
TFB6	1.0	0.5	0.48
TFB7	3.0	1.5	0.88
TFC1	3.0	1.0	0.25
TFC2	2.0	0.8	0.48
TFC3	1.5	0.8	0.65
TFC4	1.5	1.0	0.53
TFC5	5.0	2.3	1.35
TFC6	4.0	1.3	0.63
TFC7	5.5	2.0	1.35
TFD1	2.0	0.8	0.95
TFD2	2.0	0.8	0.95
TFD3	2.5	1.5	0.25
TFD4	2.5	0.5	0.90
TFD5	3.0	0.8	0.43
TFD6	4.0	1.5	0.95
WCA1	9.0	0.8	0.25
WCA2	23.0	0.5	0.25
WCA3	3.0	3.0	3.40
WCA4	2.5	0.8	0.75
WCA5	2.5	1.0	0.80
WCA6	2.8	0.5	0.25

Table A2.2 AA analytical data (a) HG-AAS/CVAAS, (b) FA-AAS (continued)

a.

Site No.[1]	As (ppm)	Se (ppm)	Hg (ppm)
WCA7	8.5	0.6	0.025
WCB1	5.5	0.2	0.020
WCB2	9.8	0.6	0.045
WCB3	7.2	0.1	0.015
WCB4	9.5	0.4	0.030
WCB5	6.1	0.2	0.035
WCB6	10.8	0.6	0.020
WCB7	8.9	0.5	0.035
WCC1	7.4	0.2	0.020
WCC2	8.0	0.4	0.030
WCC3	6.5	0.2	0.030
WCC4 AOV1	9.1	0.3	0.030
WCC4 AOV2	9.1	0.4	0.030
WCC5	7.0	0.4	0.020
WCC6	9.8	0.3	0.015
WCC7	8.3	0.5	0.035
WCD1	7.7	0.3	0.030
WCD2	5.5	0.5	0.045
WCD3	7.6	0.4	0.040
WCD4	10.5	0.3	0.030
WCD5	7.8	0.7	0.055
WCD6	8.6	0.6	0.025
WCD7	6.9	0.4	0.025
WCE1	6.3	0.6	0.020
WCE2	5.8	0.5	0.030
WCE3	8.7	0.5	0.030
WCE4	5.1	0.4	0.025
WCE5	7.7	0.4	0.030
WCE5 AOV1	7.4	0.5	0.025
WCE5 AOV2	8.1	0.5	0.030
WCE6	6.5	0.4	0.025
WCE7	7.5	0.5	0.030
WCF1	7.2	0.2	0.020
WCF2	8.1	0.4	0.015
WCF3	8.3	0.7	0.045
WCF4	6.9	1.1	0.030
WCF5	7.4	0.4	0.030
WCF6	7.6	0.6	0.035
WCF6 AOV1	9.9	0.4	0.035
WCF6 AOV2	9.0	0.5	0.045
WCF7	7.1	0.8	0.030
WCG1	5.8	0.4	0.040
WCG2	9.1	0.6	0.030
WCG3	9.5	0.7	0.035
WCG4	9.0	0.3	0.025
WCG5	9.9	0.7	0.050
WCG6	11.1	0.3	0.040
WCG7	10.1	0.4	0.030
WCH1	7.1	0.3	0.030
WCH2	7.0	0.4	0.035
WCH3	6.9	0.4	0.020
WCH4	6.4	0.5	0.020

b.

Site No.[1]	Au (ppb)	Pd (ppb)	Pt (ppb)
WCA7	2.0	0.8	0.43
WCB1	2.0	0.5	0.25
WCB2	2.5	0.8	0.25
WCB3	2.0	1.3	0.60
WCB4	3.5	1.5	0.53
WCB5	2.5	0.8	0.25
WCB6	9.5	0.8	1.28
WCB7	2.5	0.8	1.05
WCC1	20.5	1.8	4.03
WCC2	3.0	0.5	0.25
WCC3	4.5	0.5	0.25
WCC4 AOV1	33.5	0.5	0.25
WCC4 AOV2	4.5	0.5	1.20
WCC5	1.5	6.8	7.63
WCC6	3.0	1.5	0.93
WCC7	3.0	0.8	0.53
WCD1	2.5	0.5	0.25
WCD2	2.5	0.8	0.25
WCD3	2.5	0.5	0.25
WCD4	2.5	0.8	0.43
WCD5	13.5	1.0	0.85
WCD6	1.5	0.8	0.48
WCD7	1.5	0.8	0.73
WCE1	2.5	0.5	1.00
WCE2	4.0	1.0	0.95
WCE3	3.5	0.8	0.43
WCE4	15.5	1.0	1.00
WCE5	4.5	1.0	1.05
WCE5 AOV1	1.5	0.8	0.95
WCE5 AOV2	2.0	0.8	0.90
WCE6	2.0	0.5	0.78
WCE7	2.0	1.0	0.78
WCF1	3.0	0.5	0.90
WCF2	1.3	0.5	1.25
WCF3	2.5	1.5	1.18
WCF4	2.5	0.8	0.80
WCF5	2.5	1.0	0.63
WCF6	3.5	1.0	0.53
WCF6 AOV1	2.5	0.8	0.38
WCF6 AOV2	3.0	1.3	0.93
WCF7	2.5	0.8	0.50
WCG1	3.0	1.5	0.70
WCG2	2.5	0.5	1.98
WCG3	5.0	1.3	0.63
WCG4	1.0	0.5	0.25
WCG5	2.0	0.5	0.25
WCG6	2.5	1.8	0.53
WCG7	1.5	0.5	0.25
WCH1	2.5	0.5	0.25
WCH2	2.0	0.5	0.25
WCH3	0.8	0.5	0.25
WCH4	2.0	0.5	0.25

Table A2.2 AA analytical data (a) HG-AAS/CVAAS, (b) FA-AAS (continued)

a.

Site No.[1]	As (ppm)	Se (ppm)	Hg (ppm)
WCH5	9.5	0.4	0.040
WCH6	10.3	0.5	0.020
WCH7	10.3	0.5	0.045
WCI1	9.5	0.4	0.045
WCI2	8.4	0.5	0.030
WCI3	7.2	0.5	0.050
WCI4	9.9	0.6	0.030
WCI5	10.6	0.5	0.035
WCI6	9.5	0.5	0.045
WCI7	8.9	0.9	0.025
WIA1	7.1	0.1	0.015
WIA2	11.3	0.3	0.045
WIA3	7.1	0.3	0.015
WIA4	10.1	1.0	0.035
WIA5	7.3	0.4	0.025
WIA6	10.0	0.5	0.035
WIA7	9.6	0.8	0.045
WIB1	7.4	0.3	0.025
WIB2	7.7	0.4	0.040
WIB3	9.6	0.4	0.035
WIB4	9.4	0.6	0.050
WIB5	11.6	0.6	0.035
WIB6	12.7	0.6	0.040
WIB7	7.7	0.9	0.020
WIC1	9.0	0.4	0.035
WIC2	9.7	0.5	0.030
WIC3	5.4	0.8	0.040
WIC4	8.2	0.7	0.030
WIC5	8.0	0.5	0.045
WIC6	10.1	1.1	0.025
WIC7	6.5	0.4	0.050
WID1	7.7	0.6	0.030
WID2	11.1	0.4	0.035
WID3	10.3	0.6	0.045
WID4	7.7	0.8	0.035
WID5	7.5	0.5	0.040
WID6	9.8	0.4	0.040
WID7	7.1	0.4	0.030
WIE1	9.5	0.4	0.030
WIE2	11.7	0.8	0.045
WIE3	12.6	0.4	0.035
WIE4	3.2	1.4	0.035
WIE5	7.9	0.5	0.035
WIE6	7.5	0.3	0.050
WIE7	8.6	0.6	0.030
WIE7 AOV1	8.6	0.8	0.045
WIE7 AOV2	8.7	0.8	0.030
WIE7 AOV3	12.3	0.8	0.030
WIF1	11.0	0.7	0.045
WIF1 AOV1	13.2	0.6	0.045
WIF1 AOV2	9.8	0.4	0.040
WIF1 AOV3	9.7	0.5	0.045

b.

Site No.[1]	Au (ppb)	Pd (ppb)	Pt (ppb)
WCH5	2.0	0.5	0.25
WCH6	1.0	0.5	0.25
WCH7	2.0	0.8	0.38
WCI1	3.5	2.0	1.10
WCI2	1.5	1.5	0.95
WCI3	2.5	0.8	0.25
WCI4	2.0	0.5	0.25
WCI5	2.0	2.0	0.25
WCI6	2.0	1.3	0.50
WCI7	2.5	0.8	0.25
WIA1	1.5	0.5	0.25
WIA2	2.0	1.3	0.80
WIA3	1.5	0.5	0.25
WIA4	2.0	0.5	0.43
WIA5	2.0	0.5	0.48
WIA6	4.0	0.8	0.65
WIA7	2.5	1.0	0.95
WIB1	2.0	0.5	0.75
WIB2	2.5	1.0	0.65
WIB3	7.5	0.5	0.95
WIB4	2.5	0.5	0.53
WIB5	2.0	0.5	0.48
WIB6	3.0	0.8	0.85
WIB7	2.0	0.5	0.53
WIC1	2.0	0.8	0.85
WIC2	2.5	0.5	1.15
WIC3	3.5	0.8	1.75
WIC4	2.0	0.5	0.25
WIC5	1.8	0.8	0.85
WIC6	3.5	0.5	0.25
WIC7	2.0	0.8	0.68
WID1	0.8	0.5	0.53
WID2	1.3	0.5	0.65
WID3	2.0	1.0	0.43
WID4	1.3	0.8	0.95
WID5	1.0	0.5	0.48
WID6	2.0	0.5	0.25
WID7	2.0	0.5	0.43
WIE1	1.5	0.5	0.43
WIE2	2.5	0.8	0.48
WIE3	2.5	0.8	0.53
WIE4	2.0	0.5	0.25
WIE5	2.5	0.5	0.43
WIE6	4.0	1.5	1.20
WIE7	1.3	0.5	0.48
WIE7 AOV1	2.0	0.8	0.43
WIE7 AOV2	2.0	0.5	0.43
WIE7 AOV3	1.5	0.5	0.43
WIF1	3.0	1.0	0.53
WIF1 AOV1	2.5	0.8	0.25
WIF1 AOV2	2.5	0.5	0.80
WIF1 AOV3	3.0	0.5	0.53

Table A2.2 AA analytical data (a) HG-AAS/CVAAS, (b) FA-AAS (continued)

a.

Site No.[1]	As (ppm)	Se (ppm)	Hg (ppm)
WIF2	6.1	1.3	0.025
WIF3	5.8	0.3	0.025
WIF4	7.8	0.8	0.035
WIF5	10.6	1.0	0.040
WIF6	10.7	0.6	0.040
WIF7	10.5	0.9	0.040
WIF7 AOV1	9.9	0.8	0.040
WIF7 AOV2	8.8	0.6	0.050
WIF7 AOV3	10.1	0.7	0.055
WIG1	10.0	0.5	0.035
WIG1*	8.7	0.6	0.035
WIG2	10.3	1.2	0.040
WIG3	9.9	0.7	0.035
WIG4	10.0	0.7	0.030
WIG5	10.7	0.5	0.040
WIG6	8.9	0.5	0.035
WIG7	8.3	0.5	0.040
WIH1	7.7	0.4	0.010
WIH1*	8.7	0.7	0.045
WIH2	11.0	1.1	0.035
WIH3	10.6	0.5	0.040
WIH4	10.6	0.8	0.025
WIH5	10.1	0.6	0.050
WIH6	11.1	0.6	0.045
WIH7	10.2	0.9	0.030

b.

Site No.[1]	Au (ppb)	Pd (ppb)	Pt (ppb)
WIF2	2.0	0.5	0.25
WIF3	2.5	0.5	0.53
WIF4	2.5	0.5	0.58
WIF5	1.0	0.8	1.20
WIF6	0.8	0.5	0.58
WIF7	3.0	0.5	0.58
WIF7 AOV1	1.3	0.5	0.80
WIF7 AOV2	1.3	0.8	0.90
WIF7 AOV3	1.8	0.8	0.75
WIG1	1.3	0.5	0.53
WIG1*	1.5	0.5	0.25
WIG2	2.5	0.8	0.63
WIG3	0.5	0.5	0.75
WIG4	1.5	0.5	0.85
WIG5	2.0	0.8	0.80
WIG6	1.3	0.8	0.65
WIG7	1.3	0.5	0.58
WIH1	3.0	0.5	0.70
WIH1*	2.5	0.5	0.25
WIH2	0.8	0.5	0.48
WIH3	1.5	0.8	0.53
WIH4	0.8	0.5	0.43
WIH5	1.3	0.8	0.75
WIH6	1.3	0.5	0.90
WIH7	0.8	0.5	0.63

[1] See note 1 for table A1.1a.